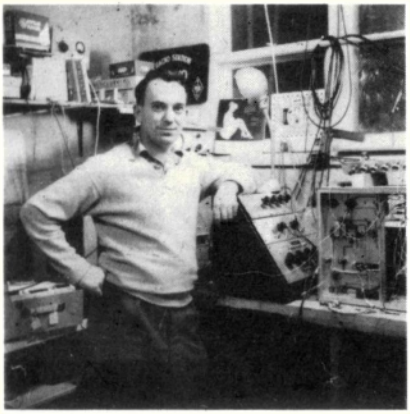
CQ-TV MAGAZINE No.151

BRITISH AMATEUR TELEVISION CLUB

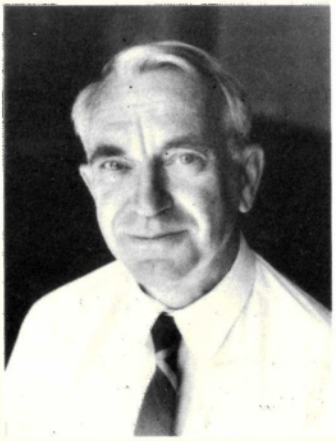
AUGUST 1990



THE CLUB FOUNDER

MIKE BARLOW

1929 - 1990



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MEMBERSHIP

FULL YEAR: Subscription to the club is £6 per year for 1990, thereafter £9.00 per year. All subscriptions fall due on the first of January. Membership application forms are available by sending a stamped addressed envelope to Dave Lawton, whose address may be found on page-2 of this issue.

OVERSEAS MEMBERS are asked to send cheques bearing the name of the banker's London agent. Postage stamps are not acceptable as payment. Overseas airmail is extra - please enquire from Dave Lawton or see the rates list with your last subscription reminder form.

The British Amateur Television Club is affiliated to the Radio Society of Great Britain and has representatives on the committee of the European Amateur Television Working Group.

The BATC is registered under the DATA PROTECTION ACT - all queries to Dave Lawton, and VAT registered - number 468 3863 01.

CQ-TV is produced by the British Amateur Television Club as its official journal and is sent free to all members. It is not for general sale.

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The BATC is a non-profitmaking club run by a committee elected from the mebership for the benefit of the membership.

Please note that any opinions expressed in this magazine are those of the writers, and do not necessarily reflect the opinions or official policy of the committee or the editor.

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

WHO TO WRITE TO

Members of the BATC committee are available to help and advise club members on any ATV related subject. Remember that all such 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 magazine or forthcoming BATC publications. Articles; review items; advertisements; other material. EDITOR: MIKE WOODING G6IQM, 5 Ware Orchard, Barby, Nr. Rugby CV23 8UF Tel: (0788) 890365 (Answerphone).

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

MEMBERS SERVICES - PCB's; components; camera tubes; accessories etc. (other than publications); queries related to such supplies: PETER DELANEY G8KZG, 6 East View Close, Wargrave, Berkshire RG10 8BJ. Tel: (0734) 403121

MEMBERSHIP - Anything to do with membership including new applications; queries and information about new and existing membership, non-receipt of CQ-TV; subscriptions; membership records; data protection: DAVE LAWTON G0ANO, 'Grenehurst', Pinewood Road, High Wycombe, Bucks HP12 4DD: Tel: (0494) 28899

GENERAL CLUB CORESPONDENCE & LIBRARY - Any general club business. Queries relating to the borrowing or donation of written material. PAUL MARSHALL G8MJW, Fern House, Church Road, Harby, Nottinghamshire NG23 7ED: Tel: (0522) 703348

PUBLICATIONS - Anything related to the supply of BATC publications. IAN PAWSON G8IQU, 14 Lilac Avenue, Leicester LE5 1FN Tel: (0533) 769425

EXHIBITIONS AND RALLIES - also arrangements and information about lectures and talks to clubs; demonstrations etc: PAUL MARSHALL (address as above).

CLUB LIAISON - and anything of a 'political' nature; co-ordination of ATV repeater licences: GRAHAM SHIRVILLE G3VZV, The Hill Farm, Potsgrove, Milton Keynes, Bucks MK17 9HF. Tel: (0525) 290 343

PUBLIC RELATIONS AND PUBLICITY - IAN SHEPHERD, Grosvenor House, Watsons Lane, Harby, Melton Mowbray, LE14 4DD. Tel: (0949) 61267

TVI & RADIO INTERFERENCE - problems of this nature to: LES ROBOTHAM G8KLH, 38 Ennerdale Avenue, Stanmore, Middx. HA7 2LD. Tel:(01 907) 4219 (not committee).

CONTESTS - BOB PLATTS G8OZP, 8 Station Road, Rolleston-on-Dove, Burton-on-Trent. Tel: 0283 813181.

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

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 6.30 and 9.30pm evenings and not before 11am at weekends.

POSTBAG

OLD KINESCOPE MATERIAL

Dear Ed,

An item for the magazine which may be of interest to other members may be the use of electronic techniques to 'clean up' audio and video signals on 50's Kinescopes. Particularly of interest are the Nat 'King' Cole show on Channel 4 which I thought eminently watchable, and I hope others – say old Peri Como shows – perhaps in colour may follow.

So, if anyone is active in this field, or has sufficient knowledge of the methods used, it may fill a few interesting pages for you.

Yours faithfully, Jim Cooke

ATV VIDEO TAPE

Dear Mike,

I am proposing to make an ATV video tape to show around radio clubs. A live demonstration is fine providing there are other local ATV'ers available to transmit! So, the alternative is to supply 'off tape'. This is where YOU the membership can help. What I intend is this:

An opening shot in my shack with behind me running a bank of monitors all displaying pictures from a number of VCR's. Throughout the demo I shall be calling on the pictures (and sound) displayed then you take over, coming back to me possibly to introduce the next ATV'er etc. Oh yes, SSTV pictures are welcome as well, on audio cassette, reel-to-reel or scan converted to 625.

The kind of material will be your decision I will work to what you send. The VCR recordings can be on any format although the final version will be on VHS for radio club use. However, a copy can be made on any format requested.

The material recorded would ideally include shots of homebrew gear, aerials, experimental equipment, DX TV, portable working ATV repeaters in use and actual QSO's. Where possible please include a sound track or, if not, a written script.

Send me what you can. Don't say that my stuff won't be any good. believe me, with careful editing ANYTHING is possible. So, even 60 seconds worth is OK, it can be slotted in and make useful fillers.

I am not asking for professionalism, we are ATV'ers after all! Come on, send me what you can, it will all be used. I can send you a cassette if you wish or I can return yours (no Scotch tapes thank you). Also I will send everyone who submits a copy of the finished programme. there is no time limit as i intend making more than one tape. So let's see if the Ham spirit still exists in British ATV.

73 ..... Eric Edwards GW8LJJ, 11 Old Village Road, Barry, South Glamorgan, Wales.

Mine will be with you as soon as I can find a few minutes spare Eric ... Ed

WOODFORD CINE & VIDEO CLUB

Dear Sir,

During my recent visit to the Video Show I was hoping to contact one of your BATC club representatives. Unfortunately your listed stand was not there so I am writing to you instead.

Following a recent article in Video Camera magazine (March/April) and as Chairman of our local Video Film Club I would like to contact our nearest amateur TV station.

My purpose, hopefully, leading to co-operation between the two of us. As a film making club we can supply ready-made,

or purpose-filmed, material which would give the TV station broadcast material.

It would seem from the Video Camera article that the Bristol Club is already doing this very successfully with their local TV station (Severnside TV Group) and I see no reason why the formula should not be equally successful in this part of the country.

Yours faithfully, W.J.Holbrook Chairman Wanstead & Woodford Cine & Video Club, 5 Higham Road, Woodford Green, Essex, IG8 9JN. Tel: 01 504 3280

70CM ACTIVITY – OR THE LACK OF IT!

Dear Sir

I am writing to you due to the lack of activity on 70CM FSTV. I have tried and spent most Sunday afternoons and evenings and other times trying to get a contact on this far from antiquated mode, which seems to have been abandoned by many ATV'ers.

I wonder if it would be possible for members to write in to CQ-TV to let other amateurs know that there is life on 70CM ATV, and may be a list of stations printed, so as to let people know who is in their location.

I am sure that many other ATV'ers feel the same way, and this may be a chance to blow the dust off and clean those lenses and start promoting 70CM ATV, as the local terrain does not allow us to use 24CM. If we cannot set up contacts on 70Cm what chance do we have on 24CM?

Yours faithfully, P.Martin G0GIR

CONVENTION BRING-AND-BUY

Dear Mike

Just a thank you from the Emley Moor group (GB3ET) and myself for the reception and help you gave at the BATC rally. It was our first attempt at a Bring-and-Buy and, thankfully, all went off smoothly. It also brings home the effort that the BATC has to put in when mounting a rally.

God my aching feet !!

Regards, Barry G6LIC

ATV IN EI LAND

Dear Mike

Just a short note to let you know that all is well here in EI and ATV is going strong.

After my last letter I got a few phone calls and now have regular contacts with GW3FDZ and more recently GW7BZY. Picture quality varies wildly with conditions and is anything from P1 to P4. We still haven't managed a P5 but are working on it!

At present the only other station I can work is Donal EI6EV who recently put up a new aerial and is putting a great signal out down the EI coast. He is north of Dublin and is well placed to work the northern coast of GW.

It would be nice to stir up a bit more activity from GW, even Derek GW3FDZ can't work anyone else on your side of the water, and he has had his ATV equipment for years!

I had hoped to make it two the convention but it will have to wait for another year.

DUXFORD RADIO SOCIETY

Dear Sir

The enclosed copy of the first News-letter of the Duxford Radio Society will give you an outline of our activity.

The name of the Society was shortened last July to the present form, and it was agreed that the time had come to expand from the score of members who have established it to a limit of around 400.

We are not an Amateur Radio Club, but combine Amateur radio with people with a particular interest in Radio History, and some expertise to offer in the

Documentation, restoration and operation of historic military and clandestine radio gear.

I hope that you will be able to bring the Society to the attention of your readers.

Yours sincerely, John I.Brown MIEE G3EUR

For further information on the Duxford Radio Society contact them at the following address: Duxford Radio Society, c/o Mr.J.Brown, 74 Humber Avenue, South Ockendon, Essex, RM15 5JN

CQ-TV TIP-OF-THE-WEEK !

Dear Mike

In addition to describing the state of one's shack, tip-of-the -week relates to the fitting on N-type plugs to the ends of Mr.Westlake's exceedingly good co-ax (ie: better than URM67, but not as good as LDF whatever it is).

Learned papers state that the solid centre conductor can be easily made to fit a standard N-plug by filing it down to size. (The cable stupid, not the plug!). Whilst endlessly scratching away away with a file, Stanley knife, and various other blunt instruments, it seemed that there had to be a better way!

Well, there is! It only takes 15 seconds, and so does reducing the core size! The answer is to use the shack crimping tool to squash the conductor - not the 'orrible cheap and nasty glorified pair of pliers type, but the proper ones that are used to fit Molex type crimp terminals. Shacks lacking the said crimping tool may have to consult with their employers regarding taking same into safe custody in the view of the demand now created by this new use.

Well. I was impressed anyway!

Regards ..... Peter G1COI

I'm afraid that reading between the lines I get the impression that Peter will soon be back on the air with us ... Ed

NEWS ROUNDUP

MEMBERSHIP NUMBERS

Our worthy membership secretary Dave Lawton has advised me that the club membership numbers are still causing some confusion. The system utilises a 6-figure number, which appears on the bottom left-hand side of the address label with your magazine, e.g: 901452.

The first two figures are the important ones for you, the member, the 90 (or whatever) represents the END of the year for which you are paid up. In the example above, the member would be fully paid up to 31 Dec 90, and would be liable for renewal as from 01 Jan 91.

The remaining four figures in the number are purely the club's membership database number, and have no relevance outside of the computer.

MORE FROM THE MEMBER-SHIP SECRETARY

We are now through the subscription renewal period and several points have arisen from this with Overseas Members in mind. these points are listed below and I hope will help overcome some of the problems encountered in 1990 renewals.

1) Paying for two years subs at once, but ONLY including sufficient extra funds for one year's air mail (when air mail required). Air mail rates quoted are PER YEAR.

2) When changing from surface rate to air mail rate PLEASE give plenty of notice. I still receive letters in April/May when two issues of CQ-TV have already been sent overseas mail.

3) REMEMBER, letters sent by surface mail

can take MANY weeks to reach their destination. We have had many cases this year of Overseas Members paying late February/early March, but receiving a notice to say that they have not paid. This is because the notices are sent out in March and the members letters have crossed with the renewal reminders. In all cases where Overseas Members have written to me about this I had received their renewals. The moral of this tale is PAY EARLY!

And now on to some general points:

a) We have had cases of a member having two entries in the membership list, one indicating that they have paid, the other that they have not. In all cases this has arisen because people have sent in their renewal on a new member application form (ie: at rallies) and are therefore re-entered as new members. I DO NOT check to see if YOU are using the correct form, or the form correctly.

b) There is still a lot of confusion with the membership numbers - see the news item preceding this one. I have had many people sending in £6 for their 1990 subs, when in fact they are paid to the end of 1990 as shown in their membership number. I then have to write to them to ask for a further £3 in order that I can enter them as paid up for 1991. PLEASE take note of your membership[number, it shows the end of the year to which you are paid up.

c) Please remember that the Membership Secretary ONLY deals with membership enquiries. If you write to me concerning Publications or Membership Services it will delay your replies all I do is pass these on to the appropriate person.

Dave Lawton, Membership Secretary.

THE BATC - THE MOVIE

Current stocks of the VHS recording of the Club's production 'The BATC - The Movie' are now all sold. If you are interested in buying a copy (£4.99) please write to Brian Summers, 29 Perivale Grange, Perivale Lane, Greenford, UB6 8TN, and he will include your name on the waiting list.

IKEGAMI TRACKING SYSTEM

In the last issue I published a letter from R.A.T.S., Kano, Nigeria requesting information about an Ikegami PTR1 Automatic Tracking System. I had hoped to be able to provide a short review of the equipment in question. However, partly due to a lack of information from the manufacturer, and partly because of the incredibly high cost of this unit, I have been unable to conduct the review. Sorry chaps.

A FEW WORDS FROM THE TREASURER

Now that we are halfway through the Year the BATC, like Readers Digest, is chasing its lapsed members in an effort to get them to rejoin. Normally we only send out the one reminder, but as an experiment we are sending out a second reminder.

Included with the reminder is a questionnaire to find out why members' haven't renewed. If you are one of those people who have not renewed we would like you to comment on what YOU think of the BATC, it's policies, CQTV, and any suggestions as to improvements (be careful you could volunteer!).

We are also going to try some "direct mail shots" to potential new members, so if you know any likely new members, it's in all our interests to get them to join.

Don't forget that the first two digits of your membership number (top right-hand corner of the address label for CQ-TV) refer to the last day of the year that your subs are paid up to.

73's ... B.Summers

No apologies for constantly repeating the remarks concerning your membership numbers, but it seems that some of you are in a state of eternal confusion, causing even more confusion and more work for BATC membership and records ... Ed.

EDITORIAL

Mike Wooding G6IQM

Mike Barlow G3CVO/T

It is with deep regret that the committee received the news of our founder's death earlier this year. We wish to extend our deepest condolences to his family. As founder of the BATC Mike left us a legacy, which I hope will continue for many years to come as a memory of his early endeavours.

CONVENTION 90

Well it appears that my fears were unfounded and that as many of you came to Harlaxton as have been to previous conventions. OK, I have to admit that there were a few complaints and non-attendance from some of you down South, but, then again, we had the opposite from some of you from up North. I suppose the famous maxim from a past United States President fits perfectly, in that 'you can only please some of the people all of the time' etc.

Weather-wise the day was absolutely superb - in fact many commented that it was more pleasant inside the house where it was nice and cool. The location, as I have attempted to describe previously, lived up to all expectations. T he house itself is a goldmine of various architectural designs and phases. Apparently it is nowhere near as old as you would expect - it having been built during the nineteenth century by a philanthroper and explorer/collector, who scoured the world for oddities to put in the house, and for ideas and bits of buildings to pinch and put into the fabric of the building. The outcome of this makes for quite a breath-taking sight, both inside and out.

You should see it at night - all lit up - quite a sight!

All this aside I personally thought that the event was an unmitigated success. There was the usual varied selection of traders, plenty of specialist groups with their displays, the microwave workshop and the various equipment displays by members. Outside in the courtyard of the house was the car boot sale/flea market, which seemed to do admirable trade.

The only point to mar the whole event was the non-appearance of the Ladies craft displays. This I have to admit to being mainly my fault. It all appeared to be arranged well in advance, but for one reason or another totally fell apart during the week immediately preceding the event, and as I was away on a company training course at the time I was totally unable to arrange alternatives. Please accept my apologies Ladies, I hope that next time we will get it right, but please bear with us (better yet help and advise us) as this is a new departure for us mere males!

Enough from me concerning the convention. I enjoyed meeting those of you that I did and to those who remembered my penchant for best bitter HI! Paul Marshall, our Club Secretary and Convention 90 organiser, has a few comments himself from the point of view of organiser, and the problems he faced. These are to be found at the end of this editorial. Please read them and let him know your thoughts. Remember, we need feedback from YOU, the membership, to be able to try and provide what YOU want.

THE CQ-TV COMPETITION

I have great pleasure in announcing the winners of the CQ-TV competition. We did not have a particularly large entry for the competition, in fact I received only 27, of which only 14 were correct! The correct answers are shown below:

1) Mike Barlow

2) 1949

3) 22

4) Every year

5) Trevor Brown or John Wood

6) A London taxi

7) John Logie Baird

8) 23cm and/or 3cm

Question 3 proved confusing to many, those who just counted the entries on the 'Who to Write To' page failed to notice that there are two entries for Paul Marshall.

The winner of the first prize, the Camtech 24CM TV transmitter, was Mike Pollard G8BWA.

The winner of the second prize, the Camtech Audio Sub Carrier and Vogad board, was Steve Simmonds G6WLM.

Once again we wish to thank Camtech Electronics for their generosity in donating the prizes. For further information on the Camtech range (watch CQ-TV 152 for a review of their new FM ATV demodulator board) contact them on 0440 62779.

CONVENTION 90 - FROM THE ORGANISERS PERSPECTIVE

Harlaxton Manor as a venue for this year's Convention was, it has to be admitted, was an experiment. However, moving away from the Rugby/Coventry are was actually nothing new. The Convention, over the past 15 years has been at a variety of venues: London, Leicester, Crick, Coventry and even Leeds! The Manor is just off the A1 near Grantham and it seems that plenty found it!

Apart from the actual area of the country the place itself was different from anywhere else we have been. Such a large place meant that the spectre of full and overflowing car parks never arose. Accommodation, although basic 'student' style, was clean and fairly cheap.

1990 is proving a difficult year for traders. The boom years of '87 and '88 are past. Times are harder and it has to be said that some traders had a difficult time (as many have elsewhere).

Whilst so many people worked very hard to help on and before the day I must thank a number of people who made the day through some grand efforts. Usually the rest of the Committee is left to manage just about everything, but this year we had some very hard-working volunteers - John Douglas, Peter Carleil, Howard Parker, Ray Hill, Dave Hill, Dave Somerfield and his hard-working friend Kev (who isn't even a member!) and anyone else who I have forgotten. Thank You.

The lecturers did us proud. An excellent effort by Steve Beeching on Camcorder technology and Peter Wells G0JEW on BSB TV amazed people with D2MAC pictures, and all at short notice.

Outside, Brian Parkin made a valiant effort to launch his aeroplane + camera + transmitter (The Crash(ers)) and made some wonderful video tape! He wasn't able to bring the model he usually does and the small one just wasn't up to it!

Thanks are also due to Allen McMurty from GI-land, who made superb job of the commemorative certificates given to Mike Crampton and John Wood.

What about next year? From a personal viewpoint I think that we have a 'home' at Harlaxton. Wandering the country is not good - people like their points of reference. Furthermore, we can go back again -we had to leave Leicester and then Crick as we grew too large for those sites - nobody even asked about Coventry.

Harlaxton Manor management are happy for us to return next year. What do you think? We can certainly build on this year's experience. Please contact me if you have an opinion on the matter.

Paul Marshall, Secretary BATC.

OBITUARY

MIKE BARLOW G3CVO/T

FOUNDER BATC

This short obituary was prepared for me by Don Reid and Grant Dixon, and I thank them for their help. Mike Barlow's autobiography will appear in the next issue.

Mike Barlow, who founded the BATC in 1949 died in Canada on 14th May 1990.

He was educated at King Williams College, Isle of Man, and following his spell of National Service he entered St. John's College Cambridge. He was an active and enthusiastic member of a variety of societies while he was at Cambridge, not the least being the University Wireless Society, G6UW.

The letter from Mike which was published in CQ-TV 147 illustrates his informative and amusing style of writing, and gives an idea of the immense effort and time which he devoted to founding the Club, and to establishing the journal CQ-TV as a quarterly publication.

After graduating in 1953, he joined Marconi's Wireless Telegraph Company Limited (as it was then called) and worked on the development of vision modulators and other video equipment at New Street, Chelmsford. He soon established a thriving branch of the BATC through his enthusiasm and ability to persuade people to help in one way or another. His house in Great Baddow became a focal point for amateur television, and the hospitality of Mike and his wife Margaret was known and appreciated by many.

In the late 1950's Mike and Margaret decided to emigrate to Canada. Their many friends in the U.K. were sad to see them depart, but it is a tribute to Mike's organising ability that the remaining members of the BATC Committee were able to continue to run the Club and build up its membership on an international basis.

Mike was one of those rare people who combine a theoretical knowledge of television engineering with a practical ability to design and construct equipment - and can then go further to publish the information in a readable style. He wrote numerous papers for the technical press on both amateur and professional aspects of television. It is worth remembering his reports of the early days of progress in amateur television which were published in Wireless World in September 1952, December 1953 and November 1956.

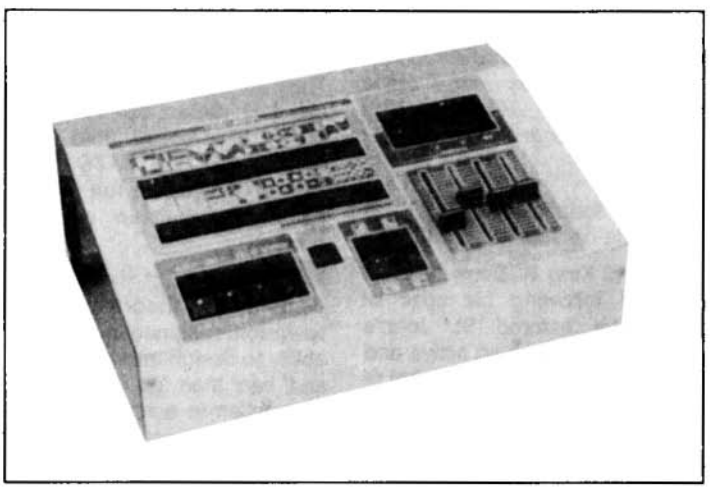
Mike's ability was recognised in his professional life: he was elected a Fellow of the Society of Motion Picture and Television Engineers, and for several years he was a member of the Board of Editors of the monthly Journal published by the SMPTE.

His enthusiasm, his wide knowledge of the theory and practice of television engineering, his friendly manner and keen sense of humour, and his eagerness to present complex information in an understandable style, all combine to make him a memorable character.

He leaves a widow, son and daughter, to whom we extend our deepest sympathy.

VIDEO MIXING DESK AND EFFECTS GENERATOR

Part–1



This series of articles first appeared in four parts in the January, February, March and April 1990 issues of Elektor Electronics, and we wish to thank the editor for his permission to reproduce them in the next four issues of CQ–TV.

GENERAL DESCRIPTION

Recent developments in consumer electronics have boosted the popularity of video recorders, portable cameras and camcorders to such an extent that the film camera has become a thing of the past.

Video enthusiasts who want to edit and mix recorded material from various video sources, and in addition require special fade–in and fade–out effects, will delight in building and using the advanced mixing desk presented here.

Also, from our point of view, the TV amateur, it is an interesting project to build for the shack, enabling us to present some of the many special effects we see in broadcast TV in our TV skeds.

Not so long ago, a small fortune would buy a bulky video recorder offering mono sound, a primitive programming facility and just acceptable picture quality if the tracking control was adjusted from time to time.

Today's camcorders (camera–recorders) cost less than these old VCR's, but offer significantly improved sound and picture quality. Stereo sound, Super–VHS and all–digital recording techniques are already available, but will take some time to become established in the consumer markets.

In spite of all its technological benefits the camcorder has one disadvantage when compared to, say an 8mm film camera: editing recordings requires a mixer, of which there appear to be few around that can be purchased ready-made at a reasonable price.

The video mixer/effects unit described here allows up to three video signals to be combined into one video output signal. The mixer also offers a number of special effects which result in attractive fad-in, fade-out and superimpose effects.

An important proviso must be mentioned at the outset: depending on the number of video sources connected to the mixer, at least one (two sources) or two (three sources) must have an external sync input. One video source always serves as the master sync source, the other one/two are externally synchronised.

The mixer always mixes two signals, even when three signals are applied. It does not allow three signals to be shown simultaneously. The mixing options are:

Video-1 with Video-2

Video-1 with Video-3

Video-2 with Video-3

Again, remember that video sources that lack an external sync input cannot be mixed. The reason for this is probably familiar to those who have experience of working with video signals, but may be less obvious to other readers.

Mixing video signals is essentially alternate switching between lines of two TV pictures. To maintain phase synchronism between two pictures their picture line content must start at the same instant. The sync pulses in the video signal serve to time this instant.

The sync pulse frequencies of the two video sources will not be equal if the syncs are derived from free-running clock circuits as used in most portable cameras. Hence, a single sync source is required to prevent the two pictures 'floating' with respect to one another in the mixed image.

It would not be fair to say that the video mixer is a simple to build project. The final design is relatively complex, and construction is only recommended to those who have experience in working with video signals, and who are confident in their soldering skills.

BASIC IDEAS AND BLOCK DIAGRAMS

The basic operation of the video mixer is best understood by looking at the block diagram in Fig.1. The three blocks shown in the drawing represent the three circuits that make up the video mixer. Each circuit

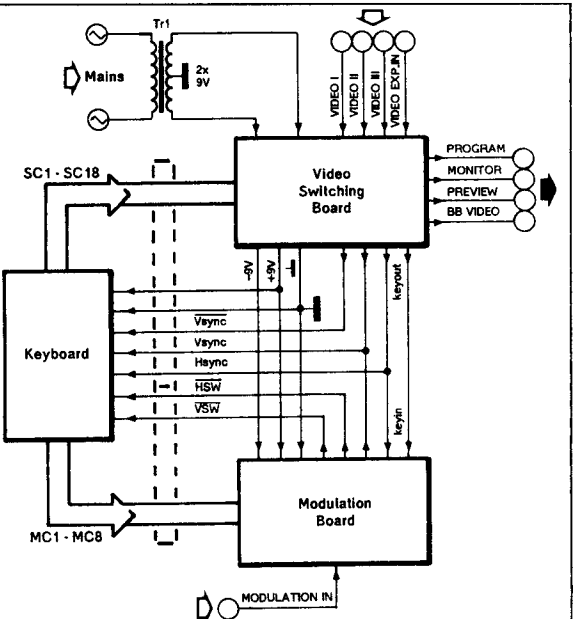


Fig.1 Block Diagram of the Video Mixer

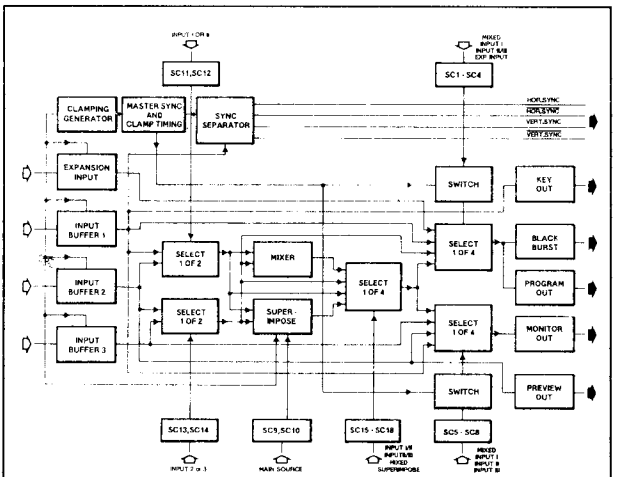


Fig.2 Block Diagram of Video Switching Board

is constructed on a separate printed circuit board. This first instalment of a four-part article deals with the video switching board. In part-2 we will discuss the modulation board and in part-3 the keyboard. Finally, in part-4 we shall address matters related to the adjustment and practical use of the video mixer.

The block diagram of Fig.1 shows four inputs, VIDEOI, VIDEOII, VIDEO-III and VIDEO-EXP.IN. The first three accept the video signals that are to be mixed. Input VIDEO-I takes the master signal that ensures the central synchronisation. The video source connected to this input does not require an external sync input, and must always be present to, provide the master sync signals for the other video source(s).

The other two inputs, VIDEO-II and VIDEO-III, are identical, and take signals from sources synchronised with VIDEO-I.

The fourth mixer input, VID-EXP.IN (expansion input) takes an additional signal that may be routed to the monitor when none of the other inputs is being used. This 'stand-by' signal may be supplied by a test card generator for example, it can not be mixed with the other channels.

The video mixer has four outputs. The BLACK-BURST (BB-video) outputs the composite sync signal for the video sources. Outputs PROGRAM and MONITOR are electrically identical and supply the mixed video output signal. The PREVIEW output, finally, allows the VIDEO-I, VIDEO-II, VIDEO-III, or the mixed video signal to be viewed independently of the other outputs.

The video switching board divides the sync signal recovered from VIDEO-I between the sub-circuits. The control signals for the modulation and the switching board emanate from the keyboard circuit (to be discussed in part-3). The function of these control signals, marked SCxx, will be reverted to in due to course.

Fig.2 shows the block diagram of the video switching board. The input buffers are at the left, the outputs at the right. Electronic switches at a number of locations select the required signals. The control blocks at the top of the diagram are used to generate the sync signals and enable the colour burst in the master signal to be inserted at the right instant into the output signal. In the mixer circuit, the horizontal and vertical sync signals are available separately in true as well as inverted form.

The KEYOUT output allows a kind of picture-in-picture effect to be achieved: one particular colour is removed from the picture on one channel, to be filled in by corresponding areas in the picture on the other channel. This effect is often used in TV news broadcasts to create a background for (apparently large) weather maps.

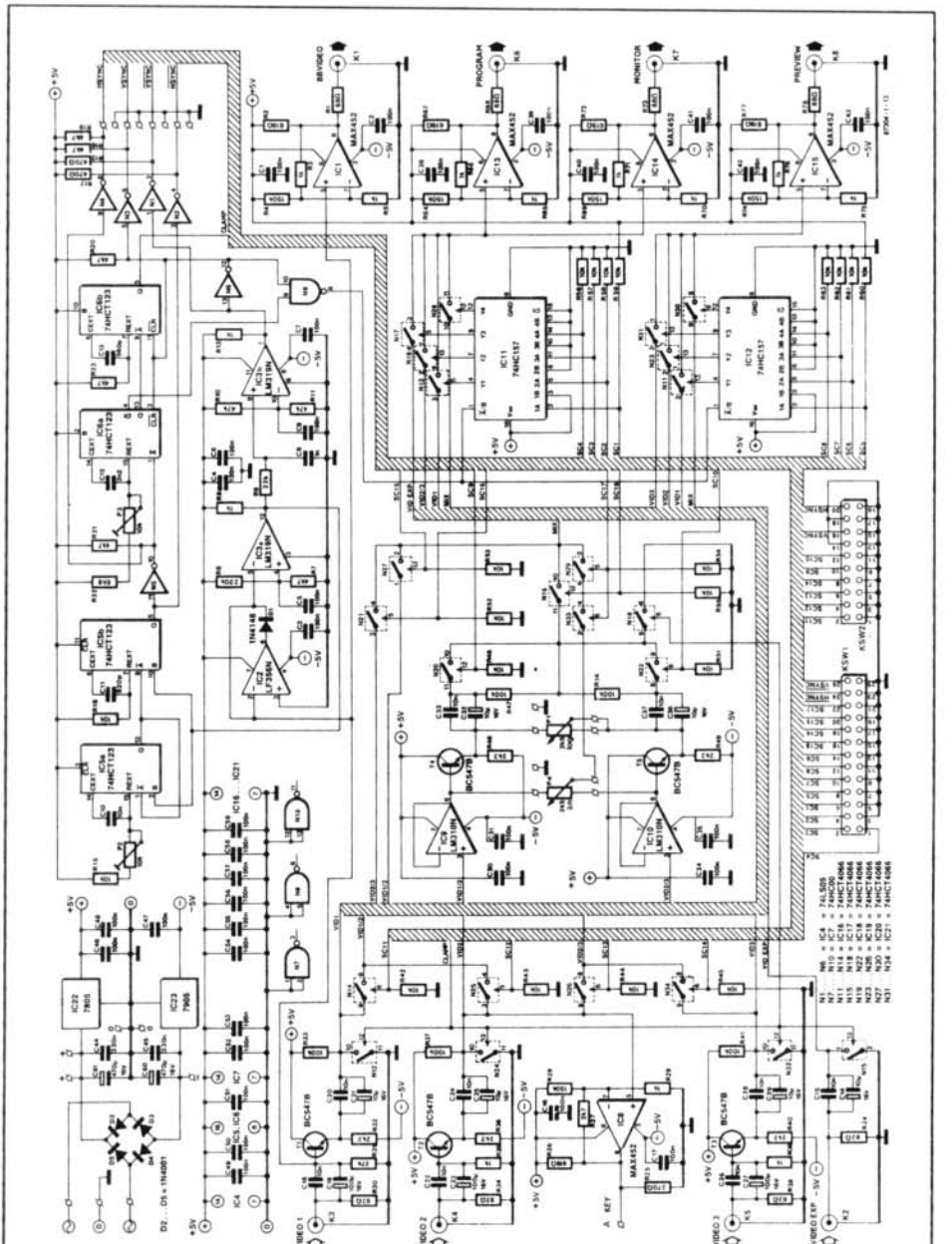


Fig.3 Circuit Diagram of the Video Switching Module

SWITCHING UNIT:
THE PRACTICAL CIRCUIT

Although the circuit is fairly complex, the diagram in Fig.3 gives a good insight into the operation of the video switching board.

The video signal applied to the VIDEO-I input, socket K3, serves to synchronise all other sources. Op-amps IC2, IC3a and IC3b form a sync separator. Circuit IC2 clamps the input signal, while IC3a and the associated filter recover the line sync pulses. These trigger IC5a, a monostable multivibrator (MMV), whose output pulses have a fixed length of 60uS. These pulses keep a second MMV, IC5b, from being started by interference during the picture

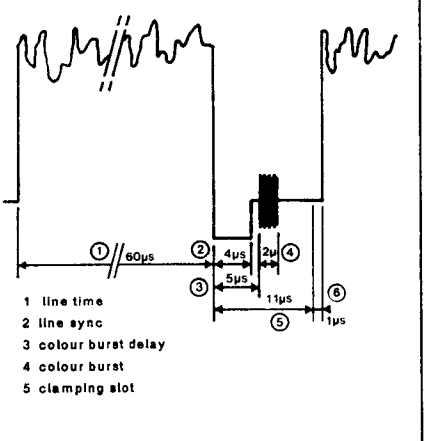


Fig.4 Picture Line Timing

line time, and ensure that a 4uS horizontal sync pulse is generated by IC5b at the end of the line only. This gives a total time of 64uS for the line content and the sync pulse, as shown in Fig.4. The first picture information appears in the line 12uS after the start of the line sync pulse.

The third MMV, IC6a, ensures that the line sync pulse and colour burst recovered from VIDEO-I are applied to all other video signals. This is achieved by NAND gate N9 switching multiplexers IC11 and IC12 in a way that VIDEO-1 signals present during an 11uS interval around the line sync pulse are passed to the output (by pre-selection on the bar-A/B input).

Integrated circuit IC6b generates a clamp pulse of approximately 1uS before the start of the picture line content. The clamp pulse serves to define the absolute black level as a direct-voltage reference in the video signal.

The analogue circuitry on the video switching board starts at the left of the circuit diagram with three input buffers around transistors T1, T2 and T3. These ensure that the video sources are terminated into the correct impedance, and further ensure sufficient drive for use at various points in the circuit.

The inputs as well as the outputs of the buffers are in series with parallel combinations of a solid (MKM) and an electrolytic capacitor to ensure a low reactance over a wide frequency range, which ensures that both the vertical and the horizontal sync pulses are passed undistorted. Each buffer output can be short-circuited by an electronic switch to give the required reference black level. The electronic switches are controlled by the clamping pulse.

There is a fair number of electronic switches between the buffers and the output. These switches are controlled from the keyboard circuit and select the two video signals that are to be mixed. The selected signals are first buffered for the benefit of two mixing effects.

Firstly, the Op-amps used allow the signals to be mixed by potentiometer P4. The mixed video signal at the wiper is passed through a series of electronic switches before it arrives at the output buffers, IC13, IC14 and IC15.

Secondly, the amplifier that follows the mixer stage is used for the superimpose

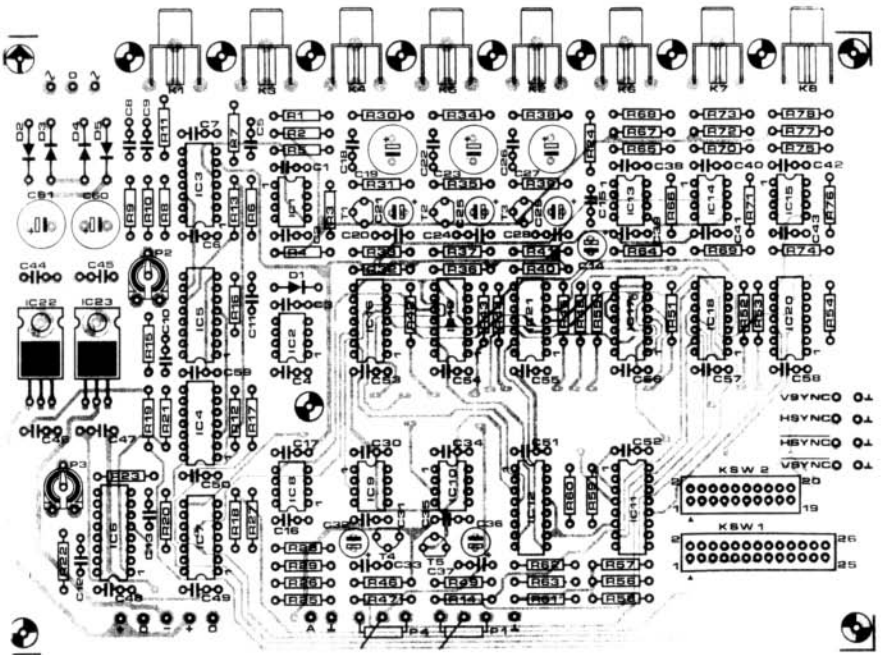


Fig.5 Component Overlay of Video Switching Board

Parts list

Resistors:
R_1;R_{66};R_{73};R_{78} = 68Ω
R_2;R_{35};R_{67};R_{72};R_{77} = 619Ω (E96)
R_3;R_5;R_8;R_{13};R_{28};R_{55};R_{59};R_{65};R_{66};R_{70};
R_{71};R_{76};R_{79} = 1kΩ
R_4;R_{29};R_{54};R_{69};R_{74} = 150k
R_6 = 220k
R_7;R_{18} – R_{21};R_{23} = 4k7
R_9 = 22k
R_{10};R_{11} = 47k
R_{12};R_{17} = 470Ω
R_{32};R_{39};R_{40};R_{45};R_{49} = 2k2
R_{31} = 27k
R_{15};R_{16};R_{42} – R_{45};R_{48};R_{51} – R_{53} = 10k
R_{22} = 6k8
R_{24};R_{30};R_{34};R_{38} = 82Ω
R_{27} = 2k7
R_{14};R_{33};R_{37};R_{41};R_{47} = 100k
R_{26} = 270Ω
P_1 = 2k5 logarithmic potentiometer
P_2;P_3 = 10k preset H
P_4 = 2k5 linear potentiometer

Capacitors:
C_1 – C_7;C_9;C_{16};C_{17};C_{30};C_{31};C_{34};C_{35};
C_{38} – C_{43};C_{46} – C_{59} = 100n
C_8 = 1n0
C_{60};C_{61} = 470µ; 16 V; radial
C_{11} = 820p
C_{12} = 2n2
C_{13} = 560p
C_{10};C_{15};C_{19};C_{20};C_{22};C_{24};C_{28};C_{29};
C_{32} = 10n
C_{18};C_{23};C_{27} = 100µ; 16 V; radial
C_{14};C_{21};C_{25};C_{26};C_{36} = 10µ; 16 V; radial
C_{44};C_{45} = 330n

Semiconductors:
D_1 = 1N4148
D_2 – D_5 = 1N4001
IC_1;IC_3;IC_{13};IC_{14};IC_{15} = MAX452
IC_2 = LF356N
IC_3 = LM319N
IC_4 = 74LS05
IC_5;IC_6 = 74HCT123
IC_8;IC_{10} = LM310N
IC_{11};IC_{12} = 74HCT157
IC_{16} – IC_{21} = 74HCT4066
IC_{22} = 7805
IC_{23} = 7905
T_1 – T_5 = BC547B

Miscellaneous:
K_1 – K_8 = PCB-mount phono socket.
KSW1 = 26-way pin header.
KSW2 = 20-way pin header.
PCB Type 87304-1 (see Readers Services page).

effect. Although the circuit around potentiometer P1 looks similar to the mixer stage, it works altogether differently. Transistors T4 and T5 ensure sufficient buffering between the mixer and the superimpose stage, while potentiometer P1 forms an adjustable short-circuit between the video signals, which are mixed in a way that ensures that their brightest picture areas are passed to the output. Effectively, a relatively dark area in one picture is covered by a brighter one at the same location in the other picture. Switches N20 and N22 determine the video channel selection if t he superimpose is not used (P1 set to maximum).

Integrated circuits IC11 and IC12 have a number of functions related to the control of the video switching board. These functions will be reverted to in part-4 of the series. For now, it is sufficient to say that control lines SC1 through SC8 are connected to switches that select the video signal that is to be fed to the output.

As will be seen in part-2 of the series, the pattern generator on the modulation board controls lines SC15 through SC18 to enable two pictures to be mixed vi an intermediate effect.

The circuit Op-amp IC8 raises then video signal at the VIDEO-II input to a level suitable for driving the keying input on the modulation board.

The power supply is quite simple. Every board has its own regulator, which takes the unregulated supply voltage from the central power supply. The video switching board has two local regulators, IC22 and IC23, to provide the symmetrical regulated suppliers of +5V and -5V.

CONSTRUCTION

The printed circuit board for this part of the project is a relatively large, double-sided and through-plated type, which is available ready-made from Elektor Electronics (details at the end of each part of the series). The component overlay shown in Fig.5 shows that the board is fairly densely populated.

Use PCB mounted Phono sockets for the video inputs and outputs as indicated on the component mounting plan. The synchronisation signals, the supply voltage and the potentiometers are connected via solder pins. PCB headers KSW1 and KSW2 mate with IDC sockets fitted on short flat cables that connect the video switching board to the keyboard unit and the modulator board.

Start the construction by fitting all connectors, solder pins and Phono sockets. Then follow with the passive components. Ample decoupling is provided by inexpensive miniature 100nF ceramic capacitors. IC sockets may be used but are not strictly required. Note that many electrolytic capacitors are radial (PCB mount) types to save board space.

bend the terminals of the voltage regulator at right angles and secure these devices with a short M3 nut and bolt. the regulators remain cool under normal conditions and do not require heat-sinks.

Finally, check your work so far. Inspect the completed PCB for incorrectly fitted parts and short-circuits. the adjustment of P2 and P3 will be discussed in the last part (part-4) of the series.

To be continued next issue.

The PCB for the VIdeo Switching Board described above is available from Elektor Electronics (Publishing), Down House, Broomhill Road, London SW18 4JQ.

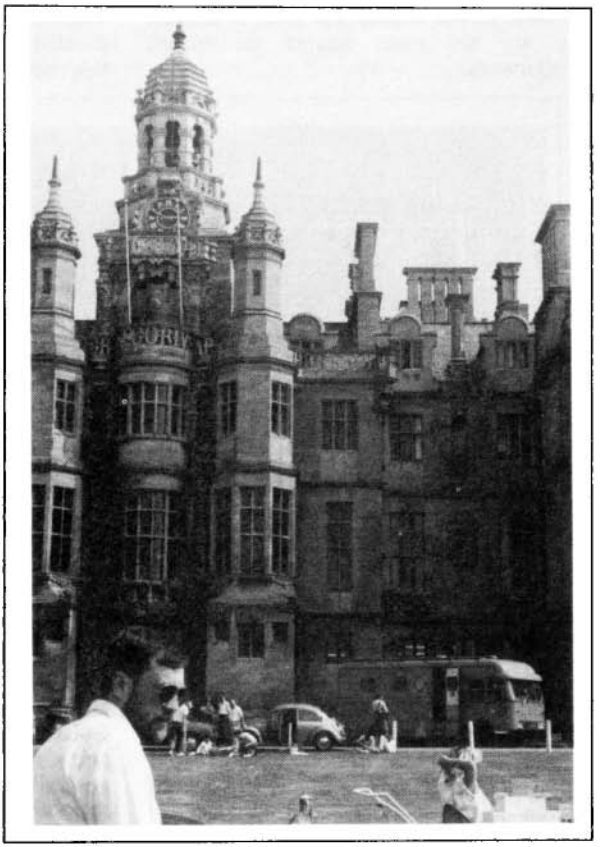
The PCB reference number is 87304-1 and the cost is £27.25 + £4.09 VAT + £2.00 p&p.

Alternatively, a PCB drawing for production of your own board (for personal use only) can be obtained at a cost of £1.50 for a reproduction on paper or £5.50 for one on film from the same address.

CONVENTION 90 - SHOW REPORT

Jenny Hirons G7BQO

This year's convention was held in one of the most unusual settings ever. Harlaxton Manor was the location of the Convention; the site just west of Grantham is certainly a very beautiful location, a most spectacular stately home and well worth a visit. But for those who missed the convention, here is the BATC report:



Firstly, for those of you who will remember, I have written a few reports for the BATC and each time I have been a G?***, but this time I got it, yes I am now G7BQO and licenced much to John (G6TGJ) my OM's relief, but now on with the report. *(Congrats Jen, now it's Kim's turn! ... Ed).*

Sunday 6th May 1990. We had stayed over the previous Saturday evening, camping out in the open along with a few other hardy per-annuals!!! A few others had collected earlier (presumably to get the early bargains) and after a good breakfast we went into the large hall.

Outside the Main Hall was Brian Summers' OB Van. Brian must have been busy last night wiring cameras into the meeting room, all set up to record the lectures. *(Not only that evening but, along with the rest of the committee and helpers, from around 6am that morning ... Ed).*

Entering Harlaxton Hall through the main drive way we were flanked by members' cars and their own car boot sales and a flea market. JAB Electronics from Birmingham had a stall, stockists for TOKO and RF products this company have just produced a new catalogue and operate an evening telephone ordering service, taking all the major credit cards.

We enter the main hall way housing the BATC's own stand with all the usual Members Services' books and badges etc. The majority of traders were on the first floor and we started in the State dining room. The first stand was a very well

supported bring and buy stand run by the GB3ET repeater group. Within the same room was Merlin Radio Systems of Wiltshire, displaying Public Domain software, power supply kits and, of course, they are the main agents for Wizard components.

Birmingham, their speciality was in used Broadcast equipment and valves, MFM from Rugeley had a very good range of computer discs at very reasonable prices. Microwave equipment and ex-MOD gear provided by Telford Electronics completed this room.

Also on show in this room was Weirmead Ltd from Watford, showing a good selection of test equipment. Nipco from Telford displayed over 3000 lines of everything from rotators to components and all sorts of goodies.

A lecture in the Gold room by Steve Beeching on the latest in camcorder technology was being recorded simultaneously by Brian Summers in his OB Van.

Moving on into the Chandelier room were DEE-COMM, their main product being aerials. A whole range of glass fibre and plastic verticals on any frequency, both commercial and amateur. Astley Video, of course with all their range of cameras and monitors, together with KENZEN from

Moving into the Conference room, Griffins G6LJY & G8SDC had a good range of 2 and 4 meter equipment together with video equipment. Steve Mitchell G8JMJ, Paul G8KFW, Dave G8NND and Jim G0FNH provided an on the spot test facility for your equipment to be checked out etc. DAC from Nottingham were next, suppliers of software and small electronic goods for amateur radio. G1OTJ from Nottingham displayed second hand video and amateur radio equipment and G8EMX 24CM RX/TX systems produced by the Worthing Repeater group.

Moving through into the Morning room we found the WAB (worked all Britain) stand with leaflets and books, new members always welcome. Severnside Television Group came next with their 23/24CM

Antenna and, new to the show, their 24CM GasFet Preamp and 24CM Transmitter. The Remote Imaging Group had displays and supplies of weather satellite reception equipment. HS Publications from Derby with equipment and publications. Oasis Computer Systems from South Glamorgan had a very good selection of games and disc drives and E.H.C Valves from Croydon demonstrating a 23cms receiver completed this area. *(To be reviewed in the next issue of CQ-TV ... Ed).*

We were now in the long gallery: starting with Mechanlec with their usual computerised engraving services, also suppliers of modems components etc we then found Taurus from Loughborough with computer bits and components, Poole Logic were selling Amateur radio and CB radio gear and publications, Camtech from Suffolk with a new video IF board *(Also to be reviewed in a future CQ-TV ... Ed)* and Barenco from Nottingham with a full range of aerial components and electronic components (they will of course make specialised hardware to customers specifications). J.M.A Power supplies came next and then the (Mike G3JMA) Colourstore 2000 system for SSTV Robot 1200 compatible software. P. Haywood G3JMX from Lowestoft showed a good range of satellite receivers and components. Bonex as usual with a fine selection of components complete with a very impressive catalogue completed this hall. The NBTV association was there as usual, attracting quite an interest.

Now on to the conservatory (sounds like a guided tour of a stately home). S & S Electronics from Bedfordshire with a good range of second hand equipment, T.A.R Components from Stourbridge displaying all you could need from fixing kits to aerials etc. Vidi Plex integrated circuits had a good selection of computer surplus items, monitors and components. Completing this room was A1 Electrics from Telford with a vast amount of computer equipment.

This about completed the 'tour', except to say that the refreshments provided were good and reasonably priced, even a licenced bar.

That's it folks, see you again next year, it's 4pm, must find OM whose that on the bring and buy stall trying to flog an old scope as a door stop. Don't look now, someone is about to buy it - sorry take it away. Well done the organisers - 73's & 88's, Jenny G7BQO.

IN THE STUDIO

Part–9

John Goode

Just in case anyone is wondering, I have reinstated the previous In The Studio series featured in past issues of CQ–TV, thus this one is 'part–9'. In this continuation of the series I shall be looking at many diverse studio techniques for dealing with both video and audio signals.

KEYING VIDEO SIGNALS

The process of keying, where two picture signals are combined on the television screen under the control of a third "key" signal is so common in broadcast television now as to go unnoticed by the casual viewer. Virtually every time we see captions, graphics, or any form of special effects, some form of keying is taking place. It's worth having a closer look at how this is achieved.

In its simplest form, the keyer consists of a high–speed electronic switch that can cleanly switch between two video signals on screen. Which part of the screen displays which signal is determined by the screen shape of the key signal, which can be anything from simple horizontal or vertical splits, via irregular masking shapes, to alphanumerics for captions.

In Fig.1 I have shown the electronic–switch type of keyer, and as this type of keying can only "flip" between the the source signals it is known as a "hard" keyer. The switch must be in one of only two states, and so the key signal is passed through a comparator to make sure that the controlling signal for the switch element is in one of two states. The key level control sets the point on the grey–scale of the key signal at which the transition occurs. (An example of a circuit for a hard keyer was published in CQ–TV 112 P.16, "A High–Speed Video Switch"). This kind of hard keying is good for some applications, such as captions, but for special–effects keying a softer form of transition usually gives better results.

I have illustrated this in Fig.2. Instead of an electronic switch, a circuit known as a "linear multiplier" is used, which is arranged as two back–to–back voltage–controlled amplifiers. I have represented this in the drawing is an electronic fader that can move between the two sources under the control of the key signal.

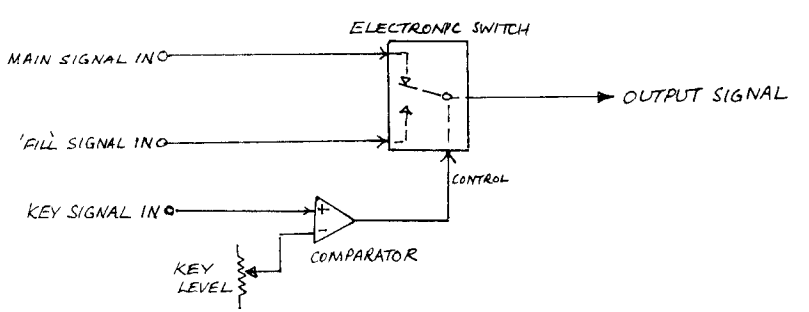


Fig.1 'Hard' (2–State) Keyer

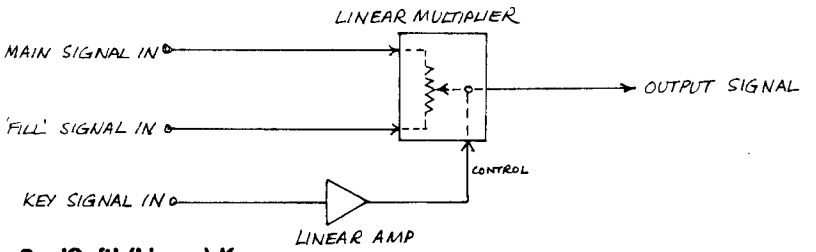


Fig.2 'Soft' (Linear) Keyer

The difference here is that the speed of the transition is directly proportional to the rate of change (slope) of the key signal transition.

This is a much more versatile circuit than the high-speed switch, as it can be used for fading as well as keying, and it forms the fundamental building-block in modern vision mixers where it is often referred to as an "effects amplifier". In Fig.5 I have shown an example of such an effects amplifier; this is a simplified version of the G8FNR/G8GLQ Mix/Effects Amplifier from the Handbook, Vol.2.

If a linear effects amp. is keyed via a comparator, so that the key signal is either "on" or "off", it will act as a hard keyer. In Fig.3 I have shown an arrangement where the keying can be either hard or soft. The effect of this on the video signal is shown diagrammatically in Fig.4. (This is only meant to illustrate the principle - don't expect actual oscillograms to look exactly like this - especially Fig.4F).

One of the problems of using the effects amp. in its linear mode is that the black-level and amplitude of the keying signal must be accurately controlled, as these properties directly affect the relative strengths of the "main" and "fill" video signals.

Normally effects amps. are lined up so that with the key signal at black-level the main signal is passed at full level, and the fill signal fully suppressed. With the key signal at white-level (+700mV w.r.t. black), the fill signal is passed, and the main signal suppressed. With the key signal at levels between these extremes, an appropriate proportion of each signal will contribute to a mixed output. It is therefore important to make sure that any camera or tape-derived key signals have their black and peak-white levels correctly set. This is particularly

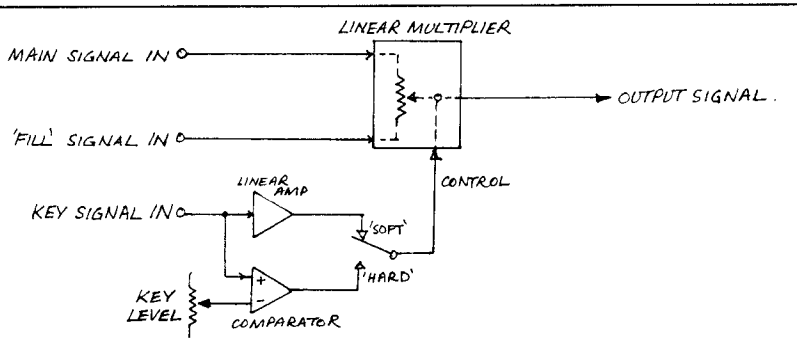


Fig.3 Linear Keyer with 'Soft' and 'Hard' Options

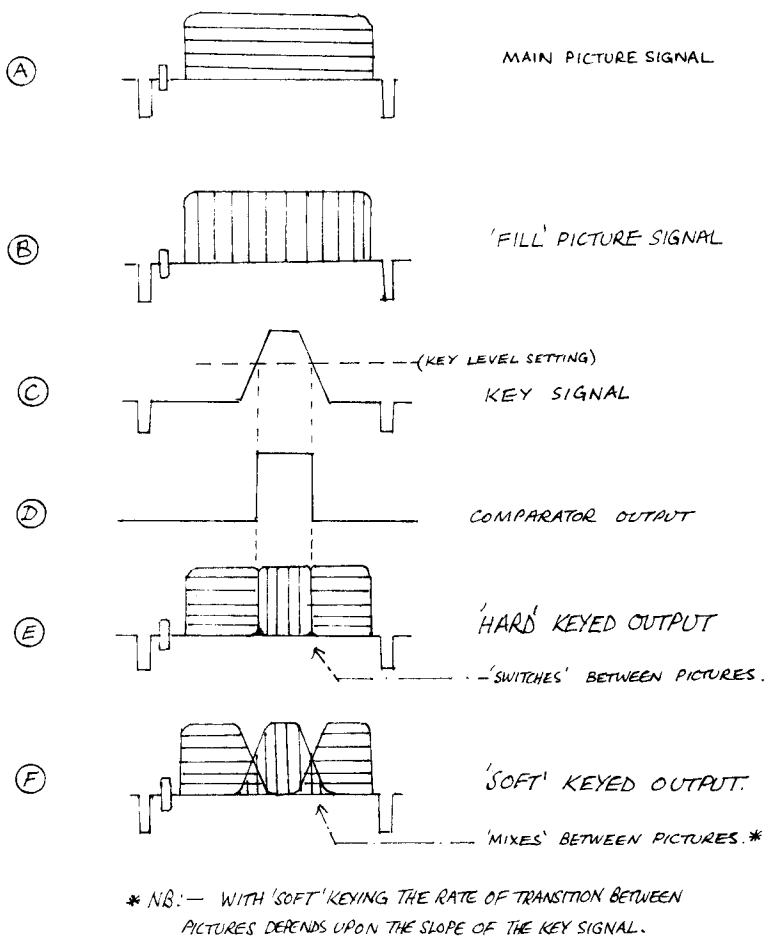


Fig.4 'HArd' and 'Soft' Keying

true of vidicon camera signals as their black-levels are poorly defined, and the pictures can suffer from shading.

At work we have recently purchased a monochrome CCD camera for caption and graphics work as this has the following advantages:-

(1) High sensitivity.

(2) No image burn-in.

(3) Predictable black-level without shading.

(4) No geometrical errors.

In order to alleviate any difficulty with linear operation I have shown a processing amplifier for the key signal in Fig.6. This clamps the key signal, and then black-clips it at about 100mV above blanking level to remove any shading etc., thus establishing

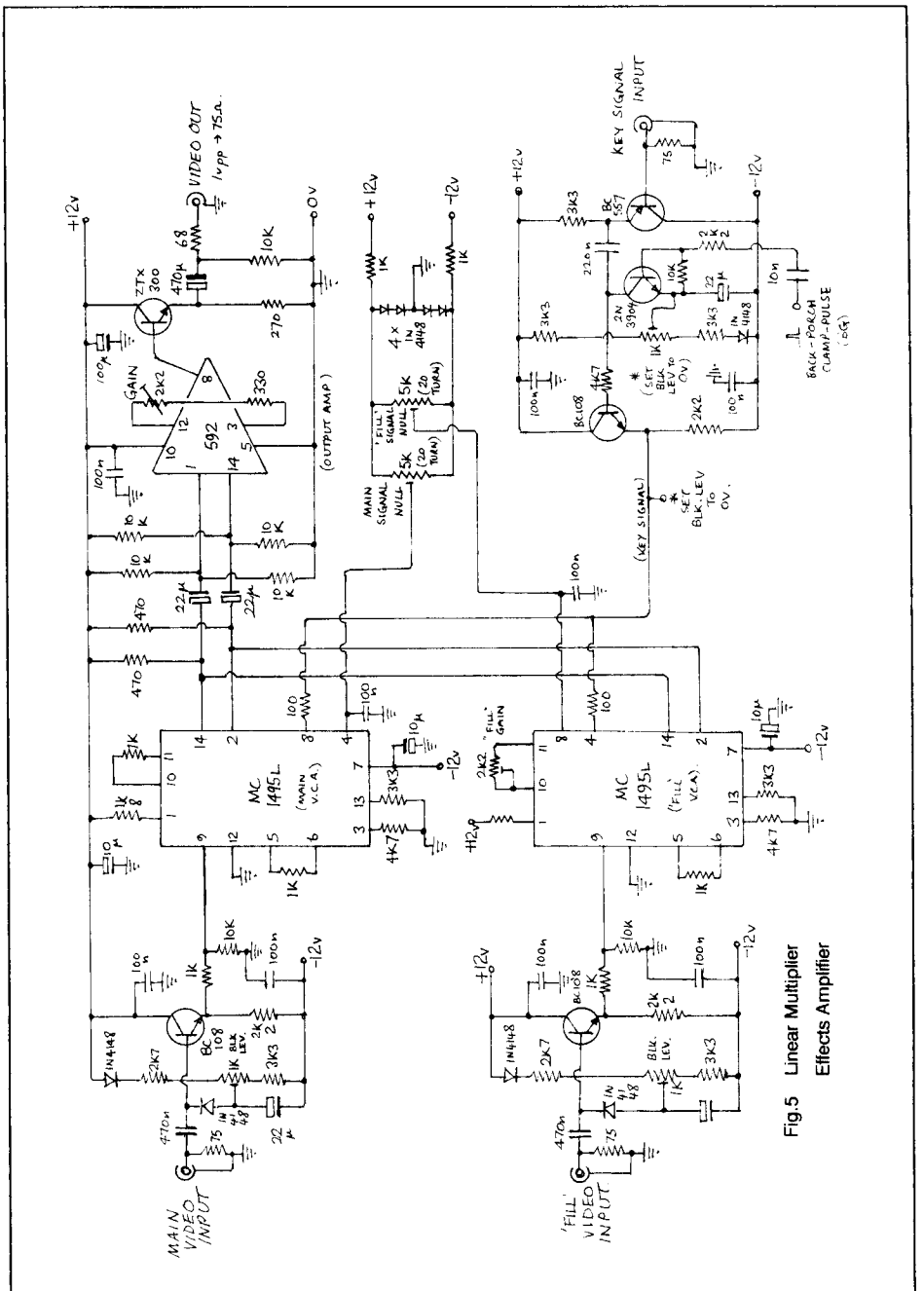


Fig.5 Linear Multiplier Effects Amplifier

a new well-defined black-level. A gain control is provided to set the output signal accurately to 700mV p-p; a peak-level LED indicator is provided as a guide. This gain control should be used rather like the key-level control is with hard keying - adjust for the best effect.

With hard keying the key signal is applied to a comparator, therefore the level applied to the key input of the effects amp. is always well-defined, and once adjusted, the above problems should not occur. A suitable comparator circuit is shown in Fig.7.

Having got a reliable linear keying circuit set up, it is then possible to use it for all manner of wipes, fades, special keying effects, and titling. In the next 'In the Studio' column I will consider the generation of these keying signals.

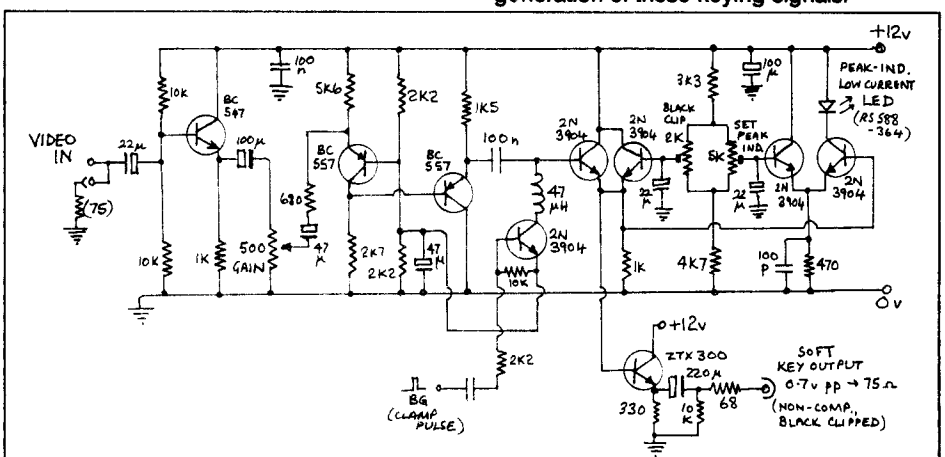


Fig.6 Key Processing Amplifier (Soft Keying)

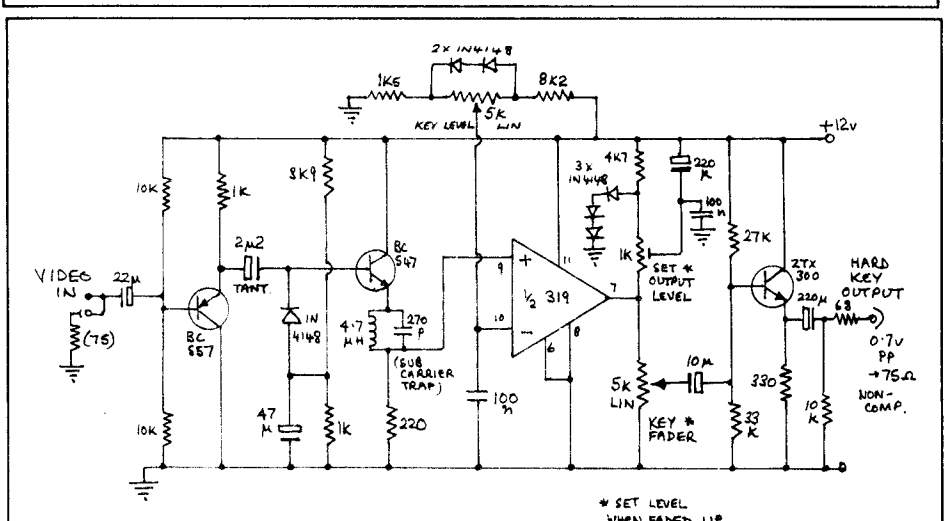


Fig.7 Key Comparator (Hard Keying)

BROADCAST VIDEO TAPE

Jeremy Power G1WVK

Over the last few years there have been dramatic advances in broadcast video-tape technology. In this article I will try to describe all the formats currently used in broadcast installations. There is a list of specifications at the end of the article, in which I have included the VHS, S-VHS and Video-8 formats, so one can compare them with the professional formats.

2" QUADRUPLEX

This format uses four record/replay heads mounted at 90 degrees to each other on a disc, which read/ write frequency modulated video onto 2" wide tape at 90 degrees to tape movement. Each line of information on the tape is equivalent to fifteen lines of video information. There are two longitudinal audio tracks, one of broadcast quality, and the other used as a cue track and later for time-code.

This format was discontinued from use in major installations around 1981, although some ITV companies use the format in cartridge form in the transmission of commercials. The main disadvantages of 2" Quad is that it is not possible to get pictures whilst spooling, or a still frame in stop.

1" HELICAL SCAN

There are three formats to 1" tape - A, B and C. I will only describe C-format as this is the 1" format most used in Britain today. The video information is recorded using frequency modulation by one record head on a drum of 13.64cm diameter. The tape is wrapped around the drum at an angle of just over two degrees, so that the information is recorded in diagonal lines 41.14cm long and 160ucm wide.

In order to accomplish still frames and slow motions, without too many digital computations, each line on the tape has to record a field (field blanking is not required). Also, with still frames the replay head has to follow the line of information at a different angle to that which was originally recorded, and so the replay head has to vibrate (150Hz) from side to side in order to get the signal at a high enough level to reproduce a picture to broadcast standards.

There are four broadcast quality audio tracks, although track-3 is normally used for time-code. The pictures can easily be edited using the flying erase head on the head drum.

U-MATIC

This format was designed for the 525-line NTSC market and, because of its success in news gathering and field production in the USA, the manufacturers decided to make a 625-line PAL version. However, because of the stricter technical specifications, they were unable to design a 6P version which could be used in ENG and ENP applications with the same quality at an affordable price to all. What the 6P world ended up with was two U-MATIC formats.

Low band was introduced in 1971 and offers reasonable quality for industrial and educational purposes. This replaced reel-to-reel VTR's in these environments. There was no VHS in those days.

High band was later to arrive in 1977 and offers broadcast quality recordings.

Information is recorded using the colour-under system, where the chrominance and luminance components of the PAL signal are split and recorded as individual signals. The luminance is frequency modulated onto the tape between 4.8 and 6.4MHz, and the chrominance is recorded below using AM.

The main difference between high and low band is the bandwidth of the chrominance signal. During replay the off-tape chrominance is added with an error signal derived from off tape line sync pulses, which produces a stable chrominance signal. However, because the chrominance is only stable enough to allow a monitor to lock to it, a timebase corrector has to be used if the signal is going to insert to a vision mixer etc.

The high band U-MATIC format boasts two full bandwidth audio tracks and a dedicated time-code track. Cassettes come in two sizes to suit both ENG and EFP and studio-based operations. Standard tape lengths are 30 minutes and 60 minutes respectively.

In 1973 U-MATIC SP was introduced with a wider bandwidth for chrominance and luminance recordings, as well as Dolby C noise reduction. When editing on U-MATIC it is possible to connect the two machines with a luminance/chrominance lead, thus avoiding the relatively noisy PAL decoding/ encoding processes.

BETACAM

Betacam was introduced back in 1982 by Sony. This 0.5 inch format uses the same cassette shell as Betamax, but unlike U-MATIC, does not use the colour under method. Instead, the signal is recorded as separate luminance and time-division-multiplexed (2:1) chrominance signals (R-Y and B-Y). These two signals are recorded simultaneously by the two record heads.

There are, therefore, another four heads; two for erase and two for replay. The output needs timebase correction before it is even monitored, in order to provide stable pictures with colour.

On camera/recorders there is a facility for confidence replay, but the display is be in monochrome. The luminance bandwidth can reach as high as 4.5MHz and the chrominance 1.5MHz.

There are two longitudinal audio tracks, normally Dolby C encoded, and one time-code track. Noise reduction is used because the audio head-to-tape speed is only 10cm/sec.

BETACAM SP

Betacam SP was developed to improve the overall quality of Betacam. By using metal tape, luminance bandwidth increased to 5.5MHz, and the noise level on the longitudinal audio tracks decreased by 5dB.

Two FM audio tracks were added, these are modulated with the vision but cannot be edited independently of the vision. Cassette length has been extended to a maximum of 110 minutes, although a larger shell had to be designed to accommodate this.

Betacam SP machines automatically switch between Betacam and Betacam SP, depending on the type of cassette inserted, and change the record/replay characteristics accordingly. Both Betacam and Betacam SP have component input/ output sockets.

MII

This format was introduced by Panasonic just before Sony introduced Betacam SP. MII (M2) uses the same cassette shell as VHS for its studio based machines, giving 10 to 90 minutes of recording time, and a smaller 10 to 20 minute cassette for portable operation.

Audio facilities are the same as for Betacam SP. The vision is almost the same, using two tracks, one for luminance and the other

for chrominance, except that the chrominance (R-Y, B-Y) is recorded by frequency-division-multiplexing.

MII has the advantage that there are some adjustments accessible to the user that are not on Betacam SP, which if lined up correctly can give very impressive results.

D1

D1 was designed by Sony and records digital component video. The format was intended for post-production work alongside digital devices like Paintbox and Harry, which have digital interfaces. It cannot achieve slow motions as the video is segmented on the tape, with the audio in digital bursts in the middle of each helical scan.

In theory, when using the digital interface, and subject to tape quality, it should be possible to dub the original an infinite number of times with no noticeable loss in quality.

D2

D2 was again designed by Sony to provide a digital VCR for general broadcast work. Unlike D1 this format records in PAL. Cassette length is between 32 and 208 minutes, depending on which of the two cassette sizes is used.

The 6MHz bandwidth is sampled at 4Fcsc, but the data rate is reduced by not recording field or line blanking. Two bursts of digital audio are recorded at each end of the vision track. Two pairs of heads are used, each recording 2Fcsc, which means that if one pair fails the other can still provide broadcast pictures. The signal-to-noise ratio is 10dB better than 1" formats. Viewable pictures are available at sixty times normal speed.

The very interesting facility that D2 offers is that it is possible to read off the tape before writing onto it, therefore it is possible to mix from the edit tape to an incoming signal and record the result on the edit tape.

TABLE OF TECHNICAL SPECIFICATIONS

	VHS	S-VHS	VIDEO 8
SIGNAL SYSTEM	COMPOSITE Y/C COLOUR UNDER	COMPOSITE Y/C COLOUR UNDER	COMPOSITE Y/C COLOUR UNDER
SCANNING SYSTEM	HELICAL	HELICAL	HELICAL
HEAD/TAPE SPEED	4.85 M/S	4.85 M/S	4.85 M/S
HEADS	2 (MORE FOR SLOW MOTION)	2 (MORE FOR SLOW MOTION)	2
TAPE TYPE	COBALT MODIFIED OXIDE	COBALT MODIFIED OXIDE	METAL PARTICLE
LONGEST TAPE LENGTH	240 MINS	180 MINS	90 MINS
PEAK WHITE FREQUENCY	4.8 MHz	5.4 MHz	4.2 MHz
SYNC TIP FREQUENCY	3.8 MHz	5.4 MHz	4.2 MHz

TABLE OF TECHNICAL SPECIFICATIONS (CONT.)

	2" QUAD	1" C-FORMAT	LOW BAND U-MATIC
SIGNAL SYSTEM	SEGMENTED COMPOSITE	COMPOSITE	Y/C COLOUR UNDER
SCANNING SYSTEM	TRANSVERSE	HELICAL	HELICAL
HEAD/TAPE SPEED	41.27 M/S	21.39 M/S	8.54 M/S
HEADS	4	3 (6 IF USING SYNC TRACK)	2 OR 4
TAPE TYPE	FERRIC OXIDE	COBALT MODIFIED OXIDE	COBALT MODIFIED OXIDE
LONGEST TAPE LENGTH	90 MINS	120 MINS	75 MINS
PEAK WHITE FREQUENCY	9.3 MHz	8.9 MHz	6.4 MHz
SYNC TIP FREQUENCY	7.16 MHz	7.16 MHz	4.8 MHz

	HIGH BAND U-MATIC	BETACAM	BETACAM SP
SIGNAL SYSTEM	Y/C COLOUR UNDER	Y, R-Y, B-Y	Y, R-Y, B-Y
SCANNING SYSTEM	HELICAL	HELICAL	HELICAL
HEAD/TAPE SPEED	8.54 M/S	5.75 M/S	5.75 M/S
HEADS	4	10	12
TAPE TYPE	COBALT MODIFIED OXIDE	COBALT MODIFIED OXIDE	METAL PARTICLE
LONGEST TAPE LENGTH	75 MINS	110 MINS	110 MINS
PEAK WHITE FREQUENCY	6.4 MHz	6.4 MHz	8.8 MHz
SYNC TIP FREQUENCY	4.8 MHz	4.4 MHz VIDEO 5.78 MHz CHROMA	6.8 MHz VIDEO 7.3 MHz CHROMA

TABLE OF TECHNICAL SPECIFICATIONS (CONT.)

	MII	D1	D2
SIGNAL SYSTEM	Y, R-Y, B-Y COLOUR UNDER	DIGITAL COMPONENT (4:2:2)	DIGITAL COMPOSITE
SCANNING SYSTEM	HELICAL	HELICAL	HELICAL
HEAD/TAPE SPEED	5.9 M/S	35.34 M/S	30.4 M/S
HEADS	10	12 - 16	8
TAPE TYPE	METAL PARTICLE	COBALT MODIFIED OXIDE	METAL PARTICLE
LONGEST TAPE LENGTH	97 MINS	94 MINS	208 MINS
PEAK WHITE FREQUENCY	9.2 MHz	PACKING DENSITY 2210 bit/mm	PACKING DENSITY 2532 bit/mm
SYNC TIP FREQUENCY	6.63 MHz VIDEO 4.71 MHz CHROMA	I/P DATA RATE 216 Mbits/S	I/P DATA RATE 142 Mbits/S

BIBLIOGRAPHY: TV PRODUCTION INTERNATIONAL No.21 Sept 1989
VIDEOTAPE RECORDING, Joseph Robinson, Focal Press
3M "HEAD TO TAPE" Autumn 1988

Retired Committee Member
George Mayo G4EUF

Photographed off-air on 24CM
at Mike G6IQM's QTH

CONTEST NEWS

1990 WINTER ATV

Sixteen entries were received for this years event, all of which were of a good standard. Despite the rather flat propagation conditions, some very good scores were attained. Dave G0KTH from Cosford joined the fun for the first time and has asked me to pass on thanks to G4EAB and G7ATG for the help and to G4EIX who he never quite got to see. Thanks for the log, a commendable first attempt.

Jamie, G0JNK raised an interesting point. He asks "if I cause TVI to the neighbours and they can read my contest numbers, can I claim the points?". Sorry, but no. However, if you were operating on 248GHz from IO27FU square, I may have considered it.

Ron G4SHC only just managed to get his entry in before the four week deadline together with a note saying, "sorry but I've just had a baby". I assume that you really ment the XYL. Congratulations on the happy event and on winning the 70CM section.

John G8MNY found conditions rather quiet and, unfortunately, just after the third session had the aerials damaged by the gales. A new system was quickly installed, LDF450 coax, high performance preamp etc. Comments for the 4th session were, "conditions still poor". Best DX of 286Km. Well done.

The January gales caused considerable damage across the country. Dave G8GKQ had to miss the fourth session because of damage which was not possible to repair in time. Dave also comments on the fact that for many contacts SSB would be a better mode for talkback. SSB is often used on the continent, around 144.170 being favourite. A move to SSB for say DX contacts would greatly reduce the congestion often found on 144.750.

Conditions on 24 were again reported as quiet. Congratulations to G3NNG for achieving first place with a score of 975 and a best DX of 113Km. It was nearly a double, with a close run second place on 70.

RESULTS: 70CM

Callsign	Pts	QSO's	Best DX @	Km
G4SHC	7803	41	G8MNY	286
G3NNG	7338	39	G4SHC	217
G7ATG	6698	48	G4WGZ	223
G8MNY	6279	35	G4SHC	286
G6IQM	3075	21	G4SHC	154
G4WGZ	2261	23	G7ATG	223
G8ONX	2189	20	G4SHC	139
G0JNK	1560	14	G8MNY	208
G8GKQ	1197	8	G4WGZ	120
G6WLM	664	7	G4SHC	137
G0KTH	39	6	G7ATG	12

24CM

Callsign	Pts	QSO's	Best DX @	Km
G3NNG	975	9	G4VTD	113
G6IQM	528	9	G7ATG	94
G7ATG	302	5	G6IQM	94
G4WGZ	160	6	G3MPS	61
G8GKQ	82	1	G8LES	41

1990 SPRING ATV

Top spot and congratulation to G8MNY/P for a fine score on 70 and to G7ATV/P for their achievement on 24. Viv of the Severnside group, G7ATV, informs me that this was purely a training exercise to try out their new mast mounted PA and preamp combination. The only minor problem they encountered was in feeding the 12 volt at 20 amps up 80 feet!

G3KKD (Cambridgeshire) used a narrowband filter in the IF for the first time during the event and was most impressed by the 10db improvement it produced on received signals.

RESULTS: 70CM

Callsign	Pts	QSO's	Best DX @	Km
G8MNY/P	5604	23	GW7ATG/P	297
G7ATV/P	5319	25	F6IFR	342
GW7ATG/P	4691	17	G8MNY/P	297
G3KKD	1744	5	GW7ATV/P	253
G7AVU	1276	9	G7ATV/P	267
G0JNK	1259	7	G8MNY/P	218
G6WLM	344	4	G8MNY/P	154

24CM

Callsign	Pts	QSO's	Best DX @	Km
G7ATV/P	1680	21	G4WGZ/P	180
G4WGZ/P	1111	11	G7ATV/P	180
G7ATV/P	388	3	G5KS	109

THE 1990 INTERNATIONAL ATV CONTEST

This years event is being organised by PA0SON of VERON, the Dutch group. As usual, all logs should be sent to me for checking and forwarding. This year there are some important rule changes which were agreed at this years IARU convention. WOULD ALL ENTRANTS PLEASE NOTE.

(1) There will be two sections per band: Section 1 - TX/RX. Section 2 -- RX only

The scores for all bands operated will be totalled together to establish an overall winner.

(2) Different numbers must be used on each band. Consecutive numbers or repeat numbers must not be used; ie: 1234 or 1122 etc.

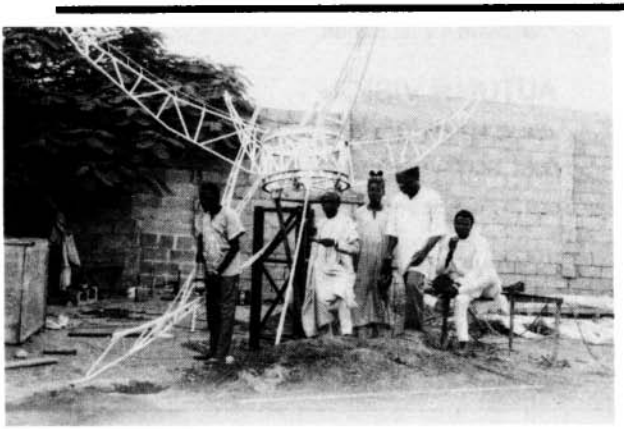
(3) Scoring will be two points per kilometer for 70CMs. Four points on 24CM. Ten point for 13CM and above. If only one station receives the others code group, then the scores for both stations are halved. The score for crossband contact is calculated by adding the scores which would be obtained on each band then dividing by two.

(4) Duplicate contacts will be penalised by the deduction of ten times the score obtained for the contact.

(5) Certificates will be issued to the first three places on each band, plus overall winner. Certificates for other positions will only be issued if a large (A4) SAE is received with the entry.

These changes only apply to international contests. U.K. contests will for the present use the existing rules.

Please let me have your views on these changes. All other rules stand.



Some of the members of R.A.T.S., Kano, Nigeria, and one of their home-brew aerials!

The wedding of the Year ?

It took a long time but he made it at last !

Yes it's true, our previous editor John Wood G3YQC married Pip on May 26th.

The committee and the club wish you both best wishes for the future. To quote John from his speech at the Convention "I will be back!"

CONTEST CALENDAR

INTERNATIONAL ATV

Saturday Sept 8th - Sunday Sept 9th.

1800 GMT Saturday - 1200 GMT Sunday.

Fast Scan TV all Bands.

AUTUMN VISION

Sunday 11th October

0001 GMT - 2359 GMT

Slow Scan & Fast Scan ATV all Bands

WINTER ATV

Saturday Dec 8th - Sunday Dec 9th

1800 GMT Saturday - 1200 GMT Sunday

Fast Scan ATV all bands.

USING OSCILLOSCOPES

Part–4

Mike Wooding G6IQM

So far in our examination on the use and uses of oscilloscopes we have found that the display system draws the waveforms on the screen, the vertical system supplies the vertical information for the drawing and the horizontal system provides the time axis. In other words, you know how the oscilloscope draws a graph; the only thing missing is the 'when'; when should the other circuits of your oscilloscope start drawing the signal and when shouldn't they?

The when is the trigger and it is important for a number of reason. first, because getting time–related information is one of the reasons you use an oscilloscope. Equally important is that each drawing start with the same 'when'. A diagramatical representation of the trigger circuit and its controls is shown in Fig.1.

Obviously the graph drawn on the screen isn't the same one all the time you are watching. If you are using the 0.05uS SEC/DIV setting, the oscilloscope is drawing one graph every 0.5uS (0.05uS/ division x ten screen divisions). That's 2,000,000 graphs every second (not counting retrace and hold–off times, which we will get to shortly). Imagine the jumble on the screen if each sweep started at a different place on the signal. But each sweep does start at the right time – if the correct trigger system control settings are selected.

Here's how it is done. The trigger circuit is told which trigger signal to select with the source switches. With an external signal, the trigger signal is connected to the trigger system circuit with the external coupling controls. Next the trigger circuit controls are set to recognise a particular voltage level on the trigger signal with the **SLOPE** and **LEVEL** controls. Then, every time that level occurs the sweep generator is turned on. The diagram in Fig.2 illustrates this process.

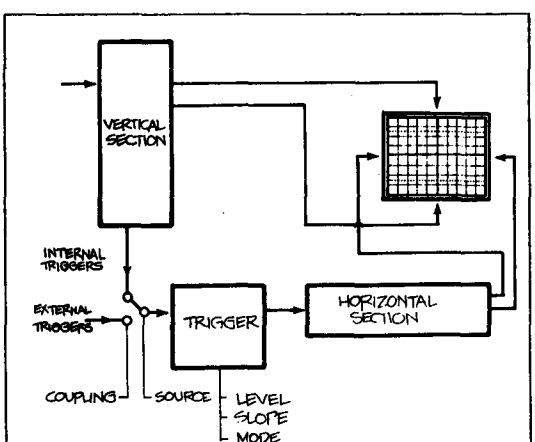


Fig.1 Trigger Control System Block Diagram

Triggering gives a stable display because the same trigger point starts the sweep each time. Slope and level controls define the trigger points on the trigger signal. When the waveform is viewed on the screen all the sweeps are overlaid into what appears to be one picture.

Some oscilloscopes, such as those in the Tektronix 2200 series, offer a variety of trigger controls. Besides those already mentioned, there are also controls that determine how the trigger system operates (trigger operating mode) and how long the oscilloscope waits between triggers (hold–off).

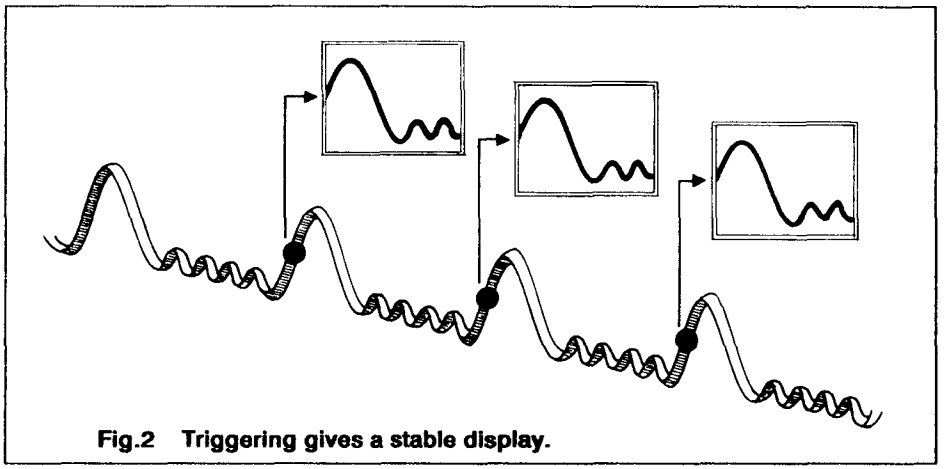


Fig.2 Triggering gives a stable display.

TRIGGER LEVEL AND SLOPE

These controls define where on the trigger signal the trigger point actually occurs. The **SLOPE** control determines whether the trigger point is found on the rising (positive-going) edge or the falling (negative-going) edge of a signal. The **LEVEL** control allows the user to determine where on that edge the trigger point occurs. See Fig.3.

VARIABLE TRIGGER HOLDOFF

Not every trigger event can be accepted as a trigger. The trigger system will not recognise a trigger during the sweep or the retrace, and for a short time after called the hold-off period.

The retrace, as described in part-3, is the time it takes the electron beam to return to the left-hand side of the screen to start another trace. The hold-off period provides additional time beyond the retrace that is used to ensure that the display is stable, as illustrated in Fig.4; only the labelled points on the diagram start the display because no trigger can be recognised during the sweep, retrace or hold-off period. The retrace and hold-off times are necessary because the electron beam must be returned to the left-hand side of the screen after the sweep, and because the sweep generator requires reset time.

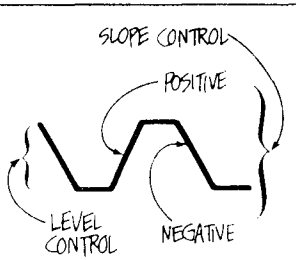


Fig.3 Slope and Level Controls

The CRT Z axis is blanked between sweeps and unblanked during sweeps, thus not showing the unwanted trace as the electron beam is returned to the start position.

On occasions the normal hold-off period is not long enough to ensure that a stable display results; this possibility exists when the trigger signal is a complex waveform with many possible trigger points on it. Though the waveform is repetitive, a simple trigger would probably result in a series of patterns on the screen instead of the same pattern each time.

Digital pulse trains are a good example; each pulse is very much like any other, so there are many possible trigger points, not all of which result in the same display.

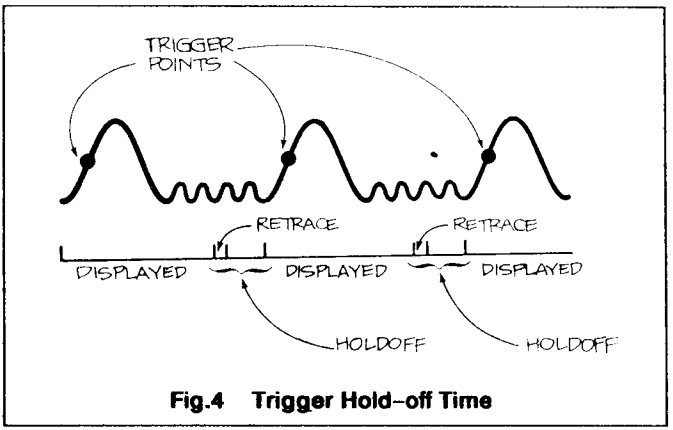


Fig.4 Trigger Hold-off Time

What is required in this instance is some way to control when a trigger point is accepted. The variable trigger hold-off control provides this capability - the control is actually part of the horizontal system because it adjusts the hold-off time of the sweep generator, but its function interacts with the trigger controls.

A diagramatic representation of a situation where a variable hold-off control would be useful is depicted in Fig.5. In the example shown, all the possible trigger points in the input signal would result in an unstable display. Changing the hold-off time to ensure that the trigger point appears on the same pulse in each repetition of the input signal is the only way to ensure a stable waveform.

TRIGGER SOURCES

Trigger sources are grouped into two categories that depend on whether the trigger signal is provided internally or externally. The source makes no difference in how the trigger circuit operates, but internal triggering usually means that the oscilloscope is triggering on the same signal that it is displaying. That has the obvious advantage of letting you see where you are triggering.

Switches on the oscilloscope, usually labelled **SOURCE** and **INT**, determine the trigger source. The internal triggering sources are enabled when the source lever is moved to **INT**. In this position the oscilloscope can be triggered on a signal from any channel (if it is a dual or multiple channel model that is), or it can be switched to the **VERT** mode. Triggering on one of the channels works just like it sounds; the oscilloscope is set to trigger on a particular point on the waveform present on that channel.

Using the **VERTICAL MODE** setting on the internal source switch means that the oscilloscope's **VERTICAL MODE** switches determine what signal is used for triggering. If the **VERTICAL MODE** switches are set at **CH1**, then the signal on channel 1 triggers the sweep. If the signal on channel 2 is being viewed then that signal triggers the sweep and so on.

If the switches are set to the **ALTERNATE** vertical mode then frequency the oscilloscope looks for triggers alternately on the two channels.

If the vertical mode is switched to **ADD** then CH1 + CH2 is the triggering signal. And in the **CHOP** vertical mode the oscilloscope triggers the same way as in **ADD**, which prevents the instrument from triggering on the chop frequency instead of the input signals.

It can be seen that vertical mode triggering is a kind of automatic source selection that can be used when it is necessary to switch back and forth between vertical modes to look at different signals.

However, triggering on the displayed signal is not always what is required, so external triggering is also available. It often gives the user more control over the display. To use an external trigger the **SOURCE** switch is set to the **EXT** position and the triggering signal connected to the **EXT INPUT** socket.

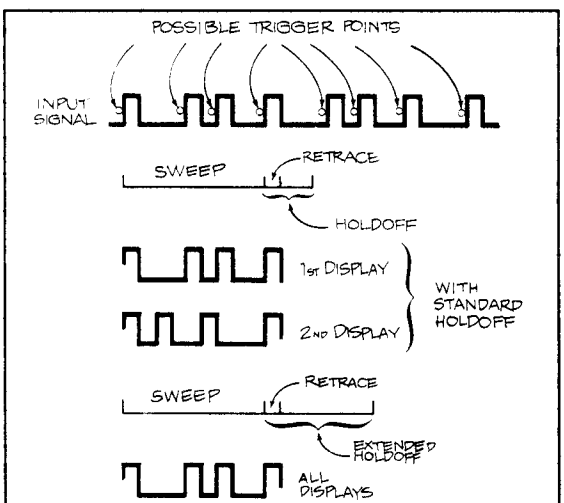


Fig.5 The Variable Holdoff Control

Occasions when external triggering is useful often occur in digital circuits; there it may be required to look at a long train of very similar pulses whilst triggering with an external clock (frequency) or with a signal from another part of the circuit.

The **LINE** position on the **SOURCE** switch gives another triggering possibility; the power line. Line triggering is useful any time that circuits that depend on the power line frequency are being looked at. Examples of such devices include light dimmers and power supplies.

TRIGGER OPERATING MODES

Many oscilloscopes, such as the Tektronix 2200 series, can operate in four trigger modes: normal, automatic, television and vertical modes.

One of the most useful is the **NORMAL** trigger mode (**NORM** on the **MODE** switch) because it can handle a wider range of trigger signals than any other triggering mode. The normal mode does not permit a trace to be drawn on the screen it there is no trigger. the normal mode gives the widest range of triggering signals, for example in the Tektronix 2200 series DC to 60MHz.

In the **AUTOMATIC** (or 'bright' base line) mode (**AUTO** on the **MODE** switch) a trigger starts a sweep, the sweep ends and the hold-off period expires. At that point a timer begins to run; if another trigger is not found before the timer runs out a trigger is generated internally by the oscilloscope causing the bright baseline to appear, even when there is no waveform on the channel input.

In the Tektronix 2200 series this automatic mode is also a signal-seeking mode. This means that for most of the signals being measured the auto mode will match the trigger level control to the trigger signal. This makes it most unlikely that the trigger level control will be set outside of the signal range. The auto mode allows triggering on signals with changing voltage amplitudes or wave shapes without making adjustments to the **LEVEL** control.

Another useful operating mode is **TELEVISION** triggering. Most oscilloscopes with this mode allow triggering from TV fields at sweeps of 100uS/division and slower, and TV lines at 50uS/division and faster. With the Tektronix

2200 series triggering on either TV line or field can be achieved at any sweep speed.

The **NORMAL** and **AUTOMATIC** modes are the most often used. The **AUTO** mode because it is essentially totally automatic, and the **NORMAL** mode because it is the most versatile.

For example: it is possible to have a low-frequency signal with a repetition rate that is that is mismatched to the run-out of the automatic mode timer. When that happens the signal will not be steady in the **AUTO** mode. Moreover, the automatic signal-seeking mode is unable to trigger on very low-frequency signals. The **NORMAL** mode, however, will give a steady signal at any repetition rate.

The last mode to be discussed is the **VERTICAL** mode, which is unique in its advantages. Selecting the **VERT MODE** position on the **INT** switch automatically selects the trigger source as explained earlier under trigger sources. It also makes alternate triggering possible. In this operating mode the oscilloscope triggers alternately on the two vertical channels. That means that two completely unrelated signals can be viewed at the same time. Most oscilloscopes only trigger on one channel or the other when the two signals are not synchronised.

TRIGGERING COUPLING

Just as selection is possible between either alternate or direct coupling when connecting input signals to the oscilloscope vertical system, it is also possible to select the manner of coupling between the triggering signal and the trigger system's circuits. For internal triggers the vertical input coupling selects the trigger coupling automatically. For external trigger systems, however, the required coupling must be selected manually.

DC COUPLING: Dc couples all elements of the triggering signal (both AC and DC) to the trigger circuit.

DC WITH ATTENUATION: allows DC coupling of very large amplitude trigger signals by inserting an attenuator (usually /10) into the EXT trigger input line.

AC: this coupling blocks the DC components of the trigger signal and couples only the AC components.

This concludes part-4 of the series. In part-5 I shall be investigating the types and correct uses of Oscilloscope Probes.

I intend to cover in future parts of the series some of the techniques in making measurements with oscilloscopes and how to interpret the results.

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A SATELLITE RECEIVER PREAMP

Michael Bielenberg DD3XE

This article appeared in the 73/89 issue of Der TV-Amateur, and we wish to thank the Editors for their permission to reproduce it here.

GENERAL

The justification for the construction of the preamp to be described below was the fact that satellite tuners are also suitable for receiving FM-ATV transmissions.

The so-called 'indoor units' have an input range of 950 - 1750MHz, and thus completely cover the 23cm amateur band. Since these satellite tuners have only average sensitivity, however, (in the region of -50 to -70dBm) you will need a relatively high degree of preamplification to receive ATV. The necessary preamp should provide the normal amateur input sensitivity of <1 uV. Further, it should have a low noise figure and ideally be as compact as possible so as to fit inside a satellite tuner.

At this stage one should also mention some other problems of satellite tuners, for example too high IF and demodulator bandwidth, which can only be cured by re-working. On the market there are countless satellite tuners whose 30MHz IFs can be modified to half that figure (around 15MHz). The latter bandwidth should provide good signal-noise trade-offs for FM-ATV purposes.

CIRCUIT

The circuit diagram of the complete unit is shown in Fig.1. The circuit design of the GaAsFET preamp corresponds broadly to the DD9DU design and offers nothing much extra. Two 50 ohm amplifier stages are cascaded after this, made up of MMICs by Avantek, which are rather handy. In my prototype I used the type MSA0685, which combines low price, small noise figure (F = 3.2dB) and high amplification. Each of the three amplifier stages adds about 14dB gain, giving a combined amplification of at least 40dB.

SPECIAL CONSTRUCTION NOTES

The PCB layout is shown in Fig.2 and the component overlay in Fig.3. The completed preamplifier is shown in Fig.4. All components are surface mount types, which reduces the mechanical preparation work necessary. The SMD capacitors can safely be substituted by small ceramic capacitors

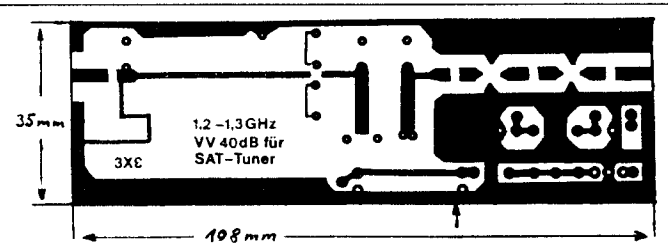


Fig.2 Printed Circuit Layout

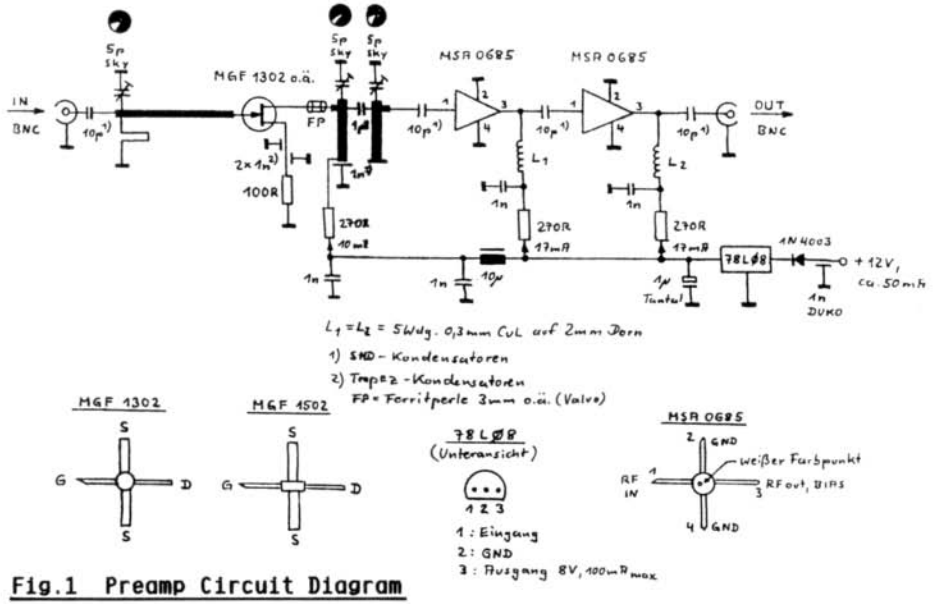
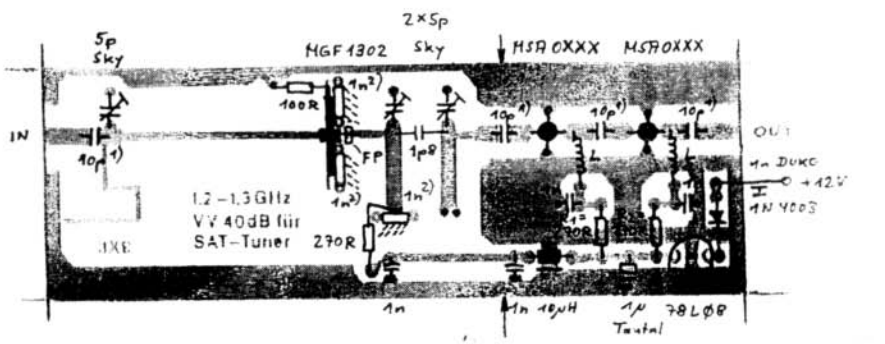


Fig.1 Preamp Circuit Diagram



• = through contact to lower ground side
1 = SMD Capacitors
2 = trapezium capacitors soldered on lower ground side
L = 5 turns varnished copper Ø.3mm diameter wound on 2mm former
R1 = R2 = 270R for MSA0685
FP = ferrite bead

All components surface-mounted (solder side = component side)

Arrowheads indicate separation points when the individual parts of the preamp are to be used separately as a GaAsFET preamp or MMIC broadband amplifier.

Fig.3 Component Overlay

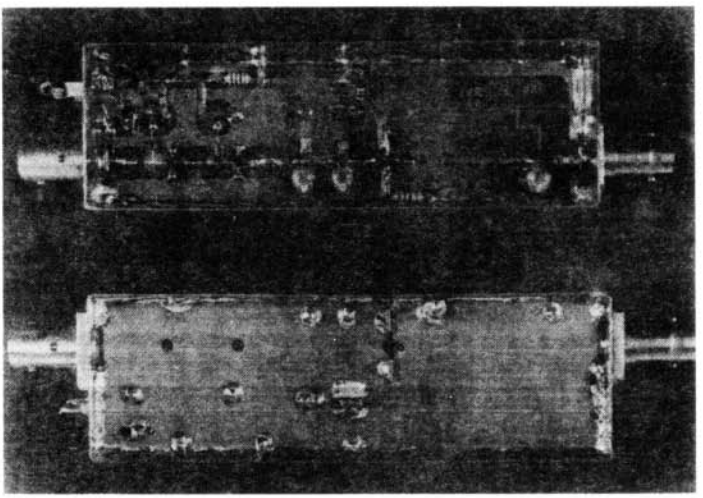


Fig.4 The Completed Preamplifier

(RM 2.5 mm) in this frequency range, but the leads must be kept as short as possible. The resistors are 1/8 watt.

On the groundplane side of the board, 1mm of the copper should be removed around the area of the three slits for the trapezium capacitors (danger of short circuits).

The centre pins of the BNC connectors should be shortened by 3mm and the Teflon collar cut away as necessary.

The circuit board is then mounted in a suitable tinplate case and soldered on both sides. Don't forget to solder the corners and around the BNC connectors. The pins of the latter should lie flush onto the PCB tracks.

Make appropriate cutaways for the GaAsFETs and ferrite beads, also a 2.5mm hole for the MMICs. Solder component leads on both sides of the PCB to achieve good through contact.

The voltage regulator should press against the case for good cooling.

Alignment hints

The trimmers should be pre-set in the positions shown graphically on the circuit diagram (Fig.1). The prototype was set up 'unscientifically' as follows: with a weak input signal on 1270 MHz the three Sky trimmers are set to give maximum S-meter deflection on a 23cm receiver connected to the output of the preamp.

This simple method of tune-up will give good results without any special test equipment.

When using this preamp with a satellite tuner, the AGC of the latter may need to be readjusted.

Final observations

If wished, the coupling capacitors can be varied to give a greater or smaller bandwidth. The two parts of the preamp can be constructed separately as a GaAsFET or MMIC-only device.

TV ON THE AIR

Andy Emmerson G8PTH

First of all, a brief word about our BATC rally at Harlaxton (which seems all so long ago now!). If you were there you won't need telling how well this event turned out; if you weren't you should be green with envy that you didn't (or couldn't) attend. I must add my words of congratulation to the hard-working souls who planned the event and made it work on the day. The venue was superb (lots of room), access by road was easy (the clear A1 road), the weather was superb (thanks perhaps to the RIG weather satellite folk!), and the demonstrations and talks were interesting. I was particularly impressed with the very effective, but low-cost 10GHz transmitter/receiver equipment operated by Bob G8OZP and Jim G0FNH. Oh yes, and finally, what we all came for - the junk was of excellent quality!

Indeed, Hugh Alison G6ANE/T (I can never remember his other call!) said we would really cringe when he wrote up the event in his second-hand and rally column in 'Amateur Radio'. He said it was the best rally he had attended (though that was said before Stockwood, formerly Shuttleworth!). Anyway, the thought was kind. And talking of kind thoughts, many thanks to the mystery person who left a pack of photocopies of old articles on TV for me at Harlaxton.

To business now, and time once more for our round-up of activity on the air, and the first letter comes from someone who has been involved in our hobby for a considerable time. The writer is Arthur Bevington G5KS (West Midlands) and he says: "I feel I must let you know that I am still very active on the air and have been since I first joined BATC in 1951. Therefore I am one of the oldest members. I am active on 70cm and 24cm 625 lines and intercarrier sound on 24cm, all home-constructed on the above. G8MTF is also active and is in my age bracket; he joined the BATC around 1952/3, so please can we be remembered? I am also very active on SSTV with a Robot 1200C and Robot 800C computer from 7MHz up to 2 metres."

SSTV in East Anglia

Andy Dunham G6OHM rang up from his Chatteris (Cambs.) home to mention that because of 'operating conditions' his TV activity is now mainly on SSTV. He has acquired a Wraase SC-1 and is busy sending out SSTV and fax signals on two metres. The best time to get him is between 7 and 9pm, particularly on Sunday and Monday evenings, though a phone call to 03543-3791 (after 2pm) will fix a schedule. His father G6SXB in nearby Wimblington is also involved in SSTV and in fact uses G3WW's old gear: it was Richard G3WW who got Andy going with slow-scan. Another local is Phil G0BDD in Ramsey St Mary, while on 70cm fast-scan you may catch G8JAN in Downham Market or G0CFD in Bourne.

From the other side of the water John Spaeth KD0LO (St Louis, USA) writes: "I have been spending the lion's share of my free time on the AMIGA. Quite addictive you know. The AVT slow scan program has kept me extremely entertained. There is much to master with this program, and just getting it up and running is formidable - never mind actually working all the available modes.

"My latest interest is monitoring the hidden carriers on the C and KU band satellites. There are many such hidden carriers and

of course my interest is with digital images such as facsimile. There is a ton of it up there and I refer to it as "The Band That Never Closes", quite a snappy name for a regular column don't you think? ... No, you may not use it because I might do just that for one of the rags.

"The fax images are extremely high resolution. Unfortunately I have not yet figured out how to print out those 1024 by 600 pictures out on my laser printer ... but I understand there is a way.

"Because I need to tune these hidden carriers, I also needed to have a general coverage receiver so I am also the proud owner of a new HF rig ... does it ever end? I am actually quite embarrassed about buying a new (used) HF rig since I am a die- hard UHF and MICROWAVE enthusiast, but after all it was only to facilitate me being able to receive images off the C and KU band satellites. Hi Hi.

Have also been working feverishly on some class A1 amplifiers for 439.250MHz. Trying to water cool a 2C39 to push it to the max and yet preserve linearity. Tried to build the popular German designs from Wiener (UHF Compendium, 1988) but these are strip line and do not like to be water cooled. So now I am in the process of designing a cavity for the tube on 400MHz. If only FM would catch on here ... class A amps would be where they belong...in the trash, hi."

Network expands

News from the East Kent ATV Network comes in from Roy G6OKB, who advises that their ambition in 1990 is to get everybody on the air with 24cm receive capability. To stimulate this, he has erected an attended personal TV beacon on 24cm, which is on the air from 1300 to 2200 daily from his Minster location. This Minster is on the Isle of Thanet, not the other Minster on the Isle of Sheppey, also in Kent! The beacon puts out a test pattern with the caption 'G6OKB BEACON. QSL 144.750' and Roy monitors the TV calling frequency in the shack. Power is 20 watts to an Alford slot antenna, 20 feet aloft and fed through second-hand Heliax cable.

One of the group, Brian G8ZYZ, has built a Wood & Douglas receiver which is used together with a 24cm dipole, a G8LES plate antenna and a Severnside ATV Group yagi aerial for mobile reception tests of Roy's beacon. Test results include P5 pictures at the Dover Bleriot memorial, P1 on the Western Heights and P5 at Great Mongeham. Roy says he is now building Trevor Brown's Teletron device and logic board for his beacon, which has acquired a new PSU. The old one blew up, passing 16V unregulated to the electronics. Now Roy uses - and recommends - the PSU over-voltage protection module made by G3ROO (Kanga Products); he has nothing but praise for this small business. You can have a catalogue by sending a SAE to Kanga Products, 3 Limes Road, Folkestone, Kent, CT19 4AU (tel: 0303-276171). A 10 per cent discount is offered to BATC members.

Four of the group recently took off from Manston aerodrome for a flight over east Kent in a Cessna aeroplane. It was a glorious Sunday morning and some excellent video recordings were made for showing on ATV.

Also in Kent, Andy Parnell or 'The SUY' as he is known to his friends, is wondering if anyone would like to help him build a TV repeater in mid-to-north Kent. He would be pleased to hear any words of support on Faversham 0795-531541. Sounds like a good idea to me, especially as a carefully sited repeater could serve Sheppey and parts of Essex as well as the Swale region.

GB3RT relocated

Not exactly hot news, I know, but perhaps I can remind you that GB3RT, the 23/24cm TV repeater has moved from Barby to a site near Coventry at the Tile Hill College of

Further Education. Hopefully this will now provide better coverage. A formal repeater group has been set up and new members will be welcomed with open arms by Mike Wooding G6IQM (Rugby 0788-890365).

Plans are afoot for a 10GHz TV repeater at Barby, for which the callsign GB3RV has been selected. More news as it happens (or six months later, whenever I can report it!).

North to Lancashire

"Having just read your article I decided to write in to you on news of ATV activity in this area. Before Christmas there was a revival of 70cm activity in the area after being dormant for a year or so. The following stations send television on 70cm: G6APK (Walney), G3YTI (Darwen) and me G3EKP (Belthorn)", writes Jim Whittle.

"But the most interesting news is of G4GVQ (Mellor, near Blackburn) who is now active on 24cm, I believe using a satellite RX for receive. I hope to join him shortly but storm damage to the house and antennas has curtailed my plans. Simon G4GVQ is looking for other contacts on 24cm in the area. I shall keep you informed of developments in Lancashire." Thanks Jim!

X-Band antics

The fine Spring weather encouraged some microwavers to bring out their portable 10GHz gear and try some outdoor TV contacts. Bob G8OZP, something of a veteran in this field, emerged on Monday 7th May to try out the path to George G4EUF some 50km away.

This was George's first real test of his gear and, fortunately, all went well. Both /P stations used 10mW gunn diode (burglar alarm) transmitters and 30" dishes; Bob's had a cassegrain feed, giving 34dB gain, while George employed the more conventional penny feed and achieved about 32dB. Bob was up in the Weaver Hills, 1000 feet above the Dove valley and saw G4EUF as P3; George's /P location was Warren Hill in north-west Leicestershire and received Bob P1.

It is worth noting that these are genuine QRP contacts and show the amazing potential of the 10GHz band. The transmitters are based on burglar alarm heads bought for £5 or so at rallies: a complete transmit and receive station can be built for well under £100.

This band is really going places, and cheap satellite receivers and solid state power amplifiers will make it even easier to achieve dramatic distances. Some people will even tell you that we should be using 10GHz for TV repeaters and reserving 23cm for the inter-repeater links. The arguments in favour of this are very strong, though too detailed to set out here.

Certainly, if we are to extend - and more important - interlink the repeater network, we really must start liaising and standardising our control protocols.

We must also avoid potential conflict with the packet movement, which also has eyes on substantial chunks of the 23cm band for interlinking. We have the potential to wipe out their (FSK) data links, while they could cause undesirable patterning on our (WB FM) pictures.

Far better then to co-ordinate our joint requirements and look for a mutually agreed solution.

The Welsh Connection

With another tale of the Boys from the Blackwood, Eric Edwards GW8LLJ sends us another welcome letter (are we G8's now an endangered species?!?). He reports as follows.

"It was Easter Friday afternoon when I loaded the SSTV converter, a portable VHS camera and 12 volt 625-line monitor into the car. I had previously contacted the Blackwood ATV'ers earlier in the week, stating that I would be SSTV mobile Friday evening. That's right, mobile SSTV!

You could hear the echoes of laughter throughout the Welsh valleys. Not put off, I carried out my plan.

"My SSTV gear consists of a G3WCY/ G4ENA SSTV to FSTV receive converter and a separate FSTV to SSTV converter. They are switchable mains/battery using Ni-Cads to supply the negative and positive rails. A couple of constant current chargers were built using the well-known 723 devices.

"All set, I proceeded to my destination when the camera fell off the parcel shelf (I don't know why they call it that, nothing ever stays on it!). So back to the shack to find something to jam somewhere to support the camera. Armed with a length of chipboard (well, where can you get real tree-wood from these days?) and insulating tape, I once again set off on my journey, calling and listening on their club frequency. Soon Peter GW4EAI answered, joined by Ces (Cecil) GW8MTJ whom some of you may remember as GW3OAJ/T alias GW6OAJ/T. Those were the days. However, they called me and suggested I try the SSTV. I had to pull into a lay- by to set up the pictures.

"The monitor sees sampled 625 line pictures from the camera and continuously digitises pictures to enable setting up levels, etc. Confirmation of pictures received by both stations on 144.500MHZ allowed me to carry on my 25 mile drive from Barry in South Glamorgan to Blackwood in Gwent. Leaving the Motorway, then entering a dual carriageway and through winding valley roads provided interesting video.

Peter and Ces could see their TV scanning a frame with a shot of a car immediately in front of me. The next frame would show a similar road shot with no car in front (each frame had a time lapse of eight seconds).

"The event was recorded and I saw an action replay later. Considering the mountainous terrain over a 25 mile path, they only lost me on two occasions. That exercise could not have been repeated with FST on 70cm given the same conditions and anyway, the viewers would have become giddy!

This test has prompted me to operate portable SSTV. So, with decent weather I will probably be active on two metres. I am geared up only for 8 second field scan, and if I were to modify my equipment in any way it would be to improve detail at 8 seconds. Mobile SSTV may not be the ultimate but it is different!

SIGNOFF

Once gain that's all for this time. Please let me have all your reports in good time for the next article and send them to 71 Falcutt Way, Northampton, NN2 8PH. Thanks.

ATV CALLING: 144.750

SSTV CALLING: 144.500

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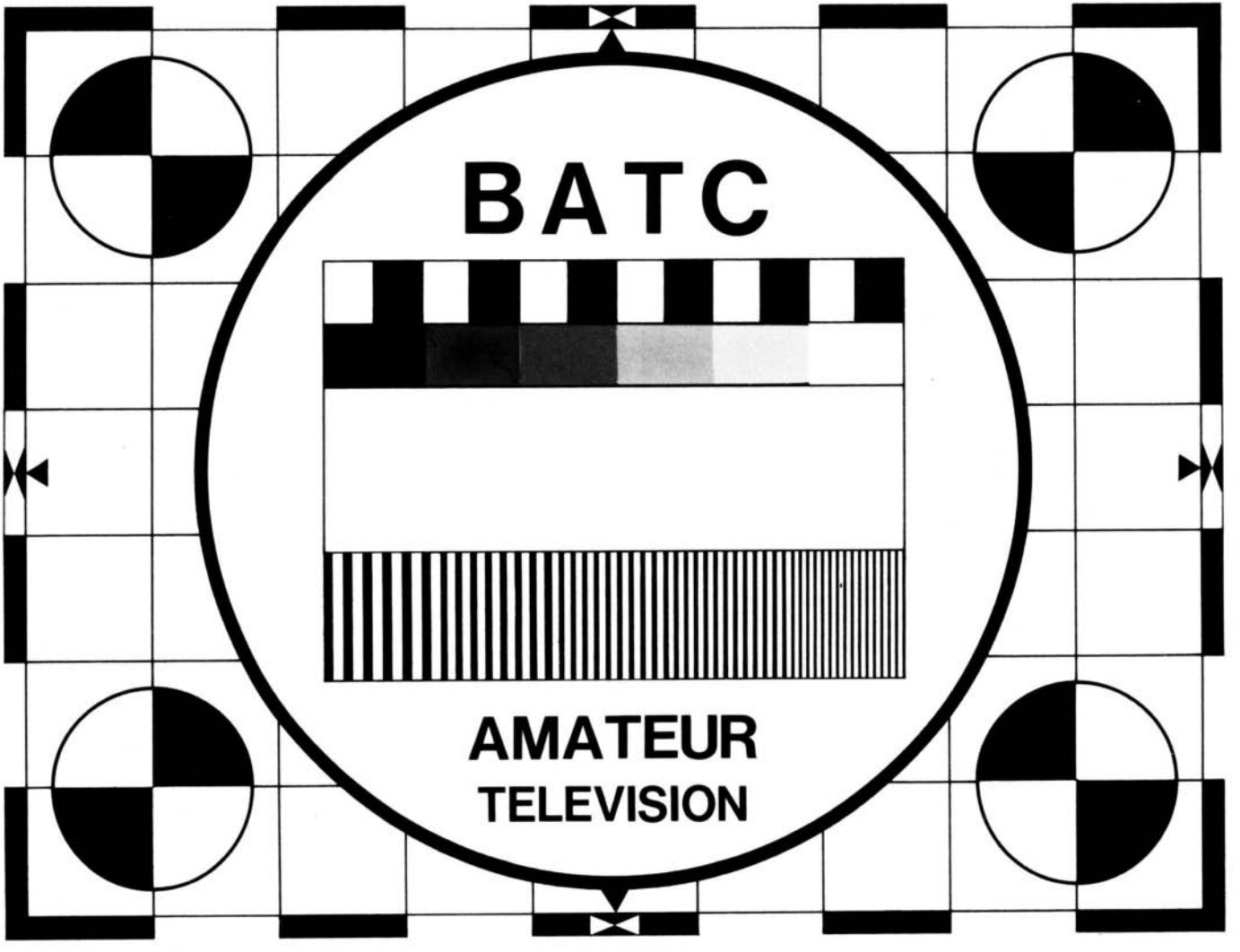
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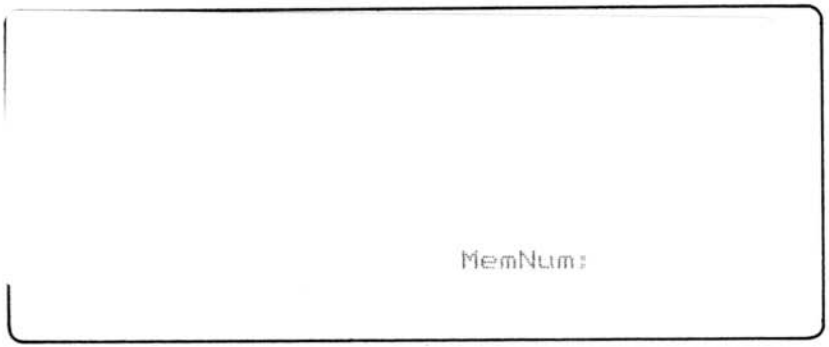

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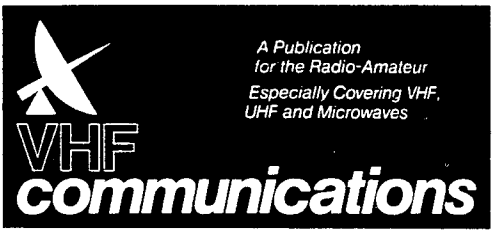
3CM ATV WORKING - 10.250GHz

3CM REPEATER O/P - 10.150GHz



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COLOUR CORRECTION

Part–3

John Goode

This part of the series describes a processing amplifier that I have recently constructed for use with PAL output cameras. As the cameras in question are normally genlocked to a master SPG, the pulses and subcarrier used in this unit are also derived from this SPG. However, it should not be too difficult to devise circuits to derive pulses and subcarrier from incoming video, giving a 'stand alone' unit – suitable circuits have been published in CQ–TV in the past.

Although the processing amplifier to be described conforms to the principles described in parts–1 and 2 of this series, there is a difference in the method of controlling the saturation from the simple circuit described in part–1. It must be emphasised that the principle of saturation control by phase addition and cancellation still applies. However, instead of feeding the separated chrominance to the saturation control, a 1495 linear multiplier IC is used as a voltage controlled gain stage. As well as giving superior performance, this also allows the burst to be gated through without level change (regardless of the saturation setting) and added to the output signal, as the re–blanking in the processing amplifier removes the original burst.

The linear multiplier works as follows: Separated chrominance is fed to its input (pin–9). The gain of the IC is determined by the voltage in the control port (pin–4). If pin–4 is at 0.7V the gain of the system (1495 +592, see Fig.2) is unity; reducing the control voltage gradually to zero will reduce the gain proportionally to zero. Now here's the clever bit! – If the control voltage continues to reduce beyond zero to –0.7V, the output chrominance signal builds up again, but with the subcarrier phase reversed! This is exactly what is required for adding or subtracting chrominance from the composite colour signal.

In Fig.1 I have shown how the control voltage for the 1495 is derived from the burst–gate and mixed–blanking signals. The burst–gate pulse does not vary, and gates the separated burst through with the same phase and amplitude at all times. However, the blanking pulse is clamped to zero volts, and the part of it representing active line–time is made to vary from +0.7 to –0.7V by means of the saturation control. See Fig.1e, f and g.

CIRCUIT DESCRIPTION

The circuit of the processing amplifier is shown in Fig.2. PAL video passes through Q1 to the gain control; the correction feed of chrominance is extracted from Q1 emitter circuit. VR1, the gain control, is dual–ganged, so that the control voltage for IC1 (1495) tracks video level. If this is not done any correction applied would change if the gain control were altered.

Returning to the main chain, the PAL video is amplified by Q2 and Q3, and clamped by Q4. Q5 and Q6 provide a black–clip function with a low output impedance for feeding the blanking stage Q7 and Q8, which removes the original sync and burst. Q9 stage removes the chrominance signal, and provides a non–composite luminance output for the colour correction modulator (IC7 Fig.3).

After passing through preset gain and HF

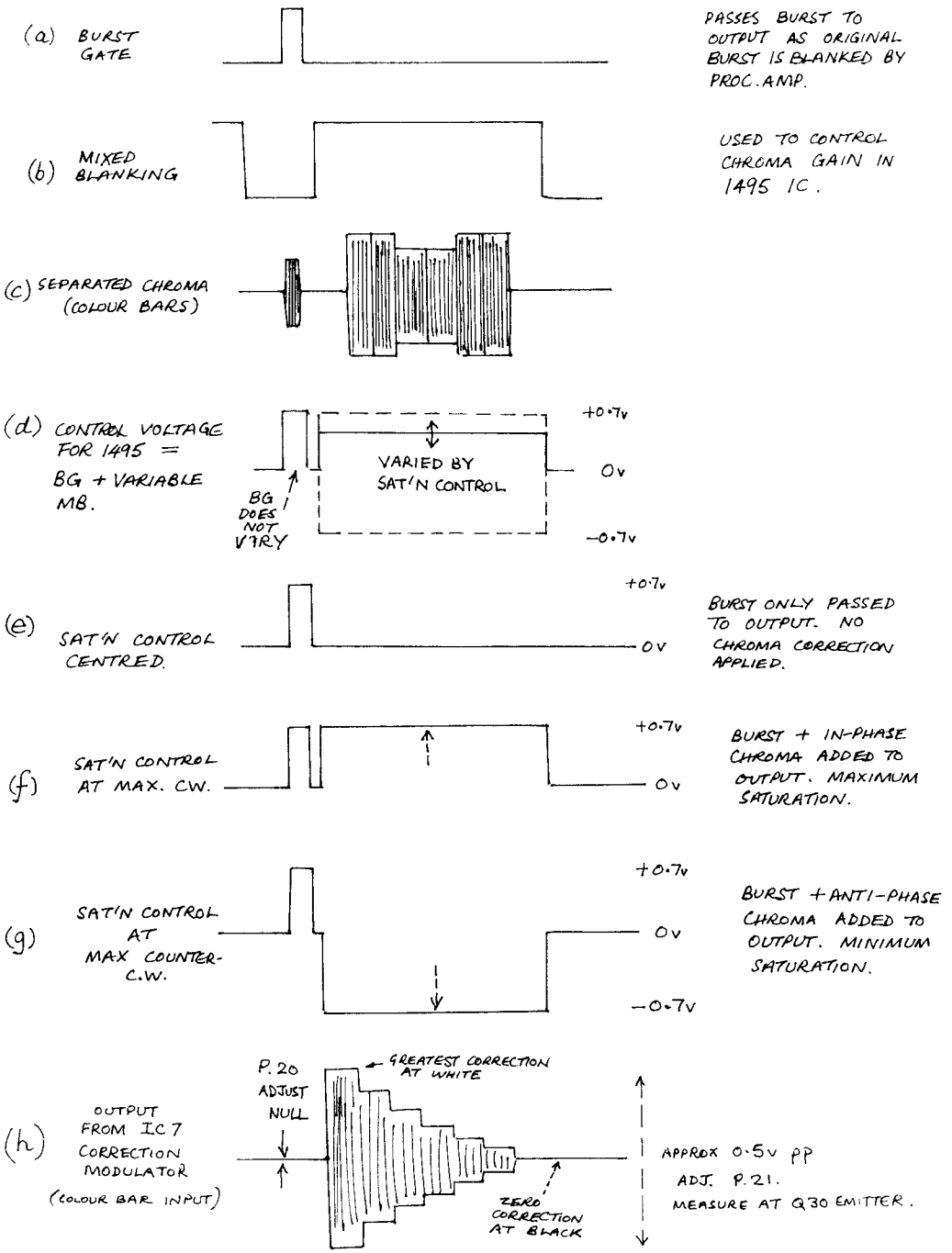


Fig.1 Method of Saturation Control

stages (P3 and P4) the signal has sync, burst and any required correction added at Q10 emitter. Q11 and Q12 form an output amplifier that can drive up to two 75-ohm loads.

Q14 in the chrominance side-chain buffers the tank circuit in Q1 emitter, and P8 gives phase adjustment for setting-up the saturation control. IC1 (1495) has differential outputs that are fed to IC2 (592) to give overall g ain setting (P11). The coarse phase link (IC2 outputs) is used if necessary to phase the re-inserting burst.

The control voltage for IC1 is built up as follows: Mixed blanking from the SPG is buffered by Q13 and passed through VR1B to IC3 (TL082, but virtually any dual op-amp will do). This provides antiphased blanking signals that are fed to opposite ends of the saturation control (VR2). The output from the slider of the saturation control is then fed to Q17, where a positive-going burst-gate pulse is added. The composite signal is then clamped to ground by Q18, and fed to pin-4 of IC1.

COLOUR CORRECTION CIRCUIT

The circuit of the colour correction unit is shown in Fig.3. This part of the unit is provided to allow white-balance correction of the signal. It consists of a phasing circuit, a colour vector generator and a correction modulator.

Referring to Fig.3; SPG subcarrier is applied to a phasing circuit consisting of Q1 and Q2, which slice the subcarrier and amplify it to TTL level. The signal can then be delayed by up to 270ns (1 cycle at 4.43MHz) by means of the dual monostable IC4. The signal is then filtered back to a sinewave and buffered by Q23. The RC networks feeding Q24 and Q25 then split the subcarrier into the 'V' (Q24) and 'U' (Q25) vectors. IC5 (1445) is controlled by the SPG PAL squarewave (PS), and is used to alternate the V subcarrier vector, whilst IC6 (592) amplifies the U vector. Both IC5 and IC6 provide differential outputs, that are fed to opposite ends of the respective colour controls - VR4 for the V signal (red/green axis), and VR5 for the U signal (blue/yellow axis). With both controls centred no correction signal should result.

The outputs from VR4 and VR5 sliders are summed at Q28 emitter, and then fed to IC7, the correction modulator. This modulates the correction chrominance with a non-composite luminance signal, giving proper white-balance adjustment (as described in part-2 of this series). Q30 buffers IC7 output, and feeds the correction signal to the processing amplifier at Q10 emitter via the correction on/off switch.

POWER SUPPLY

A suitable power supply is shown in Fig.4, using three-terminal regulators. It is entirely conventional apart from using 5 volt regulators for the 9 volt supplies. Note that as the positive regulator is 'sitting' on 4 volts it must be insulated from the chassis.

SETTING-UP

The two prototypes built so far were set up using a vectorscope, and since the action of the unit hinges upon adding correction vectors to the colour signal, this is the only way to guarantee complete accuracy. Nevertheless, I realise that such an instrument is not generally available to Club members, and so I will attempt to give a line-up procedure using an oscilloscope and a picture monitor only.

1) Lift the +9V, +12V and -9V connections from the power supply. Power up and check for correct voltages. If OK switch off, and reconnect to main circuit. Recheck voltages with the connections restored.

2) With no input and power on, connect a multimeter to the video out and adjust P5

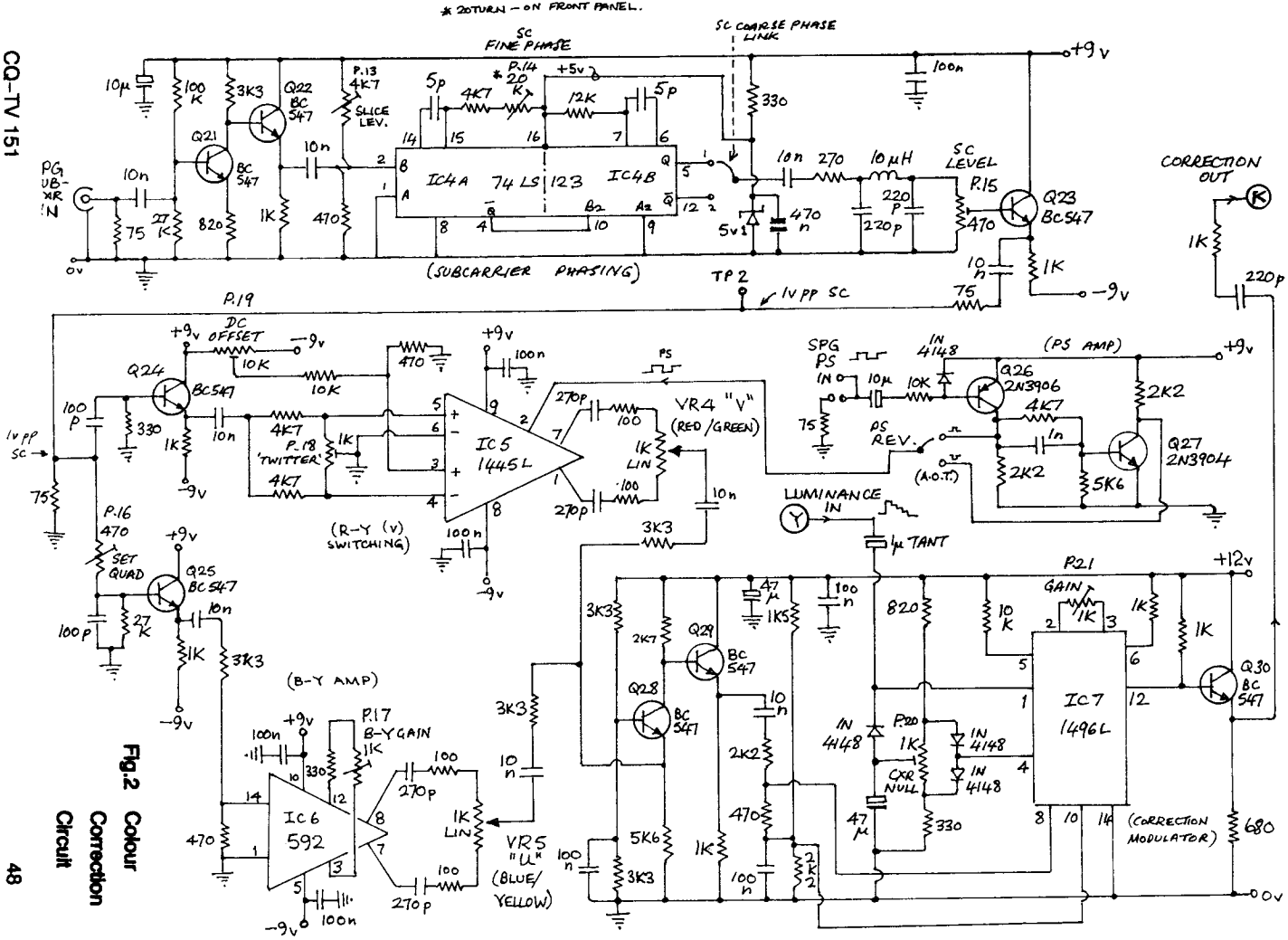


Fig.2 Colour Correction Circuit

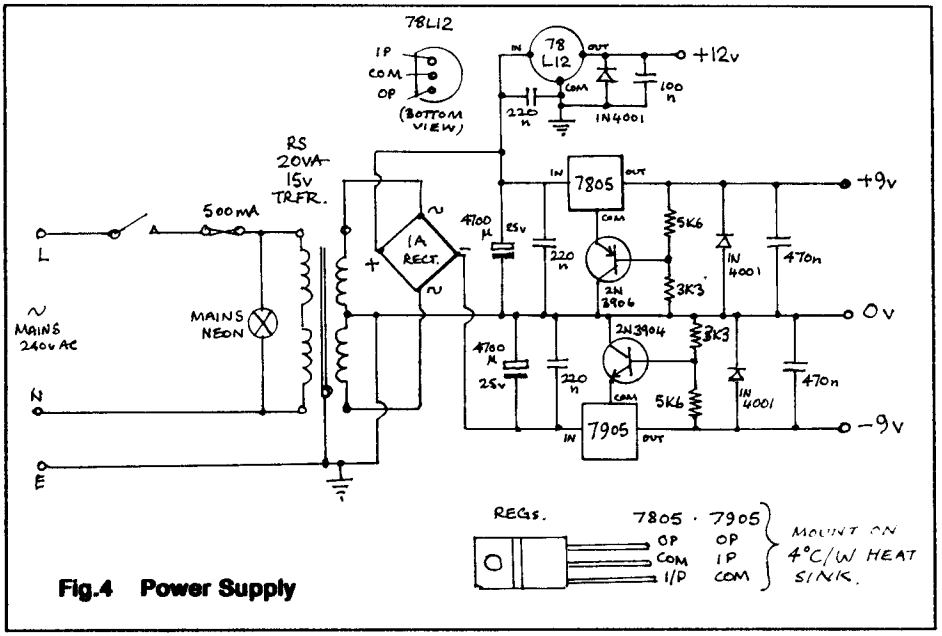


Fig.4 Power Supply

to give zero volts DC. Connect 1V peak-to-peak (p-p) colour bars to the main input. remove the test link (IC2 output) and open the correction switch. Connect SPG pulses to the unit and 'scope the output terminated with 75-ohms. Set VR1 and VR3 to centre positions. The signal should be colour bars, but without a colour burst. Now adjust the following pre-sets:

P2 to maximum resistance
P6 to set sync to 0.3 volts
P1 to set black level nominal (no pedestal)
P3 to set white bar to +0.7 volts with reference to black level
P4 to set amplitude of chroma to equal that of the input signal
P2 to clip just negative to the lowest excursion of the blue bar.

3) Now the chrominance side-chain. First it is necessary to set up the IC1 control waveform. 'Scope TP1 (Q13) and set the blanking pulse to 1.4V p-p using P7. With VR1 centred, check that equal and opposite pulses appear at each end of VR2. Now 'scope Q18 collector and check for the presence of the burst gate pulse. (The pulses at this point will be somewhat rounded due to the action of the 10nF capacitor on pin-4 of IC1). Adjust VR2 so that the control pulse is at its most positive (as Fig.1f), and then adjust P12 to make the burst pulse of equal amplitude. Now operate VR2 to check the action of the control pulse (Fig.1f and g). Use the 'scope in DC-coupled mode to check that the control signal is clamped to approximately zero volts, as shown in Fig.1. If all is well re-centre VR2 so that the control signal is as Fig.1e.

4) Move the 'scope to the test link at the output of IC2 (still disconnected). Trigger the 'scope from MS. The output shown on the 'scope should be of colour burst only, but will probably consist of spurious subcarrier. Adjust P10 and this should null the subcarrier, just leaving the burst. The burst may have a DC offset, adjust this out with P9. Now try adjusting VR2; chrominance should appear as it moves off its centre position. Return VR2 to the centre position ready fro the next stage.

5) Re-connect the test link and connect

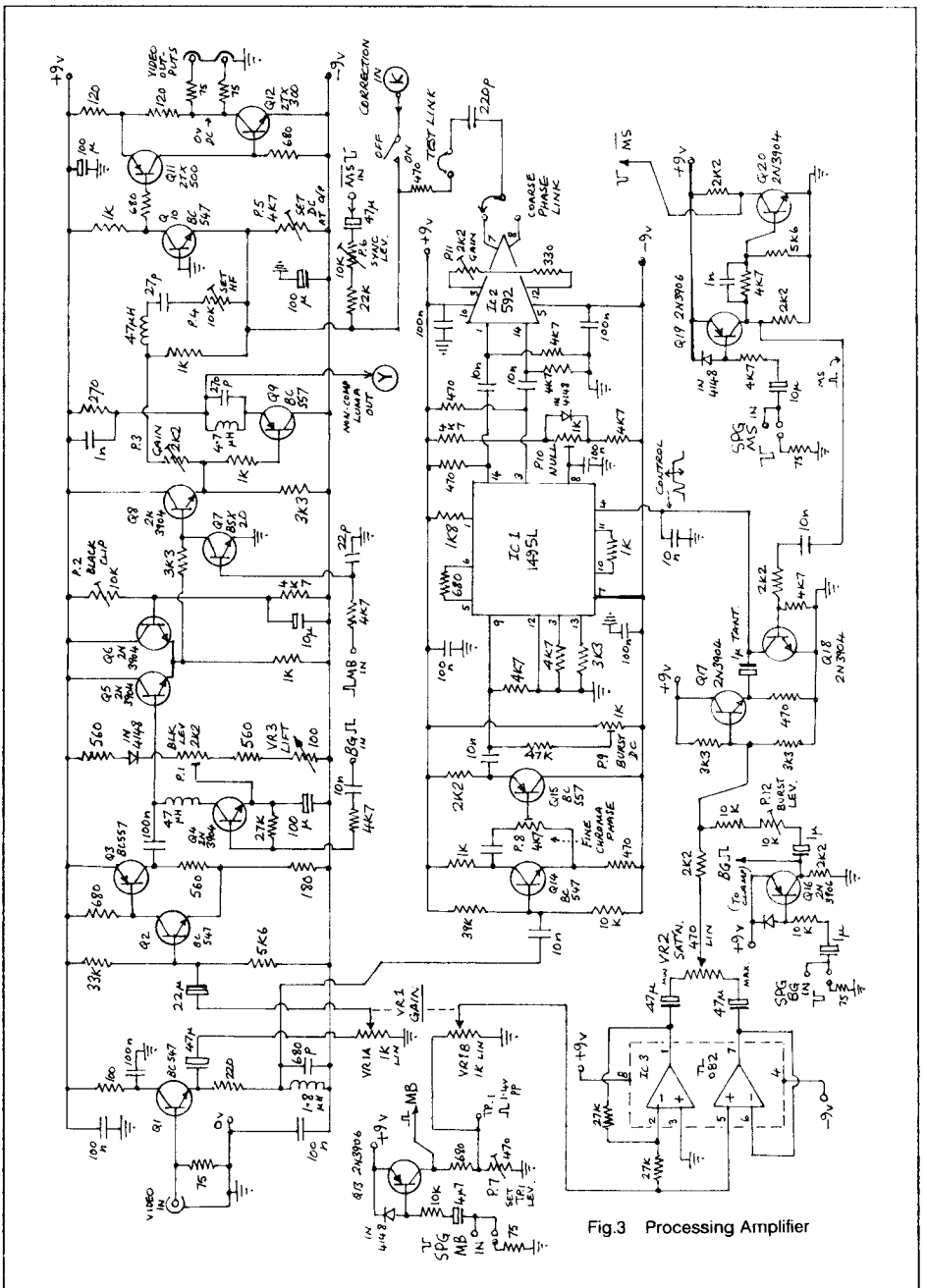


Fig.3 Processing Amplifier

the 'scope, a monitor (and a vectorscope if available) to video out. The output signal should now have a colour burst. Observe the bars on the monitor, and if the colour sequence is wrong change the course phase link at IC2 output. Now adjust P8 (fine phase) for maximum colour saturation – if a vectorscope is available adjust for correct phase between bars and burst using the graticule. Now operate VR2 and variation of the saturation should occur. With VR2 set to minimum use P11 to minimise saturation – it should be possible to make it adjustable from almost monochrome to double normal.

Without a vectorscope it may be necessary to fiddle with P8 and P11 several times, in order to get it right. When you are happy that it IS right trim the burst level to that of the input signal (nominally 0.3V p–p) using P12.

SETTING UP THE COLOUR CORRECTION

6) Connect subcarrier to the input and connect the oscilloscope to TP2, with it triggered from MS. If no subcarrier is present adjust P13 until it does appear. Now set its amplitude to 1V p–p using P15. Set P16 to its central position. Now use the 'scope to make sure that a 0V to +9V PS signal is present at pin–2 of IC5 (1445). Transfer the 'scope to the slider of VR4 and turn the potentiometer to maximum clockwise. Line–alternating subcarrier should be present. Use P18 and P19 to minimise line–by–line 'twitter' (amplitude and DC offset variations).

Now turn VR4 completely counter–clockwise and repeat the last adjustment. A compromise setting will be found that gives minimum 'twitter' over the complete range of VR4. Note the maximum amplitude of this signal (V) and transfer the 'scope to VR5 slider, set to maximum clockwise. Adjust P17 so that the maximum amplitude of the U signal equals that of the V signal.

7) Use the 'scope connected to Q29 emitter to confirm that the U and V signals are combined when VR4 and VR5 are moved off centre. Next, centre VR4 and advance VR5 to maximum clockwise. Move the 'scope probe to Q30 emitter. With colour bars as the input IC7 should produce an output as shown in Fig.1h. P20 should be used to adjust for subcarrier null during the blanking period (and the black bar), and P21 to adjust the overall amplitude to about 0.5V p–p. This determines the amount of correction available, and may be varied if required.

8) Finally, the subcarrier phase adjustment. Remove the colour bar signal from the input and replace it with a black–and–burst signal. Connect a 'scope and monitor (and vectorscope if available) to the video output.

Advance the 'lift' control (VR3) to give a pedestal of about 0.5V and switch the correction switch to on. Turn the V control (VR4) to maximum clockwise and observe the monitor; the screen should turn to a slightly magenta–ish red. If it turns green reverse the 'SC course phase link' at the output of IC4. Now adjust P14 for maximum saturation on the monitor. If using a vectorscope adjust P14 until the correction vectors lay on the V axis, having first lined the graticule up with the burst.

Next, centre VR4 and advance VR5 (U) clockwise. The screen should then turn blue; if it turns yellow the 'PS REV link' by Q26 should be changed. When this is done it may then be found necessary to change the course phase link back. It is not possible to predict the relative settings for these links, but one of the four combinations will give correct operation of the U and V controls. If a vectorscope is available operation of the V and U controls should cause the vectors to move along their respective axes; P16 can then be used to trim the quadrature of the vectors. Lastly, return the 'lift' control to its centre position and the line–up is complete.

LOGIC CIRCUITS

Part-6

John Wood G3YQC

STANDARD PULSE INPUT AND OUTPUT CIRCUITRY, A BEAM SWITCH FOR OSCILLOSCOPES AND PUSH-BUTTON MEMORY CIRCUITS.

STANDARD SPG PULSES

Outputs

Nearly all television equipment has to drive, or is driven by, other equipment by means of standard pulses. These are the usual Line Drive, Field Drive, Mixed Blanking, Composite Syncs and, in the case of colour, Burst Gate and Line Ident. (the latter two being sometimes known as Burst Flag, Y-axis switch, PAL switch etc.)

In the U.K., and many other countries also, these pulses have been standardised at 2-volts peak-to-peak negative-going into 75-ohms, so as to feed co-axial cables. This is very convenient as far as TTL ICs are concerned because a 75-ohm source, when not terminated, produces 4-volts - and so does a TTL gate. Theoretically then, a TTL gate can have 75-ohms hung on it to give 2v pulses, but in practice this is not so because the DC conditions of the IC are upset. It is, however, possible to overcome the problem to some extent. Fig.1 shows a

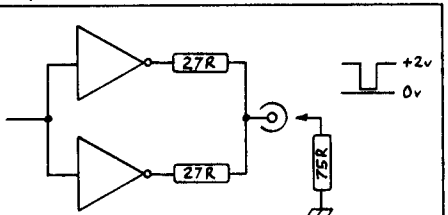


Fig.1 75-ohm Outputs - DC coupled

suitable solution and this has been used in the BATC SPG system described in CQ-TV 75.

The problem with this method is that two gates are necessary and the output is always above earth. If a series capacitor were included then the DC would be removed and so would the excessive loading on the gate. This system does in fact work quite well and Fig.2 shows how it is achieved. Values for C and R are given in Table-1.

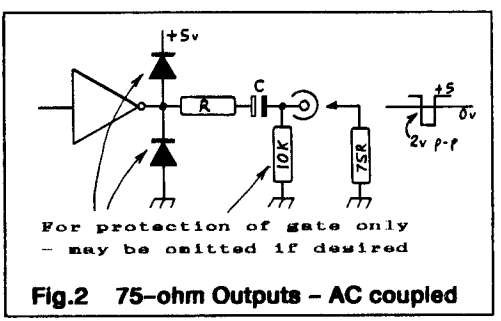


Fig.2 75-ohm Outputs - AC coupled

A series resistor is necessary because the output impedance of the gate is less than 75-ohms and thus the source impedance is made up to 75-ohms. Unfortunately, the gate is still upset to some extent by having such a low resistance to drive and the value of the resistance depends on the type of pulse and its polarity.

The DC-blocking capacitor value is determined by the amount of tilt allowable in the waveform at the load and Table-1 gives capacitor values for a 1% tilt. It will be seen that the amount of standing DC also depends upon the type of pulse.

The capacitors are rather large for the longer duration pulses as may be expected

Table 1 75-Ohm outputs - values of R and C for 1% tilt on longest part of pulse

625 pulse	longest pulse uS	series R ohms	minimum C uF	standing d.c. mV
L.D.	6.5	43 or 39	6.8	+205
F.D.	480	47	330	+55
M.Bl.	1600	24 or 22	2000	+565
C.Sy.	27.3	47	100	+150
B.G.	2.25	47	2.2	+40
L.I.	64	nil	47	+975

(Output on Line Ident is only 1.95 Volts)

Table 2 75-Ohm outputs - values of C to give clean output pulses

625 pulse	C 2v pulses	C 1v pulses	Max C necessary
L.D.	10nF	22nF	220nF
F.D.	470nF	1uF	6.8uF
M.Bl.	32uF	68uF	150uF
C.Sy.	100nF	220nF	1uF
B.G.	6.8nF	10nF	100nF
L.I.	470nF	1uF	2.2uF

(Input resistor for Line Ident 1.8k not 10k)

as the circuit is of course our old friend the differentiator. For amateur use, therefore, the larger values can be reduced to something more convenient without undue effect - unless the following units do not clip the pulses!

Inputs

External pulses have also been mentioned before and chief amongst these are the standard SPG pulses. The circuit of Fig.4 shows the input arrangement necessary to accept standard pulses and Table-2 gives the value of C for normal and reduced (double-terminated) input levels.

The 10k resistor sets the input bias for the IC to make the input normally high in order to accept negative-going pulses. The value of C depends on the amount of tilt that can be tolerated (see Fig.5). Excessive tilt causes the gate to turn off too soon and high frequency oscillations may

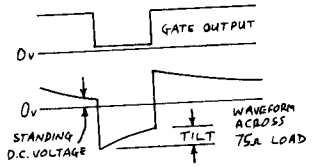


Fig.3 Tilt

occur during the mid-point of biassing towards the end of the pulses.

Table-2 gives also the maximum value of C that it is necessary to use to avoid any oscillations. Normally the output signal can be reduced to about one quarter of the normal pulses before such oscillations occur.

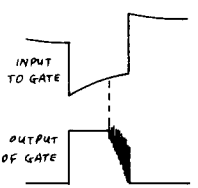


Fig.5 Oscillations in Pulses due to Tilt

Too large a value of C is expensive, but it should be remembered that if an input arrangement as shown comes after a TTL output stage, also having a capacitor, then the two amounts of tilt will add. In general, then, the biggest possible capacitors should be used.

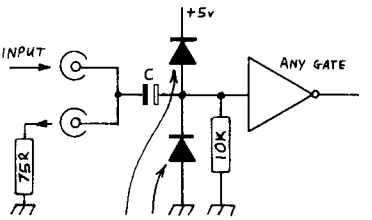


Fig.4 75-ohm Inputs

Outputs using two gates

Two gates in parallel to drive a 75-ohm load are better than one gate alone - for the ICs anyway - the DC conditions are less severe. When a series capacitor is used, then the values of the series resistors become higher than when no capacitor is present. This is because the DC loading is different. We have just seen this for the single-gate output stage, but when two gates are used for standard pulses the values of the resistors remain constant for each type of pulse. (With the exception of Line Ident which, because it is a square wave, is more demanding). Fig.6 gives all the details for two-gate outputs.

SIMPLE DIGITAL BEAM SWITCH

The problem of comparing several digital pulses for relative timing is forever occuring in IC work, especially in television and in particular when SPG pulses are being investigated. The following circuit (Fig.6a) provides a simple method of displaying up to four

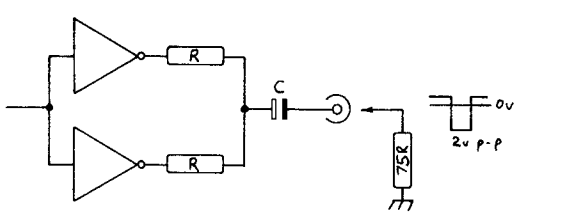


Fig.6 75-ohm Outputs - AC Coupled - Doubled ended

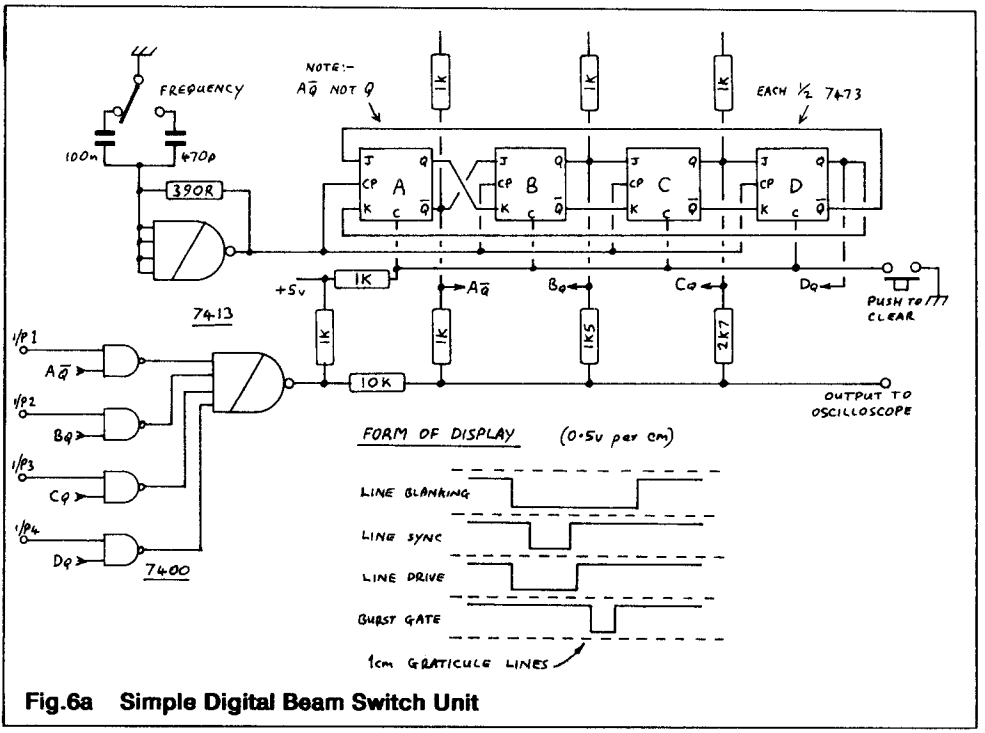


Fig.6a Simple Digital Beam Switch Unit

digital waveforms simultaneously on any oscilloscope – digital only, because digital IC gates are used for ease of construction.

The principle is to rapidly switch between the four signals and at the same time to add a particular amount of DC voltage to each of the signals. This DC is in effect a Y shift voltage to separate the four traces.

The four input signals are selected by means of two-input NAND-gates and collected together in a four-input NAND-gate. The selection pulse comes from a ring counter (or shift register). This is arranged to provide a high output from only one bistable at a time. by means of the clearing and cross-coupling arrangement. When the bistables are cleared they are ALL made Q-low but the cross-coupling ensures that the $\overline{Q}$-output 'high' is fed round the rest of the bistables as a 'high' – one at a time. This provides the circulating selection pulse. The system has to be first cleared otherwise the waveform fed round depends upon what was in the bistables. A push-button provides the simplest way of ensuring that the system is cleared properly.

The repetition frequency must not be locked in any way to the input signals and so a free-running oscillator is used to provide the clock pulses for the ring counter. Its frequency is not critical but is usually about 10KHz. A choice of frequency enables any pulse frequency to be viewed without trouble.

Four different DC levels are obtained from the ring counter by means of the 1k, 1.5k and 2.7k resistors to the output point. Note that the $\overline{Q}$ feed of 'A' is used and the Q feeds of 'B' and 'C'. Bistable 'D' is not used and so its DC is zero. The selected pulse also goes to the output point via a

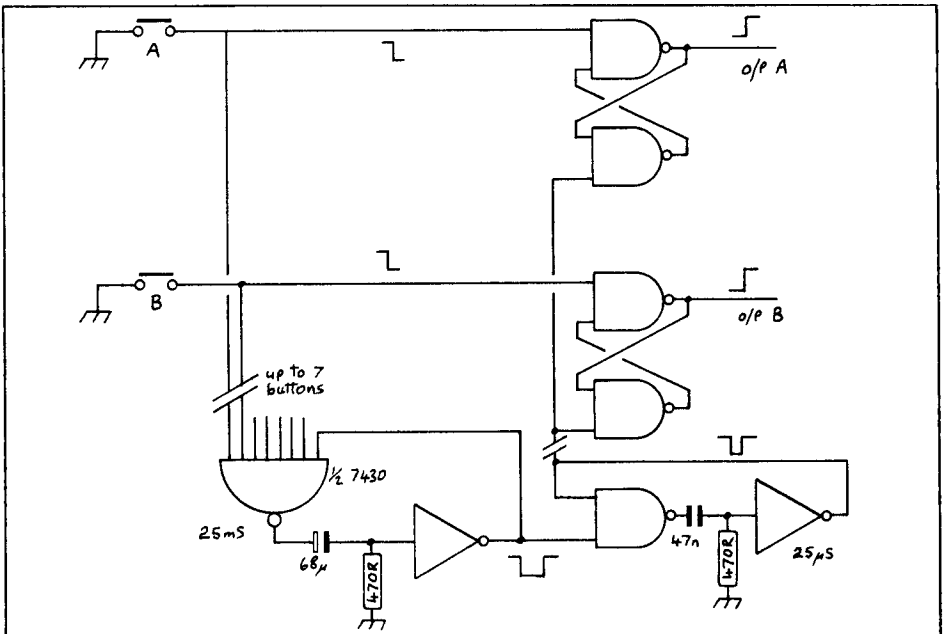


Fig.7 Simple Latching Push-button Memory

10k resistor which makes its level at the output smaller than the steps between the DC levels. Pull-up resistors of around 1k are fitted to the outputs of these feeds to ensure flat DC levels.

The output waveform fits between four adjacent 1cm graticule lines when the input sensitivity of the 'scope is 0.5v per cm. Number one input is at the top and so on down to number four.

The oscilloscope must be triggered from an input source – not the oscillator. Note that because the output signal levels are much lower than the normal logic levels it is especially important to decouple the circuitry properly in order to minimise spikes and rings. It should also be borne in mind that the output pulse shapes do not necessarily represent the input shapes because of the amplitude limiting of the gates, although the durations should not be affected to any great extent.

PUSH-BUTTON MEMORY CIRCUITS

Mechanically latching push-buttons are falling out of fashion these days in television. Instead, electronic memory systems are being used. There are many ways in which the selection of a push-button can be memorised and one of them is by means of digital integrated circuitry. The following pieces of circuitry show some simple means for doing the job.

One problem with normal push-buttons is

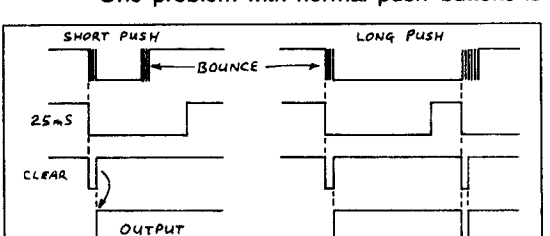


Fig.8 Waveforms for Fig.7

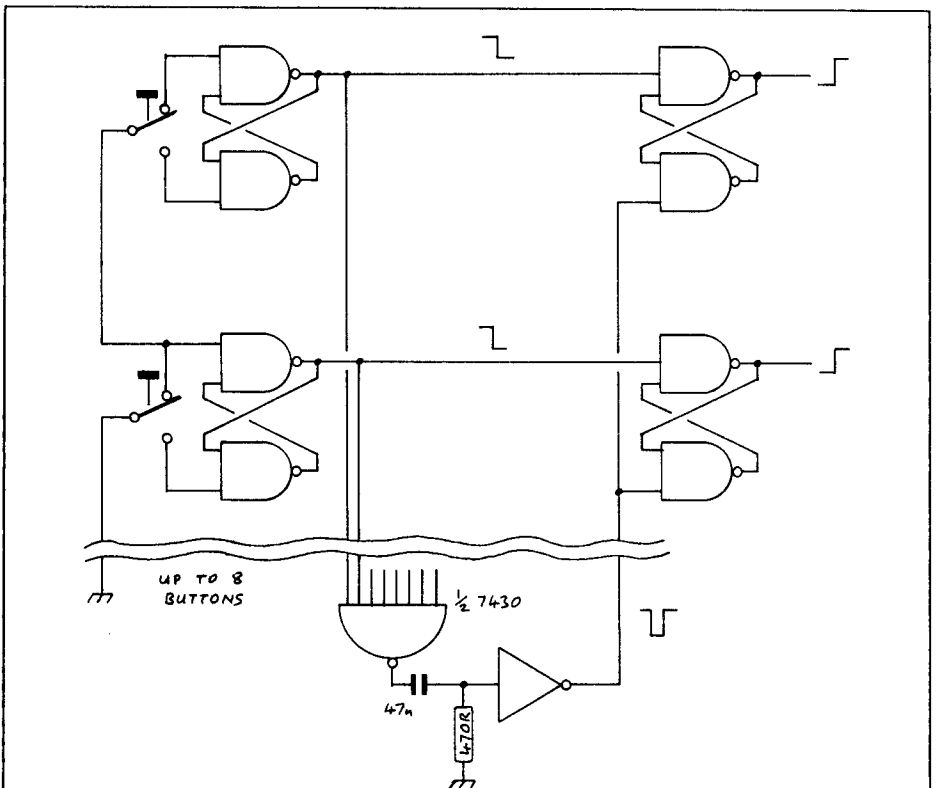


Fig.9 Spike-free Memory System

that the contacts 'bounce'; that is, they make and break several times in rapid succession for both making and breaking actions of the switch.

In the first system shown in Fig.7 the bounce is overcome by the use of a monostable which produces a 25mS pulse from the first of the bounce pulses and thus covers-up the rest. Any one of the push-buttons starts this monostable. It also sets an R-S bistable, but whilst it does so, the leading edge of the 25mS pulse is used to clear ALL the R-S bistables via a 25uS monostable. The input due to the pushing of the button lasts longer than this clearing pulse and so just one of the bistables remains set - the selected one. The time periods involved are not critical and represents a compromise between a spikey output signal and a long period between pushes. Both outputs from each bistable have these spikes. There is also another advantage with this simple system and this is that more than one button can be pressed at one time and can result in more than one output at once.

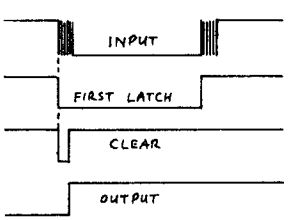


Fig.10 Waveforms for Fig.9

Fig.9 shows a version without output

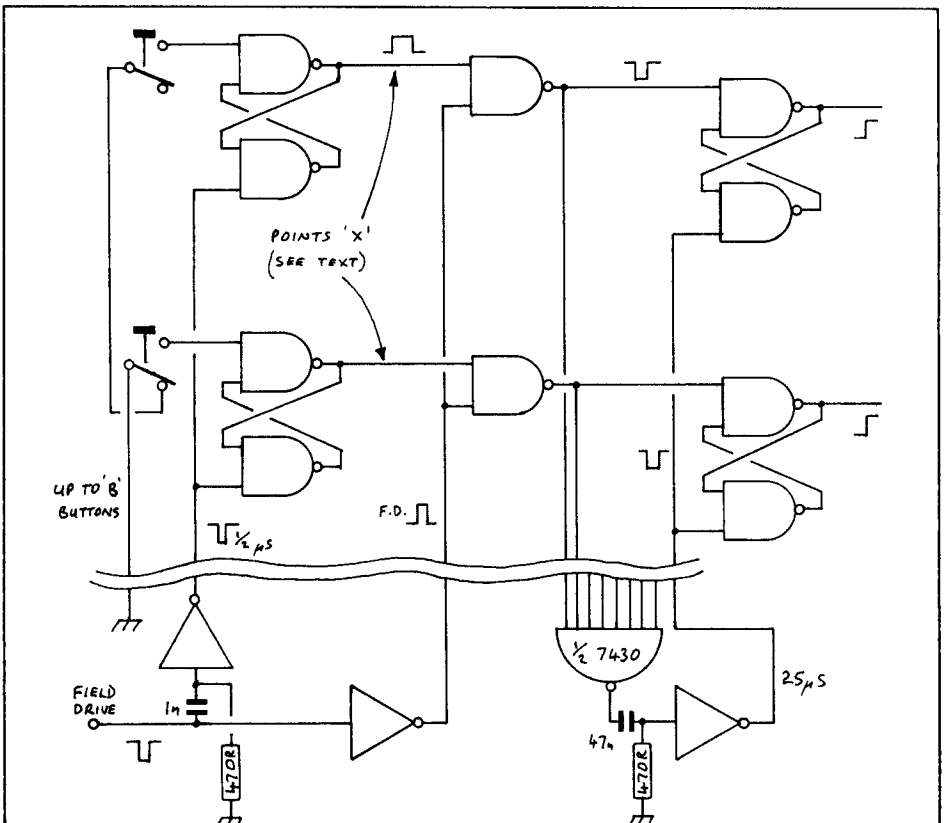


Fig.11 Switching During Field Blanking Time

spikes. In this, the input signals are taken from R-S bistables run from change-over push-buttons. These are set and reset by the first bounce and do not respond to further pulses to their inputs once set or reset. The 25mS monostable is no longer required.

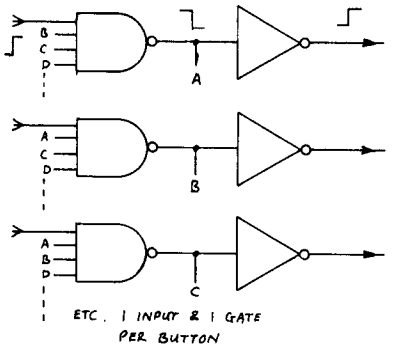
Vision mixing equipment goes a step further with the switching of video, in that the switching time is arranged to always occur during the field blanking time, so as to reduce the visible effects of a video cut. This is relatively easy to do with ICs as Fig.11 shows.

The buttons are linked to prevent more than one output being selected at once and every button triggers an R-S bistable. The reset input of each of these bistables is fed with the trailing-edge of Field Drive. The output of each bistable thus never exceeds one field in duration and always ceases with a Field Drive pulse trailing edge. A two-input NAND-gate follows each bistable and one of the two inputs is Field Drive complete and positive-going. Thus for one button pressed, ONE of these gates provides a negative-going Field Drive pulse which triggers both a 25uS monostable and another R-S bistable. This part of the system is then as shown in Figs 7 and 8. The output signals change with the leading-edge of Field Drive.

Fig.12 shows an electrical method of providing an interlock. It is intended to fit in the circuit of Fig.11 at the points 'x'.

The action is very simple. Initially each gate input is low and all the cross-coupled outputs are high because each gate output is high. The first input to go high causes that gate's output to go low and since every gate is connected to every other gate, all the others remain high and cannot be made low. An inverter is then required to get the necessary polarity.

Incidentally, this circuit forms the basis of a panel game priority selection system - the first to press the button wins and locks out his opponents.



Fig,12 Interlock Using Gates

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MODIFICATIONS TO THE ROBOT 1200C ANALOGUE PANEL

Robert Scarfe G4TUK

GENERAL REMARKS

The analogue panel in the Robot 1200C SSTV converter is a compromise design to enable Robot to sell the unit in all countries, but was mainly an NTSC unit. PAL was a secondary consideration and only simple PAL was ever incorporated. Whenever a station from a PAL area has been worked, hanover blinds on the chrominancewas always observed to a varying degree, so I looked into the possibility of adding a delay line to cure the problem.

The main problem was lack of space as the analogue panel sits on spacers above the digital one, with only about one inch spacing, so fitting the delay line with it hanging down under the print was not desirable.

Also, siting it above would cause problems fitting the lid back on. So, if a delay line was to be fitted it would have to be small.

MATERIALS

On digging about in the scrap TV panels that I keep, I found a Ferguson TX10 signals panel which had a Philips DL700 with a pair of matching coils. It seemed a good one to use, particularly as many of these sets and the sister TX9 are now on the second-hand market, some very cheaply because they have low emission crt's, and the signals panel is often advertised by surplus companies.

FITTING THE DELAY LINE

The only place for the delay line to go is on the front left-hand side, but first the crystal has to be moved: remove it then lift R27 and drill a small hole in the middle of the resistor symbol. (Always when making holes check the under-side for print tracks). Place the crystal in the hole vacated by R27 nearest to the front of the panel; join it to a new 680-ohm and push though the new hole. Attach the other end of the resistor to the R27 hole nearest the

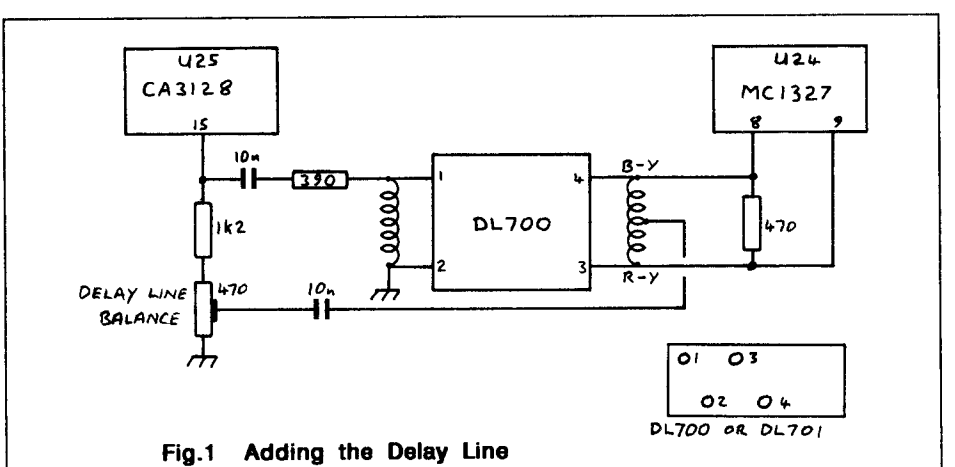

Fig.1 Adding the Delay Line

rear of the panel. Remove C20 and fit on the under-side of the panel, which will have a small clear area between the trimmer and the front edge.

Glue the delay line to the front edge near the area that has been cleared, but make sure that the legs do not short to the top earth plain, and leave to dry.

Next fit the centre tap coil by bending out the legs using the crystal strap holes in the panel. Leave the centre tap pin hanging over the edge of the panel. The input coil will fit next to it and use the C20 earth end hole and the the crystal hole. Now cut the tracks to the original crystal holes and place a small jumper from the trimmer to the crystal, which is now in R27 hole, to reinstate the circuit.

Cut the tracks to pins-8 and 9 of U24 and the print short between the pins and wire as the new circuit shown in Fig.1 overleaf. All links and components except two go on the under-side of the panel. One is the new delay line balance preset, which is best fitted in place of R36 with only one end soldered. The other is the 1K2 to the end of C33 nearest to U25. Put the 390-ohm on the other end of C33 (which used to go to U24 pins 8 and 9) which now goes on to the input coil of the delay line. Then from the slider of the balance preset fit a thin wire via a 10nF capacitor to the centre tap of the output coil on the under-side of the panel.

ALIGNMENT

Adjustment is best done with a colour bar generator, but highly saturated signals from a camera will do. Firstly, set R29 to mid position. Then increase R24 to increase saturation. Set the delay line balance preset to minimise pairing on red, then adjust the coils for least pairing on all colours, before a final adjustment of the balance preset. It may be easy at this stage to snatch a picture, then check the individual colour memories for pairing before returning the saturation to normal.

VIDEO FILTER

The video input filter was also designed to attenuate the NTSC colour subcarrier at 3.58MHZ so it would have a sharp roll-off from 3 MHZ.

People who have built the VK clone LM9000 will have seen the new modified filter by Brian Cottermole ZL2BFC. Since owners of the 1200c may not be aware of it I will reproduce it here in Fig.2. This new filter will give much more of a flat-top response, extending to nearly 4 MHZ, then with a sharp roll-off to 4.43 MHZ. The changes are L2 to 120uH; C5 to 39pF; C6 to 82pF; remove C7 and replace with a 47pF in series with a 120uH choke.

Gaining nearly a 1MHz in video response makes a tremendous improvement and clears the blurred-looking pictures.

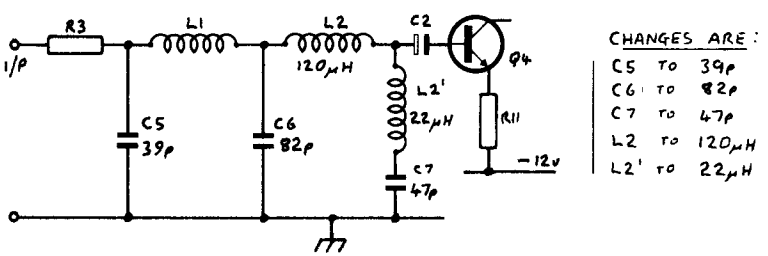

Fig.2 Video Filter Modification

SEPARATED Y/C INPUT

There is one possible further stage of modification for owners of a Super-VHS camera with separate outputs for video and chroma. The input filter can be disposed of as there will be no subcarrier on the video signal to be filtered out. Robot did put a spare BNC socket on the back which can be used for the new chroma input.

Remove R23 to fit a new 270-ohm with longer leads and re-fit it over the top of L3. This will enable the fitting of a new two-pin plug and socket of the same type as already fitted, one pin earth and the other signal input. Remove R2 and re-fit on the under-side of the panel, one end to the new input pin and the other to L3. Also, from the input pin fit an 82-ohm to earth and lift the right-hand end of R3 and right-hand leg of C2 and link the two components, which will by-pass the input filter.

With this modification results with Super-VHS are really superb, but possibly extending beyond the resolution of the frame store in the 1200c. With no cross colour effects the pictures look very clean indeed.

SIX PIXEL GAP

Most Robots in use in 625-line countries always have a gap of about six pixels on the left hand side of the picture. Experimenting, it seemed that a delay of a few nanoseconds on the sync caused the video to shift to the left. Examining the circuit shows that after sync separation by Q3 the resultant sync pulses are fed to U10, a 7414. The only reason for that seemed to be the introduction of a delay though the use of gates in series.

The possibility of fitting one or two more gates was discounted as there is no space on the panel and I don't like sub panels. A few changes around U10 were tried but caused poor sync shape, so an integrator was fitted on the input to U10 with instant success. The new circuit in shown in Fig.3

Lift the collector of Q3 and the leg of R6 where they enter the panel next to each other and join them together in mid-air. Fit a 330pf capacitor to the earth of R6 and the other leg to one of the vacant holes in the panel. Now fit a 2K2 preset from the junction of R6 and the collector of Q3 to the other hole in the panel.

Adjustment is necessary because the gap is not the same in all 1200C's. Snatch a picture and then put colour bars with your call on it, and set so that the left-hand edge lines up with the white bar. All that remains is to remove the preset, measure it and replace with a fixed-value resistor. By doing the change this way you avoid cutting the print which looks neater.

CONCLUSION

Successful completion of this series of modifications should enable existing robots to hold out against an expected second generation of higher resolution scan-converters for a bit longer! If anyone else has any thoughts on the subject I should be pleased to hear from them ... Robert Scarfe G4TUK, Freshfields, Great Melton Road, Little Melton, Norwich, NR9 3NR.

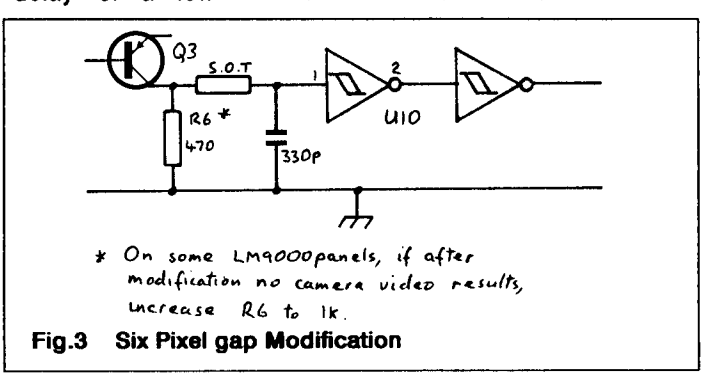

Fig.3 Six Pixel gap Modification

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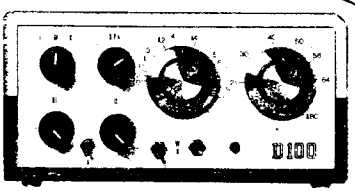

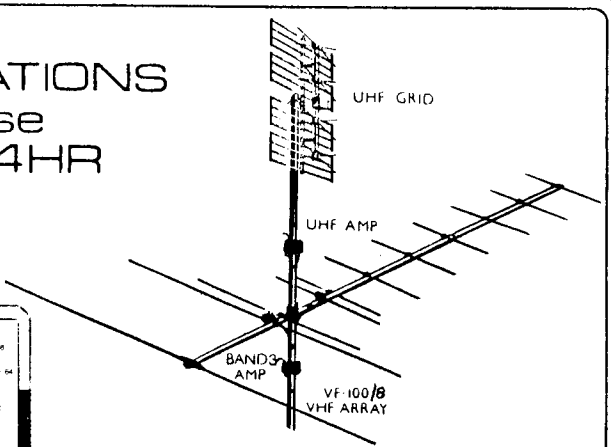

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RECEIVING SECAM ON THE THORN TX9 CHASSIS

Richard Edeson G4FBA

Having been on holiday to France and being a satellite television enthusiast, I was quite excited at the prospect of watching TV5, the French language service aimed at Europe. After the initial setting up of the dish and associated problems I got my first pictures from Eutelsat F1. In those days there were only two Eutelsat birds up and running at 7 degrees east and 13 degrees east.

TV5 was a big disappointment; the output very boring, all talk, or old films in black and white and I soon got fed up of watching, especially with my limited understanding of French. However, there was something worth looking at; RAI UNO the Italian equivalent of BBC 1 with adverts.

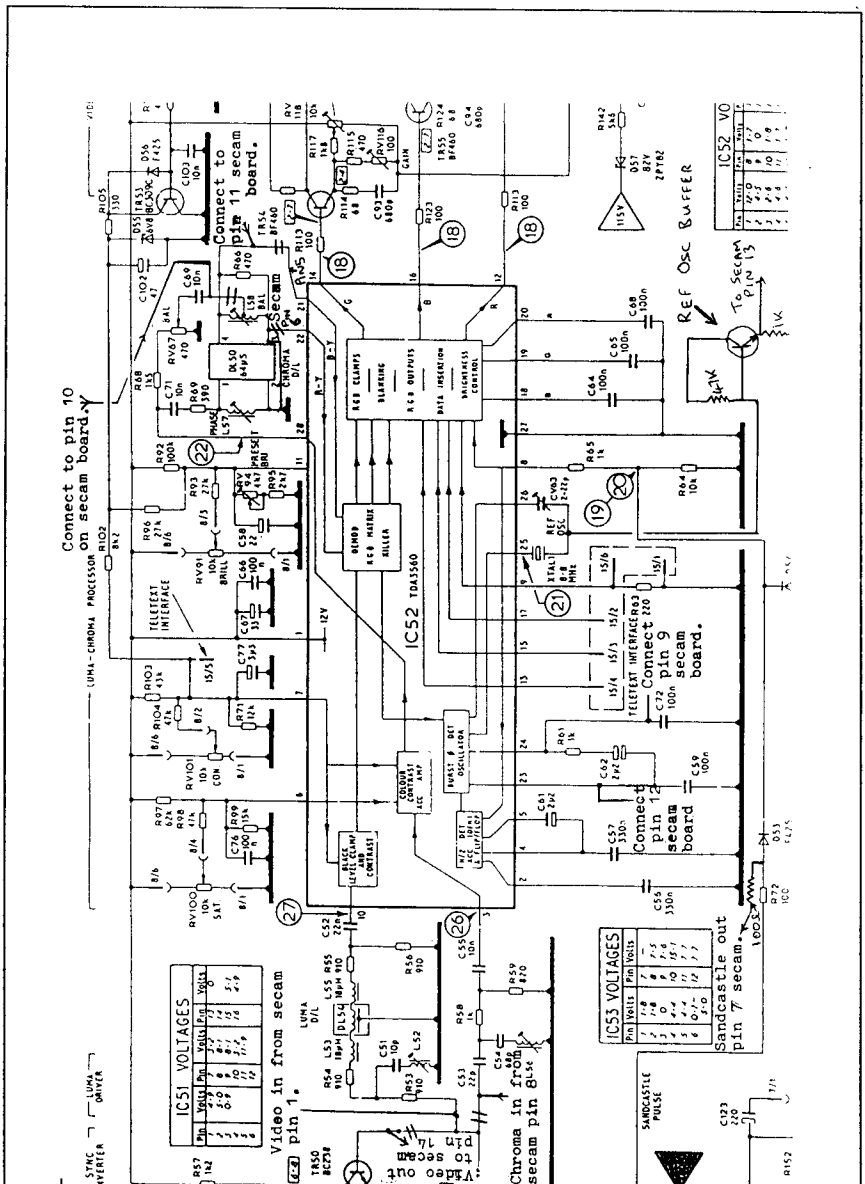
After about 10 months of tuning around 11Ghz. and much deliberation, I decided to buy a LNB for the 12GHz band which includes the Telecom satellite. These satellites are used by France to distribute various video links and data/telephony. Also two full time transponders were used to distribute La Cinq and M6, two of France's 7 TV channels.

The satellites also have an output at 4GHz, serving the Caribbean and other overseas French Dependencies. At that time only one Telecom satellite was in use, Telecom 1A, 1B having developed a fault and as far as I know not returned into service. Now 1C is carrying the main services which recently include Antenne 2 with Teletext, Canal + scrambled for most of the time but in the clear three times a day weekdays, the most interesting been 8AM French time when they run a recording of the previous nights CBS evening news with subtitles, great if you are learning French. La Cinq and M6 are still there in the clear and Canal J scrambled most of the time. All these channels are in Secam except Canal J which is in PAL.

No problem this Secam I thought, still has R-Y and B-Y. It won't be hard to make a transcoder. I'll modify a board out of a telly. Garex sell a Secam PAL transcoder module rescued out of some dual standard television. Famous last words those, after many hours of trying to get monostables to give the correct levels for sand-castle pulses I still had not got it right. Other things like jobs in the house, lack of enthusiasm etc made me give up. Then, my sister's television went wrong; no colour, a TX9, nice little set which mostly use the TDA3560 decoder chip. Reading through the Mullard applications book while looking for the fault, I also looked at another chip description, the TDA3591, a Secam processor which works together with the TDA3560 to form a PAL/Secam decoder.

It took a little while for the full possibilities to grow on me, and I remembered an advert in Television from Sendz components worded " C.Cam Decoder with TDA3591 ". I sent off for one. The fault incidentally was RV67 the U V balance pot open circuit.

Whilst waiting for the postman I kept studying the TX9 circuit and the applications note and its two chip decoder. The board arrived no circuit included but by now I was sure it would work. The component count is not too high so drawing out the circuit is fairly easy. It looks virtually the same as the applications note circuit. Now comes the tricky bit, cutting the track on the TX9 and finding enough bits of different coloured wire, 13 to be exact.



Thorn TX9 chassis showing modifications and connections

Before I start on the details a bit more info on the TX9. My sister did not want a TX9 with PAL/Secam capability so I thought I would look around locally for a second hand set. A quick check of Television advertisements and I rang two suppliers of ex-rental televisions in Leeds and found a dusty but working set with a good tube. Here you need to ask if you can take the back off and make sure the decoder chip is the TDA3560. The mod won't work with the ???chip. The firm on Copley Hill were very helpful in this respect.

The Secam decoder module has a fourteen pin plug. The listing is as follows:

Pin-1 is the luminance output from the TDA3591 to the TDA3560. (Composite video goes into the Secam chip first where identification of Secam/PAL is carried out.) Connect to R53 at TR50 end. I found it easiest to unsolder the lead of R53 at the TR50 end and connect plug 1 directly to the resistor. This breaks the normal luminance input path via R53 to the TDA3560.

Pin-2 is the 12 volt supply. Connect to positive of C67 on TX9 board.

Pins-3 and **4** are the earth pins. Connect to C67 negative on the TX9.

Pin-5 is the B-Y output. Connect to pin 21 on the TDA3560. Cut the print to isolate from the delay line.

Pin-6 is the R-Y output. Connect to pin 22 on the TDA3560 and cut the print as with plug-5.

Pin-7 is the sand-castle pulse input. Connect to the junction of R72 and D53 on TX9 board.

Pin-8 is the chroma out to the TDA3560. Lift the leg of C53 at the TR50 end and connect direct to C53.

* **Pin-9** Connect to junction of C72 and R61 on the TX9 board.

Pin-10 is the undelayed chroma input. Connect to C69. Lift the leg connected to L58 centre tap and solder to C69 on the TX9 board.

Pin-11 is the delayed chroma input. Connect to R66 at the junction of pin 4 on the delay line on the TX9 board.

* **Pin-12** Connect to the junction of C59 and C62 on the TX9 board.

Pin-13 is the subcarrier input. Connect to the junction of Xtal 1 and CV63 on the TX9 board.

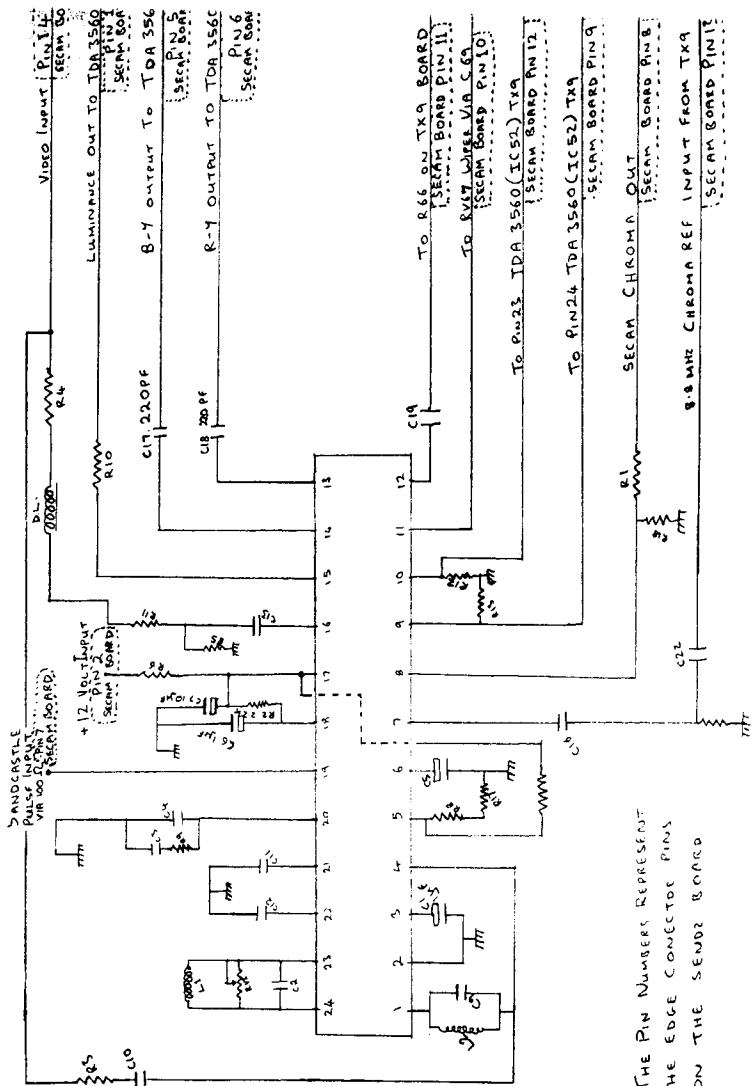
Pin-14 is the video input from the TX9. Connect to PL19 on the TX9 board.

* These two pins give phase relationship information about the oscillators in both chips.

Now join pins-2 and 3 of the delay line on the TX9 and that's it. Well, almost, it depending on the lengths of wire between the two boards. I had a problem with subcarrier oscillator pulling and a simple cure was a single transistor emitter follower to buffer the crystal and the TDA3591. You may have to tweak the coils on the Secam board to get the colours right on Secam. I had to adjust RV67 to remove slight Hanover bars on Secam. Operation of PAL was not affected. Switching of systems is automatic and occurs instantly. In practice there is a slight saturation change between systems. If you equire a source of Secam colour bars then tune in Telecom 1A at 8 degrees west. There are normally some available.

This modification is designed to work on the type of signals fed from a satellite tuner which give 6MHz intercarrier sound and is not suitable for direct reception off air. The French use system L which has amplitude modulation sound at 6.5 MHz spacing from the vision carrier and positive going vision modulation. For those of you who live in the south of England, close enough to receive signals direct from France, you will need to invert the video polarity and also build an A.M. sound demodulator.

Signals from Telecom 1A and 1C are very strong here in the North of England (Knottingley West Yorkshire) reception is



Circuit Diagram of Sendz Secam Decoder (courtesy Sendz Components)

good on a 90 cm dish. I use a 1.2 M dish and my LNB has a noise figure of 2.1 dB. This system provides a good picture on all channels except during heavy rain. The LNB is mounted to the side of the 11 Ghz LNB. I feed two coax cables into the house and use a television switch to select the LNB in use, also a cheap line amp costing about five pound or so from Micro X to make up for the losses in the plugs, switch and long cable runs.

It's now possible to buy a 1.4 dB 12 GHz LNB for less than one hundred pounds, so I would estimate that good pictures could be obtained on a 65cm Astra dish. Micro X are displaying pictures in their office in Leeds from Eutelsat F5 on a 65cm dish with a 1.4 dB LNB. The pictures are almost noise free on the strongest transponder, SAT 1.

A bonus with Telecom is the large number of Radio Stations on separate subcarriers, too many to give an accurate list. The most entertaining I think is Radio FM (RFM). It was possible to pick up NRJ, pronounced Energy, but this has now disappeared from Telecom. These channels are syndicated all over France and have Local opts in and out. The style is very fast, little chat and a tendency to play the 12 inch or LP version of a record. Some are broadcast in stereo (separate channels not multiplex).

Since writing this I have obtained the circuit for our main television at home, a Thorn Tx100 chassis going under the Logic name. This uses a TDA3562 which along with the TDA3561 all work in conjunction with the TDA3591 as a Secam/ PAL decoder. The TDA3562 has feedback from the tube to maintain correct black balance as the tube ages. It looks as though this will be even easier to modify as the PCB has removable links to facilitate the fitting of a secam daughter board. I have not worked out the pin relationship with respect to the Sendz board but I don't think it should present any problems.

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Less: Depreciation	1445	-	634	-	65	-
CURRENT ASSETS						
Stocks- members services	3415		3732		3335	
publications	5992		2046		2879	
Payments in Advance	430		-		-	
Midshires Building Society-						
deposit account	9557		10408		14885	
Lloyds Bank Plc-						
current account	3779		5856		2735	
postage account	-		-		380	
investment account	13000		10000		-	
GiroBank account	30		16		-	
		36203		32058		24214
Less:						
CURRENT LIABILITIES						
Creditors and accruals	932		907			
Subscriptions received in advance	11293		8599		1471	
		12225		9526		2378
		£23978		£22532		£21836
Represented by:						
ACCUMULATED FUND						
Balance brought forward		22532		21836		16441
Add:						
Surplus of income over expenditure		1446		696		5395
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In accordance with instructions given to us, we have prepared these accounts from the accounting records of The British Amateur Television Club, and from information and explanations supplied to us.

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THE BRITISH AMATEUR TELEVISION CLUB

INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDED 31 DECEMBER 1989

	1989	1988	1987
INCOME			
Subscriptions	12669	12744	13183
Members services	897	243	1642
Publications	2314	742	1183
Advertising	809	703	907
Building Society interest	649	523	826
Bank interest	976	392	-
Miscellaneous	-	-	1
Exhibitions	1839	1840	1430
Donations	58	62	99
Postages	296	433	191
	20507	17682	19462
less:			
EXPENDITURE			
CQ.TV printing	9794	7410	7297
CQ.TV postage	4184	3229	3323
CQ.TV production	2431	-	-
General office expenses	309	823	870
General postages	364	1155	465
RSGB affiliation fee	12	11	11
Committee members' expenses	116	180	112
Exhibitions	724	1530	1176
Advertising	295	455	304
Insurance and awards	55	123	81
Depreciation	-	634	65
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THE AMIGA AVT SSTV SYSTEM

Peter Lockwood G8SLB

The Amiga Video Terminal has now been released in this country by ICS Ltd., Arundel, West Sussex. It supports all the SSTV modes, including the NewModes (M1,M2,S1,S2), and also 60, 120, 240 line analogue FAXIMILE transmissions (not office type digital FAX).

The system consists of a fairly small metal cased interface unit, a very well screened multicore cable, a bag of various plugs for user terminations, a very thick manual (for very thick users ?) and a single 3 1/2 inch disk wrapped in oven ready foil (mmmm... very tasty !). All of these items were well wrapped and arrived in first class working order. The interface requires a 12 volt supply from somewhere and I used one of the 'battery eliminator' type units since the interface only draws about 150 mA.

My Amiga setup uses the A500 expanded to 1 MB RAM, with the A590 hard drive and 2 MB RAM expansion, and I use the Philips 8833 monitor in linear RGB mode. References to using a minimum of 1.5 MB of RAM were not relevant in my case, but there is documentation on the disk (and from ICS themselves) for reconfiguring the system for as little as 1 MB machines. A more up to date manual is also on the disk, but I suggest the fitting of a new ribbon and a fresh box of paper before attempting to print it out, as its about 145 K in length.

I did actually try the FAXIMILE functions, which seemed to work except for 'autostart' mode, but I am not really familiar with this aspect of image reception so all the following will relate to the SSTV side of the system.

Since I constructed the LM9000 project (see DIY Robot 1200 article in CQ-TV 148),

which is converted for NewMode and Wraase operation I have the ideal reference for checking out the functions of the various devices that purport to be the ultimate in SSTV operation. I can put a near photographic image, which has been stored on disk and uploaded from my BBC micro using DIGIVISION software, into the LM9000 ... and observe the results when connected directly to the system under test ... in this case the AVT unit.

To be fair, the software issued with the AVT is v3.0d BETA and there are a few problems to be sorted out for use in this country, especially with our accepted sizes of picture image compared with the American NTSC standard. There has been an attempt to change the system to PAL for the actual running of the software but, for instance, the NewMode pictures are all 16 lines too short.

It must be said that the major breakthrough in high resolution colour SSTV is, in fact, a step backwards. I refer of course to the 'sync less' NewModes which rely on the station receiving the image being in exact synchronisation with the transmitting station, very similar to the old FAXIMILE mode. The reduction in line error is very significant using these NewModes and the results of various forms of interference can be reduced.

The AVT system can be preset using 'trimmer' values in order that a straight edged picture will be received from a station using 'Martins M1, M2' or 'Scottie S1, S2' modes of operation. The actual AVT mode also promises great things but I was unable to find anyone using the mode to try it!

Now there is a problem with this great 'all singing and dancing' package, the received SSTV picture on the Amiga monitor screen is seriously degraded compared with the image that was sent to it, even in the NewModes. The HAM (Hold And Modify) picture shows very poor boundaries of colours which gives a very rough looking picture at present. I feel that this is totally a function of the Amiga display mode, since the 'picture' can be retransmitted back to the LM9000 and it looks very reasonable. In other words, the data is captured by the Amiga but not displayed properly, at the moment.

I also found the fact that a colour picture sent to the AVT system shows itself in 'black and white' as it comes down the screen, then changes to colour after the receive period, very strange when compared with the normal systems. The screen display also looks a bit disarranged in the receive mode, but it clears itself up a lot for the final colour image display, so that makes up for the first impression.

The ability to 'snatch' screens from within the Amiga environment means that the system is rather more versatile than the system would at first appear. It means that Digiview images and the like can be used for SSTV, and also the received SSTV pictures can be saved in IFF form for use in 'slideshows' or printed out ... if the image is considered to be of reasonable quality.

Facilities within the software are almost boundless, and only a few of them would be used normally, so in this context the big 'icon panel' does seem to get in the way when the program is in use, being rather more bewildering in its complexity than useful.

So these are my findings, for what they are worth, and if you have the odd 305 pounds sterling then you may like to take a look yourself to this 'interesting' little add on to the Commodore Amiga computer.

SSTV CALLING: 144.500

REPEATER ROUND-UP

Andy Emmerson G8PTH

PROGRESS ON EMLEY MOOR

First of all, the Emley Moor repeater, south of Leeds in Yorkshire. On the problem front GB3ET has suffered a loss of signal to the south east. Ken G8VDP first reported the problem and then set off up the tower to investigate the problem. Everything in the turret room was found to be functioning well, but a look at the aerial itself soon revealed the problem. The aerial is mounted on a YTV mast on the north east of the tower and points east into what was the clear, but the tower has now grown a new dish on the east of our TX aerial and this dish completely obscures any RF to the south east. At present they are not sure how they are going to fix this problem but you can rest assured that they will find a fix – 'We have come too far to lose all our south east viewers', says Trevor G8CJS.

The transmitter has been changed for a free running Solent unit on loan from G6LIC, which is proving to be more stable than the Wood & Douglas TVT 1240 used before, so they have invested in a crystal-locked version. This is now being complete by Clive G8EQZ and will shortly go into service. Ant Products (Derek Simpson) has now almost finished the new receive aerial which is the same design as the transmit aerial, and this will go into service in due course.

The loaned satellite receiver is still in service but Clive G8EQZ is looking into a better one so until then users will have to put up with the low deviation in repeat mode.

Flushed with success at now being able to radiate colour signals from the new transmitter, Trevor has rebuilt the logic so that eight different test patterns are now being radiated. The pages rotate in sequence and include News, Coming Events and a very large ET caption for the hard of viewing. Page 8 has a very large K and is only displayed when someone has accessed the repeater and dropped out. The K is maintained for about 10 seconds, so it is possible to get back from TX to RX in the most antiquated of stations and see proof of having got in. The 10 seconds is interruptible by any other incoming signal, and so does not hold up QSO's.

On the finance front they have had one or two further donations, one from G6RIL who will shortly be seen on the repeater with a Wood & Douglas RX and Solent TX and SC1040 PA. Producing software and EPROMs takes up a lot of time but generates some income for the repeater, so it must be worthwhile!

One of the prominent features of the BATC's convention at Harlaxton in May is the Bring and Buy stall which this year will be managed and run by GB3ET. This will mean a lot of work for the group but they get to keep the commission charges so it will swell funds.

On the organisation front a committee has been formed and meetings are held monthly at Wooly Edge Services on the M1 (northbound). If you are interested please get in touch with either Barry or Trevor. Barry G6LIC can be reached on 0924 822605 and Trevor G8CJS can be reached on 0532 670115.

NEW PROPOSALS

Several schemes for new television repeaters are in the offing. These include GB3TN at Fakenham, GB3TT at Bolsover, GB3DV 'somewhere in Dorset' (all these are 24cm) and GB3XT (10 GHz) near Burton-on-Trent. I have contacts for the last two, in case you'd like to offer assistance or

support. For the Dorset repeater you should get in touch with Les G0FAJ, 29 Overlands Road, Wyke Regis, Weymouth, Dorset. Bob Platts G8OZP is your man for GB3XT, and he is at 8 Station Road, Rolleston on Dove, Burton-on-Trent, Staffs., DE13 9AA.

In addition, the Rugby TV repeater GB3RT has moved from Barby to a site on the west side of Coventry at Tile Hill College of Further Education. The aerials are sited on the roof of the building at a height of around 500 feet above sea level. Mike G6IQM is now planning a 10GHz repeater, GB3RV, to be sited at RT's original site at Barby.

There was a scheme for a TV repeater covering Oxford and the Vale of Aylesbury but that seems to have gone quite lately. But if you know different ...

REPEATER ROSTER

Just to keep you up-to-date, below is a list of TV repeaters already on the air, compiled from the RSGB's Repeater Report. The format is repeater callsign, channel, location, the callsign of the person to contact for further information (see callbook) and status in January 1990.

All these use FM, except GB3UT and GB3VI. I'd welcome news from any of these groups, also any updates and additions.

ANDY'S SOAPBOX

The more I look at the way amateur television is going, the more I see repeaters as the future. I am not convinced they are entirely for the best, but they certainly promote activity and encourage newcomers to the hobby, people who may be unable or unwilling to set up a more elaborate station for simplex contacts.

Pressure on the lower UHF bands is bound to increase, almost inevitably from the packet radio people, who have given amateur radio a 'high-tech' image and a degree of street credibility that it was lacking for a while.

I won't bore you with my views on packet except to say that I think it is killing off 'real radio' and causing very real QRM to our video mode. We should seek to reach an accommodation with the PR brigade and learn to live together, though, and not ignore the situation.

But changing technology will inevitably

GB3AF	RMT2	Durham	G1FBY	temporarily off the air.
GB3CT	RMT2	Crawley	G4ZPP	operational.
GB3GT	RMT	Bellahouston, Glasgow	GM0GIB	operational.
GB3GV	RMT2	near Leicester	G0CND	on low power.
GB3HV	RMT3	High Wycombe	G4CRJ	operational.
GB3NV	RMT2ish	Nottingham	G6YKC	operational.
GB3PV	RMT2	Cambridge	G4MDC	temporarily off the air.
GB3RT	RMT2	Coventry	G6IQM	operational
GB3TG	10GHz	near Milton Keynes	G4NJU	licenced.
GB3TV	RMT2	Dunstable Downs	G4ENB	operational.
GB3UD	RMT2	near Stoke-on-Trent	G8KUZ	operational.
GB3UT	RMT1	Bath	G8CPF	AM TV beacon only.
GB3VI	RMT1	Hastings	G4BCO	AM, operational.
GB3ZZ	RMT2	Bristol	G8VPG	operational.

determine the way our hobby moves, regardless of what other modes do, and I am convinced we shall all be moving to 10 GHz soon. Even five years ago that sounded like arrant rubbish: you needed a degree in microwave technology and a G3 callsign to work X-band, and even then you could only make it work with a monster dish on a war-surplus tripod from some mountain-top in north Yorkshire or Wales.

Now it's all different: there are small dishes, surplus satellite TV receivers at silly low prices and Solfan heads for £5. You'll be able to put together a complete station for well under £100 and some kind soul will put up a TV repeater on a tower block in nearly every major town. These repeaters will be linked on 2.3GHz and by tapping out a few touch-tone digits on a keypad mike, you'll be able to hook yourself through to another TV repeater 75 miles away or more. Too bad that your QSO partner is not monitoring currently, but some things never change in amateur radio. Am I right or am I right? Drop me a line and express your own point of view!

GOOD (QUALITY) NEWS

Are you an ATV junkie? Do you flick through 'CQ-TV' voraciously and still want more after that? Well, how about an off-beat idea? Join another repeater group! (Severnside Group members stop reading now ...)

I say this because I am continually impressed by the quality and quantity in 'P5', the newsletter of the Severnside ATV Group, and it seems a crime that most ATV'ers don't get to see it! Recent issues have included an excellent series on video editing, books reviews, how to get the best out of a Solent transmitter and a low-cost DTMF (touch-tone) encoder. You get an extremely worthy 10-page effort every quarter and by subscribing you are also supporting the work of the repeater group. For details send an SAE to Shaun O'Sullivan G8VPG, 15 Witney Close, Saltford, Bristol, BS18 3DX. Don't forget the group sells admirable antennas, pre-amps and FM TV transmitters for 24cm: again, a SAE to G8VPG will bring you details.

IN RETROSPECT

COLOUR SSTV – ALMOST THE STATE OF THE ART, CQ-TV 150

The section dealing with Amiga software in this article was virtually out-of-date as we went to press, but unfortunately I was unable to rectify the matter at the time. However, Roland Humphries, ther author, has sent me some new copy to replace that section and it is reproduced below:

AMIGA SYSTEM (formerly the Black Belt system by N4EJI). The full version of this is now on sale in the U.K., marketed by ICS Ltd. It consists of a hardware box and software for Amiga 500, 1000 and 2000 computers with at least 1Mbyte of memory. The Amiga mouse is utilised and the system requires an RGB monitor.

A digitiser such as the 'DigiView' is necessary to snatch pictures in Robot, Scottie, New mode and the new Amiga ATV mode (Amiga TeleVision). Additionally, it supports the old speeds of 25.5, 51 and 102 seconds.

The new form of colour slow scan is a very narrow-band system requiring, it is claimed, only 400Hz of space. It is also claimed that by using the narrow-band filter on the transceiver, pictures will be continued to be received despite QRM right down to S0 levels.

Also included in the program are colour graphic fonts, weather/news FAX and a comprehensive package of picture manipulation facilities. The new ATV mode is of course incompatible with all other modes.

In the USA the complete package, including a computer and monitor, costs around $1300 (£800ish !). There is, however, likely to be some problem of compatibility with versions of the Amiga being sold in the U.K. and the rest of Europe, and intending purchasers should make enquiry before purchase.

SSTV – THE AVT SYSTEM SECRETS REVEALED, CQ–TV 149

The author John Langner advises us of a couple of errors that crept into the article.

Page 80:

1) the image

2) a header with digital information

should read:

1) a header with digital information

2) the image

also on page-80:

Each group had the pattern:

? mmm sssss mmm sssss

but the second set of mmm sssss are inverted and should be denoted as:

BAR mmm sssss.

COLOUR CORRECTION, CQ–TV 150

John Goode has advised me of a small but quite significant error that crept into his article on page-25 line-15. The whole sentence should read:

One of the benefits of this method of modulation is that it IS POSSIBLE to add two different encoded colour signals together, and the resulting encoded signal gives the correct resultant colour, exactly as if the signals were in the RGB form.

RSGB TO COMPOSITE VIDEO CONVERTER, CQ–TV 150

Just in case anyone is morbidly interested, the empty box at the beginning of the article should have contained a picture of the completed boxed unit, for some reason our printers failed to reproduce the artwork.

10 x 1 VISION SWITCHER, CQ–TV 150

Peter 'Members Services' Delaney noticed a typo' error on line-4 of paragraph-2 of this article, it should read as follows: The data supplied gives the crosstalk specification as 60dB which is more than adequate for our requirements.

TRANSISTOR SUBSTITUTION, CQ–TV 150

Peter Delaney also comments that the 2N1893 is listed by Grandata, address as shown in CQ-TV 150 page-6 (I wondered who the 'smarty pants' would be! ... Ed). Grandata also quote quite a range of Japanese 2Sxxx devices, and TBAxxx, TDAxxx devices used in TV's, also some ANxxx, CAxxx, HAxxx etc. Other rarities stocked by Grandata are the ZNA134 and ZNA234 devices used in the Club's SPG projects.

Another useful component source is Maplin, who stock the SAA1043 Sync Pulse Generator IC, also the TEA2000 Pal Coder IC and its 270nS luminance delay line.

Peter also says that I omitted to mention a general purpose video amplifier transistor, such a beast being a BC183 (NPN) or BC213 (PNP). New constructors may not realise that that BC183L and BC213L are electrically the same, but that the leads come in a different order.

Finally, the BUxxx series of transistors, usually used in TV line-output stages, often come in versions suffixed 'D' (Please Note that 'D' is not always the identifying suffix used). These versions contain a reversed-biassed diode within the package acting as a 'recovery' or 'efficiency' diode (we used to call 'em boost diodes in the old days!). This will not cause any problems when using a BUxxxD as a replacement for another type without such a diode in the package. However, if you are replacing an existing BUxxxD type then it MUST be replaced with a similar type with a diode.

DIY ROBOT-1200, CQ-TV 148

Updated information concerning this project has come to me from Australia via Dennis Anderson G6YBC. Unfortunately the prices quoted in the original article were rather out-of-date, and the Starter Kit has been expanded to include the PCB's for the power supply and the PAL delay line. The correct (dated 13/3/90 from new Zealand) details are as follows:

LM9000C Starters Kit No: F103

Enrolment Fee: $110.00

New revised documentation & service manual, 3 books with 21 colour photographs; $131.20

Printed circuit boards (now five PCB's), Analogue, Digital, Switching, Power Supply and PAL 'D' Delay Line boards: $176.00

Personalised front panel Scotchcal with your Call Sign printed on: $ 35.00

Front panel switches (30 off) with coloured Light Emitting Diodes and engraved switch buttons:
$165.00

Special camera control/switch pot and knob to match front panel: $ 13.00

Packaging: $ 20.00

Postage: $
56.00

Insurance value $600: $ 15.00

Total: $721.20

This is approximately £220 at the current exchange rate.

Further details from and orders to: TV Enterprises, RMB 4201A, Tallangatta Valley, Vic. 3701, Australia.

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BROADCAST BAND DX-TV RECEPTION

Garry Smith and Keith Hamer

The period between April and June has produced some really excellent DX reception via all modes of propagation, although we haven't had any reports of Middle East or African reception in the U.K. so far.

At the time of compiling this column every Band-1 channel is jammed with signals from almost every point of the compass!

It becomes rather frustrating when signals cannot be identified, because of so many co-channel transmissions.

But at least it's better than having no DX at all!

Identification seems much more difficult this season, mainly because of extended programme hours in many countries, and also changes in presentation style by some broadcasters.

Has anyone seen a test card yet?

RECEPTION ROUND-UP

One enthusiast witnessed some rather outstanding F2 reception on April 6th when Australia came through on channel-0 at 1215 UTC! Let's hope we'll see some more F2 towards the end of this year.

A few Sporadic-E openings were present from around the 15th. The first spectacular opening occurred on may 15th, which lasted from early morning until well into the evening. Italy has been a regular signal this season, followed by Spain and the USSR. Band-111 Sporadic-E occurred during the late afternoon of June 1st when the USSR news programme 'BPEMR' was noted on channels-R6 and R7.

Tropospheric reception was present on many days and available throughout most of May in some locations, especially in the north of England where a sea path helps. May 1st was a particularly eventful day for tropospheric reception.

MAY HIGHLIGHTS

```
01.05.90: 1215 E2 SVT-1 (Sweden) 'KANAL 1' 'SVERIGE' PM5534              (BB)(SM)
          Trops inc. Belgium, Lux'bourg, N'lands, W. Germany, France     (SH)(KJ)
               E36 RTL+ Dusseldorf relay in West Germany           (KJ)(KB)(DG)
               E35 and E36 TELE-5 (West Germany)                        (DG)
               E52 SAT-1 (West Germany)                                 (DG)
               E46 3-SAT (West Germany)                                 (DG)
               E48 BFBS 'SSVC' 'GERMANY' PM5544                         (DG)
               E49 Eins Plus 'ARD/BADN 1 PLUS' FuBK                     (DG)
               E6 DFF-1 (East Germany)                                  (KJ)
               E34 DFF-2                                                (KJ)
               A80 AFN-TV Soesterberg (AFN-TV Netherlands)        (KJ)(DG)(CH)
               E57 SWF-3 (Südwestfunk -West Germany)                    (KB)
14.05.90: 0805 E3 Unid weak signals. RTBF-1 (Belgium) via tropospheric DX?  (GS)
          0815 E4 TVZ-1 (Zagreb TV) with 'English Program'                 (KB)
          0915 E3 Uind weak steady cartoon with 'ET1' corner ID            (GS)
          0930 IA RAI UNO (Italy) with US soap/police series          (KB)(IJ)
          1005 E2 (just below) Italian private tx                          (GS)
               IB RAI UNO progs                                            (GS)
               IA TVA Italian private tx with 'Video Magazine'             (GS)

          1630 E2, E3 & E4 TVE-1 (Spain) progs  (GS)(KJ)(KB)(DG)(CH)(IM)(IJ)(SM)
          1729 E4 TVZ-1 (Zagreb TV) with clock                       (KJ)(IJ)
          1835 E2 TVE-2 progs                                              (DG)
          1850 E3 JRT (Yugoslavia) prog (Beograd or Ljubljana)       (KJ)(CH)(SM)
               E4 JRT prog (poss TVZ-1)                                (CH)(SM)
```

1855 IA and IB RAI UNO progs (DG)(SM)
Trops inc. W. Germany, Belgium, France, N'lands

15.05.90: 0630 R1 TSS (USSR) progs (IM)
0701 B3 JRT 'Skolski Program' (schools) (GS)(SH)(KJ)(KB)(CH)
E4 JRT 'Skolski Program' (KJ)(KB)
0750 E4 RUV (Iceland) with 'RUV' 'ISLAND' PM5544 (also later) (GS)(IJ)
0800 E4 TVZ-1 progs (IJ)(SM)
0811 IA and IB RAI progs (serial then Breakfast TV) (KJ)(KB)(BB)
R2 Unid newsreader (GS)(KJ)(CH)
E2 TVE-1 prog (CH)
0950 R1 TVP (Poland) with dark background PM5544 test card (KB)(BB)
0955 R2 TSS UEIT test pattern (BB)(IJ)

1250 E3 JRT 'RTV' 'LJUBLJANA' PM5544 (SM)
1300 IA and IB RAI UNO progs (GS)(SH)
E3 Unid progs (GS)
R1 and R2 Unid progs via SpE (GS)
1315 E3 SRG-1 (Switzerland) 'DRS' caption (SM)
1315 R1 CST (Czechoslovakia) '1-SR-P' test pattern (IJ)(SM)
1330 E2 and E4 ARD-1 (West Germany) announcer (SM)
1328 R2 CST 'SR1 TV' 'BRATISLAVA' PM5544 (IJ)
1415 E2 SVT-1 PM5534 (IJ)
1430 R1 TSS news (IJ)
1500 R1, R2 and R3 TSS sometimes in colour (SM)
R3 Unid co-channel programme with 'TN' logo (SM)
1500 R1 MTV-1 (Hungary) text pages (SM)
1540 R1 TVP PM5544 (SM)
1600 R2 EESTI TV progs (IJ)

1700 R1 and R2 TSS with clock and 'BPEMR' (KB)(CH)
R2 Unid co-channel signal (KB)
R1 CST progs (SH)
IA Unid Italian private tx (SH)
1745 IA RAI UNO progs (DG)
E2 SRG-1 (Switzerland) (SH)
E2, E3 and E4 West Germany (SH)
R2 TVRL (Rumania) (SH)
2000 R1, R2 and R3 TSS progs (SH)
R1 and R2 MTV-1 progs (SH)
E2a and E4 ORF progs (SH)

31.05.90: 0750 R1 Unid cartoon (KB)
0811 R2 MTV-1 showing UK's 'The Charmer' (KB)
0914 R1 and R2 TVP PM5544 (KB)(DG)
R1 TSS UEIT test pattern (KB)(BB)(DG)
1000 E2 TVE-1 progs (until 1720) -TVE-2 at times (DG)
E2 NRK (Norway) 'Greipstad' PM5534 (IJ)
1024 E2 SVT-1 PM5534 (IJ)
1028 E2 SVT-1 'KANAL 1' 'SVERIGE' PM5534 (later E4) (KB)(DG)
1040 R2 TSS UEIT test pattern (KB)(DG)
1050 E2 NRK 'Bagn' PM5534 (IJ)
1107 E2 NRK 'Melhus' PM5534 (KB)(BB)(IJ)
1120 E3 NRK 'Hemnes' PM5534 (IJ)
1230 R2 TSS 'GOSTELERADIO' caption (DG)
1223 R2 Unid vertical bars pattern (DG)
1310 E2 TVE-1 prog. from Madrid (BB)

1725 R2 MTV-1 adverts then UK's 'The Charmer' (KB)
1800 R1 TSS clock with 'Olivetti' ID (BB)
1807 IA RAI UNO adverts (KB)

		R1 and R2 TVP -LWT play with Nigel Havers then adverts!	(SH)
		R1, R2 and R3 TSS 'BPEMR'	(SH)
	1850	E3 JRT news and weather	(DG)
	2000	E4 Unid '7 SINN' caption	(DG)
	2007	R1 Unid 'KULTUR JOURNAL' with 'Spitting Image' type puppets	(DG)

JUNE HIGHLIGHTS

01.06.90:	1115	IA and IB RAI UNO progs	(KB)(BB)(DG)
	1225	R1 and R2 TSS UEIT test pattern	(BB)
	1240	E2 ARD-1 with ARD/ZDF news and logo	(BB)
	1330	E3 TVL-1 with 'RTV' 'LJUBLJANA' PM5544	(BB)(DG)
	1345	R2 CST 'SR1 TV' 'BRATISLAVA' PM5544	(IJ)
	1350	R1 CST '1-SR-P' test pattern	(IJ)
	1716	E2 TVE-1 cookery programme	(KB)
		R1, R2 and R3 TSS 'BPEMR'	(KB)(SH)(CH)
		R4 TSS 'BPEMR'	(CH)(SH)
		R5 TSS 'BPEMR'	(SH)
		R6 and R7 TSS 'BPEMR' via SpE!	(SH)
		IA and IB RAI UNO progs	(SH)
		IC Unid Italian private tx	(SH)
		IC RTSH (Albania) progs	(SH)
		E2 West Germany	(SH)
		L2 TDF (France) Canal Plus progs	(SH)
		R2 and R4 CST-1 progs	(SH)
		R1, R2 and R3 TVP progs	(SH)
05.06.90:	0600	E2, E3 and E4 TVE-1 test card	(IM)
	0700	E3 TVE-1 'Buenos Dias' Breakfast TV	(KB)(BB)
	0800	E2, E3 and E4 TVE-1 (inc. clock in colour)	(BB)(DG)
	0842	E3 RTP (Portugal) 'RTP PORTO'FuBK	(BB)
	0950	E3 NRK 'HEMNES' PM5534	(BB)
	1020	E2 NRK 'MELHUS' PM5534	(BB)
	1200	E4 RUV (Iceland) PM5544	(KB)(CH)
		R1 CST test pattern	(CH)
	1800	E4 RUV programme schedules for 'DAG 1 RAS2' also on E2!	(BB)
	1840	IA RAI UNO progs	(DG)
08.06.90:	0845	R2 TSS	(CH)
		E3 TVE-1	(CH)
		IA and IB progs	(CH)(GS)
	0858	E2 Unid FuBK followed by clock and YL announcer	(CH)
	0905	E3 Unid PM5544 with tone floating with JRT	(CH)(GS)
	1030	E2 SRG-1 FuBK	(CH)
		E4 TVZ-1 FuBK with 'JRT ZGRB1' ident.	(CH)
		IA and IB RAI UNO progs	(CH)
	2300	L2 TDF Canal Plus progs	(CH)

The above logs are extracts from TeleRadio News Issue No. 47.

Many thanks to the following who have supplied logs and reception reports: Simon Hamer (SH), New Radnor; Stephen Michie (SM), Bristol; Garry Smith (GS), Derby; Kevin Jackson (KJ), Leeds; Kevin Bolger (KB), Scarborough; Bob Brooks (BB), South Wirral; David Glenday (DG), Arbroath; Chris Howles (CH), Lichfield; Iain Menzies (IM), Aberdeen; Ian Johnson (IJ), Bromsgrove.

SERVICE INFORMATION

RUMANIA: The first network TVR-1 is now relaying the French satellite programme 'Canal France International' Mon-Fri during the main transmission break between 1300 and 1330 local time. There are plans to construct a relay transmitter at Bucuresti exclusively for 'Canal France International' transmissions.

EAST GERMANY: The service has now reverted to its original name of 'Deutscher fernsehfunk' (DDF) which was in use until the early seventies. The test patterns now display the identification 'DFF-1' or 'DFF-2'.

DFF-2 now carries a teletext service with a long header title beginning 'TECHNISCHER .....'.

East Germany is now supplying material for the '3 SAT' satellite service, in addition to Switzerland, Austria and West Germany.

POLAND: The first private TV station is now in operation at Wroclaw on channel-R28. Called 'Echo' it broadcasts for 4 hours per day with its own programmes plus a selection of satellite material.

USSR: Belorussian TV no longer shows the once obligatory 'BPEMR' main evening news programme from Moscow. All Belorussian first-network transmitters now carry the extended version of CT-1, closing down at approximately 0300 local time!

In Lithuania the Kaunas R7 transmitter now broadcasts '3 SAT' instead of CT-1.

The Soviet TV clock has undergone a facelift, it now carries the brand name 'OLIVETTI' across it!

YUGOSLAVIA: TV Zagreb is experimenting with stereo sound on the 1st network using the West German 'A2' system (twin intercarrier frequencies of 5.5MHz and 5.74MHz). The U.K. teletext system is used by TVZ on the 1st and 2nd networks.

TV Ljubljana has changed its name to 'TV Slovenia', although the PM5544 test pattern still bears the identification 'Ljubljana' for the time being. RTV Zagreb will also change its name to 'RTV Hvratska' (RTC Croatia). TV Ljubljana (or TV Slovenia) also uses the U.K. teletext system.

BELGIUM: Since May 22nd a 500kW transmitter has been in operation at Wavre, broadcasting TELE 21 programmes on channel-E28.

CZECHOSLOVAKIA: Sixteen former CT-1 (USSR) relays are now being used to provide a new TV service called 'OK-3' (Otevreny Kanal which means Open Channel). Since May 14th a selection of satellite programmes is being shown, such as CNN, TV5, La Sept, CT-1, Scr eensport, World Net and occasionally MTV. The PAL system is used.

Information kindly supplied by Gosta van der Linden and the BDXC, Netherlands; Bernd Trutenau, West Germany; Dalibor Frkovic, Yugoslavia; Roger Bunney, U.K.; David Glenday, U.K.; Andrew Emmerson, U.K.

DON'T FORGET THE INTERNATIONAL ATV CONTEST

1800GMT SATURDAY SEPT 8th to 1200GMT SUNDAY 9th

YOUR CLUB AND COUNTRY NEEDS YOU - BE THERE !

A NEW HAM TV MAGAZINE

FROM THE HAM THAT BROUGHT YOU ATV DX VIA BALLOON: WB8ELK

AND

FROM THE HAM THAT GOT ATV IN THE AUG. 27 ISSUE OF **TV GUIDE**: KB9FO

Amateur Television Quarterly. A high quality technically oriented ham TV magazine.

PROFESSIONAL STAFF FOR EDITING

In the tradition of the BATC, CQ-TV, Ham TV in the US needs a technically oriented ATV magazine. Amateur Television Quarterly is being started to fill this need. Each issue will cover technical subjects, build-it projects, equipment reviews, theory articles and operating news. Each issue will have virtually **no** editorial content except for FCC and operating news. Each edition will be edited by a professional staff of technical and journalistic experts. Not every item submitted will get published unless it passes our editorial and technical staff.

VALUABLE CONTENT

The first issue is expected to be out in January of 1989. Each issue should be at least 48 easy to read pages. That's 48 pages of useful information not 12 pages of ads for in house products and promotions.I Areas covered will be FSTV, SSTV, video and related subjects. Our internal text paste up is done on daisy wheel and laserjet printers . . . no hard to read dot matrix fonts!

YOUR INPUT NEEDED

In order to succeed we encourage your input. This can be in the form of articles, operating news, subscription or comments. Amateur TV Quarterly will PAY for your technical articles. You won't get rich but it will keep you in typewriter ribbons. Our initial distribution of 4,000 copies will make you famous! This may mean even more issues per year if response is large enough! Well known ATV'ers have already submitted prime material for the debut issue.

YOUR RESPONSE PLEASE!

Please check the boxes below and let us know your thoughts about our project. You can subscribe now and the funds will be kept in escrow until we publish our first issue. Issue dates: January, April, July, October, mailed month prior, deadline second month prior.

☐ **Yes, this is an idea who's time has come. I will support the effort as indicated:**

- ☐ operating news from my area _____
- ☐ promotion of subscriptions in my area.
- ☐ classified or commercial ad space, please send rates.
- ☐ my subscription for 1 year $15 (USA) $20 Canada US Funds
  Introductory special: 2 years $25 $30 Canada US Funds
- ☐ Technical article or regular column about _____

FOR FURTHER INFORMATION PLEASE CONTACT OUR U.K.AGENT:

MIKE WOODING G6IQM
5 WARE ORCHARD
BARBY
Nr.RUGBY
CV23 8UF

TEL: 0788 890365

SEVERNSIDE TELEVISION GROUP

24 cm FM TV TRANSMITTER

Our state of the art 24 cm FM TV Transmitter gives a solid 2.5 W output on two switchable channels - 1249 and 1255 MHz are standard, but others are available to order. The ready assembled unit has both line and mic level audio inputs for inter-carrier sound, and front panel audio and video gain controls. The RF circuitry is state of the art, featuring surface mount components, superb stability, SP5060 pll chip and the SC1043 pa module. See the review in CQ-TV 150. The price is £220.00 plus £5.00 postage.

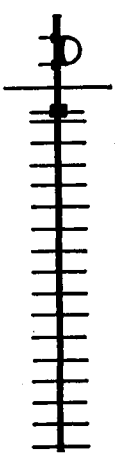
COMPLIMENTARY 20 W PA

A 20 W pa using the high power SC1040 pa module is now available to go with the 24 cm Transmitter. The cost is £150.00 plus £5.00 postage.

23/24 cm PRE-AMPLIFIER

Our 23/24 cm GaAsFET pre-amplifier really is the hottest design around, and yet it is still very stable. See the review in CQ-TV 150. The typical gain is 17 dB with a noise figure of only 1 dB. The gain across the 23/24 cm band is flat, but there is 8 dB of rejection at 700 MHz, thus helping to reduce broadcast TV breakthrough. All this is achieved by the ATF 10135 GaAsFET in a state of the art circuit using surface mount components and careful screening between input and output. The pre-amp is fully boxed and assembled (but not weatherproof) and does not contain RF change-over circuitry. The price is £52.00 plus £1.50 postage.

Cheques payable to AZTEX ELECTRONICS. Send to Ken Stevens G4BVK, Aztex Electronics, 20,Coberley, Footshill Rd., Hanham, Bristol BS15 2ES. Tel. 0272 677 005 after 7 pm or weekends. Please send an SAE for full details on any of our products. Delivery 28 days.



As over 250 users from all over the UK will know, the STG 18 element wideband yagi is the affordable aerial for 23/24 cm ATV. Don't forget that your aerial must cover all the band for repeater working. Just look at some of its star features ;

* Frequency coverage 1240 to 1325 MHz.
* Gain 10 dB across the band.
* SWR about 1.5 across the band.
* Length only 900 mm, weight only 300 g.
* Supplied with clamp for masts up to 55 mm in diameter. End mounting design as shown.
* Neat and unobtrusive, it looks just like a domestic UHF TV aerial, but is smaller.
* Best of all, the price is still only £14.00 plus £2.50 postage (UK only, please write for export air freight rates).

→ **NEW PRODUCT** : Precision made 3 pole inter-digital filters for 1245 to 1320 MHz. Less than 1 dB insertion loss. To order, state centre frequency and either BNC or N sockets. Price £50.00 plus £2.50 postage.

Cheques payable to SEVERNSIDE TELEVISION GROUP. Send to STG, 15,Witney Close, Saltford, Bristol BS18 3DX. Tel. 0225 873 093 after 7 pm and weekends only. Allow 28 days delivery.

THE WORTHING AND DISTRICT VIDEO REPEATER GROUP

GB3VR ATV REPEATER BRIGHTON

1W FM-TV 24cm TRANSMITTER THIS TRANSMITTER GENERATES ITS SIGNAL DIRECTLY AT THE WANTED FREQUENCY WHICH MAY BE SET ANYWHERE IN THE BAND. ON-BOARD INTERCARRIER SOUND AND FIXED PRE-EMPHASIS ARE STANDARD FEATURES. THE KIT INCLUDES THE DIECAST BOX AND COSTS £70.00

23/24cm ATV CONVERTER THIS UNIT BLOCK CONVERTS THE 1.3GHz TO THE DOMESTIC UHF TV BAND. USE THIS KIT WITH A STANDARD TV TUNER AND BATC IF PCB, FOR A COMPLETE FM RX SYSTEM. APPLICATION NOTES INCLUDED. £40.00 INC DI-CAST BOX.

TWO CHANNEL PLL THIS NEWLY DESIGNED TWO CHANNEL PHASE LOCKED LOOP WILL IMPROVE THE OVERALL STABILITY OF THE SOLENT 1WATT TRANSMITTER. TWO CRYSTAL LOCKED CHANNELS, AND A THIRD FREE RUNNING TUNING POSITION ARE AVAILABLE. KIT PRICE ONLY £30.00. CRYSTALS FOR THE PLL ON CHANNELS RMT1, 2, 3 OR SIMPLEX 1255MHz £7.00 EACH. OTHER FREQUENCIES TO ORDER.

VIDEO AGC KIT. THIS UNIT ACCEPTS A COMPOSITE VIDEO SIGNAL IN THE RANGE 0.15 TO 2V p-p AND OUTPUTS A CONSTANT 1V p-p ACROSS 75-OHMS. THIS UNIQUE AMATEUR DESIGN IS A MUST FOR TV STATIONS AND REPEATERS. £16.00 EACH.

EXPANSION BOARDS FOR THE CIRKIT CROPREADY TEST CARD GENERATOR. BOTH 2 AND 8-WAY EXPANSION BOARDS ARE AVAILABLE ENABLING THE SELECTION, BY S/POLE SWITCH OR BCD, OF EXTRA EPROM PATTERNS. PRICE: 2-WAY £7 & 8-WAY £18.

AUTO BOARD FOR THE 8-WAY EXPANSION BOARD. THIS BOARD HAS BEEN DESIGNED TO PLUG INTO THE 8-WAY BOARD TO PROVIDE AUTO SELECTION OF ANY NUMBER OF EPROMS FITTED AND TO DISPLAY THEM IN TURN. A VARIABLE SCAN RATE FROM 5 TO 90 SECONDS PER TESTCARD IS POSSIBLE, AS WELL AS HOLD. PRICE £10.00.

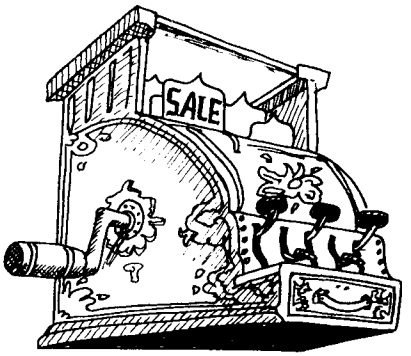
EPROM SERVICE FOR THE CIRKIT TEST CARD GENERATOR. A FAST RELIABLE SERVICE WITH A RANGE OF DESIGNS INCLUDING BATC, IBA LOOK-ALIKE, EBU TYPES 1 & 2 TEST CARDS, CONTEST NUMBERS, TEXT, GREY SCALE PLUS MANY MORE. THESE EPROMS ARE TO THE FULL SYSTEM I STANDARD. SAE FOR FURTHER DETAILS OR TEL. GEOFF ON (0903) 32161 (7 TO 8pm). PRICE: £6.50 PER CHIP. PLEASE STATE B/W OR COLOUR WHEN ORDERING.

COLOURISER KIT FOR THE CIRKIT TEST CARD GENERATOR. BY THE ADDITION OF THIS KIT, THIS POPULAR ELECTRONIC TEST CARD CAN BE UPGRADED TO PRODUCE COLOUR IN ANY GREY SCALE AREA, ON EXISTING OR NEW EPROMS. AN IMPROVED DESIGN TO THE CIRCUIT DESCRIBED IN CQ-TV 139. PRICE £20.00.

THE 'NEW ATV' PROGRAM FOR THE 48K SPECTRUM. THIS VERSION HAS OVER 60 COMMANDS, WHICH INCLUDE 7 TESTCARDS, MEMOPAD, CLOCK WITH ALARM, MAPS, TONES, LOCATOR CALC (OLD & NEW), FLAG, X-HATCH, VARIOUS SIZE TEXT PRINTING PLUS A DISK TRANSFER COMMAND AND MUCH MUCH MORE. ALL THIS FOR ONLY £6.00. OPUS DISK VERSION £8.00. A MUST FOR ALL SPECTRUM OWNERS.

BBC AMATEUR TELEVISION PROGRAM FOR THE BBC MODEL 'B' AND MASTER. PROGRAM INCLUDES 8 TESTCARDS, MAIDENHEAD LOCATOR SYSTEM, VARIOUS MESSAGE PADS, PLUS MANY MORE FEATURES. AVAILABLE ON 80 TRACK DISC OR 40 TRACK D/SIDED DISC, FOR ONLY £8.50. SEND NAME LOCATOR AND CALLSIGN WHEN ORDERING.

ORDERS TO THE TREASURER OF GB3VR,:-
R.STEPHENS G8XEU, TOFTWOOD, MILL LANE, HIGH SALVINGTON, WORTHING, SUSSEX, BN13 2SX



MARKET PLACE

ADVERTISING RATES:

Market place ads - Free*
Full page - cover - £50.00
Full page - inside - £40.00
Smaller displays - proportional

*Advertisements are placed in this column free of charge to paid up members only, please quote your membership number. Addresses will be included unless otherwise requested. All paid advertisements are subject to standard rate VAT.

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

FOR SALE

BIRD POWER SENSORS for Bird Thruline Power Meters. Each sensor has recently been checked and calibrated on a Hewlett Packard calibration rig. Element type 5C 100-250MHz 5W ... £20 each p&p included. Mike Wooding G6IQM, 5 Ware Orchard, Barby, Nr.Rugby, Warks., CV23 8UF. Tel: Work 0788 76125 x35, Home 0788 890365 .

C-MOUNT TV LENSES. 1 off COSMICAR 12.5mm/f1:1.9 ... £35 plus carriage. 1 x VARIFOCAL 16 to 32mm/f1:1.6 ... £35 plus carriage. Mike Wooding G6IQM, 5 Ware Orchard, Barby, Nr.Rugby, Warks., CV23 8UF. Tel: Work 0788 76125 x35, Home 0788 890365 (Answerphone).

BELL CURRENT METER Model 1776 complete with P102 clamp plus full service manual ... £30 ono. Mike Wooding G6IQM, 5 Ware Orchard, Barby, Nr.Rugby, Warks., CV23 8UF. Tel: Work 0788 76125 x35, Home 0788 890365 (Answerphone).

PANASONIC WV1850/B Newvicon CCTV camera c/w auto-iris lens Fujinon 1.8/8mm ... £85. Brand new PANASONIC 1" Newvicon type S4119, never been out of box ... £30. JAVELIN NEWVICHIP CCD CCTV camera model JE-7242X c/w auto-iris lens 1.3/14mm, cost new £450, in as-new condition, will haggle around ... £150. SONY 1810 U-matic VCR plus 30 tapes plus workshop manual ... £75. Bench DMM Data Precision model 1750, red LED display, built-in rechargeable battery ... £40 ono. MARCONI TF2002/AS AM/FM Signal Generator, 10kHz to 72MHz, solid state in good working order ... £65. ICOM BP8 battery pack unused ... £18. Would consider swops on any of the above, I am looking for a 6-8 channel sound mixer, a VHS or U-matic portable VCR, a small studio colour camera for ATV use. Ray Hill G0IMV, 'Marclecote', Ledbury Road, Ross-on-Wye, Hertfordshire, HR9 7BE. Tel: 0989 62906.

TOWER 3-sided, about 50ft c/w some guy ropes ... offers. PHILIPS 1700 VCR (heads OK) plus 3 tapes ... £10. FLEET STREET EDITOR desktop publishing package for the Amstrad 6128 ... £15. ELECTRIC ORGAN, Hamond two-manual plus foot operated bass pedals ... £50. 6' x 8' small shack, wooden by Halls, cedar fully lined inc floor ... £100. About 10M of 0.5" FOAM FLEX FEEDER ... offers. Home-brew 70CM amplifier, about 75W output vision, 240V operation ... £25.

LOW-BAND U-MATIC manual edit pair in need of slight attention, comprising JVC CR8300F recorder and CP5002 player ... £500 ono. NINE LARGE RBM COLOUR MONITORS, need fixing, free if you want them. FOUR EX-BBC COLOUR CODERS, all working, were used with EMI 20001 cameras ... £100 ono. Ring Nick on 021 472 1841 x249 or 0785 662956.

CONSIDERING THE SALE OF THE FOLLOWING; 3 x fully working EMI 2001 camera channels. 1 x complete EMI 2001 camera channel in need of repair. 3 x semi-complete EMI 2001 camera chassis. 3 x semi-complete EMI 2001 CCU's and PSU's. 3 x working/semi-working EMI 2001 lens packages. 4 x working EMI coders presently used with EMI 2001's. 1 x regulated mains supply used to power EMI 2001's. Several full sets of EMI 2001 camera manuals and large quantities of camera cable. The above must be sold as a complete lot and I would be interested in any offers. Ring Nick on 021 472 1841 x249 or 0785 662956.

PHILIPS 20" VIDEO MONITORS. I have 15 of these high-quality units for sale. The cabinets are very compact for this tube size. Some tubes new, some nearly-new, none are flat ... £25 each. A number of BRAND NEW 20" TUBES also available. Dave Elmer Tel: 0602 283704.

ROBOT 400 SSTV CONVERTER c/w manuals, all leads etc. Perfect condition ... £295. ROBOT 800 SSTV-C/W-RTTY etc, perfect condition, all manuals etc ... £195. AMIGA SSTV PROGRAM TX and RX, full colour c/w manuals etc ... £55. Telephone Dave Probert on 021 552 7560.

SONY HVC-4000P COLOUR CAMERA, 2/3" Trinicon, 6x zoom, macro, electronic view-finder, dual sound channels, manual focus, reverse image. Hard carrying case. Comes complete with Sony HVR-320 remote control pan/tilt unit (zoom, focus, run, etc from touch pad) and Sony VFC-6CB mike extension cable. Has 14-pin cable termination (easily altered). All in first class condition and order. Original boxes and manuals. Used for remote bird photography and SSTV ... £250. Roland Humphries G4UKL. Tel: 0326 40595.

EMI/PROWEST STUDIO RACK EQUIPMENT FOR SALE. VDAS, PDAS, Pattern Generators, Stab Amps, Audio Crosspoints, Effects Generators. Plus lots more. All in new or near new condition. Phone for list. Chris G4RBR 081 891 1263.

PRACTICAL TELEVISION: I have many 1950s and 1960s issues spare for disposal, 50p each including postage. Send me your wants list! Andy Emmerson G8PTH, 71 Falcutt Way, Northampton, NN2 8PH. Tel: 0604 844130

VSWR METER. UHF Westminster. TECH RF signal generator (120kHz to 500MHz in 7 ranges). Mullard teletext modules. Satellite TVRO with LNA for C-band. Homebrew TVRO using ASTEC modules, ideal for 23CM ATV. MM 23CM varactor tripler and 23CM to 2M IF downconverter. Tonna 70CM 16-element Yagi ... Offers any item please. Phil Staniforth. Tel: 0473 682675 evenings after 7pm. 0473 647436 office hours.

FREE TO ANYONE WILLING TO COLLECT: Ampex VR7000 series 1" VTR plus large quantity of tape. Philips LDL series 1/2" VTR (3 off) plus a few reels of tape. Peto Scott 12" metal case monitor. Pye Lynx camera. Sanyo 1360 Time Lapse VTR (1/2" open reel) plus a few reels of HD tape. Sanyo 1100sl editing VTR (1/2" open reel) plus a few reels of HD tape. All equipment will need some attention but service manual are available. Contact Peter Benson Tel: 0533 522179 (work) or Tel: 0455 822922 (home) after 7pm.

ROBOT 400 SSTV SCAN CONVERTER, original and unmodified. Complete with manual, circuits and leads. Will throw in a monochrome camera if collected ... £225 or W.H.Y. Ken Thompson G4PAD, 113 Gordon Road, Stanford-Le-Hope, Essex, SS17 7QZ. Tel: 0375 671238.

BBC MODEL-B WITH DS 80-TRACK DISC DRIVE, tracker ball, ROM/RAM expansion card (16k RAM - battery backed fitted), various ROM's, teletext adaptor, discs, printer (with optional tractor unit), Prom programmer and 16" monitor style colour TV (composite video & audio I/P's). All in first class condition. Hansen FS7 144/432MHz power & VSWR meter. UHF Westminster. TECH RF signal generator (120kHz to 500MHz in 7 ranges). Mullard teletext modules. Satellite TVRO withLNA for C-band. Homebrew TVRO using Astecmodules, ideal for 23CM ATV. MM 23CM varactor tripler and 23CM to 2M IF downconverter. Tonna 70CM 16-element Yagi ... Offers any item please. Phil Staniforth. Tel: 0473 682675 evenings after 7pm. 0473 647436 office hours.

DYNAMCO 7100 OSCILLOSCOPE with IY2 D.B. 30MHz module & IY4 TV waveform module & IX2 delay TB module. Circuits etc ... £150. COSSOR CDU110 DB oscilloscope. Approximately 25MHz B/W, delay TB. With circuits ... £100. Musa 24-way J/F. BNC's on rear. As new, unused, list price £450! ... best offer secures. EMI 2001 spares ... please enquire. Brian Summers G8GQS. Tel: 081 998 4739.

EXCHANGE & WANTED

Wanted WIDE-ANGLE LENS or converter for JVC KY1900 camera, also remote zoom control for the same. SONY RM-4400 Edit Controller and Sony ECM-50 PSW microphone. Peter Snell Tel: 0634 723838 daytime, 0634 719962 evenings.

HAVE A NUMBER OF CCTV CAMERAS (RCA & Baxell) in good working order, with high-sensitivity Ultricon tubes (90mA heater), complete with lenses. Will part-exchange for ATV equipment, transmitters, receivers, aerials to set up two ATV stations on 24CM FM. Only quality equipment considered. Dick Saagi G4AQV Tel: 0533 552809.

WANTED 24CMS TV GEAR, TX, RX, amplifier and aerials. Required by the 'A'll 'T'ime 'G'reat contest group. Peter Wallace Tel: 0952 613080.

WANTED CQ-TV 142, TWT type W526F and PSU for TWT mount type WM107FP. Telephone C.Whitmarsh G0FDZ on 081 304 9750.

WANTED CORRESPONDENTS WORLDWIDE in radio, TV and other electronic fields. Object - exchange of circuits, techniques, ideas (also holidays possible). Write to Veeas Jaun Keepersad, c/o Sund Jadunundon, Clairfonds Road No.1, Vacoas, Mauritius.

WANTED A CIRCUIT DIAGRAM of a Thomson TE 3619 PI Television (French) made in Spain. As Sony have no spares I know where there is a Watchman should anyone require bits (model FD10B). J.Brown, 45 Marlborough Avenue, Falmouth, Cornwall, TR11 4HS.

WANTED: Basic Television (Technical Press), volume 2 only. 405 line SPG (and other 405 stuff!). Murphy industrial TV camera (the one with a fibreglass case!). Band I set-top antenna, the type with a large loop and a walnut bakelite base. All old TV literature, especially CCTV sales leaflets and catalogues. 2" x 2" slides of test cards and captions to borrow and copy or buy. Callsign generator or similar using real diodes in a matrix. Andy Emmerson, 71 Falcutt Way, Northampton, NN2 8PH. Tel: 0604 844130.

WANTED: JVC COLOUR CAMERA GX-77, Sony HVS2000 and matching camera. BATC HB1 projects character generator, SPG, Pal coder. Mike G7GTN. Tel: 0272 622638.

WANTED ELEMENTS FOR BIRD 43 THRULINE POWER METER: 100H (100W 2-30MHz), 25D/50D (25W/50W 200-500MHz), 25E/50E (25W/50W 400-1000MHz) and particularly 5K/10K (5W/10W 1100-1800MHz). Would also be interested in any other Bird elements covering similar or adjacent power-frequency ranges. John Lawrence GW3JGA, 40 Aberconway Road, Prestatyn, Clwyd, LL19 9HL. Tel: 07456 3255.

WANTED: Either a 1/4" video machine (playback only OK) or someone to transcribe a 1/4" video recording to VHS (or BETA) format. This is for a commercial concern so a fee for such a service would be paid. Please contact Alison or Alistair at Stable Recordings. Tel: 0505 85488.

WANTED: 1" Plumbicons P8147/8 or similar. Marconi Mk.8 spares or W.H.Y. EMI valve SPG, green case model, circa 1961. Good quality rack-mount master ø waveform monitor. Brian Summers G8GQS. Tel: 081 998 4739.

WANTED: for the Coventry 24CM repeater GB3RT and the Rugby 3CM repeater GB3RV (not yet operational) two Spectrum-48 computers, to enable a teletext type news and data service to be added. If you can help by donating or selling to the group at a ridiculous price a Spectrum please contact the Engineering and Operations Manager Mike G6IQM at the the editorial address. Also wanted for the Rugby TV Repeater Group ***MEMBERS.*** If you are interested in joining the group and helping to support operation and maintenance of the repeaters ***YOU CAN*** *for only* ***£5*** *per year.* If you are interested please contact Dave Murray G1GPE, 12 Newdigate, Chesterton Heights, Leamington Spa. Tel: 0926 316240.

WANTED: Wood & Douglas 1250DC50 24CM downconverter. George Mayo G4EUF QTHR. Tel: 0530 242378.

LATE NEWS

Brian Summers G8GQS (our *worthy* treasurer) advises me that he will be attending the Lincoln Hamfest on Sunday Sept. 9th with his Outside Broadcast vehicle. After a successful outing at the Convention he feels brave enough to try again. If you would like to see this fully operational OB vehicle again, or for the first time, Brian will be delighted to see you there and give you a demonstration.

23Cm TV RECEIVER

The E.H.C. 23Cm TV receiver is contained in a modern grey moulded case with all internal circuitry screened where necessary.

The number of controls has been kept to a minimum, i.e. Tuning, Video gain, Volume, Change over from 5.5 to 6Mhz sound and On/Off.

A wide band I.F. amplifier followed by a phased locked loop de-modulator allows high quality video to be resolved and yet still produces sufficient video output with a deviation of only 3Mhz.

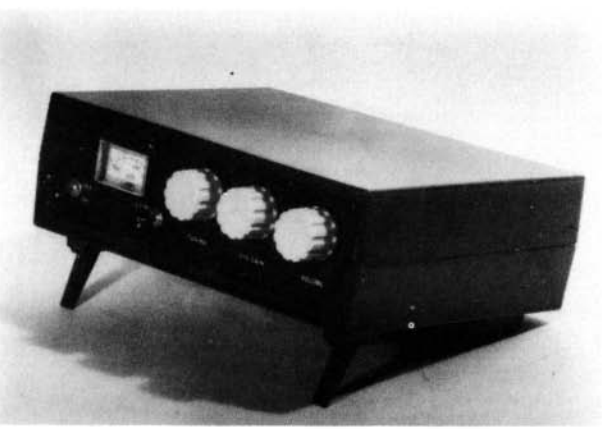
The down converter uses parallel tuned circuits to give good attenuation of broadcast TV signals. All tuned circuits are etched on the P. C. board including the local oscillator, which reduces frequency drift to a low level after only a few minutes warm up.

The receive frequency is displayed on a M/C meter which measures the DC voltage to the varicap tuning diode, this being quite adequate for wide band FM TV signals.

Where surface mounted components are an advantage they have been used.

- All-in-one package or individual P.C. boards.
- Intercarrier sound switchable 5.5 or 6Mhz.
- Tunable 1240-1320Mhz.
- 11-14 Volt supply. (Ideal for /P operation.

Price complete unit in case:
£230.00 *inc. VAT*



I.F. Board with switchable sound 5.5-6Mhz. I.F. frequency adjustable from 35-70Mhz (Please specify when ordering), 70Mhz used with our down converter.

Price **£105.00** *inc. VAT*

Down Converter in metal box operates from 8.5 volts from stabilizer on IF board. Uses two tetrode GaAs Fets and BFR96 for oscillator, 70Mhz IF output.

Price **£55.00** *inc. VAT*

No external components, i.e. meter, controls or sockets are supplied with the IF board or the down converter.

Please add **£3.45 carriage** *to all orders.*

E.H.C. (Valves) Ltd.,
7 Pavement Square,
Lower Addiscombe Road,
Croydon, Surrey. CR0 6RD

Phone 081-654 7172 daytime
or 081-651 0767
8-9 p.m. week days.

CAMTECH ELECTRONICS

21 GOLDINGS CLOSE
HAVERHILL SUFFOLK
CB9 0EQ ENGLAND
TEL 0440 62779

NEW....Camtech VIDEO-IF board.....

Camtechs VIDEO-IF board is a complete video IF amplifier and FM demodulator system designed for the amatuer TV market, with specifications comparable to a professional system. The VIDEO-IF board also has an audio sub carrier demodulator and AF amplifier, all on a single Euro card size PCB.

The circuits employ some novel techniques and established circuit ideas, which together with todays state of the art semiconductor devices, puts this product at the top of its class.

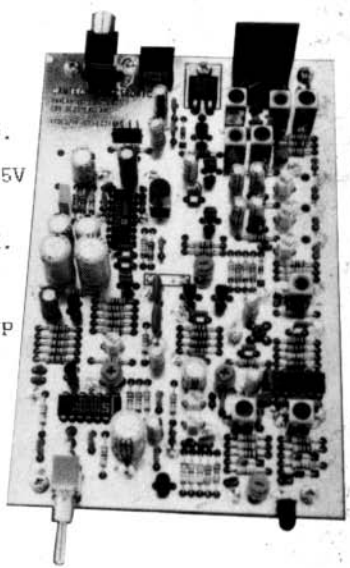
The VIDEO-IF board is available as a kit or built and tested assembly. The kit however is not suitable for the inexperienced, as there are over 180 components !.A comprehensive technical description is supplied with each kit, together with detailed assembly instructions, test procedure and circuit diagram. Test equipment requirements are as follows;

1] Oscilloscope. 2] Multimeter. 3] 30 to 50 MHz signal source.

Details of a simple FET Colpits oscillator signal source are enclosed with each kit. This can be tuned to the required frequency by listening to harmonics on a domestic VHF FM radio.

SPECIFICATION;

1]	IF INPUT IMPEDANCE	50 OHMS.
2]	IF INPUT FREQ	40 MHz.
3]	IF 3dB BANDWIDTH	16 MHz.
4]	IF SENSITIVITY	50 uV PD.
5]	IF AGC DYNAMIC RANGE	60 dB.
6]	AFC OUTPUT,(IF +/-7MHz)	2V +/-0.5V
7]	VIDEO 3dB BANDWIDTH	12 MHz.
8]	VIDEO S/N RATIO	70 dB.
9]	VIDEO OUTPUT LEVEL	1V PK/PK.
10]	VIDEO OUTPUT IMPEDANCE	75 OHMS.
11]	AUDIO SUB CARRIER RECEIVER	6 MHz.
12]	AUDIO OUTPUT INTO 8 OHM SPEAKER	1 WATT.
13]	AUDIO S/N RATIO	60 dB TYP
14]	AUDIO DISTORTION	<5 %.
15]	POWER SUPPLY REQUIREMENT	12VDC (0.5A)



FEATURES;

6 MHz AUDIO SUB CARRIER DEMODULATOR
VIDEO SIGNAL INVERT SWITCH
STANDARD CCIR VIDEO DE-EMPHASIS
AUTOMATIC FREQUENCY CONTROL OUTPUT FOR TUNER
EURO CARD SIZE PCB, 160 X 100 MM.

INTRODUCTORY PRICE;

KIT.....£ 79.95 EXC VAT
BUILT AND TESTED ASSEMBLY.....£ 99.95 EXC VAT
[UK] PLEASE ADD VAT @15% AND P&P @£2.00
OVERSEAS (ZERO VAT) PLEASE ADD P&P @£6.00.