

# CQ-TV

MAGAZINE  
No.125

## BRITISH AMATEUR TELEVISION CLUB

FEBRUARY 1984

CAPTURE YOUR  
CAPTIONS &.....

gm4bv  
calling

gm8hgt

BRIGHTEN-UP  
YOUR IMAGE

AND.....

TX/RX timing

Dividing by 'N'

3MHz video filter

TV's for monitors

UK 'International' results etc. etc.....



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PLEASE NOTE: If, when writing to a committee member, a reply is required, please enclose a stamped addressed envelope or, in the case of an overseas member, an International Reply Coupon.

## MEMBERSHIP

FULL YEAR: £4 or £1 for each remaining quarter of the year.  
All subscriptions fall due on the first of January each year. Overseas members are asked not to send foreign cheques please.



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CLOSE FOR PRESS DATE FOR THE MAY ISSUE.....20th March 1984

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# EDITORS POSTBAG

Dear Ed,

Many thanks to G8ABD for describing the mods to the Handbook Coder. The addition of the two diodes to the circuit has made such an improvement to the temperature stability that it removes the main area of comment about the design at a stroke! I suppose the moral is 'if you come across a mod such as this, don't sit on it - publish it!' I have received a letter from G8LAM which clears up the business of interlace/non-interlace on the BBC Micro (Model B, OS 1.2). For anyone else who doesn't know, the commands are either:-

\*TVx,0 or \*FX144,x,0 = interlace on  
and  
\*TVx,1 or \*FX144,x,1 = interlace off

In the above commands, the value of x can be used to shift the screen display up or down:-

value of x	
2	move up 2 text lines
1	move up 1 text line
0	default position
255	move down 1 text line
254	move down 2 text lines

These commands only take effect when the next MODE instruction is met (and only apply to modes 0 to 6).

John Goode.

Dear Ed,

With the increase in ATV activity on 70cm I think it is fair to point out that some operators may not totally appreciate the power of a video transmitter, especially one that is on 435MHz.

I am disappointed to see that video equipment is still being sold for this frequency, and I think some of the problems that may result should be pointed out to our newcomers.

The problem which seems to be more prominent these days is interference to UHF FM repeaters. Yes I know we were here first but that is no reason to ignore the problem.

RB15 is the highest repeater

frequency with it's input on 434.975MHz, therefore a TV transmitter on 435 can be bad news to some poor unsuspecting repeater user with a low power hand-held. "You have just been jammed old man by some strange noise", and of course it will never talk to them. With the insertion of a GOOD solid-state linear the problem can be magnified very easily and, locally, can cause interference way down into the phone end.

I have jotted down some pointers which members may like to bear in mind:-

1. Operate as high in the band as is possible without infringing the licence conditions. 436 to 437MHz carrier frequencies usually solve the majority of problems.

2. If solid-state amplifiers are used, then be very careful not to overdrive them; most of the 10W input linears do not like the full drive that some of the black boxes will deliver.

3. Limit the video input bandwidth where possible, (see this issue and CQ-TV 120 & 122). Beware of digital sources such as computers etc. Unless they are filtered they can produce very wide bandwidths indeed.

4. If at all possible, have a listen to your local UHF repeater and see if you do cause any cross modulation or blocking; you could make friends this way rather than enemies.

I use all of the 70cm band and try to have total respect for it and it's users. We could be getting a bad name in certain quarters as the producers of maximum QRM with the least effort.

Ken Walker G8DIR

Dear Ed,

Further to "Did You Know" on page 51 of CQ-TV124, I just thought that you might like to know that the Akai VS-9700 VHS Video Recorder also tunes down to 430MHz. I have been using one as an ATV receiver for quite some time now.

GW3FDZ



Dear Ed,

Scotland is alive and well!  
Interested and active up here on ATV  
(as well as myself) are GM3PIL in  
Nairn, GM8AZS in Elgin, GM4HMN in  
Lossimouth, and GM4GUQ in Inverness.  
Almost ready to go on air is GM1BII  
in Nairn and on SSTV are GM3JFG and  
GM3PIL.

Thanks for an always interesting and  
helpful magazine and good luck for  
the success of the Club in the  
future.

Iain McHardy GM3JFG.

Dear Ed,

I have recently built the 70cm  
ATV transmitter detailed in CQ-TV122  
and, as was mentioned in a  
subsequent issue, my unit failed to  
oscillate on the correct frequency  
(even after implementing the  
mod's!).

My fix was to rewind L1 with  
16-turns and connect the 5.6pF  
capacitor to a tap 4-turns from the  
supply end of the coil. Even though  
I am using a 72.5MHz crystal the  
output was then at the correct  
frequency.  
Congratulations on a most inter-  
esting magazine.

Graham Hankins G8EMX

Dear Ed,

1983 has been a good year for DX  
working on ATV. I have notched up  
(among others) F1EDM, PA3BJC,  
PE1JSC, PE1GVS, PE1DWQ, PE1HLR,  
PE1AAQ, and the most outstanding  
station worked in December was  
GU8FBO in Gurnsey. Not bad  
considering I live near Derby and  
run only 10 Watts p-s-p into a  
48-element at about 40 feet.

I would appreciate any ATV contacts  
from down South and the West.

I am enclosing some photographs  
which you may be able to use in the  
mag.

Dave Webster G6SKO

Dear Ed,

Many thanks for a fantastic  
magazine! pity I can't understand  
all of it, gets a little complicated  
for a nuts and bolts man.

Still trying for my licence for the  
3rd time (it's that 2nd part!).

Lots of activity in my area thanks  
to G4TVC and the boys.

430, now 1250, I wonder what they  
will do next? 10GHz on wet wool and  
tin cans I shouldn't wonder.

Again many thanks for CQ-TV.

Peter Smith, Crawley, Sussex.

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## NEWS ROUNDUP

### SHOW DATES

Please note that the BATC will be  
exhibiting again at the RSGB Amateur  
Radio Show at the NEC exhibition  
centre in Birmingham this year. The  
dates for this event are 28th and  
29th of April.

The date for the BATC's 1984  
Convention has been changed from  
that stated in the last issue. The  
Convention will now take place on  
the 13th of May 1984.

More details may be found elsewhere  
in this issue and a full Convention  
guide will be included with CQ-TV  
126.

### REGION-1 IARU CONFERENCE.

Committee member Graham Shirville  
G3VZV, is to attend the  
International Amateur Radio Union  
conference in Sicily later this year  
as an observer on behalf of the  
BATC. Graham has been engaged in a  
considerable amount of research in  
preparation for this important  
event, and will be well able to  
lobby and advise delegates on behalf  
of ATV in the UK.

This move is part of the Club's  
continuing efforts to gain a  
stronger voice in the administration  
of the airwaves, especially where  
amateur television is concerned.

## OVERSEAS MAILING

Overseas members are reminded that when sending money to the BATC, including membership renewals, payment should be made either by a cheque drawn on an English bank or by International Money Order. Please do not send foreign cheques. Unless otherwise arranged CQ-TV magazine will be sent by surface mail. Should you wish to have your copy sent by air this can be arranged by including sufficient payment with your subscription renewal to cover the extra postage.

The extra charges are:-

Europe	£1.25 per year
Zone A	£1.75 per year
Zone B	£2.50 per year
Zone C	£2.75 per year

Principle countries and their zones are as follows:-

Australia	C
Bahrain	A
Barbados	B
Canada	B
Egypt	A
Hong Kong	B
India	B
Israel	A
Japan	C
Kenya	B
Kuwait	A
Malaysia	B
New Zealand	C
Nigeria	B
Oman	A
Pakistan	B
Saudi Arabia	A
Singapore	B
South Africa	B
South America	B
United Arab Emirates	A
U.S.A.	B
Zambia	B

When requesting airmail please make clear on your renewal form that air mail is required.

This list should have appeared in the last magazine but unfortunately disappeared somewhere in the bowels of the word processor.

All subscriptions should be sent to:-

Mr.D.Lawton, "Grenehurst", Pinewood Road, High Wycombe, Bucks HP12 4DD, England.

## SUBSCRIPTIONS

All subscriptions for 1984 should have been paid before the first of January. Members who have not yet renewed are reminded that unless they do so before the first of April, they will be automatically deleted from the clubs' computer files and will therefore receive no further issues of CQ-TV magazine.

Subscriptions are £4 per year and should be sent to:-

Mr. D.Lawton, "Grenehurst", Pinewood Road, High Wycombe, HP12 4DD

## VIDEO MODULATOR

An error crept into the video modulator circuit diagram on page 45 of the last issue.

The base of the BD137 output transistor should connect to the emitter of the previous stage and not to the collector as shown.

First to spot that one was Trevor Brown G8CJS.

## NEW AWARDS

Four new CQ-TV awards have been issued recently; G6FPU attained the gold award in just 4-months working on the air. G8SSY receives the bronze award for receive only and this was for just 6-days operation. Better still; G8MCQ wins his bronze certificate for contacts made in only two hours during the BATC Summerfun contest this year. Lastly, another receive-only bronze award goes to G6LTZ.

Congratulations to one and all.

## VSB TRANSMITTER (Handbook 2)

39MHz Source.

In order to make the drain load of 1VT1 resonant at 13MHz, 1C4 should be n33 (330pF) not 33pF. As shown, 1C4 and 1L1 resonate at around 50MHz and the crystal will probably not oscillate at all.

The capacitor that resonates the output coil on the same board should be increased to 33pF.

## BATC PUBLICITY

The committee has decided to commission an advertising campaign for 1984. Display advertisements have been prepared for the May Convention and also for insertion in suitable periodicals. Twelve magazines have been selected and the advert will appear in each publication once in the year.

A recruitment drive is being worked out for this year in an effort to obtain more members, this is so that we may gain more muscle in Amateur Radio negotiating and policy-making circles, thus ensuring a fair deal for amateur TV in the future. Further details of the campaign will be published in the next issue.

## NEW SERVICES FOR MEMBERS

The BATC has installed a news 'Hotline' service controlled by a telephone 'answerphone' machine. The programme is updated at least every week or as often as necessary.

Up to the minute news and information will be included as well as essential details about the BATC.

The Hotline is located in Leicester in order that it is as close to everyone as possible.

The Hotline is open 24-hours per day - 'phone: 0533 600108.

The Club is negotiating the acquisition of the use of a number of pages on the PRESTEL data service. As with the hotline this will carry the very latest news concerned with amateur TV as well as details on the Club itself.

Further details on these services will be included in the next issue of CQ-TV magazine.

## FIBREGLASS BOOMS

A couple of issues ago G8EBM described the results of his experiments in using fibreglass booms and support masts for TV aerials.

Although such fibreglass material is not generally easy to come by, a couple of sources have been found by Roger Bunney, according to the

January issue of 'Television' magazine. Bantex Ltd., Abbey Road, Park Royal, London NW1 can supply lengths up to 6ft at £3.50 per foot, and Jaybeam Ltd., Kettering Road North, Northampton NN3 1EZ can also supply the tubing at a similar price. The contact at Jaybeam is Mr.M.E.Ward.

## VIDEO OUTPUT ON THE BBC MICRO

G3BHT has sent in the following details concerning the video output on BBC Micro's:

Issue-4 boards have a link (S39) just to the left of the UHF modulator. The 'Advanced User Guide' includes this link option on page 488 and shows:

Link open - Monochrome to BNC socket.

Link closed - colour to BNC socket.

The link appears on the circuit diagram in the Advanced User Guide but is not detailed in the user guide supplied with the BBC Micro.

## REPORTER WANTED

Are you going to be at the BATC Convention in May?

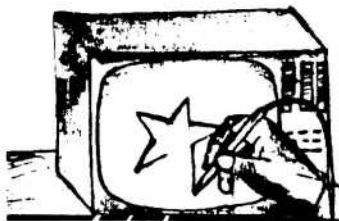
Would you like to write a report on the show for the following issue of CQ-TV?

If the answers to both the above questions are 'yes' then the Editor would like to hear from you.

If someone could take this task from me, I may be able to actually visit all the exhibits myself! That would make a nice change!

If you would like to help please 'phone me on Rugby (0788) 69447 (evenings) as soon as possible.

ED



# BRIGHTEN UP YOUR IMAGE

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## Part 1

By Norrie Macdonald GM4BVU

As I have noted before in these pages, ATV in itself is a fascinating subject; just to be able to transmit moving pictures in colour over many miles can be enough for some people.

But I think ATV can be split into two separate activities, 1. the RF transmission with aerials, black boxes, home-brew video sources etc and 2. the techniques of programme material preparation. The common theme of course is 'operating' which links the two.

CQ-TV has always treated the hobby mainly from the constructors' point of view, and the many projects featured, especially in recent years, means that there is really no excuse for someone with an interest in ATV not taking the plunge; and this is where they hit the eternal question "But what do I show?" This is the purpose of this series, to provide some simple and cheap answers, using my own station by way of illustration.

My Earliest recollection of receiving amateur TV goes back many years to two 'old-timers', the first being old Jimmy the taxi-driver, GM3KXM, now alas no longer with us. Now as you can imagine, he was not technically minded, but he was game, and successfully transmitted pictures from home-brew gear to GM3SAN, GM8BKE and others long before I stopped drooling about ATV and actually got on the air.

But Jimmy's camera work was terrible, the ceiling being the most obvious feature, coupled with the non-existent lighting and a focus problem that made the picture look like it was foggy! Still I remember playing Othello on his Micro viewing the screen by ATV long before micros were commonplace. And it was fun!

The other memory is of John, GM3YLD, in Coatbridge radiating excellent black-and-white pictures to me from his shack, which was in his bedroom. The interesting point here is that his wife was quietly undressing for bed in the background, obviously unaware of her audience....! Good depth of focus to....!

The salient feature of these stories is that the viewer is rapidly bored by a 'mug-shot' or pictures of the equipment, so I hope to persuade you, the ATV operator, that a lot of satisfaction is to be found in using your imagination to amuse and stimulate your viewers; and sometimes you don't know who is watching!

In this article I will tackle the simplest method of varying your visual image, and all you need is a camera, mono or colour. Graphics are a standard part of the professionals' way of presentation, although today more is done by video typewriters and other computerised gadgetry. But good results can be obtained (in colour) with nothing more than some coloured card, Letraset,



pens, glue and a pair of scissors. Plus of course some patience! And maybe even a little artistic flair, although I must confess to being useless at drawing.

Let's start with the easiest way to get colour pictures - cheat - use someone elses. A favourite source of excellent quality colour pictures is from calendars, or magazine or colour supplements.

The important first step is to provide a rigid base for the caption, and this I do by buying large sheets of coloured card from my local art shop, for around £1. Each card is cut using a sharp Stanley knife and a straight edge to give four cards of roughly 12.5" x 10". The trick to make this economically viable is to use the coloured side where the background is to be visible, and also use the reverse side for full-screen pictures, that is two captions per card. With a super range of colours available an impressive selection of backgrounds is quickly established.

Consider caption 1. This is a reproduction of a painting by Henry Redmore entitled 'French Fishing Boats off the Coast', and was culled from one of the many calendars featuring nautical scenes. In fact these calendars are so easily obtained that I have a set of 'personalized' captions using this common theme for all my regular contacts.



1

And the lettering.... well this is easily done with Letraset, although care is needed with spacing and alignment to ensure neat results. However you will quickly find that key letters on your sheet are used up, and it ain't cheap!, especially in the larger sizes as used for ATV.

Well I have to confess to using a technique probably not available to many of you. I have access to a software package designed specifically for producing text, graphs, histograms and pie charts, and the output of this is to an eight colour graphics plotter. And it even spaces and centres the letters.

I can quickly produce repetitive items such as call-signs by a single line edit, making a uniform series of captions dead easy. But do not be disheartened, I have to use Letraset too for much of my work. Don't forget plastic stencils, these are readily available from art shops (at a price) but try stationers and even childrens toy shops. The best type of pen to use with stencils is the Rotring 2000 Isograph range. These are proper art pens and come in a variety of line widths.

Before I leave caption 1 a few more pointers. Remember the TV screen has a 4 x 3 aspect ratio so your pictures should be trimmed to a suitable size corresponding to that format. I use 11" x 8.3" which is near enough. The picture is centered on the caption card and locating marks at the corners allow accurate positioning once glue is applied. I use Cow Gum, again available from the local art shop. The smell has been made rather off-putting

lately to prevent glue-sniffing, so do this when the XYL's out! Although the instructions say to apply glue to both surfaces and leave to dry (like impact adhesive) I don't. I apply it using an Evostik spreader to the picture and then mount it immediately onto the card, pressing down all over (working from the centre out) to exclude all air bubbles. Once dry, any excess glue may be removed by rubbing with a finger when it rolls into a little ball which can be lifted off without marking the artwork. In the same way the lettering is added by trimming round the coloured frame of the computer plot and sticking it wherever the composition of the picture allows.

Caption 2 is again cut from a magazine, with Letraset lettering, except for the big numbers which are cut from black card and stuck on.

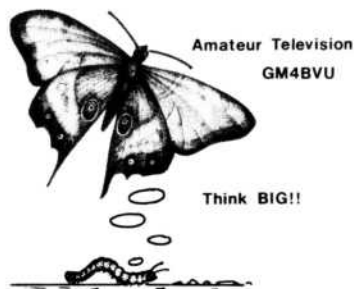
Caption 3. This one is from a newspaper job advert. The butterfly and caterpillar are stuck on, some extra bits are drawn on with a felt-tip pen, and finally more Letraset. What could be easier?

Caption 4. One particular form of artistic presentation which goes down well is the colour picture of a shapely young lady, glued in place with, in this case, a message closely linked to the picture. I have a popular series of these - but all in the best possible taste.

Caption 5. This is a montage of three separate sources, the TV set outline being from a video magazine, the shack shot is a standard 35mm colour print shot on Kodacolour II, with the computer again providing the lettering.



2



3



**GM4BVU  
pushes out  
watts of  
video**

4

Caption 6 is a variant of the same technique, with a picture poached from a magazine, "amateur TV" is added in red Letraset but this time GM4BVU is done with stick-on plastic letters about 1" high, also available from the art shop.

Caption 7. A picture from a colour advert in a professional video magazine with a computerized message stuck on.

Caption 8. Finally another standard 35mm colour print, with Letraset added.

The captions are limited only by your imagination and the amount of time you are prepared to spend, but I feel the results merit the effort, and this is borne out by the favourable comments from viewers via both RF and tape QSO's. Cartoons and seasonal greetings go down well at Christmas. Remember the objective is to inform, amuse, stimulate and even impress your audience by the slickness of your presentation. Colourful graphics are the cheapest way to do it.

Next time we will look at other programme material. Till then get the scissors and glue out!



5



6



7



8

# TV ON THE AIR

Well, wotalotigot! Grateful thanks for all your letters received in the last three months. I think I received enough material this time to fill the whole magazine, thanks largely to the superb conditions at the end of the first week in December. I have tried to squeeze everyone in, but apologies if details are pared down a bit. Anyway, let's get going.



Seventy centimetres is our natural starting point and on "that weekend" conditions were wide open. What's more, operating standards were high, reflecting great credit on all concerned. It was only the space shuttle idiots who spoilt things when they invaded our calling channel on Sunday morning, giving us an object lesson in how not to work DX! Anyway, there were some cracking signals around - I have to single out Brian G8DTQ (Caterham), Ken G8DIR (Shrewsbury) and

Jean-Francois F1EDM (Bordeaux-St. Clair) who all put out P5 pictures. All three used QRO amplifiers, which does help, but even ten watt stations had a field day as well. F1EDM was so strong that he overloaded my masthead preamp here at Northampton and I had to unpower it to see his pix properly. He worked as far north as Shrewsbury at least, which is several hundred km. and fair DX in anyone's book.

Other stations who were active recently include:

G4MDU (Stoke Bruerne), G8CHK (Pattishall), G8JBQ (Milton Keynes), G3TGE (Newport Pagnell), G3UDC (Bletchley), G8FAK (Cranfield), G4CPE (Luton), G4HGZ (Dunstable), G4CRJ (High Wycombe), G8UGU (Long Buckby), G6LUV (Bletchley), G3UMF (Oxford), G8BWC (Nottingham), G8MNY (south London), G6TRX (Romford), G8FBO (Guernsey), G6SKO (Somercoates), G6CUQ (Redditch), G8JMJ (Stoke), G3VPC (Wimborne), G4HMG (Iver), G6YLG (Sedgeley), G8WBO (Salisbury), G6HMS (Lincoln), G8VBC (Woodville), G1BTF (AL32e), G4EUF (Leicester), GU6EFB (Guernsey), G3YQC (Rugby) and yours truly G8PTH (Northampton). Obviously there are many more, but these are the callsigns reported to me! DX stations logged in the Midlands included DD5CE, PE1GVS, PE1DWQ, F3YX, PE1HLA and PE1DWA: just because you don't live near the coast it doesn't mean you are debarred from seeing/working continental stations! In fact this year has been very good for UHF openings and as long as you keep an eye on the "DX indicators" (i.e. patterning on out of area ITV channels) you shouldn't miss the lifts.

Incidentally, during the December opening I noticed a couple of stations were having difficulty with solid state "linears": basically they were tuning for maximum smoke on the power meter. Unfortunately this doesn't work with TV and merely produces a cramped and unwatchable picture with no syncs. TV is negative modulation, so in fact you should tune for minimum on the power meter - this sounds crazy but it's (almost) true! You really can't transmit TV unless you can see the outgoing waveform, and this means having a detector in the antenna feedline coupled to a 'scope. Apart from getting some tolerant person to



Photo by G6SKO in Derbyshire.

"talk you in" there is no other way of sending a properly modulated TV signal - honestly!

News from North Wales: Derek GW3FDZ (Dyffryn Ardudwy) and Keith GW8WNB (Tal-y-Bont) are on 70 cm TV every Wednesday evening at 8 pm (talkback on 144.75). They'd welcome extra folk in the net, so why not join in? Their locations enable them to cover most of Cardigan Bay and they will be pleased to arrange skeds (ring Dyffryn 343 or 7714).

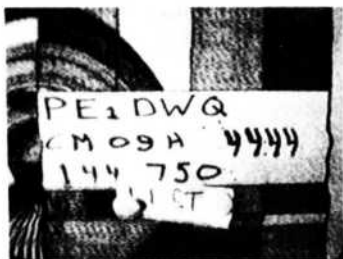
Robin G6CEZ dropped me a line from his Fordingbridge QTH; he has been having a bit of a struggle with a homebrew camera to malcolm Burrell's design in "Television" magazine. He would welcome correspondence with members who have got this project going. The station uses Wood & Douglas transmitter, Fortop 2GHz converter and the MBM 48 antenna. Other locals active include Bill G2HCG, GW8W0 (Salisbury) and G4RLF (Wilton) and Robin now looks forward to working a few GU and GJ ATV stations.

Our Scottish scribe, Norrie GM4BVU has been transmitting SECAM as well as NTSC! Monday night is activity night in central Scotland: stations to watch out for are Keith GM8HGT (Shettleston), Angus GM4JYZ (Kirkintilloch), GM4UBJ (Motherwell), George GM6AOR (Longridge), Iain GM6HFH (Stonehouse), Tom GM4PRO (Chapelhall), Tom GM3HBT (Larkhall) and Willie GM8FAA (Moodiesburn). To finish 70 cm, the following had their pictures in the Benelux DXers magazine, having been received on 18th June in Holland: G3RJM, G6BIA, G3UMF, G3ZUP.



The excellent opening mentioned above was just as good on 24 centimetres, and several stations exploited this fact. CQ-TV editor John G3YQC in Rugby saw plenty of activity on the 3rd December and had a P5 two-way contact with G4CPE in Luton. John also transmitted to F1EDM who was able to receive his signals at P4.5 and then transmitted them back on 70 cm to prove the point.

Another who played this trick was Rod G8VBC (Woodville, Derbys.), who also had a P5 two-way with G4CPE and managed to get a P5 report from Jean-Francois (40W RF output). Rod also saw his own pictures coming back. Unfortunately F1EDM's 24 cm transmitter was out of commission but Rod achieved his first two-way to France when F3LP (Le Havre) returned his signals. This contact was P1 in both directions. F1EDM clearly has an excellent site and appears to launch straight into the ducts.



Photo's from G6LTZ in Stratford, Bucks.



Rod remarks that radar interference from Cleve Hill is awkward at all times, but during this lift it was intolerable, wiping out all reception with Rod's normal rather wideband FM system. He had to resort to slope detecting signals with an AM receiver (narrower band). This at least gave recognisable pictures but even then the screen was blanked out every seven seconds.

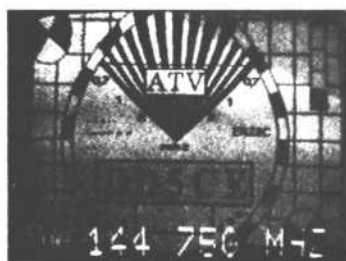
Other 24 cm news has been received from Ian G8CQE (near Croydon) who has been starting QRP tests with Dave G8GKQ in Penge. Dave is slope detecting, using a R&EW design converter. Others starting out include G4JQU, Alan G8CMQ and Nick G8MCQ, all in the New Forest area, with some stimulus from Mike G8LES who is apparently working down in Southampton.

Moving east, Tony G8RX in Lancing is one of the Worthing Repeater crowd and is on the air on 24 cm. To transmit he uses the RadCom microwave drive source and a "black brick", the blue ones having run out! This gives 4 watts ready for a varactor tripler; the diode for the latter cost just £1 and works just as well as the expensive ones (which are available again from Wood & Douglas). Receiver is BATC converter and BATC FM IF strip. Antenna is homemade 23 element yagi. Tony is building a 2C39 PA to the CQ-TV design and is just waiting for the DX ...

Repeater news is good - GB3VR is operating for tests under manual control at G8KOE's residence and seems great. GB3GV has also been tested as a beacon, and as soon as the proper licences come through we can expect great things. 1984 will be the year of the repeater!

Moving up to higher frequencies, Gary G4CRJ has been out portable on 10 GHz. On 13th August he worked G4CRG/P over a 14 km path from Blunsdon, near Swindon, to CRG/P at Barbury Castle on the top of the Marlborough downs. Grade 3 pictures (complete with QSB from passing cars) were received by Gary, which pleased him no end since (a) the link took an hour to set up and (b) he had had the gear for five years and previously he had never achieved DX further than one side of a demonstration hall to the other. Gary also had a VCR but with flat battery; in the end he had to resort to putting their car battery across the VCR nicad to get 10 seconds of recording! This at least made a permanent record of the contact and could be used to show G4CRG how his pix were received.

Transmitter was G4CRG design varactor-tuned 15 mW Gunn oscillator using a 10 inch dish. Receiver, fed from an 18 inch dish, was G4CRJ design using hybrid-tee mixer down to 500 MHz, then TV tuner down to 38 MHz IF and quadrature detector for FM demodulation. We don't get many 10 GHz reports in CQ-TV - why not?



Photo's from G6LTZ in Stratford, Bucks.



This time I have lots of SSTV news. I actually met an SSTVer at the Leicester rally and he assured me there were others like him, though he was reluctant to identify himself or put pen to paper, presumably for fear of incriminating himself. A bolder type is Grant G8CGK in Ross-on-Wye, who received good pix on two metres during the December opening from PA0APM, DF8BA and F1EDM. Signals from the latter were so good that they look like closed circuit quality, proved by the printout Grant sent in. He has his receiver linked

to a computer system and an Epson MX-80 dot-matrix printer, which does a superb job with the SSTV image. Grant also bemoans inconsiderate FM stations who say "QSY 1 MHz down" from S20 and land on the SSTV calling channel, then complain of "thermostat" interference. Yes, it's a pity that some folk are so ignorant of band plans and speciality modes; obviously they don't read this column.

Richard G3WW (Wimblington) sends a comprehensive list of active stations: noteworthy are Keith G4GZN (Catford) and G3CCH. Richard has now worked 1,937 SSTV stations two-way, a remarkable record and mentions two SSTV nets held every Saturday: IVCA at 1500 GMT on 14230 and the USA net at 1830, again on 14230. He mentions two new SSTV periodicals hailing from the States, "SSTV Today" and "Vision". More news from G3WW in my R&EW column.

Ian G4NVC (Gloucester) is the proud owner of a homebrew Robot 400 and is pleased to acknowledge the help he had from Maurice G3TLZ to get it going. Results are very successful, starting with I2II, PA3BCW, LZ1MH and EA3PE on the first two evenings of operation (6 & 7 October). Ian too relates sad tales of bandplan ignorance and phone stations deliberately "squashing" SSTV signals on 14230 kHz. He asks if anyone has details of using the BBC micro for SSTV, and encourages people to call CQ-SSTV more often on 144.500.

Quick final notes: Robin G8XEU has enhanced his Spectrum program mentioned previously, and it is now available on Microdrive for £10.50 inclusive. A BBC version is on the way, too. Details in return for SAE to Robin Stephens, Toftwood, Mill Lane, High Salvington, Worthing, Sussex. Ask for details of other radio -orientated software. In Athens BATC member Bill Mercer has at last got a working SECAM coder, using the Hitachi HD4007 i.c., which also produces all the pulses for a subcarrier locked PAL coder. Bill is also building the John Goode PAL coder.

Arthur VK7SE writes all the way from Penguin, Tasmania, to mention that their repeater VK7RTV (444.25 in, 426.25 out) has been running since October 1983. Solar cell powered, it is sited on Mount Duncan on the northwest coast, and some 45 minutes walk from the nearest spot reachable by car. Every component of the repeater had to be carried by humans up a steep and rough bush track - but it was well worth it!

That's it: there has been a lot this time, so apologies if I had to trim down your news. I always enjoy reading your letters and printing your news even if I don't get a chance to reply to each letters. Let me have more news for next time and send it to me at 71 Falcutt Way, Northampton, NN2 8PH. Many thanks - Andy Emerson, G8PTH.

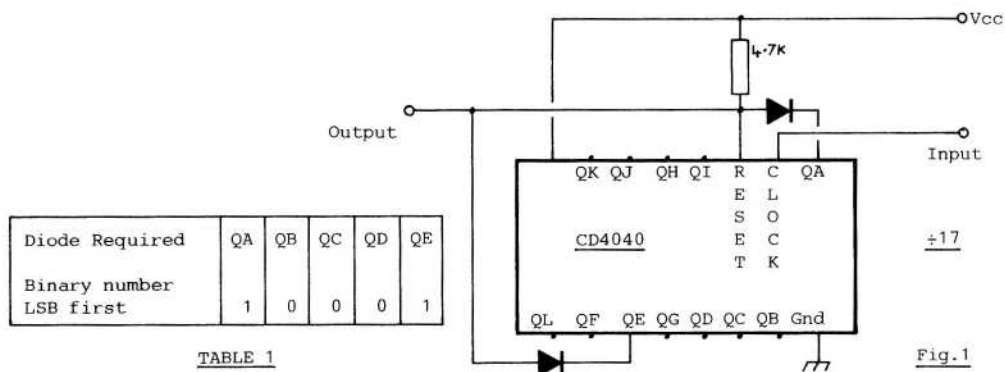
# DIVIDING BY 'N' WITH A CD4040

By Trevor Brown G8CJS

The CD4040 is a very inexpensive 12-bit counter which, by the addition of a simple diode array, may be programmed to divide by any desired number.

First, choose the number by which you wish to divide and convert it into binary form; ie 17 = 10001. Each '1' corresponds to a diode being required in the array. The diodes are placed as shown in fig.1 of the LSB of the binary number, indicating a connection to QA.

The CD4040 reset is active 'high', so pulling it high with a 4.7k resistor will cause a reset - providing none of the diodes are conducting, a state which exists when the binary equation has been met by the counter.



## NEW NBTV GROUP IN DERBY

Following a talk on NBTV at the Derby Amateur Radio Club on the 29th of September by Doug Pitt, which stimulated much discussion, a further meeting was arranged by Andy Mansfield (G6YDI) at his shack in Derby. This took place on the 21st of October and was attended by Doug, who gave a further demonstration of NBTV techniques, together with Jim Wilson, Dick G4PDE, Tony G6MWS, Mac G6JTJ, Alex G1BTA, Alan G6TKM and John G6XMG.

The proposal by Andy that those attending should form the nucleus of a Derby NBTV Group was approved unanimously.

A number of disc cameras are to be built and test transmissions commenced as soon as possible, initially on 70cm FM.

Anyone in the Derby area who wishes to find out more about this new Group is invited to contact Andy at 3 Whittaker Road, Derby.

A good use for this circuit would be a digital caption roller for use with electronic character generators. If the circuit is driven with mixed sync pulses and set to count 320 then a pulse will appear at frame rate. If the count were 321 the frame pulse would appear progressively later and the captions would roll down the screen. (Fig.2).

[illegible]

# BATC AMATEUR TV CONVENTION '84

**MAY 13th**

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# THE 'Q-STUDIOS' SHOW

Q-Studios, a small but rapidly growing commercial television studio complex, located just outside Leicester, was the venue for the clubs' latest show which was held on the 20th of November.

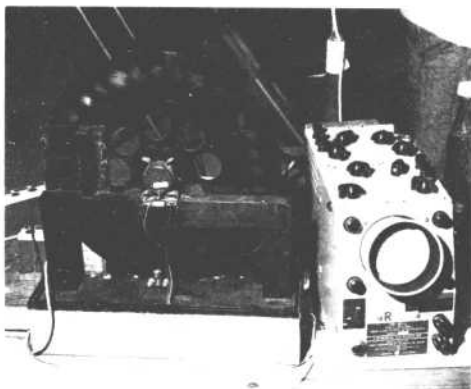
I am bound to report that the show was not a complete success, due mainly to the attendance being considerably lower than expected. Having said that, the show was very much enjoyed by all who went (around 400) and provided - for the majority - an opportunity to look round a professional TV studio.

The trade stands and exhibits were held in studios A and B. Studio A was the largest, the most striking feature of which was the rounded off (no bottom corner) main wall, used for continuous background effects. Full studio lighting, recording and complete studio facilities are available to this area.

Studio B is a little smaller and is mainly used for discussions, interviews, and music recording etc.

Conducted tours were organised throughout the day by Q-Studio staff which started with a short introduction explaining the function of the studio and illustrated by some rather nice

demonstration video tapes. This talk took place in the main sound recording theatre which was littered with musical instruments and paraphernalia.



'Live' NBTV system.



The L-Wave stand. L to R: G3ZUD, GBLMW, G3RSX, G6KUI, G4TFN.

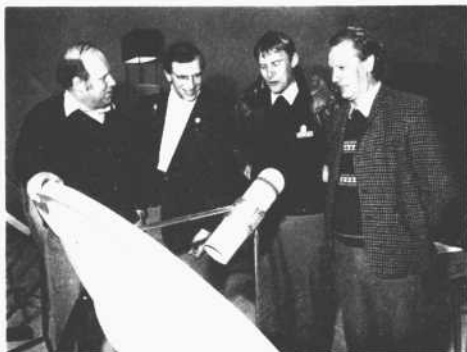
A full demonstration of the 24-track recording and mixing studio was given together with an impressive demo. tape showing off the system facilities, (did it HAVE to be so loud?)

The editing suite was suprisingly sparse although there was some very nice hardware on view. Most of the studios work is done on U-Matic Hi-band equipment but can be dubbed onto VHS or Beta as desired. The studio is mainly used for advertising and promotional productions although the IBA Channel 4 company use it from time to time.



It was a pleasure to see many of the regular exhibitors at the show and it was even better to see some new faces as well. The BATC stand was in full swing as usual although trade was not as brisk as it might have been.

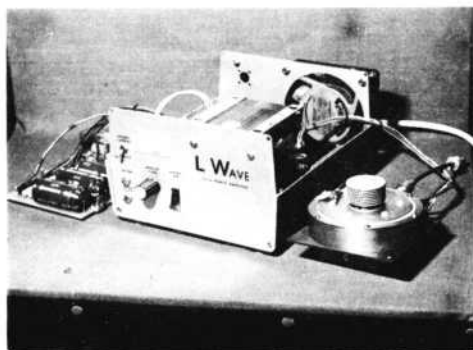
Doug Pitts' NBTVA stand had a live demonstration of 32-line TV using the disc camera (cover removed) and receiver shown in the photograph. The live action shots were very good considering the TV standard being used.



Premier Pattern Making. L to R: G4IHT, GBTNE, G8TSQ, G6CTD.

G4ILT's Premier Pattern Making Co. Ltd., of Leicester had a demonstration of off-air signals received direct from the 4GHz Gorizont Russian TV satellite. On offer

were some nice microwave dishes ranging from the basic 4ft model to a huge 8ft job. That'd bring in the 24cm signals, all you have to do is keep it up in the air!



A close-up of the L-Wave 23cm power amp.

It was nice to see the Wigston Amateur Radio Club who were selling kits for a ni-cad battery charger which is a current club project. A very useful map kit was also on sale consisting of QRA maps, beacon lists, repeater lists etc. When I visited the stand it was being manned by G8VQM. Also there was the Leicester Radio Society who had some super photo's of their field day and portable activities. On stand were G4RLC, G4PDZ and G6WOK.

The Daventry branch of Geoffry Creighton photographers were showing off some home video systems and advising on all aspects of home video.

The Leicester Repeater Group had the new ATV repeater GB3GV on show together with an off-air tape recording taken from an early test transmission which included lots of colourful Teletext style pages of information which are to be transmitted as part of the system identification and information mode. An audio speech synthesiser was also demonstrated which will be used on the repeater sound channel.

L-Wave Electronic Manufacturers were showing off a very nice 23cm cavity power amplifier (see photo) together with its own internal PSU, all contained in a smart cabinet. Unfortunately, it seems, the Q of the amplifier is a little



Brisk trade on the R.A.Kent stand with G4POY on the right.



The Wood & Douglas exhibit. L to R: June (of W&D), G4MEF, G6ABP, G4VMM.

too good therefore the available bandwidth from the unit is not really sufficient for FM-ATV use. Also shown was a nice looking 23cm in-line power meter. This instrument - which also measures reflected power - may be switched between 3W and 30W sensitivities. At £28.50p this looks like a good buy. (33 Gillam Butts, Countesthorpe, Leicester LE8 3PX).

Wood & Douglas again had a comprehensive display including a live demonstration of microwave FM-TV. W&D seem to have overcome their recent moving problems and holdups and I was glad to see the emergence of some 24cm ATV modules. A nice looking 420MHz oscillator kit was on view which also includes an on-board FM modulator. The oscillator is lockable to an AFC voltage source. I was told that the FM IF strips should be readily available by now and that the companion 24cm to 52MHz receive down-converter should be available in the new year. It is interesting to note that a 24cm varactor tripler is to be made available which will deliver sufficient output to drive good sized power amplifiers.

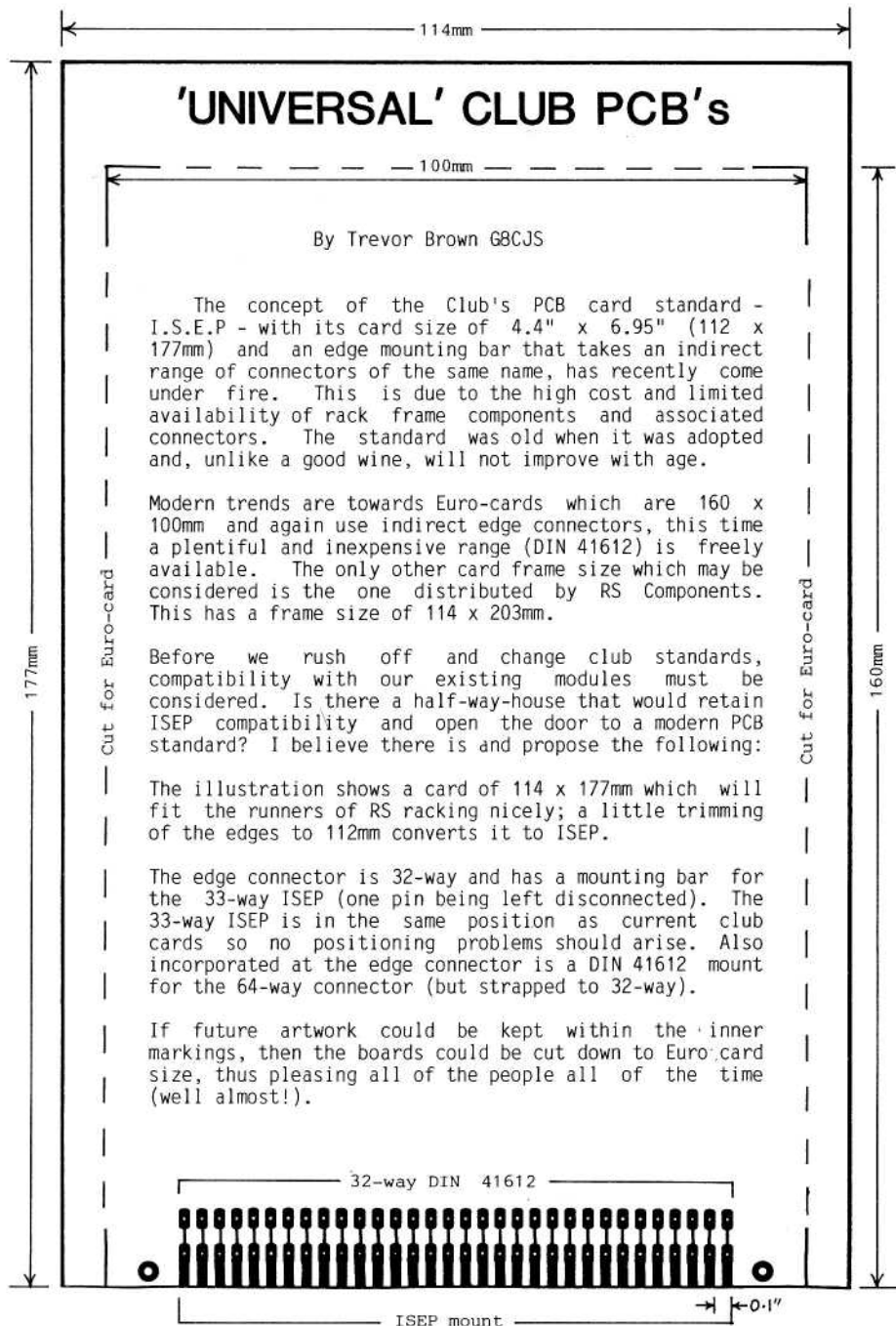
R.A.Kent Engineers were doing a brisk trade in monitors, cameras, camera wall brackets and ball-and-socket heads (very useful these) also for camera mounting. The stand was also laden down with lots of bits and pieces.

Quantel had a demonstration of their image storing system. Well, that was something else! The special effects that can be created are really super. You've all seen them, they're the ones that zoom the picture all over the screen and tumble the images in all directions. The crowd around the stand was continuous and I suspect that some of the gear was chained down! Is this what we amateurs can look forward to? After all, all you need is a M'byte or so of fast RAM.

Brian Summers held court in a separate building with his OB van. Brians special demonstration was an excellent chroma keying system operated with two commercial studio colour cameras. The results were very nice indeed and a credit to the builder.

Those that came had a very good time and thought it well worth while turning out. Those that didn't I fear may have lost their opportunity.

DON'T FORGET TO PUT MAY 13th IN YOUR NEW 1984 DIARY. SEE YOU THEN.



# 'UNIVERSAL' CLUB PCB's

By Trevor Brown G8CJS

The concept of the Club's PCB card standard - I.S.E.P - with its card size of 4.4" x 6.95" (112 x 177mm) and an edge mounting bar that takes an indirect range of connectors of the same name, has recently come under fire. This is due to the high cost and limited availability of rack frame components and associated connectors. The standard was old when it was adopted and, unlike a good wine, will not improve with age.

Modern trends are towards Euro-cards which are 160 x 100mm and again use indirect edge connectors, this time a plentiful and inexpensive range (DIN 41612) is freely available. The only other card frame size which may be considered is the one distributed by RS Components. This has a frame size of 114 x 203mm.

Before we rush off and change club standards, compatibility with our existing modules must be considered. Is there a half-way-house that would retain ISEP compatibility and open the door to a modern PCB standard? I believe there is and propose the following:

The illustration shows a card of 114 x 177mm which will fit the runners of RS racking nicely; a little trimming of the edges to 112mm converts it to ISEP.

The edge connector is 32-way and has a mounting bar for the 33-way ISEP (one pin being left disconnected). The 33-way ISEP is in the same position as current club cards so no positioning problems should arise. Also incorporated at the edge connector is a DIN 41612 mount for the 64-way connector (but strapped to 32-way).

If future artwork could be kept within the inner markings, then the boards could be cut down to Euro card size, thus pleasing all of the people all of the time (well almost!).

# A 'BEEB' TEST-CARD

Members with BBC microcomputers may like to enter the following program, which generates a colour test card complete with callsign insert. Your own callsign may be entered in line 30.

Thanks to Simon Hindle G8NVS for sending in this useful program.

```
10 ON ERROR GOTO 430
20 REM callsign must have no more
   than 8 characters
30 A$="G8NVS"
40 g%=(640-(LEN A$*30))
50 c%=5
   :n%=10
60 IF LEN A$<6 c%=6
   :n%=9
70 IF LEN A$=8 c%=4
   :n%=11
80 MODE 2
90 VDU 23,1,0;0;0;0;0;
100 PROC GREY
110 GCOL 0,0
   :MOVE 0,1008
   :MOVE 0,1024
   :PLOT 85,1280,1008
   :PLOT 85,1280,1024
120 GCOL 0,7
130 FOR I%=0 TO 1280 STEP 80
140 IF I%>=480 AND I%<=800
   THEN MOVE I%,0
   :DRAW I%,224
   :MOVE I%,336
   :DRAW I%,1008
   ELSE MOVE I%,0
   :DRAW I%,1008
150 NEXT
160 FOR I%=0 TO 1008 STEP 56
170 IF I%=280
   THEN MOVE 0,I%
   :DRAW 480,I%
   :MOVE 800,I%
   :DRAW 1280,I%
   ELSE MOVE 0,I%
   :DRAW 1280,I%
180 NEXT
190 FOR I%=0 TO 15
   :READ D%
   :PROCRECT(I%,17,D%)
   :NEXT
200 FOR I%=0 TO 15
   :READ D%
   :PROCRECT(I%,0,D%)
   :NEXT
210 FOR I%=0 TO 17
   :READ D%
   :PROCRECT(0,I%,D%)
   :NEXT
220 FOR I%=0 TO 17
   :READ D%
   :PROCRECT(15,I%,D%)
   :NEXT
230 FOR I%=5 TO 10
   :READ D%
   :PROCRECT(I%,15,D%)
   :NEXT
240 FOR I%=2 TO 13
   :READ D%
   :PROCRECT(I%,14,D%)
   :NEXT
250 FOR I%=2 TO 13
   :READ D%
   :PROCRECT(I%,13,D%)
   :NEXT
260 FOR I%=2 TO 13
   :READ D%
   :PROCRECT(I%,11,D%)
   :NEXT
270 FOR I%=2 TO 13
   :READ D%
   :PROCRECT(I%,10,D%)
   :NEXT
280 FOR I%=2 TO 13
   :PROCRECT(I%,7,0)
   :NEXT
290 FOR I%=2 TO 13
   :PROCRECT(I%,6,0)
   :NEXT
300 FOR I%=2 TO 5
   :PROCRECT(I%,5,0)
   :NEXT
310 FOR I%=2 TO 5
   :PROCRECT(I%,4,0)
   :NEXT
320 FOR I%=10 TO 13
   :PROCRECT(I%,5,7)
   :NEXT
330 FOR I%=10 TO 13
   :PROCRECT(I%,4,7)
   :NEXT
```

```

340 FOR I%=C% TO N%
:PROCRET(I%,3,4)
:NEXT
350 FOR I%=C% TO N%
:PROCRET(I%,2,4)
:NEXT
360 VDU 16
370 VDU 5
:GCOL 0,7
:MOVE G%,180
:PRINT A$
380 PROCstripe(2,5,20)
390 PROCstripe(6,5,16)
400 PROCstripe(10,5,8)
410 GCOL 0,7
:MOVE 520,728
:DRAW 520,840
420 A%=GET
430 VDU 23,1,1;0;0;0;
:MODE 7
:END
440 DEF PROCRECT(A%,B%,C%)
450 GCOL 0,C%
460 A%=A%*80
:B%=B%*56
470 MOVE A%,B%
:MOVE A%,B%+56
:PLOT 85,A%+80,B%
:PLOT 85,A%+80,B%+56
480 ENDPROC
490 DEF PROCstripe(M%,N%,O%)
500 V%=7
:M%=M%*80
510 FOR G%=M% TO M%+312 STEP O%
520 IF V%=0
THEN V%=7
ELSE V%=0
530 GCOL 0,V%
540 MOVE G%,340
:MOVE G%,446
:PLOT 85,G%+0%,340
:PLOT 85,G%+0%,446
550 NEXT
560 ENDPROC
570 DEF PROCGREY
580 FOR K%=0 TO 2 STEP 2
590 P%=&2A00
600 IOPTK%
610 .GREY LDA£0
:STA£75
620 LDA£30
:STA£76
630 .A LDY£0
640 .B LDA£42
:STA (£75),Y
650 INY
660 LDA£21
:STA (£75),Y
670 INY
680 CPY£0
:BNE B
690 INC£76
700 LDA£76
710 CMP££80
720 BNE A
730 RTS
:J
740 NEXT
750 CALL &2A00
760 ENDPROC
770 DATA 7,0,6,0,6,0,6,0,0,6,0,6,0,6,
0,7,7,0,2,0,2,0,2,0,0,2,0,2,0,2,0
,7,7,0,4
780 DATA 0,4,0,4,4,0,0,1,1,0,1,0,1,0,
7,7,0,3,3,0,7,7,0,0,0,0,7,7,0,3,3
,0,7,3,3,1,1,3,3,7,7,7,7,0,0,0,0,
7,7,7,7,7,7,7,0,0,0,0,7,7,7,7,3
,3,6,6,2,2,5,5,1,1,4,4,3,3,6,6,2,
2,5,5,1,1,4,4

```

In the interests of conserving space this listing has been produced using a special formatter which splits most program lines over several lines of print.

When entering a line do not press RETURN until you reach the next line number.



# TV'S FOR MONITORS

By Steve Beeching

A number of articles have been written recently on converting TV's to work as receiver/monitors, that is, either as a straight TV or as a video monitor, but they did not offer much practical advice, or circuits.

In this article I shall not only discuss the practicalities but I will also include realistic circuits which are flexible enough to cope with any set.

We will have to start with a warning that the set to be converted MUST HAVE A 'COLD' CHASSIS, that is, one which is ISOLATED from the mains supply. Isolation may be via a switched-mode power supply or by fitting an extra mains isolating transformer. If a mains transformer is to be fitted then it can only be achieved if the set does NOT have a thyristor half-wave rectifier. The choice of TV to be converted is therefore limited mainly to small mains/battery portables, Grundigs with CUC chassis (switch-mode isolated) or Sony KV chassis (using an isolating transformer). You must check on the TV set before deciding whether or not it is suitable for conversion.

The elements involved in conversion are:

1. Input buffer amplifier.
2. Output impedance buffer.
3. Audio control.
4. TV/Monitor switching.

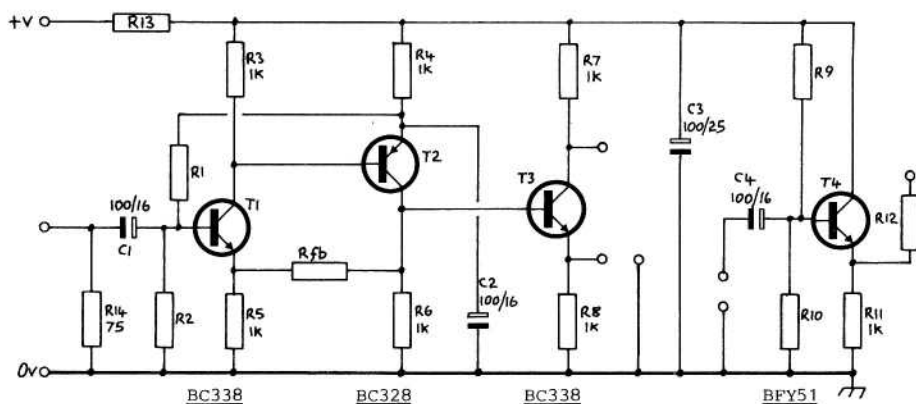


Fig.1

BASIC VIDEO AMPLIFIER

Let me explain these in detail:

## 1.2. THE INPUT AMPLIFIER.

This is reproduced in Fig.1 and is generally called my 1k video amplifier due to the number of 1k resistors involved. The PCB which is available for this accommodates all of the components shown although not all of them are utilised in any single configuration, the idea being to enable a single printed board to be used for a number of different modules.

For use within a receiver/monitor, T3 and its resistors R7 and R8 are not used and the collector of T2 is linked to the output terminal. Also, C4, R9 and R10 are not used. T4 obtains its DC bias from the output of the video demodulator IC within the TV. In some early Grundig models using the GC200 and GC600 chassis, two video outputs are used within the set, video and chroma from the positive demodulator output and syncs to the sync separator from an inverted demodulator chip output, hence the use for T3 which will provide both positive and negative video signals, don't expect any super bandwidth from its collector though.

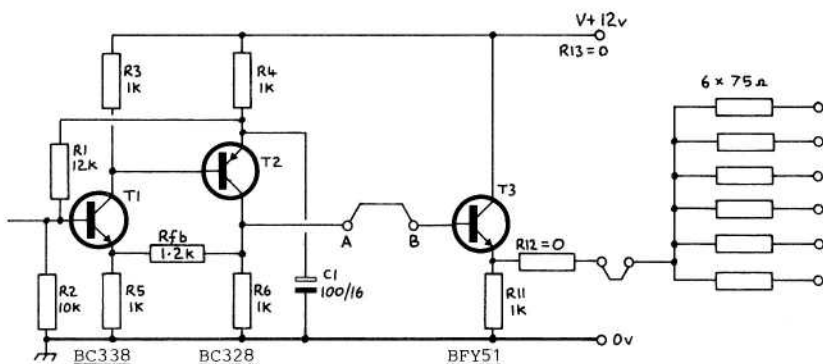


Fig.2

MODIFICATIONS FOR DISTRIBUTION PURPOSES

If we look at Fig.2 we can see the construction of a video distribution amplifier. Points A and B are linked, R12 is zero and there are six outputs, bandwidth is around 8MHz. Note that T2 provides the bias for T4.

A similar arrangement will be used for the receiver/monitor modifications, 'A' is the video input signal to the TV video processing circuits and 'B' is the demodulated signal - buffered out.

The most important point with this video input amplifier is the fact that the gain and DC level can be adjusted to match the demodulated signal. If you have access to a 'scope, measure the amplitude of the demodulated signal within the TV after the 6MHz sound filter. Also note the height of the sync

pulse tip above chassis. It is then possible to alter Rfb for gain and the ratio of R1 and R2 to alter the DC level. The advantages here are that when switching from TV to monitor, with a standard 1v p-p input, there will not be any change in contrast or brightness (that is Black Level) between the two displays. If the TV has black level clamping within the circuits to the tube drive, then a DC shift will have little effect. Grundigs do clamp, Sony KV2000's, (early versions) do not, although later ones may. As you can see, with a little care a good signal match can be obtained.

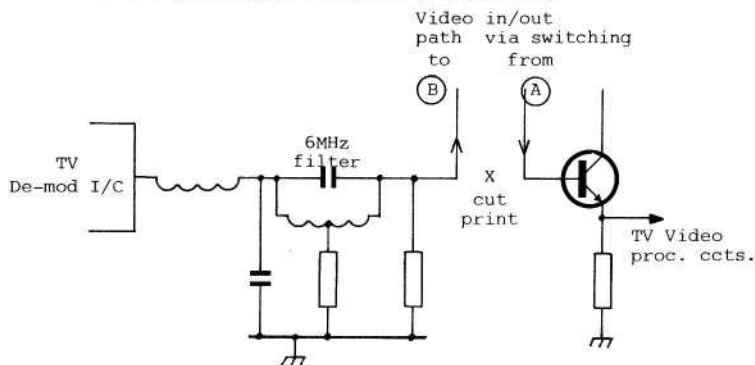


Fig.3

#### CONNECTION POINTS TO A TV RECEIVER

Fig.3 illustrates the point to which connections to the TV video circuits are made. The video output will go via the output buffer and the input signal via the input amplifier and switching to the TV video processing circuits.

### 3. THE AUDIO CIRCUIT.

Before we go on to the actual switching circuits, let us consider the audio problem. In most modern sets the volume control is varied by a DC signal, either from remote control A/D converters or simply via a DC potentiometer. Audio level control is within the demodulator IC which inhibits any input audio unless an external volume control is fitted. Or does it?

The most sophisticated way is to fit another DC controlled variable gain amplifier (Fig.4), and then wire up the demodulator IC to full level. The DC control signal available from within the TV can then be re-routed to the new circuit, with suitable matching. The trick is to be able to match the DC signal, in level and range, so that the additional circuit is undetectable. This is not that easy, but is achieved by the relationship between R3, R4 and sometimes R5, with C1 thrown in.

A starting point is R5 = 1k, R3 = 10k with R4 not fitted. Sony sets with a 12v range will require something like: R3 = 10k, R4 = 3.3-3.9k. Grundig CUC chassis: R5 = 1k, R3 = 22k, R4 not fitted. In the remote controlled CUC chassis R5 = 1.5k, R3 = 4.7k, C1 = 4.7uF, R4 not fitted. You will have to experiment a bit, don't make C1 too large or the volume control will have a 'lag'. Also on certain sets with a potentiometer control, the input to R3 may need to be biased 'up' to +V with something in the region of 10 to 47k if the range is restricted.

# MEMBERS SERVICES

Items from these lists are available to club members only.  
This list supercedes all previous ones.

QTY	PRINTED CIRCUIT BOARDS	EACH	P&P	TOTAL
_____	'Project 100' sync generator (CQ-TV100)	£3.00	0.30	
_____	TX-9 video/audio in/out (CQ-TV119)	£2.25	0.30	
_____	FM-TV demodulator (CQ-TV122)	£3.00	0.30	
_____	Wide-band 70cm ATV tuner (HB1)	£3.00	0.30	
_____	Amateur television receiver (HB1)	£1.50	0.30	
_____	Electronic character generator (HB1)	£3.00	0.30	
_____	Colour test card (set of 3-double-sided)	£15.00	0.60	
_____	Horizontal aperture corrector (HB1)	£3.00	0.30	
_____	PAL colour coder (HB1)	£3.00	0.30	
_____	Vision switcher matrix (HB2)	POA		
_____	Vision switcher logic (HB2)	£4.00	0.30	
_____	Vision mixer (HB2)	POA		
_____	70cm VSB transmitter-7 boards (HB2)	£15.00	0.40	
_____	SSTV pattern/sync generator (HB2)	POA		
_____	Character colourizer,(printed legends HB2)	£5.00	0.30	
_____	Piggy-back keyboard (HB2)	£2.25	0.30	
_____	70cm TV transmitter (TVA and CQ-TV122)	£3.00	0.30	
_____	ATV up-converter (TVA and CQ-TV112)	£2.25	0.30	
_____	Video filter (TVA and CQ-TV122)	£1.00	0.16	
	*HB1 & 2 = Handbooks.TVA = TV For Amateurs			
_____	SPG, greyscale, char gen (Ham Radio Today)	£4.set	0.60	
_____	SSTV to FSTV converter & reprint (Rad Com)	£10.set	0.60	
	<u>STATIONERY,ACCESSORIES AND COMPONENTS</u>			
_____	BATC test card - with data sheet	0.50	0.24	
_____	BATC reporting chart (illustrated)	0.12	0.20	
_____	BATC lapel badge - diamond - button hole	0.40	0.16	



BATC lapel badge - round - pin fastening	0.50	0.16
BATC callsign* lapel badge-pin fastening *Write callsign CLEARLY. Sent by supplier	£1.50	nil
BATC key fob	0.60	0.16
BATC equipment stickers - 1" round	0.15	0.16
BATC windscreen stickers - 2.5" round	0.10	0.16
1" Vidicon scan-coils (low Z focus coils)	£6.00	£1.20
1" Vidicon scan-coils (high Z focus coils)	£6.00	£1.20
2/3" Vidicon scan-coils	£6.00	0.80
Vidicon bases - 1" or 2/3" (state which)	0.50	0.16
TV camera lens mounts - 'C' type	£1.00	0.24
13.14MHz TV TX crystal (Hbk 2)	£5.00	0.16
108MHz TV TX crystal (TV for Am)	£7.00	0.16
5MHz SPG crystal (P100)	£2.75	0.16
TBP28122 PROM. Pre-programmed for colour test card circle. (eqt.74S471)	£10.00	0.25
2732 EPROM. Slow-scan program	£12.00	0.16
4.433618MHz PAL colour subcarrier crystal HC18-U (wire leads), NEW	£2.75	0.16
TOTAL		£
POSTAGE		£
TOTAL ENCLOSED		£

#### CAMERA TUBES & ORDERING INFORMATION

Members requiring EEV Leddicon, EMI 9777 Ebitron, 9728, 9706, 9677 (1" EMI) vidicons or 9831 (2/3" EMI) vidicon should enquire for the latest prices and delivery. ALL enquiries needing a reply should include a SAE or IRC.

OVERSEAS MEMBERS should ask for a quotation of postage costs before ordering.

PUBLICATIONS must be ordered separately from the Publications Department.

CHEQUES are payable to "The BATC" and should be for English banks only please  
ORDERS TO:- Mr. P.Delaney. 6 East View Close, Wargrave, BERKS RG10 8BJ,  
England. Tel: 073 522 3121

BLOCK CAPITALS PLEASE

name		call	
address			
		post code	

# PUBLICATIONS

PLEASE DETACK HERE

QTY	PUBLICATION	EACH	P&P	TOTAL
_____	AMATEUR TELEVISION HANDBOOK vol.1 by J.Wood G3YQC and T.Brown G8CJS	£1.50	0.40	_____
_____	AMATEUR TELEVISION HANDBOOK vol.2 by T.Brown G8CJS	£2.00	0.40	_____
_____	TV FOR AMATEURS by J.Wood G3YQC	£1.50	0.25	_____
_____	CQ-TV BACK ISSUES. The following issues are still available although stocks of some are low. Please circle those required.			
_____	68,88,89,90,91.....	0.25	*	_____
_____	93,94,95,96,100,103,105,106,107, 111,117,118,119,120,122,123,124,125..... *Please estimate appropriate postage	0.50	*	_____
_____	RE-PRINTS. Photocopies of any article from past issues of CQ-TV are available. Payment (if ordered separately) in UK postage stamps please.	0.20 per sheet	0.20	_____
_____	INDEX. All main articles in past issues of CQ-TV and 4 Handbooks. Inc. page count, (essential for ordering re-prints).	£1.00	nil	_____

TOTAL                      £ \_\_\_\_\_

POSTAGE                      £ \_\_\_\_\_

TOTAL ENCLOSED                      \_\_\_\_\_

## AUSTRALIA

Would Australian members please note that the "AMATEUR TELEVISION HANDBOOK" Vol.1 is available direct from the Wireless Institute of Australia at: PO Box 300, South Caulfield, Victoria 3162. (Only available to WIA members) Please enquire for volume 2 and "TV FOR AMATEURS".

All other orders please to:- BATC PUBLICATIONS, 14 LILAC AVENUE, LEICESTER LE5 1FN.

name	callsign
address	
post code	



# CQ-TV AWARD

This award is available to both transmitting and receiving amateurs and SWL's, in any part of the World, whether or not they are members of the BATC.

The award is for contacts made using fast-scan high definition television systems only.

## TRANSMITTING AWARD

For pictures transmitted which have been successfully identified by another station, claim 2-points per kilometer; if the contact becomes a successful two-way exchange of pictures, then 10 bonus points may be claimed by each station regardless of distance.

## RECEIVING AWARD

For any picture positively identified - claim 2-points per kilometer.

## POINTS

Points are claimed as above for 70cm contacts; however, if the contact is on 24cm or above, the points total should be doubled.

The award is divided into five grades: For the Bronze - 1,000 points, for the Silver - 5,000 points, for the Gold - 10,000 points and for the Diamond - 100,000 points.

## CONTACTS

A station may be worked once only per day for the purpose of this award. It is quite possible for the award to be gained by working the same station many times. The aim is to promote ALL activity.

## THE AWARD

Upon qualification for the Bronze award, a certificate will be issued together with a Bronze seal; the certificate may be up-graded later with Silver and Gold seals. The Diamond award is in the form of a specially made trophy.

## APPLICATIONS

Applications should include log details consisting of call sign, date of QSO, band, location of the station worked and points claimed. Contacts made from other than the home station should be clearly marked. QSL cards are not required, but the application should be checked and signed by one other licenced amateur.

CERTIFICATE APPLICATIONS SHOULD INCLUDE A LARGE (12"x8.5") STAMPED, ADDRESSED ENVELOPE. For upgrade seals an ordinary SAE should be enclosed.

Applications should be made to the Awards Manager: Rod Timms G8VBC, 16 Butt Lane, Woodville, Nr. Burton-on-Trent, Staffs. DE11 7EL

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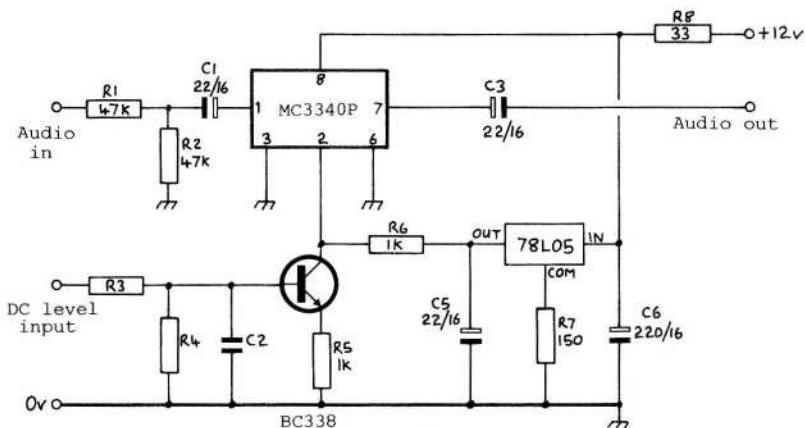


Fig.4

DC CONTROLLED AUDIO AMPLIFIER

#### 4. THE SWITCHING MATRIX.

Fig.5 illustrates the switching arrangements. It allows for an output to be present from the TV when in receiver mode. It is not a good idea to have long leads to and from the switching due to the presence of the 6MHz filter.

If a long screened cable - by long I mean of the order of 10-inches - is present between the 6MHz demodulator filter and the output buffer, then the capacitance of such a cable will de-tune the filter and perhaps reduce the level of the chroma signal. To overcome this I have developed a solid-state switching matrix.

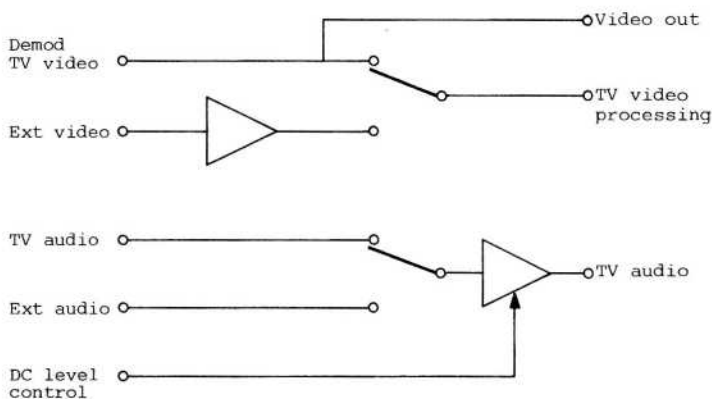


Fig.5

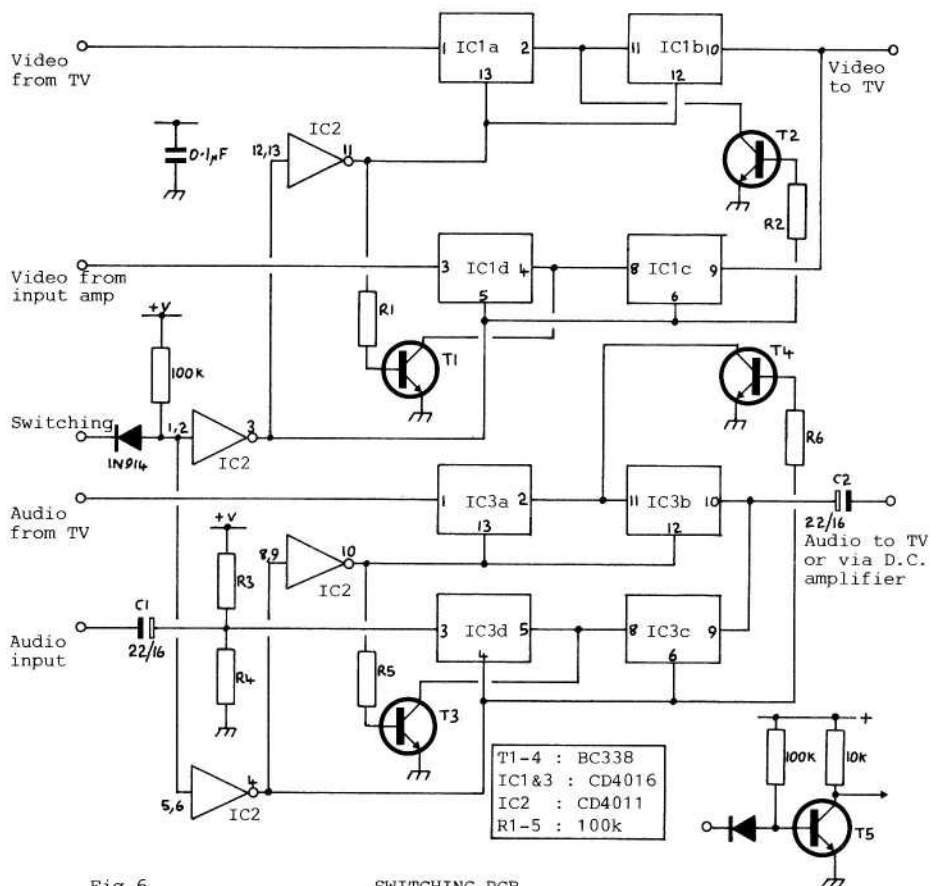


Fig.6

SWITCHING PCB

C-mos switches can be used for video switching, in fact some of the more sophisticated video recorders now have solid-state switches for signal routing. When I first tested the CD4016 some years ago I found that there was some chroma leakage through the internal capacitances so I hit upon the idea of using a 'T' network. This consists of two elements of the 4016 in series and a transistor between their junction and ground. For a throughput the two 4016 elements are switched 'on' and the transistor switched 'off'. The reverse is true for isolation when the elements are 'off' the transistor is 'on' to ground thereby clamping the signal path firmly to deck, there is however still some slight leakage. If 100% colour bars are present at the video input when in the receiver mode, there may be some colour flashing in the background, but for normal uses isolation is adequate.

Fig.6 shows the full solid-state switching circuit as available on the PCB. Again various changes will need to be made to accommodate all circumstances. TV is the normal condition, held on by a 100k resistor, switching to monitor is effected by grounding the input via a diode.

When the diode is grounded, IC1a and b are switched off, whereas T2 is switched on. IC1d and c are switched on and T1 is switched off. Note that IC1b protects the output signal from being grounded by T2, hence the use of a 'T' network. The audio side has small differences. In order for the C-mos switches to work they must be biased correctly, as the audio input is decoupled there is no DC voltage to the C-mos switch so two 100k resistors are fitted to bias IC3d and c.

Provided that the audio from the TV is taken from an IC pin, no biasing will be necessary, if, however, it is taken via a capacitor, then two further resistors will be needed and provision is made for them on the PCB.

If reverse polarity switching is required, then a transistor can be added as shown by T5 to invert the signal such that it is low for TV and high for monitor use.

With remote controlled TV's monitor switching could be taken from the 'AV' (Audio Visual) switching signal in the remote receiver, if this is the case the signal may not fully ground as it is from an IC or similar source. The output of an AV terminal of a remote control receiver will sit at about 400-500mV above ground. The forward voltage of a single diode could prevent switching as the voltage on the end of the 100k resistor will sit at about 600mV and with a forward voltage of around the same value for the diode T5 may not fully switch off. Therefore T5 will have to be fitted with two diodes in its base circuit as shown in fig.7.

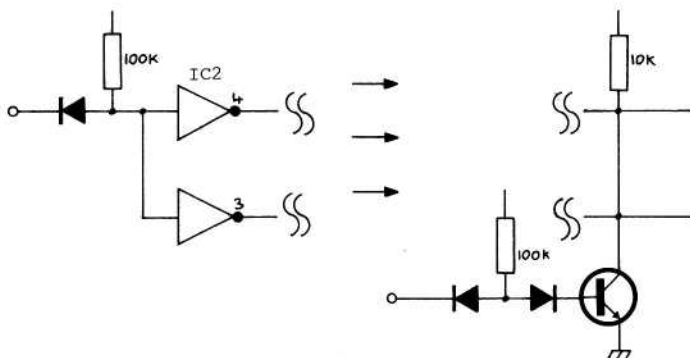


Fig.7      AV 'LOW' MODIFICATION

As T5 is an inverter the first two stages of IC2 will have to be disconnected and isolated. T5's collector is connected to the print pads of IC2 pins 3 & 4 and the legs are cut off the chip. Fig.7 also illustrates a modification for the condition of monitor 'low'. The second diode will meet the requirement of slightly more than 1v to switch on the transistor, provided that the input switching voltage goes down to at least 0.5v then the transistor will switch off. This arrangement will be suitable for adding to T5 of fig.6 if necessary.

The idea of logic switching is to take advantage of AV switching voltages found within many TV's. This normally switches the line timebase time constants but it can be used to effect receiver/monitor switching and give the whole arrangement a touch of class! However, if you want to fit a common switch, be my guest.

Finally, I do have one or two squat (short and fat) mains isolating transformers which will fit Sony KV2000 TV's rated between 80 and 100VA, depending on how hot you want to run them. Also printed circuit boards for the video amplifier, audio DC volume control and the solid-state switching matrix.

All enquiries please to: Newark Video Centre, 108 London Road, Balderton, Newark, Notts NG24 3AQ.

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## **CONTEST NEWS**

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### SEPTEMBER 1983 INTERNATIONAL CONTEST

As you will see from the results shown below there was a good level of activity for this contest. Unfortunately, our usual good luck did not give us much support this year and both weather and radio conditions were best described as "awful" still even those poor poeple who went portable said they enjoyed themselves! so I must just hope that their enthusiasm has not been washed away !

The leading U.K. station this year was G8GLQ/P which was the Bristol TV Group operating from some 20 kilometres South West of Bristol. Conditions were so bad that the Worthing Group G6WOR/P, high up on the South Downs just north of Worthing, were unable to make two-way QSO's with any continentals but were still able to just take second place from G8CMQ/P operating from near Newbury.

Although it appears from the results that this was a mainly "London and South East" contest there was in fact plenty of activity in the Midlands and the South West - it seems though that in those areas not so many operators wish to actually send in entries.

My thanks to G6VAH/P for his check log.

The full international results will be hopefully available in time for the next issue and certificates will eventually be sent to all entrants.

# U.K. RESULTS

<u>POSITION</u>	<u>CALLSIGN</u>	<u>POINTS</u>	<u>QRA</u>	<u>BEST DX</u>	<u>QSO'S</u>
<u>70 cms</u>					
1	G8GLQ/P	4907	YL57G	G8DTQ-189K	30
2	G6WOR/P	4585	ZK09F	G8GLQ/P-174K	44
3	G8CMQ/P	4572	ZL53A	G61RJ/P-121K	36
4	G8DTQ	4464	ZL60E	G8GLQ/P-189K	43
5	G8MNY/P	3845	ZL26F	G8GLQ/P-133K	35
6	G8MLA/P	3701	ZM54J	G6WOR/P-168K	32
7	G3UMF	2761	ZL15F	G6WOR/P-112K	26
8	G3WSC	2515	ZL80H	G8MLA/P-155K	31
9	G4EUF/P	2367	ZM24J	G8MNY/P-118K	21
10	G6HCT/A	2238	ZL38E	G8GLQ/P-159K	32
11	G6CUQ	1552	ZM51F	G8GLQ/P-119K	14
12	G4CRJ	1359	ZL38B	G4RZ0-88K	24
13	G8CQE	1254	ZL50D	G8CMQ/P-101K	19
14	G4RSB/P	1189	ZN53C	G8MLA/P-111K	14
15	G6MNJ	1126	ZL39D	G8CMQ/P-90K	17
16	G4LXC	1100	ZL39H	G6WOR/P-88K	15
17	G3SQQ	929	ZN74B	G3DFL-97K	13
18	G4TEP	794	ZL29D	G6WOR/P-90K	14
19	G4NGS	747	ZL48D	G6WOR/P-53K	14
20	G8GKQ	643	ZL50C	G6WOR/P-65K	14
21	G8VBS	477	ZL60E	G8DTQ-114K	6
22	G2BM1	406	ZL38J	G8CMQ/P-73K	8
23	GM4BVU	320	XP20E	GM3RVX-89K	8
24	G8ZQF	240	YL38F	GW6CNS-54K	6

## 23 cms

1	G8MLA/P	116	ZM54J	G8VBC-53K	2
2	G6WOR/P	26	ZK09F	G8K0E-13K	1
3	G6HCT/A	2	ZL38E	G4CXB-1K	1

## 1984 EVENTS

May 20th - Summerfun Contest  
 September 8-9th - International Contest

## RULES

### Summerfun Contest

DATE: Sunday May 20th 1984  
 TIME: 10.00 - 16.00 GMT  
 SCORING: Logs have to be entered per band operated

- A) Two-way QSO on 70cm: 2 points/km.
- B) Two-way QSO on 23cm: 8 points/km.
- C) Two-way QSO on 3cm: 16 points/km.

Multi-op-stations may only use one callsign.  
 Crossband QSO's must be entered in the log for the transmit band.



EXCHANGES: The following data is to be exchanged;

1. Code-group, which consists of four digits, individually chosen by each entrant, i.e. 1865 or 9732. The code group must be exchanged in video only.
2. Call, QTH-locator, report, serial number starting at 001 each session, this data to be exchanged via video or phone.

Should one of the stations fail in receiving the picture of the other, the scores of both stations are to be halved.

144.75 is the main calling channel -please QSY as soon as contact has been established.

Please keep video transmissions as brief as possible.

LOGS: Must include postal address, locator, and station details and be mailed not later than 30th June 1984,

G. SHIRVILLE G3VZV

18 Church End,

Milton Bryan,

Milton Keynes,

Buckinghamshire MK17 9HR

Good luck to all for 1984 !

73's

Graham P. Shirville G3VZV

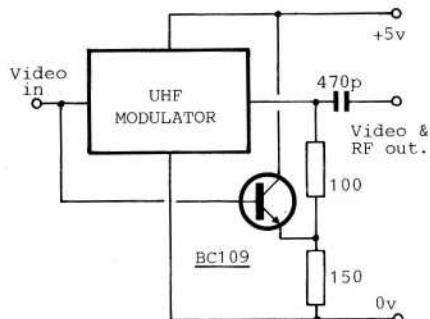
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## VIDEO OUT FROM AN 'RF ONLY' MICRO

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By John Hiron G6TGJ

All those who have wanted to extract composite video from their computer but found only an RF output, say AYE!



OK, this one's for you. This simple circuit, employing just four extra components, will enable you to superimpose RF from the modulator stage of your machine onto a more usable video signal whilst still retaining the RF capability for use on the domestic tele. All this and out of the same socket to!

Do keep component leads as short as possible in order to minimise instability and stray pickup from the computers' QRM generator.

All the best for 1984 and above all - have fun.



# CIRCUIT NOTEBOOK

No.39

By John Lawrence GW3JGA

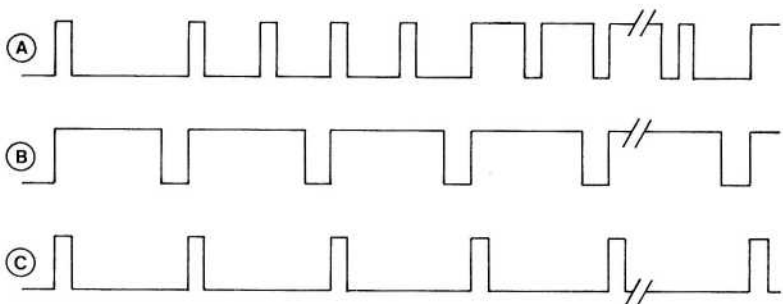
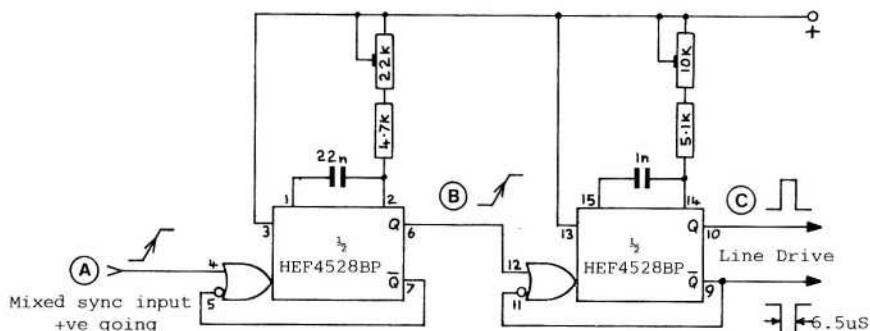
The topic for this edition of Circuit Notebook was kindly submitted by Derek Whitehead GW3FDZ.

When using the Ferranti low-cost ZNA234 Pattern Generator chip as his station SPG, Derek reports a snag in that 'pure' line drive is not available. This is needed for such purposes as driving the Vertical Axis Switch (Circuit Notebook No.33).

In the circuit shown, which uses an HEF4528BP, the first half is connected as a non-resettable monostable with a time constant long enough to miss the half-line pulses. The Q output drives the second monostable to give Line Drive pulses of 6.5uS, suitable for the VAS circuit, or any other requirements.

Field Drive can be obtained using part of the circuit shown in Circuit Notebook No.34.

Incidentally, there is an error in the diagram in Circuit Notebook No.34. (CQ-TV 119 page 15), the numbering of pins 2 & 3 on IC1 are transposed. The signal goes correctly to the inverting input, but this is actually pin 3, not pin 2 as shown. Sorry!



# DX-ATV?

By Tony Marsdon G6JAT

Have you ever wished you could QSO with ATV'ers all over the World - with P5 pictures?! Well, according to John Fox WB2LLB/4 in an article in the July 1983 issue of 'A5', the American ATV magazine, you can. He advocates taking up the suggestion in the old CW insult "QMT" ("try mailing it!") - and posting your QSO's around the World on videotape.

John recommends the use of the VHS format videocassette system since this seems to be perhaps the one most widely used. One of the main problems is likely to be the differing standards used around the World - briefly, American countries and Japan mainly use the 525-line / 60 field-per-second standard with NTSC colour, whilst Europe, Africa and most of Asia use the 625-line / 50 field-per-second standard (as in the U.K.), with either PAL or SECAM colour systems. The article in 'A5' magazine includes a very comprehensive list of all the various countries and their TV systems to which interested readers are referred.



Interchange of tapes between countries using the same line/field standards is easy, although colour tapes will only replay in black and white if you are using the wrong system. A PAL videorecorder should just about replay a SECAM videotape in colour, provided of course that you have a suitable decoder! Vice-versa is not necessarily true, however.

When it comes to 525-line / 60 field however, things are a little more awkward, as tapes recorded on one standard will not replay directly on machines of the other standard. Double or tripple-standard VHS machines (and TV's/monitors) are available in the U.K. from several well-known suppliers in London and elsewhere who specialise in the export market - John reports much greater difficulty in obtaining multi-standard equipment in the U.S.A. The only problem of course is the expense - but perhaps if you were thinking of buying a VHS anyway, it might be worth considering paying the small amount extra for a multi-standard machine. Take care, however, as some machines will only RECORD in PAL, even though they play back in all three systems. Machines which both record AND playback multi-standard seem to be much rarer. It is worth mentioning that most dual-standard machines when working in the 525-line standard can replay in what is referred to as 'modified NTSC', i.e. NTSC with the colour subcarrier frequency at 4.43MHz instead of the usual 3.58MHz. This means that it is easier to process using a modified PAL decoder - certainly a possibility for the more experienced constructor. Many modern TV's will lock to the 525-line pictures, as the horizontal frequency is very close, and the vertical hold control often has sufficient range to lock to the 60Hz field

frequency - albeit with reduced height, which is soon cured by a quick tweak on the height control and adjustment to the vertical linearity.

If you want to exchange QSO's with stations in 525-line countries, unless the receiving station has PAL equipment, it will be necessary to send tapes in the 525/NTSC standard. So, unless you are fortunate enough to have a fully NTSC video chain, you will probably need to have your material 'standards converted'. The professionals use very expensive digital equipment (DICE and ACE for example) but for amateur use tolerable quality can be obtained optically - that is, by re-shooting with an NTSC camera the pictures from a PAL monitor. Carefully set up, John says this system can give quite reasonable results, and the flicker caused by the 50Hz/60Hz difference in frequency is not too objectionable.

Perhaps any reader who has this facility and might be prepared to offer a service to others would like to contact the Editor?

John, WB2LLB/4 says he has exchanged videotaped QSO's with stations in many countries, including F6BFY in Paris and FE1035. In the U.K. GW8GKF has received a tape of U.S. ATV news in PAL from A5's tape library, and John has also received a PAL tape of B.A.T.C. news sent to him by Trevor Brown G8CJS.

This idea is a good way of widening your circle of ATV contacts, and CQ-TV would like to hear from anyone interested or already involved in QSO's of this kind.



A COUPLE OF STATIONS WIDELY WORKED  
DURING RECENT LIFT CONDITIONS.  
Photo's by G6SKO and G6LTZ.

# 3MHZ VIDEO FILTER

By Alan Simpson G3UMF

An ATV transmission from a colour video source will contain relatively high amplitude sidebands spaced at the colour subcarrier frequency, (approximately 4.43MHz for the PAL system) above and below the carrier. Where vestigial sideband (VSB) filtering is in use, the lower sideband will be reduced by an amount depending on the efficiency of the VSB filter and the linearity of any subsequent amplifier.

For many ATV contacts, the received signal strength is insufficient for an acceptable colour picture, though still adequate for black and white. (At G3UMF only about 10% of contacts are strong enough for colour). For such contacts it is pointless to radiate colour sidebands which not only cause unnecessary interference to other band users but actually reduce the amount of transmitter power available for luminance information.

Very few domestic colour cameras and video tape recorders provide facilities for removing the colour information and this must therefore be done by means of a filter between the colour source and the transmitter.

## CONSIDERATIONS

The video filter described in CQ-TV 120 with modifications in the article "70cm Code of Practice" in CQ-TV 122, employs a TOKO filter type 237LVS1110 to provide a 4.5MHz video bandwidth suitable for colour transmission.

The next standard filter listed in the TOKO range is type 237LVS1109 having a cut-off frequency of 2.3MHz. A trial of this filter in the CQ-TV 122 circuit gave considerable degradation of the black and white picture with objectionable ringing after vertical edges.

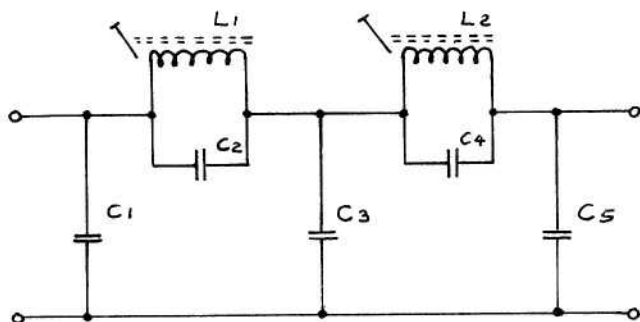


Fig.1

A further disadvantage with this range of filters is their 1k-ohm design impedance. This requires a buffer amplifier to be used if the filter is to be included in a standard 75-ohm video system. The filter described here is an attempt to overcome both these limitations.

The requirements are for a low-pass filter with a 3MHz pass-band, reasonably good attenuation outside this pass-band, very good attenuation at 4.43MHz, and 75-ohm input and output impedances. In addition, the filter should not require elaborate test equipment to set up.

## CIRCUIT DESIGN

The circuit shown in Fig.1 meets all these requirements. For the technically minded, it is a 5th-order low-pass filter with Darlington response. The circuit and normalised component values were 'lifted' from Ref.1.

Fig.2 shows the calculated response curve for this filter, assuming ideal components. The passband ripple is 0.1dB and the stopband attenuation is 40dB. The design values have been chosen so that the first notch is at the colour subcarrier frequency. This provides for maximum attenuation at this frequency.

The measured performance of the prototype filter agrees reasonably well with this calculated response. Worst case stop band attenuation is 37dB at 5MHz and 11MHz. Attenuation at 4.43MHz is 48dB.

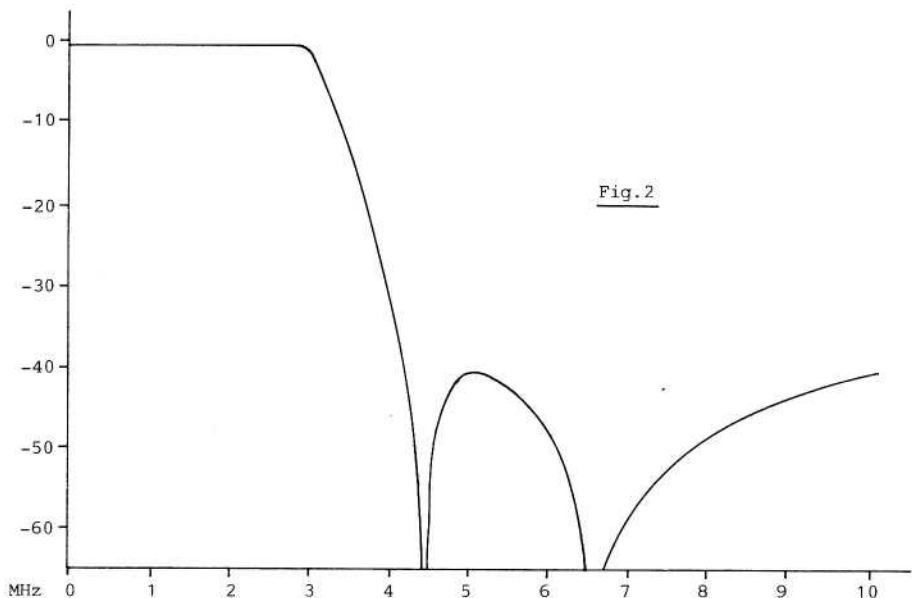
## COMPONENTS AND CONSTRUCTION

Table 1 shows the component values for the filter. In each case the calculated value is given together with the actual value used in the prototype. In most cases the required capacitance value is made up of a parallel combination of two preferred values. The capacitors used should ideally be 5% or better, ceramic or polystyrene. (Avoid the use of 'Hi-K' ceramic capacitors, these have a very high temperature coefficient).

	Theoretical Value	Actual Value(s) Used for Prototype
C1	546.8pF	470pF + 68pF
C2	368.5pF	330pF + 39pF
C3	1128.9pF	1000pF + 120pF
C4	123.8pF	120pF
C5	718.7pF	680pF + 39pF
L1	3.509uH	see text
L2	4.763uH	see text

TABLE 1

The inductors used in the prototype are wound with a single layer of 34-SWG enameled copper wire on a 5mm diameter former with a ferrite core. The number of turns required was determined empirically such that the coil and its parallel capacitor could be brought to resonance by adjustment of the core, at the required notch frequency (4.43MHz for L1 and 6.55MHz for L2).



The resonant frequency was measured using a Grid Dip Oscillator (GDO), with the rest of the filter disconnected. In the prototype, L1 was found to require 35-turns and L2 40-turns.

For those averse to winding even 40-turn coils, TOKO inductor type MKANK4174HM (Ambit stock number 35-41740) would appear to be a ready-made alternative. However the author has not tried these in this circuit.

#### ALIGNMENT

Assuming the correct value capacitors have been used, the only adjustment needed is to bring the two tuned circuits to resonance at the correct frequency. This may be done for the separate tuned circuits using a GDO as described above. Alternatively, the complete filter may be driven from a signal generator and L1 and L2 adjusted for minimum output at 4.43MHz and 6.55MHz respectively.

Provided the filter is operated with 75-ohm source and load impedances, it should then work. With most modern cameras and VTR's there should be no problems. However in some computers the video output is taken directly from a low-impedance source. In this case a 75-ohm series resistor may be required to give the necessary 75-ohm source impedance for the filter.

Ref.1. Active filters, Girling & Good, Wireless World, April 1970.

# A TX/RX TIMING SYSTEM

By I.M.Waters G8ADE

Those who use mast-head preamplifiers with exotic expensive transistors, need to be careful about the timing of events when changing from receive to transmit and vice-versa, if damage is to be avoided. I have seen various circuits advocated for this purpose but, since all of them use slugged magnetic relays, it was thought that something better could be done.

The circuit shown in fig.1 ensures that, when going to transmit, the head amplifiers and converters are off and aerial relays changed over before any RF is generated. Conversely, RF has been shut off before head-amplifiers and relays etc. are energised for receive.

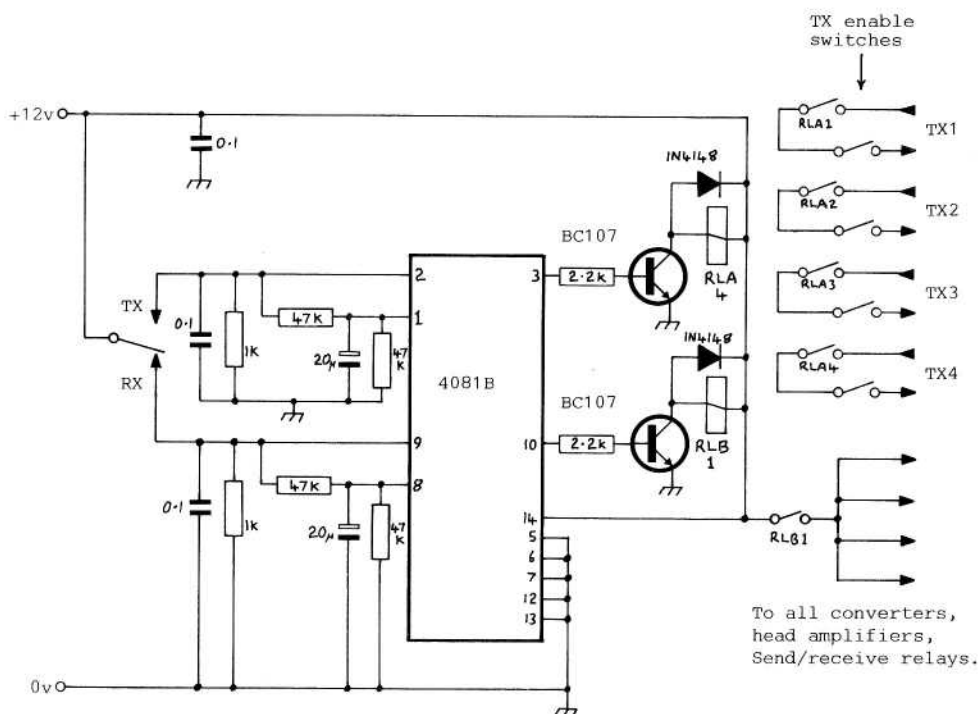


Fig.1

TRANSMIT/RECEIVE TIMING SYSTEM



## CIRCUIT DESCRIPTION

Assume that the station is on receive. Upon operating the master station TX/RX switch, pin 9 of IC1 (a quad 2-input AND) goes low, pin 10 goes low, RLB opens and all converters etc. are shut off.

Almost instantaneously pin 2 goes high but pin 3 will not go high until a time delay, determined by a 47k resistor and 20uF capacitor, has charged up allowing pin 1 to also go high. RLA then closes and transmitters come on. The delay can of course be adjusted by the values of the R-C time constant.

On returning to receive, pin 2 goes low, pin 3 goes low instantaneously, RLA opens and the transmitters shut down. Pin 9 goes high but RLB will not close until the receive RC time constant on pin 8 has charged up.

There is thus a separately adjustable delay introduced in both directions. The 47k resistors in parallel with the 20uF capacitors discharge these and after a change in either direction.

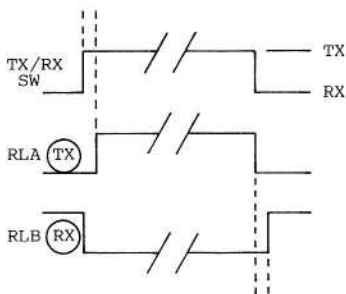


Fig.2      TIMING RELATIONSHIP

## APPLICATION

At G8ADE all transmitters are controlled by the one station master TX/RX switch. The transmitter (or transmitters) which actually come on is determined by which TX enable switches are closed. This is a safety measure to prevent the possibility of, say, a 2-metre transmitter being independantly controlled and left on whilst receiving on 70cm. Harmonics in the 2m output might couple between aerials and damage the 70cm mast-head pre-amplifier.

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# G3WCY SSTV SCAN-CONVERTER

Some notes on the G3WCY slow-to-fast scan converter

By J. Brown G3LPB

The scan converter design was published in 'Radio Communication' magazines of February and March 1983, and is the work of G3WCY. It is based on a circuit by ZL1LH, after a design by JA0BZC. The original used a 1MHz crystal oscillator with 7 IC's to derive all the necessary pulses - this design is rather different in this area, using a 555 timer as the clock in place of the crystal oscillator. There are further changes in the LED driver stages, the ZL version using 2 printed boards with the LED driver IC's. Although some of the original ZL boards were available in this country, boards for the G3WCY design are readily available from the BATC (Members services). Although seemingly rather expensive, bearing in mind the complexity and the fact that there are two boards, the club price in fact represents excellent value.

## THE DISPLAY

The completed unit allows SSTV pictures to be displayed on a normal video monitor, or even via a UHF modulator, on an ordinary TV set; this latter is not recommended however, since the video quality inevitably suffers. The standard pair of boards will only produce monochrome pictures; if two extra digital (memory) boards are used, together with some additional switching, colour pictures can be displayed on an RGB monitor. I wonder if the BATC has made arrangements for members wishing to build a colour version to buy extra digital boards singly? (ED. Certainly, if the demand is there. Please enquire from Members Services).

The 'Rad Com' article is quite comprehensive, and it is worth reading it right through a few times before commencing construction - to my knowledge, two projects have been successfully constructed and functioned perfectly first time. My own unit is well on the way to completion. Now on to some points which may help other constructors; but first two small corrections:

C105 was omitted on the circuit diagram, although shown correctly on the component layout and in the parts list. The circuit should appear as in Fig.1.

In Part 1 of the article, Figure 3 has IC26 as a 7493, which is shown on the component layout, but omitted from the parts list.

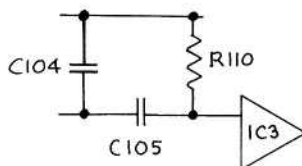


Fig. 1

## COMPONENTS & CONSTRUCTION

The digital (memory) board has a large number of links - it's a pity that it was not possible to design it as a double-sided board. Great care is needed in fitting these, as omissions are difficult to correct later and some links pass beneath IC's. Thin enamelled copper wire is recommended for these, preferably of the self-fluxing variety, and the use of IC sockets makes it easier to fit links beneath them, as a groove can be filed in the underside to accommodate the wire. A possibly cheaper alternative might be to use 'Soldercon' IC socket pin strips. With care, the links could alternatively be soldered on the underside of the board, using insulated wire or sleeving, and 'stood off' by the use of Veropins. Although this makes the top of the board look much tidier, unfortunately the underside now looks like a rat's nest!

As the boards are densely packed, it is advisable to take care when purchasing components. The RS range of 0.4W Metal Film resistors (1%) are most suitable, as they are exactly the right size, and the range covers all the odd E24 values required. RS also supply suitable 0.1uF de-coupling capacitors. Good quality presets should be used - it's worth using Cermet types, as they are more robust than some others. With careful shopping around, it should be possible to save enough on the IC's to more than cover the cost of using high quality passive components.

## FURTHER NOTES

In my experience, tuning-in an SSTV signal is quite tricky, as best greyscale reproduction does not always correspond to best sync pulses. I prefer to tune for best syncs, and let the greyscale take care of itself. To this end, on my converter, I intend adding a tuning indicator to the output of IC9 to indicate when the output at 1.2KHz is correctly tuned. I shall use either a LED (tune for best flashing on line syncs) or a small meter (tune for maximum deflection).

I understand that modifications are available for a variable width control, and conversions to the once popular 256-line (34S/frame) standard, which was scarcely practical even with the long afterglow of the 5FP7 CRT, but might return to popularity with modern digital scan-converters.

With the increasing difficulty of obtaining CRT's and scan coils suitable for SSTV, G3WCY is to be congratulated for coming up with this economical digital converter, which will hopefully encourage many more people to try this very interesting mode of operation.

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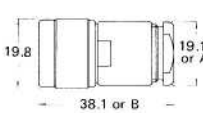
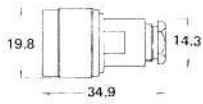
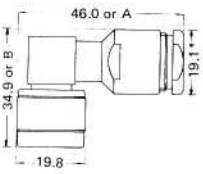
# COAXIAL CONNECTORS

The series N is a range of screw-coupled, coaxial connectors of very high performance well into the GHz range.

They are available in both 50-ohm and 75-ohm impedance versions and may be used with a broad range of coaxial cables of up to 23mm external diameter (see CQ-TV122).

It is important to note that the 50-ohm range is NOT intermateable with the 75-ohm range.

## 50 ohm and 75 ohm series N

					PLUGS																
Connector outline	Dim.		Assy. data Fig.	Greenpar 50 ohm 75 ohm	No.	Cable clamp	Cable groups														
	A	B					1	4	6	7	10	12	25	27	30	52	60	62	73	79	107
<b>PLUGS</b>    	18.3 44.5		3 or 15	15001	17001	A or —															
			15			—															
			3 or 15	15013		A or —															
			3 or 1	15015		A or —															
			4	15015	17015	C															
			3			A															
			4			C															
			6 or 5	15055		A or —															
			7	15055	17055	C															
			6			A															
			7			C															
<b>ELBOW PLUGS</b>  	42.9 32.9		3 or 2	15003	17003	A or —															
			4	15003		C															
			3			A															
			4			C															
			6	15074	17074	A															
			7	15074		C															
			6			A															
			7			C															

\*15074 and 17074: 14.3mm.


\* 15074 and 17074: 14.3mm.

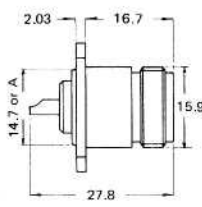
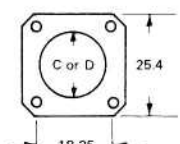
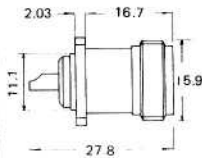
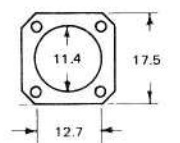
Type N is probably the best series of connector available to radio amateurs capable of accepting large diameter cables such as UR67 or Pope H100.

The connectors are used at all frequencies from HF to microwaves; they are even used in the 10GHz band. For 23/24cm amateur TV they are a must if signal losses are to be kept to a minimum.

Apart from the connectors illustrated here, there is a wide range of free, panel and bulkhead jacks (sockets) available which accept coax cables rather than panel sockets which only accept equipment wires.

#### JACKS and ELBOW JACKS

Connector outline		Dim. A B	Assy. Data Fig.	Greenpar 50 ohm 75 ohm	Cable clamp	Cable groups																		
						1 4 6 7 10 12 25 27 30 52 60 62 73 79 107																		
<b>JACKS</b> 	12.140.0	15	15004		—																			
	18.346.0	15		15003	—																			
		6	15021		A																			
		7	15021		C																			
		6		15031	A																			
		7		15031	C																			
		3 or 1	15022		A or C																			
		4	15022		C																			
		5		15032	A																			
		4		17002	C																			

PANEL SOCKETS			MOUNTING DETAILS	MOUNTING HOLES
	12.0	15007 17007 15042	 <p>Dimension C: rear mounting — 16.1 Dimension D: front mounting — 12.2 or 16.1 (007, only)</p>	6 BA — G 4 - 40 UNC — F 3.2 mm. dia. — H 6 - 32 UNC — J
		15011 17011		3-56 UNF — E 4 - 40 UNC — F 6 BA — G 3.0 mm. dia. — H 2.8 mm. dia. — K

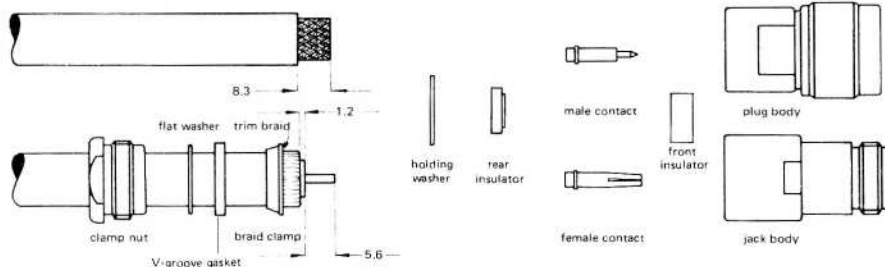
# Assembly instructions

**Fig. 3. Improved MIL-style braid clamp, captive centre contact**

1. Place clamp nut, flat washer (when provided) and V-groove gasket over cable. Note that groove in gasket is towards free end of cable.
2. Trim outer sheath from cable to dimension shown.
3. Fit braid clamp over braid so that internal shoulder butts against end of outer sheath.
4. Fold braid back over clamp, avoiding crossed wires.

5. Trim off surplus braid as shown.
6. Trim dielectric to dimension shown, and check conductor length is as specified.
7. Tin centre conductor.
8. Slide holding washer and rear insulator over dielectric to butt against braid.
9. Mount contact (male for plugs; female for jacks) over centre conductor with shoulder pressed against rear insulator.

10. Hold cable and contact firmly together, and solder.
11. Slide V-groove gasket, flat washer (when provided) and clamp nut up to braid clamp. Ensure V-groove gasket seats on clamp.
12. Fit front insulator over contact to butt against rear insulator.
13. Press sub-assembly into body as far as possible, and engage clamp nut.
14. Holding body and cable rigid, tighten clamp nut to shear V-groove gasket.

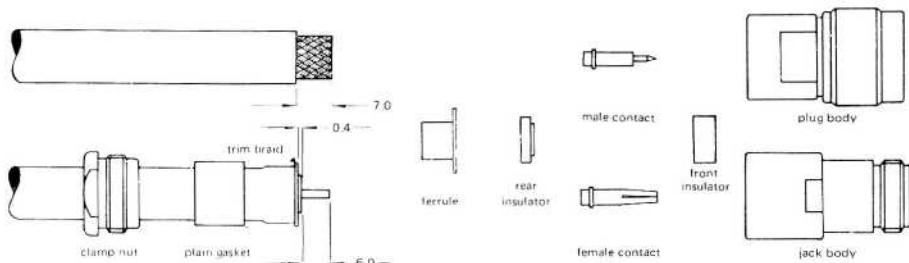


**Fig. 4. Pressure sleeve cable clamp, captive centre contact**

1. Place clamp nut and plain gasket over cable.
2. Trim outer sheath from cable to dimension shown.
3. Fold back braid and insert ferrule between outer sheath and ferrule.
4. Trim off surplus braid as shown.
5. Trim dielectric to dimension shown, and check that exposed centre conductor length is as specified.

6. Tin centre conductor.
7. Slide rear insulator over dielectric to butt against ferrule.
8. Mount contact (male for plugs; female for jacks) over centre conductor with shoulder pressed against rear insulator.
9. Hold cable and contact firmly together, and solder.
10. Slide plain gasket and clamp nut up to ferrule, trapping braid.

11. Fit front insulator over contact to butt against rear insulator.
12. Press sub-assembly into body as far as possible, and engage clamp nut.
13. Holding body and cable rigid, tighten clamp nut to compress plain gasket and retain cable.

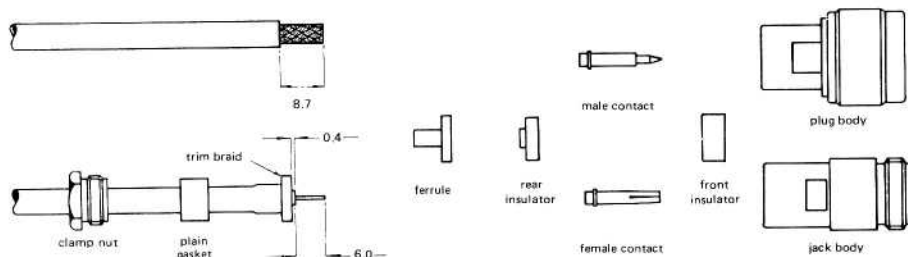


As a guide to type selection, the most widely used straight plug for amateur purposes, accepting both UR67 and H100 cables, is GE15015C1 or GE15003C1 for elbows. Since Pope H100 cable is slightly thinner in diameter than UR67, a short length of sleeving or a few turns of PVC tape should be used to increase the diameter to ensure a snug fit into the clamp nut.

Our thanks to Greenpar Connectors Ltd for permission to publish this information.

**Fig. 7. Pressure sleeve cable clamp, captive centre contact**

1. Place clamp nut and plain gasket over cable.
2. Trim outer sheath from cable to dimension shown.
3. Fold back braid and insert ferrule to trap braid between outer sheath and ferrule.
4. Trim off surplus braid as shown.
5. Trim dielectric to dimension shown, and check that exposed centre conductor length is as specified.
6. Tin centre conductor.
7. Slide rear insulator over dielectric to butt against ferrule.
8. Mount contact (male for plugs; female for jacks) over centre conductor with shoulder pressed against rear insulator.
9. Hold cable and contact firmly together, and solder.
10. Slide plain gasket and clamp nut up to ferrule, trapping braid.
11. Fit front insulator over contact to butt against rear insulator.
12. Press sub-assembly into body as far as is possible, and engage clamp nut.
13. Holding body and cable rigid, tighten clamp nut to compress plain gasket and retain cable.



## NEW CLUB FOR CHESTERFIELD

The club is situated at New Bold in Chesterfield and already has its own room which can be used at any time by club members. The intention is to give local amateurs an incentive to build and operate their own equipment and, to this end, a certain amount of test equipment is to be made available to help members in testing and setting up their home-brew gear. Plans are afoot to transmit both slow and fast scan television from the clubhouse with the usual talkback on 2m.

Opening nights are Monday and Friday each week from 7.00 till 9.30pm. Further information may be obtained by contacting Bob Kugler G8VQS at 96 Sanforth Street, Whittington Moor, Chesterfield or 'phone Chesterfield 31696 anytime.



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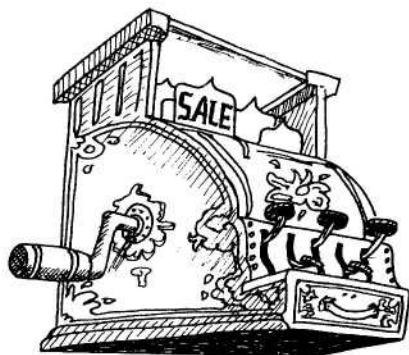
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Peter Smith. 65 Otlands, Gossops Green, Crawley, Sussex. Tel: Crawley 24231.

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IKEGAMI 0.5" colour VTR Mod. TVR321, in working order, clean £85

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## EXCHANGE & WANTED

MEMBERS ONLY (not trade!). I may be able to help with that semiconductor or IC that you are looking for; (Far Eastern types?) SAE with enquiries please.  
J Brown 45 Marlborough Avenue, Falmouth, Cornwall TR11 4HS

SHIBADEN VTR, works perfectly but needs new heads. I NEED a lens with iris control, prefer telephoto but open to offers of any. Also any ATV bits wanted.

Dave Webster G6SKO. 27 Birchwood Lane, Somercotes, Derbyshire. DE55 4LZ.

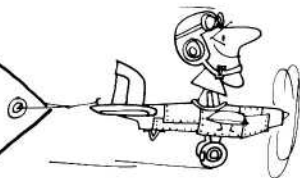
I HAVE recently bought a monochrome monitor made by Data Dynamics Ltd., type TDE/31. Could anyone either supply a circuit or advise on increasing the width as there appears to be no adjustment for this.

Graham Hankins G8EMX. 11 Cottesbrook Road, Acocks Green, Birmingham B27 6LE

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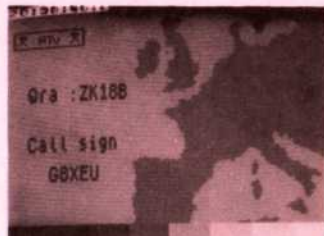
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