

# CQ-TV



No. 168

November/December 1984



G4TUK

Microwave ATV & Radio Expeditions



The Flying Spots and the *Eidophor*

Videocrypt - an overview

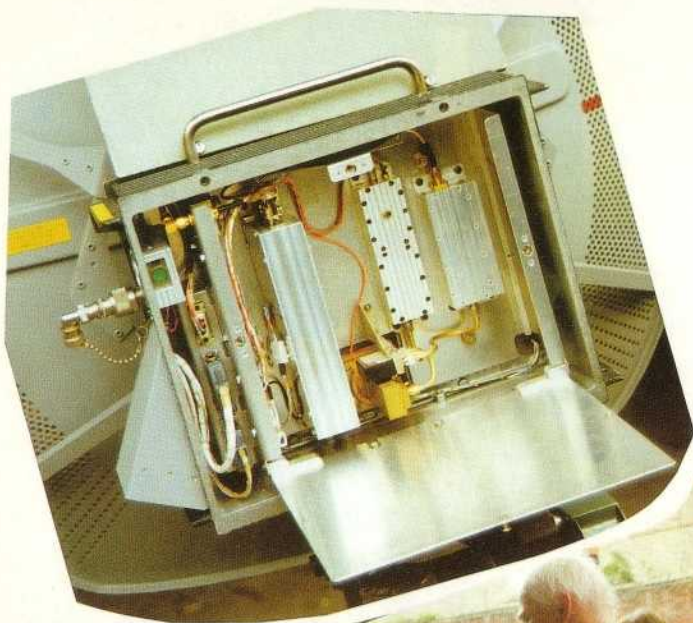
SSTV for the Amiga



Radar Clipping to Sync Level

BATC, RGM & ATV - A future?

BRITISH AMATEUR TELEVISION CLUB



CAT'94



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**CLOSE FOR PRESS FOR THE NEXT ISSUE .....20th DECEMBER 1994**

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## POST & NEWS

### ATTACK ON 70cm ATV ?

*This is a copy of a letter sent to our Graham Shirville and although it may be a little late to respond as the letter suggests I would strongly advise all of you to make your feelings known to Peter Burden as requested ... Mike*

Dear Graham,

At the recent VHFC meeting on June 11th we discussed, jointly with DCC, the possibility of designating more space on 432 MHz for packet radio use on 432 MHz. The nature of packet radio use of 432 MHz is such that they require a number of sub-bands as widely separated as possible. To this end we are looking for comments (both for and against) on the designation of one or more of the following sub-bands for packet radio operation.

430.4 - 430.6 MHz

439.6 - 439.8 MHz

434.4 - 434.6 MHz

438.6 - 438.8 MHz

433.8 - 433.875 MHz

I'd be grateful if you could make this information widely known amongst the ATV fraternity who, I imagine, may have some fairly strong feelings about some of the suggested frequencies. I'm happy to receive comments via letter mail, packet radio (G3UBX@GB-7MAX) or Internet Email (jphb@scitsc.wlv.ac.uk).

Can I emphasise we're only looking for comments at the moment, we won't take any action until October at the earliest and it is likely that the effective date of any changes will be sometime in 1995.

73 ... Peter Burden G3UBX, Chairman RSGB VHF Committee, 2 Links Road, Penn, Wolverhampton, WV4 5RF.

### ATV RECORD? - YOUR GUESS IS AS GOOD AS MINE!!

*I like this letter, and I am reproducing it here just to show that I am not nationalistically biased, even though I don't understand much of it! ... Mike*

Dear Sir,

Si considera inresante publicarlo en la revista, a continuacion le expongo 2 WAYS CONTACT ATV - 432 MHz entre IBERIAN PENINSULA AND CANARIAS ISLANDS.

"El pasado dia 10 de Julio de 1994 entre las 11,00 y 13,00 UTC se realizaron diversos QSO's ( 2 ways), en la banda de 432 MHz ATV entre EA8FT, EA8HZ, EA8BEE, EA8AMD y EA8AOM desde el QTH de este ultimo colega situado en 'La Esperanza' Tenerife (Isla Canarias) sobre 1.100 mts altitud (loc IM18TK) y las estaciones peninsulares EA7CPT (loc IM66VM), EA7BI (loc IM66IM), EA7FWG (loc IM66VO); este ultimo solo en recepcion. La distancia aproximada entre las cuadrículas es de 1.312 km.

Los controles fueron de P4-5 y se produjeron durante dos horas. se utilizaron modulos hibridos de la serie SA-U4 como amplificadores de potencia, con Anenas Tonna de 21 Elementos (F9FT).

Cabe destacar que no se usaron ningun tipo de preamplificador de recepcion, es decir se utilizaron receptores de TV standar 6 videos domesticos. Los equipos de transmision fueron construidos por sus OM's respectivos.

De todo lo descrito, se guardan copias en cintas de video y fotografias."

Mientras todo esto ocurría, yo estaba disfrutando de un día de Playa con mi familia (era Domingo) así que no pude realizar el contacto, y de estar en al Shack lo pudiera haber realizado, ya que igualmente transmito y recibo en las bandas de 432 MHz y 1,2 GHz. (Hi..Hi).

Saludos ... Jose Luis Sanchez EA7WJ (loc IM66VO).

### HELP WANTED - CRT's

*This letter was written to Malcolm J Sparrow G3KQJ and he has asked me to reproduce it here... Mike.*

Dear Sir,

I am writing to you on the off chance that you are still a member of the BATC. I used to be a member some years ago and am looking for some cathode ray tubes type VCA97 as used in aircraft during the war (type 62

units). Would it be possible to enquire through the club or can you put me in touch with a suitable source?

G.A.Sturdy, 125 Manor Court Road, Nuneaton, Warwickshire, CV11 5HQ.

### HELP WANTED - LYNX IR CAMERA?

Dear Editor,

I am writing to ask for help! I have been given a rather ancient PYE LYNX camera which is rather special as it is an INFRA-RED camera. The reference number on the top is LDM 0001/01 and I have been told that the LDM indicates that it is of Philips manufacture. There is a 9-pin D socket on the top cover, which connects to two twin sockets on the power board. There is also a 9-pin D socket at the rear which is labelled 'DRIVES'. The video output is in a BNC socket.

The camera apparently runs from either battery, 105-130 V AC or 200-250 V AC. There is a flying lead at the back which has a 4-pin DIN plug on it.

Can anyone help by supplying a service manual? That is the ideal, but any information which will enable me to get it up and running would be most welcome.

With best wishes ... C Grant Dixon, Kyrle's Cross, Peterstow, Ross-on-Wye, HR9 6LD.

## CQ-TV 167 LETTERS - RALLY 94

Dear Mike,

I feel that your response to Terry Martini's letter is a little unfair. I have attended a number of events this year and I have to agree that the BATC was, in my opinion, one of the ones with the highest proportion of computer goods. This I would suggest though, is in no way your fault.

There is little that can be done to regulate what people sell on their stalls and in any case, it is a sign of the times that, as you say, many people can't get enough computing into everything they do.

Personally I left the BARTG due to the swing to near 100% computing and I have no doubt other club memberships will follow eventually. The days of the Real practical electronics man seem to be numbered. I would not blame an organiser for that, so changing the organiser would be of no benefit.

There is one criticism I would like to take the opportunity to air, and this applies to several events now. Venues need to be chosen with adequate car parking NEAR to the event. There is no joke in carrying heavy radio/TV/computer gear half a mile back to the car. Your event suffered from this, but admittedly not so badly as events like Drayton Manor which must win an award for distance.

Oh and by the way, I am not one of those want-everything-but-do-nothing types, I am an event organiser for

another group, and I know there is hard work to please, but we can all learn things that are not always obvious at the time.

Yours ... Martin Loach

*Thanks for your constructive comments Martin, my only comment will be with respect to choosing a venue with good parking facilities. I don't think such a place exists! I reckon Drayton Manor is paled even by the most prestigious - or so we are told - venue - The NEC!!! ...  
Mike*

## MIR INFO PLEASE

Hello, I am an Italian radio Amateur and I often listen to the Russian manned space station MIR. I have come to know that MIR sends down to Earth ATV images, but I have no idea about how to get them. If you have any indication about it would you please send it to me. I would be very grateful.

I do thank you in advance and wish you all the best for your activities.

Andrea Geymer, Via Ponderano 28,  
10149 Torino, Italy

The new address for letters to  
CQ-TV is:  
The Editor,  
36 Grasmere Green,  
Wellingborough,  
Northants, NN8 3EJ

## Editorial

### *Mike Wooding G6IQM*

*Well folks, as those of you who attended CAT-94 at Shuttleworth last weekend already know, the time has come for me to put away the Editor's red pen - well, for CQ-TV anyway.*

For all sorts of reasons I am retiring as Editor of your magazine and handing the reins on to Chris Smith G1FEF, who I am sure will look after CQ-TV well.

As I said above, there are many reasons for my making this decision, not least of which is the fact that I would like to get some time back to actually play radio! As most of you know, for the past three years I have owned and published VHF Communications, and that of course takes a lot of my time also, however, KM Publications does help to buy some of the luxuries of this modern life of ours - food, heat, light, etc.!!!

Another reason for my deciding to retire is that I firmly believe that the magazine needs a 'new broom', to sweep out some of my stale old ideas and bring in some new ones. Whilst the content of the magazine is essentially yours, there is so much of me in it as well that it is time to get the vacuum cleaner out and get rid of some of the cobwebs.

Talking of cobwebs, I also believe that the entire top echelon of the Club itself, namely the Officers and much of the Committee should also stand down. Many of us have been serving on your committee for over 10 years, and some for much longer. This cannot really be wholly good for the Club, especially in these ever changing times.

What we need is new blood organising and running things - new ideas - new directions - new inspirations - or am I wrong? Probably I am, because *not one* person offered to stand for committee at the BGM last week!! Not one out of over 2000 of you! Either the membership (and that means you) is totally satisfied with what Committee is doing, or is completely apathetic as long as they are not expected to actually get up and do something.

Strong words? Well I am never anything if not contentious - and I ain't changing now just cos it's my last one! But seriously folks, please think about the Club, the way it is going, up, down, forward, backward? The Club needs you, your continued support and your comments, criticisms, thoughts and most of all your help.

*Many thanks for your support during my years as Editor ... 73 Mike G6IQM*

*The new Editor of CQ-TV is*

**CHRIS SMITH**

***36 Grasmere Green, Wellingborough,  
Northamptonshire, NN8 3EJ  
Tel: 0933 676054***

**Please send anything for CQ-TV to Chris at the above address. Anything sent to Mike from now on will be subject to delay and may even get lost.**

**It will also cost the Club extra in redirection postage!**

**Please do not Fax anything destined for CQ-TV to Mike. As yet Chris is not available on Fax, but maybe in the future.**



# BATC, BGM & ATV - A Future?

Norman Ash G7ASH

*I thought I would write down a lot of what has been floating around in my mind since our BGM at Shuttleworth. It is difficult for me, because I want to see us and ATV progress much further than the situation that we find ourselves in at present.*

When I was a little boy I used to see media reports about ATV and BATC activities. I also used to see Amateur Radio; it inspired me and I thought of all the different things I would like to get involved with - if only I could do that. I said to myself I'll never be capable enough to be able to get into that, you obviously have to be very well qualified - I was wrong! - You can be, but the hobby is what you make it.

Now, I was attracted by the 'image' and inspired by the 'potential' I saw and I've come round to BATC via the back door. I got involved with CB radio and emergency monitoring and that took me on to Amateur Radio, at the same time I was working in Television Production professionally, so the two came together quite naturally.

Now it is important that everyone takes my opinions as they are intended, and that is as an attempt at constructive remarks to help the club find an even better future than that which we have at present.

In a club such as ours you will always find a complete range of different ideas and opinions from one extreme to the other. Some may not want any change others may want to change everything. Maybe it is better for us to look at our future in terms of the maximum freedom and flexibility BATC can offer these members. Plus the commitment of the ordinary members like myself to become active in some respect of this club's activities. I cannot see the point, personally, to be a member of anything if you are not going to get involved in some way or another. Should you do get involved, then it is only fair that each of us should put, just a little bit back into the club, of what we take out of it.

The committee give up their own free time to provide us members with much we value and to further ATV. If they were charging us the full commercial rate for their services, I doubt if there would be a club for very long.

It is very difficult to put forward ideas to change and improve without offending the very members and friends of BATC, that have done and given so much already. I think it is not on, to even express constructive criticism for these reasons. Criticism implies someone somewhere has got things wrong (according to someone else!).

So let me try to put my opinions forward from the point of view that everything is perfectly fine for the present BATC and ATV in Britain today. What future would I like to see? What direction would I like to see the club and ATV go?

My opening remarks say a lot to me: As I said after the BGM, the club is noticeably middle-aged - where *IS* the future without younger enthusiastic members?!!

My future for BATC would be a 'pro-active' BATC - one which overtly sets goals and standards for others in ATV to follow particular paths. One which would take a high profile in the *Media* by planning and staging *media attracting* events.

My impression of 'our image' is one of the 'dusty studio shack' and the old cherished pride and joy' equipment, which we all work on (quietly - in secret little hide-aways), from which we occasionally emerge for a fun day (like CAT 94). That's fine for us, but we all have to decide if that is all we want and accept the fact that it will fade away without replenishment of new members.

It is this 'image', this 'impression' (*regardless if it is correct or not*), which is important in attracting anyone into our hobby. I say we need a wider image and impression of what we are all about, at the same time as recognising and including the 'fine business' at a personal, individual member's 'pride & joy' level. We would need to identify all the values which we hold dear and present them well, for others, not involved with the hobby to understand what we are all about: What does BATC stand for, where is it going, what will it be doing in 5 or 10 years time? What are the things we do now? What are we developing? What impression do we make to outsiders? What impression would we like to make to outsiders'?

To me the widening of the formal structuring of the club, towards the answers you want to these questions and the adjusting of our image to fit the reaction you are looking for from outsiders are my two 'key' areas for my future BATC.

If I was growing up today, what would attract me through the front door? I think I would first need a *warm welcome* by the membership- who take a *personal interest* in me. Secondly, I would be attracted by actually "*doing interesting things*". At a young age, I would think most youngsters would find the technical side 'heavy going' (and therefore most would say they find it "boring"). "*Doing interesting things*" would mean *actually making real* programmes with a *real* TV crew in a *real* TV Studio or 'on location' for a *real* 'Broadcast'.

The youngsters have the enthusiasm and energy for this side and the older members have the greater knowledge and skills, I think if BATC developed along these lines, it would be to the mutual benefit of all of us: I know from professional experience, the one thing most youngsters like in School, or College (*and youngsters of all ages!*) and that is making their own TV programmes.

I would be willing to co-ordinate TV production aspects, provided everyone agrees on what should and should not happen and I get plenty of volunteers!! We can then

pursue this issue which was brought up again after the BGM, concerning linking the repeaters for RSGB/BATC/ATV News Broadcasts. I was very pleased to see so many people in favour of it and I hope BATC takes it up with RSGB and RA on our behalf. This is an example of the sort of 'up-front' profile we need as a UK organisation.

With Arthur C. Clarke C.B.E. as our President, we surely can exploit the mixture of Science Fiction and Science fact (the exotic DX of a 4S7 contact? Hi) and our association with such a famous person, to promote ourselves and our hobby's future, with the Media and outsiders we come into contact with? Thoughts?

I had the impression (*and I could be wrong about this*), but I thought that there were many ideas from many interested members in our final session at CAT 94. Time was very short there and so much constructive discussion didn't appear to actually get BATC any further than it was before, other than to clear the air and get a general opinion on subjects of concern from members. The same with the previous session on the future of ATV. Personally I could not believe that it was called this - much of the session being about the use of an Amateur Radio band! Maybe I missed hearing the title of the session correctly?

I would put an open question to everyone about those two sessions. What has BATC actually achieved from both these sessions? What points have actually taken us further forward in the direction we want to go, which was not there before these sessions?

Dare I suggest we formalise these sessions a bit more in order to get constructive outcomes which BATC find acceptable to endorse. If everyone agrees, they need to recognise that this is a two way process - it needs the BATC committee AND an actively contributing membership!

Can we ask in CQ-TV for *members issues* - add these to the *committees issues*, then ask for 'Papers' to be presented, the session given, the response written up in CQ-TV and the committee looking to what action is required (if any) on behalf of BATC. Does it require approval by the committee, does it require a membership vote on? In the end the club is only as good as its **active** members can make it anyway!

I felt I was unprepared for the Future of ATV session, I haven't been involved as long with the club as many of the members attending that day. Therefore I didn't know what has already been covered in the past. For me, I needed a presentation at the start of the session to expose-the issues (*which must have been of concern to someone to arrange the session*) to be presented and placed into context, before I felt ('big-mouth' here) could open up! Even then what would be the point if everyone agrees with each other and no outcome results?

If I were to admit to anything being not as I would wish, about the present BATC, it would be CO-ORDINATION. Can someone tell me why RAYNET should get all the kudos and credit for OUR members OUR initiative and OUR facilities in activating an equivalent video-based service? Surely this is exactly what this club needs to put a good positive image across to the general public. Look how much good RAYNET has done for Amateur Radio's image in the public's mind.

I will throw down the gauntlet on this one and say to anyone interested, to get in touch with **The Group of National Experimental Amateurs (GXONEA)** through me. We are set-up specifically to further Amateur Radio and innovate and inspire new aspects and developments in Amateur Radio nationally. If there is enough of you willing to contribute - we will run it!

I have had very little time to write this article - apologies for rambling on! There's much much more!!

### **Final thoughts for you all to consider, about other aspects**

If you respond well to my video-based (Raynet type) group, we will be going for events support activities, which bring in monies to fund the costs and to re-invest into the hobby, we will be in regular contact with the public, where they can see us actively contributing to something worthwhile. I am quite happy for GXONEA to be associated with all that!

Would someone be willing to co-ordinate fund-raising for BATC (*if it is not being already*)? Would BATC agree? Could we start a Vintage/Historical preservation fund and use part of this income to restore members\* and BATC's equipment (**and Vehicles!**) to original pristine condition? [\*Members who actively turn up to promote and further the hobby!] Could we look to link-up with Broadcast Anniversary events along with the Media coverage? Can we have some reactions from our PR co-ordinator? Can we have a more active / interactive linkage with the professional, Museums, Historians, Curators? Can we ask one of our members to take a special interest in our relationship to the rest of the world, on behalf of the club?

Do you think I've given enough provocation to think about?!! I hope I haven't offended anyone by my comments- as I say they are my personal opinions, maybe I've got it all wrong?

73 Norman

*Thank you Norman, as far as I am concerned you got it dead right! As we discussed at Shuttleworth, one of the main reasons for my retiring as Editor is my sincere belief that the majority of the Committee have been doing it for too long. What the Club needs is new ideas, a new direction and (forgive me Trevor) a new leader. How about it Norman? ... Mike*

# Rally 95

*will be held at the*

## **Sports Connexion Coventry**

*on Sunday April 30th  
for further information, trade  
bookings, etc., please contact*

*Mike Wooding G6IQM,  
5 Ware Orchard, Barby,  
Nr. Rugby, CV23 8UF*

*Tel: 01788 890365*

*Fax: 01788 891883*

## Video editing - a follow up to CQ-TV 167

Mike Sanders G8LES

*“He who enters here may fall quickly into a snake pit.”*

Now then, would it be a good idea to start, by defining what I want out of my video equipment ? Yes of course it would. Ok, so let's look at my requirements. I have two main activities

- (1) Audio editing (for speech programmes and radio plays)
- (2) Video and audio editing (general purpose amateur activity)

Both of which of course I would like to be dead accurate. It was a great surprise to me that it was activity 1 that was the most testing of equipment accuracy. This is because your eyes really don't care if the scene changes at the point where the persons arm is raised or back down by their side. However the ears are very critical of gaps, repeats, incorrect background continuity, coughs and clicks.

I started out with 2 Panasonic FS100's and an MX12 mixer. I used these with the Panasonic 8 event editor the WV-EC300E. What a pain in the neck that was. Each edit jogged the frame forward at the time it takes to slowly read “chunk..... chunk .....chunk.....”, 17 chunk chunks, it just took for ever. The other problem experienced was that the edit went wrong if a transmission was made on 2 Metres whilst editing took place. This was due to RF getting up the counter circuit. Panasonic technical said “we are sorry but our equipment is not designed to be used in that sort of environment”!! Even reminding them of the need to test equipment for RF susceptibility had no affect on the guy I talked to. So, 2 ferrite beads were fitted on the FS100's control track head leads. That stopped it.

So now time for a review. Its too slow and I want a list of edits longer than 8 storable/reviewable. I went to the Euro Foto Centre to see what they had for editing and for captioning. I purchased the Videonics Titlemaker and a Video Pilot editor. Now to connect it all up. Well of course the first thing was that the Pilot needed the player modified to provide the linear audio track out, (for it to read timecode) on an extra socket. But not as I first wired it: after the mute circuit. This gave no timecode on shuttle search. Oops-a-daisy sorry pardon, now I'll find the pin of the audio chip before the mute circuitry and wire it to there.

After considerable amounts of time were spent wiring up Scart plugs and the Pilot connected to the PC with the software loaded I settled down to try it all. The connections to be made were as follows:-The Videonics Titlemaker was very good on results but any fade to black resulted in an orange background. There appears to be a subcarrier imbalance occurring somewhere in the box. The only way to solve

this was to take the 7.8 kHz PAL switch and subcarrier out of the mixer. These needed adding to black level in equal amplitude and opposite phase to the error. Also there were big spikes around the burst and the frame pulse was much larger than the line pulses. This upset some of my monitors. All these were corrected by modification and the manufacturer informed. I don't know whether the current models have these problems solved.

Now to the editor. The first thing to do was to time code the source tape to be edited by putting the recorder into audio dub and selecting time code from the Pilot's menu. Ok. Whilst that is going on I'll have a look round on my radio and turn the aerial round. Turn on the rotor, rotate the aerial turn off the rotor at the mains switch. Bleep from the Pilot the time code had stopped and the software had locked up. Oh tera groan. Its susceptible to mains spikes. Make an AC filter box and insert it in the mains lead and start time coding again. Hooray its done it.

Now what's next. Ah yes, go into edit mode from the Pilots main menu and look for the first scene I want. Mark its in and out times and do this for several scenes. Hmm Ok so now I want to record it. Place the recorder in pause record. Set it going. Bleep time code error. What! Software lock up reboot. Lost all the edits. Triple tera groan I did not save them to disk first. Do it all again AND save it. Try to set it going again. Bleep LTC error, software crash. Frustration mounts. Resist any temptation to open the window and chuck it all out. What did it do. It ran the player back from scene 3 looking for the in point for scene 1 and then went to wind it back some more to do a pre-roll and ran up to the beginning of tape sensor. The software/hardware has no recovery from this situation. New rule. If you are going to edit tapes run them on at least 1 minute before any recording begins before you go out to record any material. All editor equipments suffer this problem to varying degrees it is the ability to stop the editing and do the first scene manually that is important.

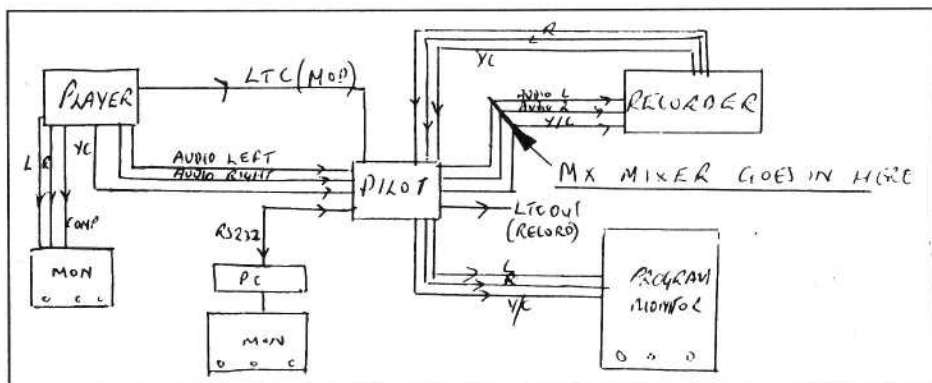
It is at this point that I need to explain that the Pilot is more than software and an interface box. It is in fact a microprocessor controller box which is under task instruction from the PC software. Thus given a task to get on with it blindly gets on with it regardless of any subsequent instructions from the PC side. This of course depends on how the interrupts from the PC are handled by this second processor. In this case they are handled very poorly, so error recovery is difficult. This type of 2 processor editing needs extremely clever software in both the PC and the box to work in a flawlessly interactive way with each other. Because such utopia rarely exists it is not a recommended equipment configuration to use.

OK. So now I have got past that and edited some video scenes and yes it does work. Now there is an audio play to do from reel to reel. It would be nice at this point to say how I got into this audio editing requirement in the first place. I am involved with our local community radio Wey Valley and a group of us present a magazine

program called Speaker's Corner, which also includes plays. The particular one that I had to edit was for the May arts week this year. After seeing the time it took to edit using a knife and chinchograph marking pencil on reel to reel I said that it's about time that this audio editing came into the 20th century and used computer control. Now to dump the audio down to the video Hi Fi track. Time code it. Now its ready to be edited. I marked all the edits and remembered to save them. Run it. I noticed that the time code numbers would occasionally flick to an out of sequence number and back to normal. When listening to the recorded result there were some mistakes. Some of these occurred at the places where the time code flicked. Also there was a burst of time code in the background at each edit. I attenuated the time code level into the Pilot box to one tenth, that stopped that, but did nothing for the flicking numbers problem. This turned out to occur at the same time as the stereo track had something loud on it. A 50% reduction of the audio stereo level into the pilot stopped that. It seems there is audio breakthrough in the CMOS switch chips in the Pilot box causing this problem. Run it again. Much better. Now there is a piece that an actor has said wrong.

He said "sacrifice of Hollaway's life", he should have said "sacrifice of Holdaway's life". It was decided that it would be OK to leave "sacrifice of life" i.e., cut out the word Holdaway. Well I tried everything. Re-calibrating the VCR delays adjusting the frames for in and out points, it was no help. I could either have "sacri life" or "sacrifice of Hollaway's life life". THAT's no good. Later in the same page of script the actor had said "R Robert" which would be even more difficult to edit than the last case in point. I tried many times to get in touch with the firm that made Video Pilot until eventually I discovered that they had gone bust. Ok so now what?

Well it looks like the Pilot is OK for amateur video making but for serious accurate production work it is no good at all. So I have my system up for sale should it suit anyone in the above requirement. Further discussion around, resulted in the opinion that precise editing was not available, with the Pilot. This was because it used infra red control only on the recorder with no feed back as to the actual tape position,





therefore it could not by design have more accuracy than it was offering me.

So what now ?. I saw an advert in Pro Video from Video Action for Editman which looked good. After seeing the Spec for it and discussing the system performance it seemed to offer all that I needed. At the same time as this I decided to upgrade to the MX50 mixer and purchase the controller module for the mixer. I had a bit of a bad start with this as I wanted to mark edits on the fly but this was not available with the E400 that I purchased. It was incorrectly understood and discussed by the supplier. I contacted the manufacturer Syntronix DTV Systems in Derby and they were only too happy to upgrade it and to settle up with the difference in price on the E400 to the E600. In this case there are 2 dumb boxes which interface the player and recorder, the PC RS232 and the MX50 together. These cannot therefore lock up like the Video Pilot. I did however have some troubles at the start.

Firstly the MX50 flashed break up lines on one channel after it was on for a couple of hours. This was solved by making a wood stand to angle it better to use and leave a good air flow underneath. This was not sufficient as it did it again after about 4 hours. It also needed some of the metal webbing removing in front of the fan on the back and inside the MX50. After loading the software from floppy and putting in my security code the main menu appeared. The first thing to do is to load the edit list data disk. This was done. Next log the VCRs. All sorts of trouble here. Random logging. Inspect I/O cables to the 5 pin edit plug. Open wire. Hmm. THAT's no good. Replace with twin audio individually screened. Try logging - no problem now. Syntronix informed. They will use screened cable in future.

A very impressive control screen is presented when entering the main program. There are two modes. Editing on the fly as you go along (DRAFT) or Fine edit mode (FEM) marking in and out points in a decision list. I could not find any way to control the mixer. A call to Syntronix revealed that the MX50 software was OK for the E400 but not finished yet on the E600 could I please wait about a month. Oh groan, but accepted. Ok so I'll get on with trying it out. The manual is somewhat behind the actual software so to use some features took several calls to get it right. I then started to lose control of the VCR pause and stop buttons. I took the lid off the I/O box and control came back. Get out the fan heater. Yep that stops it completely. THAT's no good. Find the 10n ceramic cap in the box and replace it with a mylar one. No problem. Syntronix informed. They had just found the same problem and had tried a new batch of units that day with a temperature stable capacitor fitted. This unit works on counter data which has the advantage of not needing to time code the source tape first, but it has the disadvantage of needing the player left powered on until the edits are finished and the tape cannot be ejected as both activities will reset the counter to zero. There is a tape eject and numbering system within the program but there are no instructions to use it, neither can I find out how to do it. I have requested this information many times but I have been waiting about 3 months for this now its about time they did it.

The worst problem of course would occur if there is a head clog or a power cut. However, does the system work ? Yes it does very well and it is very accurate. There was absolutely no need to use the VCR calibration tables, the pre-set values are fine. I had to split a sentence on audio editing from a closely spaced "isn't it anyway" to start "anyway". Using EDITMAN's review facility I was able to fine adjust to the exact point, as it was only marked using the pause button listening to the audio track. I have only found 2 things the software won't do. One is edit of less than a second, which locks it up and two, to make up a repeated action sequence with the same couple of seconds of video again and again.

I have received the software update to control the MX50 and a hardware mod for the VCR I/O box to trigger off the caption generator. The MX50 control works well but for 3 factors. 1. You have to be careful that the correct effect bus is selected before you start editing because it can get it wrong. Bearing in mind of course that the take button is only a trigger and can be left on either bus from the last activities. 2. The A/B switching command from the software does not work correctly once an event is set. This does not affect the final edit but does not switch to the commanded player on the MX50, therefore you cannot always watch the program monitor to cue the VCR. 3. I would also like it to have a variable take time as this is pre-set to one second. In action the most difficult thing is to get continuous inter scene effects. This is no fault of the editor, but what you have to do is to stop say the B player a few seconds early at the end of scene 1, change to scene 2 use the same out point of scene 1 to start the B player and then mark the event and crossover to the A player. The same thing has to be done for the end of scene 2 and so on. I also want to perform an A/B roll edit.

I purchased a Panasonic FS88 as a second player. This was wired in and performed well. As it is the event timer that is used to trigger both the caption generator and the A/B roll if you don't want a caption at each scene change you must program in a blank page in the caption generator to avoid this, or switch it off of course. It is possible to program in each scene 10 mixer effect events as well so there is a large amount of flexibility. So apart from tape interchange during editing, MX50 control improvement and caption triggering switch off, I have now got a very acceptable system with Editman that is sufficiently accurate for me. Syntronix seem a friendly company to deal with although sometimes due to pressures of work a little slow at fixing things.

I would recommend these systems to anyone wanting to do serious editing, as things evolve they have a very good system in the making with just a few finishing touches to add. I have not yet tried to add in PC graphics but this is a facility available. The only thing I would like now is a record deck with stereo linear audio tracks and Dolby. As Panasonic don't make the 8000 any more this takes one into the professional deck and the associated pricing. *That will have to wait.*

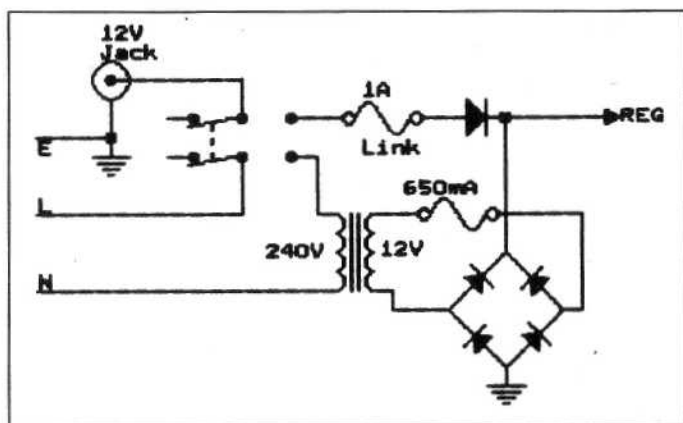
# Modifications for the Panasonic WV-1400/B B&W Camera

John Stockley G8MNY

*These 2/3" tube cameras are fairly common on the S/H market, and make a good small rostrum camera. Here are 2 mods, one for 12v powering, and the second to genlock the camera.*

## 12V Powering

The camera is totally powered from its +9V regulator, so it is a simple matter feed it a 12v supply. Fit a 12v power socket to a central hole on the rear panel. Divert the mains neutral wire from the double pole switch, straight to the



transformer. Cut a good gap in the bridging PCB track from the Transformer to the switch. Wire the 12v socket to the old neutral side of the mains switch. Solder the cathode of 1N4001 diode to the bridge rectifier +ve, wire a fuse link (1A wire) from the switched 12v to diode anode, this isolates the internal DC feed from the external one. Before switching on RE-CHECK the wiring to make sure all is well! Consumption on 12v is 400mA, On 12v Switch SW401 to "INT" to get 625 line working and not unlocked Frame timebase.

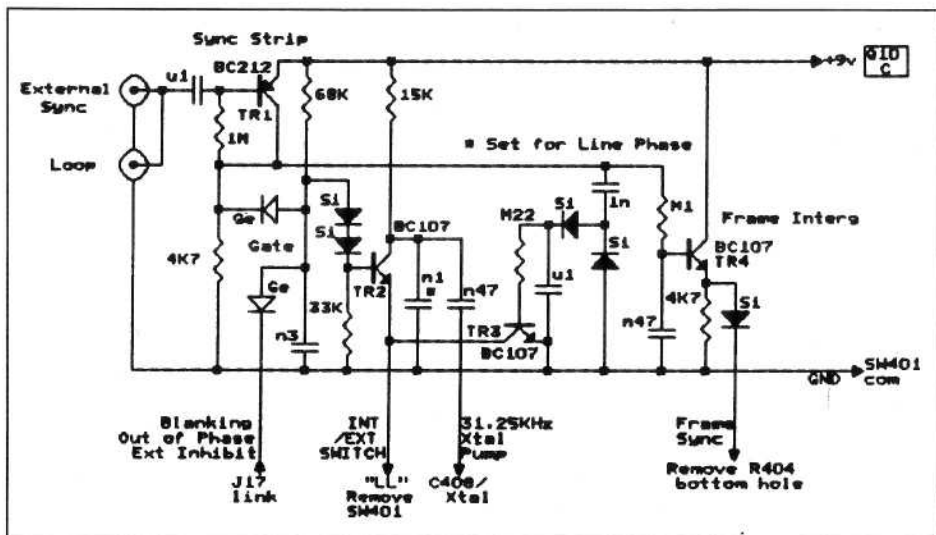
## Genlock

The Circuit: External loop through video drives PNP TR1, biased as a sync stripper. TR3 is turned on with the rectified external syncs, and it enables the camera frame locking circuit, to switch from internal to Line Lock source (Line=mains frame lock). TR4 is fed with filtered syncs and it collector injects frame syncs into the Line Lock circuit. TR3 also enables TR2, its base voltage is offset with 2 silicon

diodes & this is driven from a two Germanium diode gate. This gate is fed with external syncs and internal blanking, the resultant windowed external syncs are injected into the 31.25 kHz crystal to cause lock it up in the correct line phase.

**Installation:** Fit two single nut mounting BNC sockets for external Sync loop through, in the existing holes on the back panel (only cover to be drilled) next to the Video out socket. Build up the circuit on a board that can be mounted using the extra transformer bracket hole between the two PCBs. Remove the video PCB, remove SW401 and R404. Locate and wire the 5 connections.

**Testing:** Double check the wiring, make sure there are no shorts and power up. With no external video, the camera should work as normal (not mains locked). With external video, the result should be frame and line lock. The line phase is adjustable by changing the 100pF cap value, but only do this after warming up, as the crystal is temperature sensitive. The frame lock circuit has no shift but the camera frame pulse occurs immediately after the external frame pulse, and is quite acceptable. But if this is a problem on your mixer, then add an adjustable 20mS 555 mono delay circuit to LL frame syncs.



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# Microwave ATV & Radio Expeditions

Tony G4CBW

*Herewith an abridged account of David, G8VZT's and Tony, G4CBW's microwave expeditions to Scotland, England, Wales and Isle of Man. The aim of these expeditions was to attempt the 'first' two way 3cm TV communications on previously untried paths; namely, the GM/G, GM/GW and GD/GM, GD/G, GD/GW. In addition to these, Sam G18GJX took to the hills with his newly modified, (for TV), equipment and added the 'icing to the cake' with his 24G and 10G 'firsts'*

## GM/GW, GM/G & GM/GI Tests

The first test was from GM to GW. David, G8VZT set up on the Great Ormes, NGR SH766838, 1083BI. At the GM end, some initial problems were encountered trying to locate a decent site. I finally found a friendly farmer who owned a good southerly facing site overlooking the sea at NGR NX524539, 1074UU. Interestingly, this turned out to be the precise same spot that Petra, G4KGC and Charlie, G3WDG found some months previous. The system was quickly assembled and P5 pictures were soon being received and sent to David at the Great Ormes Head. The path was totally over sea and approximately 171km long. The signals received by David were so strong that he managed to receive them using only the LNB + 3dB horn, and relayed them live via another 3cm link to Brian, G3SNW at Bolton, SD671112, 94km. Brian linked the signals out on both 24cm and 3cm to an audience in the Wirral, Manchester, Stoke-on Trent and I understand, Dublin.

After our GM/GW success, David moved site to NW England, NGR NY060118, 1084GL where we again managed to exchange P5 TV signals. Afterwards, David travelled to Scotland to meet up with myself for a joint venture. A most interesting signal that varied every day was that of Dennis, G3FNQ's personal 3cm beacon. During the hours of daylight it was invariably weak with lots of fading and signal strengths down to nearly noise. But in the evening, and particularly late evening, the signal would peak up to S9+ with only the occasional long fade. Two way TV pictures were easily exchanged at these times with Dennis, who was running about one watt to a modified squarial. The path length was about 161 km. A one way TV contact with Tom, G , I083LJ also took place. Tom was able to receive our 15 watts, but, unfortunately, we could only detect TV syncs from his 10mW. Not bad though, a distance of some 183 km. Also at this time, Bob, G4NCI in locator I083KJ managed to receive 3cm TV pictures from Scotland at P4. This was our first encounter with superefraction over a sea path, and most interesting it was too.

Another interesting signal was that from Mike, G3JVL. By using aircraft scatter propagation, we were able to make number of successful contacts on both CW & SSB. The distance is about 506 km. This too, was my first introduction to this type of propagation.

These contacts would have been over quickly but for my fascination with the length and strength of Mike's aircraft scattered signals. These were peaking up at times to S8, and with periods of many seconds. The bursts were quite amazing to listen to. I now wish that I had tape recorded them!

We moved site on the 27th May to Port Patrick, NGR NW995543, 1074KU, and parked up next to Port Patrick Radio Station, with the kind permission of the Station Radio Officer, who also happened to be a licensed radio amateur. Two schedules were arranged for that day, the first with Sam, G18GJX, and the second with Roy, G3FYX and Phil G3PPF. Contact with Sam was soon established on two metres, followed by immediate success for David, GM8VZT/P and Sam, G18GJX/P with their first, and the first two way TV 3cm contact between the Countries. Signals were P5 both ways.

This was followed up with the first 24 GHz two way TV contact between GM4CBW/P and G18GJX/P, and again was the first TV 24 GHz contact between the Countries. The second part of the day was spent trying to exchange 3cm SSB/CW signals with Roy, G3FYX & Phil, G3PPF who were at Pendeen Watch, Cornwall, >500km. The intention being that should the path open with superefraction, a wide band FM test was to have been attempted. Needless to say, it did not. Well, you can't win them all.

### **3cm Cumulative 28th May 1994**

It was decided that we would use the site at NX524539, 10724UU for the Cumulative Contest. Radio conditions were thought to be flat, nevertheless, eleven two way and a one way contacts were made. The nearest, GW3UKV/P at 216km, and the furthest, G3JVL at 506 km. The most difficult was Andy, G4MAP 339/519 at 309 km, which ended up being a marathon struggle for over half an hour. Full marks to Andy for his perseverance.

### **GD/GW, GD/G, GD/GM, GD/GL, GD/EL & GW/GL Tests.**

The first TV schedule from the Isle of Man was with Mike, E12DJ, 1063VJ. Due to Mike's holiday arrangements, (leaving for holiday on 23rd June), the schedule had to be timed for the evening of my arrival; 22nd June 1994. The ferry docked at about 1800hrs, and it was a case of driving with haste to pick up Robert, GD4GNK and then on to a site at NGR SC222774, I074PD for our first test. Within minutes of our 3cm TV transmission, Mike, E12DG called on two metres to announce he was

getting P5 pictures. The path was about 129km. I then asked Mike to transmit to us, Mike answered, "I will transmit to you shortly, I'm still building the modulator"! After about an hour, Mike called to say that the modulator was now working, and that all he had to do was box it and fix the lot atop his tower. At 2230hrs, Mike stated that he was now about to climb his tower to install the 3cm transmitter and squarial system! At 2310hrs, we were rewarded with Mike's 20mw 3 cm TV pictures peaking P5 with some fading. Well worth the effort, and the first two way between EI & GD. It was then back to Robert, GD4GNH's house for beer and to sample his culinary expertise hot meat & potato pies at about 2 am in the morning, and very nice they were too.

The following day's schedules, (23rd June), was initially, to work 3cm TV between David, GM8VZT at NGR 195765, I085IB, for the GM/GD contact and later that day to work David at NGR NY060118, I084GL, for the GD/G contact. While David was travelling between sites, it was intended to work Mike, G3JVL on SSB/CW. Unfortunately, I could not get access to my chosen site, and the alternative site at NGR SC268752, was totally screened in Mike's direction. However, David's pictures from his two sites were again P5 and the two way contacts were completed with ease.

That evening, we set up the portable system in Robert's back garden to work Mike, G3JVL, who was due to fly off on holiday six hours later. Then, a problem! The oscillator started jumping frequency. After some workshop repairs, (pushed crystal back into its holder) we got the system running and managed to work Richard, G4FCD, Charlie, G3WDG and Mike, G3JVL, on SSB / CW.

The weather on Friday 24th June turned out to be really poor, with high winds and driving rain. To make it worse, there was site access problems again and I ended up at the far south of the island in NGR SC207713, I074PC. The first schedule was with David GW8VZT/P at the Great Ormes Head, NGR SH766838, I083BI, 103km. Another very easy contact with P5 both ways, and the first GW/GD. Sam, G18GJX/P at NGR NW478428 was worked at 1434hrs P5 both ways, in fact there was so much signal in hand that when Sam moved his dish towards David, his signals were still peaking P4. The distance was 101km. An attempt to work the path between David at the Great Ormes and Sam at Calm Point SH766838 / NW478428, distance 204km only resulted in a one way with David receiving Sam's twelve watts peaking at PI. Sam could not detect any signal from David's one watt. The very poor weather taking its toll.

Roy, G3FYZ and Phil, G3PPF set up their station at Anglesey, NGR SH436906, I073TJ, at the late hour of 6pm due to a vehicle mechanical problem which had cost them a six hour delay. Initially, both stations were worked on 3cm narrow band at S9. It was then realised that we were not line of site. So Phil and Roy moved site to NGR SH472908, I073UJ, where we managed to work Roy, GW3FYZ/P two way on

wide band FM, (sound), 84kms followed by a one way TV contact. My TV was P4 with Roy. But, unfortunately, Roy's signal was not received in return. Subsequently, it was found that Roy had found a faulty connection which was never noticed in the dark which had caused the transmission failure. Never mind, next time perhaps.

### **3cm Cumulative 26th June 1994**

The weather was very poor again with very low cloud and visibility down to about two hundred yards. However, the site proved to be very good; NGR SC393819, I074SE. A total of 22 stations were worked, 18 two way and 4 one way. Best two way DX was G4FUF at 446km and the best one way DX was G4ZXO/P at 485km. As a separate entity, David, G8VZT and myself went to Wales, NGR SH516567, I073VC, on the 24th July 1994 to work Sam, G18GJX who was portable at Cain Hill NGR NW478428, I074BR.

After a number hours of just watching weak synes, Sam's picture became P5 and the first GW/GL (G18GJX/P/GW4CBW/P) on 3cm TV took place. A little later David managed the same path to equal the distance record of 212km with his one watt system. In between going out portable, Sam and I have been trying work on 3cm TV from our respective home QTH's. On the 31st July Sam went portable at Cain Hill NGR NW478428, I074BR in an attempt to work on 3cm TV to me at my home QTH NGR SJ828513, I083UB, distance 302kms. After hours of receiving synes, Sam's signal peaked at P4. Unfortunately, Sam could only receive synes from me, we shall keep trying to work this path.

### **Station Equipment List**

Sam G18GJX: 4 Foot Dish, TWT @ 12 Watts output, Modified LNB  
David G8VZT: 2 Foot Dish Solid State PA @ 1 Watt output, Modified LNB  
Tony G4CBW: 60cm Dish TWT @ 15 Watts output, WDG Heat/ Modified LNB

*Stop Press:* Sunday 21st August, managed to work Sam, G18GJX/P at NGR NW493697, I074BX from NGR SD734235, I083TQ distance 266km two way 3cm TV contact for a first GI/G (G4CBW/P-G18GJX/P). Conditions improved and Dave G8VZT/P managed to equal the distance with his one watt.

**70cm ATV is SERIOUSLY under threat**  
**USE IT OR LOSE IT !!!!**

**Lobby your Zone Rep - write to the RSGB**



# Philips Colour Monitor type HCS3 Mods

John G0HAT

*The Philips HCS31 8" colour monitor has often been seen at ATV related rallies at a reasonable price, is capable of producing excellent pictures and can make a convenient shack set without taking up too much space. Here are a few comments based on my own experiences with two of the units and which might be worthy of sharing with others.*

Both the monitors as purchased more or less worked - composite video goes into pin-20 (hot) and 17 (ground) of the Scart plug internally terminated by  $75\Omega$ . Audio input may be applied to pin-6 (hot) and 4 (ground) of the same connector.

If you wish to use adjust the sound level frequently, a filed down piece of "volume control spindle" will fit snugly into the audio gain pot behind the front flap recess better than a screw driver or trim tool.

However, both units as received suffered from intermittent abrupt change of colour balance which proved to be due to unreliable pre-set pots on the small PCB carrying the tube base connector. Replacement of these six pots by normal skeleton types effected a cure.

It seems that with ageing many of the pre-set pots can become unreliable despite their "quality" appearance and should be replaced as necessary.

Also, the monitor as received has a long time-constant (flywheel) line oscillator which is fine for avoiding ragging due to noisy line syncs but results in quite bad jitter on pictures replayed from a typical domestic video recorder. Thoughtfully the chip designers have provided the option to shorten this time constant. The chip TDA 2594 located about half way along the right hand side of the main PCB (as viewed from the front of the set) should be identified and a connection made between pin-13 (VCR TC) and pin-18 (ground) via a 100k resistor and a SPST switch. Closing the switch should result in a stable picture on replay from a domestic video recorder.

*If you have any simple modification suggestions for equipment commonly available and useful to ATVers such as this article, or if you have a pet circuit that you find useful, don't keep it to yourself, let CQ-TV print it. No matter how small the article, we are always interested ... Mike*



# ALIAS SMITH and BROWN

Trevor Brown G8CJS

*In CQ-TV 163 page 32 was a circuit for converting BSB receivers to PAL operation. The hardware was designed to complement the software from previous articles that brought D2MAC to these receivers. A PCB was available for this project but has now been discontinued. For those of you that would like to photo etch their own PCB I have reproduced the board copper work, component layout and parts list.*

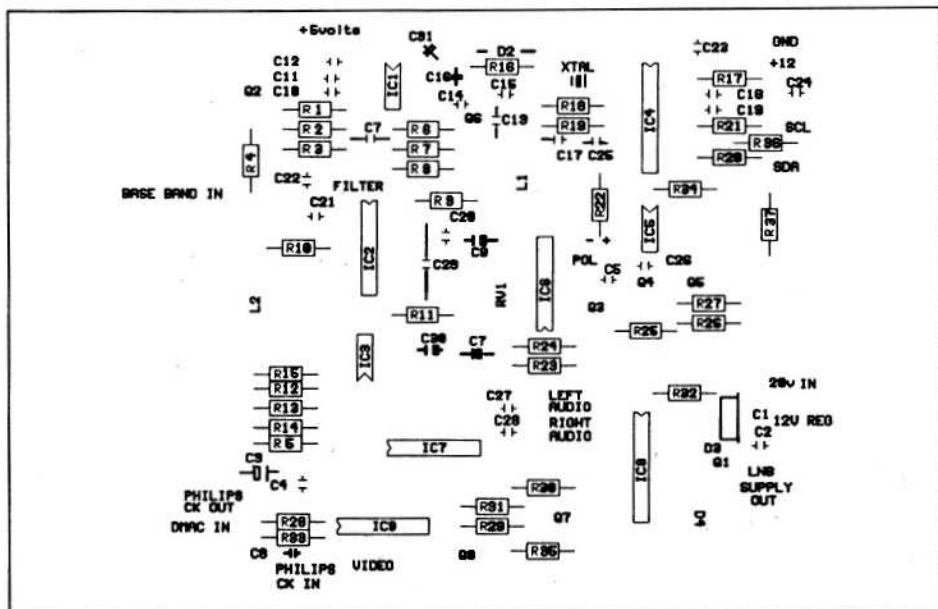
The artwork on the board is fine and so a great deal of care is required but as the board is only single sided I thought some of you may like to try. The software is not a problem and is still available from either Chris or myself at £15 including postage, please state Philips, Ferguson, or Tatung, and in the case of Tatung please enclose the DMAC software for reprogramming as the chip is reusable and not a standard EPROM.

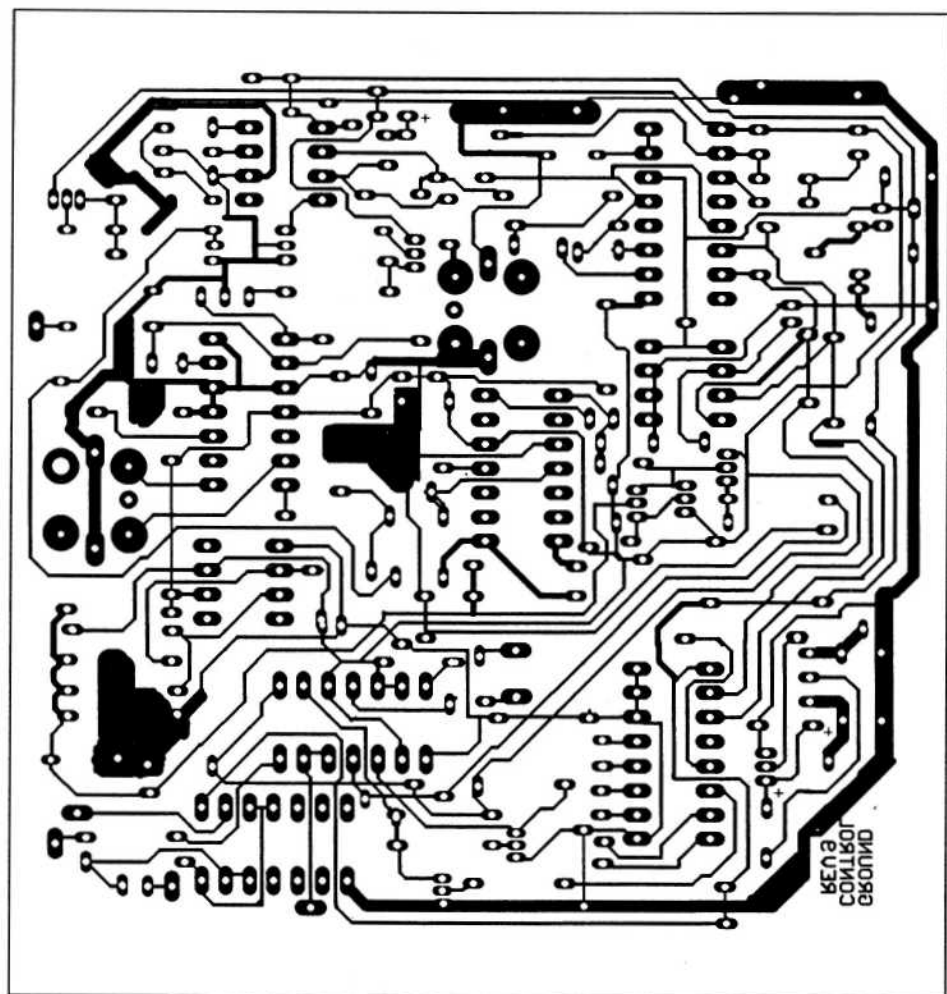
Why Alias Smith and Brown? - it was a comment from one of the readers that I thought I would share with you.

## PARTS LIST

QTY	REFERENCE	DESCRIPTION
13	C1,C2,C4,C8,C11,C13,C16, C17,C20,C23,C24,C25,C31	10nF Ceramic
3	C3,C7,C9	100uF 16V Electrolytic
2	C5,C18	100nF Ceramic
2	C6,C10	100pF Ceramic
3	C12,C14,C15	33pF Ceramic
1	C19	220nF Ceramic
2	C21,C22	22nF Ceramic
1	C26	2n7 Ceramic
3	C27,C28,C30	10uF 16V Electrolytic
1	C29	3n3 Ceramic
1	C32	1n0 Ceramic
1	RV1	4K7 Preset
1	R10	4K7
6	R1,R2,R5,R7,R15,R26	1K0
5	R3,R25,R30,R31	3K3
2	R4,R6	100R

4	R8,R9,R20,R21	330R	
1	R11	1K5	
1	R12	33K	
2	R13,R16	100K	
7	R14,R17,R22,R23,R24,R29,R34,R32	10K	
1	R18	15K	
1	R19	5K6	
2	R27,R28	560R	
1	R33	1M0	
1	R35	10k	
2	R36,R37	Only required on Tatung	3K9 See note in Tatung 'installation' section
1	D1 (Shown as D4 on overlay)	IN4148 Signal diode	
1	D2	BB809 Varicap diode	
1	D3	BZX88C4V7 Zener diode	
7	Q1,Q2,Q3,Q5,Q6,Q7,Q8	2N3904 or 2N3903 NPN Transistor	
1	Q4	2N3906 PNP Transistor	
1	REG1	LM7812 Voltage regulator	
1	U1	NE602 IC	
1	U2	TBA120 IC	
1	U3	741 Op-Amp IC	
1	* U4	TSA6057 PLL IC	
1	* U5	PCD5882 IC EEPROM IC	
1	U6	NE592 Video Amp IC	
1	U7	4066 CMOS IC	
1	* U8	PCF8574 IC IC	
1	U9	74HC02 IC	
1	Y1	4MHZ Crystal	
1	* L1	KAC6184A Inductor	
1	* L2	KACSK586HM Inductor	
1	CF1	CFSK10.7 Ceramic filter	





**70cm ATV - 435.500 MHz**

**24cm ATV - 1256 MHz**

**10 GHz ATV - 10150 MHz**

# The Flying Spots and the *Eidophor* !

Gordon Sharpley G3LEE

*No this is not about a circus act! It is about those monolithic monumental twin lens telecines made by EMI Research laboratories.*

I joined Granada television in Manchester when the studios first opened. After a short period in the maintenance department, it was decided that I should be banished to telecine.

Studio engineers in those days regarded telecine people as strange troglodytes, seldom emerging from their dark catacombs where they practised their black arts. In time, I too learned the black arts like using the de-flickering shims, cleaning the mirrors, oiling the governor and avoiding the EHT!

An EMI film scanning suite (to use its correct title) was really an awesome sight. It consisted of seven bays nearly eight feet high finished in grey hammered paint. A small control desk with a ten inch monitor and a polished oak shelf stuck out from bay two. We had two of these machines. They must have certainly been the largest single piece of picture origination equipment ever made. Even an Ampex VR 1000 complete with its console would look puny beside one.

An EMI became part of the building, bolted to the floor with many half inch Rawlbolts, and each cabinet bolted at the top to the "suck" side of the air conditioning trunking. The main frames of thick angle iron looked as though they were made on the Clyde. Of course the circuitry was all valves. Near to 100 of them. Every diode was thermionic. Many large valves and power supplies were used to lock the one third horsepower motor to field drives. EHT at 25kV for the scanning tube was derived from the mains via a large transformer and a voltage multiplier with large capacitors, all in an oil filled box. I bet it could have given 100mA with ease. A smaller version of this supplied 10kV for the monitor tube. (None of your weedy flyback stuff here).

One of our machines had a slide scanner with a separate tube. Changing over the EHT required opening a box on top of the EHT transformer. Despite all the interlocks and great chrome plated discharger balls, something always found enough hysteresis to give you a reminder who was boss. This slide scanner gave the highest resolution picture available on the station - approximately 700 lines per picture width. Quite good for the 405 line days.

The success of these telecines was in large part due to the development by EMI of the 11-stage photomultiplier tube and the all DC coupled video electronics. With DC coupling one could get strange faults. If a valve early in the chain 'died', one

would find all subsequent stages alternately cut off or glowing red hot. Valves were nice like that, unlike transistors, they did not die without a struggle and gave you a clue to what was wrong.

The flying spots used continuous motion. The film moved smoothly through the gate. No intermittent motion as in cinema projectors. Like a Rolls-Royce they made very little noise in motion. The gearbox which drove the various sprockets was another beautiful bit of British engineering, all large bronze gears and wormwheels, once again in an oil-filled box. On top of this gearbox sat the governor. I am sure this came from an early wind up gramophone! If the picture seemed to shrink and stretch in height it was a sure sign that the leather pads on the governor required a drop of 3-in-1. By skilled mechanical design, the disc of the governor always flicked most of the oil straight into ones eye!

All this ponderous machinery coupled with a substantial flywheel on the motor shaft had considerable inertia. After pressing the stop button it merrily coasted on for about 20 seconds. No problem when running out at the end of a reel of a feature film, but disastrous when running commercial breaks. You would be in the middle of the next break before it stopped. The only method of rewinding was to take the reels off and do it manually! The problem was overcome with a high-tech idea. A Sturmey Archer bicycle hub brake was fitted to the motor shaft. The Bowden cable was threaded through the machine to a conventional cycle brake lever fitted on the edge of the control desk. Success! A skilled operator could now stop on the exact frame of the next leader.

I remember one time when we had to replace one of these Bowden cables. I was dispatched out to Manchester's Deansgate where all the cycle shops were located. I showed my broken cable to one proprietor who was obviously proud of his knowledge of every part for every bike. Truthfully I told him it was for a flying spot. "Flying Spot?", he said, "must be foreign bike!". Anyway we found a suitable cable. I loved those old machines even with all their idiosyncrasies. I was very sorry to see them go. They were our last link with the old EMI research laboratories where real electronic television was born. I would be pleased to hear from anyone who knows what became of any of the EMIs, especially No's. 9 and 10.

## **The Dreaded Eidophor!\***

Despite my being a bit on the short side, the very biggest lumps of television technology seem to have followed me during my career, like "The Flying Spots" above. One large bit of machinery I met was the Eidophor big screen television projector. A very clever Swiss invention. Running the Eidophor at Granada was linked to being in charge of telerecording and providing scoring devices for games

shows. The logic in this arrangement escapes me, but perhaps it was that they were peripheral things which were more of an art rather than a science!

The Eidophor is one of those devices that, like the shadow-mask tube, should not really work. You can imagine the scene in the research labs when the inventor of the colour tube explained his idea to his colleagues. I bet they were rolling on the floor ..... A million little holes! ..... perfect alignment with phosphor dots ..... Three guns! ..... Ha Ha Ho Ho Ho. It will never work!! I think the same thing probably happened to the Eidophor chap.

The Eidophor was probably unique in that it required the simultaneous services of an electronic engineer, high vacuum technician, plumber, refrigeration specialist and dare-devil to operate it. The Eidophor was mainly used for public relations jobs. One favourite was providing a large picture of the proceedings at party conferences, in an adjacent hall (where the bar was located!). Another was world class boxing, in cinemas, usually very late at night, via satellite.

In a nutshell, the picture projected came from a high intensity Xenon arc lamp via a revolving mirror in a high vacuum carrying an oil film. A scanning electron beam deformed the oil film with the image. This deformation caused light to pass through a Schlieren optical system and then through a lens onto the screen. Simple isn't it?

Actually, the whole thing was very complicated, by the facts that the oil had to be at a precise temperature to avoid lag. The oil had to be recirculated and spread very evenly over the mirror. The electron beam was focus modulated and the electron gun and mirror chamber had to be demountable and were continuously pumped. The cathodes had a hard life and had to be replaceable! It was capable however of producing a bright 100:1 contrast ratio picture on a 24 x 32 ft cinema screen if required.

The Xenon arc lamp was not too simple either. It had an internal pressure of fifteen atmospheres. Nearly three hundred pounds per square inch trying to get *OUT!* A cathode ray tube has only one atmosphere trying to get *IN!* The handbook was full of dire warnings about the lamp and terrifying stories were told by *Eidophorists* (?) of flying glass and square lamphouses becoming spherical! Thoughtfully, goggles and a very long thick pair of Swiss woolly gloves were provided. It was also suggested that one wore ones jacket back to front to protect the chest and neck!

As the Eidophor usually travelled with its lamp removed it was necessary to replace it on site. Not being able to see properly because of the goggles, not being able to feel or grip because of the gloves, as well as being restricted by the back to front jacket, this was not an easy task! Assistance was never forthcoming as the rest of the crew magically disappeared as soon as the lamp box was opened!

Fitting the lamp required tightening two large clamps which gripped the lamp glass to copper seals, a job not for the faint hearted or ham fisted!



The thing consumed 25 Amps at 80 Volts. This power came from a wheeled supply about the size of a tea trolley, but infinitely heavier. To get the Eidophor fired up the first thing was to start up the high vacuum backing pump. This made a jolly Tapocket -Tapocketa sound, but if it went spladop spladop you were in trouble already. When the pressure had been reduced sufficiently by the backing pump, one started the oil diffusion pump. All this pumping took about an hour and a quarter at least.

The electron beam was then set with a black level video signal fed into the machine and the Schliren bars adjusted so that the light was just cut off from the screen. If the picture trailed and smeared, as though it was being written on the sands of time, it probably meant that the oil temperature was wrong. That's where the heating and refrigerating came in.

De-ionised water was used as an interface in the heat exchanger with the oil, and that's where the plumber comes in!

Eidophor cathodes lasted about 100 hours, but of course, with the usual perversity of inanimate objects, always blew at the most critical moment. Eidophorists have almost been lynched in cinemas full of fight fans when the screen went black as the knockout punch was on its way!

The machine I had dealings with was of course monochrome, but some years later a colour version came along. This was basically three Eidophors bolted together! We never had one of those, thank goodness!

*"Eidophor"* is a registered trademark belonging to GRETAG Aktiengesellschaft, Zurich, Switzerland.

*Have you got any amusing stories or anecdotes concerned with your work in the Broadcast TV or Video world? If so let CQ-TV print them and we can all have a laugh! ... Mike*

## NARROW BANDWIDTH TELEVISION ASSOCIATION

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

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

# The GB3UD Repeater Group Test Card

Chris Lewis G6ACL

*Having failed to get two Cropredy test card generators to work in the past I decided third time lucky and sent off for the board designed by Martin G7MRF of the Stoke on Trent Repeater Group GB3UD as advertised in CQ-TV 166.*

Within a few days a very professional looking board arrived on my doorstep, screen printing and double sided with through-hole plating. At £18 plus £1.50 postage and packing some amateurs may think it is overpriced, although working with PCB's at work all the time I find it good value for the quality of board especially since a percentage of the price of the board funds the repeater.

Ninety percent of the Cropredy board faults were attributed to the very fine tracks on the board supplied in the Cirkit kit, which is no longer available. Although the circuit is not original and is taken from the BATC publication "The ATV Compendium", it basically consists of the standard Radio and Electronics World's July '83 test card but with a PAL coder added to produce colour where required.

Extra features include a 1 kHz "line up" tone generator and extra filtering in the TEA 2000 PAL coder circuitry to cut down cross-colour patterning on the 4 MHz grating on the display.

Construction was straightforward, most of the components available from Maplin although I would recommend a company called "Viewcom" in London who advertise in Elektor for all the TTL devices as these are not all available from Maplin. Please use decent components as directed by the comprehensive documentation supplied with the board.

The 2732 EPROM required for the board is available through Trevor Burndred and Martin Farmer and is programmed with your callsign.

The following testcard EPROM's are available :-

- a. Split colour bars with callsign
- b. BATC Test Card (similar to IBA)
- c. IBA type test card
- d. EBU type test card
- e. colour bars only
- f. Text

Testing of the unit is easy and should work first time although setting up of the coder is a bit 'fiddly' as there are so many things to 'tweak', but by following the supplied instructions you should have no difficulty. When set up repeatedly switch on and off twelve volt supply to ensure the colour signal 'locks' every time, if not a little more 'tweaking' is required. The unit takes just over 200 mA and I would recommend a large heatsink to be fitted on the twelve volt regulator.

And did mine work first time ? Yes when I soldered the crystals in the right positions. Both Trevor and Martin gave me a first class back up service with EPROM's, Boards and technical assistance and I wish them luck with the repeater.

### USEFUL ADDRESSES

Trevor Burndred G0KBI 52 Everest Road, Whitehill, Kidsgrove, Stoke-on-Trent, ST7 4DY Tel: 0782 782886

Viewcom Digital integrated circuit specialists, 77 Upperton Road West, Plaistow, London, E13 9LT; Tel: 081-471 9338

Maplin Electronics P.O.Box 3, Rayleigh, Essex, SS6 2BR; Tel: 0702 554161

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PE1NBS via GB3LO on 31.05.94

# Using The MC 13077 Encoder IC

John Goode

*Recently, Maplin have included the Motorola MC 13077 advanced PAL/NTSC encoder chip in their catalogue. Unlike earlier encoder chips, this one is capable of external synchronisation, accepts RGB or YUV inputs, and is capable of producing high-quality outputs.*

The outputs from the MC 13077 can be either composite or separate Y and C for use with S-VHS or Hi-8 VCRs. The cost of the MC 13077 at the time of writing is £5.25 incl. VAT, and it comes as a 20-pin DIL or surface-mount chip. There is a very comprehensive data-sheet available from Maplin on request, and I recommend that it be obtained by anyone thinking of using the device. Maplin normally supply the 20-pin DIL plastic package.

This article describes a new PAL coder design based on the MC 13077. After the numerous setting-up adjustments required on the earlier discrete coders (CQ-TV 134), it's really quite remarkable (and sickening) to see the quality of the signal that emerges from this chip in terms of subcarrier leak, accuracy of matrixing, spot-on quadrature, and all that without any external adjustment!

Reference to Fig.1, the chip block diagram, shows that it uses a  $4x f_{sc}$  oscillator (17.73 MHz for PAL), and this is used as an internal clock for generating accurate subcarrier phases and internal pulses for free-running operation. However, there is a phase-locked loop included that allows the  $4x f_{sc}$  to be locked to an external CSC applied to pin-9. Similarly, the internal BG and PS pulses can be overridden or reset by external signals.

The sync input (pin-7) determines the timing and standard that is to be encoded. This input includes a sync-separator, and so the reference could be a video signal if convenient. For PAL encoding, serrated vertical sync pulses are necessary (to maintain the PAL Squarewave sequence), but for NTSC a block vertical sync is permissible. In the NTSC mode, the PS output (pin-9) is grounded; in the PAL mode the internally generated PS can be reset to phase it with an external PS signal by momentarily grounding pin-19. A circuit that automatically does this at switch-on is included in the new design.

The MC13077 operates from a 5volt supply, requiring typically 70 to 75mA. The three outputs, (Comp., Y and C), are each emitter followers capable of driving video into  $150\Omega$  loads; that is, a series build-up  $75\Omega$ , plus a  $75\Omega$  load. Additional  $75\Omega$  outputs can be fed via extra emitter-followers, although with a 2.25 volt swing and only a 5 volt supply the biasing is critical; a diode is therefore included to offset the level shift imposed by the emitter-follower. See Fig.2.

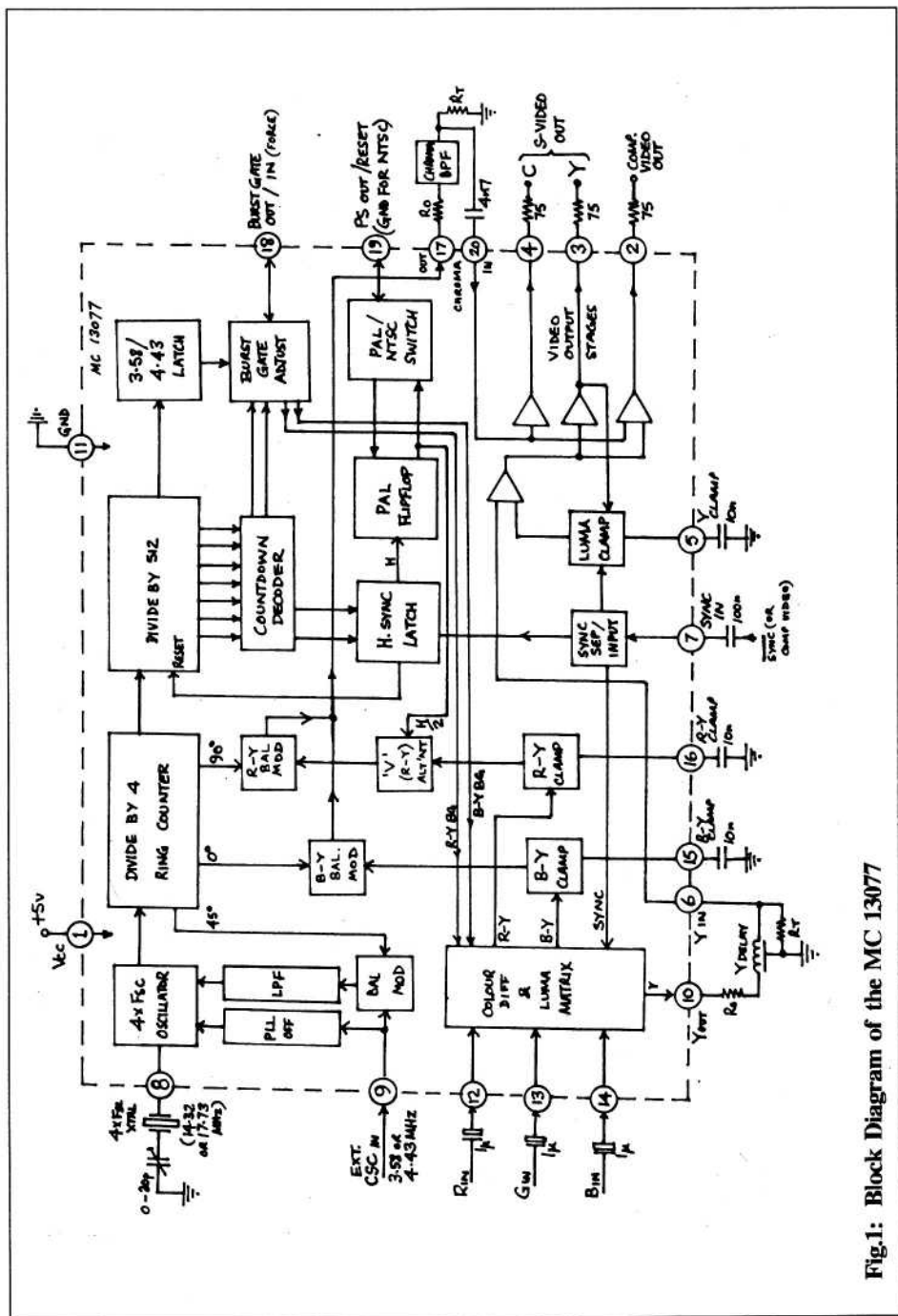


Fig.1: Block Diagram of the MC 13077

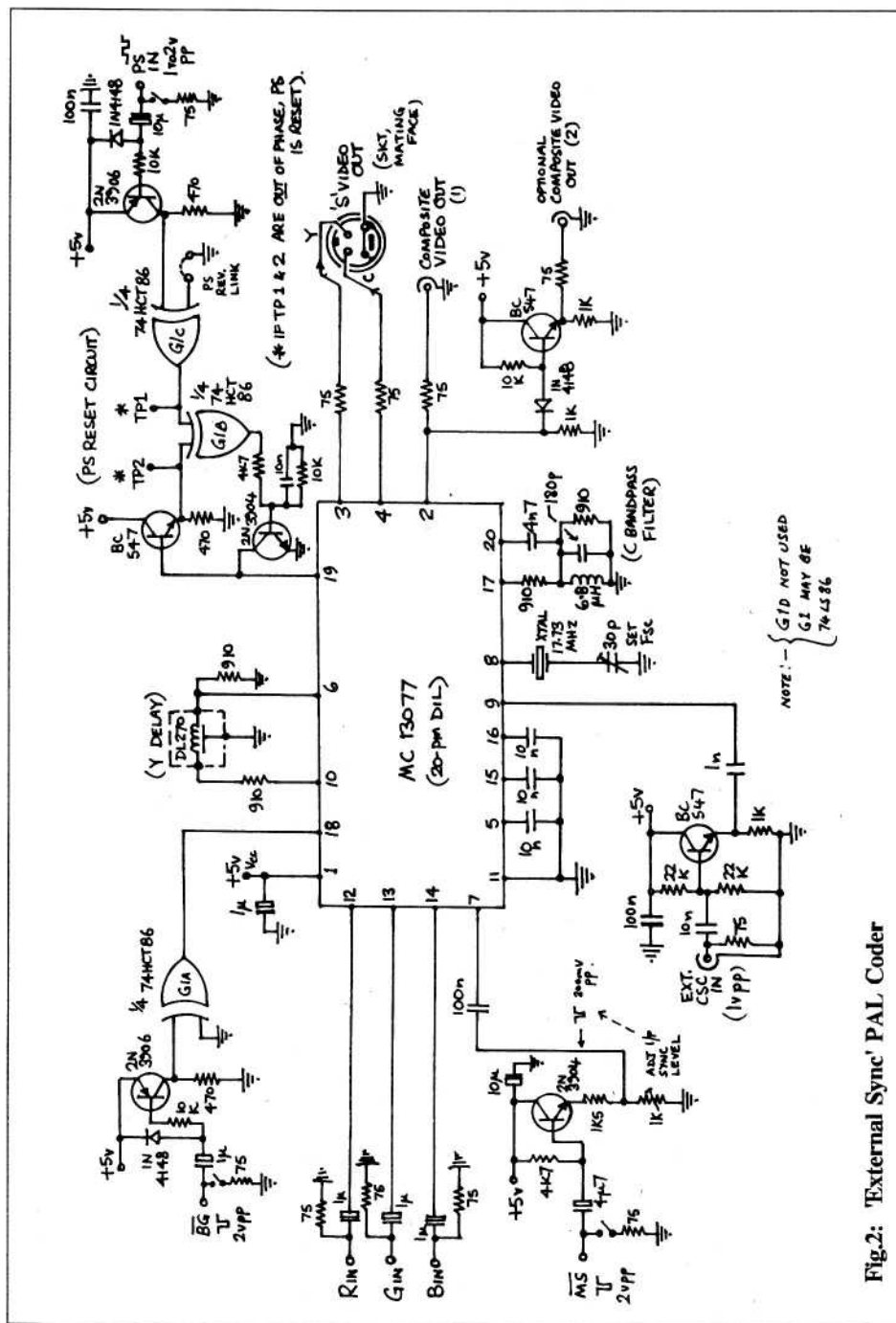


Fig.2: External Sync' PAL Coder

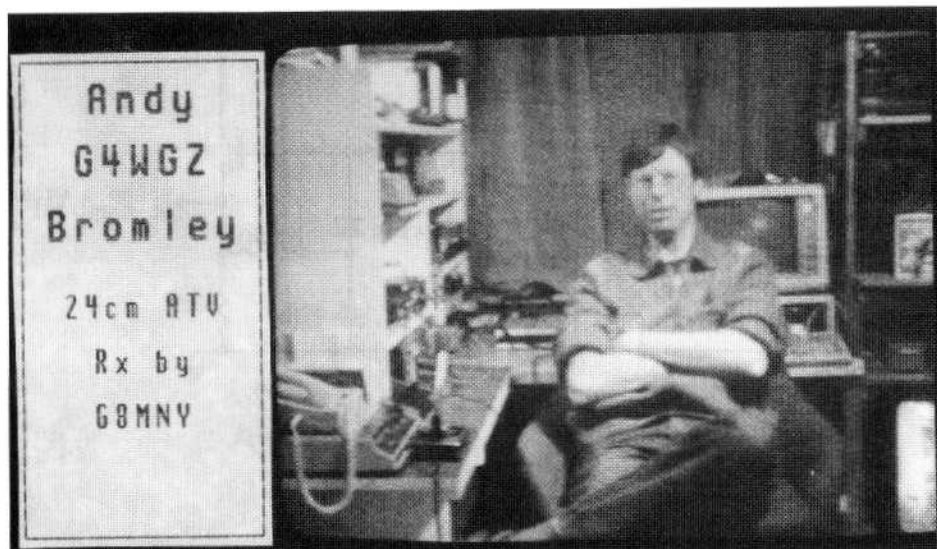
The data sheet recommends a Toko bandpass filter type H286-4963DAD for the chrominance signal (between pins 17 and 20). The group-delay of this filter leads to the requirement for a 400nS delay in the Luminance path.

A simpler alternative is to use the Philips DL270 270nS receiver luma delay line (available from Maplin, Stock No UH84F, £1.36). Subtracting the internal filter delay of 100nS means that we need a bandpass network with a delay of 170nS. The network used (6.8uH//180pF,  $Z_0=910\Omega$ ) has a delay at CSC of 165nS; its response is -20dB at 1 MHz, compared with -22.5dB for the specified Toko Filter. However, the Toko has 6dB better suppression at 8.86 MHz. (Figures calculated using Number One Systems "Analyser" Computer Program). I feel that this compromise is justified on the grounds of both economy and convenience.

Although the MC13077 is specified for RGB inputs, it is possible to accommodate Y U V inputs by feeding Y into the RGB inputs, and feeding U and V directly into the chrominance modulators via the pins that normally connect the clamp capacitors (15 and 16). For more details on this mode of operation, see the data sheet. Note that the output sync level (not adjustable) is specified at the NTSC standard of 280mV rather than the PAL level of 300mV. Finally, the PAL 4xFsc crystals (17.734475 MHz, parallel resonant, 30pF) can be obtained from:

Golledge Electronics Ltd, Merriott, Somerset, TA16 5NS; Phone: 01460 73718, Fax: 01460 76340

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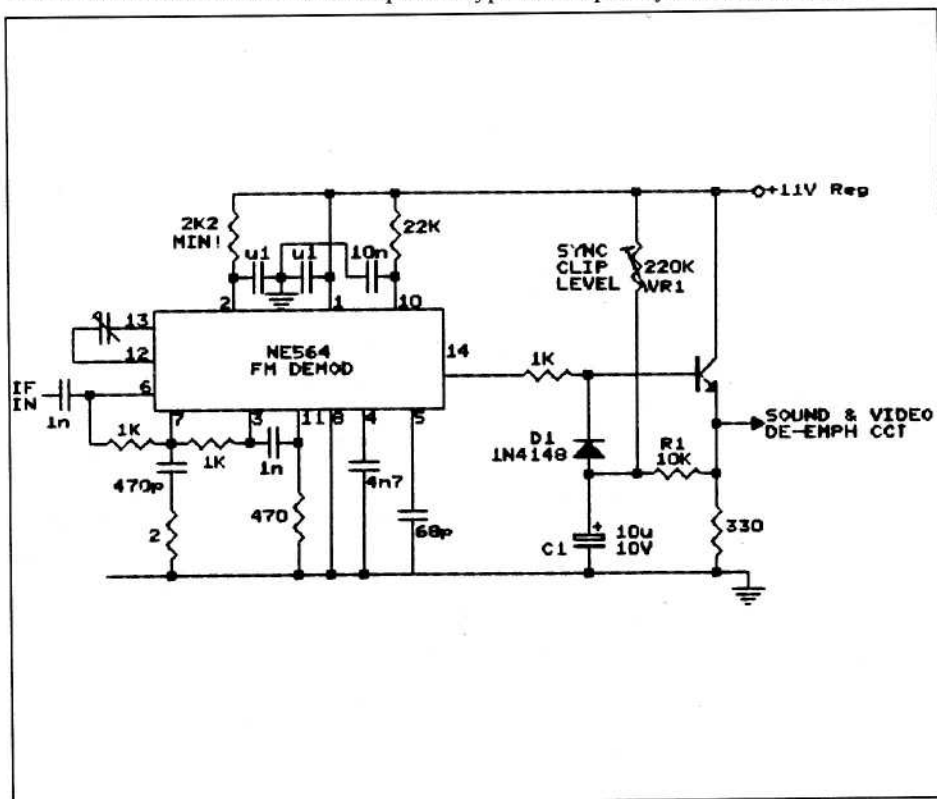
# Radar Clipping To Sync Level

John Stockley G8MNY

*This circuit has been recently used on GB3HV to limit the large negative pulses on the recovered video from the NE564 demodulator.*

These pulses had been effecting the video amp DC levels, resulting in short periods of no sync. The use of negative clipper after the de-emphasis network was not used as that would allow the radar pulses to damage the video syncs, by integrating them with the syncs before the clipper.

Clipping in the buffer before de-emphasis was more effective. The effect of loosing the sound subcarrier during radar clipping was not noticeable. The circuit takes the average buffered DC video level with R1 & C1. RV1 is used to just get D1 to clip the high impedance base signal, when a white picture is present by adjusting VR1. The NE564 circuit shown is an improved type developed by G4CRJ/G8LES.





## *Press Release*

# **Amateur Television Repeater GB3TM**

*The Amateur Television Repeater GB3TM, which is located near Amlwch on the Isle of Anglesey in North Wales, came on air on Thursday 14th July 1994.*

The allocated Channel is RT1-2 which specifies an input frequency of 1249 MHz and an output of 1316 MHz. The repeater accepts 625 line fast scan F.M. TV signals with 6 MHz inter-carrier F.M. sound and re-radiates these in the same mode. The station is located 154 metres above sea level and has a clear signal path over the sea in virtually all directions covering the Lancashire and North Wales coast, to Ireland, Isle of Man and possibly Scotland.

The transmitter uses the Worthing phase locked loop transmitter, as a drive unit, followed by a Mitsubishi M57762 broad band integrated module providing a power output of 10 watts. The receiver is a modified professional satellite receiver preceded by a GaAsFET pre-amplifier and followed by a video amplifier to provide a standard video output signal. The home-constructed aerial system consists of two Alford slot aerials machined into a common vertical aluminium tube, one above the other providing omni-directional horizontal polarisation. The aerial system is fitted in a plastic tube (drain pipe) for complete weather protection and is mounted on an existing radio tower about 10 metres above the ground. A five element band-pass filter, centred on 1249 MHz is connected between the receive aerial and the receiver to prevent the repeater transmitter causing breakthrough.

The control logic is based on the BATC I<sup>2</sup>C Teletron system and contains a caption generator, Z80 processor, video signal detector, video and audio switching, keyboard decoder and PAL coder. The transmitter, receiver and control logic are housed in 19inch rack cabinets, fitted in a dedicated cubicle. The repeater operates continuously, in beacon mode, displaying a variety of captions, news pages with audio morse code identification.

When accessed by a valid signal the repeater provides through transmission of video and sound. The usual 'K' and 'time out' functions are provided and the news pages can be up-dated remotely. Software for the project has been written mainly by G1FEF with additional programming by G8VAT and GW8PBX.

GB3TM is the only ATV repeater within the Arfon Repeater Group which serves Amateur Radio and now Amateur Television, in West Wales. The technical team includes GW3JGA, GW3MEO, GW4KAZ, GW8FEY and the Repeater Keeper, GW8PBX. Reports would be most welcome and should be sent to GW8PBX, QTHR.

# Sansui VX-99 Vision Processor Mods

John Stockley G8MNY

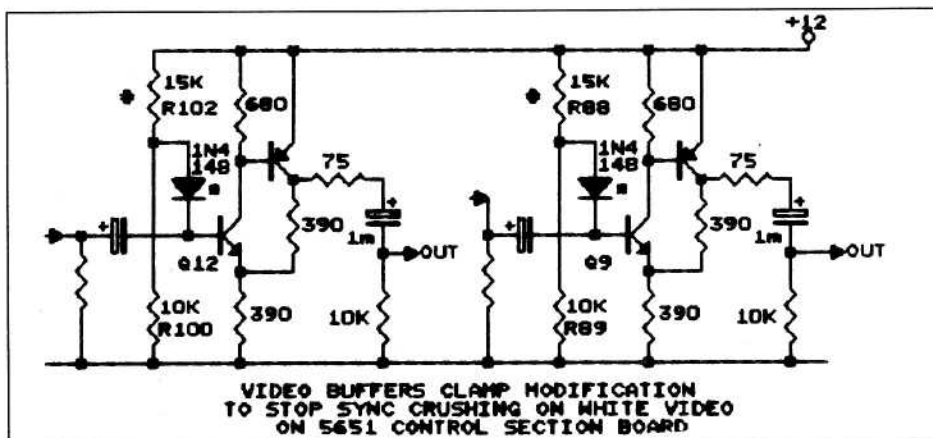
*Although the Sansui VX-99 Vision Processor is a very useful piece of equipment it does have one or two idiosyncrasies. Here are a few modifications that will help to overcome most of them and also perhaps provide a few more!*

## Modifications

- 1) Correct the sync fault, found with an "all white" video source.
- 2) Correct colour phase unbalance, between A/B input.
- 3) Null colour crosstalk between A/B inputs.
- 4) Provide 12V DC powering.
- 5) Remote effect wiper control.
- 6) Add B&W "Key mode."
- 7) Multiple Wipe list.

## SYNC CRUSHING

Two of video output amplifiers suffer from this, as they are used in series, the sync compression effect is additive. I have corrected this by removing the two bias resistors, and replacing these with a "component tripod" of the original 10k $\Omega$ , a new 15k $\Omega$  and a signal diode. The resultant structure fits in place of the two resistors. The modification works by trying to keep the bias level clamped, and so stopping the sync tip voltage getting too close to ground, when the pull down current is inadequate.

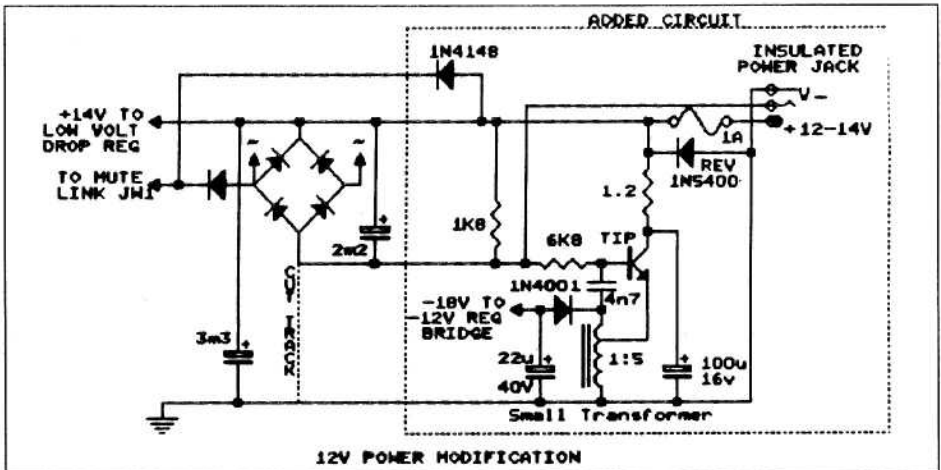
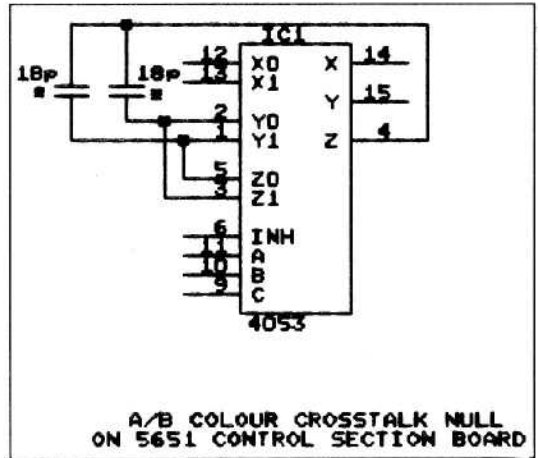


## A/B COLOUR BALANCE

Colour difference is very evident on a vectorscope, the colours change depending on how you do the mix even with two identical inputs A and B. I found that the tuned colour input Transformer T1 on the main colour PCB, would not tune far enough to correct the difference. The cure was to put a 200pF across the JW1 and JW2 wire jumpers gives added f correction.

## A/B COLOUR NULL

Colour crosstalk is visible when the other source has BLACK in some A/B switching modes at about -32dB. I found the crosstalk was visible in only two out of the 4 input options, and that the crosstalk is negative, i.e. it gave the receptacle colour. So by adding two 18pF capacitors across one of IC1 electronic switches this opposite phase could be added to cancel the crosstalk. The reduction was at least 10dB, giving >40dB isolation, on 100% colour bars. A/B colour crosstalk to the mixers own background black still remains.



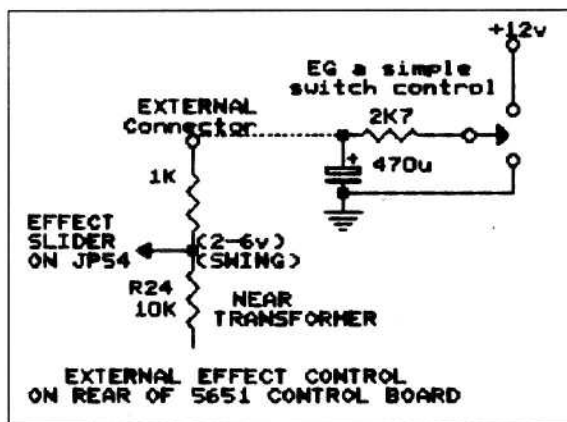
## 12V POWERING

Most of the mixer runs on 12V @ 500mA, from an very low voltage drop regulator. So simply feeding 12V via a fuse link and idiot diode, into the storage capacitor works for this rail. The other rail is -12V @ 40mA, and uses a transistor regulator fed with about -18V. I used a ordinary NPN "TIP" transistor in a self oscillation transformer stage, and derived -18V by rectifying the back EMF of the full winding. The transistor bias 6.8K<sub>Ω</sub> and the 4n7, may need selection depending on the transistor gain and transformer winding.

All inverter components were mounted around the transformer. The whole lot was then cable tied through the existing holes in the PSU PCB. To stop the inverter running when on mains power, a switched power jack. The inverter is biased only when bridge rectifier is not earthed by the jack break contact and pulled up to +12v by the 1k8. Although at ground potential, the power Jack must be insulated from ground to stop audio hum loop, because on mains power, the rectifier pulse current flow through the jack. Overall power consumption on 12v is 600mA, and I have not noticed any problems so far with low voltage.

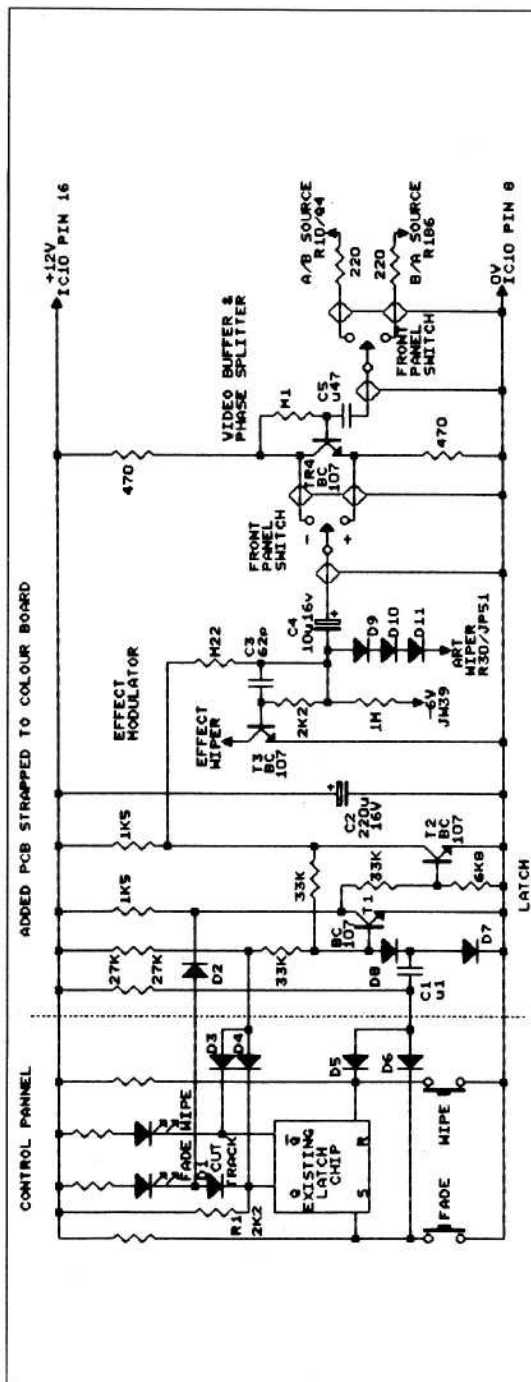
## REMOTE EFFECT

This enables switch, relay or direct computer remote control of the main fader, and only consists of adding 1 internal resistor and a connector (use one of the spare Scart pins if you like). The place to solder on the 1k $\Omega$  (for protection) is on the JP54 end of R24 near the mains change can be measured as you move the wipe slider. The voltage swing needs to be +2 to +6V and damped to show up the effect. I found a 2.7k switched between 0 and +12V gave the desired swing, and allowed a 470 $\mu$ F to give an adequate effect time. The manual control still has some effect when external voltages are connected, and it enables the equal in and out timing of the "effect" to be adjusted.



## ADDING KEY MODE

This uses the existing WIPE and FADE mode buttons to control this mode. When pressed together the WIPE and FADE LED's go out. This state is detected by D3 & D4 and sets the two transistor latch T1 & T2. Pressing either of the buttons again,



through D5 & D6 clears the mode. To make both LED's light up in this mode (the WIPE LED defaults on) the track in series with the FADE LED is cut and bridged with D1, a second pull up resistor 2k2 is placed to the nearby +12v track, this permits this LED to be lit independently of the existing latch chip.

With KEY mode on, T1 is on, the FADE LED lights up through D2. T2 is off and its collector voltage is used to bias up T3, that to video modulates the DC on the EFFECT CONTROL wiper, with the pre selected video source. The bias is adjusted through D9, D10 and D11 from the 0 to -2V on the "ART" control. The M1 resistor to -6v ensures T3 is well cut off when the mode is not selected. The EFFECT wiper voltage and a selected "wipe wave form" feed a comparator that produced the KEY that drives the vision switch.

T3 is fed either from positive or negative video, from the  $\bar{n}$  switch, which is derived in the phase splitting buffer stage T4. The buffer is fed with either A/B or B/A video. Two changeover slide switches (I used matching black slide ones) are mounted on the front panel to the left of the NEG mode switch. Two square holes are needed in the 3mm Aluminium fascia and 2mm plastic. The switches are

"captured" in the soft plastic with the aid on an iron. All the video wiring is in thin screened lead except the fader control which is open wire. The whole circuit is easily made on a strip or other type of PCB, and can cable tied to the CHROMA PCB wiring.

## KEY RESULTS

The KEY mode, can key on and off at up to 3 MHz, the SOFT wipe control giving apparent sharpness control as it softened and speeds up edges, at the same time. KEY sensitivity is adjusted by ART control and can be enhanced by selecting the WIPE mode "shape" that best fits the wanted KEY, and choosing a EFFECT control position, that combined the key and wipe best. The ñ KEY switch works like the NOR/REV button, but with the inverse of the wipe shape.

The MIX key can be used to colour in graphic keys generated from a genlocked B/W camera.

## MULTIPLE WIPES

This pictorial list is the effect of pressing more than 1 wipe button, not mentioned in the

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# ELECTRO-MECHANICAL ASSEMBLY

## 24cm Pre-Amplifier

The GaAsFET pre-amp previously manufactured by G4BVK under the AZTEX Electronics banner is back in production. Designed to fit between your RX antenna and your receiver it offers a gain of 17dB with a noise figure of only 1dB. The gain is flat across the 23/24cm band and has an 8dB roll-off at around 700 MHz to help reduce broadcast TVI. A highly stable design based on the ATF10135 GaAsFET using SMT components, it is boxed and aligned. The DC supply can either be via the coax or external to your requirement. RF switching is not provided. A 70cm version will be available in the near future.

**Price: £67.00 + £2.00 p&p**

**Electro-Mechanical Assembly, 18 Mandeville Close, Wyke  
Regis, Weymouth, Dorset, DT4 9HP. Tel: 0305 77857**

# CAT'94 REPORT

## SHUTTLEWORTH COLLEGE

SEPTEMBER 10TH & 11TH

**Paul Marshall G8MJW**

*September came round very quickly. The 'phone was its usual self around Convention time, always ringing. The calls themselves are seldom brief, mostly it is someone you know vaguely, or worse still, someone you know well. The calls can sometimes last an hour! All very nice really, and I'm sure BT make good money out of our Conventions! Their current ad. campaign amuses me,*

*'It's good to talk...'*

Well, what of the Convention itself? It is not for me to judge the success of the event, that is your job, so I will just try and give a flavour of it without singling anyone or anything out too much.





The Saturday afternoon saw the gathering of the really faithful, some bearing exhibits and some from far away. Setting up was punctuated by much chatter and some deeper conversations. The afternoon was mainly bright and sunny, apart from a violent hailstorm which rather inhibited any outside setting up for a while.

The good weather returned and as the evening approached, those gathered began to anticipate dinner. Around 40 people attended the 'semi formal' dinner and Chris Smith entered into the spirit of the thing completely by turning up in his dinner jacket! The meal was excellent, (*it ought to have been the courses were all in French! Who says that the BATC has no style?*) and upon retreating to the bar some earnest talk peppered with lighter chatter carried on till past closing time.

The next morning was much less fraught than many a previous year no real setting up to do, and best still, the 'team' didn't have to get up at 6 am! The balance of the traders and exhibitors rolled in and set up their wares. This was not a Rally it was a members event and it was pleasing to see the real core of the club turn up, especially those with things to show.

I will depart from my intention of not singling anyone or anything out, by just mentioning the lecturers they really did do an excellent job for us during the course of the day:

Dicky Howett delivered a talk for the first time in fine style on the EMI 203 camera and some related TV history.

John Standon delivered an excellent and well presented lecture on digital image processing .

Barry Jackson stimulated much thought with his presentation on JPEG compression which included an interesting demonstration.



Video tapes were shown, including a Convention Address by Ian Waters G3KKD, and some interesting US TV repeater footage supplied by one of our visitors, Ken Wood K6IIS.

I must also recount the seminar groups which were well attended. The Repeater Forum and ATV into the Future were chaired by Graham Shirville G3VZV and Bob Robson GW8AGI. These no doubt will be the subject of separate reports.

The BGM that followed was one of the best attended that I can remember, and I have been to every one since 1974.

I will remember it as a friendly, untroubled 'do' where people actually had time to talk, to communicate on a level deeper than is ever possible at a Rally, and hopefully it will have made a contribution to steering ATV into the next century.

My one overriding disappointment is the relatively low turnout there were certainly sufficient people to make the event work, and many of those were the prime movers and vanguard of ATV. It was a members event not for massive trading or anything else other than TELEVISION.

On a purely personal note I would like to thank the three people who telephoned to thank me for the event, and especially the four people who wrote to me saying how much they enjoyed it. Things like that make it worthwhile.

We had a good international turnout, two from the USA, four from Holland, three from Ireland and one from Switzerland. This kind of support really leaves little excuse to those who claim our events are always 'too far to come'. (*Sorry about that little dig.*)



The event had a feeling of the old BATC Conventions, Leicester or Crick in its early days before it became too big.

*Is this what people want?*

*Is the split event the right formula?*

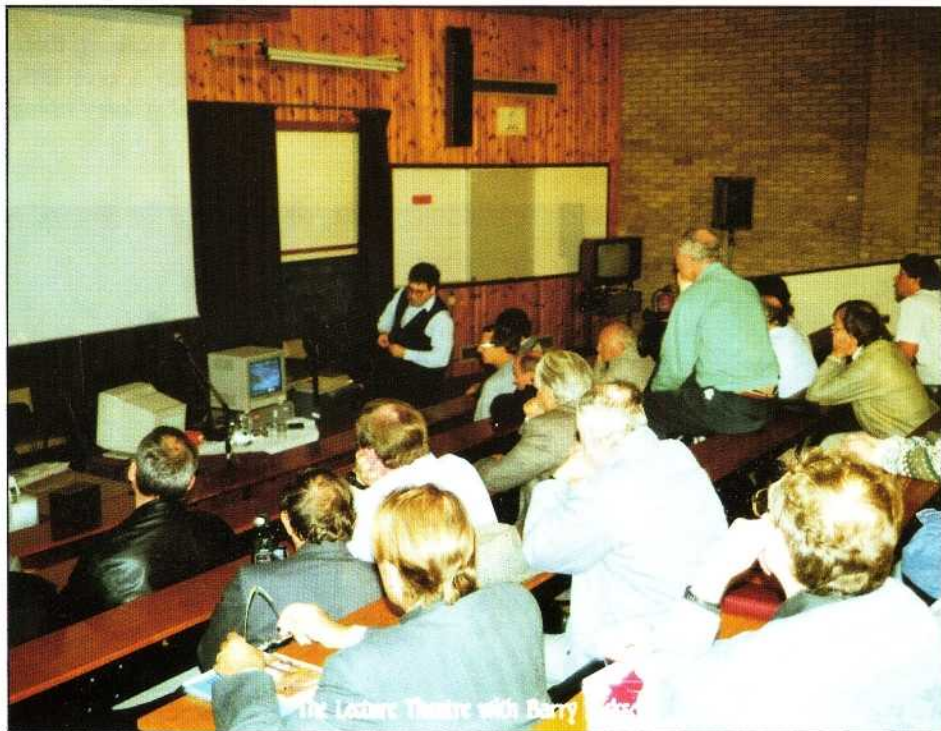
*What do you think?*

Please write to me or telephone, but **DO SOMETHING** if you possibly can. I can be contacted on 0522 703348 or write to me at:

***Fern House, Church Road, Harby, Newark, Notts., NG23 7ED***

The lecture hall proceedings were all videotaped and we hope to make a video available to members and interested clubs and groups. To try and raise the standing of the club I think it would be good to publish a 'Proceedings of BATC CAT '94' which can be sent to interested parties and perhaps to colleges where hopefully we might encourage some younger members which we sorely need.

In conclusion I would like to thank all those people who contributed in any way they are too numerous to mention individually, but the Committee as well as myself thank them.

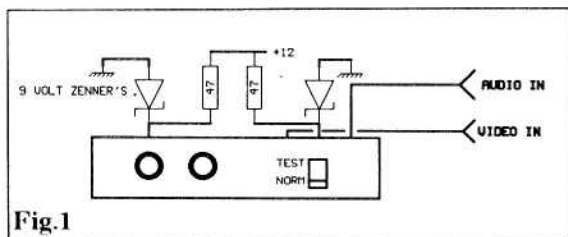


# ATV Receiver from a surplus Pace SS3000

Trevor Brown G8CJS

*We now seem to have reached a point where satellite receivers are appearing on the second-hand and surplus market, perhaps they lack sufficient channels or the inevitable Videocrypt decoder that seems essential to find anything worth watching from outer space. They may be faulty or incomplete, but they are full of reusable components. I claim no originality for the following information most of it was gleamed through PCB tracing.*

I picked up a couple of Pace SS3000 in a sorry state for under £10 and have reused many of the components. The RF modulator on the 33000 takes in both sound and vision and also provides a test pattern on the output for tuning in the TV set, Fig.1 Shows how to connect it, so you can use a standard TV set as a monitor, for both sound and vision.



The two front end modules also worked, they take in 24cm ATV and produce a video signal, be it of low level, add a simple video amplifier and you are watching the local ATV repeater. The tuning voltage and module supply can be derived from 12 volts unless you need to tune all the way up to 1750 MHz, but there is not a lot of ATV activity up there. Fig.2 shows the basic receiver.

Fig.3 shows how to reuse the sound chip and add sound to your ATV receiver. I have also included the RF modulator so you can drive a standard TV receiver. The whole unit works from a 12V supply and as such makes an ideal mobile receiver. The front end sensitivity is a little down, so a good pre amp is a worthwhile investment and if you can find one that's powered via the coax cable then you need only add the LNB supply preferable through a suitable fuse so if you omit the pre-amp and use a loop Yagi you don't do too much damage.

I am still left with mains transformers which are the expensive toroidal kind for future projects, some voltage regulator chips and two interesting Character generator chips which as yet I have no data on, but if you have, my address is in the who to write to bit on the last page of the Members' Services Supplement.

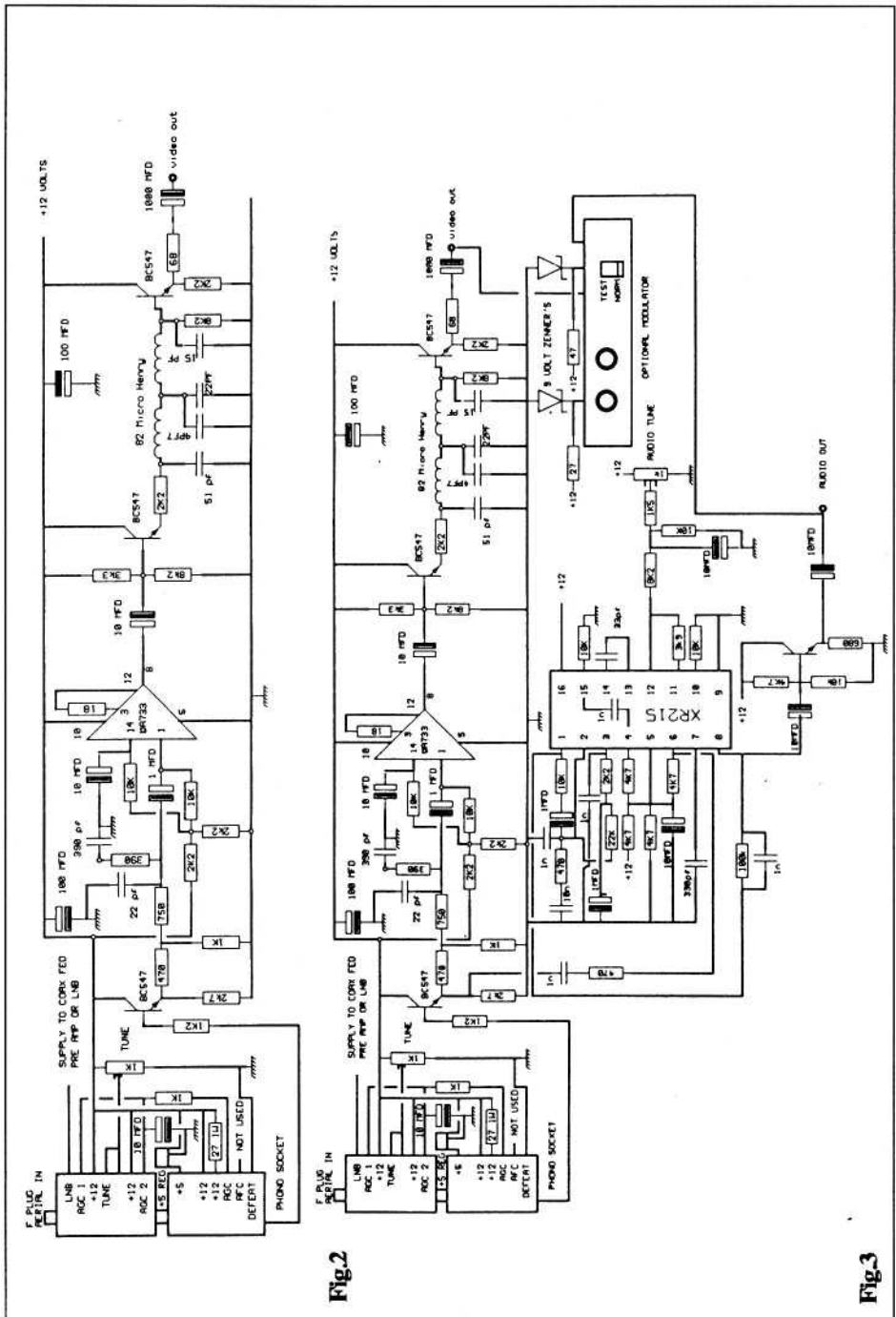


Fig.3

## Contest Calendar

### Autumn Vision 94

Saturday 12th and Sunday 13th November

Time 1800 GMT Sat. to 1200 GMT Sun.

Slow & Fast Scan all bands

Entris by 5th Dec. 1994

### Winter Vision 94

Saturday 10th & Sunday 11th December

Time 1800 GMT Sat. to 1200 GMT Sun.

Slow & Fast Scan all bands

Entries by 3rd Jan 1995

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**PC**

**JVfax - SSTV**

**PC**

**HamComm and PktMon**

Complete pack available with these excellent programs, 9FD or 25FD TRANSCEIVE interface, Manuals, and some GIF pictures for £ 22.50 inc.

Telephone 081-595 0823 or send me a S.A.S.E and an extra stamp for a nicely Illustrated Information leaflet.

Peter Lockwood G8SLB, (BATC), 36 Davington Road,  
Dagenham, Essex, RM8 2LR.

THE BRITISH AMATEUR TELEVISION CLUB

BALANCE SHEET AT 31 DECEMBER 1993

	<u>1991</u>	<u>1992</u>	<u>1993</u>
<u>FIXED ASSETS</u>			
Office equipment			
<u>Additions</u>	625	780	1,130
less- Depreciation	<u>625</u>	<u>780</u>	<u>1,130</u>
	-	-	-
<u>CURRENT ASSETS</u>			
Debtors	-	-	500
Stocks- members services	4,106	5,473	7,817
publications	4,161	8,923	7,014
Nationwide Building Society	-	24,065	11,550
Midshires Building Society- deposit account	12,161	-	-
Lloyds Bank plc- current account	6,333	-	-
investment account	22,000	-	-
Girobank account	80	119	119
Royal Bank of Scotland- current account	-	5,392	5,527
investment account	-	9,000	25,010
	<u>48,841</u>	<u>52,972</u>	<u>57,537</u>
less-			
<u>CURRENT LIABILITIES</u>			
Creditors and accruals	1,087	959	959
Subscriptions received in advance	<u>18,280</u>	<u>17,379</u>	<u>18,748</u>
	<u>19,367</u>	<u>18,338</u>	<u>19,707</u>
	<u>£29,474</u>	<u>£34,634</u>	<u>£37,830</u>
Represented by-			
<u>ACCUMULATED FUND</u>			
Balance brought forward	25,647	29,474	34,634
add-			
Surplus of income over expenditure	<u>3,827</u>	<u>5,160</u>	<u>3,196</u>
	<u>£29,474</u>	<u>£34,634</u>	<u>£37,830</u>

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.

Chartered Accountants  
Gainsborough  
23 August 1994

**RNStore & Co**  
Chartered Accountants

THE BRITISH AMATEUR TELEVISION CLUB

INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDED 31 DECEMBER 1993

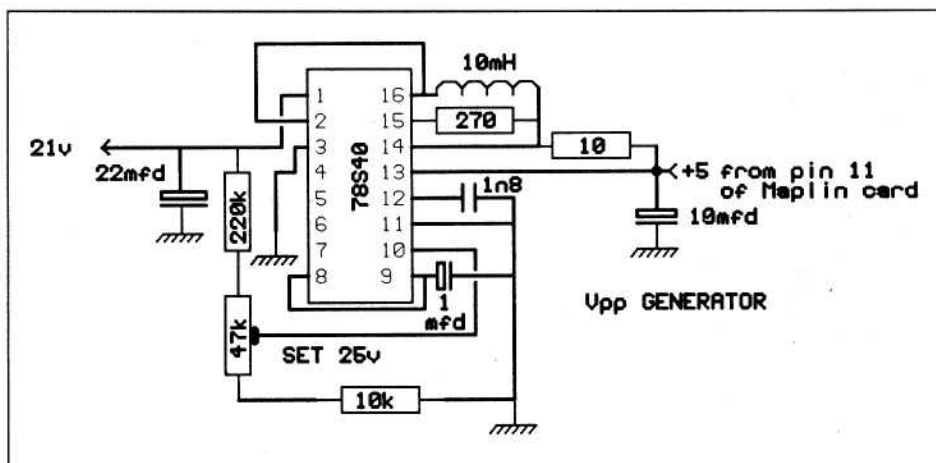
	<u>1991</u>	<u>1992</u>	<u>1993</u>
<b><u>INCOME</u></b>			
Subscriptions	17,317	17,602	17,470
Members services	873	1,223	925
Publications	781	990	1,055
Advertising	475	587	621
Building society interest	481	1,104	494
Bank interest	1,714	880	655
Exhibitions	1,912	2,713	3,018
Donations	107	122	342
Postages	265	309	359
Donated equipment sales	364	2,581	7
	<u>24,289</u>	<u>28,111</u>	<u>24,946</u>
less-			
<b><u>EXPENDITURE</u></b>			
CQ TV printing	8,955	8,638	9,401
CQ TV postage	4,179	4,159	4,377
CQ TV production	1,149	1,679	1,757
General office expenses	924	671	664
General postages	1,068	974	858
RSGB affiliation fee	18	15	15
Committee members' expenses	139	88	28
Exhibitions	1,789	2,146	2,478
Advertising	14	-	-
Insurance and legal	55	133	60
Miscellaneous expenses	314	129	-
Members' benefits	1,177	665	1,144
Accountancy	245	255	255
Rally attendance	436	434	322
Recruitment	-	1,535	207
Project development	-	1,160	56
Bank charges	-	270	128
	<u>20,462</u>	<u>22,951</u>	<u>21,750</u>
<b><u>SURPLUS OF INCOME OVER EXPENDITURE</u></b>	<b>£ 3,827</b>	<b>£ 5,160</b>	<b>£ 3,196</b>

# BEYOND TTL

Trevor Brown G8CJS

*In CQ-TV 166 we covered a simple EPROM programmer for the PC. The interest was beyond expectation in both requests for the software and suggestions for additions and improvements many that are still under active consideration.*

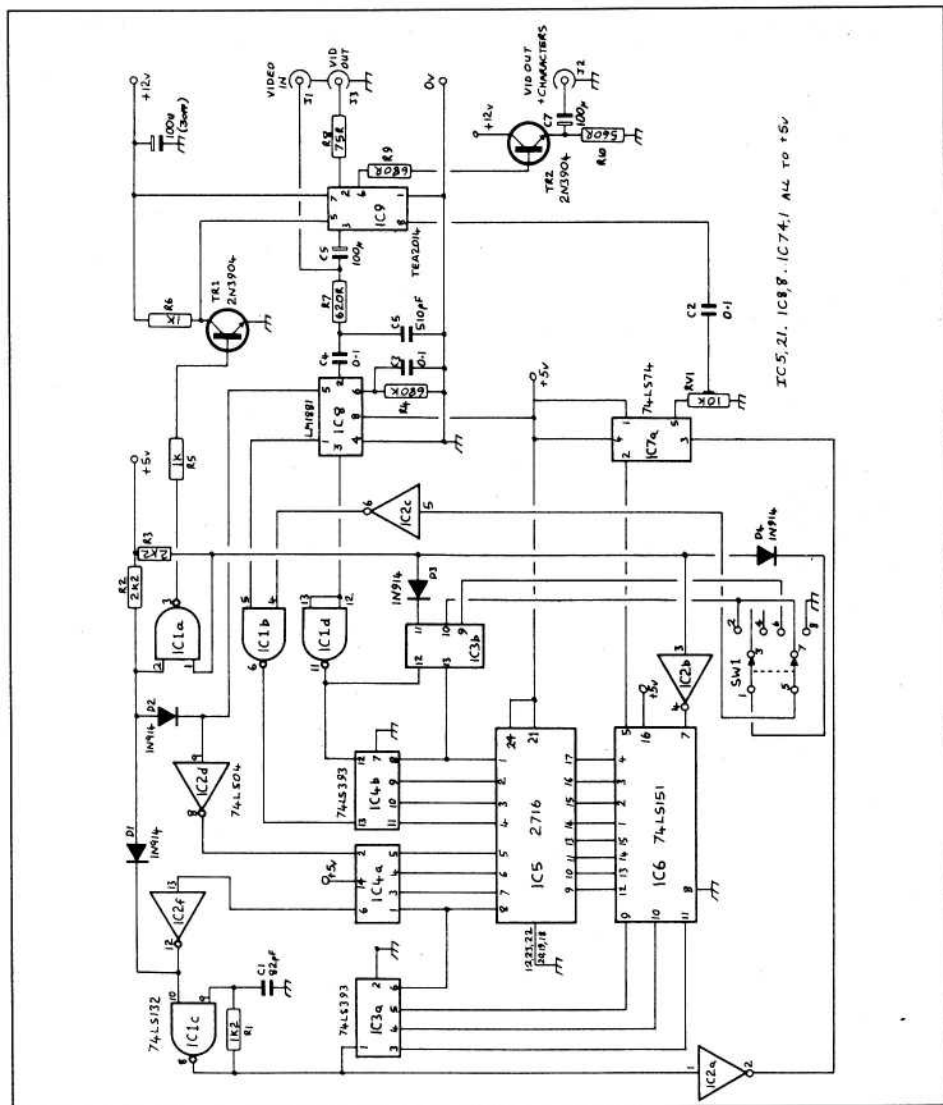
Chris has written version one of the software and is working on adding a hex editor, (to quote Tina Turner 'All Systems in Overload'). The circuit below was just some of the input, it came from a Mr D.L.Smith who sent it via my FAX machine, I have redrawn it as the original suffered in the process to a point where it was difficult to read pin numbers and values.

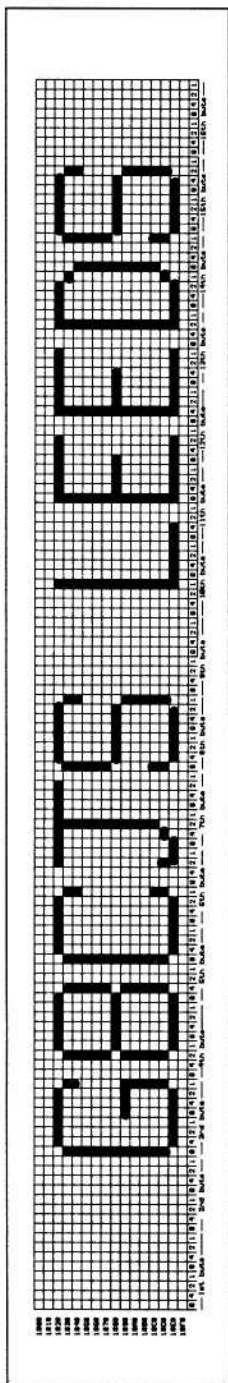


The circuit removes the need for a mains power pack in that it generates a variable V<sub>pp</sub> that can be set to +12v or +21v. The circuit is driven from +5v and removes the problem of 21v regulators which are a little thin on the ground. This additional circuit enables the EPROM programmer to be driven from the +5 and +12 rails that are available within the PC. I also take the point that you would all like the switches removing and menu selection of the devices implementing, along with a suitable PCB design ( If only I didn't have a full time job, if the boss is reading please ignore that last remark). It also appears that there are two versions of the Maplin interface card, one version with a fuse and one without. The fuse version has the +5 on pin-14 of the D type connector, and the non fuse version has the +5 on pin-11 of the D type connector. Thanks Maplin.



Now we can programme EPROMs the affluent ones via a PC, and the impoverished via a Spectrum ( see page 64 of The ATV Compendium for a Spectrum EPROM programmer which still has a PCB available via members services). Let us now start and put this technology to use.(PC owners will need a Hex editor such as Xtree until Chris comes up with one for the custom software). In the ATV Compendium Page 15 is a simple character generator that will superimpose a short message about fourteen characters long on a video signal. A PCB is available and the circuit diagram is reproduced below for those of you too mean to buy the book.





With the new power of an EPROM programmer at your finger tips let us set to and programme an EPROM for the generator. The PCB will suit numerous EPROMs, but I will only cover the 2764. The PCB needs a couple of modifications, pin-2 of IC5 (the EPROM) has no print so join it to pin-1. The same for pin-27 so join it to pin 28 (sorry but the original design was for a 24 pin device the PCB was laid out for 24 pins and then, almost updated to 28 pin devices). There is also a solder bridge that needs making so as to ground pin-25.

The PCB is now ready to accept a 2764 all you need do is programme one. You need to plan your important message / callsign on a matrix of 16 by 128 as per the diagram, shade in where you would like text and leave it blank where you would like picture. Leave a space of about 2 characters at the start.

Once you have finished the art work you need to crunch it into numbers and enter them into the EPROM programmer. Start at address 1800 (just one of the secrets I have kept to myself).

The first byte is calculated by looking at the first eight squares and adding up the column values shown at the bottom of the chart for shaded squares only. The result is 00 hex because there is no shaded area. If we carry on entering 00 until we get to address 1823 we should enter 7e, i.e.  $4+2+1=7$  and  $8+4+2=e$ . 1824 should be 1f and 1825 should be 87.

I will not dazzle you with any further mathematics but if you study the chart long enough it will make some kind of sense. You will then be able to prepare your own chart unless you want to radiate my callsign and QTH.

When you have successfully done battle with the EPROM and programmed it with the appropriate information then remove the EPROM fit it into the character generator and stand back and admire your handy-work or return to the drawing board and re-think your arithmetic.

# Satellite TV News

**Paul Holland G3TZO**

*Much has happened since the last issue of "Satellite TV News". In this issue I report on the latest satellite launches, a host of planned new channels and the latest news on developments in compressed digital TV technology.*

## GENERAL LAUNCH NEWS

The following launches are planned for the remainder of this year. All satellites listed operate in Ku Band and will carry either carry DTH Satellite TV services or a combination of permanent and occasional use TV feeds. It can be expected that an increasing use of digital compression will be seen on these new satellites.

Date	Satellite	Launch Company	Orbit
10/94	Astra 1D	Arianespace	19. 2 E
10/94	Orion F1	General Dynamics	37. 5 W
11/94	Eutel II F6	Arianespace	13. 0 E
11/94	Telecom 2C	Arianespace	3. 0 E
12/94	Panamsat 3	Arianespace	43. 0 W

## INTELSAT NEWS

### Planned Intelsat Launches for 1995

Intelsat 704 66. 0 E Replacing Intelsat 505 IOR Intelsat 705 31. 0 W New AOR satellite Intelsat 707 18. 0 W Replacing Intelsat 515 AOR Intelsat 708 40. 5 W New AOR satellite

Each series VII satellite carries 26 C Band and 10 Ku Band transponders.

### New Intelsat KX series satellites

Intelsat are considering launching a series of Ku band satellites dubbed Intelsat KX. Intelsat KX is envisioned as a mid Atlantic back up for Intelsat K currently located at 21. 0 W. Intelsat KXA would be targeted at business currently served by PANAMSAT in S. America. Intelsat KXB would target the pan European regional and DTH market currently served by Eutelsat and SES.

Contracts for the initial KX spacecraft were to have been placed in September. No details of the payload were available as the CQ-TV deadline approached.

## ORION ATLANTIC

October was scheduled for the launch of Orion F1 which will be located at 37.5 W. This is the first satellite launched by a new US based organisation called Orion Atlantic. The satellite is engineered specifically to support international VSAT networks together with television, audio and data distribution using low cost small diameter earth stations. Orion F1 will provide uplink and downlink facilities across Europe and N. America and will provide options for compressed digital video transmission and international satellite TV news gathering.

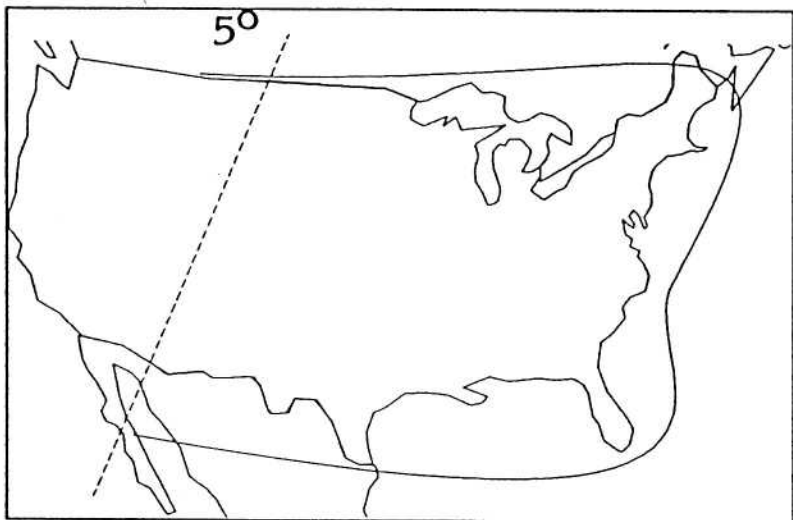
### Orion F1 Satellite Profile

Launch Vehicle:	General Dynamics Atlas IIA
Manufacturer:	British Aerospace (Eurostar 2000)
Launch Mass:	2340 kg
Location:	37.5 Deg W
Lifetime:	11 years
Power Consumption:	3.1 kw
Transponders:	34
Amplifiers:	15 W SSPA's
EIRP Spot Beam:	54 dBW (max)
EIRP Broad Beam:	48 dBW (max)
Polarisation:	Dual linear with spacial diversity
Transponder B/W:	54 MHz (28 Tp's) 36 MHz (6 Tp's)
Uplink Frequencies:	14.0 - 14.5 GHz
Downlink Frequencies:	11.45 - 11.7 GHz 12.5 - 12.75 GHz

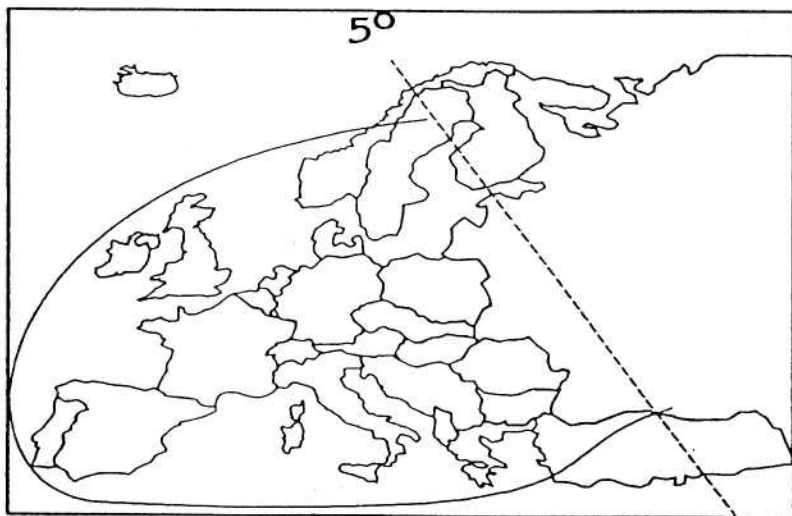
Fig.1 overleaf shows the North American and European broad beam coverage area.

### EUTELSAT II F6 (Hot Bird 1)

All 16 Tp's on this satellite have now been booked. The list of broadcasters and channels is reported as follows ; Tonis TV (Ukrainian), Dow Jones (24 hr per day business news), RTL (2 Tp's), NBC Super Channel, The Chinese Channel, MTV, RAI Uno, RAI Due, TV 5, Polonia Sat, Premiera TV (Canal Plus owned), RTE International MCM (French Music Channel), Dubai TV and the Dutch PTT (probably for a Philips Media/Graff cable PPV service). It is clear from this list that there will be a major musical chairs exercise following the commissioning of Hot Bird 1. Current Eutelsat broadcasters will relocate from existing satellites together with new broadcasters taking both the resulting spare and new capacity on Hot Bird 1. The new BBC European News Channel is not reported as listed for Hot Bird 1 and may be destined for a spare TP on Eutelsat II F1.



North American Broad Beam Coverage



European Broad Beam Coverage

Fig.1: Primary Coverage Areas of Orion 1

## ASTRA 1D

At the time of writing there was little hard news about allocation of the 14 FSS TP's on this satellite. One option being rumoured is that B-Sky-B may take as many as 8 TP's to provide a Near Video on Demand (NVOD) movie service. As usual SES are keeping their cards very close to the chest as the scheduled launch date of 28th October approached.

## TURKSAT 1C

This second Turkish satellite (Turksat IA is at the bottom of the Atlantic) will be launched by Arianspace in mid 1996 and will be positioned at 31. Deg E.

## NEW CHANNELS

In addition to new channels reported elsewhere in "Satellite TV News" the following services have either been reported or announced for European Satellites ;

**Sci - Fi Channel:** Now likely to launch a cable service via Eutelsat in January or February 1995. An Astra launch is also possible (perhaps on spare capacity released by TV3/TV1000 Channels to Intelsat 702)

**Viva 2:** A second Music TV service from Viva in competition to VH1. Licence applications have already been made in Germany and the service would almost certainly be carried by Eutelsat and should launch early in the new year.

**Canal Plus Poland:** A further spin off from the French channel will launch via Eutelsat (probably at 13. 0 deg E) in the next few months carrying a general entertainment service.

**German Childrens Channels:** US company Viacom have applied for a licence to run a new German version of the Nickleodeon Channel. The service will be unencrypted and will use Eutelsat capacity. In competition with this Viacom service Disney have also applied to German authorities for a similar service. This service, called RTL SUPER, will be aimed at both DTH and cable delivery but has not indicated a satellite carrier to date.

**Other German Channels:** These include Reise TV (Travel), ZAP TV (TV Info), SUN TV (Youth), KABEL 2 (General Entertainment), Weather Kanal, DSF 2 (Sport), SAT 2 (General Entertainment) and COM TV (Oldies Music). All should launch before mid 1995.

**Tele 55:** This successor to the now defunct French La Cinq service is due to launch on Eutelsat in mid 1995.

**Canal Assemblee Nationale:** The French parliamentary channel is reported to be opening on Eutelsat. No launch date has been given so far.

**Warner Brothers:** US company Warner Brothers have announced plans to launch a string of "family" oriented thematic channels in Europe. No timescales have so far been announced.

**CBS News Channel:** The Canadian broadcaster CBS is planning to extend its 24 hr news service to Europe in competition with CNN and the BBC.

**Canal Plus:** The French broadcaster has announced plans for the introduction of a bouquet of digital TV services. Manufacturers have already been invited to tender for manufacturing the decoders with the service planned for launch in late 1995. The receiver/decoders will probably use Eurocrypt encryption for the MPEG 2 compressed services, however see my comments further on regarding digital TV encryption standards.

## TRANSPONDER REPORT

### Turksat 1B 42. 0 Deg E:

Turksat 1B transponder frequencies are as follows;

Vertical	Horizontal
Tp 1 11. 490 GHz	Tp 9 11. 486 GHz
Tp 2 11. 590 GHz	Tp 10 11. 574 GHz
Tp 3 11. 678 GHz	Tp 11 11. 662 GHz
Tp 4 10. 979 GHz	Tp 12 10. 980 GHz
Tp 5 11. 012 GHz	Tp 13 11. 030 GHz
Tp 6 11. 054 GHz	Tp 14 11. 080 GHz
Tp 7 11. 096 GHz	Tp 15 11. 130 GHz
Tp 8 11. 162 GHz	Tp 16 11. 180 GHz

The majority of Turkish channels now located on Intelsat 604 at 60 Deg E and the various Eutelsat satellites will transfer to Turksat 1B. No allocations were available as we go to press however all services should be up and running as you read this.

### Eutelsat I F4 25. 4 Deg E.

The BBC Arabic Service is now located on 11. 658 GHz (H). Despite the inclined orbit of this satellite P5 reception is possible at this QTH. The feed is intended for retransmission on ARABSAT 1D at 20 deg E by Rome based Orbit Communications.

### DFS 3 Kopernikus 23. 5 Deg E.

The purchased by the DBP of an interest in Astra's operator SES is the precursor to the migration during 1995 of all the existing TV services from this satellite (see also TV SAT). Future use will be in providing telecoms services to the former East Germany and other East European countries.

### **Eutelsat I F5 21. 5 Deg E**

RTS SAT (Serbian TV) is back on Tp 10 11. 498 GHz (V) following storm damage to the uplink station in Belgrade during the summer.

### **ASTRA 1A,1B,1C,1D 19. 2 Deg E**

Expect to see considerable movement of channels both on and off the Astra System over this latter half of the year. The following changes are definite or probable;

- \* VHI replacing MTV on Tp 22 ( 7 days 24 hrs)
- \* CMT Europe to move from Tp 41 to Tp 24 ( 7 days 0600 - 1900)
- \* The Learning Channel to open on Tp 41 ( 7 days 0900 - 1600)
- \* Sky Travel to launch weekdays on Tp 47 (Weekdays 1200 - 2400)
- \* Sky Romance (Soap) to launch on Tp 47 (Weekdays 0800 - 1200)
- \* TV3's Sweden/Norway/Denmark to move off Astra to Intelsat 702
- \* Sci Fi Channel to share Tp 46 with Nickleodeon
- \* Travel Channel/Super Channel to locate on vacant Tp's
- \* FilmNet Plus on Tp 11 to move off Astra to a cable only feed possible from 1. 0 Deg W
- \* FilmNet The Complete Movie Channel on Tp 63 to relaunch as FilmNet Poland (still encrypted in VC2)

### **Eutelsat II F3 16. 0 Deg E.**

Algerian TV commenced a service in late summer on 11. 658 GHz Tp 34 (H). Programming is in clear PAL. Polsat is now uplinked direct from Poland sharing Tp 34 with Algerian TV on 11. 638 GHz (H)

### **Eutelsat II F1 13. 0 Deg E.**

Test transmissions started in the early Autumn for EURATEL (European Arab Television), a new Arabic service due to have launched a 24 hr service from October. The Brussels service was located on Tp 38 11. 617 (V) however as the CQTV deadline approached test transmissions ceased !

With the move of services off Kopernikus and TV SAT, RTL has relocated here on TP 33 11. 596 GHz (H).

### **SIRIUS 5. 2 Deg E**

Transponder allocations are as follows;

TV3 Sweden (Clear Pal)	11. 785 GHz (RHC)
TV6 Sweden (Clear Pal)	11. 862 GHz (RHC)
TV4 Sweden (Clear Pal)	11. 938 GHz (RHC)
FilmMax (D2Mac Eurocrypt)	12. 015 GHz (RHC)
ZTV (New Music Channel) *	12. 092 GHz (RHC)

\* Not yet launched



### **Tele X 5. 0 Deg E.**

NRK left this satellite on September 12th following its move to Intelsat 702. TV5 Nordic changes its name to TV Femman on Tp 3 12. 476 GHz (LHC) and is the only channel remaining on this satellite.

### **Telecom 1C 3. 0 Deg E**

Sure to be in big demand is Korean TV which has applied for a licence from German authorities to operate a subscription service on this satellite. The fee will be DM 70 per month and the service will be encrypted in Syster/Nagravision. Using material from the Korean state broadcaster the service will be primarily news and general entertainment. I have application forms. . . . . ?

### **Intelsat 702 1 Deg W.**

Channel allocations are as follows;

Horizontal			Vertical		
Tp 61	11. 016 GHz	TVN	Tp 71	10. 969 GHz	
Tp 62	11. 096 GHz	TV3 Norway	Tp 72	11. 054 GHz	
Tp 63	11. 176 GHz	NRK	Tp 73	11. 133 GHz	TV1000
Tp 65	11. 555 GHz	Norsk TV2	Tp 75	11. 478 GHz	STV 2
Tp 69	11. 679 GHz	STV 1	Tp 79	11. 597 GHz	TV3 Denmark

TV3 Sweden will be allocated a vertical Tp together with the Israeli services previously on Intelsat 512. The Israeli services are due to leave Intelsat 702 early in the year possibly creating capacity for FilmNet if it closes its ASTRA DTH service.

### **Telecom 2B 5. 0 Deg W.**

La Cinquime will launch on December 15th on ARTE's transponder,

Tp R3 12. 606 GHz (V). This is a publicly financed French educational channel that will use ARTE's downtime during the day. The service is likely to be unencrypted and will use SECAM. RTL TV was due to encrypt in "Smartcrypt" on 15th October. Tele Monte Carlo encrypted in Syster Nagravision about the same time to form part of the " Canal Satellite" package on Telecom 2A. A new French cable only channel called Multivision launched in September on Tp R7 12. 543 GHz (H) in D2Mac Eurocrypt.

### **Intelsat 515 18. 5 W**

SVT 1 & SVT 2 will remain on this satellite for now. TV Norge and TV 2 Norsk ceased transmissions in September.

### **TV SAT 19 Deg W.**

There have been reports that the Deutsche Bundespost (DBP) are looking to close down the D2Mac services on this satellite with a view to selling the spacecraft to

one of the Scandinavian operators. It is possible that the Swedish Space Corporation might be looking to augment capacity at 5.0 deg E currently occupied by Tele X and Sirius. An alternative buyer would be the Norwegian PTT to provide additional capacity at 1.0 Deg W.

### **Intelsat 512 21. 3 Deg W**

Now relocated at this position from 1.0 Deg W.

## **DIGITAL TV UPDATE**

### **MPEG 2 Chips**

IBM has introduced a single chip MPEG 2 decoder, which will form the core of a family of MPEG 2 products for the broadcast and consumer market. When in full production the chip should cost \$98 per unit. Other MPEG chipset manufacturers are C-Cube, LSI Logic, SGS Thomson, AT &T, Motorola and Texas Instruments. Manufacturers such as C-Cube are developing MPEG 2 chips that incorporate DigiCipher (General Instruments proprietary encryption system) chip sets. Motorola are developing a similar product that also includes Dolby AC-3 audio decoding. The majority of manufacturers are looking to ramp up production during 1995.

### **Domestic Satellite Receivers**

Thomson are struggling to meet demand for their new digital receivers used in the US for the new 150 channel Direc TV DBS service which launched this summer. These units are currently retailing at \$700 in the US. In the UK it is believed that the NTL/Pace Digital receivers currently being developed for ASTRA 1E will retail at under 400.

### **Digital Encryption**

The final design for domestic digital DTH receivers may incorporate more than one smart card slot for different encryption systems. Although agreement has been reached in Europe for a single compatible scrambling standard (compatible with MPEG 2) there is still no agreement on the commercial issue of who controls the conditional access technology (smart cards).

Canal Plus is openly pushing for Simulcrypt to be adopted. The programmes scrambled in Simulcrypt will be able to carry different digital access codes allowing users to access various services with a single decoder. The catch is that for broadcasters wishing to access say the French market they would have to negotiate with Canal Plus to use Simulcrypt technology.

EC regulators were, until recently, pushing hard for the more open Multicrypt system. This system allows all broadcasters access to a common conditional access system not controlled by any particular vested interest.

## CONCLUSION.

That's all for this edition of Satellite TV News. Please do write and let me know of anything that you are doing in the area of Satellite TV that would be of interest to CQ-TV readers. I know that many of you are modifying and upgrading the now considerable amount of surplus satellite equipment that is available at Rallies and the like. Please share your experiences so that others can benefit. I am also always pleased to receive snippets of news and "off air" photographs to try and keep the content of Satellite TV News interesting and informative - so please do write in.

*Paul Holland, 'Chatterton', Chapel Lane, Threapwood,  
Nr.Malpas, Cheshire, SY14 7AX*

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## SUBSCRIPTION RENEWALS FOR 1995

Subscription renewal time is upon us again. The subscription for the coming year will remain the same as last year.

<b>1995 only .....</b>	<b>£9.00</b>	<b>95 + 96.....</b>	<b>£17.00</b>
<b>95 + 96 + 97 .....</b>	<b>£25.00</b>	<b>95 + 96 + 97 + 98.....</b>	<b>£31.00</b>

Is my subscription due you might ask, check the first two digits of your membership number on your latest CQ-TV address label. If it is 94, then your subscription is due. If it is 95, then your subscription is not due until the end of 1995, etc.

It does help the Club in time and effort if you renew promptly and also take advantage of the multi-year discounts. It also helps to keep the subscription at its present rates. If we have to keep sending out reminders it is YOUR money we are using in stamps and envelopes.

Overseas Members rates are the same for surface mail. Airmail rates for Zone 1 is an additional £4.50 per year (America, South America, Canada, India) and Zone 2 and additional £5.50 per year (Australia, New Zealand, Japan). Please note that there is no additional airmail rate for members in the EEC and Europe.

# Notes on the On-Screen Level Indicator

**John R Ranson G7NND**

*The BATC Level Indicator designed by John Goode and described in CQ-TV 142, together with the PCB from Members' Services works very well - after the following modifications to the board!*

The first thing to notice is that there are two level indicators on the same board (generous as ever the BATC). They cannot be split into two separate boards so don't try. The edge connector on the layout diagram does not agree with the edge connections on the board and are as follows:

DIAGRAM	BOARD
1 0V	0V
2 +5V switched No.1	+5V switched No.1
3 NU	NU
4 NU	NU
5 NU	NU
6 NU	NU
7 NU	NU
8 0V	0V
9 NU	NU
10 -5V switched No.1	-5V switched No.1
11 NU	NU
12 +5V No's.1&2	+5V No's.1&2
13 NU	NU
14 Video I/P No.1	Video I/P No.1
15 NU	NU
16 5V No's.1&2	-5V No's.1&2
17 Video I/P No.2	Video I/P No.2
18 Video O/P No.1A	Video O/P No.1A
19 Video O/P No.1B	Video O/P No.1A
20 0V	Video O/P No.1B
21 +5V switched No.2	NU
22 NU	0V
23 NU	NU
24 NU	+5V switched No.2
25 0V	0V
26 NU	NU
27 NU	NU
28 -5V switched No.2	-5V switched No.2

29	Video O/P No.2A	Video O/P No.2A
30	Video O/P No.2B	Video O/P No.2B
31	NU	NU
32	NU	NU
33	NU	NOT THERE

The optional input buffer in CQ-TV 142 is already on the board. On both the circuit diagram and on the layout diagram there are two C18's, a 220n in parallel with R26 and a 10n on pin-11 of IC3. The layout diagram shows Q4 of indicator No.1 the wrong way round. No.2 below it is correct.

Now for some track changes:

- the track under C23 of indicator No.1 will have to be cut as it shorts it out. IC1 of indicator No.1 should have +5V on pin-11.
- The track will have to be extended to the +5V rail from C9 with a very short piece of wire.
- The track will also have to be extended on indicator No.2's +5V rail, again with a very short piece of wire, between R18 and L1 next to it, otherwise there is no -5V to Q's 4 and 5. Be very careful not to get any solder bridges across the tracks, some of them are very close together.

I hope that these notes may be useful in putting this unit together. using this board means that I can release a small 'scope to other duties and if I can find a cheap colour monitor I can stop trying to assess colour pictures on a B&W monitor!!

## ***KM Publications - Software List***

'PUFF' with Handbook (Caltech)	£ 18.50
Motorola/SM6MOM-W6 PUFF Supplement	£ 11.00
Siemens S-parameters	£ 9.50
Philips S-parameters	£ 14.50
HP AppCAD/HP	£ 16.50
Post & packing on above £1.50 for UK, £3.00 for Overseas, £7.50 for Airmail	
CAE No.1 collection (CQ-TV 163, pp 27-30)	£ 70.00
CAE No.2 collection (CQ-TV 163, pp 27-30)	£ 70.00
Post & packing on above £5.00 for UK, £7.50 for Overseas, £10.00 for Airmail	
The G6IQM Atari ST ATV program	£ 15.00
Post & packing on above £1.00 for UK, £1.50 for Overseas, £2.50 for Airmail	

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# Fine Tuning the ZNA234 Test Pattern and Sync Generator

Kevin Pye G4EER

*The original article for the ZNA234 Test Pattern and Sync Generator was published in the BATC book 'Micro and TV Projects and the circuit was as shown below in Fig.1.*

When I came to use the mixed sync output from the unit I found that the video waveform was also present. I added a diode, D1, to isolate Mixed Syncs from the video, but this upset the DC conditions for TR2, so RA was added to compensate. I then adjusted the bias of TR1 to give the correct 70:30 video:sync ratio. The modifications are shown in Fig.2.

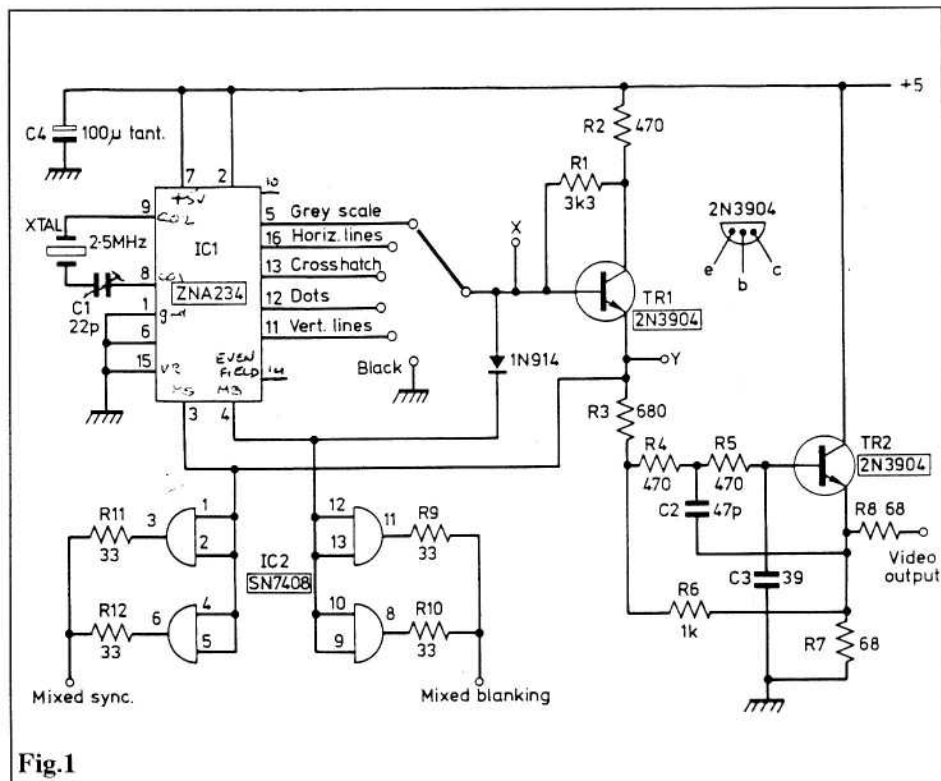


Fig.1



# VIDEOCRYPT - An Overview

Chris Smith G1FEF

*Videocrypt is a system for encrypting video, making it impossible to watch unless you have a suitable decoder. Below is a somewhat simplified view of how the system works, and of the interaction between the Smart card and the system operator.*

The system works by cutting each TV line in two, then splicing the two line fragments with another two line fragments. There are 256 possible points on each line where the cut can be made, these points vary in a pseudo-random sequence. Data is transmitted on unused lines (like Teletext data) that informs the decoder where the cuts have been made. The decoder can then reverse the encryption process and produce a watchable picture. This data is however encrypted itself, it has to pass through a decoding algorithm to produce the correct cut points. This algorithm is contained within the smart card that is inserted into the front of the decoder.

The smart card is defined by ISO 7816. Part one describes the physical-shape and size of the card, which is 85.60 mm long, 53.98 mm high, 0.76 mm thick and the edges are rounded with a radius of 3.18 mm. It has eight contact areas, each of which is at least 2 mm wide and 1.7 mm high. Part two of the ISO standard defines the location and purpose of the eight contacts:

	A	B	C	D
C1	10.25	12.25	19.23	20.93
C2	10.25	12.25	21.77	23.47
C3	10.25	12.25	24.31	26.01
C4	10.25	12.25	26.85	28.55
C5	17.87	19.87	19.23	20.93
C6	17.87	19.87	21.77	23.47
C7	17.87	19.87	24.31	26.01
C8	17.87	19.87	26.85	28.55

- A represents the maximum distance between the card's left edge and the contact area's left edge.
- B represents the minimum distance between the card's left edge and the contact area's right edge.
- C represents the maximum distance between the card's top edge and the contact area's upper edge.



D represents the minimum distance between the card's top edge and the contact area's lower edge.

These areas are only minimum areas, the actual contacts may be larger but must of course be properly isolated from each other.

C1	VCC	Supply voltage (+5 V, max. 200 mA)
C2	RST	Reset signal
C3	CLK	Clock signal
C4		reserved
C5	GND	Ground
C6	VPP	Programming voltage (5-25 V)
C7	I/O	Data input/output
C8		reserved

Part three of ISO 7816 defines the electrical characteristics of the interface, which is very lengthy and involved as it covers several different permutations. The videocrypt standard however uses a half duplex asynchronous format, with 9600 baud, 8 data bits, even parity and 2 stop bits. It also inverts and reverses each bit in the data byte.

At the broadcasting end a 32-byte message is generated about once every 2.5 seconds, this is passed through the same algorithm as the one found in the smart card producing a 60-bit value. This 60-bit value is passed through a second algorithm producing the 8-bit cut points for the next 2.5 seconds. The 32-byte message is transmitted with error correction in the vertical interval, each time one of these messages is received by the decoder, it is passed straight to the smart card. The smart card returns a 60-bit value which the decoder uses to generate the same sequence of 8-bit cut points to reconstruct the picture.

These 32-byte messages can also contain control commands for the smart cards. Each card has its own unique number, individual cards can therefore be activated, deactivated, or told to display messages on-screen. Each 32-byte message also contains a 4-byte digital signature which the smart card can decode, to decide whether the signal originated from a legitimate source. This stops hackers from sending their own 32-byte messages to cards to activate them.

The algorithm contained in the smart card is cryptographically strong, making it very difficult to work out what the algorithm is by observing pairs of 32-byte messages going in and 60-bit values coming out. Together with the 4-byte digital signature, videocrypt remains a very secure method for controlling access to satellite transmissions.

The clone cards that have appeared on the black market were only made possible because someone obtained the secret algorithms for stations such as Sky, The Adult Channel, TV Asia, etc. This information was probably leaked by someone working

for News Datacom (the smart card manufacturers). It is also possible that someone read the program contained in the EPROM on the smart card, although this is rather difficult and would require very specialist equipment. All the above stations used the same algorithm, the only difference being a 32-byte secret key table. In may this year BSKyB switched on their issue-9 cards making all the existing clone cards useless. So far the other stations have not issued new cards, so clone cards that decoded stations other than Sky still operate.

It is not known whether BSKyB have changed only the 32-byte secret key table, or the entire algorithm. But rumour has it that there are several different options in the new issue-9 cards. Allowing BSKyB to alter the encoding on a regular basis without issuing new cards. This will make it very awkward for clone card manufacturers to produce cards that last for any length of time.

Most clone cards use one of Arizona Microchips 'PIC' chips, these are RISC type microcontrollers. The software only implements the decoding algorithm and ignores the other commands and pay-per-view functions making the software a lot simpler. This also resulted in the clone cards reacting slightly differently to the genuine smart cards and BSKyB used these 'bugs' to deactivate some clone cards.

For those interested in 'playing, with the system, a PCB is available from myself that interfaces the decoder with the serial port of an IBM Compatible PC (See figure one). I also have some public domain software that runs on a PC and will emulate a smart card via the serial port. This software was originally written by someone from Germany and emulated the BSKyB series-7 card. Although the full program will not now work, since the series-9 card was activated, I have modified it to remove all traces of BSKyB's algorithm and secret key table, so as not to upset anyone. It does however give you a good idea of how the communication between card and decoder operates, and will display an on screen message.

*I can be contacted on (0933) 676054*

Most of the above information was gleaned from the public domain software written by Markus Kuhn in Germany.

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# TV ON THE AIR

Andy Emmerson G8PTH

## New World Record Distance for ATV Contact

*An unbelievable 2,518-mile path has been covered on 434 MHz, with full colour reception to boot. That's exciting news from the States that an excited Henry Ruh, publisher of ATV Quarterly magazine, faxed over in mid-July.*

Here are the details.

The summer tropo duct between Hawaii and mainland USA opened strong enough on July 11th for the first fast-scan ATV contact over this 2,500-mile path. Paul Leib KH6HME, long known for his VHF-UHF DX from Hawaii to USA, Japan, New Zealand and elsewhere, had to wait nearly two years after ATV equipment was hand carried to his Moana Loa Volcano hams shack by Tom O'Hara W6ORG and Gordon West WB6NOA. Gordon and Paul had been trying for two years, but band conditions were not co-operative for the normal summer tropo conditions until this month.

Paul's 432.0 CW beacon on horizontal beams was heard in the Los Angeles area, triggering locals' DX alarms. Several coastal hams have systems which monitor the frequency and alert the station owner when a signal is detected. Paul rotated the phase for vertical polarisation for ATV since California uses vertical for ATV. Paul's station consists of a 10 watt PC Electronics transmitter and a Mirage D1010NR ATV amplifier. Early in the afternoon Paul and Gordon were rewarded by a strong tropo opening. Initial signals were P2 to P3 and Gordon called Tom to alert other Southern California ATVers to the band opening to Hawaii. As the afternoon went on, the signals got better. Pictures provided by Gordon West WB6NOA show strong video with colour.

Gordon is about 2,508 miles from KH6HME but Gordon's world record ATV DX contact was not to last. In fact it was soon shattered when Mike Henkoski KC6CCC in San Clemente, California at 2,518 miles also received the KH6HME signal. Mike also supplied ATVQ magazine with a photo of his reception, which was in black and white. Mike was able to video-tape his reception using a Hi-8 camera and ATVQ has a 5-minute copy on VHS with live audio as Mike describes the contact to Tom W6ORG. The Electronics video ID graphics are clearly visible, and Mike's video captured all four screens. Mike KC6CCC is the owner of Microtech video, manufacturer of micro ATV transmitters suitable for radio-control use and Gordon West operates the Gordon West ham radio school. Both are active and avid hams.

Gordon is also known for his many columns and articles in various magazines and is a keen maritime mobile operator.

The opening lasted about four hours with Paul transmitting 15 minutes on the hour and half hour. A return signal was not accomplished because Paul did not have a TV set in his mountainside QTH! A set was to be taken the next day. Voice co-ordination between Hawaii and California was on 144.170 SSB. This same opening was in later days able to produce a new record 2304 MHz contact and efforts were made for 10 GHz contacts but without success.

Our thanks to Henry Ruh and Tom O'Hara for this report. Henry has sent over a video tape of the contact which lasts for about 5 or 10 minutes. I have transcoded it to PAL and will be pleased to supply copies to anyone who sends me a tape, a sticky address label and return postage. A pound coin or four 25p stamps towards costs will be appreciated too. Tediously I cannot quickly lay my hand on the previous 70cm ATV record (it's in the filing system somewhere!) but I have little doubt that this latest affair knocks all previous efforts into a cocked hat!

## **Plug for SCART**

What does SCART mean to you? Probably Syndicat des Constructeurs d'Appareils Radiorécepteurs et Téléviseurs or the clever but flawed connector they designed, but according to September's Practical Wireless it also stands for the Solent Club for Amateur Radio & Television. What's more they are planning to build a 23/24cm television repeater, GB3AT. They're not affiliated to BATC but they probably won't mind having BATC people join them, so if you're in the district you can see them on the first Tuesday of every month at the Royal British Legion Club, 366 Brook Lane, Park Gate, Southampton. All potential members are welcome here, it says. If you can't wait or would like further information contact Ian Bennett G6HNJ on 0703-556564.

## **On-air News**

If the system has worked you will already have read a report in the news section of this magazine about the new North Wales repeater from John Lawrence GW3JGA. He adds that he has had two good P4 to P5 contacts with EI6AS and EI2EM in the Dublin area. The group is about to present a demonstration of amateur television through the repeater for the Dragon Radio Club in Menai Bridge, Anglesey, in the hope of enticing more stations into the ATV mode. Having just mentioned Dublin, here's a note from Dave EI2HR in Tallaght, Dublin 24. He writes: "On the 29th of May, I was firing up my 405-line Emerson television with Test Card C. Because of a fault in the turret tuner, I have been injecting the signal into the sync separator at LF. So when Rod EI3CZ called in on 144.75 for a test, I plugged the 405 signal into the 24cm TX and awaited results.

“After first complaining about the jumbled signal, he quite correctly said that it appeared to be running at the wrong speed. So I admitted pulling his leg and asked him to record and re-transmit the signals, which resolved perfectly when received. Although he is only about 1 km away from me, I feel pleased that we brought a little 405 back to life in this way. Local ATV News. 13.6.94, 22.05 UTC: I exchanged P5 signals with G3SMU on 23cm (too late for the contest) a very pleasing contact.

14.6.94: EI2DJ received 3cm pictures from G3SMU, is this a first for G/EI ? I think earlier tests were EI/GW. Local tests on 3cm are being carried out by EI6AS, EI3CZ, EI7CL and EI2DJ, whilst I know that there are others with 3cm gear. Donal EI6EV had an ATV contact with G8DQZ/P in York on 70cm during the contest. Alas, I only received his syncs. For most of us the opening came a day too late for the contest. EI2EM, whose QTH is Swords, north of Dublin, normally found on 70cm, is now receiving 23cm. Late news: Mike EI2DJ now tells me had a two-way P5/P5 with intercarrier sound on 3cm with G3SMU on 27.4.93 (so I had my facts wrong, sorry).

And now a letter from Michael Sheffield ZL1ABS in New Zealand. He writes: “The Auckland ATV repeater station ZL1BQ has operated steadily for about three months now with a new exciter. It is a VSB exciter made by the Hills company. The output frequency is 615.25 MHz. The output is very pure spectrally. The exciter is followed by a three stage linear TV amplifier constructed by Wayne Griffin ZL1UJK. It comprises a BFR96, a BFQ68 and a BLW34. The power output is a very linear 2 watts. The amplifier has two power supply rails, 15V and 24V. The input frequency is 443.25 MHz which is within the New Zealand 70cm amateur allocation of 430 to 449 MHz. The site that the repeater operates from is only 400 metres away from the main TV transmission site for Auckland. This is good because the viewing public will be beaming in the right direction. The lowest power commercial UHF TV channel “MAX” (Music Television) is 20dB more powerful than us. So affordable options for increasing the power output are being discussed.

“Graham Baker ZL1TOF is undertaking to write new software for a Tandata Viewdata terminal. It is an item has been available cheaply, from the local surplus store, for use as a TV typewriter by ATV operators.”

Mike continues: “Good news from other parts of New Zealand. The ATV operators in Christchurch (South Island) have got their repeater ZL3AC running on Channel 39 (615.25 MHz in the New Zealand 50cm amateur band) with 100mW output. The input is 443.25 MHz (70cm amateur band) with the usual (for New Zealand) 5.5 MHz sound carrier. Wayne ZL1UJK built the amplifier they are using. A 5-watt stage is under construction. Pete ZL3TJH is the trustee and chief engineer. He lives high up in the Port Hills above Christchurch, which is a very flat place otherwise. So in spite of the QRP output power, the test card is being seen over a good area.

The ATV operators in the Manawatu area (Central North Island) are getting closer to getting an ATV beacon (prelude to a repeater) on air. The organiser Michael ZL2UKW reports that all the transmitter modules are now in separate shielded boxes. The exciter output is quite low, needing a driver stage to get to the 100mW minimum useful level. Another one of Wayne ZL1UJK's BFR96S amplifiers is likely to be used. Trevor Browns' Teletext video pattern generator circuit is being used to have a multi-page video message board from the ATV beacon.

A report in the RSGB's RadCom magazine says that Charlie G3WDG and Petra G4KGC in Rushden, Northants. have been carrying out trials on 10 GHz, mainly on packet, but they also managed to receive P5-quality television signals over a very obstructed path of about 40km from G3ZFP (Studham, Beds.).

From Lowestoft in Suffolk comes a letter from Paul Godfrey G8JBD: "Just a few lines regarding some of this summers DX goings-on the Lowestoft television repeater GB3LO. "On the 11th and 12th May ON6DV was seen and worked by Robert G4TUK in Norwich, Dick G4RRX in Norwich and Chris G0DWV again in Norwich. On 31st. May, Fred PE1LJY in Zaandam (10km north of Amsterdam) was seen and worked by among others:-Paul G7SEC and Ray G4RKP both in Lowestoft. As the evening went on the QSO went on to include Peter PE1MUO ( 25km north west of Amsterdam), PE1NBS and G4YFQ Graham in Lowestoft. Between overs colour bars were seen from ON4AIM and an aerial view was seen with call sign P16HEM. "Jeff F5RZC 's modified BATC testcard was seen by G4RKP around 21.14 GMT on 23rd. June. Jeff was having a local QSO with another French station and did not realise his pictures were being relayed through GB3LO, but a call on 144-75 did result in a QSO with G4RKP."

## **Last word**

One of the things our hobby needs desperately is publicity, so I am delighted to see the Kent Television Group have issued an excellent three-sheet information leaflet. It explains in simple language what the ATV hobby is all about, how to get started and what their own group is up to. There's also a handy map of Kent and south Essex with active ATV stations pinpointed.

Well done! You can obtain a copy of the leaflet if you send a large stamped addressed envelope to Ian Vincent G4MLY, 1 Lullington Road, Belvedere, Kent, DA17 5NJ.

*Please address your items for TV on the Air to:*

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

# SSTV FOR THE AMIGA

Andy Emmerson G8PTH

*Those of you who read my ATV column in Short Wave Magazine will know that I discussed computer programs for slow-scan television. Afterwards I received an interesting letter from the town of Jaworzno in Poland. Rather than paraphrase it, I thought it more interesting to leave the text just as it is...*

Here Milosz SP9UNB. Last time I got from my friend Les G0JEI a copy of your article in Short Wave Magazine from February 1994. You described there Pasokon TV SSTV system and at the end you encouraged others suppliers to feature theirs product for SSTV. Well , I am just the author of such an SSTV system. Its name is "Micro-Fax 4.3" and it is dedicated for Amiga computers family.

I don't want to describe it here too wide, because all basic informations are save in document file on the enclosed disk, so I give you here only the features not present there.

The system consists of two parts: software and small hardware. Since program can work with different interfaces that comes from other SSTV products being in the market, basically program is sold without hardware. For those people who want (and who are able ) to built hardware themself, there are three schematic diagrams of simple interfaces saved on the program disk. And if one want to get full system ready to use, I manufacture also special multimode interface that works not only with Micro-Fax but also on packet-radio (with program Amicom 2.0).

The program itself has few version: one working on all Amigas ( from cheapest A500 to the best A4000) and the second, with improved parameters, for new machines with the AGA-chipset (A1200, A4000). The most important feature (in compare to other such programs ) is full multitasking operation. Even during transmission/reception it is possible to work in another parallely running programs and also to perform all functions in Micro-Fax itself. So it is very easy for example to start painting program together with Micro-Fax and when it transmit or receive ,we can enjoy preparing next picture.

Hardware blitter allows us to flash grab the pictures from other programs onto Micro-Fax screen (also in opposite direction) so using that I can immediately move prepared picture from painting program to Micro-Fax and transmit it, or for example start fram e grabber with its software, get photo from camera or VCR and just transmit it on the air by one mouse click ... Of course all basic functions known in such programs are present here: load/save picture from harddisk, text writing, font and colour selection, quick switch from one mode to another and so on...

Although the current version (v4.4) is quite comfortable in use, there is many things to do in future: now, in color modes program use only 4096 colours (maximum for older Amigas ), but newer Amigas can display up to 262,000 colours from 16 million, so probably next versions will use this full palette. Also, in compare with other such software for Amiga, the received pictures are not as sharp as could be (allowing full multitasking causes some distortion in timing , so it's better to run program on faster machine). But all most often-used SSTV and fax modes are included now and I intend to add new in future.

The price for full working, commercial version is \$30 (inc. P&P), upgrades are \$10. This version has callsign of its owner written into it and transmitted with each picture. But there is also freeware version, with some functions disabled as well freeware SWL version (all modes and saving but only on RX side ). This freeware is available for anyone and free to copy (To get from me please send blank disk and one IRC ).

The dedicated multimode interface cost \$60 (inc. P&P) now. Its schematic diagram and the board layout are both on paper and saved on disk. You may publish this materials anywhere but manufacturing for profit is forbidden without my permission. I have until now over 100 registered users in whole Europe. If you want to get some opinions about the system I have a list of all users from UK with callsigns, address and versions of program.

The Micro-Fax (commercial version) is available exclusively from : Computer Service Studio Milosz Klosowicz ul.Matejki 20/30 32-510 Jaworzno POLAND Tel/fax: 00 48 35 64082 (after 4.00 PM). For any questions and problems I am also available via packet-radio network : SP9UNB@SP9ZDN.KA.POL.EU.

It is advised to send the price as the money order or at least as the letter with VALUE DECLARED (insured) . NEVER normal or registred letters. Registered users will can get the next versions only for 1/3 of this price.

### **Brief specification:**

This program allows you: Transmit and receive fax with speed 60,90,120,180,240,360 lines/min with modules 1/1, 1/2, 288, 576

In resolution 320x256/16 or 320x512/16 shade of grey or in colour mode 320x 256/512 x 4096 col (!!)

Transmit and receive SSTV M1, S1, Sdx, 180s in resolution 256(320) x 256/4096 colours - transmit and receive SSTV b&w 8s, 16s, 32s.

Separate version only for A1200/4000 allows to work fax and colour fax in resolution 640x512 x 4096 colours ( 256000 colours soon !)



# 13cm ATV TX a la CQ-TV 160

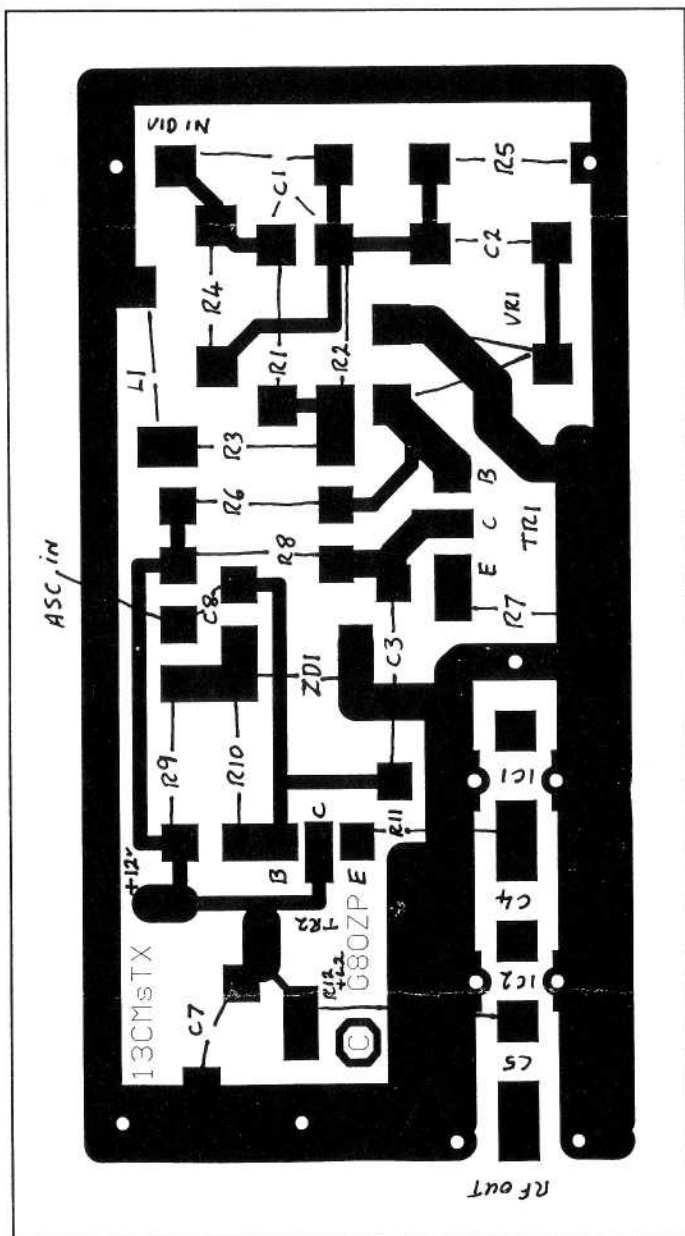
**Bob Platts**  
**G8OZP**

CQ-TV 160 contained details of a simple 13cm ATV transmit and receive converter.

Whilst not designed as a brain teaser, the transmitter has caused much head scratching by some constructors regarding the component placement.

Also, unfortunately, during the publishing process (*can't blame that one on me Bob - come on now!*) an extra track was added to the original design.

The adjacent figure shows the correct PCB layout with component placement overlaid.



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(19 consecutive volumes) £150. All prices VAT & carriage included

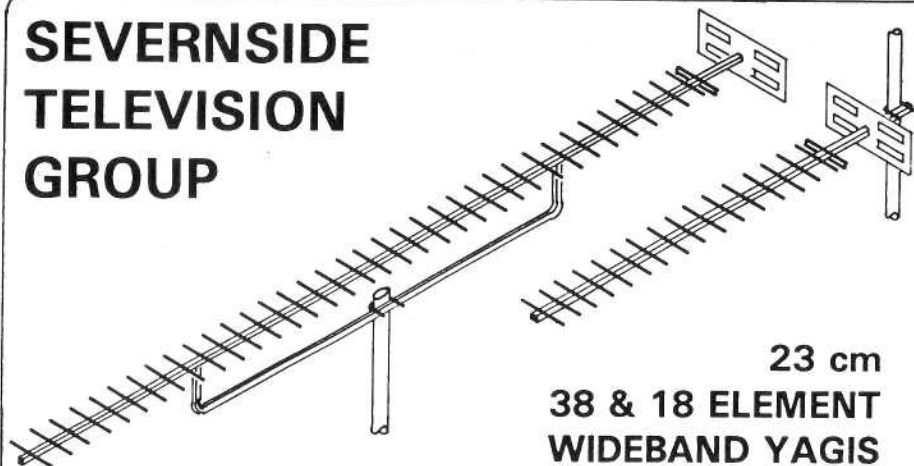
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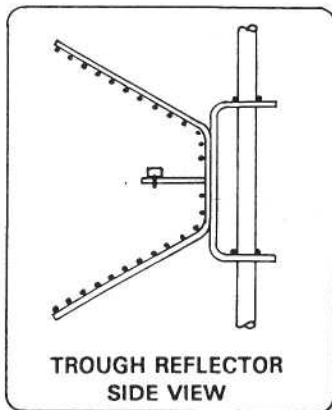
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**TROUGH REFLECTOR  
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# WORTHING & DISTRICT VIDEO REPEATER GROUP

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This transmitter generates its signal directly at the wanted frequency which may be set anywhere in the band colour or B/W. On-board intercarrier sound and fixed pre-emphasis are standard features. The kit includes diecast box and cost £80.00

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This add on vastly improves the overall frequency stability of the 1 watt transmitter. Two crystal locked channels and third free running tuning position are available. Kit price only £30.00  
Crystals for the PLL on channels RMT1,2,3 or simplex 1255Mhz £8.00. 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 design is a must for TV stations and repeaters. £16.00 each.

### THE SPECTRUM ATV PROGRAM

This 48K version has over 60 commands which includes 7 Testcards, memo pad, clock, maps, tones, locator calc (old & new), flag, x-hatch, various size text printing plus disk transfer command and more. All this for only £6.00  
Opus disk version £6.00 a must for all spectrum owners.

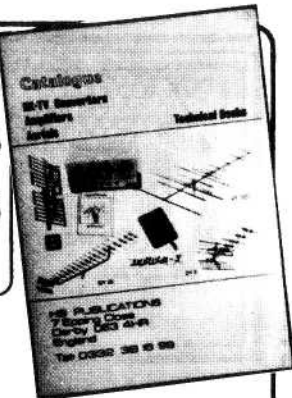
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A reduced I.F. bandwidth lifts the reception threshold thus helping to resolve weak signals that are normally lost in the noise when using an 'up-converter' or a multi-standard TV receiver with its inherently wide-bandwidth I.F. stages. Bandwidth reduction improves selectivity too, thus assisting adjacent channel reception, particularly in Bands I and III where interleaved channel allocations occur.

#### ● THE ULTIMATE IN DX-TV RECEIVERS!

Our latest model, the D-100 «SUPER», features AGC (Automatic Gain and Bandwidth Control); as the signal becomes stronger the vision I.F. bandwidth widens, thus providing optimum picture quality. Manual I.F. bandwidth control is also provided.

#### ● MULTI-SYSTEM SOUND (via FM radio)

#### ● AUTOMATIC BANDSCAN

-useful when an opening is imminent. † Speed adjustable.

#### ● VHF/UHF COVERAGE (typical)

Bands I/II (Lo-band); 44-90 MHz, Band III; 110-230MHz, UHF; 470-850MHz (470-690MHz using car battery).

† Wideband I.F. output facility.

‡ Converter output; UK channel 65 (adjustable).

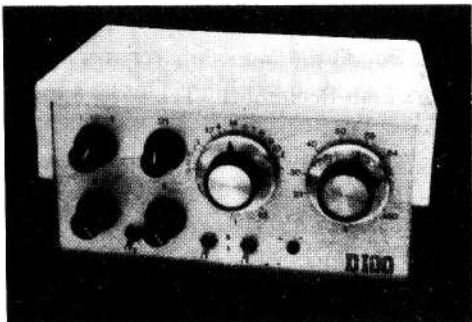
#### ● DUAL POWERING FACILITY

Mains or car battery † 110V version available for USA.

Each individually-calibrated unit comes complete with instructions, TV systems map and channel relationship plan.

#### ● PRICE: UK £124.95 (inc. P&P).

(Air/Eur add £10.00, Air/USA add £25.00 (110V version).



- A SPECIAL 'SPORADIC-E' PACKAGE SYSTEM IS AVAILABLE WHICH INCLUDES THE D-100 «SUPER» DX-TV RECEIVER PLUS A CHOICE OF LO-BAND AERIAL FROM THE FOLLOWING SELECTION:-

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† Connect internally for multi-directional coverage or use the switch provided to use each dipole separately.

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† Covers 48-70 MHz (Band I channels E2-4).

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Features 130 MHz IF input frequency, Plessey video demodulator, Switchable CCIR video de-emphasis + video invert and switchable meter functions, signal strength / tuning meter. Video output - 75 $\Omega$  composite video. Audio demodulated outputs available are 600 $\Omega$  0dBm and 0.5 Watt loud speaker amplifier. This unit is to the highest quality construction using plate-through hole PCBs with selective solder resist finish. Available in kit form or ready assembled.

## **Microwave Tuner / Down Converter.**

Features the very latest in commercial microwave integrated circuits and surface mount technology. Ultra low noise PHEMT GaAsFET front end followed by stripline image filter and MMIC amplifier to a 5 GHz Gilbert cell mixer. Exhibits 35dB conversion gain and tunes (LO) 800 to 1600 MHz, with an IF output up to 200 MHz. Also features an external LO output to drive a synthesiser, such as Camtech 2.4 GHz synth board. Unit comes completely ready assembled with instructions.

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A full featured audio modulator to compliment your video station. Contains microphone amplifier, 50 $\mu$ s pre-emphasis filtering, speech compressor, 15 kHz low pass filter and modulator / 5.5 to 6.0 MHz oscillator. Output is fully buffered and filtered to provide 0dBm @ 75 $\Omega$  modulated  $\pm$  50 kHz. Available in kit form or ready assembled.

**For details on these items or a copy of our latest Catalogue, please write or phone to the address above. Credit card facilities available.**



# VHF COMMUNICATIONS

VHF COMMUNICATIONS magazine is published four times per year and is available from KM Publications, 5 Ware Orchard, Barby, Nr.Rugby, CV23 8UF, Warks. U.K. Tel: 0788 890365; Fax: 0788 891833. The yearly subscription is **£15.00**, which is payable by credit card (+ a surcharge of 75p), personal cheque (drawn on a UK bank or bearing the name of a UK banking agent), postal orders or bankers draft made payable to VHF Communications. This subscription includes surface mail charges, air mail is extra at £6.00. The magazine is a **MUST** for the radio amateur interested in VHF, UHF and Microwave working, containing, as it does, detailed constructional articles for equipment operating in these bands.



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Non trade 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 VAT.

Copy should be sent to the Editor at 36 Grasmere Green, Wellingborough, Northamptonshire, NN8 3EJ before 20th December. Tel: 0933 676054.

**FOR SALE**

**OUTSIDE BROADCAST UNIT.** A rare opportunity to buy a complete ex-BBC type 2 Scanner, there were only 9 made and this is the only one known in private ownership. The vehicle is 35ft long and has separate but interconnected vision, production and sound areas. Extensive documentation and spares available. Complete with EMI 2001 Camera Channels. Please contact Richard Harris to discuss on 0749 343876.

**FOR SALE:** Potential OB Van, as seen at CAT-94, Shuttleworth. Ex-GPO support van, fully insured and MoT until next Spring. Currently gutted with considerable potential for fitting your own racking and equipment. Based on Karrier chassis, built 1962, 2.2 litre petrol engine. Relatively compact (size of bread van or small mobile shop) with plenty of room to walk around inside. Low mileage, mechanically sound (£2000 spent), aluminium body so no rust, needs only repaint and minor touch-up jobs. Workshop manuals and history, photos supplied. Price negotiable to good home. Andy Emmerson G8PTH, 71 Falcutt Way, Northampton, NN2 8PH. 01604 844130.

**SILENT KEY SALE:** Some of the items in the last advert are still available especially the heavy/ old/ ugly/ non working ones! Some of it will have to be dumped soon or sold cheaply so re-read the advert and contact Brian or Paul on 0895 810144 or 0522 703348.



**RCA P52 150 CP 52" BACK-PROJECTION TV** with remote control and P.I.P., full service info, done 2 hours service!, but 120V NTSC ... Offers. Sony KP-36XBR2 36" Back-Projection TV, nearly new, sorry no info, 100V NTSC ... Offers. Toshiba 21K-D15(K) 21" NTSC TV new, boxed ... Offers. Set of three JVC VHS-C torque gauge, alignment tape and check tape cassettes, new and boxed ... £450 the set (current JVC price £800!). Fred Field. Tel: 0245 362022/440800; 0860 942873.

**VHS-C CAMCORDER KIT** (PSU/Charger/DC Power, RF Mod & connection cables, VHS adapter, 3 batteries, etc.). CamCorder has IR focus, 6x zoom, amorphous rec/play heads and flying erase head, and electronic viewfinder. All in good working condition ... £255 ono + postage. Philips Tuner Board (RF in/Video out) U321 tuner & G11 select/gain & IF detector modules on PCB, with TBA750 IC and other components, working condition unknown. Any reasonable offer. Mervyn Leeder. Tel: 0858 464753.

**FOR SALE:** Electronic Visuals 17" Colour monitor EV6002 PAL/RGB input, working with copy of Handbook, 3 available ex my OB VAN. Phillips EL 8111 11" mono monitors in working order with circuit, also some non workers for spares or fix. Some of the Items from my last advert in CQ-TV 167 is still available ring for details. Handbooks: Fernseh MC37 colour monitor, Barco CM33 colour monitor, Prowest PM17/9a colour monitor, Prowest M11/3A mono monitor, Citroen CX diesel H/book; offers or swaps. B. Summers G8GQS 0895 810144/0850 014892 not QTHR.

**FOR SALE:** Scopex 2D10 Dual trace 10 MHz Scope in working order with manual L75. P.White 0628 580247 (office) 0628 21718 (evenings).

**BBC MASTER COMPUTER** with twin Opus disc drives ... £150 ono. Atari 520 ST Computer with 1M disc drive and two 1/2M disc drives, Atari SM125 High res Mono Monitor, three Atari PSU's and a CRP A4/A£ Digitiser Tablet with PSU and Stylus. The lot ... £500. Microwave Modules 435 ATV TX ... £100 ono. Robot 400 SSTV TX/RX with colour mods ... £200. Brian G6PKS. Tel: 081 304 3992.

**MANY ELECTROMECHANICAL PARTS** electronic parts from JVC 1" 800 series VTR. Anyone interested as I will ultimately throw them away. Require working colour board for model 871P - ideal swap. Colin Stirling GM8MOI. Tel: work 041 440 4584; home 041 632 9960.

**MICROSOFT** Windows for Workgroups Version 3.11, new and still in the original packing, unregistered! ... only £20. Dave Lawton G0ANO. Tel: 0494 528899.

**1.8m DISH** with 1.5 dB LNB and Polariser, and Polar Mount. Dismantles for transport ... £85. Mike Frey. Tel: 0628 27350.

**Old BETAMAX VCR**, useful for spares ... Offers. VHS Camera Hitachi VKC-870, perfect working order, single tube Saticon with electronic viewfinder, shoulder mounted with variable iris and titling facilities, still in original box ... Offers. Shintron composite/encoded key Chroma Key with manual ... Offers. Professional fluid head Tripod, universal head with Manfrotto legs ... Offers. Martyn Taylor. Tel: 0689 826827.

**TEST EQUIPMENT FOR SALE:** Spectrum Analysers: HP 141S with 8554L 1250 MHz plug-in and 8552A IF plug-in, 2 intermittent faults but manuals available. Marconi 2370 Digital Analyser with 2373 frequency extender up to 1250 MHz in good working order. HP 835A with 8557A 350 MHz plug-in, good working order. HP 8444A Opt.059 Tracking Generator. Marconi 2008 450 MHz Signal Generator, good working order with manual ... £135. Telequipment D54 10 MHz Oscilloscope, good working order with manual ... £35. Panasonic Cordless Telephone ... £10. **WANTED:** HP 8558 1500 MHz plug-in. HP 8554B 1250 MHz plug-in. HP 8555A 18 GHz plug-in. I need to rationalise my test equipment and will part with 2 of the analysers depending upon the plug-ins I am offered. W.H.Y? Give me a call to see what we can work out. (\*\* G8GKQ, if we have not made contact before this appears please give me a ring as I have lost your number and address !\*\*). Noel Mathews G8GTZ. Tel: 01256 462385.

**FOR SALE or EXCHANGE:** Sony M2 Camera, excellent condition and low hours use; Sony VO4800 Lo-band U-Matic Portable VTR, PSU, flight case, batteries, tripod mount, etc. Realistic offers considered or swap/part exchange for good VectorScope, Waveform Monitor, Grade 1 Monitor 20" in good working order, VDA's, ADA's or other interesting items for my SVHS studio. Bell & Howell 16mm Film Projector, optical sound, used once, same deal applies. Phone Andy G6TOO evenings. Tel: 081 397 8900.

**NEWNES 'RADIO & TV SERVICING'** volumes 1 to 6 in good condition ... £4 each. JVC 1" OPEN REEL VTR TYPE 711P WITH MANY TAPES AND MANUAL ... £75 ono. Dave Hazel. Tel: 0793 765390.

**WOOD & DOUGLAS 1250DC50 24cm DOWNCONVERTER** module, WDV 400/1200 Varactor Tripler module, 70LIN3/10E UHF 10W Linear Amp board, 70LIN3/70LINLT 3W UHF Linear board, 70FM10 (MD10PA) board, Vid IF WBFM Video Demodulator board, SCR-2 6 MHz Sound Demodulator board (also known as FIF1), UFM01 430 MHz Master Oscillator board, TVSG1 Sound Subcarrier Mixer board (also known as SCT-2), Microwave Modules Aerial Preamp 70cm module, 40ft 4-section aluminium triangular lattice self-supporting Aerial Mast with all fittings for side of house. 4 Yagi Aerials with Phasing Harnesses. 2 x 4-stage tuned cavity Notch Aerial Filters (19" rack-mount). Pye Lynx B&W Cameras + C-mount Lenses (various powered zoom and spares etc. ProWest B&W Monitor (12") + spare boards. Offers. Mel Thurlbourn. Tel: 0362 638224 evenings and weekends.

**OWING TO A BIG REDUCTION IN THE STORAGE SPACE** available to me I must reluctantly dispose of some of my large collection of mono and colour TV's, audio/HiFi, valve/transistor radios, audio/video tape recorders and items of test equipment. The collection spans ca. 1948-1985. For a full listing please send an A4 SAE with 25p postage to: Dave Hazell, 126 Sevenfields, Highworth, Wiltshire, SN6 7NQ. Tel: 0793 765390.

**WANTED:** 3cm ATV Transmitters & receivers. Anything considered for this ATV band. Telephone Robin G6PAE: 0268 524968.

**WANTED:** AV in/out kit and r/c kit for Philips VR2020 (Video 2000) VCR. Original service manuals for: Ferguson 3V29 or JVC equivalent, Sanyo VTC5000 Beta VCR, Ultra V1984 series 405 TV, Hitachi SDT7765 music centre. Complete Murphy V789 or V783 mono TV + FM radio (circa 1962). Funal IFT for Murphy U502 radio. Audio output transformer for Decca SRG600 series radiogram, p/no. 56449. Manual for Telequipment SS1E scope. Rotary control knobs (vol/bri/con) for 12" Philips/Pye T-Vette 2 (X12T740/--). Dave Hazell. Tel: 0793 765390.

**WANTED:** A Spectrum Analyser up to about 1 GHz or so. Also wanted a JVL Quad Loop Yagi for 23cm ATV. Paul Young. Tel: 0327 341267 evenings.

**WANTED:** Details of a 2732 EPROM contents for Test Card Generator as featured in Radio & Electronics World July 1993. Cropredy Electronics supplied an EPROM service at one time. Colin Stirling GM8MOI. Tel: work 041 440 4584; home 041 632 9960.

**WANTED:** Philips televisions: 383 (9" table model), 2405 (9" table model), 2407 (9" console model), 2412 (9" console model with radio). Pre-war CRT of EMI (Marconi or HMV); pre-war television; cabinet for Ekco TA201; pre-war television brochures. I can collect. Does anyone know of the existence of a Philips experimental TV (with radio) type SG860A (C.1947-1948)? Thank you for your kind help. Jac Janssen PE1OCE, Hoge Ham 117D, NL-5104 JD DONGEN, The Netherlands. Tel: (from UK), evenings) 010 31 1623 18158. Fax (at the office, from UK, please mark "private"): 010 31 13 624664. OFFERED: help with documentation of Dutch (mainly Philips) TV's from 1930s to approx. 1960; various TV sets of 40's-50's.

**WANTED:** Operating and service manuals for Marconi Instruments Ltd sweep oscillator plug-in RF units type 6766A (8 - 12.4 GHz) and type 6790A (0.01 - 2 GHz), and for Panasonic colour video camera WV-3890E. Originals or Xerox copies. If you can help, please contact Peter Grannell G4TQB QTHR telephone 0782 583318(day) or 0782 610398 (evening). Thanks.

**WANTED:** ASTON TELETEXT Encoder help for GB3HV. I am working on an ASTON Teletext Encoder for the High Wycombe ATV repeater. I have the full set of drawings & notes (that cost G8LES an arm & a leg!), but I need more info with programming up the TWM1 memory/encoder unit from the RS232 link from a PC. So far only 4 test pages work. I have the matching Editor TCG3 unit, but it has a missing card & proms so I don't give much hope for that bit. I also have the video Capture Graphics unit TCU1. G8MNY Tel 081-688 3089.

**WANTED:** Circuit Diagram and/or manual for Sony AVC3250CE Camera. All costs refunded. Bob Short G3GNR, North Trew Farm, Highampton, Beaworthy, Devon, EX21 5JG. Tel: 01409 231301.

**WANTED:** Urgently wanted Circuit for Tektronix ITS Gen 148!! can you help? Early Pye, EMI, and Marconi television product catalogues for 1946 - 1960 wanted for research for article / book. Tactical nuclear weapon - No just testing to see who's awake! TV related books wanted WHY. Bosch KCN portable camera circa 1975 for collection. "G Plan" teak wall unit and base unit. Van type trailer 4 wheel 1.5 tonne? 63A plastic CEE17 blue mains connector, fixed sockets needed. B. Summers G8GQS 0895 810144/0850 014892 not QTHR.

**WANTED:** Any circuit diagram/PCB layout for Sony, Hitachi, Canon Hi8 CamCorder or PalmCorder (i.e. A2Hi, TR805, FX700, VMH37, etc.) made in the last 3 years, to see how the electronics in one works. Will pay postage, photocopy costs. Mervyn Leeder. Tel: 0858 464753.

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