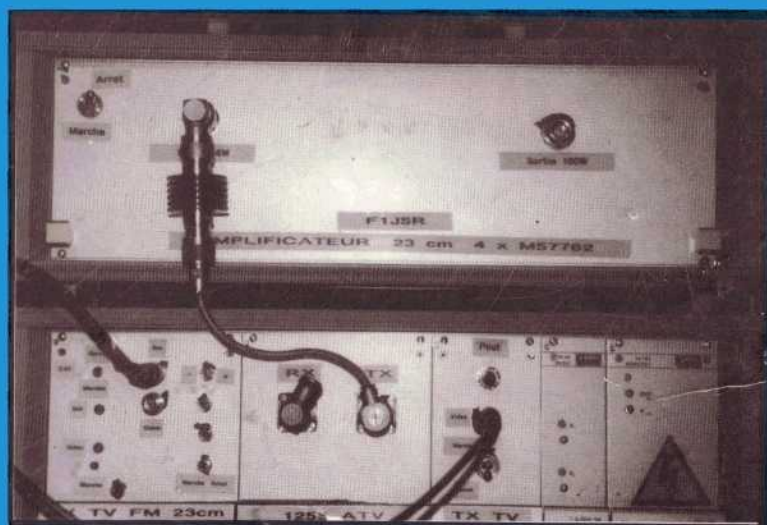


# CQ-TV



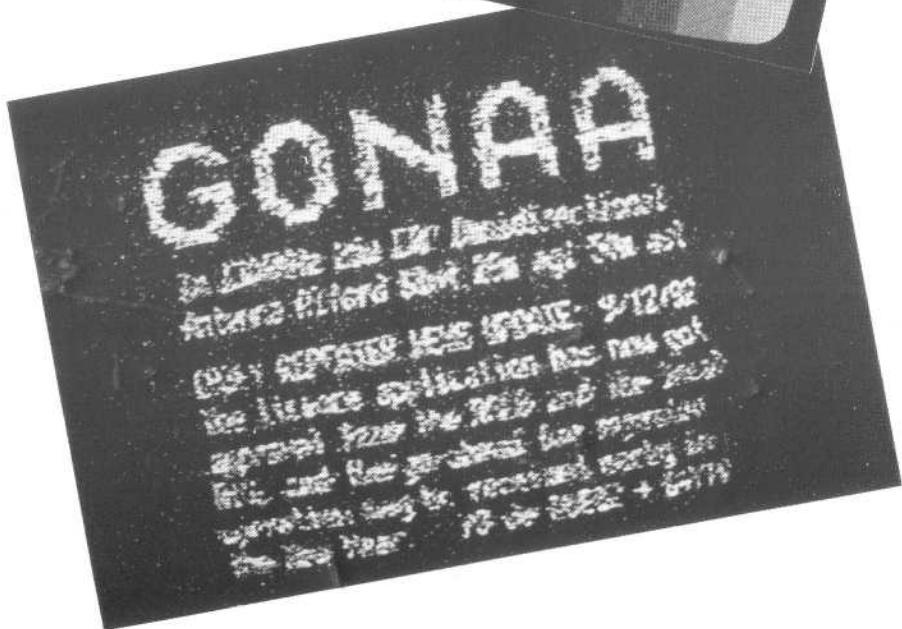
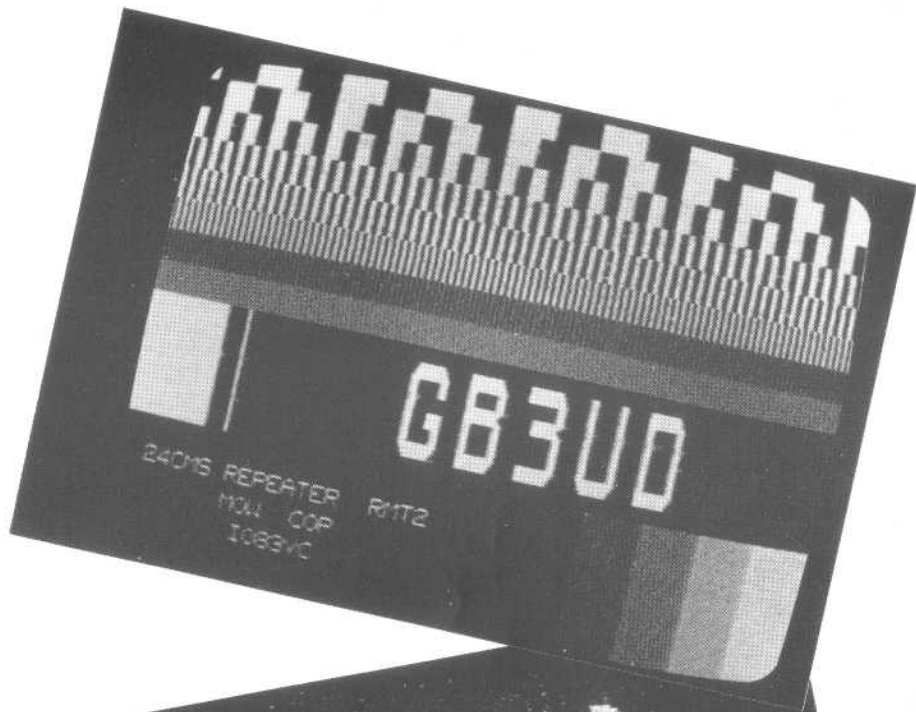
No. 162

May 1993



**A Solid State Broadband 80W Amplifier for 24cm  
Angel Vilaseca HB9SLV & Serge Rivière F1JSR**

**BRITISH AMATEUR TELEVISION CLUB**



Photographs from Dave Clarke G7KAO - see TV On The Air, page 63

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CLOSE FOR PRESS FOR THE NEXT ISSUE ..... 20th JUNE 1993

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The camera-ready artwork is produced on an OKI OL400 Laser printer.

The magazine is printed and bound by APEX PRINTERS of Rugby.

# POST

Dear Friends,

I am sorry to have to bring some bad news at the start of 1993, but my wife Eunice's long battle against asthma and angina came to a crisis point on the evening of Tuesday January 5th, and she was taken to hospital, where she died on Wednesday January 6th at 7.15 am.

Sadly yours ... Grant Dixon G8CGK

## GB3RT Coventry - Activity Review

This report was taken off packet from the G6WLM PMS. Steve G6WLM is the manager of GB3RT - not me as it states on one of its beacon video pages! I gave it away a long time ago ... Mike.

Well after the Wind & Rain over the past few weeks, RT is still active. How did your aerials fair?.

2/1/93

With conditions up GB3RT was seen as far south as Margate with P3+ reports. A selection of C/signs monitored through RT were: G8MNY...P4 G6GHP...P3 G8LES...P5 G4WIM...P5.

G8LES transmitted very interesting video on GB3HV, excellent explanation of the workings of GB3HV. Especially on switchable antennas and a Vic 20 as control unit. Thanks Mike.

G4WIM; I don't think this station was aware he was into RT, nice pictures through nevertheless. Hope to see you again Tim.

11/1/93

GOGIL informs me that when weather permits he is going to install 24cm aerial. He tells me he has received RT about P3 with the aerial standing on his landing. Looking forward to seeing your video when aerial fully installed. Sounds like a sensitive receive setup Gil.

12/1/93

G1YFI, after a slight hitch in his 24cm transmitter kit, John finally became active on the TV band with P5 pictures through RT with only 10mW. John's pictures were also seen direct on 1.5W by G0HOV in Wolston with a P2 report. He was very pleased as his location is in a dip.

31/1/93

G8EMX: P5 picture into RT, monitored whilst typing this update. I wonder how you are receiving RT now Graham. Good luck on your repeater project.

5/2/93

G6IQM: (who?) After an extensive aerial face-lift Mike called me to report that he could receive RT a P4 with a bare receiver, no preamp. The group and I are pleased to hear you might becoming active on ATV again.

8/2/93

G0HWC: P5 pictures into RT. I believe this was a first from that station. Paul from Northampton was in crossband with Len G8ONX. Paul's report for GB3RT was a P5.



Other local stations who have been seen are G1IJT, G8ONX and, last but not least, G0HOV.

73 ... Steve G6WLM

## THANKS

Dear Trevor,

I am writing this letter to thank you and the other gentlemen of the BATC - namely Chris and Paul - for all the help you have given me in resolving my 'monitor' project. I was disappointed that I couldn't use the SCART input of the TV set I had borrowed, but it seemed that it was not correctly wired - pin-20 did not accept the Sync input as it should have done. As it was a new set I did not feel inclined to dive inside it! Thanks anyway for the phone calls in search of the information.

My thanks also to Paul for producing a circuit that has enabled me to convert an old Sony Trinitron into quite a reasonable colour monitor and composite video source. I am sure a dedicated multi-sync monitor would give a clearer picture, but that is for the future!

So I now have a fully working SSTV set up, using the Superscan 2001 converter, and I can thoroughly recommend this unit to any other budding SSTVers - it was a pleasure to build and it worked as soon as I applied power! A couple of small problems remain to be sorted out and I am working on these as time permits.

I am now looking forward to the bands opening up a bit, so as to get some good contacts in super colour SSTV - what a

pleasant world to see these pictures in colour - a great improvement over my Spectrum B&W original set up.

I have had some good contacts on 80m and 20m, but would like very much to make some local contacts on 2m. I know there used to be a net in the north Essex area, but I haven't heard it lately. Do you happen to know what fate has befallen it?

Perhaps you could put a mention in CQ-TV sometime, Trevor. I live in South Suffolk, between Ipswich and Colchester and would welcome some local activity on SSTV.

Once again, thanks for all your help - 73 ... Nigel

*Our esteemed leader passed your letter on to me Nigel, so I decided that discretion was the better part of valour, dropped my Total Editorial Control stance, and decided to publish it !! ... Mike.*

## WRONG AGAIN!

Dear Mike,

Glad you were able to use my contribution about inductors (CQ-TV 161, p74), unfortunately an error has occurred in the example tables, mH should read uH.

Also, although I'm not in a position to offer corrections, the circuits of the 'BATC 23cm ATV Rx' have a number of errors that would make construction difficult. Several components are not identified and C24 and C21 are obviously the wrong value on the components list, to name but two.

Thirdly, do you have a spare copy of the

# NEWS

Mag<sup>2</sup>, please, as my copy has two blank pages (24-73 unprinted).

Lastly, thank you for your effort in producing the magazine.

73 ... John Cronk GW3MEO

*Many thanks for your letter John and your submissions to the magazine and apologies for the error in your last article. Concerning the "£cm Rx please refer to 'In Retrospect' on page 73 of this issue. Concerning the unprinted pages - at least I can pass the 'buck' on that one !!! ... Mike.*

## CONVENTION 93 TALK-IN

Dear Mike,

Thank you for your invitation to attend this year's Rally at Harlaxton Manor and your kind offer of a free table.

I can confirm that we will provide the Talk-In station again this year. As before, the station will be on the air from 0730 hours and will stay open for as long as required.

We will operate on S22, SU22 and via the local 70cm repeater GB3GR.

Regards ... John Kirton G8WWJ, Secretary Grantham Radio Club

*John, on behalf of the Grantham Radio Club, please accept our grateful thanks from myself, the Committee and the Club for your help and efforts in making our Convention a success ... Mike*

## HOME COUNTIES GROUP NEW MAN !

At the Home Counties ATV Group Annual General Meeting after a long discussion of the future of the club it was decided to continue the clubs objective of holding regular meetings and to try to improve the attendance.

The meetings are held at the Binfield Club on the B3034 near Reading on the 4th Tuesday each month. a series of lectures and demonstrations are planned.

Full details of events and membership are available from the clubs *new* secretary ; Brian Summers G8GQS 0895 810144.

## WIRELESS WORLD

An interesting article appeared in the March issue of Wireless World (it will always be WW to me!) written by John Cronk GW3MEO describing his 24cm ATV Rx.

## MONEY MATTERS

The BATC's Accounts and treasurers report for last year are now available to any member who wants a copy. Write to B. Summers Hon. Treasurer, 11 Harefield Road, Uxbridge, Middlesex, UB6 1PH.

# AFFILIATED REPEATER GROUPS

Repeater	Channel	QRA	Location	Contact	Telephone
GB3ET	RMT2	IO 93 EO	Emiley Moor	B.Keedy G6LIC	0924 822605
GB3GT	RMT2	IO 75 UV	Glasgow	A.Beale GM1FML	041 445 3060
GB3HV	RMT3	IO 91 OO	High Wycombe	M.Sanders G8LES	042063859
GB3KT*	RT2R	JO 01 MI	Hoo Peninsula	D. Clarke G7KAO	0322 220536
GB3RT	RMT3	IO 92 CJ	Coventry	S.Simmonds G6LWM	
GB3TG	RT103	IO 91 PX	Milton Keynes	D.McQue G4NJU	0903 378 277
GB3TN	RT2	JO 02 KS	N.Norfolk	M.Farnsworth G4WVU	
GB3TV	RMT2	IO 91 RU	Dunstable	D.C.Asquith G4ENB	0582 27907
GB3UD	RMT2	IO 83 VC	Stoke-on-Trent	T. Burndred G0KBI	0782 2886
GB3UT	RMT1	IO 81 JU	Mendip RG.	M Edwards G8CPF	0225761296
GB3VI	RMT1		Hastings	E.C.Vast	0424 424845
GB3VR	RMT2	IO 90 WT	Brighton	D.Stewart G4HSY	0903 212373
GB3ZZ	RT2	IO 81 RM	Bristol	S.O'sullivan G8VPG	0225 873098
G4ECT*	Cheshunt & District A.R.C.			R. Brunton G4TUT	081 804 3704

Other ATV groups who are BATC members:

N.B.T.V. Group				D. Pitt	0602 282896
G4HTV	G4HTV Amateur Radio Club, Bristol				
VK4BTV	South East Old ATV group, Chermside, Queensland, Australia				
VK2RFM	Australian ATV Club, Liverpool, NSW, Australia.				
G5FZ	Lincoln Short Wave Club				
FF6KFQ	CENG/AAC/Radio Club, Grenoble Cedex, France				
G7BTI	British Telecom A.R. Group, Madley				

Non Affiliated Repeater Groups:

GB3TT	RT2R	Chesterfield
GB3CT	RT2	Crawley
GB3GV	RT2	Leicester (Temp Low Power)
GB3NV	RT2R	Nottingham
GB3LO	RT2R	Lowestoft (Temp Low Power)
GB3PV	RMT2	Cambridge

**BATC contact: B.Summers G8GQS, 0895 810144**

# The BATC BBS (Bulletin Board System)

**Chris Smith G1FEF**

The BBS has now settled into its new home, after a few teething problems, not least of which was the letter sent out to all regular users, informing you of the new (wrong) number! Our apologies for that, next time I won't ask the BT engineer what the number is, I'll wait for the paperwork! For anyone still not sure it is:

## 0933 413396

The hardware has changed a bit as well, the software now runs on a 286-12 PC clone and is attached to a LAN (Local Area Network). This means that the hard disc space limitation of 60MB's has now been overcome, the file server on the network has a 300MB hard drive, so there's plenty of free space now. Also, by the time you read this, the modem will have been replaced with a modern, high speed unit. If all goes well with the installation, you should now be able to log on at any of the following speeds:

V21 - 300/300 Baud

V22 - 1200/1200 Baud

V22bis - 2400/2400

V32 - 9600/9600 Baud

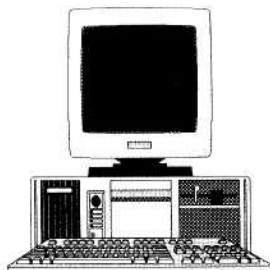
V32bis - 14,400/14,400 Baud

Also, V42bis data compression and MNP2-5 error correction protocols are supported. So whatever your modem's capabilities our modem should now be able to match it.

Once again, I would like to invite everyone to contribute to the growth of our BBS, there seems to be a dedicated dozen who do all the work, uploading new software, taking part in the conferences, etc. Whilst the other 120+ users just download software and take little or no part in the message side. Please, if you have ANY ATV RELATED material, upload it to the BBS. If you have any interesting ideas or information on an ATV subject, let us all share it. Finally, remember that items for inclusion in CQ-TV can be uploaded to the BBS as well.

We hope to demonstrate the BBS at Harlaxton this year, so if you have any questions or just want to see what it's all about, come along and say hello.

Chris Smith - Sysop



# CONVENTION '93

## THIS YEAR'S HARLAXTON

Things will be slightly different at this year's Convention - nothing too drastic, but it is worth explaining the background.

The University of Evansville, which operates Harlaxton as its European campus, has in common with many organisations, been experiencing a downturn in economic activity. To help secure the future of this magnificent manor, large sums of money have been invested in what they call the 'garden Project'. This involves the rejuvenation of 200 acres of land, gardens and lake around the Manor House.

Starting this Spring, the Harlaxton Authorities are to admit the general public for an entrance fee of £2.50.

We thus faced a problem as they would not waive the charges on the day of our Convention. However, it has been agreed that any person, or group of persons, bearing the **ENTRANCE TICKET** on the **label carrier with this magazine**, or a copy of any **CQ-TV**, or a copy of any **RadCom** (or photocopy) will gain entry for the usual £1 each. This will gain you entry to **EVERYTHING**, the Convention and the Garden Project.

So, everything will be as normal provided that you **REMEMBER TO BRING A MAG !!!!!**

Please tell your friends and colleagues who might be coming along - it will save them money!

At a time when many medium-sized rallies such as ours are being squeezed by their hosts (sometimes to extinction) Harlaxton represents a very cost-effective venue for the resources provided. Having researched the situation it appears that we will be hard-pressed to find a similar venue with its facilities at a similar cost. Unless, of course, it's on the Isles of Scilly or Benbecula ! (*Now there's a thought! ... Mike*).

Paul Marshall, Convention Organiser

**ACCOMMODATION:** As usual, accommodation is available at the Manor for those wishing to stay overnight. We have been advised that the evening meal has been improved and that it will be available for a longer period this year. The charges are as follows:

Single Room: Bed & Breakfast £18.00 Bed and Breakfast and Evening meal ... £24

Twin Room: Bed & Breakfast £36.00 Bed & Breakfast and Evening meal £48.00

**Please Note:** ALL accommodation applications **MUST** be made direct to Harlaxton Manor. Please address your enquiries to: Mrs. Watkins, Harlaxton Manor, Harlaxton, Nr.Grantham, Lincs. Tel: 0476 64541.

**CARAVAN & CAMPING:** As last year, pitches will be £7.50 each and **MUST** be booked in advance. Please contact me (Mike Wooding) at the editorial address with your reservations. All pitches to be paid for in advance - I am still owed £14 from 1991 which I trustingly paid for an ex-member who kindly forgot to pay me back !

**THE NIGHT BEFORE:** Yes, your committee will be available en masse in the bar on Saturday night. However, just to confuse us all we shall be using a different bar. Directions will be posted on the doors. We would love to see you there, especially if you come to ply us with ale, rather than with mumbles of malcontent, etc.

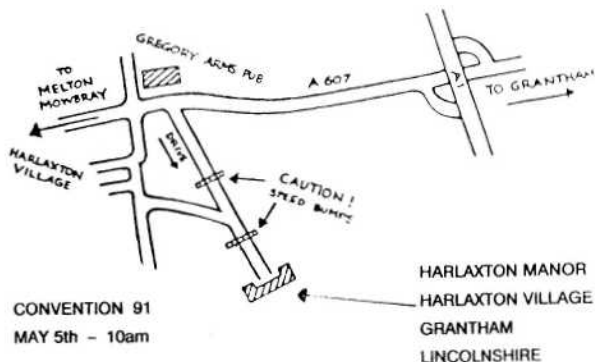
**VOLUNTEERS:** In previous years it has been very pleasing to see the number of members helping. If you can spare an hour on the day please contact Paul Marshall on 0532 703348 before the event. We start the day at 0600 hours - **DO YOU ?**

**TALK-IN:** talk in will again be provided by the Grantham radio Club. The station will be on the air from 0730 and will operate on S22, SU22 and via the local 70cm repeater GB3GR.

**OPENING TIME:** (The Convention not the pubs!) Doors open at 10.00, this also applies to those staying overnight on Saturday (unless you are a trader, or an exhibitor - or even (hint, hint) a volunteer helping to set up!). Quite apart from some of the best bargains going before the doors open, the traders and exhibitors object to people under their feet when setting up shop.

**CAR BOOT TRADERS:** Please identify yourself at the gate, whereupon you will be charged the fee (£5 upwards depending on size and space required). Please note that the trading area will be located in a different place to previous years. **YOU MUST** follow directions exactly, otherwise you may be required to leave.

That's it then. I, along with the Committee, look forward to seeing you all there. We hope you have an enjoyable day, it helps make all the effort worthwhile ... Mike



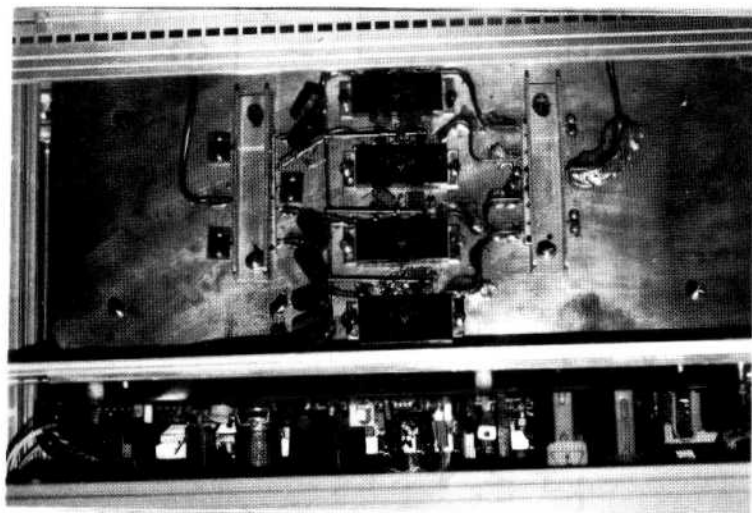
# A Solid State Broadband 80W Amplifier for 24cm

Angel Vilaseca HB9SLV and Serge Rivière F1JSR

## DESCRIPTION

This circuit produces 80 Watts of RF on the 23cm band, with 4 Watts of drive. It is made with four coupled hybrid amplifiers M 57762 from Mitsubishi.

One of the most interesting points about the unit is that it can be used for mobile or portable use, because it only needs a 12 volt power supply. It is rather compact and can be fitted into a standard 19" rack. It weighs about 10kg with its switching power supply, so it can advantageously replace a 2C39 tube amplifier. For the owners of QRO tube amplifiers (F 6007, TH328, 338, ..., types), this circuit can be used as a driver. Unlike tube amplifiers, this amplifier is suitable for all modes. It is broadband, which allows for ATV use, and does not drift, which means that no retuning is required during operation. The broadband qualities of the individual amplifiers are retained in the global circuit, because we used broadband power splitters.



Photograph 1



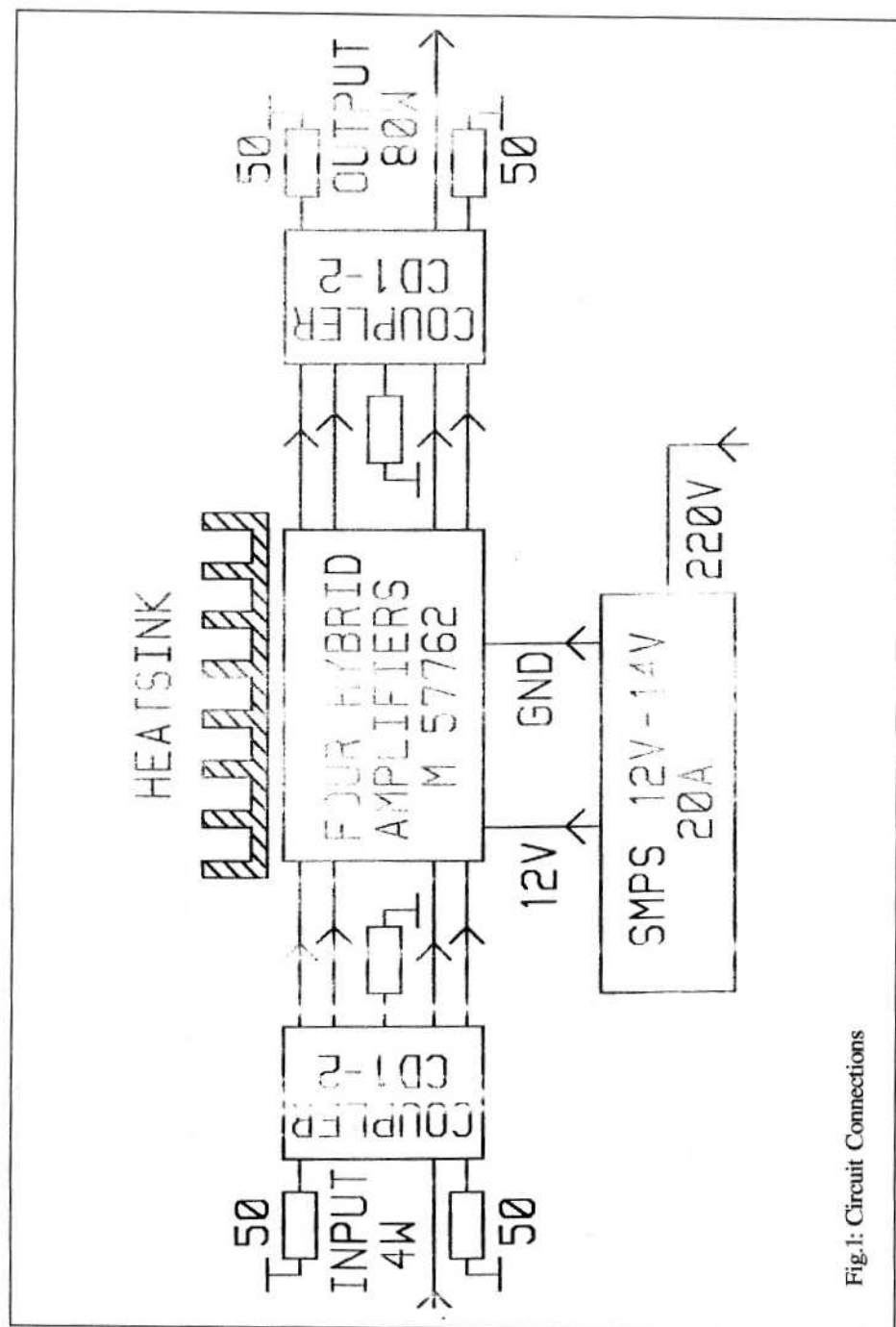


Fig.1: Circuit Connections

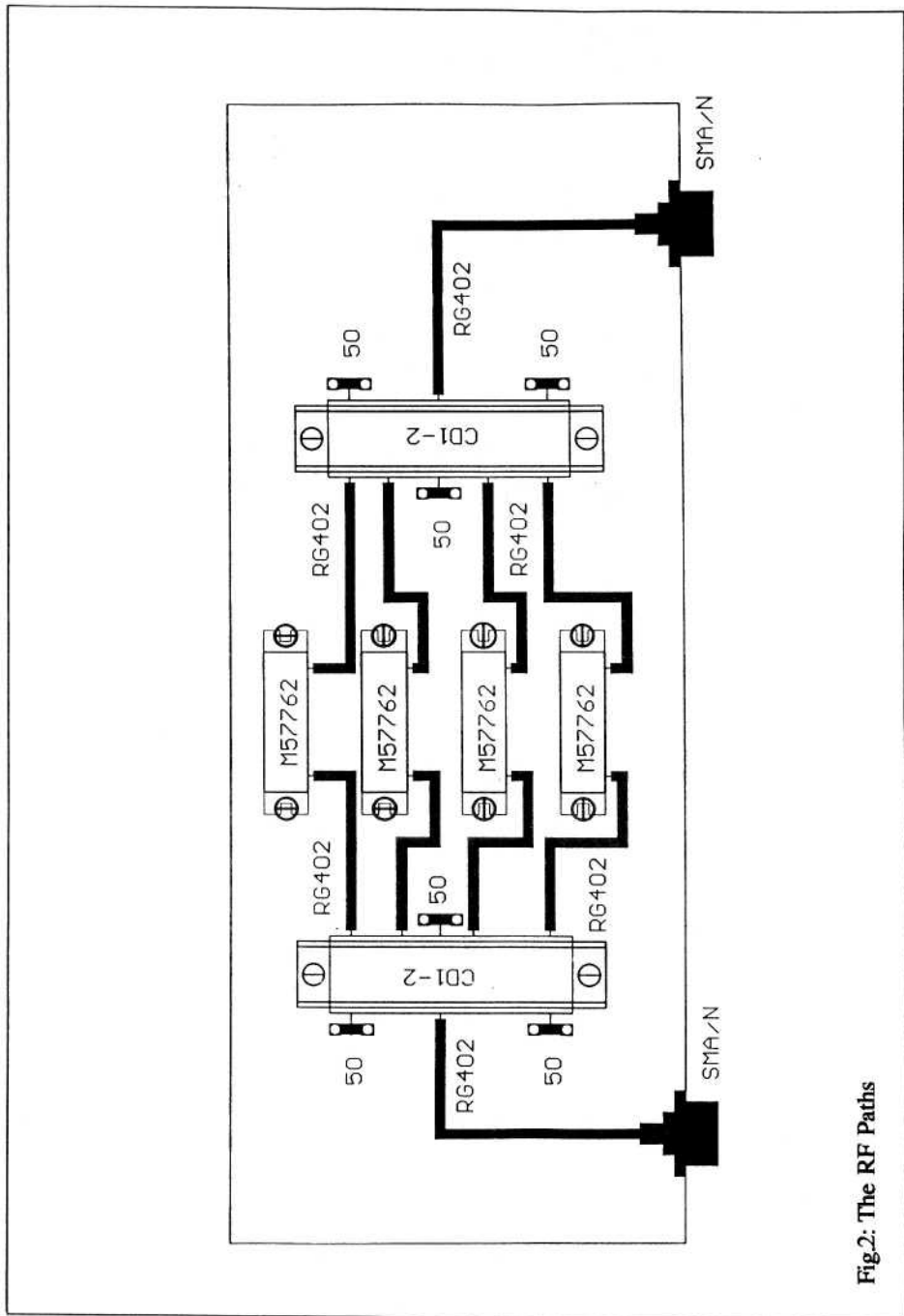
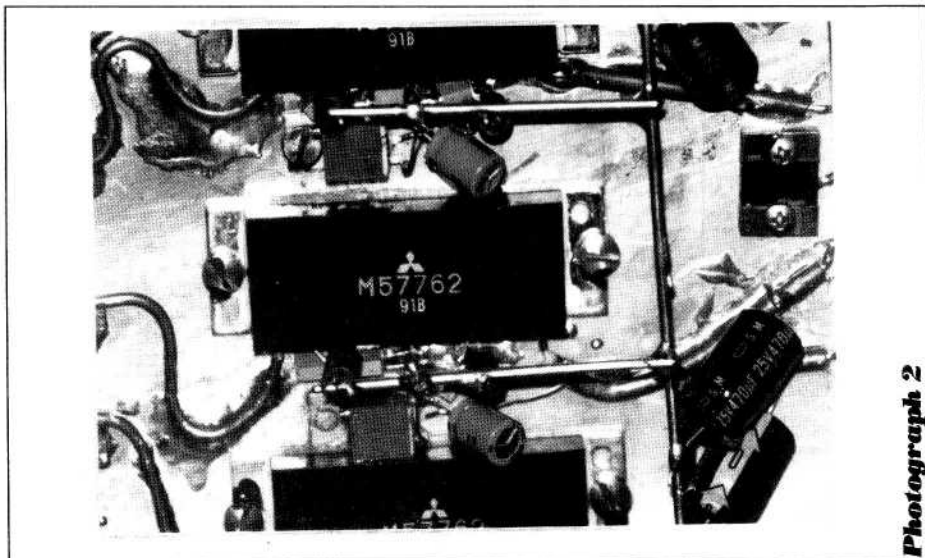


Fig.2: The RF Paths



**Photograph 2**

Multi-'brick' amplifiers have been described before, using splitters made up of four coax stubs. Although much cheaper, such an approach requires extreme care to be used in the realisation to avoid unbalances. Unbalance produces losses, thus decreasing both gain and power output capabilities.

Furthermore, a coupler made from coax has a much narrower bandwidth than with hybrid couplers, which means that the broadband capability of the hybrid amplifiers is also lost in the global amplifier. This can be a disadvantage for FM ATV operation for example.

The circuit connections are shown in figure 1 and the RF paths can be seen in more detail in figure 2 and in photographs 1 and 3.

The input RF power reaches the four-way power splitter through low-loss (semi-rigid) coaxial cable. The power splitter is broadband and needs only 50 ohms low-reactance resistors, which can be seen in photograph 2, as external components. The latter are required to absorb any unbalance at the splitter's outputs.

With 4 Watts at the amplifier's input, allowing for a slight insertion loss in the splitter and the coax stubs (0.3dB global) about 1 Watt comes out of each of the four splitter outputs, and is brought through four identical lengths of semi-rigid coax to the four hybrid amplifiers' inputs.

Power supply decoupling is very important and must be carried out using good quality capacitors and short leads at each hybrid amplifier's power input.

No printed circuit board is required for the amplifiers to avoid losses. RF input and output leads are soldered directly to the coax inner conductors. The same technique is

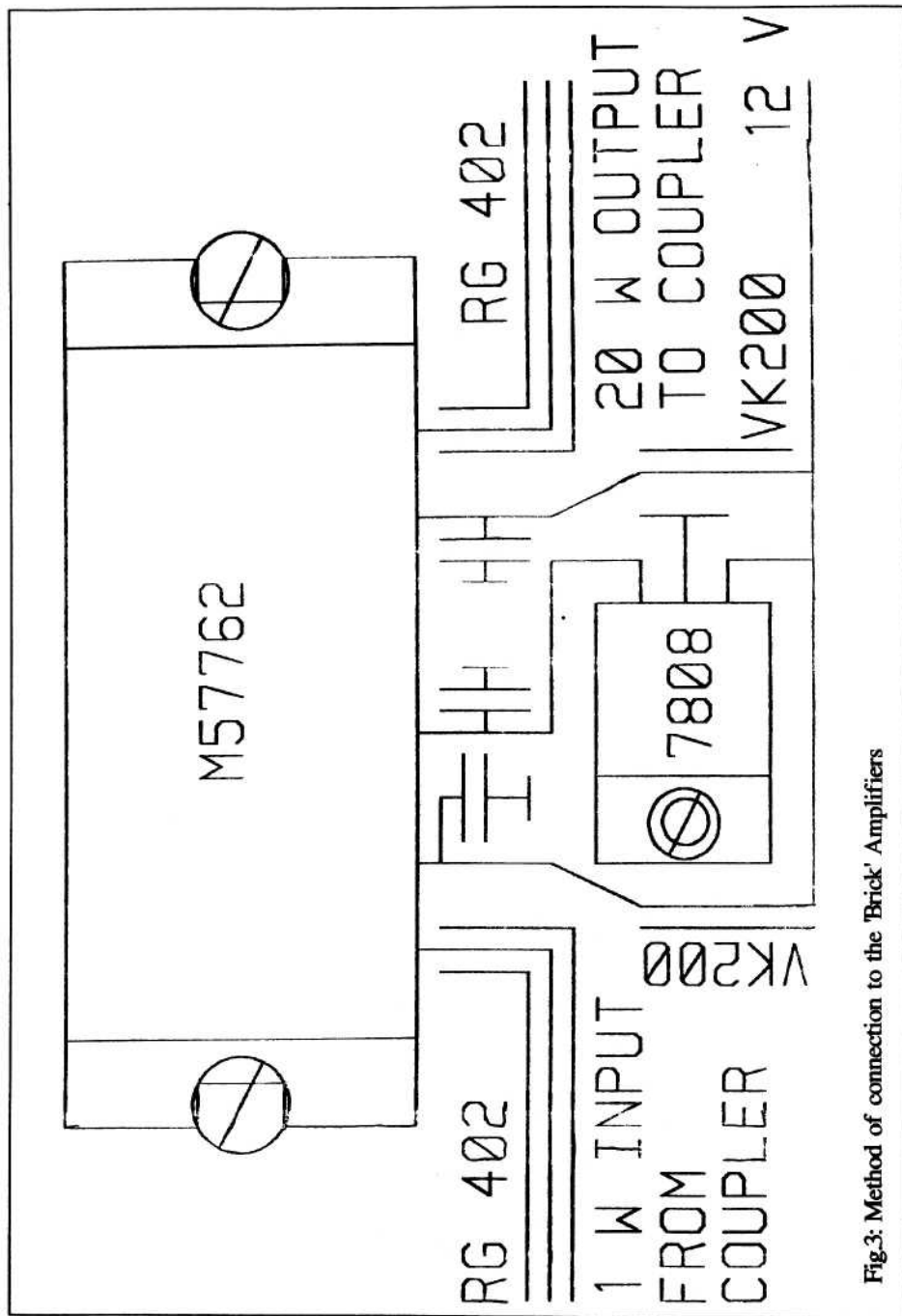


Fig.3: Method of connection to the 'Brick' Amplifiers

used for the power supply leads. This can be seen in figure 3. Photograph 3 shows a close-up view.

The outputs of the four amplifiers are connected with semi-rigid coax to a second hybrid power splitter, which is used the other way around to merge the outputs from the four hybrid amplifiers. Three balancing resistors are also used here, somewhat larger than at the input.

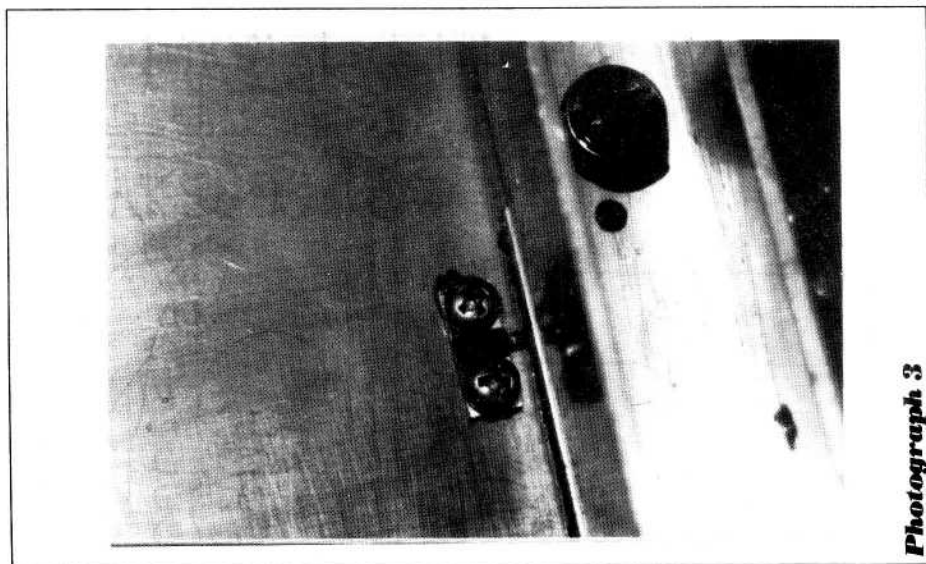
Semi-rigid type RG 402 coax cable is used throughout the RF paths. It has low losses, can be readily soldered and its power handling capability is quite high at these frequencies.

The whole circuit is mounted on a large copper plate, which acts as a ground and is bolted onto an aluminium heatsink. About 200 Watts will have to be dissipated and a fan can be useful here.

The coax stubs are soldered directly to the copper plate, which makes a very stable assembly. This is essential in this kind of circuit.

The 50 ohm resistors and the hybrid amplifiers are bolted to the heatsink. The copper plate and the heatsink are drilled together. The holes in the copper plate are then slightly enlarged and only the heatsink is tapped. The 6dB hybrid couplers are pressed against the copper plate by a U-shaped metal profile, visible in photographs 1 and 2.

The power splitters' packages must make good contact with the copper plate on their whole length. This requires small holes to be drilled in the copper plate to make space for the rivet heads in the splitters' packages.



**Photograph 3**

Thermal compound should be used under the hybrid amplifiers and between the copper plate and the heatsink. It should be stressed that the final quality of this circuit depends mainly upon the mechanical stability of the assembly and the quality of the RF connections.

## TESTING

This is the easiest part, because there is nothing to be tweaked ! Connect a 50 ohm 100 Watt 1.2 GHz specified dummy load at the output through a power meter and another dummy load at the input. Turn the power supply on and check that the 12 volt and 8 volt rails on the amplifiers. Check that NO RF is present at the output.

Turn the power off and replace the dummy load at the input with an RF generator at the correct frequency. Increase the power progressively at the input and check the output power as well as the balancing resistors temperature, which should not rise at

all unless there is an unbalance somewhere ! The gain must be about 15dB.

The test equipment used was:

- HP 435A Power Meter
- HP 8481A Power Sensor
- Narda 769 30dB Attenuator
- HP 8558B Spectrum Analyser
- HP 8444A Tracking Generator
- HP 5386 Frequency counter

On our prototype the impedance match was better than 25dB from 1240 to 1310 MHz. Saturated output RF output power was 80 Watts with a 12 volt power supply, 90 Watts with 13 volts supply and 100 Watts with 14 volts.

Power supply current is of the order of 18 Amps at 13 volts and output power is saturated and 20 Amps at 14 volts. Figure 4 shows power output versus power input.

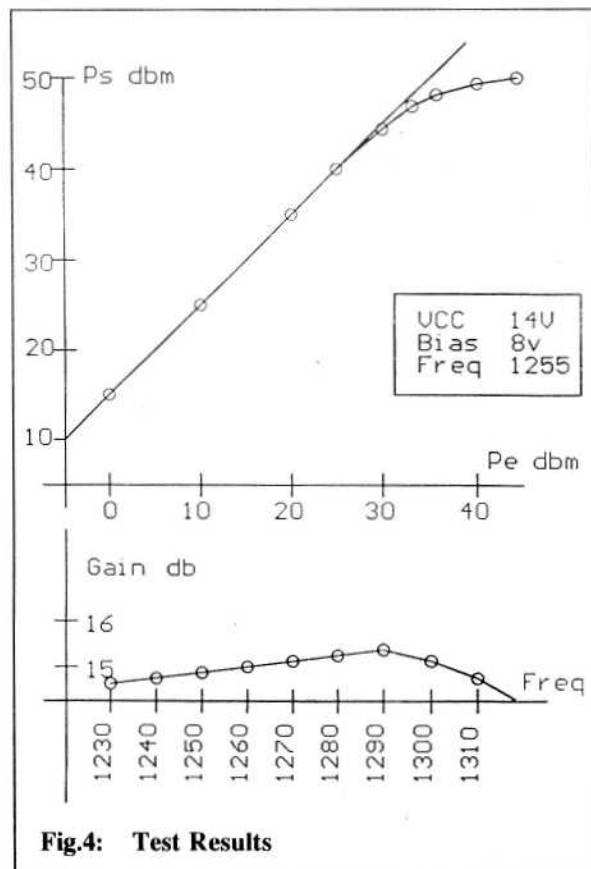


Fig.4: Test Results

The amplifier and an ATV transmitter are shown in the photograph on the front cover. Our thanks go to Marc F3XY for confirming our results.

## PARTS LIST

1m	RG 402 Semi-Rigid Coaxial Cable	RS Components
6	Resistive Loads	ELHYTE SARL type T-250-500-10
2	6dB Couplers	Nucleudes SCD type CD 1-2
4	Hybrid Amplifiers	Mitsubishi type M 57762; RF Parts Co.

### Suppliers addresses:

Elhyte Sarl, B.P. 34, 91620 La-Ville-Du-Bois, France. Tel: 16 (1) 69 01 68 51

Nucleudes SCD, Av. du Hoggar, Z.A. du Courtabeuf, B.P. 117, 91944 Les-Ulis 2, France. Tel: 16 (1) 69 07 10 20

RF Parts Co., P.B. 700, San Marco, California, USA

# KM PUBLICATIONS

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Motorola/SM6MOM-W6 PUFF supplement	£ 11.00
Siemens S-parameters	£ 9.50
Philips S-parameters	£ 14.50
HP AppCad/HP	£ 16.50

P&P please add £1.50 for U.K.,  
£2.50 for Overseas surface, £7.50 for Air Mail

**KM Publications, 5 Ware Orchard, Barby, Nr.Rugby, CV23 8UF**  
**Telephone: 0788 890365 \* Fax: 0788 891883**



# USING TELEVISION - Part 1

Norman Ash G7ASH

## Introduction

**There is a general tendency in technological hobbies, for the enthusiast to be naturally captivated by the technology itself. But with television, its fantastic potential usage is equally exciting.**

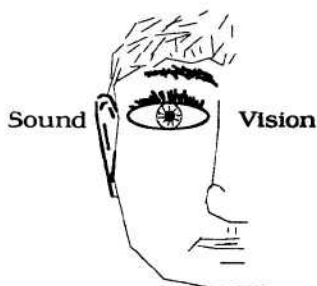
**In this series of articles, I shall be looking at using television, as well as presenting and producing the content for such use. This is a fairly neglected aspect of Amateur Television, but one, I believe most ATV enthusiasts would be more than a little interested to know more about.**

## Part One : Qualities

Methods and techniques are based upon the 'qualities' which television has. It is these we need to exploit. If we are ignorant of them, or choose to ignore them, then television usage is very likely to be much less effective.

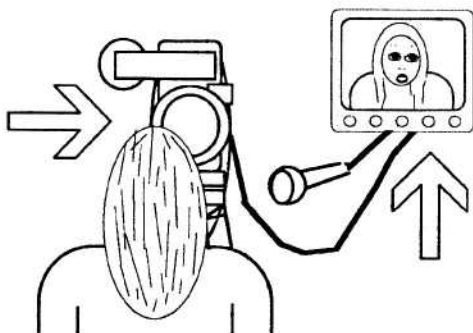
Television is by no means 'played out' or 'closed to further development'. As true amateur experimenters, you have every opportunity to develop methods and techniques, new to television, as well as use existing ones.

## Vision and Sound



television uses our most powerful senses

**Vision & Sound**



television's principal use is in **Human Communication**

*It is highly effective for this role because it uses our most powerful senses.*

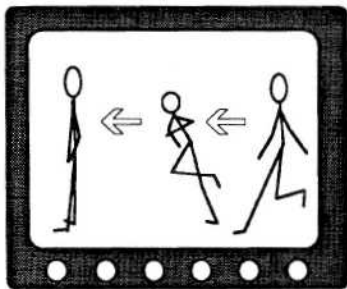
## Time

Television is said to be a **time based medium** :

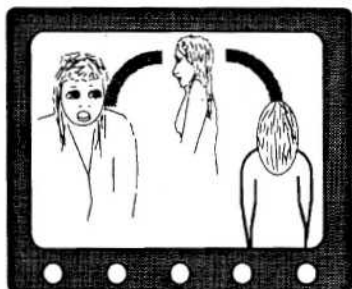


The ability to change information over time (in both **Vision** and **Sound**) makes television able to communicate particular information, which other media cannot.

Television is able to communicate visual aspects, such as movement and three dimensional information.



*Movement*



*3 Dimensional*

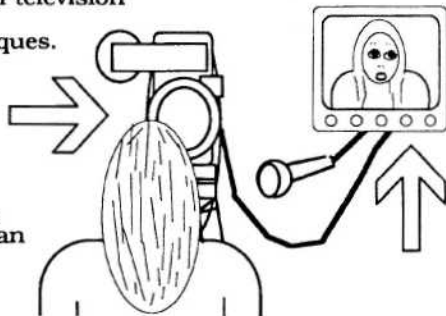
The sound also can similarly communicate movement, position and space, using two or more sound channels.

## Immediacy



**In many ways television is similar to film.**

In fact, many of the methods and techniques of television have grown out of filmic methods and techniques.


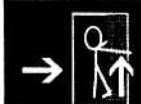

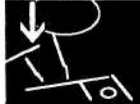


The main difference between film and television is that television can communicate immediately.

## Manipulative Control

The television Producer can manipulate the vision and sound to effectively convince the viewer of what the Producer wants. This may not be what actually occurs.

-what's the message here ?

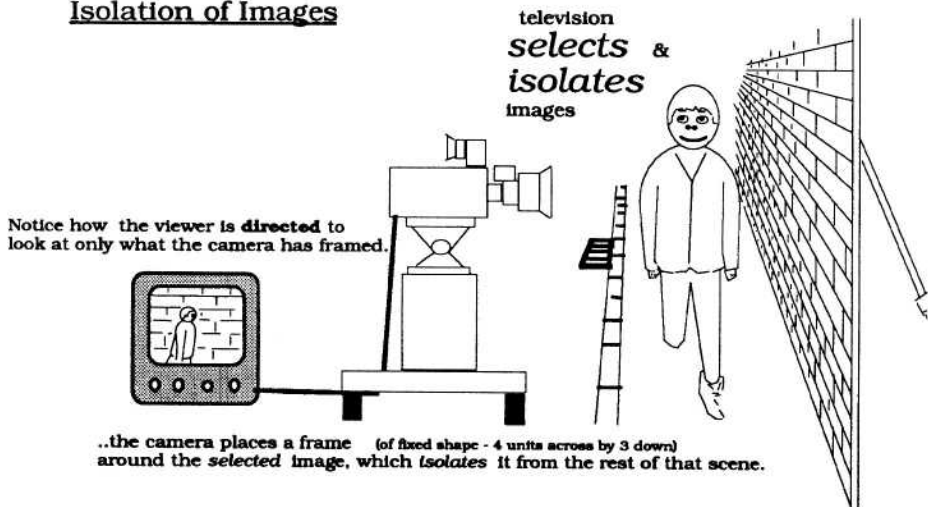
description	man in silhouette crosses the screen	doorway-man arrives/opens -enters	man appears from behind camera -walks away	man appears over baby in cot
Vision				
Sound 1st version	baby yelling & screaming		woman screams (climax)	
Sound 2nd version	nursery rhyme music (strings)		giggles	

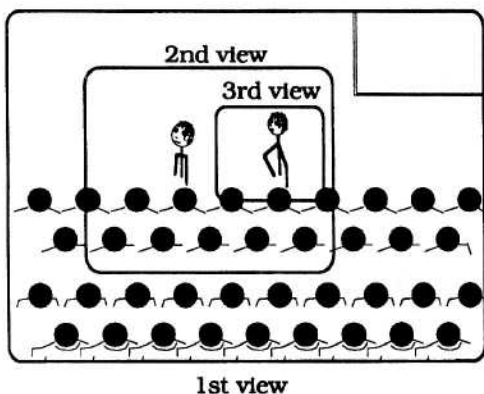
Notice how the whole meaning of the same vision is changed by the different sound versions. It shows that both vision and sound can be used to effectively carry the message - when this is combined, it has a very powerful 'reinforcing effect', which helps to convince the viewer of what you want to express.

Think in terms of...  
the **sound** reinforcing the **vision**  
or  
the **vision** reinforcing the **sound**

Think in terms of...  
**which is the best medium**  
for expressing your message,  
vision or sound ?

## Isolation of Images

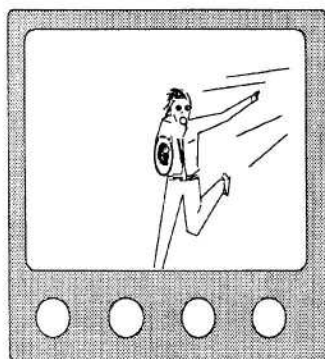




If you were a member of the audience (left), you could establish where you were and where other features were, in relation to each-other.

On television, we have to show the viewer these relationships first, before we look closely at what is going on.

Notice how in this example the subjects are presenting themselves to a 'live' audience and not to the camera (which is simply '*observing*' what is going on). This has the effect upon the viewer of being **excluded** from the proceedings.



Here the subject is presenting directly to the camera - involving the viewer directly.

This technique is used a lot where the camera takes a 'role' in the action (therefore the audience experiences the action from this role).

Notice how, in this example that the subject will have the same effect directly upon each viewer (contrast this with the example above, where the presenters cannot constantly direct their presentation to each individual in the live audience).

*television is known therefore as a..*  
**'one to one' medium**

### Effective Communication

You may say, many Amateur television operators just want to communicate over the air - *well exactly* !

**Effective communication** (even in a very simple way) means making television technology exploit these inherent qualities, rather than them work against you -

work against you - here's an example of what I mean :



"this is G7ASH transmitting from the 1993 ATV convention"

*caption on the screen*

*station talkback*

The viewer is receiving two conflicting messages simultaneously .. they switch off from taking in your messages and start to figure out what the two messages have in common, in order to make sense of it (if they already know, then one or other message is not necessary anyway!)



*What about this example ? :*

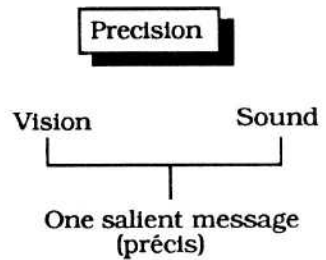
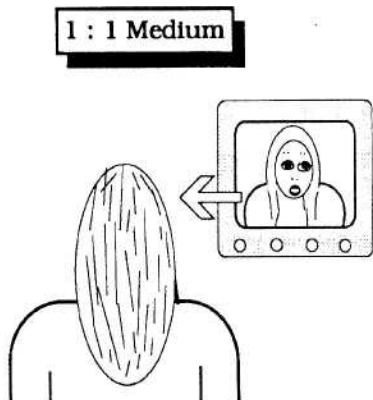
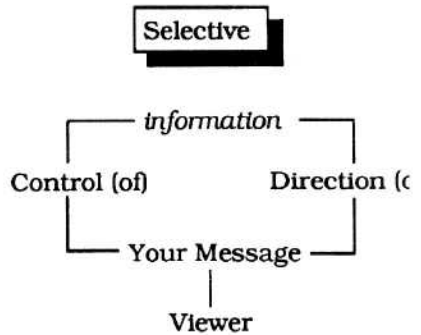
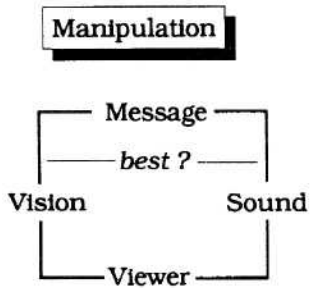
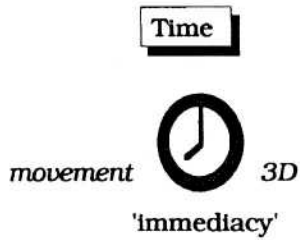
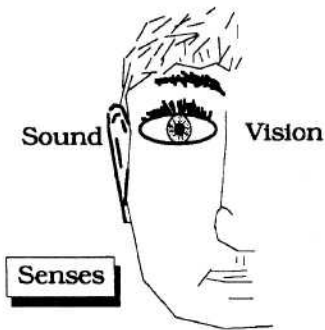
"this is G7ASH transmitting from the ATV convention near Grantham"

*caption on the screen*

*station talkback*

In this case the sound (talkback) is reinforcing the vision (caption) information; the message is clear and unconfused. Information which is obvious, or unimportant has been left out.

### Summary



**So in large or small scale use of Amateur Television, the exploitation of televisions qualities will make for more effective communication and a high standard of presentation.**

**If I've got you thinking ! - then look out for part two, in which I shall be looking more closely at the methods and techniques involved.**

*Normally material supplied by authors for the magazine is prepared and edited by myself and master artwork produced on the Club's laser printer. However, in this case the material supplied by Norman is of such a high quality, and equally so as not to cause detriment to the professional artwork layout, I decided to use Norman's original material as supplied and, courtesy of a bit of KM Publications hardware, scan Norman's artwork in as an image. This means of course, that the fonts and text size will vary from my norm, but I hope that the effect that Norman intended has been preserved ... Mike*

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## **GB3TM - a 24cm ATV Repeater for North Wales**

Work is nearing completion on an Amateur TV Repeater for North Wales operating in the 24cms band. The station will be located at Nebo, an exposed location 144 metres above sea level and 2km east of Amlwch on the east coast of the Isle of Anglesey.

The site has panoramic views and signal paths extending across the sea to the Isle of Man in the north, eastwards to the Lancashire coast and along the North Wales coastal strip. Southwards the signal path crosses Anglesey to Snowdonia and westwards it crosses the Irish Sea to the coast of Ireland. The location is an established PMR site, National Grid Reference SH 471 906 and the repeater aeriels will be positioned on the main mast approximately 10 metres above ground.

The repeater licence has now been issued, the Call Sign being GB3TM -Teledu Mon (Television Anglesey in English). The repeater will operate with horizontal polarisation on Channel RT2R, with an input frequency of 1249MHz and an output frequency of 1316MHz. The receiver will accept input signals which are frequency modulated with 625 line video (System I) having 6MHz intercarrier sound.

The amateurs in the ATV Repeater Group are Barry GW8FEY (transmitter construction and testing), John GW3MEO (receiver and aerial construction), John



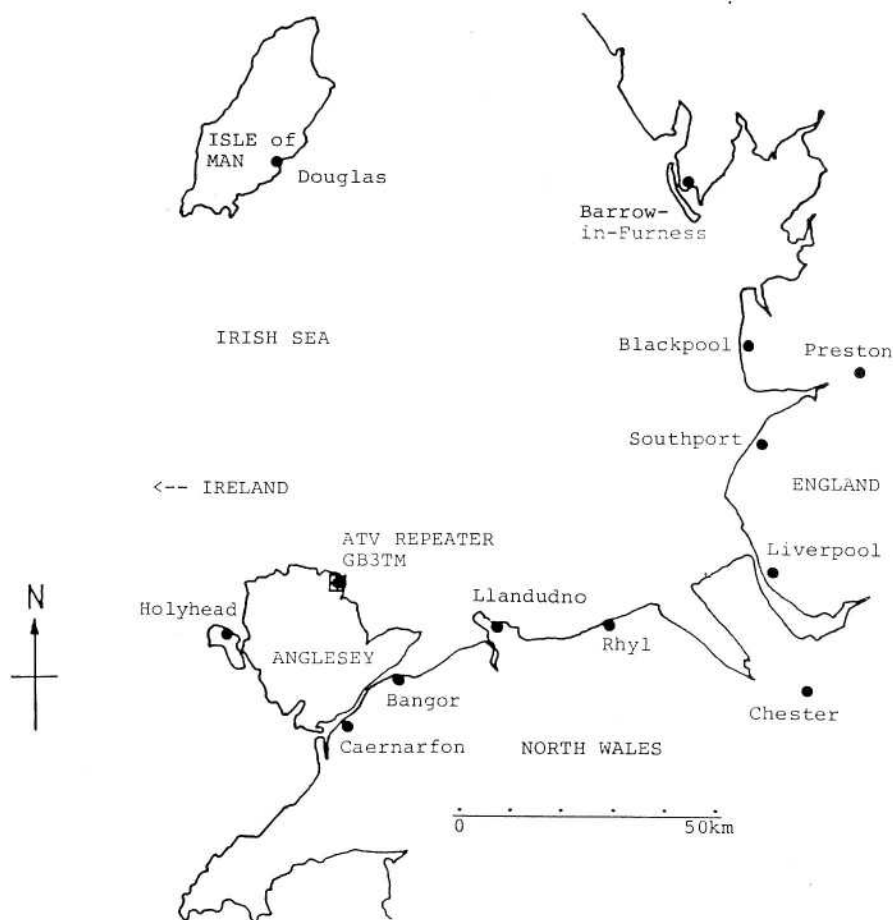
GW3JGA (technical planning and measurements), David GW8PBX (computer control) and Brian GW4KAZ (Licence and site planning), Brian is also the Chairman of the local Arfon Repeater Group through which the Licence application was made.

The Group wish to thank the GB3ZZ (Bristol) ATV Repeater Group for providing the control software, which was originally developed for their repeater, and in particular Brian Kelly GW6BWX for his help and advice.

It is hoped that the station will commence testing, initially in beacon mode, shortly after Easter 1993, when reception reports will be most welcome.

For further information contact Brian Davies GW4KAZ, daytime phone 0286-674166 Ext. 2130 or via Packet Mailbox GB7ABB

Submitted by:- John Lawrence GW3JGA, 40 Aberconway Road, Prestatyn, Clwyd LL19 9HL Tel. 0745 85325



# AN INTERNAL 24cm SWR BRIDGE

**John Stockley G8MNY**

External SWR bridges and power meters are ways too fiddly to connect up, lossy, and expensive pieces of test gear, that you always need connected when they're not. This bridge design has been used inside "Brick PAs" and "1 Watt exciter".

The only difference in a 23cm SWR bridge to a VHF one is the reduced scale. So if the miniature bridge pickups are small enough, they can be placed over only a few millimetres of 50Ω track, which can be found on most PA layouts. The circuit diagram of the bridge is shown in Fig.1 and the construction details in Fig.2.

## COMPONENTS

All the components are mounted with minimum lead lengths. There are better diodes than 1N4148, but it gives surprisingly good performance at these frequencies. The forward signal terminating resistor is not critical, but a very small one should be used in an attempt to get the "100Ω" required at 1200 MHz.

The reflected terminating resistor is too critical to guess at, so a very small preset trim pot was used. This was a high value plastic 1k, but worked OK. The RF pickup wires should be about 6mm-10mm long.

## CALIBRATION

- 1 Adjust the calibration pot to give no meter reading on a **GOOD LOAD**.
- 2 With reduced output (PA run on 10V) and **NO LOAD** connected, adjust pickup distances so that forward and reflected give the same reading.

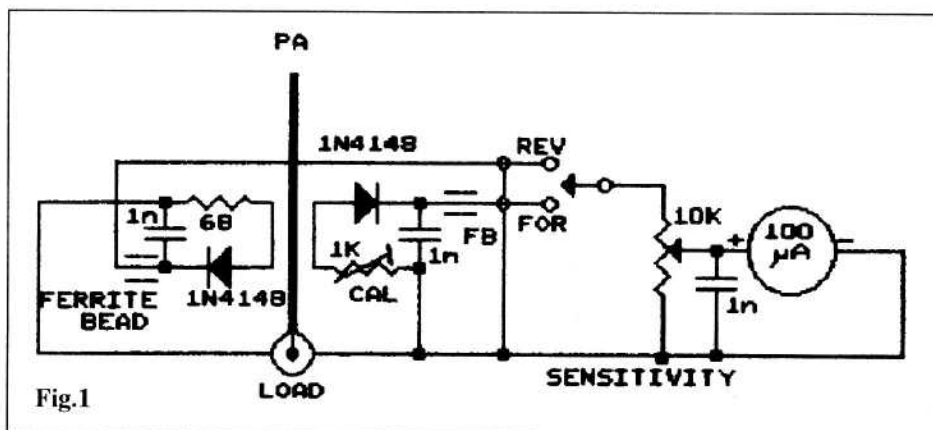


Fig.1

- ④ As 2 but with a **FULL SHORT** connected, adjust distances for best compromise in forward and reflected readings.
- ④ Re-check 2.
- ⑤ With full power set the sensitivity potentiometer for FSD.

### METER SCALE

Deflection %	100	80	72	50	33	20	8	0
SWR 1:	Inf	9	6	3	2	1.5	1.2	1
Loss dB	Inf	4.4	3	1.3	0.5	0.2	.035	0

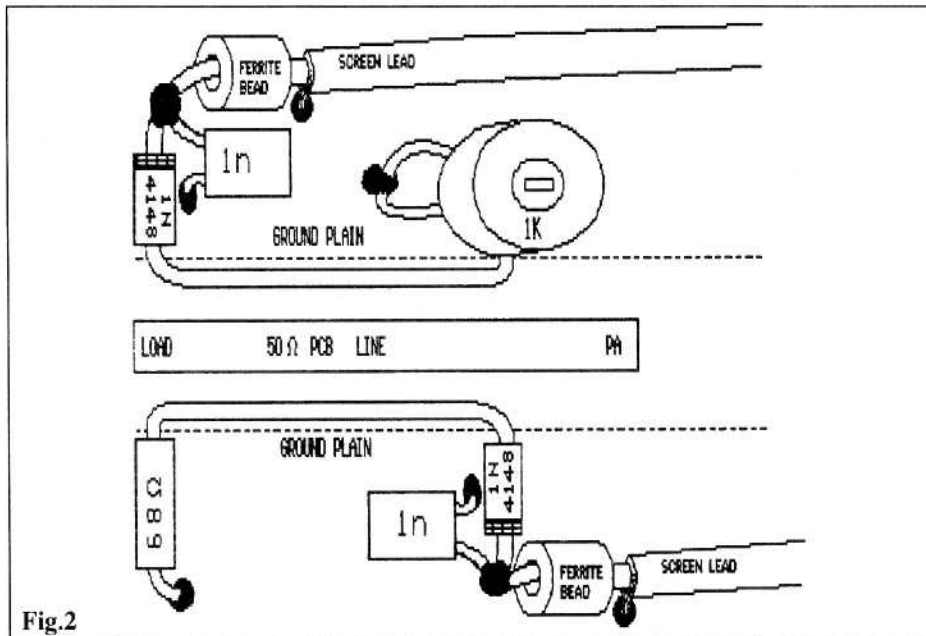


Fig.2

**24cm ATV NEEDS YOU  
SUPPORT YOUR LOCAL  
ATV REPEATER GROUP**

# An On-Screen Video Level Indicator

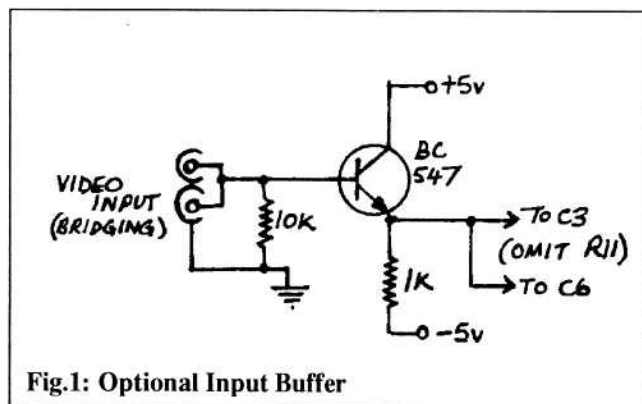
*This article first appeared in CQ-TV 142 in May 1988 and I have been asked that it should be repeated again, as this unit is a very useful addition to any ATV shack. Furthermore, there may be some video whizz-kids out there who can offer a modification suggestion as to how the indicator might produce a bar-graph type of display at the bottom of the screen, or wherever, for repeater use perhaps ... Mike.*

**BATC PCB Stock No: 26**

**John Goode**

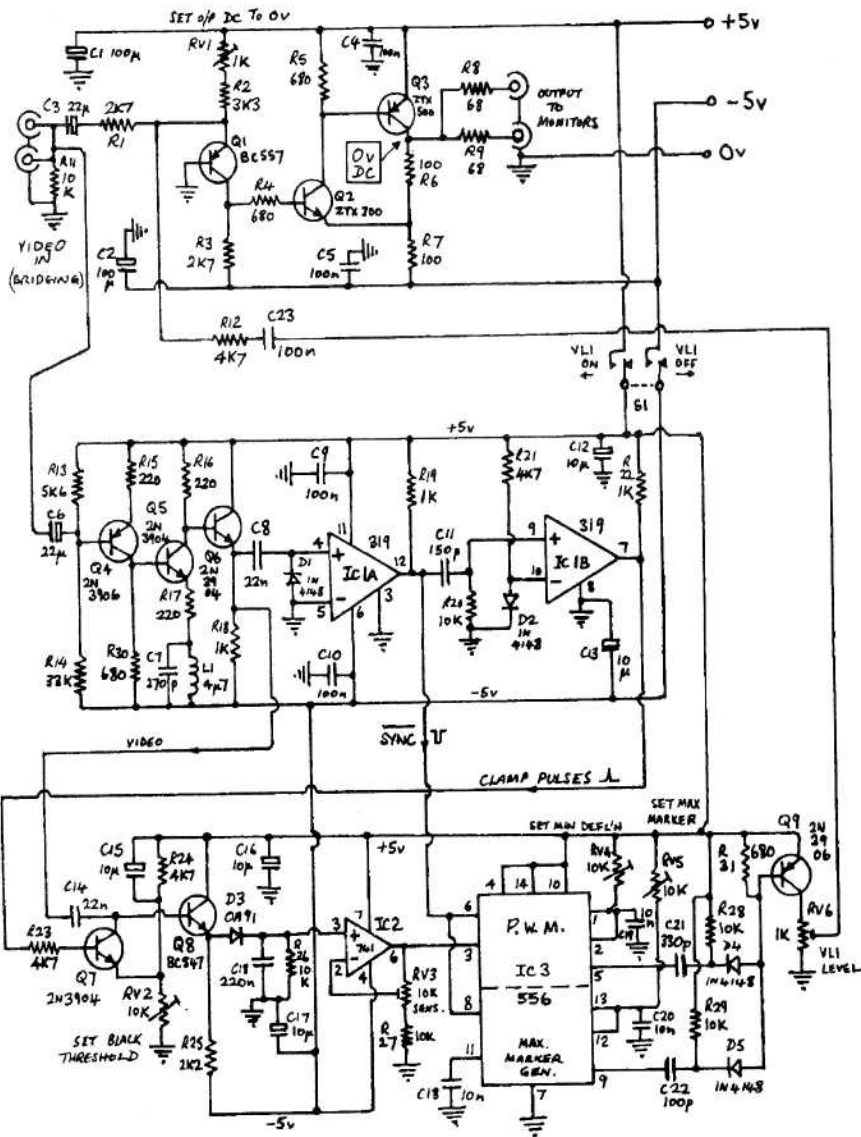
The purpose of this circuit is to provide an indication of video level that can be superimposed over the relevant video on-screen. The idea came from the viewfinder level display used on some JVC 3-tube cameras, although the circuit is my own. It saves tying-up a waveform-monitor or oscilloscope for continuous monitoring of video level, and, particularly in the case of the oscilloscope, it is much easier to use as there is no trigger level and stability to fiddle with. The level display is shown switchable - in order to ensure complete suppression in the "off" mode the supply rails are removed from all of the circuit apart from the video amplifier.

As the indication signal is mixed with the video signal it will be realised that this circuit is designed as a monitoring circuit, and should not be inserted in the transmission chain. The input of the circuit is therefore shown as suitable for bridging 75Ω. In fact, the original circuit is fed from a built-in selection system, and so strictly speaking the input impedance (about 2k) is a bit on the low side for bridging. In Fig.1 I have shown an optional input buffer that raises the input impedance to around 10k for those of you that are keen.



**Fig.1: Optional Input Buffer**

Fig.4 shows the screen format. The vertical line on the right of the screen represents the maximum video level (nominal 1V pp), and the wavy line indicates the average level on each line of the TV screen - the further to the right, the higher the level. The indication is derived from the luminance part of the signal,



IC1 - LM319 Dual Comparator  
 IC2 - 741 Op-Amp  
 IC3 - 556 Dual Timer

Fig.2: On-Screen Video Level Indicator

and takes no account of the colour subcarrier. With a black or colour-black signal the line falls back to the position indicated by the dotted line on the screen. As the circuit has a back-porch black-level clamp, no indication of sync level is given.

A block diagram is shown in Fig.3. Referring to the side-chain, video is amplified, the colour suppressed, and then clamped by Q7. Sync is separated and clamp pulses generated by IC1. Meanwhile the clamped luminance is rectified and a DC voltage derived dependent on the luminance amplitude. This voltage is applied to the "control" input of one half of a dual timer type 556 which is triggered by sync from IC1A. The effect of this is to make that half of IC3 generate a pulse every TV line, the duration of which is dependent upon the control voltage representing luminance amplitude (pulse width modulation). Meanwhile, the other half of IC3, also triggered by sync, acts as a monostable to generate the maximum level marker. The outputs from IC3 are differentiated and combined, and then added to the direct video via R12.

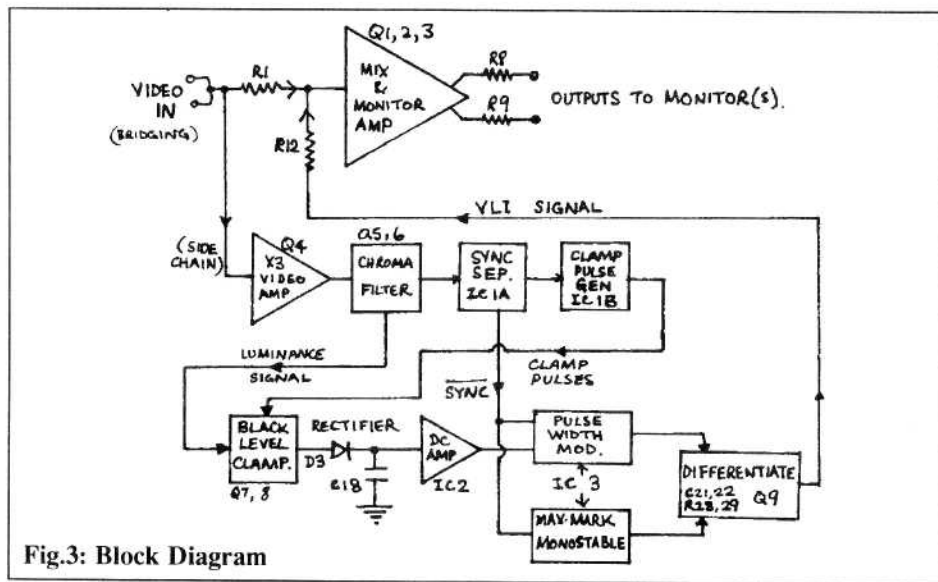


Fig.3: Block Diagram

The actual circuit is shown in Fig.2. It should be possible to follow this from the above explanation. I'm afraid that a dual 5V supply is necessary for the correct operation of the DC amp IC2. The value of the hold capacitor C18 (220n) was arrived at after considerable empirical experiment, and has been found to give the most accurate indications when compared with the same signal viewed on a professional waveform monitor (one-field timebase setting). The video amp was not mentioned in the earlier description, but is very straightforward, consisting of a common base mixing amp Q1, and a standard feedback pair Q1,3 providing dual 75Ω outputs for picture monitors.

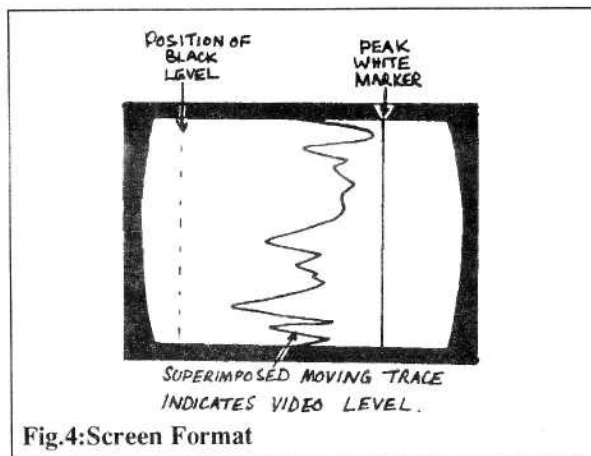
## SETTING UP

Ironically, building this circuit will allow those who don't have access to an oscilloscope to measure video level - however, an oscilloscope is necessary to set up this circuit so that the signals used for calibration can be checked! You will need the following signals for setting-up:

1. A black (or colour-black) signal, (300mV sync).
2. Staircase (or Colour Bars), IV pp, 300mV sync, 700mV signal. Their amplitudes should be as accurate as is possible.

First, power up and allow to warm up. With no input, adjust the DC at Q3 collector to zero volts by means of RV1. To begin with, set RV2 to minimum (Q7 emitter grounded), and RV3 slider to the IC2 pin-6 end of its track. Centre other presets (except RV1, of course!). Apply the black signal to the input - making sure that it's correctly terminated. Use a 'scope to check that sync is appearing on pin-2 of IC1, and pins 6 and 8 of IC3. Check that clamp pulses are at pin-7 of IC1.

If the circuit is working properly, there should now be two vertical lines on the screen. The thinner line is the maximum marker. Use RV5 to position it on the right of the screen (see Fig.2). Now use RV4 to position the thicker line, (which is the signal indication), at the left of the screen for black level - refer to Fig.2 again.



Gradually advance RV2 (black threshold) whilst viewing the screen, until the signal line JUST moves off its black position, and then back off. The idea is to get it on the threshold so that as soon as a video signal above black is applied the line will move.

Disconnect the black signal, and apply the IV. staircase or bars. Check that the input termination is correct. Now advance RV3 (Sensitivity) until the thick signal line

lays JUST to the left of the maximum mark - the two lines should be almost on top of each other. Finally adjust RV6 so that the markers stand out clearly against the video signal on screen.

That concludes the line-up procedure - it only remains to try it with a "real" moving picture, and try comparing the indications given with an oscilloscope display!



# SATELLITE TV NEWS

## Paul Holland G3TZO

This edition of Satellite News is somewhat shorter than normal due to the need to get CQ-TV to you before the BATC convention in May. I expect to be at the convention on May 2nd so will look forward to seeing many of you there on the day. For those interested in Satellite TV there are a number of Satellite Traders who have booked space at the convention so you may just find that bargain you are looking for.

News happens quickly in the Satellite World. Much of what was only rumoured when CQ-TV 161 went to press has now taken place. Screensport and Lifestyle have gone from ASTRA to be replaced by more German based programming. Hispasat is now carrying traffic at 31 Deg W as is THOR the renamed MARCO POLO 2 at 0.8 W. Eutelsat II F4 at 16.0 Deg attracts new services seemingly on an almost weekly basis. By the end of this year it is certain that European Satellites will be carrying a significant number of new services and will see further developments in standards such as HDTV and pay-per-view channels.

Thank you once again for your letters which continue to show a high level of interest in Satellite TV reception. Mike Hutchings from East Tytherley wrote to tell of an interesting experiment he had conducted with a home brewed Elektor RX using an SL1451 demodulator. Mike says that .... " just before the holidays I got a chance to experiment further with my receiver. I found that a very much better picture resulted by simply increasing the supply voltage to the tuner from 12V to 15V. There was a marked reduction in the number of sparklies which I assume to be due to increased threshold performance of the FM Demodulator at the increased input level resulting from running the RF stages at higher current. However, the IF amplifier hybrid is now at its absolute maximum limit so reliability may suffer !".... As Mike goes on to say in his letter, the overall video signal-to-noise may well be degraded, but is probably less obvious than the improvement in chrominance noise. Has anybody else got an interesting tale to tell.

A number of members with redundant BSB equipment have written to ask what they can do with it. Several articles by our Chairman have documented very well the options open for modifying the various BSB receivers, as well as how to convert BSB antennas from RHC to LHC polarisation. There is still however a degree of confusion over the use of BSB antennas. A few letters I have received indicate that people do not realise that BSB was transmitting in the DBS band of 11.7 - 12.5 GHz. In fact, BSB's highest frequency was 12.091 GHz and most BSB aerials covered only 11.7 - 12.2 GHz. They are therefore ideal for TV Sat and TDF transmissions, but would require a tweak of the LNB's Local Oscillator to receive non-DBS band signals.

The March Edition of "What Satellite" carried a very non technical description of how to get at the Local Oscillator to adjust it. If you are looking for a BSB aerial to modify I would highly recommend the Matsushita Squarial. which was heavily subsidised at the launch of BSB and should have cost over £140.0 on its own without the receiver.

## LAUNCH OF ASTRA 1C

This month sees the planned launch of ASTRA 1C. ASTRA in the UK could still not provide footprint information as late as early March. It is likely SES are waiting to see who signs up for Transponders before committing themselves. Although full details of which channels will take space on ASTRA 1C is yet to be finalised, the allocation of transponder frequencies has been announced. For those who have not seen them yet they are as follows;

TP 33 (H)	10964.25 GHz	TP 34 (V)	10979.00 GHz
TP 35 (H)	10993.75 GHz	TP 36 (V)	11008.50 GHz
TP 37 (H)	11023.25 GHz	TP 38 (V)	11038.00 GHz
TP 39 (H)	11052.75 GHz	TP 40 (V)	11067.50 GHz
TP 41 (H)	11082.25 GHz	TP 42 (V)	11097.00 GHz
TP 43 (H)	11111.75 GHz	TP 44 (V)	11126.50 GHz
TP 45 (H)	11141.25 GHz	TP 46 (V)	11156.00 GHz
TP 47 (H)	11170.75 GHz	TP 48 (V)	11185.50 GHz

ASTRA 1D will be launched in mid '94 with ASTRA 1E planned for early '95. ASTRA 1D is described as a "buffer satellite", providing back-up for both ASTRA 1B and 1C and will be able to handle existing transmission standards and HDTV. Astra 1E is planned to be primarily for digitally compressed transmissions. Compressed transmissions will allow for programming for special interest channels as well as pay-per-view services.

## EUTELSAT NEWS

Eutelsat have announced construction of the EUROPESAT 1 Satellite. EUROPESAT 1 will be operational by late 1994 and will be positioned at 19 Deg West. This DBS Satellite will provide up to 14 channels with 110 watt output power and will broadcast TV and Radio services. The first services are likely to be French and German. The UK has currently no interest in this project, which is timed to replace capacity currently provided by TDF1 and TV SAT, also at 19 Deg W. The design life for EUROPESAT is 12 years .Reception will be possible with 30cm antennas for PAL/Secam transmissions, however, 45cm antenna will be recommended for widescreen D2Mac transmissions.

EUTELSAT II F6 which is to be launched early next year is already taking bookings from prospective service providers. EUTELSAT II F 6 will be co-located with

EUTELSAT II F2 at 13 Deg E and will provide an additional 16 channels of entertainment television programming. The stated intention of Eutelsat is to establish a rival "HOT SPOT" at 13 deg E to rival ASTRA. Eutelsat say that the satellite, currently being built by Aerospatiale in Cannes, will be receivable on 80cm antennas in all of Central and Western Europe (see footprint on page 36).

## **CARD TRICKS**

Some of those equipped with D2Mac equipment having Eurocrypt decoders may have been puzzled by advertisements offering a "small PCB" to replace the normal smart card supplied for channels such as TV1000 and Filmnet. The adverts go on to claim that the PCB will give universal access to any D2MAC or Nagravision encrypted transmissions. An article by John McCormack of "Hack Watch News" gives the offer some credibility. The article explained that the Eurocrypt system is based on a detachable secure processor philosophy (the smart card). The decoder, therefore, is nothing more than a dumb terminal. The smart card is the active component and alone controls the operation of the decoder. The current Eurocrypt cards are EPROM type with 8k EPROM and 6K of ROM. The main crypto algorithms and hash functions are stored in the ROM with service data (i.e. FilmNet/TV1000/BBC Europe) stored in the EPROM. The basis of the PCB being offered is that it replaces the 6805 on-card processor. Power for the PCB, which is built to the same dimensions as the smart card, is received from the decoder in the normal way. I provide this information for background information only and would not offer any recommendations to purchase - caveat emptor !

There was some consternation back in February when Sky distributed their new 07 cards. Many people were puzzled by a new caption when the new card was inserted which showed the letters P and T followed by a series of zeros. The answer is that Sky intend to launch a pay-per-view service within the lifetime of the new 07 cards. The P and T refer to "Prepayment" and "Tokens". Deduction of prepaid tokens will occur when the "authorise" button is depressed on the Videocrypt decoder. It could get very expensive with "sticky fingers" about !

## **TRANSPONDER REPORT**

### **DFS 3 Kopernikus 33.5 Deg E.**

No activity has been noted at this QTH since the Deutsche Bundespost (DBP) launched this third in the DFS series of satellites late last year.

### **ASTRA 1A & 1B & 1C 19.2 Deg E**

Reports from Germany indicate that TP19 currently occupied by EINS PLUS will be taken over by ARD on 27 August. The same reports also say that ZDF the other main German broadcaster will take a transponder on ASTRA 1C around the same time. At the time of writing the following candidates for ASTRA 1C have been identified;

Thames TV (2nd Channel to UK Gold), The Box (Video Jukebox), Discovery Channel, Bravo, The Disney Channel, Nickleodeon, The Cartoon Channel, The Games Channel, a possible "bouquet" of channels from TF1 the French broadcaster and a further two Spanish Channels.

### **Eutelsat II F3 16.0 Deg E.**

February saw the start of Secam transmissions from Morocco's State Broadcaster RTM. The new service uses TP25 10.972 GHz V with Widebeam coverage of the whole of Europe and the Mediterranean Basin. February also saw the start of TGRT, a new Turkish language service. TGRT can be found on TP26 11.095 GHz (V). A second Polish service called TV POLONIA joined POLSAT (TP34 11.678 GHz H) on 31st March. TV Polonia, which has the largest on screen ident I have seen yet, is run by the Polish State Broadcaster TVP and is to be found on TP21 11.060 GHz (H). A further Eastern European Channel called Mosaika proposes bringing together a "Bouquet" (that word again !) of programmes from throughout central and eastern Europe. Countries involved so far are Czechoslovakia, Bulgaria, Hungary and Poland. Mosaika probably will not launch before early summer.

### **Eutelsat II F1 13.0 Deg E.**

April should have seen the launch of the previously reported "HOT TV". This French based service was planned to be using France Telecom capacity on TP42 12.604 GHz H. Transmissions will probably be in D2Mac with Eurocrypt encryption.

TV 5 Europe is now operating a 24 hour service with Teletext.

The re-named Red Hot Television commenced a phased transfer to the new Enigma encryption system on 20th March. All official SAVE decoders were to have been changed out by early May. During the transition period the channel transmitted using both encryption methods, but on alternate evenings.

### **Eutelsat II F3 7.0 Deg E**

EBU traffic has been extensively noted on this satellite since the transfer from Eutelsat 1 F5 earlier in January. The majority of transmissions have "sound in sync" and therefore will not normally lock on a standard monitor. Has anyone yet tried a sync inserter to overcome the problem ?

Vatican Television (TelePace) can be found most days on 11.680 GHz H.

### **Tele X 5 Deg E.**

FilmNet Plus has now appeared on this satellite at 12.673 GHz LHC polarisation. Unfortunately, this is the top end of the Telecom Band which I can not cover as I do not have a receiver IF capable of tuning up to 2.0 GHz.

### **THOR (Marco Polo 2) 0.8 Deg W.**

Thor relocated to this position from 31 Deg West early in the new year. An EIRP of 54dBW covers the whole of Scandinavia requiring a 45cm antenna within this first

footprint contour. The available footprint information gives no indication of anticipated EIRP over the UK. Frequencies in use are as follows: 11.785 Ghz 11.861 Ghz, 11.938 Ghz, 12.015 Ghz 12.091 Ghz

All transponders utilise RHC polarisation. Test transmissions initially were initially in unencrypted DMac however all services will eventually encrypt in Eurocrypt. Channels occupying this satellite are likely to be CNN, Eurosport and probably FilmNet however no firm announcements were available as we went to press. A strange mixture of DMac and D2Mac standards will reportedly be used by the five services eventually carried by THOR with CNN using DMac. The Norwegian PTT (Televerket) intends to make 0.8 Deg West the Scandinavian "Hot Spot" in conjunction with Intelsat 512 and the launch in 1994 of a new Intelsat Series VII satellite at this position.

### **Telecom 2A 8 Deg W**

For those wishing to practice their French language skills it is worth checking both Canal Plus and CineCinemas both transmitting in D2Mac with Eurocrypt. Throughout the month the encryption changes from both hard to soft scrambling, with periods of many days where the channels may be observed in the clear.

### **Intelsat 601 27.5 Deg W**

A new cable only channel from United Artists may well appear on this satellite some time around this month. The channel, known as "The Cable Network", will broadcast to UK cable nets for 10 hours per day.

### **Hispasat 1A 31 Deg W**

The Tele Cinco, Antena Tres and Canal Plus Espana, previously found on Eutelsat II F3, moved to this satellite in February to join TVE on TP 23 12.149 GHZ RHC. Tele Cinco can be found on 11.090 GHZ (V) and as I write, is unencrypted. Signals are P5 at this QTH for both these channels.

## **NEW PRODUCTS**

There are no product reviews this time as nobody offered me anything to review ! There is news, however, of a few interesting goodies which no doubt some of you would like to get your hands on.

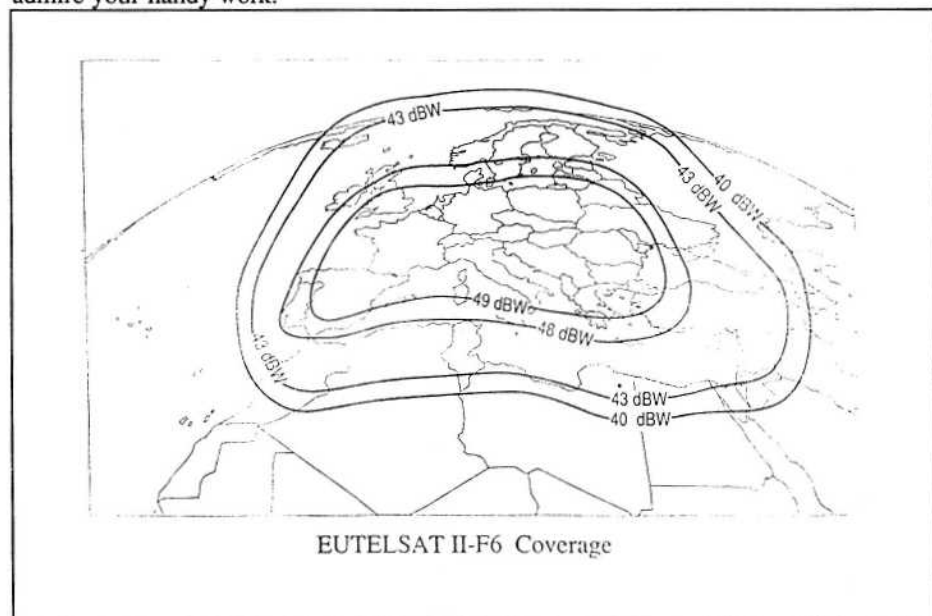
Chaparral, who produce the well known Monterey 20 and 40 receivers, have just announced a budget receiver the CR110. The receiver is initially being launched in the US and offers Autotune polarity and dish positioning, on-screen graphics and parental access control. Chaparral have also launched the Corotor II Plus Wideband feed horn. This new feedhorn covers both C and Ku Band, but has been developed to also handle circularly polarised transmissions across the entire European Band (FSS, DBS and Telecom). For those interested write to Chaparral at: 2450 North 1st St., San Jose, Cal 95131, USA.

A bit closer to home and it seems that Maplins are now offering products for use in satellite reception. Two products which would be of interest are a Secam-Pal transcoder and a portable satellite alignment meter. I hope to be able to bring some more details on these two products in a future issue.

I also hope to bring you news of all the new products to be revealed at The Cable and Satellite Show in the next issue. The trend to be monitored over the next year or so will be the move to Digital Video Compression Technology. It may well be that when looking back from five years hence that we are enjoying the last year or so of a period when reception in the clear of both DTH and Business Television was the norm. We had better make the best of it while we can !

For those of you who like to keep up to date with news of the satellite world the electronic edition of "SATNEWS", a fortnightly newsletter published by M2 Communications Ltd., can be found on the BATC's computer Bulletin Board System (Telephone 0933 413396). Instructions on how to find the newsletter are given when you log into the BBS. The files are compressed using the well known PKZIP programme, so you may have to download that programme as well to be able to view the file.

Well that's all for this time. In the next issue of Satellite News, I will report on the Cable and Satellite Show and report on satellite related activities at the BATC Convention. Please continue writing and if any of you have any interesting photos, such as embryonic teleports at your QTH, please let me have them so we can all admire your handy work.





# The Phoenix 16 ele 70cm Aerial

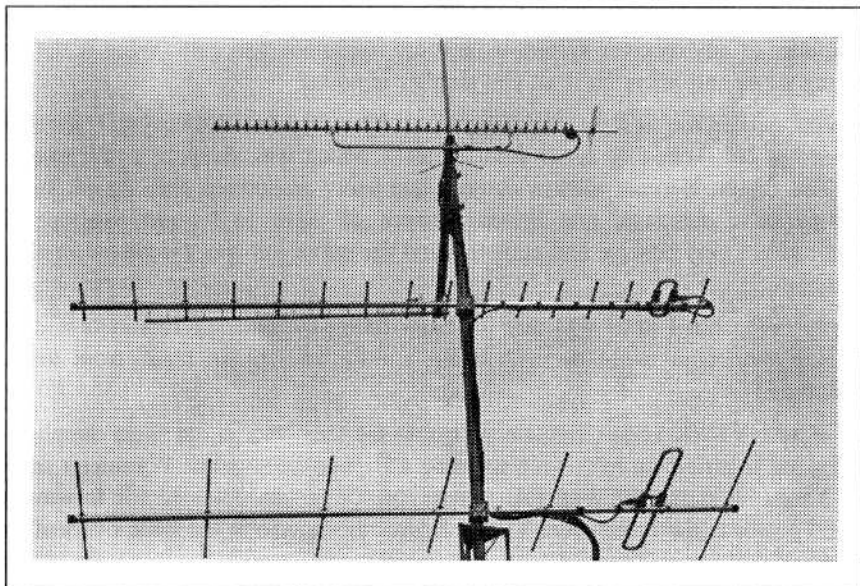
*Review*

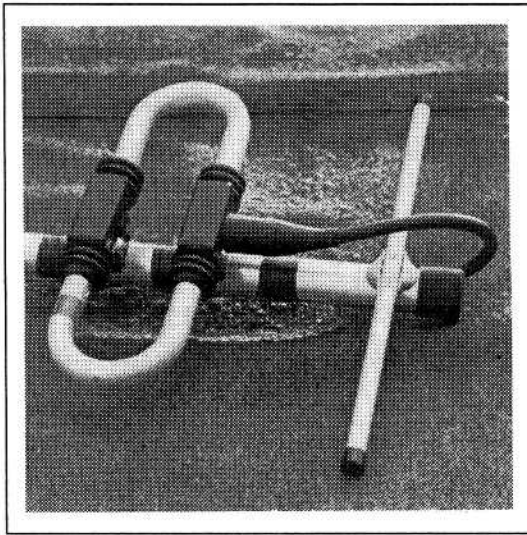
## Mike Wooding G6IQM

Being something of a SeventySentimentalist myself and, particularly as I am about to become active on ATV again, I was interested to discover that Phoenix S.M.D. were more than happy to produce a 70cm aerial 'cut' specifically for ATV use. Accordingly, I obtained the first such aerial to be produced by them for a review.

Phoenix S.M.D. have been around for quite some time and have built a reputation for producing very high-quality products. I can now concur that this is indeed true. However, Phoenix aerials are not for the weak-masted, the price, apart from the Sterling one that is, for this quality is that Phoenix aerials are generally somewhat heavier than others on the market. Thus, those of you that use the odd length of scaffolding pole and a few 6'' nails - honest, I can take you to an ATV shack where that is exactly the case (true John ?) should think twice before considering these products. However, enough of this, to the aerial:

The review model of the Phoenix 432/16 duly arrived and was ready-assembled. This is not normally the case, but as this was a first off the line, the manufacturer had left it assembled after testing. The aerial is approximately 2.9 meters long (4.06 wavelengths) and of a single-boom construction, the boom being 32mm in diameter and produced from 16 gauge seamless aluminium tube. The parasitic elements are





constructed from 12.5mm diameter 16 gauge seamless tube and the driven element from 19mm diameter 16 gauge round seamless tube. The aerial weighs in at 4.5 kg complete with cable and mast clamp.

The driven element assembly is constructed as a completely sealed unit, incorporating the matching assembly and the stub feeder connection. The stub feeder is made from high specification cable some 3.8 meters long and terminated in a good quality N-type plug with a cable shroud for weather-proofing. All the nuts and bolts and fasten-

ings are made from stainless steel. All Phoenix aerials come supplied with a test certificate and are covered by a 5-year guarantee.

The driven element is of the folded dipole type with a DC short-circuit, which gives added static protection and thus reduces the 'noise' characteristic of the aerial. It is probably this parameter of an aerial's characteristics, the noise performance, that is the most important. It is no good having an aerial with super forward gain, excellent front-to-back ratio if it is 'noisy'. As I have stated oft times before, the noise performance of any receiver system is far more important than gain. What is the good of having super amplification if all you amplify is noise?

As stated earlier the review aerial came ready-assembled. However, I have also purchased a 2m 7-element aerial from Phoenix which was shipped in the usual kit form. The driven element always comes completely assembled and sealed, but the boom, parasitic elements, and driven element all have to be put together. The instructions are very concise and complete and the entire job was completed in around half an hour.

The only complaint I have was that the bolts fixing the parasitic elements and their saddles to the boom could do with being a little longer, but apart from that, no problems.

A set of test VSWR versus frequency figures for the 70cm aerial were supplied by Phoenix and I carried out my own tests using a Bird 43 throughline Wattmeter and my trusty Yaesu radio and 10 Watt PA. Converting the results obtained for forward and reflected power to the more usual VSWR figures the figures in the table overleaf were recorded.



Frequency	VSWR
430.000	1.26:1
431.000	1.28:1
432.000	1.22:1
433.000	1.17:1
434.000	1.21:1
435.000	1.29:1
436.000	1.24:1
437.000	1.17:1
438.000	1.18:1
439.000	1.20:1
440.000	1.23:1

## CONCLUSIONS

My overall opinion of the aerial is that it is an excellent unit, extremely well designed and engineered. It exudes an impression of quality and durability. The off air tests have also proved the aerial to be as good as it looks and the VSWR measurements show that the aerial is well-tuned and flat across the entire 70cm amateur band.

The fact that it comes with a completely sealed and tuned driven element means that a fully operational aerial can be assembled and erected in virtually no time at all. I particularly liked the reasoning behind the 4m of feeder supplied with the aerial, especially if you are considering buying, stacking or boxing a set of them, as you will not have to worry about balancing the feeder lengths to the power splitter, it is already done for you.

As I noted earlier, Phoenix aerials are not the 'lightest' around, but I believe them to be amongst the strongest and most durable. Watch this space in the future - a little bird tells me that a 24cm aerial is at the design stage!

**Note:** After discussion with Phoenix it transpires that the 432/16 aerial will not be specifically 'cut' for 70cm, owing to the fact that because of my 'bullying' them into producing the ATV version in the first place, they have actually ended up with an aerial that now covers the entire 10 MHz of the band anyway ! Also, they will be supplying longer element fixing bolts once current stocks have been depleted.

Further details on the full range of Phoenix aerials can be obtained from:

PHOENIX S.M.D., Amateur Products Division, Phoenix House, P.O. Box 1526,  
Wincanton, Somerset, BA9 9YA. Tel: 0963 34992. Fax: 0963 34360.

# GENLOCKING THE CROPREDY

**John Stockley G8MNY**

## INTRODUCTION

With all video sources Genlocked, vision mixing effects like, Fades, Wipes, Chroma Key, become possible. So the commonly used station Testcard Generator is a prime target for a genlock modification. The Complex electronics involved are not so daunting if tackled piecemeal. A double beam oscilloscope may be needed for this project.

To do any genlock, all three (two for B&W) oscillators, Line, Frame, and Colour, must be continuously adjusted to be the same frequency and phase as the external source. The circuit was developed in these three chunks, with the colour being optional. The caption generator functions normally with no external source. The diagram in Fig.1 shows the basic locking circuit and in Fig.2 the requirements for colour locking.

## LINE

This uses ordinary UHF/VHF varicap diodes V1 and V2 (in parallel as required to tune) in series with the 8 MHz crystal on the PCB with a 1M resistor. This should give at least +/- 2 Hz of line frequency for a 3 to 11V swing. The use of a crystal oscillator in the original circuit, limits the frequency change too tightly, to be able to "line lock" from VCR sources!

The varicap control voltage is derived by comparing the slightly delayed (adjustable CR) external syncs extracted by T1, with the Cropredy's line square wave fed into T2. Storing the phase difference as a DC Voltage in the 10nF capacitor, and feeding this to the varicaps V1 and V2.

## FRAME

This is not so easy, the Cropredy circuit is a non-interlaced design, and it only gives 312 lines instead of the 312.5 per scan. Because of this, it is not capable of producing the "odd and even" frame sync pulses. So once line locked the caption slowly rolls up the external picture at a frame every 3 seconds.

This circuit stops the scroll by killing the line count after the frame sync pulse until the start of picture. The external frame sync is extracted by T3 and is delayed (some

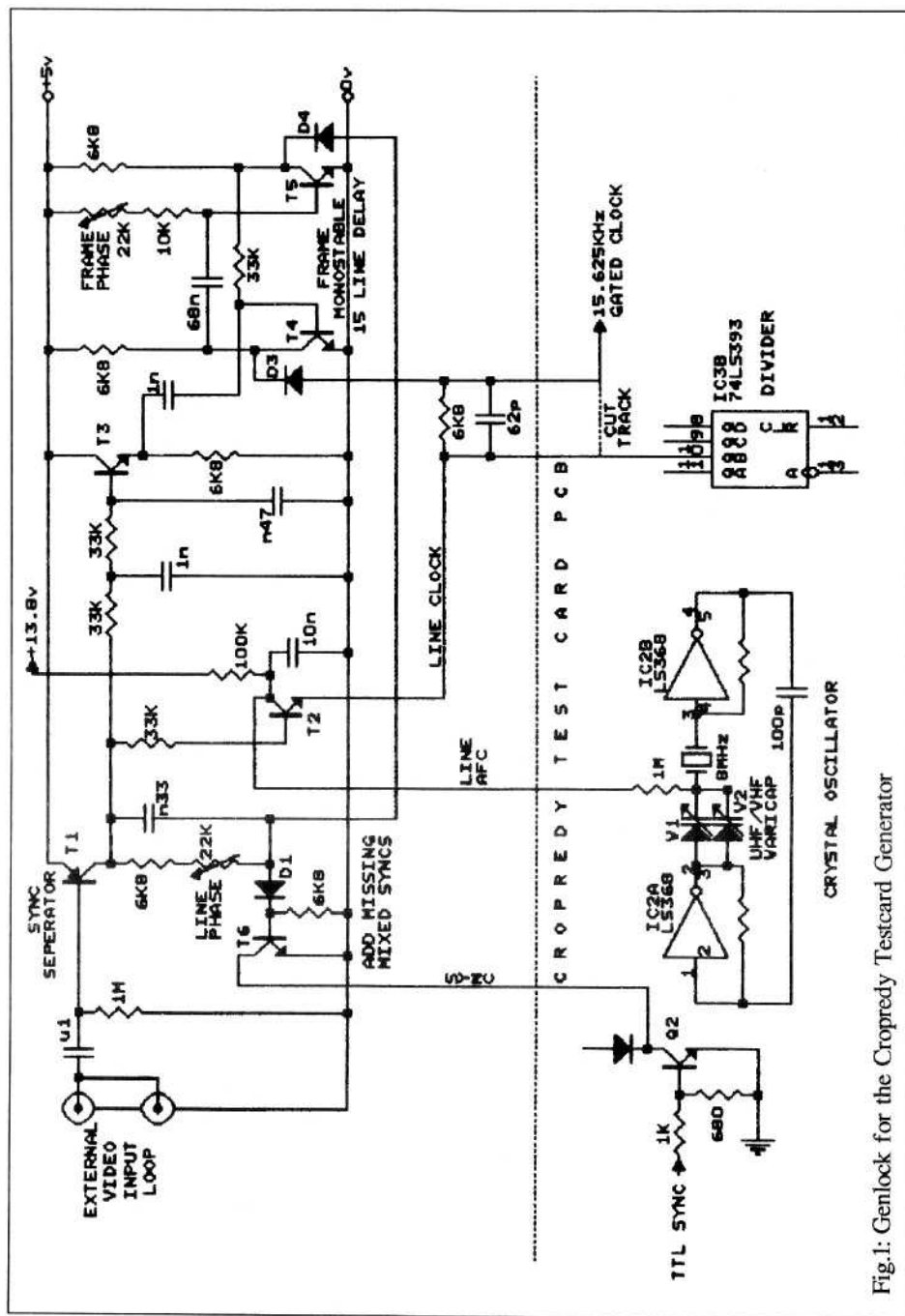


Fig.1: Genlock for the Croppedy Testcard Generator

15 lines) by the monostable T4 and T5. T4's output also inhibit the line clock. The resultant hole in the line sync output and the incorrect frame syncs (Odd/Even) are both covered up by adding the external syncs for the monostable time by T6.

## COLOUR

There have been two types of additional Colourisers available for this unit, both use the TEA2000 PAL encoder IC, and this circuit will work for both. Since a lot of the complex colour encoding signals are hidden inside the chip a novel approach has been used to correct "PAL out of lock" condition. The twice colour subcarrier crystal frequency, is controlled in the same way as in the line circuit. The Control voltage is derived by comparing the difference in the external and local colour bust phases.

First a burst gate pulse is derived by adding the 15, 30, 60, and 120 kHz clock pulses, with 4 diodes D1-4, and the 6k8 pull up resistor. This pulse is used to biases on T7 and T8, which feed external and local, amplified colour bursts, to their respective 4.43 MHz tuned circuits (The Ls are about 8 turns on 1/4" ferrite core slug). The local source is fed from the 2V P-P low impedance point, the NFB 8.2pF across T8, provides a phase shift control on the T8's tuned circuit. The OA91 germanium diodes across both tuned circuits limit the RF pulses to the same level. The two burst signals are then added, and used to turn on under biased T9, depending only on their phase differences. T9's collector voltage is stored in the 10n, and passed to the varicap V3 by the 1M resistor.

Unfortunately that's not the end of it, as PAL can lock up out of phase. This situation is detected by transistor T10 turning on, when there is a 7.5 kHz ripple in the loop voltage. This causes T11 to put 32 kHz clock pulses into the TEA2000, the chip then gets "confused" and has another go at locking up.

## B&W SETUP

Useful test points for locking the scope are IC3 pin-10 for line frequency, and IC4 pin-9 for frame.

Make sure that the varicap voltage swing gives a good line lock range. Check that the sync separator is giving clean syncs (CR decay on trailing edge). Adjust the "Line Phase" preset so that the external and local syncs are coincident. This is best done by ADDING the signals in the scope!

Test that the frame pulses trigger the monostable, and that the line clock to the rest of the PCB is disabled during the monostable on time. Adjust the "frame phase" preset so that the external video's frame pulse is two lines ahead. Adding the scope traces here also makes it clearer. Test that the video output is JITTER free and correctly locked. Now go back and re-test the line phase, as these two are not completely independent.

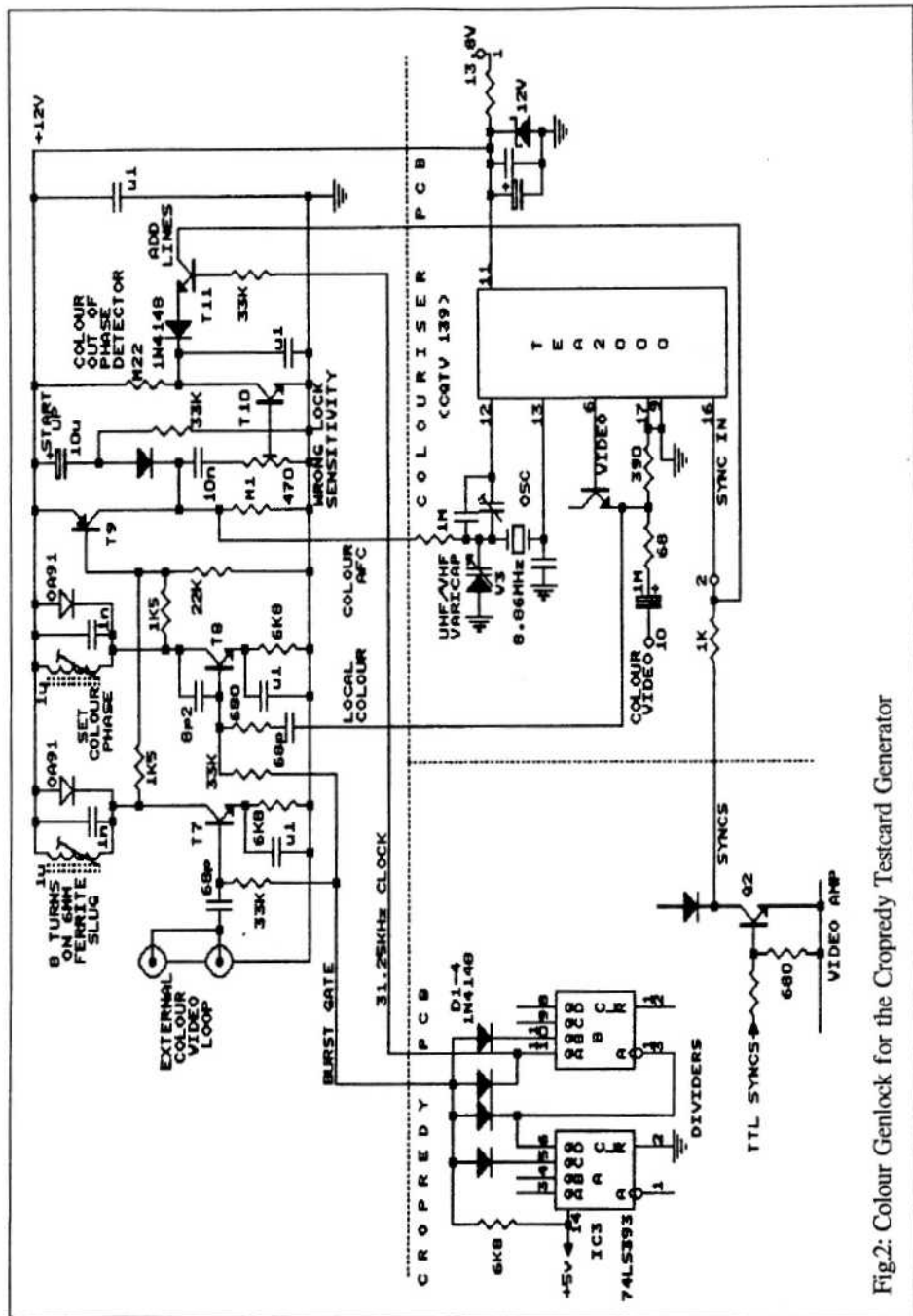


Fig.2: Colour Genlock for the Cropredy Testcard Generator

## COLOUR SETUP

Verify that the varicap voltage swing gives adequate change in subcarrier frequency.

Check that the burst gate pulse, is coincident with the external colour burst (adjust Line Phase slightly). Tune up both tuned circuit for maximum signal (use a divide by 10 scope probe). For now set the slider of "Wrong Lock" pot to ground. Adjust the colour crystal trimmer to get a colour lock, i.e: no beat voltage on the AFC output (slight 50 Hz ripple OK), if it locks up in "wrong lock", then pulse off and on the external source.

Test the "Wrong lock" circuit by putting the crystal trimmer off frequency and checking that as you turn up the "Wrong Lock" pot, that T10's collector has gone to about 4V, and that there are corrupting 31 kHz clock pulses going to the TEA2000 sync pin.

With the colour crystal trimmer back on frequency, change the external source, the colour will occasionally lock out of phase, seen as a fine 7.5 kHz on the AFC voltage (and Horrible colours on TV). Adjust "Wrong Lock" preset so that the picture just flips into lock.

For accurate colour phase adjustment, set up a vision mixer and display both external and caption source. Set the colour crystal trimmer to the mid of the lock range, tune the local tuned circuit so that a TV colours are right. Swap sources around on mixer and re-test. The colour crystal trimmer should give the best colour at the best lock position.

When all adjustments have been set up correctly, consistent correct colour lock should be obtained from all 625 line PAL sources.

---

## NARROW BANDWIDTH TELEVISION ASSOCIATION

The Narrow Bandwidth TeleVision Association, founded in 1975, specialises in the mechanical and low definition aspects of ATV, and offers genuine (moving) TV within a basic bandwidth of 6 - 7 kHz. The techniques, basically an updated form of the Baird system, are a unique mixture of mechanics, electronics and optics. Membership is open World-wide on the basis of a modest yearly subscription (reduced for BATC members), which provides an annual exhibition and quarterly 12-page newsletter, together with other services.

For further details write to: **DOUG PITT, 1 BURNWOOD DRIVE, WOLLATON, NOTTINGHAM, N28 2DJ.** Telephone: 0602 282896.

# The Annual Severnside Bash !

## Jean G0AWX

Yes, we've been at it again on the Severnside Repeater (GB3ZZ), we chose January 3rd 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 had to scrub him later??). Next came our Chief Engineer Steve G8KUW, who gave us a superb sketch of 'Captain Jean-Luc Picard of the USS Enterprise', with authentic background and dressed as the 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 'Bo Peep', 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 would all 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 seen was a 'Nookey Bear' who crept around the base of a 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 that I keep our Chairperson 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 banded around the airways! Not to be outdone, Ivor G1IXF followed his wife with 'Rabbit' from Alice in Wonderland. The costumes in both 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, which says something about the members of GB3ZZ !! One more year of fun for Severnside TV Group, but most of all the initiative and the work that went into the costumes so that others might have a good time is very rewarding. The Group wishes to take this opportunity to thank everyone who made the evening such a success. Warm wishes for a healthy New Year to all ATVerS.

# How to Repair Electronic Equipment

**Step One:** Approach the ailing instrument in a confident manner. This will give the instrument the mistaken idea that you know what you are doing. It will also impress anyone who happens to be watching, and if the instrument should suddenly start working properly, you will be credited with it's repair.

**Step Two:** Wave the service manual at the instrument. This will make it assume that you are at least familiar with the source of knowledge.

**Step Three:** In a forcible manner, recite Ohm's Law to the instrument. (Caution before taking this step, refer to a reliable handbook to be sure of your knowledge of Ohm's Law). This will prove to the instrument, beyond a shadow of doubt, that you posses some technical knowledge. This is a drastic step and should only be attempted if the first two steps fail.

**Step Four:** Jar the instrument slightly, this may require anything from a one to two metre drop, preferably onto a concrete floor. (Note: you must be careful with this step because, although jarring is an approved method of repair, you must not mark the floor.)

**Step Five:** Brandish a large screwdriver in a menacing manner. This will frighten the instrument and demonstrate your knowledge of the deadly 'short circuit' technique.

**Step Six:** Add a valve..... even if the instrument is solid state. This will prove to the instrument that you are familiar with design techniques and confuse the instrument thereby increasing your advantage. If this doesn't work, then proceed to the most dangerous and drastic step. It is seldom needed and is a final resort if all else fails.

**Step Seven:** THINK!!

Thanks to Malcolm ZLLAZ and Spectrum Magazine (New Zealand ARS) Sept. 1991



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1'' vidicon tubes are available in different heater ratings (95 and 300mA) - 6'' long; (EMI types 9677, 972B and EEV types P849). 2/3'' tubes have 95mA heaters (EEV type P8037). These tubes are all of separate mesh construction, with magnetic focus. Tubes available to special order include electrostatic focus or deflection, and low light types not previously available to club members. Prices vary depending on the size, type and grade of tube. A tube guide appears in CO TV 149 and 150. Please contact Members Services for further information. The stripe filter tubes used in domestic type colour cameras are not available through BATC, and normally must be ordered direct from equipment supplier. Members requesting information on prices or other types of tube or equivalents are asked to send a stamped, addressed envelope for their reply.

## **CIRCUIT DETAILS can be found as follows:**

Revised ATV Handbok: PCBs 7, 17, 21, 22, 23, 24, 53, 63

Amateur TV Handbook (vol.2): PCBs 52

An Introduction to ATV: PCBs 10, 18, 25, 40, 41, 36, 47, 82, 83, 84, 85, 86  
TV for Amateurs: PCBs 19, 49, 51

Slow Scan TV Explained: PCBs 59, 60, 61, 62

Amateur TV Compendium: PCBs 11, 12, 27, 28, 29, 30, 31, 54, 55, 56, 57

Micro and TV projects: PCBs 14, 33, 34

CQ-TV(xxx): PCBs 13(128), 16(134), 20(130), 26(142), 35(143), 58(139)

Item 46 is supplied with circuit details, etc.

# WHO TO WRITE TO

Members of the BATC Committee are available to help and advise Club members on any ATV related subject. Please remember that all Club work is done in spare time, so please try to keep such queries to a minimum.

**CQ-TV MAGAZINE** - Anything destined for publication in CQ-TV or forthcoming publications; articles; review items; advertisements; other material. EDITOR: MIKE WOODING G6IQM, 5 Ware Orchard, Barby, Nr.Rugby, Warwickshire, CV23 8UF. Tel: 0788 890365 (Answerphone); Fax: 0788 891883.

**CLUB AFFAIRS** - Video tape library; technical queries, especially related to Handbook projects: TREVOR BROWN G8CJS, 14 Stairfoot Close, Adel, Leeds, LS16 8JR. Tel: 0532 670115.

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**BATC TELEPHONE BBS SYSOP** - CHRIS SMITH G1FEF, 19 Crabb Street, Rushden, Northamptonshire, NN10 0RH. Tel: 0933 58220.

**CQ-TV AWARDS** - BOB WEBB G8VBA, 78 Station Road, Rolleston-on-Dove, Burton-on-Trent, Staffordshire., DE13 9AB. Tel: 0283 814582

**SATELLITE TV NEWS** - PAUL HOLLAND G3TZO, Chatterton, Chapel Lane, Thrapwoun, Nr.Malpas, Cheshire, SY14 7AX. Tel: 0948 81429.

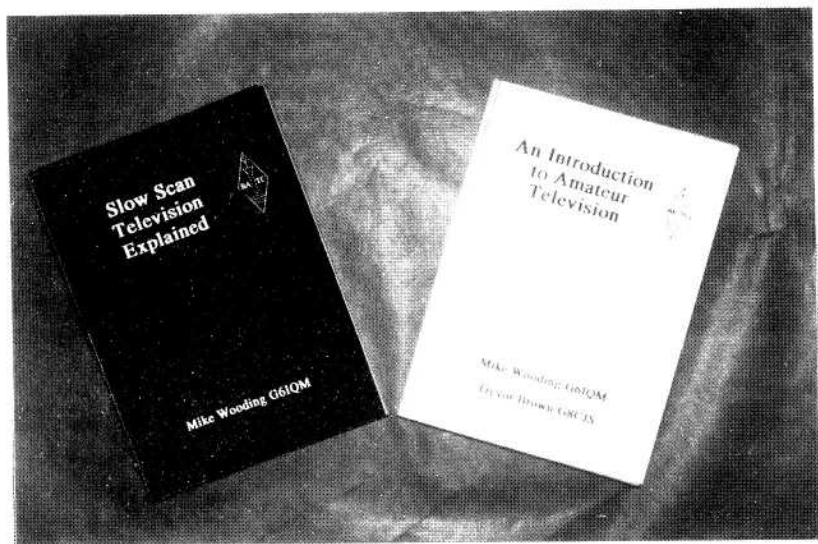
**TV ON THE AIR** - ANDY EMMERSON G8PTH, 71 Falcutt Way, Northampton, NN2 8PH. Tel: 0604 844130.

Where possible, it is better to telephone your query rather than write. Please do not call at unsocial hours. As a guide, try to call between 1830 and 2130, and not before 1130 at weekends ... Thank you.

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# CIRCUIT NOTEBOOK No.48

John Lawrence GW3JGA

## Video OpAmps

“OpAmp” usually brings to mind circuits using the 741 OpAmp - the workhorse of audio and control circuits, but of little use in video applications.

Over the last few years various specialist semiconductor manufacturers (such as Analog Devices, Elantec, Harris, Linear Technology and Maxim) have been introducing new video OpAmps capable of operating up to, and well beyond, 50 MHz. They have applications in computer VDUs, HDTV etc. They also offer a simple solution for TV video distribution and as buffer stages in video switches.

The video line driver circuit in Fig.1. uses the Analog Devices AD829 video OpAmp, it is taken from their data and application sheet, (1). The AD829 is also available from Electromail (RS Components) as Stock No. 296-605.

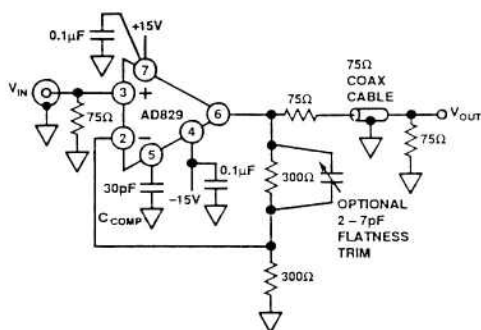
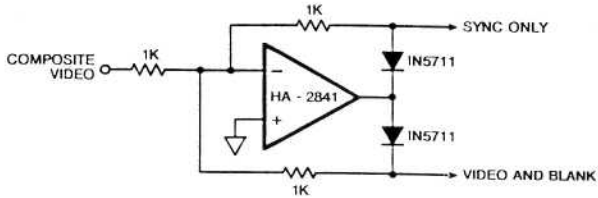


Fig.1: Analog devices AD 829 in a Video Line Driver circuit, with a flatness over frequency adjustment (0.1dB at 30 MHz)

Fig.2. shows a very simple sync separator circuit using a Harris HA-2841 video OpAmp. The circuit is from the Harris Designers Guide, page 45.

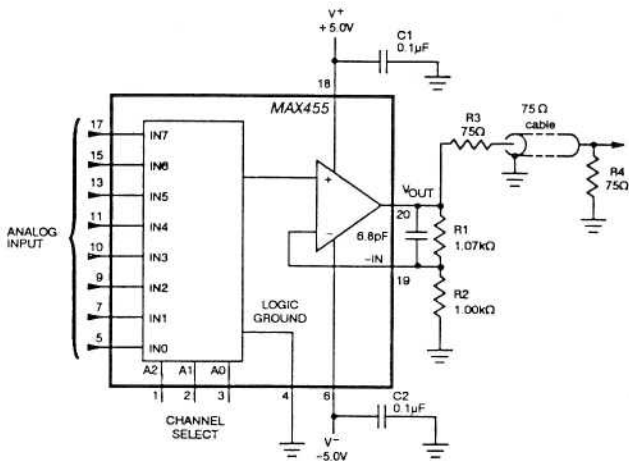
For video multiplexing/switching, the Maxim 452 series offers a simple solution to providing a 2, 4 or 8 input video switcher with the minimum of external components. Fig.3. shows the MAX455 in an 8 input circuit. The input is selected by applying a 3-bit address to the Channel Select pins. The video OpAmp line driver is included within the IC Details are given in (3) page 8-42.



**Fig.2: Harris HA-2841 Wideband Video OpAmp used as a video sync separator**

## References.

- (1) Analog Devices AD829 Data Sheet Polar Electronics Ltd., Cherrycourt Way, Leighton Buzzard, Beds. LU7 8YY. Tel. 0525.377093.
- (2) Harris Designers Guide Thame Components Ltd., Thame Park Road, Thame, Oxfordshire OX9 3UQ. Tel. 0844.261188.
- (3) Maxim 1992 New Releases Data Book Maxim Integrated Products (U.K.) Ltd., 21C Horseshoe Park, Pangbourne, Reading RG8 7JW. Tel. 0734.845255



**Fig.3: An 8-input Video Multiplexer/Switcher using the Maxim MAX455**

# A Simple Wipe/Key Unit

Steve Ward GW1XVC

This is an add-on circuit to the Vision Mixer by Eric Edwards GW8LLJ described in CQ-TV 147.

## IN THEORY

The FXA and FXB in Eric's circuit are taken to a 2-pole 3-way switch, which allows selection of Fade, Key or Wipe to be made. Actually, the circuit shows the sliders of the fader control connected to the FX inputs, which also permits fading of the Wipe or Key inputs.

Two 4047 ICs (see Fig.1) are used to generate the line and field monostables, with the inputs derived from the LM1881 in the mixer circuit. The 1M preset across the 100k Horizontal Wipe control sets the travel limit, as viewed on the TV screen. A similar preset could be placed across the Vertical Wipe potentiometer if required.

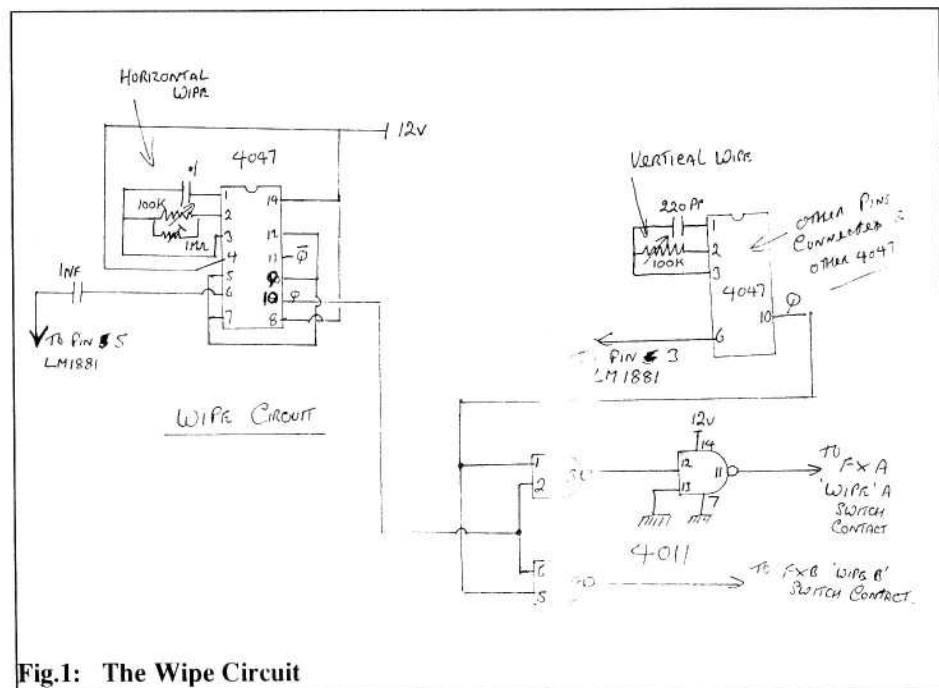
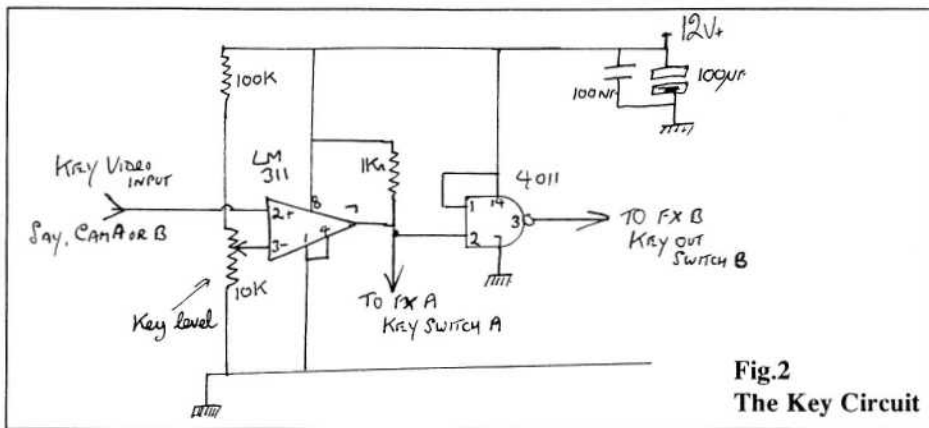


Fig.1: The Wipe Circuit

A simple Key circuit for captions or black/white Key effects (FX) is shown in Fig.2, using an LM311 comparator. The clipping level (Key) is set by a 10k potentiometer.



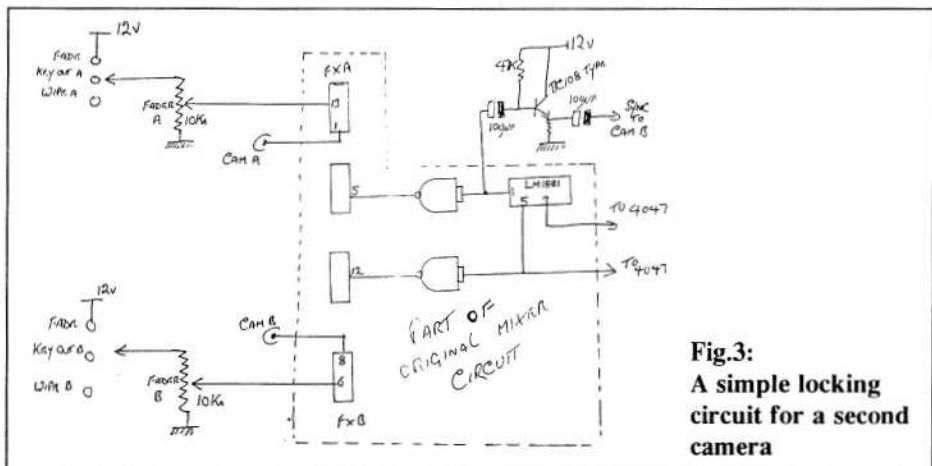
**Fig.2**  
**The Key Circuit**

## IN PRACTICE

Connect two cameras having the same output level to Eric's mixer. A simple locking circuit for the second camera is shown in Fig.3.

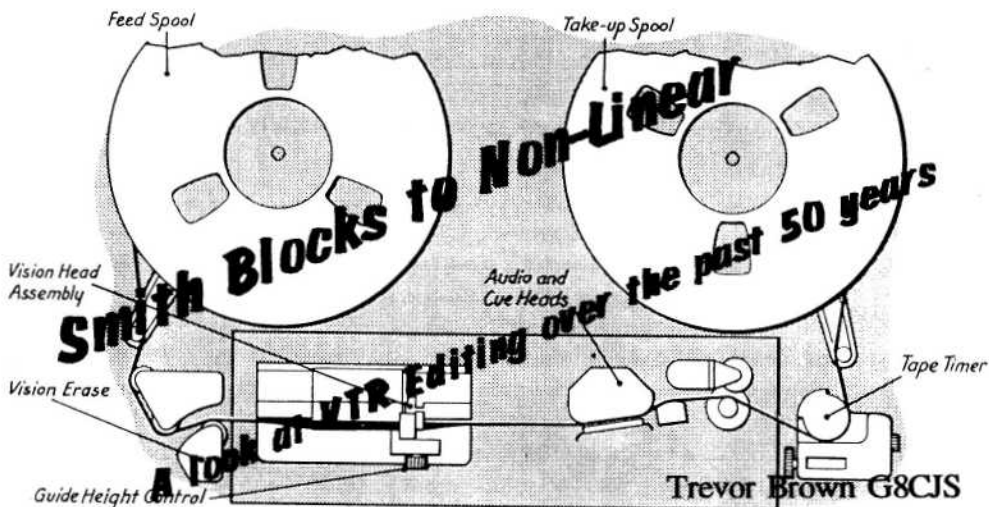
Bring out the faders, 3-way switch and Key level control to the front panel. a further 2-pole 2-way toggle switch could also be wired to switch from A/B or B/A, by applying 12 volts to input A and 0 volts to input B. Only A will pass; if the switch is reversed the opposite will apply.

Very good keyed captions can be accomplished with very little (if noticeable) delays, due to the minimum of components used.



**Fig.3:**  
**A simple locking circuit for a second camera**





As tape editing systems start to appear on the home market I thought it would be a good idea to look back over the early days of professional VT editing and follow its progress up to present day.

The first video tape recorder was built by Ampex and demonstrated in the States in 1956, but it was the early 60's before we got down to editing tape. The System used was called physical editing and was performed by cutting out the unwanted pieces of tape with a razor blade and rejoining the tape ends with some rather special sticky tape. This system of editing was only possible because of the format of the tape (Quadroplex) which consisted of 2" wide tape, with the tracks being laid across the tape and separated from each other by guard bands. The tracks were made up of 17 TV lines (625 line format). The start and finish of each TV frame was identified by developing the tape, this meant covering the tape with a solution saturated with very fine iron filings which then rendered the format visible, and with the aid of a special

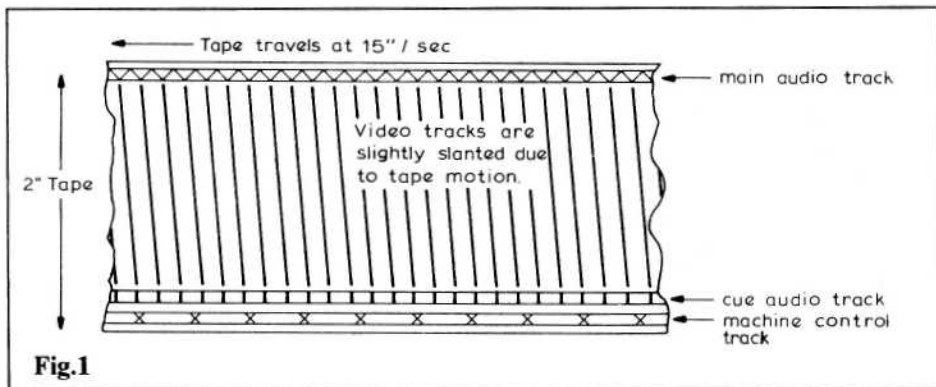


Fig.1

microscope and editing platform. The start and finish of a TV frame could then be identified and suitable cuts and joins made. The developing fluid was then washed off and the edit could be replayed. The microscope and editing block became known as a Smiths block.

The system had many disadvantages, if the start and finish of the TV frame was wrongly identified then a servo disturbance would result. This was a major problem as it could take anything up to 15 seconds for a Quadrox machine to regain servo lock after such a disturbance, with the resulting picture in the meantime being completely unwatchable. The other major problem to this system was that video tape must be kept clean to avoid dropout, and covering the tape with iron filings did not help. To this end the microscope was soon replaced with a moving head that could read the tape without the need for developing, the information being displayed on an oscilloscope tube. This not only reduced the dropout problems, but replaced the microscope with a scope display that made the engineer feel a little more at home.

The other major disadvantage to this system was that the edit, cut both the sound track and the picture track in the same place, but like film the sound does not sit next to the picture it represents or the video and sound heads would have to be sited in the same place on the VT transport (see the title picture). The sound head is some 9" after the picture head and with a tape speed of 15 inches per second the sound edit would be



**Sony BVE-9000 Editor; Courtesy of Sony Broadcast & Communications Ltd.**

some half a second after the picture edit. This problem persisted all through the days of physical edits and restricted the choice of edit points to the quiet bits of the programme.

This technology remained up until the early days of colour TV, where the PAL sequence had also to be observed, and a 4 field sequence maintained across the edit point. Despite the many disadvantages it had some advantages in that the edited material did not suffer degradation in generation losses due to editing, a scene could be moved from the end of a tape to the beginning, or an extra scene could be inserted between two other scenes, and editing only required a single VT machine.

The next stage was electronic editing which came in around the early 70's. In this system the selected parts of the material are electronically copied to another tape. This system does leave the original studio recording intact, but incurs picture degradation due to generation losses. The appearance of electronic editing was soon coupled to programmable editors where the selected edit could be rehearsed before being performed.

The editors had many strange names such as RCA's TEP. They all worked in a similar way by recording a tone bleep on the recording machines cue track and then counting control track pulses from the bleep to the selected edit point. The system could be rehearsed by the record and play-in machine being run together and at the desired edit point, as indicated by the counters, a relay would switch the sound or the pictures or both on the VT monitoring from the record machine to the play machine and simulate the edit. The technology was slow and cumbersome. The edit points were selected by viewing the tape at play speed as Quadrox machines are unable to produce a picture when the tape is stationary, as the head only has access to 17 TV lines. The counters were loaded by watching the pictures and pressing a load button at the desired point. The edit could then be rehearsed and the count modified by thumb wheels, and only when satisfactory could the relay switch be replaced by a command to cycle the record machine from play to record, thus printing the edit.

The microprocessor soon appeared and brightened things up with better displays and a keyboard, but the next quantum leap was time code. Every single frame on the tape was numbered with unique 24 hour code consisting of hour, minute, second and frame, there being 25 frames to the second. This code was recorded on the audio cue track and could be read by the editor and the desired frame selected at the keyboard. This not only gave frame accurate edits but the selected numbers could be kept on a floppy disc.

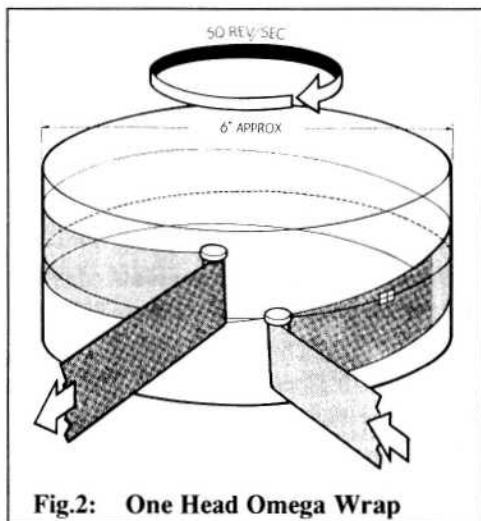
These numbers were called an edit list and in theory enabled another edited master to be assembled from the studio master tape, without a further generation loss incurred by copying the edited master. In practice the list was most useful for breaking the golden rule of VT editing, start at the beginning, assemble the shots in order and finish at the end, by what became called list management.

In list management the stored numbers can be moved around rather like a wordprocessor moves text around. The amended list can then be run rather like a computer programme and the TV programme will be re assembled from the studio master tape. List management enables several assembled shots to be moved from the end of the tape to the beginning and all the other shots moved up to make room for them. Once the list has been modified then the master tape needs to be rebuilt from the change point onwards and this takes time. One problem of this technique is that all the required shots may not be on the same tape, so enters checker-board working. The first studio tape is loaded and then it will copy all the relevant parts onto the edited master tape and leave the appropriate size holes for material on other studio tapes, these holes are then filled when the studio tape has been changed for the subsequent studio tapes. List managed systems were of limited use because of all these complications, but all this was to change.

The helical scan machines started to appear first of all on the non broadcast market with Philips 1500 machines and then later the Sony U-matic followed by Betamax and VHS. These non broadcast machines were used to make non broadcast copies of the unedited tapes, often with the time code displayed in picture. A rough list of edit points could be made by simply viewing the material and selecting the time codes of the best takes and save valuable time in the edit suite. This technique soon became refined into editing the material on the non broadcast tapes with an editor which made a list of the time codes which could then be carried into the broadcast edit suite and repeated on the original material. The non broadcast edit became called off line editing and the broadcast edit became called on line.

The helical scan format soon found its way into broadcast with the adoption of a 1'' single head Omega wrap machine called C format. This format records a single frame diagonally across the tape making, slow motion and still frame, possible.

This new format reduced the cost of broadcast VT machines, the reducing cost of machinery increased the number of broadcast machines to be found around the station and to a large extent put off line editing into a decline. The time code changed from an audio signal to a teletext style code at the top of the picture, the latter being called LITC and the new teletext code called VITC this could be read in still frame and made the selection of edit points more accurate.



**Fig.2: One Head Omega Wrap**

The on line edit suites started to expand and instead of two machines that could perform only simple cuts, three machine suites became the norm. This enabled mixes and digital effects to be added in the edit suites. Off line editing started to decline as all the tumbles and wipes of on-line could not be viewed in the off line suite.

A production revolution initiated the next change, this revolution was equipment led and became called EFP. The equipment began to shrink in size. First to appear was a small battery powered C format VT machine that could be used for recordings in the field often with a single camera. The camera and the VT machine soon became one, and Camcorders appeared. First of all news quality using a new format called Betacam and then full broadcast with Betacam SP. Betacam and Betacam SP were two headed Omega wrapped cassette formats. These single camera shoots produced tapes that had no vision mixer cuts, things being shot several times from lots of different angles and then assembled in the edit suite. The production technique was not new it was the standard way film was shot, but it escalated the editing work in VT suites.

The off line system has now started to make a comeback in something called Non Linear editing. It is very early days for this technology but systems with names like Lightworks, Henry and Avid are fighting to put their equipment on the market.



**Sony BVE-9000 Editor; Courtesy of Sony Broadcast & Communications Ltd.**

Non linear editing makes use of a computer and hard or optical disc storage along with digital compression to store pictures, sound and time codes. The pictures can then be recalled onto the VDU and viewed and edited from the keyboard. The end result being an edit list that can be edited in an on line suite. The early systems lacked good digital compression so the results were low resolution pictures, it was often hard to see lip-sync, but the latest systems are very good and we will see more off line editing. Try watching the end credits to see if off line credits appear.

Along side the editing technology the VTR formats are on the move again with the introduction of cassette based digital formats called D1 D2 D3 soon to be followed by D5 ( D4 is bad luck in Japanese ) D2 and D3 have the ability to read the tape video and inlay captions and re record using only a single VT machine. Vision mixes can also be carried out in a two machine edit suite using these cunning formats. This works by lifting off the digital picture mixing in the required information and putting it back further down the tape. The system is called read before write. Do it the other way around and you are in trouble. The effect is limited to mixes wipes and inlays and will not cope with DVE effects because of the frame storage, the material has not emerged from the DVE when it is time to write it back to the tape.

I hope you found what can only be described as a very brief look at the history of one particular field of professional Television. The subject is complex and involved and I have made many omissions, but I hope you found it interesting.

---

## A Watt Meter for 24cm

I have not been operating on 24cm ATV for long, but I must say that I have received a great deal of encouragement while setting up this mode. So, perhaps I ought to mention some of those who have helped, mostly were from the Nottingham Repeater Group working GB3NV and all have helped in one way or another, particularly Richard G8BWC, who looks after GB3NV.

Recently, I had the good fortune to have a QSO on 2m with Arthur G5KS. Arthur has been an active radio amateur for over 60 years, over which time has has built most of his equipment, including his ATV gear, no mean achievement that.

I explained my need for a Watt meter for 24cm ATV to Arthur, whereupon he told me to build one, and very kindly at considerable trouble due to his eyesight problem, he sent me a detailed plan and drawing. This I have now completed and it works admirably. The design drawing is reproduced overleaf

73 ... Harold Bent G0EZW



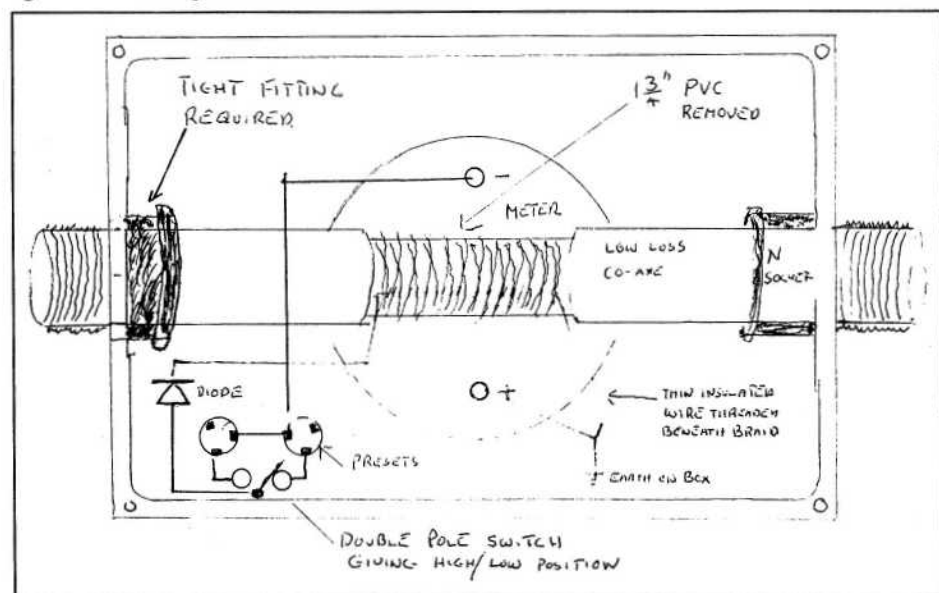
## Arthur Bevington G5KS - A Watt Meter for 24cm

### COMPONENTS

- 1 Die-cast 6" X 3" X 2"
- 1 Double-pole switch
- 2 N-type sockets
- 2 200k preset resistors
- 1 Diode 1N914 or OA47 Gold Bonded
- 1 Short length of low-loss coaxial cable; approximately 6"  
Note: the cable must have a copper braid and not a copper sheath
- 1 Small piece of Vero board
- 1 500 $\mu$ A Meter

### CONSTRUCTION

Most of the construction details can be gleaned from the diagram below. The meter and switch are mounted on the bottom of the box and the preset resistors mounted in such a way that access holes drilled for them through the die-cast box are accessible when the unit is mounted in-line with the aerial feeder. The unit should be calibrated against a known power meter.



# TV ON THE AIR

## **Andy Emmerson G8PTH**

**NORTHERN NEWS:** Here's some fascinating news of a very active ATV network which sorts of parallels the Manchester Ship Canal (well, not exactly but I though that might fix its position in your mind!). Courtesy of Brian G3SMU I hear the system starts with G3UVR in Heswall and is sent on 3cm to G3SMU halfway up Winter Hill (Bolton). Signals are retransmitted on 3cm and combined with other 3cm signals from G6ZBV (also Bolton) at the QTH of G4CBW in Newcastle under Lync. From here they are radiated on 24cm to all comers (or receivers). G4CBW has a fancy video effects generator and apparently manages to show incoming signals as well as his own, all in the same picture -it sounds magic!

In fact the whole system is working so well, they are thinking of establishing a repeater at Brian's place, the precise mix of 24 and/or 3cm inputs and outputs to be determined. It's great to hear of keen activity and enthusiasm like this (I gather they have experimented with stereo sound and simultaneous data transmission as well); that's what will keep ATV bubbling. I look forward to hearing more about this enterprising project.

**EAST YORKS REPEATER PROGRESS:** "Don't call it Humberside any more," says Clive Reynolds G8EQZ, who with Andy Goy G4HJD and Richard Guttridge G4YTV are celebrating the arrival of a licence for the amateur television repeater they have built. GB3EY is the new callsign and by the time you read these words it should be operating in the 24cm band on channel RT3 (1248MHz in, 1308MHz out). The slightly odd choice of frequencies was more or less forced on them by a radar station in the coverage area.

The new repeater is located at Aldbrough, offering a good service area to the east of the Yorkshire Wolds and the south bank of the Humber to the east of the Lincolnshire Wolds. It runs 25 watts ERP from an Alford Slot antenna, which should provide a good TV repeater service from Bridlington in the north to Cleethorpes in the south and Hull to the west.

The site owner is Tony Leake G0NAA, who has a farm on the cliff top. The use of the site and the 75-foot lighting tower will be shared with Tony's antennas and those of GB3HA when it moves down the coast from Hornsea. The group plan to interlink GB3EY with GB3ET on Emley Moor, also to add touch-tone controlled user facilities, so it sounds as if things are bubbling there.

These stalwarts have put a lot of effort into getting everything on the air and they are now looking for some user support. If you would like to join in the fun, you why not



contact Clive G8EQZ on 0482-563691 or Richard G4YTV on 0964-562948? You can also call them on 144.750MHz, the ATV talk-back frequency or write to them QTHR.

“Our licence application must have been the fastest ever granted,” continues Clive. “From start to finish, the whole process took just four months, with no come-back on any points. Fortunately there were no objections, but we weren’t expecting any from the amateur community because we put a lot of effort into educating the local users of the airwaves. We visited every club in the coverage area and gave talks and demonstrations of ATV, told them how TV repeaters worked and generally made it all sound interesting and useful. As a result, we got everybody on our side and things have worked out very well.”

This public relations aspect is crucial, I think. I hear of some repeater groups (but they are really more like one or two man bands) who do nothing to get locals interested. They build the box, put it on the air and that’s it. And when nobody shows much interest, they claim the amateur fraternity is not supporting them. I’m not naming names but if the cap fits, well... isn’t it time to do something?

As hams, we complain how the public tend to react with total indifference to amateur radio and television but at least the public have the excuse that they don’t understand about widgets and haven’t had it all explained to them. It ought to be easier to get the amateur radio community interested in ATV, but how can they be if they haven’t been told what’s going on? Some repeater groups can’t even be bothered to tell fellow ATVerS what’s going on!

Sadly, there seems to be no news from the groups allegedly at work in Bath, Hastings or even Northampton. The last letters from Scotland, Stoke and Nottingham were about eight years ago. Come along guys, why not drop me a line and tell the rest of the ATV world what you are up to? Do you even exist any more?!? Do you care? Does the rest of the BATC care? Frankly I’m coming to think I don’t care, but I still think it’s a shame, so deep down in my heart I suppose I do care. OK, end of sermon, back to the story.

**NEWS FROM POLAND:** Yes, it’s a bit late, but... Stanislaw Pazur writes: “On 16 and 17th May last, the eighth congress of members and sympathisers of the Polish ATV club, RVG, took place in Kalisz. The discussion focused on creating a system of packet radio. A transmission of ATV from the car was presented and they also showed interesting constructions of FAX and SSTV modems for Amiga and PC computers. The management of the club was chosen. The president is Wojciech Cwojdzinski SP2JPG, the vice-president Bartosz Pastusiak SP3CAI and the secretary Kaziermierz Slomski SP2ERD. The club bulletin will not be issued any more and the current news will be published in amateurs’ magazines.”

**DX FROM DARTFORD:** Dave Clarke G7KAO (Dartford, Kent) has been enjoying operation lately. “Just to let you know there was another good lift on Monday 28th December last year. At about 21.30 I saw GB3UD (P5, 248km),

GB3NV (P4, 194km), G0NAA beacon (now, there's a thing!) and worked through GB3TN (*see the photographs on the inside front cover ... Mike*). However, I saw all these on my Severnside aerial (with home-made extension) which is on fixed alignment towards GB3TN; I had to make do with this because my G3JVL loop yagi had become very deaf due to a severe build-up of ice on it! "Has anybody else had this problem and not realised it? The symptoms were increased domestic TV breakthrough and my pre-amp kept taking off," he writes.

**TWO DECADES PASS:** What was considered high-tech in amateur TV twenty years ago? Well, home made vidicon cameras were, and so was anything made from integrated circuits. In fact in 1970 the BATC held CAT-70, the Conference on Amateur Television, at Churchill College, Cambridge University and staged what was probably the club's most ambitious function ever. There was all manner of home-made equipment on display, whilst over the two-day event the club showed films on technical subjects (for example the (then new) Post Office Tower and colour television. Best of all was a number of live outside broadcasts and hook-ups with ATV stations all over East Anglia.

An 80-minutes long recording was made of the live link-ups, but only on the 405 lines system. The open reel tape recorded then has been sculling around over the years and probably has not improved with the keeping, so it seemed high time to do something about it. Martin Loach G8UDJ has one of the best collections of well maintained video recorders from the year dot and was able to make a pretty passable transfer from Sony open reel to VHS, still on 405 lines. In turn, I have now made an optical transfer to 625 lines, which works quite well all considered. If you'd like to gape at old I.O. cameras, monoscopes and other gear you can now buy the souvenir VHS tape. You'll be able to see G6ADM/T, the late G6WJ/T, G6NOX/T, G6REH/T, G6KKD/T, G3VZV and other BATC luminaries as they looked 23 years ago! The tape is supplied on a good name-brand E-180 and posted first class, whilst the price is £5 (which just covers total costs, wear & tear, etc.). Drop me a line if you're interested.

**IRISH PROGRESS:** Every now and again I get a letter from Ireland with news of ATV developments over there. This time it's a set of three photos from Dave Hooper EI2HR, near Dublin (*see photographs on the inside rear cover ... Mike*). Dave has now got his ATV station up and running: he has supplied detailed captions for each photo, so rather than repeat the information here I have used Dave's write-up with the photos.

**LETTER FROM SWITZERLAND:** We don't seem to hear so much these days about ATV operation in central Europe, so a letter and photos from Hardy HB9RRH in Niederzuwill came as a welcome surprise.

He writes: "I am active on ATV with 70cm AM and 23cm FM. I made an entry in last September's IARU Region 1 ATV contest with a small 70cm transmitter working with 1.2 watts only. The portable transmitter weighs just 300 grams, without batteries,

and was developed and built by my friend HB9CSU, Dr Hans Karl Sturm. Hans Karl has just completed a fine repeater, the HB9FW, situated 790 metres above sea level. It is about 3km from my QTH, which is at JN47NK.

“Repeater input is 23cm FM on 1274MHz, output on 70cm AM with 60 watts sync power on 432.350MHz picture, 437.850MHz sound. The antennas for 23cm and 70cm are slotted tubes, arranged as a four-antenna system on each band, all home-made. The preamp is 20dB. The relay covers the region of eastern Switzerland as far as Ulm in Germany. It is intended to make a link-up with the repeater DB0GY situated near Friedrichshafen on Lake Constance. We are awaiting permission from the post offices of Germany and Switzerland.

“Apart from the repeater, I am quite often QRV from the top of some mountains. German amateurs have relayed my transmissions on several occasions as far as Munich as I have been active from a mountain some 1,500 metres above sea level, sending pictures of hang-gliders starting from snow-covered slopes. It was a real thrill to us all. Two years ago I went together with my son to the Zugspitze, which at nearly 3,000 metres is the highest mountain in Germany (near Garmisch-Partenkirchen). Hans Karl was able to receive my 70cm transmission in colour: the signals of my little 1.2 watt transmitter covered the distance of about 180km with flying colours.”

**MORE REPEATER NEWS - IN BIRMINGHAM...:** G8EMX is putting out a lively bulletin giving details of progress with the new Birmingham repeater. “I am pleased to announce a MAJOR DEVELOPMENT,” he writes. So it must be good if it warrants 36-point capitals. No, I must not jest, because it seems things are bubbling in Birmingham. The Midland Amateur Radio Society (MARS) have given their willing agreement for the TV repeater group to mount an Alford Slot repeater on top of their club HQ for TV coverage trials. Thursday evenings and Saturdays are the most likely times for access. The site is about half a mile north-west of Colmore Circus and it is likely to replace a previous location planned. At this stage it is not clear what propagation is likely to be from the new site, so trials are to go ahead: in fact they should have started by now. G8EMX ends his newsletter with a very shrewd note: “We need ATV activity on both bands (70cm and 24cm).” That’s right - don’t write off 70cm yet!

**...AND IN BRISTOL:** The latest edition of “P5”, the Severnside Group’s newsletter, has arrived and gives details of their 10GHz TV repeater trials. Shaun O’Sullivan G8VPG writes: “Work on our proposed 10GHz amateur television repeater continues to progress. A major milestone was passed on November 29th last, 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 10.15GHz, 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.

“A number of people with 10GHz receiving equipment were eagerly awaiting the switch-on to see if the signals were watchable. For receive everyone was using converted satellite TV LNBS in conjunction with dish antennas of varying sizes. The reports received were very encouraging and suggest we should obtain good coverage of the Bristol area. Roy G3FYX at home in Winterbourne sent in a P5, commenting that more deviation was required. This was a comment everybody 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 fading, which I think surprised even him. Ken G4BVK at home in Hanham utilised his main steerable 1.2-metre satellite dish but still could not see anything (later investigations showed one of the stages in his LNB was not working). Finally Steve G8KUW dashed around /portable to various sites in the Filton area but also drew a blank.

“The results from the day’s work will enable us to produce the necessary area coverage map and complete the licence application forms. However, we must first get formal permission to use the site. It is a super site which is the reason why we are keeping it a little under our hats. All will be revealed in due course!”

Thanks Shaun for an interesting insight into what goes into preparing the ground for a new repeater. We wish you luck and look forward to further news.

**CZECH MATE:** One of our Czech readers, Miroslav Mate, is setting up a video studio and would very much like to acquire any semi-professional equipment readers may have spare. Basically, this would be a donation because however bad our economic situation is, theirs is a whole lot worse. Cameras, VTRs, tape, etc. would all be welcome. Nobody is expecting readers to empty their own shacks, but it may just be that some of you are in a position where you have influence of disposals of this kind of gear at work. We could arrange transport to Moravia, so if you’re feeling generous or would like to help, please get in touch. He also needs the manual or circuit for a CONNEXIONS TCR 8520/CM 8720 satellite receiver. Please contact me, Andy Emmerson on 0604-844130.

**LAST WORD:** It appears there may be another ATV repeater in London, this time in Central London. There’s a whisper that Imperial College is considering a 24cm repeater at its South Kensington location (perhaps on the roof of the Imperial Institute tower?!?). We’ll let you know when there’s any more news.

**Andy Emmerson G8PTH, 71 Falcutt Way, Northampton, NN2 8PH**

# The Parabolic 24cm ATV Units

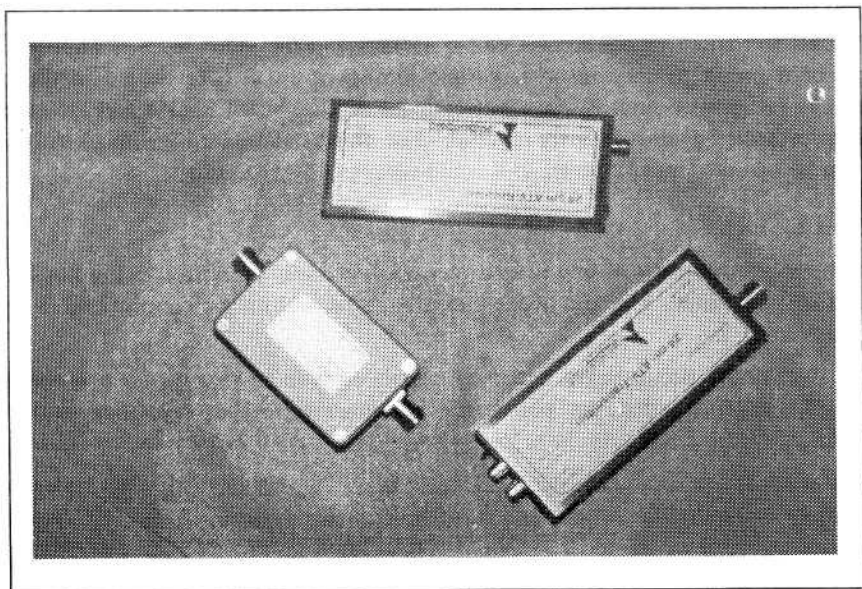
*Review*

## Mike Wooding G6IQM

In our endeavour here at the CQ-TV office to keep you advised of new products available to the TV amateur I like to think that we manage to keep you well informed and up-to-date. So, I was very pleased to receive a fax late December from Parabolic AB of Sweden advising me of a new range of 24cm ATV products that are now available. Consequently, a set of the equipment was obtained and a CQ-TV technical review carried out. The system is modular in design and comprises a Transmitter, Receiver and Preamplifier. They are all stand-alone units, which may be used independently with other equipment, or together to form a complete ATV transceiver.

### THE TRANSMITTER

The unit is highly professionally presented in a black extruded aluminium enclosure measuring 157mm x 65mm x 35mm (183mm long overall including sockets). On the end plates are mounted the input Audio and Video Phono sockets and the output N-type socket respectively. On the end plate holding the input sockets are also mounted the on/off switch, the power indication LED, the audio level control and a bank of 6 dip switches - more about these below. On the output socket end plate the DC input socket is also found.



The case is held together by 4 screws in each end plate and the body of the enclosure is in two pieces, which separate to reveal the printed circuit board firmly screwed to the lower case. The RF output socket is soldered direct to the PCB, thus eliminating any impedance matching problems due to connecting wires.

The PCB is a daunting sight to anyone who is not accustomed to the latest state-of-the-art construction methods using surface-mount devices - over 90% of the components are SMD devices, and those that are not, are not solely because such components are not yet readily available as SMD.

Now, that bank of 6 dip switches. The basis of the transmitter is a BCD synthesised oscillator, the frequency of which is determined by the selection of these 6 dip switches. A printed table is supplied with the unit and gives the various switch combinations, allowing the frequency to be selected anywhere from 1240 MHz to 1279 MHz in 1 MHz steps, thus covering the spectrum of the band normally occupied by ATVers operating simplex.

I can imagine in some situations that this method of frequency selection may not be entirely user-friendly, in that if the transmitting station wishes to change frequency, say from the local ATV repeater input to a simplex frequency, then changing the selection of some, if not all, of the switches is required. This could prove somewhat impractical if the unit has been housed in a cabinet.

However, I do know that there are many stations who operate 24cm ATV with only one transmit frequency available to them, and by default that is probably the local ATV repeater input frequency. For my part, it would not prove to be a problem having, to all intents and purposes, a fixed transmit frequency of 1249 MHz.

The video and audio inputs are via phono sockets and the video level is adjusted by means of a preset potentiometer accessible through a small hole drilled in the end plate. The DC power input is via a conventional centre-pin DC socket and the supply is diode protected against polarity reversal. The unit has an internal voltage stabiliser and can be operate from 12 volts, so it could successfully be used /P.

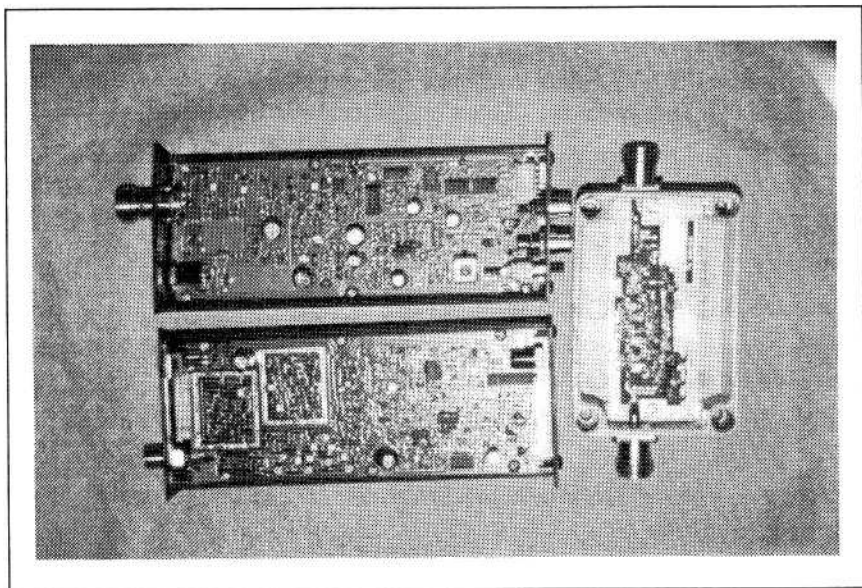
## **THE RECEIVER**

As with the transmitter, this unit is also very professionally presented, being housed in an identical enclosure. The end plates carry the input and output connections as with the transmitter.

Again, the printed circuit board is heavily populated with surface mount components, in fact I guesstimate that the percentage is higher with this unit than with the transmitter.

The RF input to the receiver is via an F-type socket, the unit obviously has a pedigree originating in the satellite world, and to compound this supposition, the receiver also supplies a DC feed via the input socket for a remote preamplifier.





The receiver comes in two versions; one with an IF output of 48.25 MHz (it can be set to any IF in the range 48 to 62 MHz), suitable for feeding into one of the FM ATV demodulators available; the second version comes with on-board vision and sound demodulators, giving the usual video and audio output levels via a 5-pin din socket. The DC power is again fed in via a centre-pin DC socket, also with polarity reversal protection.

The tuning control is a 10-turn preset potentiometer accessible through a hole drilled in the end plate housing the AV output and DC input sockets. This type of tuning control is not practical for a day-to-day 24cm ATV receiver as used in the shack, but would be ideal if the unit were to be used as a fixed frequency receiver, as would be the case in an ATV repeater. Alternatively, it would not be a difficult task to remove the 10-turn potentiometer and use a panel tuning control hard-wired to the unit.

## **THE PREAMPLIFIER**

This unit is housed in a fully weatherproof die-cast housing measuring 100 x 65 x 40mm, with N-type sockets for input and output, which are fitted with O-rings for in order to complete the weatherproofing. The DC power supply is fed in via the coaxial feeder to the output socket from the receiver. A supply of 12 to 18 volts at approximately 60mA is required. The preamplifier is a multi-stage unit with a GaAsFET device at the front end. The preamplifier is claimed to have gain in excess of 40dB over the amateur 24cm band with a noise figure of around 1 to 1.5dB, which would make it a very useful unit indeed. There is no tuning required or available.

## BENCH TESTS

The usual stringent CQ-TV bench evaluation was carried out on the two units and the results obtained are shown below. The test equipment used was as follows:

Anritsu MS2601B Spectrum Analyser Anritsu M4680M Tracking Generator Hewlett Packard 5342A Microwave Frequency Counter Racal 9232 Power Supply Unit Datron 1081 Digital Multimeter Ailtech 7310 Noise Monitor Ailtech 7618 Noise Source

### Transmitter:

Frequency range: 1240 to 1279 MHz

Frequency Accuracy and Stability 1249 selected: at switch on 1248.987 MHz; after 15 minutes 1248.876 MHz; after 60 minutes 1248.982 MHz

Output Power: 1240 MHz +24.16 dBm; 1260 MHz +23.88 dBm; 1279 MHz +24.16 dBm

Phase/Synthesiser Noise: 126 kHz from fc -61.57dBc; 152 kHz from fc -49.09dBc; 2.4 MHz from fc -55.38dBc

Harmonics: 2nd -14dBc; 3rd -29dBc; 4th -38dBc; 5th -38dBc.

Audio Subcarrier: 6.3 MHz (state preferred ASC frequency when ordering!) -17.75dBc

ASC Harmonic: 12.66 MHz, -42.0dBc

Power Supply: 13.5 volts @ 295mA

Note: +24dBm is approximately 250mW

### Receiver:

Frequency Range: from below 1200 MHz to 1360 MHz

Sensitivity (using a wideband video modulated carrier): 90uV for a discernable lift in the noise floor; 110uV to give detectable sync pulses

Video Output: 0.6 volts into 75 ohms for a received signal with recommended ATV deviation levels.

Audio Output: An actual level measurement was unable to be made, but a high enough level to drive a simple one-chip audio amplifier is available.

Power Supply: 13.5 volts at 190mA

External DC for Preamp: 12 volts

### Preamplifier:

Gain at 1280 MHz = 46.28dB

24cm Gain bandwidth relative to 1280 MHz = +2dB @ 1240 MHz to -5dB at 1320 MHz.

Noise Figure at 1280 MHz 1.55dB



No spurious signals or harmonics detected due to preamplifier.

Power supply: 12 to 18 volts @ 58mA

## OFF AIR TESTS

**Transmitter:** The transmitter performed very well indeed, delivering of the order of a quarter of a watt into the aerial system. Of course, at this power level only localised tests were possible, but the results would be the same if the power were boosted by an external PA.

The usual shack level of video at around 1 volt peak-to-peak resulted in well contrasted pictures on the control receiver (a Wood and Douglas receiver with a BATC Demodulator).

The transmit frequency was extremely stable and the unit got barely warm, even after over 1 hour of transmit time. The audio quality was a little more difficult to ascertain due to the incompatibility of my the control receiver and the transmitter, but with the matching receiver was found to be excellent.

As stated earlier, the method of frequency selection does not really allow for dual or multiple frequency operation, but as this is not necessarily an essential feature of a 24cm ATV station, then I do not consider it that detrimental.

**Receiver:** The sensitivity of the unit without any external preamplifier was not as good as the Wood and Douglas system, but that is a somewhat unfair comparison, as the W&D unit features a GaAsFET RF front-end and this receiver does not. However, that aside the pictures received were of a good quality, although I got the impression that the receiver still exhibits wideband characteristics which bear proof of its pedigree, as a TVRO receiver. That aside, the P4 pictures I received from GB3RT without any added amplification were of satisfactory quality, but as the signal strength was reduced the pictures became less than stable, which could be directly attributed to the wideband characteristics of the unit.

Due to my somewhat 'stropy' monitor I was unable to detect any colour on the picture, but with the aid of my trust oscilloscope colour burst was found to be present on the output video waveform.

**Preamplifier:** As expected from the bench tests, I found this unit to be extremely good. The original P4 picture I received from GB3RT was lifted to a screen-bending P5 with full colour, so even my monitor couldn't refuse any longer! Reducing the signal strength to an apparent P2 with the picture from the receiver on its own becoming unstable, the preamplifier lifted the picture to a very good P4, bordering on P5, still with locked colour. All receive tests were carried out with the unit at the receiver input and not at the aerial itself, thus around 20m of cable were in the receiver path in front of the preamplifier.

## CONCLUSIONS

The equipment is very professionally constructed and presented. The transmitter I liked, although it is essentially a single frequency unit, by nature of the method of frequency selection, an extremely stable signal can be provided at any desired ATV simplex frequency or repeater input. The quality of the video and audio was good.

The receiver, I feel, could be improved as far as amateur TV use goes. As I mentioned previously, the bandwidth appears to be too wide, which results in degraded quality of resolved video. However, I have seen far worse pictures from other equipment on the market!\*\*

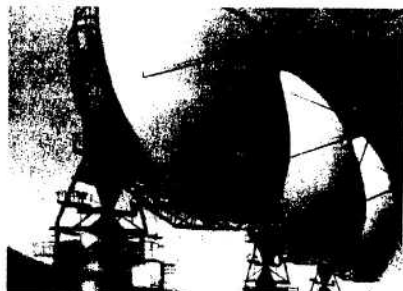
The preamplifier I found to be excellent. Although I have yet to see it at its best at the top of the mast, the preamplifier lived up to its high specifications. I feel that this unit is perhaps the best of the three units tested.

**\*\*Note:** After a subsequent conversation with the manufacturers it was confirmed that both the receiver and the transmitter are wideband units, around 26 MHz. However, in the light of my comments they will be redesigning the ATV related units with the more usual bandwidths we use. Also, for a £10 surcharge the audio subcarriers can be set to 6 MHz.

The equipment, further information, prices, etc., are available from Parabolic Systems AB, P.O. Box 10257, S-434 23 Kungsbacka, Sweden. Tel: +46 300 410 60; Fax: +46 300 406 21. (See the advertisement elsewhere in this issue).

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# IN RETROSPECT

*I am afraid that I have to apologise to many of you on behalf of the Club's development team. It appears that a considerable amount of errors crept into the second version of the BATC 24cm ATV Receiver published in the last issue. Below are the corrections known to date ... Mike.*

## **THE BATC 23cm ATV RECEIVER Mk.2 - CQ-TV 161, pp9 to 19**

**Page 10, Fig.1:** The legend in the centre of the PCB marked vertically top to bottom as: + +/- - , should be: - +/- + .

**Page 11:** The bottom line of the page should read: MHz trap - L11 and C24 to remove any residual audio carrier on the video signal before

**Page 12, Fig.2:** ASTEC module pin-12 feeds the Noise Meter ASTEC module pin-13 feeds the Signal Strength Meter

**Page 13:** First paragraph, third sentence should read: The bias for this stage is set by R7 (47k) and R19 (22k) and fed via D1. (Note: R19 is not marked on the circuit diagram in Fig.3 page 14, but is the resistor directly below R7, shunted by an electrolytic capacitor, also unmarked which is C20 - 10uF).

The first line in the third paragraph should read: The output of the module also feeds the 6 MHz signal developed across L13, via C38,

**Page 14, Fig.3:** Diodes D2 and D3 are really D3 and D4 respectively. In addition the 1N4148, the real D3, is shown the wrong way around.

On the NE592 pin-5 is really pin-10 and pin-9 is really pin-5.

The video output transistor references are TR1 for the NPN and TR2 for the PNP.

**Page 16, section TESTING, fifth paragraph:** The pin number references to the power connections on the D-plug depend as to whether the plug or socket is chassis mounted. As a security measure, in your construction check which pin of the PCB mounted part of the D-type is connected to ground and wire the other part accordingly.

**Pages 18 & 19:** Parts List: C18 is 100nF, MMIC2, TR4 is an AFT20135

A large number of components on the circuit diagrams are either unmarked or incorrectly marked:

The diode by R7 is D1

The R and C just below R7 are R19 and C20

The non-electrolytic capacitor between R10 and LK3 is C18

The R20 (there are actually two !) at pin-14 of the NE592 is actually R27.

The R28 in the video out feed is really R23.

The C23 in series with L11 is really C24 (Toko data recommends a value of 560pF to resonate at 6 MHz).

The C24 as marked on the circuit diagram in Fig.3 is really C25.

The capacitors shown on the circuit diagrams as C21, C37, C44, C42, C49, C50 and C28 all require 1 to be added to the number to make it correct, e.g C21 is really C22.

As above, the capacitors marked C53, C48, C52 and C51 should all have 1 added to the number.

The inductor from C13/C37 to ground is L13.

R39 should not be connected to pin-1 of the XR215 but to pin-5.

The reference R40 just below R39 should be deleted and ignored - there is no resistor there.

The capacitors shown as C40, C34 and C39 are really C34, C35 and C40 respectively.

The resistor shown as R32 between pins-9 and 10 of the XR215 is really R33.

The junction of C39, R35 and R45 should connect to the junction of R39, R40 and R46.

Capacitor C14 in the output lead from the 7805 regulator is really C11.

The Zener diode below R14 is D2.

The resistor shown as R16 is really R15.

The capacitors marked as C43, C20, C21, C36, C42, C41 and C47 are really C41, C21, C23, C37, C43, C42 and C48 respectively.

## **A 24cm TRANSMITTER - An Introduction to Amateur Television, pp71 to 80**

Although not exactly referring to known (or admitted!) errors by the development team, the following letter has been edited and included as a reference source for any others having similar difficulties.

Chris G1EZJ

Why is it always me?

Hello to all fellow ATV operators. I have just finished building the new 24cm BATC Video transmitter and thought I would relate a few problems I came across and managed to modify or cure!

First of all, I used ALL the CORRECT components (Surface mount caps, etc.). After completing the transmitter PCB I mounted it into a die-cast box, fitted all the controls and an N-Socket for the aerial. I hooked up the transmitter via a 2A meter to a 12 Volt regulated supply. I loaded up the transmitter into the 24cm antenna and fed 1V of video from my Cropredy Test Card Generator. I powered up the supply and got a reading of about 100mA. So far, so good!

I dug out my 1300 MHz frequency counter and put the probe around the oscillator and got a reading of 780 MHz!. I tried all the mods on the sheet but to no avail. In the end this is what I had to do to get it on frequency at 1249 MHz.

- (1) Replace C12 (12pf chip) for a 4.7pF Ceramic with SHORT LEGS !!!
- (2) RL1 should be 220 ohm.
- (3) Replace R16 with a 68k resistor.
- (4) Fit a 10k resistor from the junction of L4/R16 to ground.

This now put the oscillator on frequency!. Now I tuned the two SKY presets for maximum output and found that I had to put a 1pF capacitor from the input to the power module to ground. This brought up the power.

The next thing was to monitor the video coming out of the transmitter and it was horrible. It was as though it had been stripped of all its Syncs and compressed (I thought it was scrambled HI) and after much cursing I found the following to improve matters 100 percent!

- (1) fit a 1.0uF capacitor (non electrolytic) across C7 (0.047uF)
- (2) Snip out L1 (yes I know its part of the Pre-emph. circuit, but....).

Well, now I had a smashing/super (can't beat a bit of Bully?) picture. But what of intercarrier sound?. Nothing. The cure took about 2 hours to find and is SOOO simple!

- (1) fit a 1pF ceramic capacitor across R16 (now 68k).

And that's it. Now it had smashing intercarrier sound!

Now I know that there are people out there who are VERY technically minded and can quote dBs, etc., until they are blue in the face, and I have to say that I am NOT one of them. I work on my own with NO immediate help locally! So what you see is what you get. I work from a practical point of view and in no way should the above be held against the design or designer of the BATC project. These are guidelines to help you IF you have similar Problems. I hope that you don't!!!

Note: The 1pF capacitors were scrounged out of old TV tuners.

Well, that's about it for now. I have been putting sound and piccies into GB3UD and the reports are very favourable!

73 DE Chris G1EZJ

# BSB Receivers Part-4

**Chris Smith G1FEF**

## **INTRODUCTION**

In CQ-TV 159 Trevor Brown explained how to provide a baseband input for the Ferguson and Philips BSB receivers. The response to the original article was overwhelming and promoted the subsequent follow articles including a review of the Trac and satellite PAL conversion kits along with simple PAL add on for the Philips that can be home constructed. This time we will be pursuing home built add-ons for the Ferguson SRB1.

## **NEW EPROM**

As was the case with the Philips receiver, the first thing you have to do is replace the software that drives the receiver. This is contained in an EPROM marked IR03, in a socket near the CPU IC. There are several different EPROMs available from different sources, they all vary in cost as well as in flexibility and usefulness. If you contact me, I can suggest a few options (yes, including my own!).

The new EPROM will enable you to receive D-MAC and D2-MAC signals, some will also unscramble the 'softscram' encrypted signals. Beware of some suppliers claiming to unscramble ALL encrypted signals. To date, I am not aware of anyone who has completely 'hacked' this form of encryption.

## **TUNING RANGE**

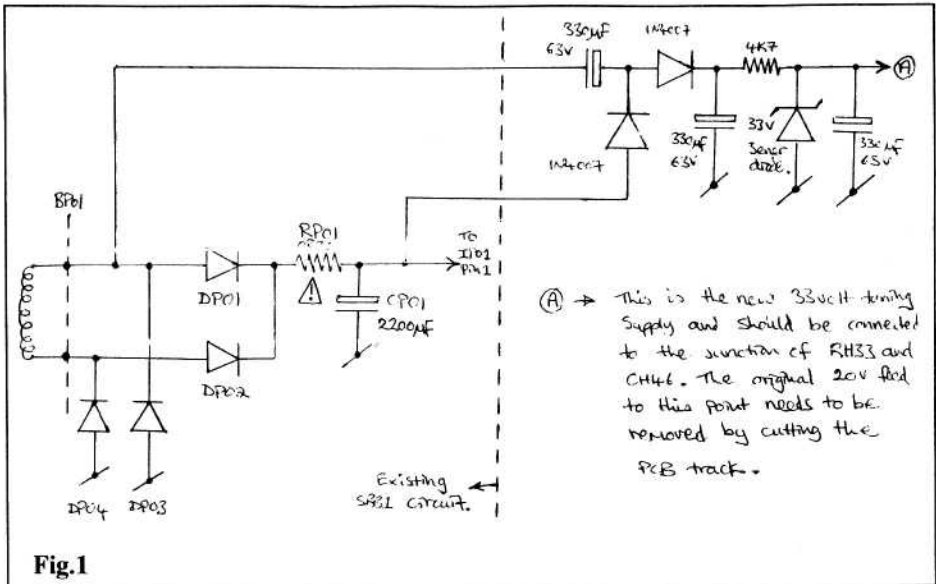
The first problem you will encounter, is trying to tune the entire band. The SRB1 was only designed to tune the first 400MHz, to cover the top 400MHz you will need to increase the tuning voltage from 20volts to 33volts, the PLL IC (IH30) will then be able to lock on to any frequency in the 800MHz IF band (950MHz - 1750MHz). To accomplish this, build the circuit in Fig.1, and install in the receiver.

Next, you will probably want to add polarity switching, so you can use the standard 'Astra' type LNB, see Fig.2. If using my software, you don't need an external switch - the software does it all for you!

## **PAL OUTPUT**

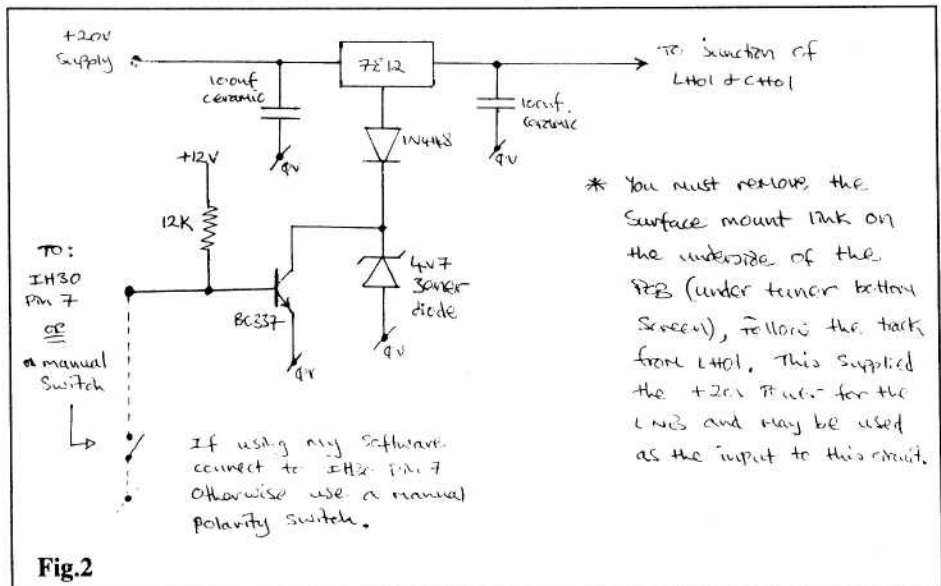
Of course the next step is to get PAL out, there are two ways to achieve this:

1 - You do it the 'hi-tech' way and build in ITT's digital PAL IC, the PVPU2204. This also needs a DPU2553 deflection processor for the syncs, a 17.73MHz crystal



and an MSP2410 audio IC. It will provide you with a high quality picture, on screen graphics, stereo audio (tuneable) and the option to add both D2MAC and PAL teletext, using the TPU2753.

There are three problems with this approach: i) It is a complicated circuit and there are no PCB's available; ii) My software is the only one available to 'drive' it and iii)



ITT's minimum order for these devices is 300 off!

Still, if enough of you club together iii) shouldn't be a problem, someone, somewhere must be able to produce a PCB and as for problem number ii) well, I really don't mind if lots of people buy my software !!!

2 - The 'not-so-hi tech' way. Take the baseband out from the receiver,

black level clamp it, to remove the energy dispersal, de-emphasise to normal CCIR standard and demodulate the sound subcarrier.

Sounds complicated, but it needn't be . . .

Firstly, if you take the baseband out AFTER the D-MAC de-emphasis, you've no need to de-emphasise yourself (OK, so its no where near CCIR spec, but as most TV sets and monitors have automatic chroma control you will not be disappointed with the result. Secondly, the audio subcarrier demod. You can opt for the easy way out and buy a kit such as the one from Cirkit for £6.50 (Page 94, Winter 1992/93 catalogue from WH Smiths). Or you can build your own, e.g.: CQ-TV 140 Page 79, CQ-TV 145 Page 43, CQ-TV 148 Page 61, etc. The only real problem is removing the energy dispersal signal, this can be achieved by a clamp circuit, a VERY simple one is shown in Fig.3. It does work, but bright pictures still tend to jitter a bit, there are better circuits around but this gives you a good starting point from which to experiment. It also shows how to switch between PAL and D/D2-MAC (no switch required with my software!)

## WHAT NEXT

So, you've done all the above, what next? Well, the PLL IC has an eight bit output port which is completely unused in the Ferguson design. In my original software, I used two of these for PAL switching and polarity switching. The latest version uses another bit for SVHS switching and gives you full access to the other 5 bits, to do with what you like. How about an antenna switch, dish positioner, audio mode select, bright red flashing lights and a klaxon for when Red Hot Dutch channel is selected?!?!

## D/D2-MAC CHIPSET

Something to watch out for when buying these receivers is the version of the chipset. The IC to check is ID7 (DMA2285), this is the square chip on the upside-down piggy-back PCB inside the screening box, behind the front panel. There are three variants that I know of: -25, -30 and -31. This is usually printed on the bottom right corner of the chip. Obviously, when buying a unit you can't pull it to bits to check this. So as a rough guide, if the serial number of the receiver is SRB1105000 or higher, its PROBABLY ok.

The -25 version had a bug that causes most software to momentarily 'scramble' a clear picture every few seconds (most annoying!). The -30 version cures this bug but

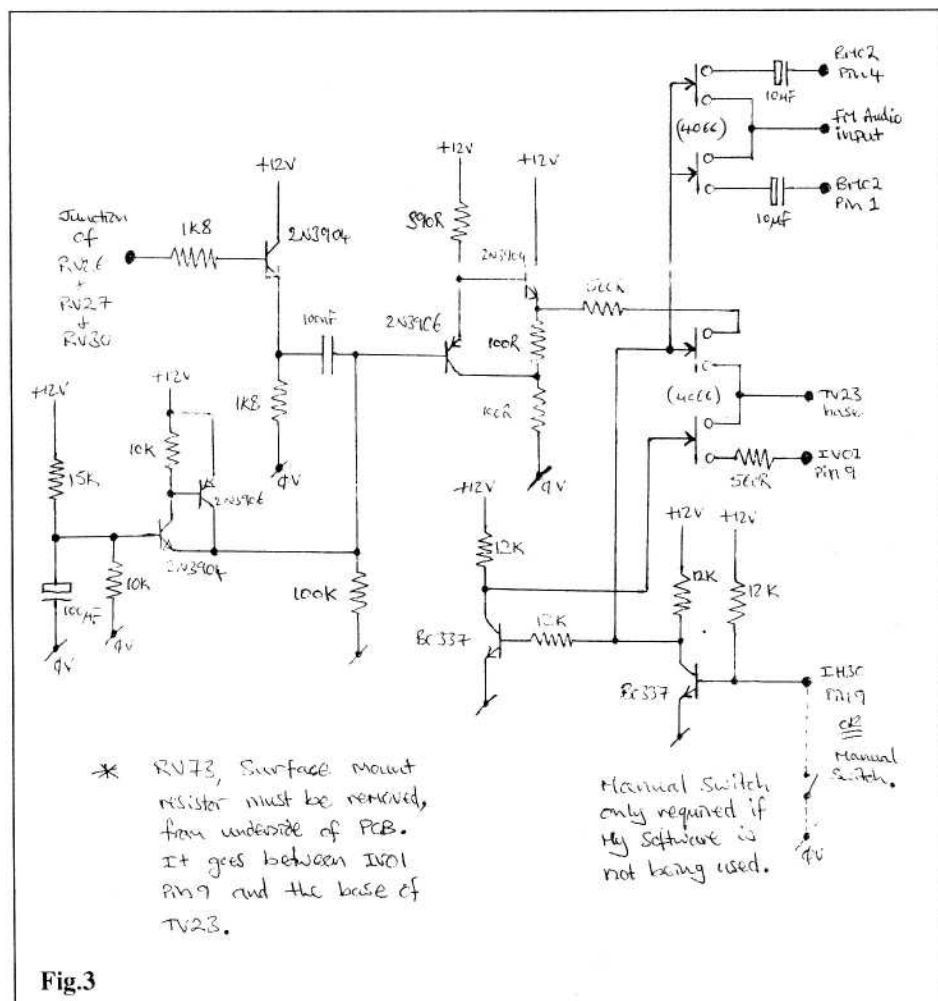


introduced a different bug to do with the audio, finally the -31 seems to be ok!

Of course, you can always upgrade to the latest D/D2-MAC chipset by replacing the DMA2285 with a DMA2286 and replacing the DMA2280 with a DMA2281. They are pin-compatible, but provide more features that software can utilise.

## FINALLY

In the mean time, if anyone has any questions they want answering, Trevor and I will be demonstrating some converted systems at Harlaxton along with a demo of the BATC BBS. If you can't wait that long, call me on 0933-58220 or Trevor on 0532 670115 or leave either of us a message on the BATC BBS, Tel: 0933-413396.



# CONTEST NEWS

**Richard Guttridge G4YTV**

## WINTER VISION

Just four entries for this contest and all from fixed stations, no portables. John G8MNY found that most of his local stations were QRT, because they didn't know there was a contest on. However he did do well with the DX with two contacts into Humberside (East Yorkshire) and one into Lincolnshire. Another John G4ZJY from Telford was also on for the contest and his best DX was with your's truly at 194 km. Des G3NNG confirmed his lead at the top of the Fixed Station Championship table.

## WINTER CUMULATIVES

Only three logs received for this contest. Conditions were generally awful. Des G3NNG starting the year off well with good wins in both the 70cm and 24cm sections. Just to remind you, that apart from the cumulatives all the contests happen on the second full weekend in the months of March, May, June, September, November and December. And to make it even easier to remember the start time for ALL contests apart from the cumulatives will be 1800hrs GMT on the Saturday and finishing at 1200 hrs GMT on the Sunday. That will standardize all the major ATV contests with our European friends. Their ATV contests are in March, June, September (The International), November and December.

## CHAMPIONSHIP LEAGUE TABLE

### BATC FIXED STATION CHAMPIONSHIP 1992

The final results of the 1st. Championship League Table. Des G3NNG wins the fixed station section, while Clive wins the portable section. Both winners will receive their prizes at Harlaxton Manor on Sunday May 2nd 1993.

1	G3NNG	4357	11	G0IMP	385
2	G8MNY	1953	12	G8ONX	226
3	G4YTV	1811	13	G4XMQ	195
4	G4ZJY	1437	14	G6WLM	173
5	G7AVU	1430	15	EI3FW	162
=6	G7ATG	1000	16	EI6EV	100
=6	G6GHP	1000	17	G0JNK	99
8	G4RNA	593	18	G4TEP	29
=9	G4WGZ	442	19	G0ETZ	11
=9	G7KAO	442			

## BATC PORTABLE STATION CHAMPIONSHIP 1992

1	G8EQZ/P	2650	7	G4WGX/P	905
2	G7ATV/P	1344	8	G8VOI/P	201
3	GW7ATG/P	1161	9	G8GON/P	168
4	G8MNY/P	1095	10	G5FZ/P	125
=5	G1COI/P	1000	11	G0IMP/P	53
=5	G8EMX/P	1000	12	GW3JGA/P	23

## CONTEST RESULTS

### WINTER VISION 93

#### 70cm

Callsign	Points	QSO'S	Best DX	@ Km
G3NNG	1814	8	G4YTV	261
G4YTV	1689	9	G8MNY	279
G8MNY	1487	8	G4YTV	279
G4ZJY	697	8	G4YTV	194

#### 24cm

Callsign	Points	QSO'S	Best DX	@ Km
G3NNG	593	4	G4ZJY	129
G8MNY	431	5	G3NNG	114
G4ZJY	307	3	G3NNG	129
G4YTV	281	4	G4AGE	96

### WINTER CUMULATIVES 93

#### 70cm

Callsign	Points	QSO'S	Best DX	@ Km
G3NNG	2309	14	G4YTV	261
G4YTV	1185	9	G3NNG	261
G8MNY	1179	16	G4AGE	225

#### 24cm

Callsign	Points	QSO'S	Best DX	@ km
G3NNG	2399	13	G4ZJY	129
G8MNY	1089	16	G3NNG	114
G4YTV	728	7	G4AGE	96

# CONTEST CALENDAR

All times 1800 hrs GMT Saturday to 1200 hrs GMT Sunday except the  
SUMMER CUMULATIVES.

## MAYDAY MICROWAVE

8th/9th May 1993 24cm and above FSTV only

## SUMMER FUN

12th/13th June 1993 All bands FSTV/SSTV

## SUMMER CUMULATIVES

Tuesday 6th, Wednesday 14th,  
Thursday 22nd and Friday 30th July 1993.  
All sessions 1900hrs GMT to 2359 hrs GMT.  
Best three logs out of the four sessions.  
Please send all logs in. All bands FSTV

## THE INTERNATIONAL

11th/12th September 1993 All bands FSTV

## AUTUMN VISION

13th/14th November 1993  
All bands FSTV/SSTV

## WINTER VISION

11th/12th December 1993  
All bands FSTV/SSTV

# 4-RAIL POWER SUPPLY UNIT

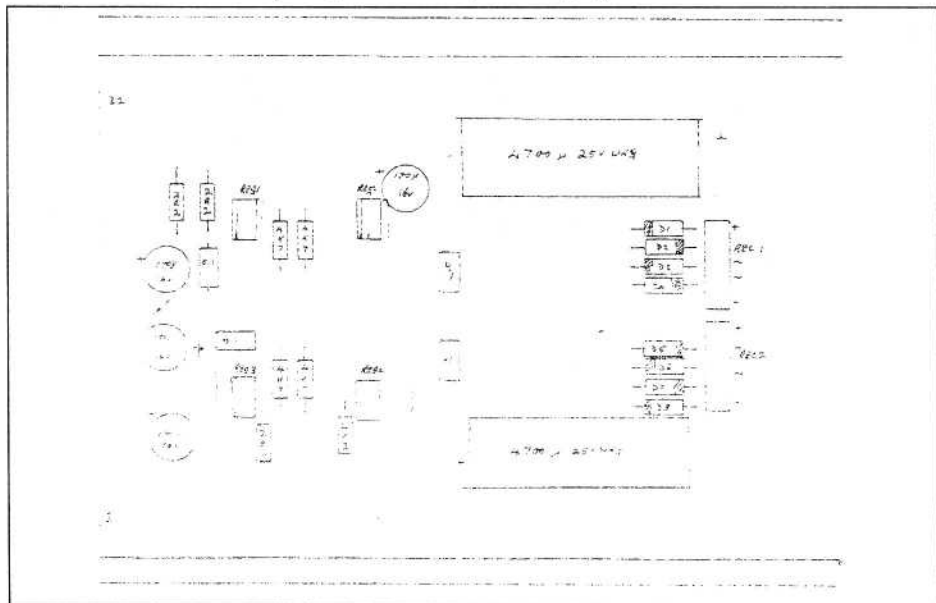
## BATC PCB Stock No: 46

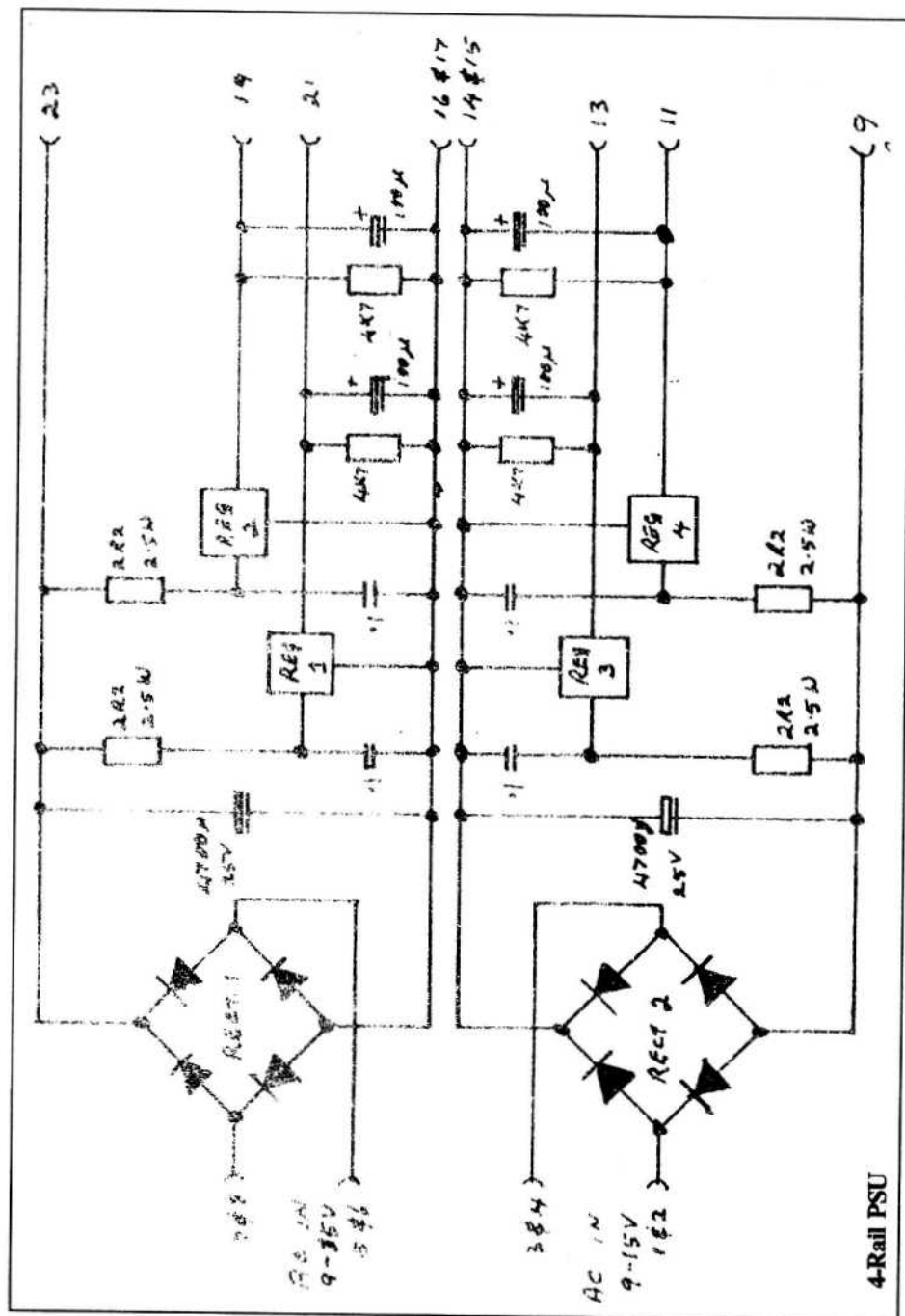
*This design by Bob Robson GW8AGI, although quite old, has never appeared in CQ-TV, yet a printed circuit board is available for it from Members' Services. The circuit is extremely useful and interfaces with several other BATC projects and PCB sets, so I have decided to publish the bare bones of the unit here ... Mike*

The circuit is shown overleaf and the PCB layout below. As can be seen, the unit utilises 3-terminal regulators for the basis of generating the supplies, with plenty of smoothing and decoupling to eradicate unwanted noise and oscillations. The AC requirements are two separate 9 to 15 volt supplies, from independent windings if a common transformer is used.

The actual requirements of the output voltages are selectable by the builder, who can use any regulators in the range 7805 to 7812 or 7905 to 7912, thus producing four supplies in the ranges +5 to +12 volts or -5 to -12 volts.

The printed circuit board is styled on the somewhat old ISEP size, which makes it a perfect stable-mate for the G3WCY/G4ENA SSTV project, or the Vision Switch/Mix Effects/Wipe generator project. However, the PCB is so laid out that it can be trimmed to Eurocard size to ideally suit, for instance, the I<sup>2</sup>C project.

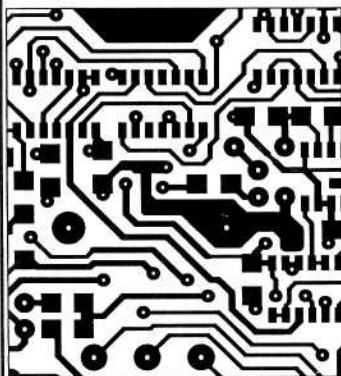




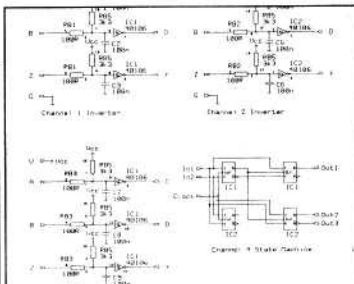
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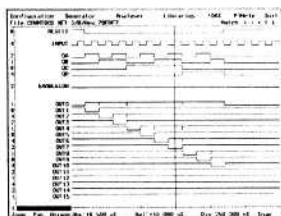
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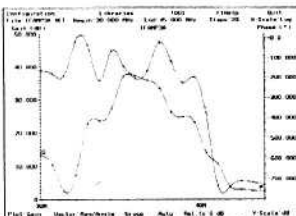
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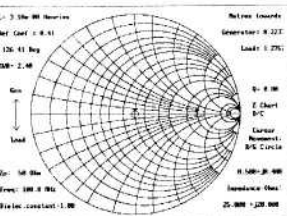
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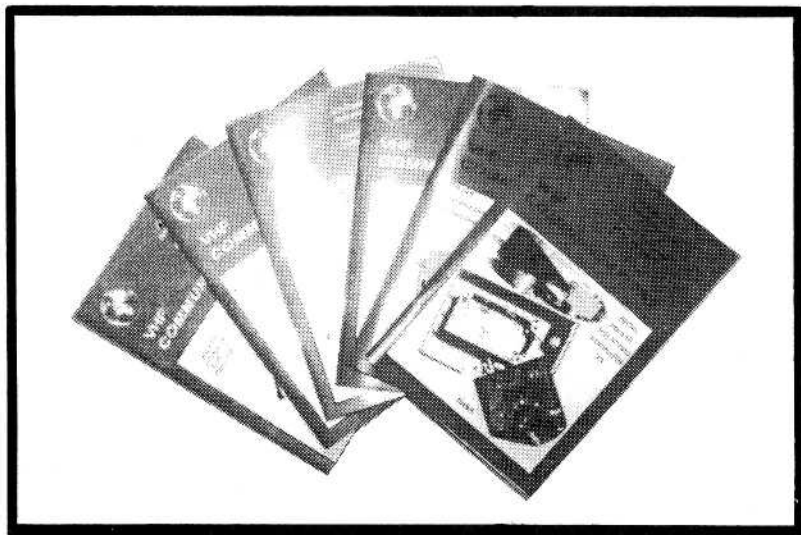
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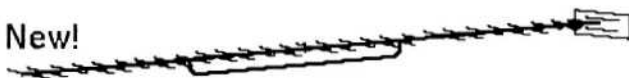


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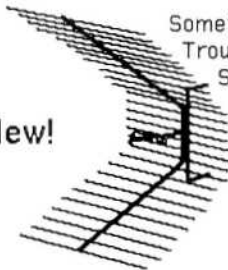
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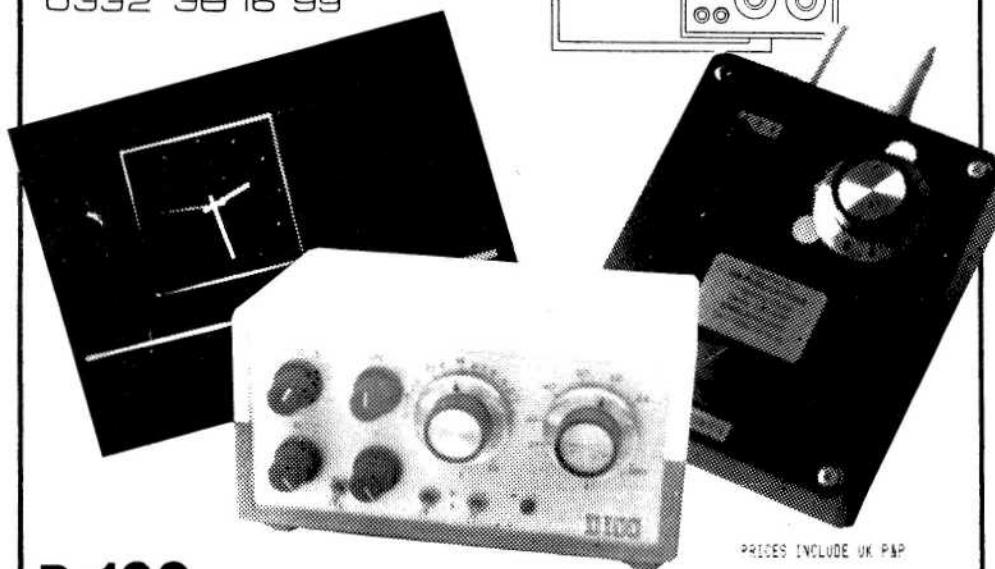
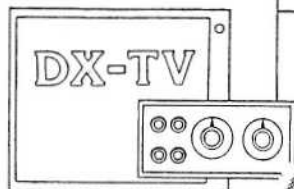
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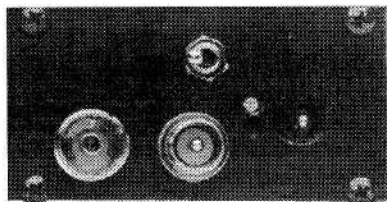
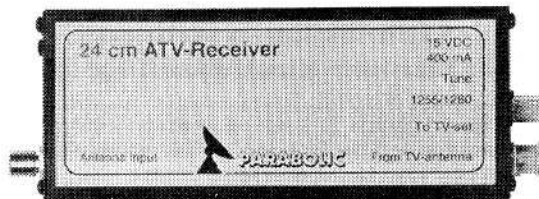
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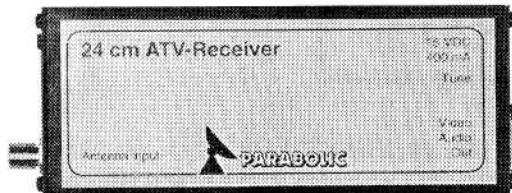
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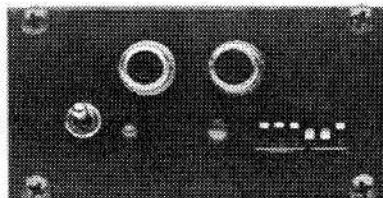
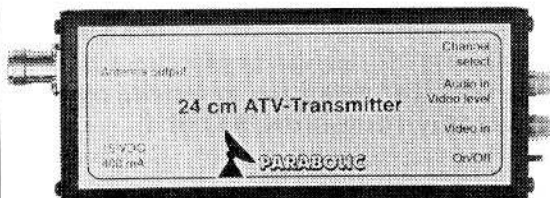
The world's smallest satellite receiver with modulated output on 48.25 MHz and audio on 53.75 MHz. (European use only).

65 x 35 x 160 mm



Same receiver with Video and Audio outputs. Will tune approx. 1200 to 1500 MHz. Both receivers deliver voltage for a preamp through the coax cable.

65 x 35 x 160 mm



200 mW FM-transmitter that tunes between 1240 and 1279 MHz in 1 MHz steps. Will drive the M57762 to about 10W.

All modules use 15VDC max 400mA (incl. preamp) but 13.8VDC is OK. The transmitter will work as low as 10VDC. A preamp with 1,0dB NF and 40dB gain is also available. One year guarantee.



**PARABOLIC**  
Systems AB

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Copy should be sent to the Editor at 5 Ware Orchard, Barby, Nr.Rugby, CV23 8UF before 20th June. Tel: 0788 890365. Fax: 0788 891883.

## FOR SALE

**THIS IS THE FILM YOU'VE WAITED 23 YEARS FOR!** Did you attend CAT-70, the Conference on Amateur Television at Cambridge in 1970? Did you enjoy the live outside broadcasts from amateur stations in East Anglia? Even if you weren't there you might like a souvenir. A recording was made of all the proceedings (80 minutes) but only on 405 lines. With the help of G8UDJ I have now made what I reckon is the best optical 625 line conversion from an ageing open reel tape. If you'd like to gape at old I.O. cameras, monoscopes and other gear you can now buy the souvenir VHS tape. See G6ADM/T, G6WJ/T, G6NOX/T, G6REH/T, G6KKD/T, G3VZV and other BATC luminaries as they looked 23 years ago! Supplied on a good name-brand E-180 and posted first class, the price is £5 (which just covers total costs, wear & tear, etc.). Andy Emmerson, 71 Falcutt Way, Northampton, NN2 8PH.

**ARCHER PAL COLOUR EFFECTS GENERATOR.** Well it does fades and wipes from one source to black and then switches to a second, non-synchronous source during the black interval. Also handles audio. manual or remote control of fades and wipes. Not bad, mint condition with documentation ... £100. Canon slide/35mm negative copier for Camcorders, etc. Mint, boxed ... £50. Taylor Hobson (Cooke Kinetal) 150mm f3.8 C-mount lens, very clean ... £25. many other C-mount lenses. Compact 19" 1U high Video Distribution Amplifier by 3M. Three channels, each five outputs ... £25. Postage extra on all items. Andy Emmerson. Tel: 0604 844130.

**24cm FM ATV TRANSMITTER**, receiver, PA and preamp; all Solent Scientific designs, with PSU; all in die-cast boxes ... £150 ono. Severnside 24cm ATV aerial ... £10 ono. Heliac connectors, 2 N-plugs for LDF-250, brand new ... £8 the pair. Pye Europa PMR rigs; one on 70cm, not working but with 433.650 MHz TX and RX crystals and microphone ... £30 ono. The second one on 2m with 144.650 MHz TX and RX crystals ... £40 ono. Mobile mounting bracket for Pye Europa ... £5 ono. PSU, +15V 0 -15V adjustable to 13.8 V DC, rated at 5 A but transformer looks much bigger ... £15 ono. PSU, 5V 30A, +15V 2.4A, -15V 2.4A (switch mode) ... £10 ono. All above plus p&p or you collect. Colin Redwood G6MXL, 45A Lullworth Avenue, Hamworthy, Poole, Dorset, BH15 4DH. Tel: 0202 665284.

**2 off TEKTRONIX OSCILLOSCOPES** type 502A dual-beam, both need a little attention, PL259 input sockets ... £25 each. A number of Electron multiplier tubes type EMI 9734A with holders ... offers. G4IOY. Tel: 081 455 0540 evenings only.

**CCD COLOUR CAMERA**, zoom and auto iris ... £50. Ikegami CTC-4730 2/3" Vidicon camera with genlock ... £25. 9" picture monitor, good definition ... £20. Kenwood DFC230 Digital VFO ... £25. Jaybeam 18ele Parabeam, 70cm ... £15. 4-way RS232 switch box, 25 lines ... £12. New case for 19" panel, 11" high ... £5. All items plus post at cost. Trevor Lumb, 2 Briarwood Avenue, Bury St.Edmunds, Suffolk, IP33 3QF. Tel: 0284 754318.

**DISH 90cm** aluminium with Swedish Microwave scalar feed ... £35. Marconi BSB dish and LNB ... £10. Mike G3VXZ. Tel: 0628 27350.

**SPECTRUM +3** ... £55. Spectrum 48k, cassette and games ... £35. Acorn Electron ... £12. Atari 130 ... £12. BBC B ... £95. VIC 20, books and games ... £20. NEC Video printer ... £50. Mullard V23 modem ... £20. RGB Monitor chassis and tube, working ... £25. Dynamco transistor scope, spares or repair ... £25. Electrocraft TV Pattern generator ... £18. Telequipment oscilloscope, working but cover missing ... £30. Realistic DX302 general coverage RX, digital read-out, FM demod, Xtal BFO and manual ... £120. Belcom FS1007 2m Xcvr and Trio 30G VFO ... £100. AVO 40 multimeter ... £25. Philips camera head ... £5. Sony 6" monitors, 2 for £5. Used 2764 EPROM, 5 for £5. Used 2716 EPROM, 5 for £5. Used 2k SRAM, 5 for £5. Stepper motor ... £3. Astec AT1020 module ... £25. Pye 12" B&W portable TV, faulty volume control, OK for 70cm? ... £6. PAL colour coder using TEA1002 ... £10. 1802 CPU chipset ... £3. AY59153 telephone dialler chip and data ... £3. Eurocard card-frame ... £5. D.L.Smith. Tel: 081 650 9601.



**LINK 110 broadcast 3-tube COLOUR CAMERA**, CCU + TV36 cable, viable, lots of spares ... £75. Diascope (Angenieux EPO) fit EMI 2001, complete with power supply, filters, instructions and travel case ... £40. Cossor oscillograph model 1039M (2.75" CRT), nice little old grey genuine antique item, plus handbook ... £50. Swaps considered on any of the above. Dicky Howett, 23 Micawber Way, Chelmsford, Essex, CM1 4UG. Tel: 0245 441811.

**2 off AMPEX VPR20 1" PORTABLES**, both working, with colour confidencer replay boards, all manuals, PSUs, etc. ... £250 each, or £450 for two. TEAC 4-track (not 1/4 track) three-head, quarter-inch audio recorder, NAB spools, 7.5/15 ips, simul-sync, etc. ... £350. As last item but two-track machine ... £200. Low-band portable video recorder, Sony VO4800, very good condition ... £200. Lighting sets, two available, old but very good; Mole-Richardson Colortran system, comprising tapped choke control box with four switched 110V nominal (lowest tapping) outlets, into which plug the lamp heads, which are Photoflood type 1kW and 500W floods and PAR38s; the whole caboodle runs from one 13A socket and produces masses of beautiful quality light for film or video; these kits were used extensively by the film industry not so long ago and by the BBC; no stands I am afraid; one box and 5 lamp heads of your choice ... £250. Fuji 14-1 ENG television zoom lens with Ikegami mount, 9-126mm ... £250. AKG BX20 reverberation unit, gold foil plate in fairly large cabinet (small fridge size), lovely sound, true stereo (2 separate channels) (I am trying to get the remote control for it) ... £100. Sony Trinitron multi-standard receiver monitor model CVM 1370QB, slight fault (keeps switching itself off) and picture a bit dull, hence ... £100. BK112 time code board to plug inside Sony BVU110 ... £60. NEC satellite system with 5 foot dish and motor driven mount and all hardware, RX model 2022, ant. pos. mod. 2025, converter mod. 2021 ... £450. Alan Driver, 19 South Road, Maidenhead, Berkshire, SL6 1HF. Tel: 0628 32122.

**1.8m SATELLITE ANTENNA**, fitted with ground fixing mount, currently in use, buyer collects ... £120. Actuator arm with control unit ... £40. LNB 1.5dB NF ... £10. Paul Holland G3TZO. Tel: 094881 476.

**SANYO VTC-M30 BETA VCR**, very good condition generally, but some playback jitter (idler tyre needs replacing?), with IR remote control (including frame step and multi-speed) and many tapes ... £30. Mike Hutchings. Tel: 0794 40923.



**BBC GRILLE GENERATOR** ... £50. Link 104 Caption Camera, working and circuits, etc. ... £50. Robot 400 Slow Scan PCB and circuits, including memory chip sockets fitted, needs finishing ... Offers. Cox NTSC Coder type 203 ... Offers. Tektronix RM529 Waveform Monitor, working ... £100. Ex-BBC Link 110 3-tube Broadcast Colour Camera, including CCU, cable, viewfinder, Varatol 30 lens with 2-times Extender, working but needs line-up ... £150. Pye LDM3001 digital Noise Reducer, working ... £100. rack of 8 Prowest Das ... Offers. 2 Prowest Vision Switchers ... Offers. 2 Prowest B&W Monitors, working ... £15 each. Patrick White. Tel: 081 847 3995 (office); 0628 21718 (home).

**FINAL CLEAR-OUT !:** Everything must go!. Camtech CV7001 24cm Downconverter 40MHz IF ... £85. Video IF Demodulator to suit (new) ... £90. Wood & Douglas 1250FM1 FM PA 20-150mW in/1W out ... £45. Wood & Douglas Sound Demodulator board 6MHz ... £13. Video AGC kit ... £10. EME Coaxial HF400 relay unit (N connections) up to 13cm/600W (new) ... £85. Panasonic A1 low-light Video Camera and mains PSU (both new) ... £90. Black Star Colour Bar/Audio Test Generator (TTL/comp/analogue, etc.) mint condition ... £145. Jaybeam D15/15 24cm (for 1255MHz) Yagis (2) (new) ... £45 each. 2-port Tonna Power Divider for the previous aerials (new) ... £30. Also a Power Divider for 1296MHz (new) ... £30. JVC CX60GB 6" Monitor/Receiver (as new) ... £150. Postage at cost. Paul Chamberlain G4XHF, 9 Goffs Close, Southgate, Crawley, West Sussex, RH11 8QB. Tel: 0293 515201 (home); 0622 696437 (office).

## EXCHANGE & WANTED

**WANTED:** Imaging Devices, Camera Tubes, CCDs, etc., for historic collection - especially 9831 Vidicon, 1.5" Vidicons, 1" Plumbicons, Ebitron. Non-working devices are quite suitable, so if you change a tube, or scrap equipment, please contact: Peter Delancy, 6 East View Close, Wargrave, Berkshire, RG10 8BJ.

**WANTED:** Colour Bar Generator module for the Link Pal Coder type 235. Circuit diagram for the Cox 1U type 168+150 Down Stream Keyer modules, including the outboard control circuits for fading - to buy, borrow or photocopy. Any Cox modules 1U type - cash waiting.

**WANTED:** EMI 2001 Camera working, non-working with as many bits and pieces as possible. Good home assured, dismantle no problem. Paul Gibbs, Hazlebrook, Henton, Wells, Somerset, BA5 1PD. Tel: 0749 675839.

**WANTED:** Has anybody got surplus to their requirements a projection monitor/TV suitable for PAL/NTSC? Also interested in one that needs attention. Please call Michael G4NVT any time on 0268 543025. Please leave a message on my answerphone if I am not there.

**WANTED:** Circuit and/or service information for TVC mono TV camera type TK-60. G4IOY. Tel: 081 455 0540.

**WANTED:** BBC B software, educational, games, amateur radio, W.H.Y. D.L.Smith. Tel: 081 650 9601.

**WANTED:** Has anyone a circuit diagram or information on the JVC CV-5001 domestic colour camera? Failing a circuit diagram, information on the pin-outs on the 12-pin connector would be useful. As usual, any costs will be refunded. Please contact: Steve Dunn G4EUM, 14 Malden Avenue, Greenford, Middlesex, UB6 0DJ. Tel: 081 423 5760 or 0426 917814 (Voicebank).

## **SLOW SCAN TV DOES NOT HAVE TO BE EXPENSIVE ANY MORE!**

**Passkon (PAH-SO-CONE) TV** is the new full-featured, low-cost alternative. The whole transmit and receive converter is on a single card which slots into your PC. This is the breakthrough that has been waited for a long time. The basic specifications are:

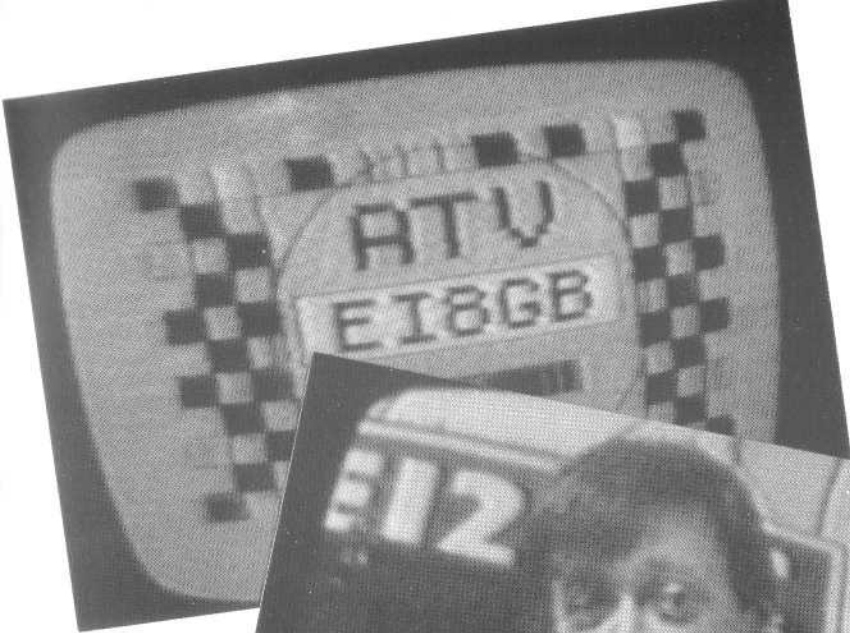
- ★ Send and receive all popular modes:
  - Robot Colour: 12, 24, 36, 72 second
  - Robot B&W: 8, 12, 24, 36 second
  - AVT: 24, 90, 94, 188 second
  - Martin: M1, M2, M3, M4
  - Scottie: S 1, S 2, S 3, S 4
  - Wraase SC-1: 24/48/96 second.
- ★ Interface fits inside computer.
- ★ No extra power supply required.
- ★ Graphical user interface with mouse support.
- ★ On-screen tuning indicator.
- ★ Full screen images on standard VGA with 320 x 200/256 colour mode.
- ★ IBM PC/AT or compatible with an empty 8 or 16-bit slot.
- ★ 286 or later CPU, 640 K memory.
- ★ VGA display (HiColor option supported).
- ★ Colour Monitor Mouse strongly recommended.

**KIT: £135.00 - Ready-built and tested: £160.00**

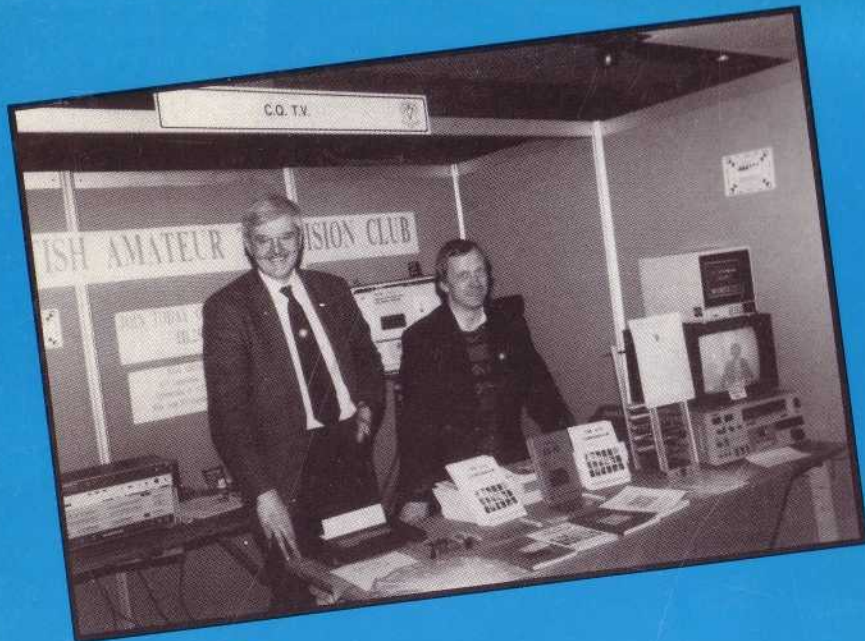
Post and packing: UK and Europe: £5.00 - Prices include VAT

Designed and developed by John Langner W120SZ.

**U.K. and European distributors: KM Publications,  
5 Ware Orchard, Barby, Nr-Rugby, CV23 8UF, U.K.  
Tel: 0788 890365. Fax: 0788 891883**



Photographs from Dave Hooper EI2HR - see TV On The Air, page 64



**The BATC Stand at the Institute of Videography Show 1992**  
**Brian Summers G8GQS Treasurer & Paul Marshall G8MJW Secretary**