

C Q - T V

No. 106

April 1979

The Journal of the  
British Amateur Television Club

# The British Amateur Television Club.



C Q - T V is the quarterly journal of B.A.T.C.  
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KT10 8JQ.

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Subscriptions and changes of address should be  
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Advertisements and articles for C Q - T V  
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## CONTESTS AND ACTIVITY

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# TV ON THE AIR

By John L. Wood G3YQC

As this is being written we are in the middle of the coldest winter for many years. The snow is a foot thick on the ground and the temperature is minus 10C. Not the kind of weather to stimulate thoughts of portable operation from hilltops, however, by the time this is in print the Spring should be upon us and we can start dusting off the /P equipment.

This year has the promise of more portable television activity than usual as interest continues to grow in the use of the 3 cms. band for TV working. It is certainly an attractive prospect taking off to some lofty peak on a warm summer day to see what can be worked, and I suspect that many surprises are in store regarding the distances which can be worked with television links.

It seems that at present there are no standards at all governing transmissions on the microwave bands, so as a start I would like to suggest the following as a basis for experimentation. The present 3 cms. band plan calls for TV between 10.260 MHz to 10.300 MHz and 10.435 MHz to 10.475 MHz. The separation is to allow for duplex operation using a 175 MHz IF frequency. I suggest TV spot frequencies of 10.280 MHz for simplex and 10.455 MHz for duplex operation. Frequency modulation is by far the easiest to achieve and I suggest that this mode be used. Video should of course, be 625 line negative modulation conforming to present CCIR standards and as used on 70 cms. The question of video bandwidth and frequency deviation will need much experimenting with but as a rule, since a deviation factor of 1 can be assumed then to transmit a full 6 MHz vision signal a minimum deviation of 6 MHz will be required. Since an acceptable picture can be resolved using only, say, 2 MHz bandwidth, then for longer distance contacts it may be a good idea to restrict the deviation to this amount. It must be remembered that the narrower the receiver bandwidth the better the signal to noise ratio will be, therefore the stronger will be the received signal over a given path. The accepted aerial polarization on 3 cms is horizontal, that is with the broad face of the waveguide upright.

I hope that these suggestions will be useful as a starting point for those experimenting with microwaves and I would very much like to hear from anyone who is engaged in this activity.

Brian Summers G8GQS near Gainsborough in Lincolnshire writes to say that he is now on the air and active. The PA uses a 4CX250B which is grid modulated. The aerial is a parabeam and is at 60ft. At the time of writing good pictures have been received by G8NOG at a distance of 35Km. Anyone interested in working Brian should contact him at the address printed on the inside front cover of the magazine.

Another gold standard C Q - T V award goes out to G8DIR in Shrewsbury. Ken's log shows many different stations worked with several excellent long haul contacts. This log certainly reflects the high level of activity in the West Midlands. Our congratulations to Ken for this fine effort.

G5KS continues his high level of activity in the West Midlands. An off-air demonstration was very successfully transmitted to the Wolverhampton Amateur Radio Society who report that the colour pictures which were received from G5KS were excellent. Another demonstration to the Dudley Amateur Radio Club was also very well received and further demo's are planned for the Walsall Club and the Midland Video Group.

Other news from the Midlands - G8PLP is now on the air with a "G5KS" transmitter. G4DYP should also be on the air by now. A couple of receiving stations in the same area are G8GUN and G2AK. All stations are very interested in skeds.

Please send all correspondence to TV on the Air, 54 Elkington Road,  
Yelvertoft,  
Northampton,  
NN6 7LU.

And don't forget the photos.

# A LETTER FROM

# YUGOSLAVIA

from Drago YU1PKW

As a member of B.A.T.C. I wish to inform you about ATV and SSTV activity in Yugoslavia. ATV activity started very late in 1974, three years after commercial TV had started programmes on UHF channels.

Some radio amateurs were interested in ATV but they had little experience of TV. The first with enough courage to start was Dragan Petrovic YU1NP1. He built two ATV transmitters with QQE03/12, and ECC85 as "series gate" picture modulator, and FM transmitter for sound. The first ATV signal had been transmitted on November 11, 1975. First results were very good and YU1NP1 continued his efforts on a new transmitter for ATV with QQE03/20 in the final.

September 9, 1976 saw the first one-way ATV QSO between YU1NP1 and YU1KM who received ATV signal on Mount Avala, near Beograd from YU1NP1 who transmitted from Mount Cer. QRB was about 70Km and power was about 1 watt.

On November 7, 1976 the first YU ATV QSO was done between YU1PKW and YU1NP1 and also their radio Clubs YU1AH1 and YU1AFV.

YU1NP1 worked with his new home-made transmitter with QQE06/40 and "Universum" camera from Quele.

YU1PKW had to repair a very old Grundig camera and for three days (and nights) he reconstructed his old AM transmitter for 144 MHz into ATV transmitter on 432 MHz with QQE06/40 in the final.

YU1NP1 worked from his home in Sabac, 70 Km from Beograd. YU1PKW worked from his home in Beograd using simple commercial antenna for TV.

In 1978 YU1PKW started 432 MHz EME and 1.2 Kw linear amplifier is used also for ATV with very good results with the new "Universum" camera and Moonbounce antenna consisting of 128 el. colinear and "built-in" preamplifier with noise figure of 1,2dB. Some experiments with this antenna and rig were very good with interesting results, and many other amateurs started an interest in ATV.





YU1PKW received by YU1NPI



YU1PKW and XYL

In March 1976 YU1PKW started SSTV activity with his home-made maonitor and many others followed him in YU1.

YU2DB was a pioneer of SSTV in Yugoslavia and he started with his home-made monitor in 1974. YU2CDS was the first YU SSTV station. At present there are about 20 SSTV stations in Yugoslavia, but many of them are not very active.

The first SSTV QSO via Oscar satellite from Yugoslavia was made be YU1PKW in 1976.

The SSTV QSO Beograd-Wien (520Km) on 144 MHz and 432 MHz was done by YU1PKW and OE3XUA in 1976 and 1978.

Finally, I will describe the equipment used by YU1PKW:  
SSTV monitor, home-made, picture tube 7BP7, Keyboard home-made WQLMD design, "Universum" FSTV camera and home made analog Fast-Slow conv. For ATV I am using MMT432/28 and video modulator, linear 1kW and preamplifier. BFT66, Antena 128 el. colinear 25dB.

I hope this letter shows you and introduces you to ATV and SSTV activity in Yugoslavia. Best wishes from Yugoslav ATV and SSTV amateurs and all the best for your very advanced and famous Club.

YU1PKW in his shack



YU1NPI during 70 km QSO with YU1PKW



# CONTEST NEWS

Contest Organiser Graham Shirville G3VZV

## RESULTS

The B.A.T.C. SSTV Contest has come and gone and only two entries have been received. This is probably due to lack of publicity and constant confusion and I will endeavour to ensure more of the former and less of the latter in 1979.

G3WW	March Cambs	AM31E	22 QSO'S	140 points
G8PLP	West Midlands	ZM41A	7 QSO'S	70 points

## 3rd ALFATROSS SSTV CONTEST 1978

1. SM5EEP	240 x / (10 x 4) + (5x21) / =	34,800
2. LZ2EE	208 x / (10 x 5) + (5x19) / =	30,160
3. ISØRUH	187 x / (10 x 3) + (5x18) / =	22,440
4. IØVMV	141 x / (10 x 5) + (5x19) / =	20,445
5. LZ2KKK	157 x / (10 x 4) + (5x16) / =	18,840
6. G3GRJ	146 x / (10 x 4) + (5x14) / =	16,060
7. WB9OGS	159 x / (10 x 2) + (5x15) / =	15,105
8. DJ6KA	118 x / (10 x 4) + (5x15) / =	12,980
9. W6WDL	68 x / (10 x 2) + (5x12) / =	5,440
10. 14LRH	70 x / (10 x 2) + (5 x9) / =	4,550
11. HA8VV	38 x / (10 x 3) + (5x14) / =	3,800
12. LZ2DL	36 x / (10 x 2) + (5x5) / =	1,620

## S.W.L.

1. 11-50071	112 x / (10 x 3) + (5x13) / =	10,640
2. LZ-1-90	84 x / (10 x 5) + (5x14) / =	10,080
3. DOK-005 1694785	32 x / (10 x 2) + (5x13) / =	2,720

So congratulations to G3GRJ as the leading G. Station.

## FUTURE

Unfortunately I received the rules on the 9th International SSTV Contest (17/18 March 1979) too late for publication in the January C Q - T V but I hope there will be plenty of U.K. entries. Certainly, the band multiplier for 28 MHz contacts should have ensured plenty of activity on that band.

## U.K. SUMMERTIME ATV CONTEST 2 - 3 June 1979

We will try running this event on the same rules as the forthcoming International Contest which will be on the 8/9th September this year, except that one-way contacts will count half points. Please note that they will not count in the September event.

## FULL RULES ARE AS FOLLOWS

DATE/TIME	18,00GMT 2nd June - 12,00 GMT 3rd June 1979
SCORING	( $\frac{1}{2}$ points for one-way contacts) 2 points per kilometre on 70 cms.

8 points per kilometre on 23 cms.  
16 points per kilometre on 3 cms

(144.75 and 144.17 MHz can be used for calling on phone - please QSY from calling when QSO has been established.

EXCHANGES      1 - A code group of 4 non consecutive digits chosen by each entrant for the whole contest period. This code group must be exchanged in video only.  
2 - Call sign, QTH locator, report and serial no. (starting at 001) to be exchanged in video or in sound if necessary.

#### ELIGIBLE STATIONS

Single or multi-operator  
Fixed /A or /P locations  
Receive only stations also welcome to join in.

#### LOGS

To include all information exchanged plus own QRA Station details, points claimed, full address of entrant, comments and views.  
N.B. Log sheets and cover sheets available from me on receipt of S.A.E.

Final date for logs: Postmarked not later than 2.7.79.

To G3VZV 18 Church End,  
Milton Bryan,  
Milton Keynes,  
Bucks.

N.B. Long CQTV calls on A5 are to be avoided

#### INTERNATIONAL ATV ACTIVITY CONTEST

DATE/TIME      18.00 GMT 8th September - 12.00 GMT 9th September 1979

All rules as June contest except that one-way QSOs will not count for points and logs must be postmarked not later than 8.10.79.

#### B.A.T.C. SSTV CONTEST 1979

ADVANCE NOTICE This will take place on 24th/25th November 1979. Full rules will be published in the next issue.

#### GWENT ATV GROUP CONTEST

This is the first of what we hope will be an annual event organised by the Gwent Amateur Television Group GW800J, who will be portable somewhere in Wales and looking forward to a very active contest. As well as those able to transmit logs are also asked from those who can only receive video. WE WOULD LIKE TO HEAR FROM YOU.

The band is 70cms  
The time is 10.00hrs - 20.00 Local time  
The Date is Sunday 3rd June 1979  
The prizes will be for winner and runner-up  
The rules will be B.A.T.C.  
The logs should be sent to Mike Rackam GW8MDO  
31 Severn Road  
Crown Estate  
Pontllanfraith  
Blackwood  
Gwent.

As a further encouragement the organiser will award a valuable prize to the leading station in each of the above ATV contests in addition to the usual certificate.

Well, that's about it for this time round, but although it is not really my department, I wonder who holds the DX TV (2-way) record? Any offers?

Finally, news, views, photographs and comments are welcome to my address as in the front cover or by telex 261817 "Allgd G". marked for my attention.

# FEEDBACK

by Tom Mitchell G3MLX

## P100

For a number of reasons the next P100 article has been held over. It will appear but there is just not enough time between issues to develop the final board. It will be produced as soon as possible. If you would like details in advance of publication please send me an SAE and be patient.

## P100 SALES

PLEASE NOTE INCREASE IN CRYSTAL PRICES AS WE HAVE HAD TO RE-ORDER.

5 MHz for SPG  
HC18U at £2.80 each  
17,73447 for Pattern Generator

SPG Board  
At £4.00 each  
Pattern Generator

Postage 10p per item maximum per order 20p.

Please order direct from Tom Mitchel G3LMX 30 Old Farm Close, Hounslow, Middx. TW4 7AB.  
(Grant Dixon usually has a small stock for the benefit of anyone wanting to order other items at the same time).

Due to the delay in posting this issue (for reasons beyond the control of the Club), I have been rather short of items for this issue. However, I have heard from Andrew Emmerson that the Sony 1340 colour portable and the Grundig 14 inch B/W portable also tune 70 cm as do most RIGONDA'S fitted with the IMI tuner.

Andy also sent details of the DIN connection standard for VCR'S which I hope to include next time, together with more details from John Goode who has provided diagrams including a veroboard layout for the latest version of the colour locking system described last time.

If anyone would like details, please send stamps to cover the cost of Xeroxing (3 sheets in each case) and I will run off copies.

Finally, has anyone had a chance to play with the Mullard TDA 2571. This chip is designed for the sync separation and line oscillator stages of TV receivers. It includes a 2LF Phase locked oscillator and a 625 line divider, so appears to have possibilities.

All letters as usual to me at the address above.





# RECEIVING 23cm A.T.V.

By Graham Shirville G3VZV

The increasing pressure on 70 cms from other modes i.e. repeaters and satellites- together with the basic restriction of available bandwidth and the projected 23 cms ATV repeaters which are at the moment on one or two drawing boards is leading some operators in this area to get going on 23 cms TV.

One way of receiving 23 cms TV is to use a 1296-144MHz convertor feeding a particular type of VHF varicap tuner. The convertors are available commercially or could be home brewed and the VHF tuner is currently (Jan 79) advertised in "Television" magazine by a firm called Sendz Components Ltd., at £1.50 each plus 12½% VAT as "VHF varicap units new 49-219 MHz".

As these tune well below 144 MHz and as most 1296 convertors have broad band IF outputs the system will be O.K. for receiving TV transmissions down to around 1250 MHz.

The address of Sendz Components Ltd. is 2 Wood Grance Close, Thorpe Bay, Essex.

As you will see elsewhere in this issue the next contests will have a multiplier for 23 cms contacts.

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# Latest news on slow scan.

By J. Brown G3LPB

Following the Slow Scan Monitor article done by the writer sometime back, many of the queries etc. should have now been answered. Many of the people needing gear should have been now satisfied and all recent enquiries for gear should now be completed. Many queried why the advertisement was from Cornwall and the gear sent off from the Midlands, well that is another story and one that no one paying the prices for almost unobtainable gear should ask.

## TO THE OTHER ENQUIRIES:

M.K. Products are now producing a complete set of eight PC boards for a slow scan monitor. Due to high costs however, they are supplied tinned but not drilled. This is not a hard task, but needs a 1mm drill, time and care. In fact, it is interesting to do, but better if one has access to a pillar type drill. The hands get tired after drilling the many holes. Two of these boards are used on the power side. One is for the 2 LT voltages and the other for the valve EHT drive unit.

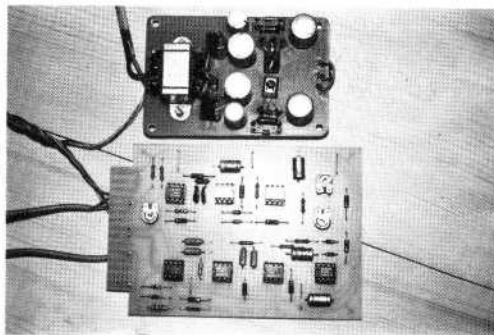
M.K. also do a very fine PC board for a filter. This uses 7-741 op amps and is in use a great asset. Many lost syncs and pictures can be viewed under the worst of conditions. Yes, some would say why 7-741s, but this I leave to more knowledgeable people than me. I am very, very happy with it.

Also available are RTTY PC boards, for direct printer drive and one model for video display unit use. This is a complete terminal unit using 741 in filters tunable for 170/425 shift, the output is open collector for feeding into a UART.

PC boards are also available for the famous WOLMD keyboard. This comes complete with a lot of data.

I give no prices here as this would be considered advertising, but I feel M.K. have at least tried to assist us in the amateur tradition.

The photograph shows the filter mentioned and its associated power unit. The power unit is home-brew and not available as far as is known.



Whilst the writer has no connections with any named persons, it is grand to see the latest data sheets from Volker DL2RZ of his SC421 scan convertor. Provision is made here for the use of an external keyboard and an electronic pen to be attached. (Both are available), but one very important addition is one can display 4 pictures at once or on a background can be added another picture. This is shown in the bottom right-hand corner occupying a quarter of the complete area.

If anyone has seen a SABA colour TV, this allows a programme to be watched with provision for a live camera to be also used to "babywatch" in the bottom corner of the screen at the same time. It certainly looks a very impressive thing as does the electronic pen with capabilities of actually handwriting reports, draw cartoons on a picture and the introduction of a keyboard allows complete station to carry out many operations. Certainly, it is not cheap but very competitive with others that are about. The SC421 allows complete control of the station from the convertor front panel, so maybe soon we shall see one in the U.K. DL2RZ will apparently send to any part of the world. There are many about in DL land, and all give very excellent pictures.

M.K. Products new address is 28 Turnberry Road,  
South Gosford,  
Newcastle,  
Northumberland.

DL2RZ may be contacted P.o. Box 6522, 2300 KIEL 14, West Germany.



B. A. T. C. WILL BE AT ALEXANDRA PALACE

DON'T MISS THE B.A.T.C. STAND AT THE R.S.G.B. EXHIBITION.

MAY 11th and 12th 1979 ARE THE DATES FOR YOUR DIARY - DON'T FORGET.



# THE VIDEO COLUMN

By Jeffrey Borin.

This is the first of a new series of articles. The aim will be to broadly cover all aspects of fast scan video techniques (excluding transmission) under the three main headings:

Devices  
Circuits  
Systems

It is not intended to give fully engineered designs but to stimulate ideas and provide the basis for circuits that can be adapted as required. The articles should be of interest to most amateurs concerned with fast scan techniques from near beginners to advanced experimenters.

I hope that readers of C Q - T V will send me notes on useful devices, circuits, etc. which may be published. Please enclose a stamped addressed envelope if a personal reply is required.

## DEVICES - THE 710 COMPARATOR

The inexpensive voltage comparator has been an industry standard device for many years. However, it has been somewhat neglected in amateur TV circles (at least if it has not then everyone has kept very quiet about it!) which is a pity since it has important applications especially in special effects circuits. Fig. 1 shows the pin connections and the table gives abbreviated characteristics. The need for two power supplies is a minor nuisance but +12V and -5V can be found in many circuits, even if the -5V supply has to be dropped from a -12V supply.

### TABLE OF ABBREVIATED CHARACTERISTICS OF 710

Supply Voltage     $V_{cc} +$     Max 14V  
   Typ 12V

Supply Voltage     $V_{cc} -$     Max 7V  
   Typ 5V to 6V

Supply Current from  $V_{cc} +$     + 10.1mA max.  
Supply current from  $V_{cc} -$     - 8.9mA max.

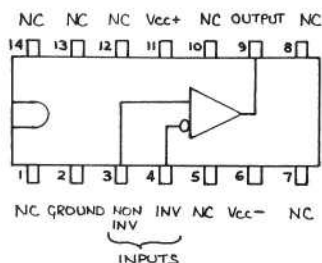
Output : TTL compatible, will drive one standard load.

Typical response time 40 nS

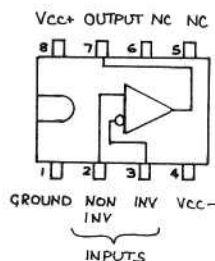
Input voltage range     $\pm 5V$

Input offset voltage typ 2mV

max 10mV for source resistance less than 200 ohms.



14 PIN D.I.L.



8 PIN D.I.L.

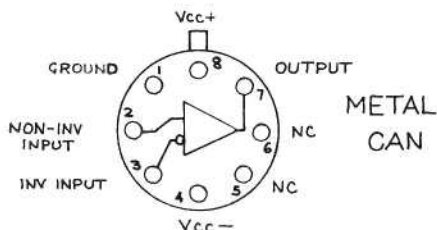
FIG1 PIN CONNECTIONS FOR 710  
(ALL TOP VIEW)

Fig. 2 shows the outline of a video slicer circuit. This can be used to derive a keying signal in a special effects (FX) circuit. The zener diode and R1 provide the -5V supply. C1, C2 and C3 should be placed close to the 710 and represent good practice for avoiding instability. The video signal is clamped and fed to the non-inverting input while a variable voltage reference sets the slicing or keying level at the inverting input. If the video voltage exceeds the reference by more than about 2mV the output will switch to TTL "1" level. Conversely, if the video voltage is below the reference the output will be at TTL "0" level. The output will drive one standard TTL load (two at a pinch).

The high speed of the 710 enables it to follow the highest video frequencies easily. The output can be used to drive a video switch for keying purposes or buffered to give very good white-on-black captions.

Fig. 3 shows the 710 in an adaptive data slicer for a teletext decoder. During the clock run-in TR1 is switched on and the mean voltage is stored on C1. This sets the slicing level for the remainder of the line. TR2 and TR3 should be well matched high gain devices. They could be replaced with FETs to reduce the loading on C1.

There are many other possibilities for using the 710. A multi-level keying unit or simple analogue to digital converter could be made by using several 710s with different reference voltages and acting on the same video signal.

Summarising the basic rules for the 710. Keep signal leads short and decouple the power supplies close to the device. Drive the inputs from low impedances where possible.

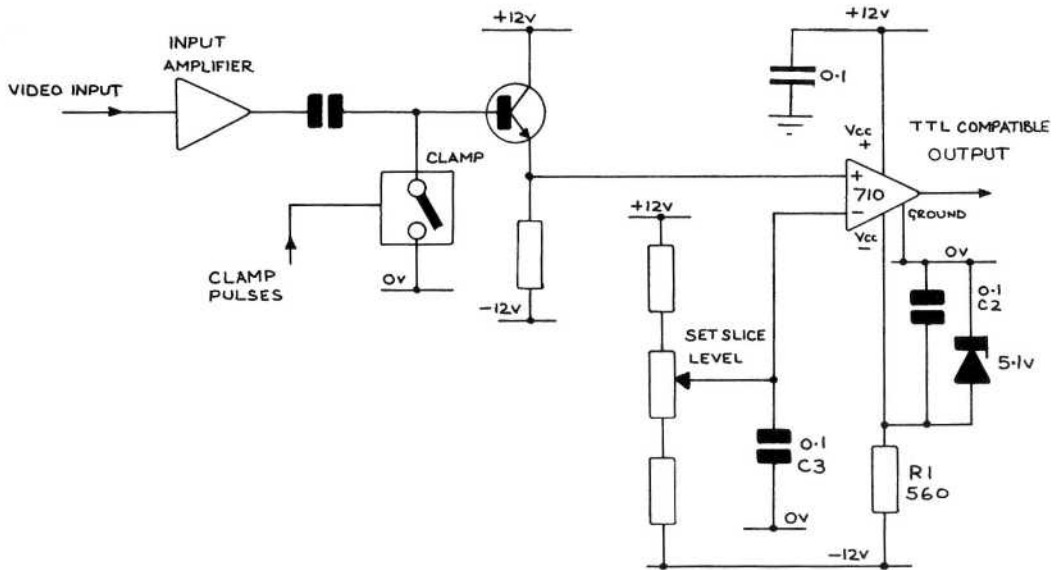
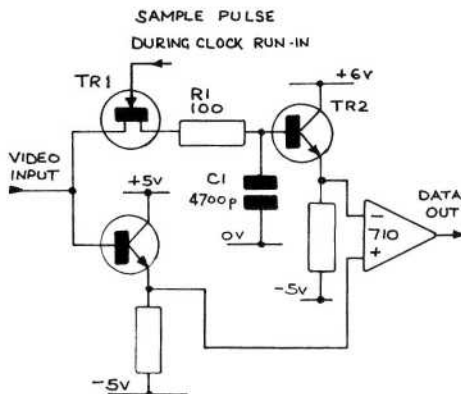


FIG.2 USING THE 710 AS A VIDEO SLICER

FIG.4. USING THE 710 AS AN  
ADAPTIVE TELETEXT DATA SLICER

# CIRCUITS - EHT Measurements

How do you measure EHT up to 25 kV ? If you have a good quality EHT probe then that's OK, but if you use calibrated (?) spark gaps or great long lethal strings of resistors having dubious accuracy then why not copy this simple design ?

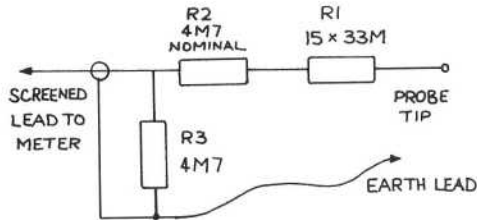


FIG 4 CIRCUIT OF EHT PROBE

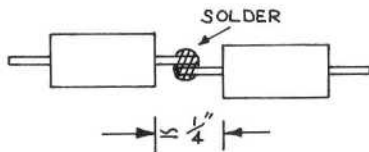


FIG 5 DETAIL FOR ASSEMBLY OF R1

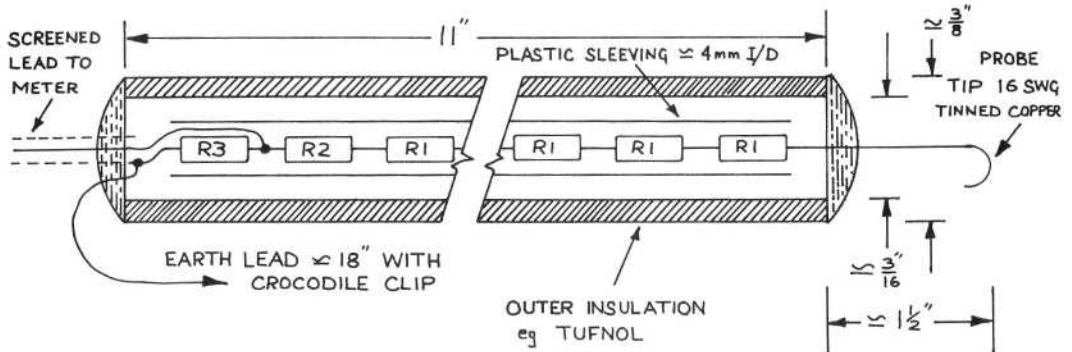


FIG 6 EHT PROBE ASSEMBLY [NOT TO SCALE]

The circuit in Figure 4 is extremely simple and will work with any 50 uA meter, or the 50uA range of a multimeter. R1 consists of fifteen 33 M resistors in series. These are Mullard type VR37 and are designed for high voltage use. They are available as "H.V.Res" from:

Maplin Electronic Supplies  
P.O. Box 3  
Rayleigh  
Essex SS6 8LR  
Tel. Southend-on-Sea 715155

Because fifteen resistors are used, their tolerances should largely average out to give a value close to 495 M total. My prototype measured 498 M. The actual value should be 500 M for a 25 kV range. If you have no facilities for measuring 500 M accurately (and it is most unlikely that you will!) bring the probe to nominal centre tolerance by making R2 = 4.7 M. This is really being a little fussy since 495 M is within 1% of 500 M and the overall accuracy will probably be governed primarily by the meter used. If you can measure R1 then choose R2 to make up 500 M if necessary. The completed probe, even if not measured should be accurate to better than 2% with absolute worst case accuracy of 5%. Unless you have extremely accurate facilities for measuring 33 M it is not worth trying to predict R1 by adding up the values of the fifteen resistors. R3 is essential, but its value of 4.7 M is not critical.

It prevents the leads to the meter floating at silly voltages if the meter is disconnected.

### CONSTRUCTION

Although I shall not normally give constructional details in this column I have made an exception here since GOOD CONSTRUCTION IS ESSENTIAL FOR SAFETY.

Figure 5 shows how R1 should be assembled. The soldering must be impeccable with no sharp points or corners. Take care not to overheat the resistors since this may impair accuracy.

Figure 6 shows the overall assembly. Attach R2, R3, about 12" of 18swg tinned copper wire for the probe tip the earth lead and the meter leads. Thin screened cable (microphone cable) is suggested for the connection to the meter. Clean the 33 M resistors with methylated spirits to remove any slight greasy deposits and pull the assembly into a length of plastic sleeving using the excess probe tip length. Ideally the sleeving should be a snug fit over the resistors, and clear sleeving allows inspection after assembly. Clean the outside of the sleeving with methylated spirit.

I used a length of thick walled Tufnol tube for the outer insulation. Ebonite is suitable, perspex even better, but polythene, pvc etc should be avoided since they are rather flexible. Bend the probe tip into a convenient hook shape, about 1½" long, as shown. This is suitable for hooking into the eht connectors of CRTs.

At this stage the probe should be tested VERY CAREFULLY on a high voltage supply, such as in a colour tv receiver. ALWAYS CONNECT THE EARTH LEAD FIRST, and beware of live tv chassis. If there is any hissing or arcing check the assembly carefully, especially the soldering. If all is well, seal the ends of the tube with Araldite or Isopon.

A possible constructional refinement is a guard ring. This is a small earthed collar (wire is suitable) near the safe end of the probe. This will catch any surface leakage current which might affect accuracy.

### USING THE PROBE

Where possible always connect the probe before switching on the high voltage to be measured. At 25 kV the probe draws 50 uA from the eht supply. Theoretically the probe could be used at up to 37.5 kV (with a suitable 100 uA meter) but this is not recommended unless you are very experienced with high voltage circuits. Certainly improved insulation would be needed at these voltages, along with better guard ring techniques. Meters more sensitive than 50 uA may be used to give lower voltage ranges and a 25 uA or 30 uA meter can of course be shunted to give 50 uA.

The prototype of this probe has been in regular use for 4 years and has proved entirely safe and reliable.

## SYSTEMS

### NOTES ON VIDEO RECORDING

There are many second-hand VTRs available. Here is a guide to those which are worth having, and which are to be avoided. First a few notes on tape. 2" tape is too expensive for amateur use. If you are one of those very few who have a quadruplex machine then I hope that you have found an ex-broadcast surplus supply. 1" tape is also expensive if bought new though secondhand supplies are occasionally available. ¾", and ½" and ¼" tapes are not so expensive and are sometimes available secondhand. Buying any secondhand tape is risky however since even if it is correctly labelled it will frequently be full of drop-outs, wrinkled or have mechanical splices in it. Damage to heads can result from the use of high energy tape on machines not designed to use it while very cheap surplus computer tape may work but frequently damages heads.

Now on to the machines, working downwards through tape widths. All are monochrome only unless stated otherwise, and remarks apply mostly to secondhand machines.

### TWO INCH (MOSTLY COLOUR CAPABLE)

Almost without exception this means broadcast type quadruplex machines. Unless you are absolutely dedicated DON'T buy one since they are difficult and expensive to maintain. If anyone has a working VR1000 (or any other quadruplex machine for that matter) in amateur use may I congratulate him - I would very much like to see it.



ONE INCH

The new 1" broadcast machines are well beyond the reach of amateurs. This leaves the older Ampex and IVC machines with a few others by Sony and Phillips. Only Ampex and IVC are worth considering; some were colour capable. All the Ampex VR5000 and VR7000 series machines were good quality as were the IVC 700, 800 and 900 series. Secondhand prices range down to about £70. There are several warnings apart from the inevitably high tape costs. First, avoid Ampex machines whose numbers end in "00" e.g. VR7000, VR5100, since these work at 60Hz field rate only. Most of the 50 Hz and switchable machines end in "03" e.g. VR7003, VR5803. Replacement heads are very expensive, around £100, more for some models and a worn drum makes a machine a complete write-off unless a good drum can be salvaged from another machine.

THREE-QUARTER INCH - ALL COLOUR

This means U-Matic. All models, many made by Sony, are a safe buy and are intercompatible with all other U-Matic machines. The tapes are not too expensive. The only snag is the initial purchase price which is unlikely to be below £400 secondhand. Beware of the replay-only machines such as the Sony 1200.

TWO-THIRDS INCH

Ikegami once made some machines to this peculiar standard. If you can obtain 2/3" tape (it is no longer manufactured) then these machines are likely to be cheap and worthwhile. Do not expect to be able to swap tapes with anybody.

HALF-INCH CASSETTES - ALL COLOUR

The new long playing format of the VHS, Betamax, Grundig SVR and Philips long play are still fighting in the market place. Philips have announced yet another format giving up to 8 hours recording. No recommendations are possible, just wait until the dust has settled. The older one hour Philips VCRs are worth buying. They are used very widely in educational and industrial studios. The N1520 and a Grundig VCR portable machine have electronic editing which is very useful since a complete programme can be assembled smoothly with only one camera.

HALF-INCH OPEN REELSONY CV2000

The first small helical scan recorder available in Britain. Specified for 405 lines only but will operate on 625 without modification. Not compatible with any other machines. Very cheap - down to £35.

SONY CV2100 SERIES AND CV5600

The standard educational machine for many years. Rugged and reliable but renewed demand for secondhand machines has made them scarce. The CV5600 was colour capable. Never use high density or high energy tape on the Sony CV series machines. A portable record-only machine was made but is very rare.

SONY AV SERIES

These machines follow the EIAJ standard, using high density tape. They include the AV3420 "Rover" portable machine. They are generally usable though an old "Rover" may be very badly worn.

HITACHI, IKEGAMI, ETC.

There were nay other 1/2" machines. The ones meeting EIAJ standard are the most usable since they interchange with Sony AV series machines. Other types can be considered if cheap.

QUARTER INCH

The Akai 1/4" portable machines are usable but again an old portable is liable to be very worn. 1/4" audio tape may work on these machines but may wear the heads rather rapidly.

## FREAKS AND ODDITIES

The high speed longitudinal machines by Wesgrove and Telcan sold in the early 1960s were never satisfactory. Regard them as curiosities rather than usable machines.

## DIY VTR

I do not know of any successful amateur built VTRs but I am sure that someone will enlighten me. Seriously though, to build a helical scan machine requires a very high order of mechanical skills. Longitudinal scan (VERA style) can work, especially if multiple tracks are used and very crude results can be obtained with speeded-up and heavily modified audio recorders.

## CONCLUSIONS

For a high quality machine, though rather expensive to run, the 1" IVC and Ampex machines are suitable. Good quality with colour can also be obtained with U-Matic machines and these are highly recommended. For fair quality with colour the one hour Philips VCR is indispensable. Various  $\frac{1}{2}$ " open reel machines give varying quality, mostly in monochrome. Best bets are the Sony CV2100, AV series and other EIAJ standard machines since their wide usage makes spares easy to obtain.

Finally I should genuinely like to hear from any amateur or amateur groups who actually use a quadruplex machine.

Please send all suggestions, comments, ideas and complaints to:

Jeffrey Borin  
50 Bonnersfield Lane,  
Harrow, Middx.  
HA1 2LE.  
Tel. 01 863 2880

enclosing a stamped addressed envelope if any reply is required.

# B.A.T.C. Publications

This is a separate department of the Club. Do not send orders for publications to Club Sales, send orders to B.A.T.C. Publications

64 Showell Lane,  
Penn, Wolverhampton,  
West Midlands.

Slow Scan Television by B.J. Arnold G3RHI published by B.A.T.C. 2nd. edition 35p +8p p&p  
A Guide to Amateur Television published by B.A.T.C. price (post paid) £1.50 to members and £2.00 to non-members. Overseas postage rates on request.

C Q - T V BACK ISSUES. The following issues are at present in stock: Nos. 68, 69, 73, 76, 77, 79, 82, 83, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95 onwards. The stocks of some are very low and will soon run out. They are: Nos. 73, 76, 79, 83 and 86. Back issues cost 50p each for Nos. 93 onwards and 25p prior to 93. Return postage allowance would be appreciated. Any article which has appeared in the journal can be supplied in photo-copy from 5p per sheet. Payment for this service should be in postage stamps. A list of all the main articles which have appeared in C Q - T V giving details of how many sheets are needed to reproduce it is available for 40p (preferably in UK postage stamps) plus a large (9" x 4") s.a.e.

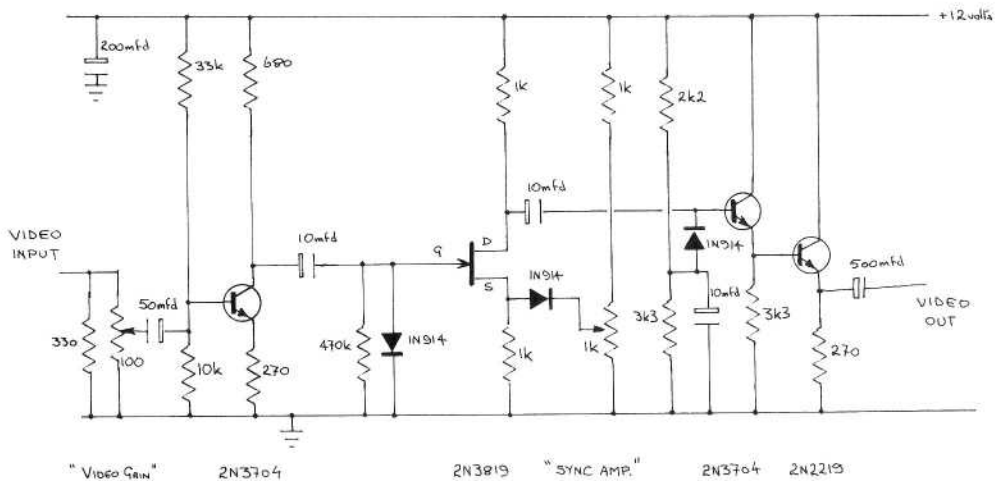
PLEASE NOTE THIS LIST CANCELS ALL OTHERS

# A Sync Stretch Amplifier

By Trevor Brown G8CJS

Modulating video onto an RF carrier always presents problems, one of which is non-linearity. This shows up in its worst as sync crushing and to a lesser extent as white crush. The way to overcome this is to pre-distort the video into the opposite shape before applying it to the modulator.

This circuit has the ability to more than double sync amplitude which will help you towards that magic 100% modulation. It also has the advantage of not using things that glow for those of you, like me who don't really trust them.



# A Simple Focus Device for Radar Tubes.

By A.J. Quinton

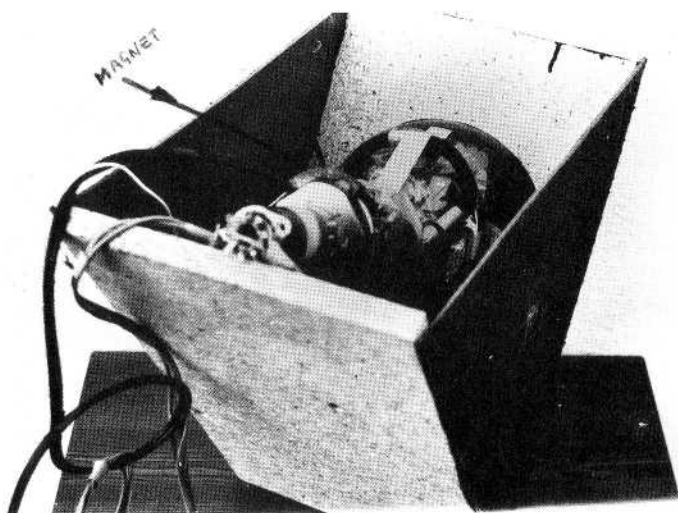
It is possible that some members may be interested in a simple focus device for ex-Government radar-type tubes. I have made up such a device and sent off details to NBTv.

As many will be aware, the radar tubes such as the 7BP7 etc. use magnetic focus, and the coils are hard to obtain - and even when they can be got hold of, there is a problem with the voltages, or with re-winding them.

In the early days of tv it was possible to purchase permanent magnet focus units with an adjusting lever. These are mounted on the tube neck but are hard to come by and will probably not fit the neck of your tube!

Using a 7BP7 tube for example I have found that a perfectly satisfactory focus unit may be made from the magnet and pole irons of an old loudspeaker. (Not too old because a modern ceramic magnet is lighter and easier to deal with.)

Take a speaker with a ceramic magnet of, say, 1cm thick. Remove the magnet by heating the assembly (remembering that excessive heat will demagnetise the material) on a hot plate until the glue softens. The usual glue is epoxy, and you can tell the right temperature by the colour and SMELL!



Use a bench grinder and with the edge of the wheel, grind three thin lines across the face of the magnet as in the diagram. Break with care along these radial lines - they nearly always break during grinding.

This leaves you with three sections of magnet.

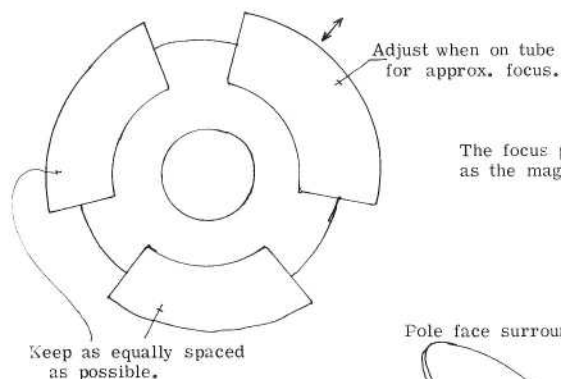
Bore out the pole face of soft iron to suit the tube neck, and remove the centre pole and do the same to this.

A thin card can be used between the assembly and the tube. It is found that the magnet parts may be positioned roughly in equal spacings between the plates with holes and slid on the tube neck to a middle sort of position between the deflection coils and the base end.

Moving the magnet bits in and out in a radial movement give an approximate focus and the bits can be glued using Epoxy resin or superglue. Five minute Epoxy is best.

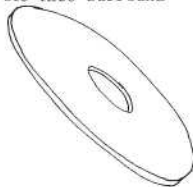
Final line focus may be achieved by sliding the assembly along the tube neck as required.

The photograph is rather poor, but does show the magnet bits on the neck of a 7BP7 with home-made deflection coils taped on the tube.

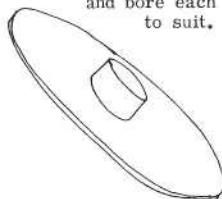


The focus power will change as the magnets cover more or less of the iron faces

Pole face surround



Remove central pole and bore each to suit.



# A One IC Sync Pulse Separator & Clamp Pulse Generator

By Doug Ingham ZL2TAR

It is necessary in many places within ATV equipment to restore the d.c. levels of a video signal. Amateur equipment often uses sync tip d.c. restorers. These have some advantages when dealing with noisy signals, but many disadvantages:

- a) Sync pulse shape distorted or amplitude variations with picture content variation.
- b) d.c. levels depend on exact sync pulse amplitude.
- c) Disturbance during field sync group.
- d) Increased disturbances with large changes in average picture levels. (APL).

A black level or back porch clamp avoids all of these problems. The following circuit, using a quad comparator I.C., is offered for discussion. One particular feature is relative immunity of this circuit to false triggering with noisy input signals. This is important if a noisy signal is to be reprocessed in a TV repeater or for onward transmission by a chain of stations.

## OPERATION

One volt of video (bridging impedance) is applied to C1, the right hand end of which has 1.5 volts d.c. bias. If the input signal is more positive than this C1 should be reversed. Q1 has a gain of 7 and its response is rolled off by C2, to attenuate colour subcarrier 17dB and HF noise. Q2 forms a low impedance drive to a sync tip d.c. restorer, with D2.

The discharge time constant R1C3 can be chosen for best recovery with sudden changes in APL, and is much shorter than that necessary to avoid distortions a,b, and c since we are only concerned with separating the sync pulses. The conduction potential of D2 sets the slice level relative to sync tips. With noisy or typically distorted input signals the best compromise is to slice at about 40% along the syncs from sync tip level. D1 prevents damage to the I.C. if excessive input video occurs.

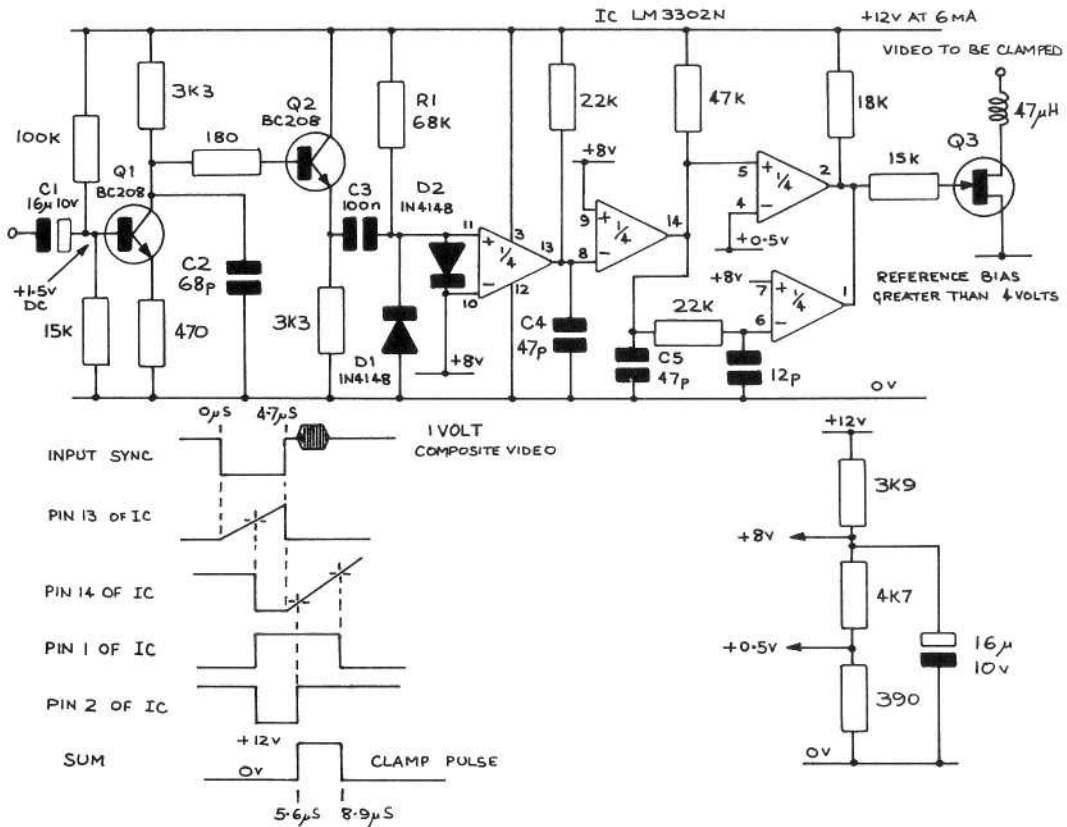
A ramp is produced across C4 which does not reach the threshold of the next comparator until 2uS after the start of the sync pulse. Thus noise spikes less than 2uS mistaken as sync pulses do not produce a clamp pulse. This is the second area preventing false operation by noise. Of course, equalising pulses 2.35uS long do produce an output and this determines the value of dead-time (2uS) and the value of C4.

A delayed ramp is produced across C5. The two following comparators determine the start and stop timing of the clamp pulse. The waveforms shown for pin 1 and pin 2 are for the other one disconnected for the purposes of explanation. Pins 1 and 2 are "wire-anded" together and the clamp pulse is produced. This output is only suitable for driving a light load, so if more than one point is to be clamped a NPN emitter follower should be placed between pin 1 and 2 and the 15K FET gate resistor.

Check the timing of the clamp pulse relative to incoming video with a HIGH impedance probe.

If the "stop" is too early "PAL blanking ripple" will be evident on the clamped video (colour only). If the stop is too late the clamp pulse will not fit the 4.7uS gap between broad pulses (field sync) and there will be a disturbance in clamped level at this point.

The 47uH choke is only required when colour signals are to be clamped or if a lot of HF noise is



present on the video to be clamped. It forms a low  $Q$  parallel resonant tuned circuit at 4.43 MHz.

The clamp FET chosen should have a low  $V_p$  (pinch off voltage) characteristic otherwise the FET will not be fully off during the active line period. The 2N5245 has a  $V_p$  of -2volts and the reference bias is set above 4 volts for a safety margin.

This circuit works without modification on 405, 525 and 625 line signals, though for 525 line colour the clamp choke should be increased to 68μH for the different colour subcarrier frequency.

# B.A.T.C. EQUIPMENT REGISTER

Some time ago B.A.T.C. started the Equipment Registry as a Club service designed to help co-ordinate the exchange of surplus equipment between members. Since then many have found the service to be extremely useful, both for second-hand gear, and for those out of the ordinary items, and it is proposed to continue the Registry for as long as it appears to be necessary.

For the benefit of new members, or those who have not used the Registry before, this is how it works. A filing system is held by B.A.T.C., cross-referenced between two sections - "Wants" and "Surplus". Into the "Wants" section go details from the forms which members have filled in and into the "Surplus" section go similar details of all the equipment known to be available, either from members, or from manufacturers, tv companies etc. When a requirement matches an availability, the members are put in touch with each other and left to sort out the purchases themselves. Every effort is made to ensure that contacts are only made where the price asked equals the price offered and for this reason we ask you specially to fill in the "price" column in the form. If you're not sure, put e.g. "approx. £1", or give a range e.g. £25 to £35. But don't leave us in the dark, unless you want to get cross with us for offering you a £55 camera when you only wanted a £10 one!

Members will be expected to reimburse B.A.T.C. for any costs incurred, although these will be kept to a minimum. It would also be appreciated if a stamped addressed envelope were included with each form, or at least a stamp. The postage costs for the Registry over the last year have been phenomenal!

As soon as you have obtained the equipment you wanted, or sold your surplus gear, do please inform the Registry so that you can be removed from the file. Otherwise the system will grind to a halt. So do help us to help you.

Don't worry if your request seems to be for the most unlikely piece of gear; it may still be possible to find it. Perhaps from a Company, or from the fantastic hoards that some amateurs have stored away somewhere, thinking that no one will ever want their "rubbish".

This service is for surplus equipment not for new; the Club has always operated a Club Sales section and continues to do so for new gear. Yokes, lens mounts, tubes badges etc. are all available and are advertised in every issue of this magazine by Grant Dixon, the Club Sales Officer. Please continue to use this non-profit making service.



# B.A.T.C. EQUIPMENT REGISTER

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Call Sign \_\_\_\_\_

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Please insert the following requirements in the Club Equipment Register.

Maximum price I  
am prepared to  
pay.

I agree to inform the Registry when the above requirements cease, and to pay 10% of the purchase price to B.A.T.C.

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Tel. No \_\_\_\_\_

Please insert the following equipment, which is surplus to my requirements, in the Club Equipment Registry.

Price required



Cut here

# BOOK REVIEW

By Tom Mitchell

I have been asked by a member of the Committee, who thought he might be too closely involved with the author, to read through the first volume of a new three part text book entitled: **CLOSE CIRCUIT TELEVISION FOR TECHNICIANS, VOLUME 1 INDUSTRIAL AND COMMERCIAL CCTV (PRINCIPLES AND CIRCUITS)** by K.J. Bohlman, T. Eng (Cie), FSERT, A.M. INST.E, Senior Lecturer in Television at the Lincoln College of Technology.

It is difficult to write a review which does not paraphrase the author's introduction to the series. The book was aimed at the technician who may with little or no formal training in this branch of electronics finds himself involved in the maintenance of closed circuit television equipment.

The treatment is basically non mathematical, although useful formulae are given and it is assumed that the reader has a basic knowledge of semiconductor devices, but not of their use in television.

The book is therefore at an ideal level for the radio amateur or enthusiast who wishes to find out about television, or for those who like me, have been at the hobby for some time it provides a very useful reference to things we ought to remember.

VOLUME 1 considers a basic modern monochrome system using semiconductors, not valves, stage by stage from camera lens to display CRT each stage being illustrated by typical circuits with component values often taken from current equipment.

I suppose it is always possible to find some small points to criticise but at first reading they appear to be minor. Do current CCTV Systems still use pedestals and I would hardly use photographs of Bellamy Lee coax connectors to illustrate constant impedance wax connectors.

These points however, are minor and I look forward to reading the next two volumes when they appear.

The book is published by Norman Price (London) Ltd., and costs £4.50. In these inflationary days probably not too bad for a soft back, well worth a look before you write it off as expensive.

## NEW ZEALAND ATV REPEATERS

Doug Ingham ZL2TAR, writes to tell us that Wellington (N.Z.) VHF group has recently commissioned its 70 centimetre ATV Repeater which serves the Capital City, Wellington and surrounding areas. The repeater is currently at a temporary location on low power (E.R.P. 100 watts) but will soon be moved to nearby Mt. Belmont, 450 metres above sea level, and the power increased. It is possibly the first "In-Band" ATV Repeater in the Southern Hemisphere and it operates on the following frequencies to PAL system B standards

Input	Vision Carrier	425.75 MHz
Input	Sound carrier	431.25 MHz
Output	vision carrier	443.25 MHz
Output	Sound carrier	448.75 MHz

The repeater operates when it receives TV-type signals on the input Vision Carrier. Narrow band AM, FM, SSB or CW signals on the input channel do not cause false triggering of the repeater.

The repeater "tail" has been lengthened and includes a colour test pattern-repeater identifier for receiver and aerial test purposes.



## AMATEUR TV IN SCUNTHORPE

Brian Summers G8GQS took part in a demonstration of atv recently when he transmitted signals to the Scunthorpe Radio Club - the result of which is a strong likelihood of a tv receiving station being set up there.

The path length was 26 Km, from Brian's QTH at Gainsborough, to the Scunthorpe Club where Mike Cox G8HUA had set up his receiving equipment. Everything went well, with no problems. A first class demo!

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## ATV Magazine's First Book...

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YOUR OWN HAM TV STATION

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# Letters to the Editor.

Dear Sir,

I fear an error has crept into my article on page 5 of C Q - T V 104. The circuit diagram is wrong, in that part B is fed via the 130 ohm resistor and part A is direct, so that in the transistor the BFY90 is modulated via the 130 ohm and the 2N6256 modulated directly. All that is required is that A is replaced by B, and B by A on the circuit diagram only.

Also no transistor types are mentioned; I used 2N2219 throughout, although the first stage could be smaller- the 2N3704 or BC109.

Another fine mess is page 10 of C Q - T V 105! The 2N2905s are wrongly drawn NPN; they are of course, PNP, but they have had their collectors and emitters transposed! The only redeeming feature is that I got it right on the printed circuit board, so it is only the veroboard people who will have troubles.

I have at the moment the problem of making a short video tape programme on B.A.T.C. activities which we can send back to Australia in return for the one they sent us. At the moment I am short of material, particularly on colour, so may I appeal to members who have tape, or film of their activities to contact me.

Trevor Brown G8CJS  
25 Gainsbro Drive  
Adel,  
Leeds LS16 7PF

Dear Sir,

I have just received C Q - T V 105 and thought I would have a go at answering G3LMX's query on page 2.

The query was about ITT Colour Sets, and I have obtained the following information from G4CPE who is an active /T operator and is in the know!

MODEL	TUNER	MODS
ITTCVC9	1043 (or 1043/05)	Short bottom end resistor in Varicap tuning circuits.
ITT CVC20-32	1043/06	No mods. required, it will tune to 432 MHz

Also the current ranges of GEC and Thorn

14 inch colour portables will tune 70 without modification.

I hope the above will be of interest.

Graham Shirville G3VZV  
Milton Bryan,  
Bucks.

Dear Sir,

Trevor Brown is to be congratulated on his article on Photo-Etching of Printed Circuit Boards ('Jan. 79). This is an area on which far too little has been written in amateur journals.

Whilst it is undoubtedly true that preparing the photographic negative has been something of a problem, I suspect that a large number of TV enthusiasts are also photographers. With this in mind, I wonder if I might mention the process I use? In the case of published PCB layouts (Life-size, or not), I take a close-up shot using an ordinary SLR camera with extension tubes, being especially careful to shoot at right angles to the paper. I then print the resulting 35mm negative on to lith-film in exactly the same way as one would produce ordinary black and white enlargements. With the use of a ruler on the enlarger baseboard, the final image can be adjusted for size.

All the points Trevor Brown makes about the coating of PC boards are most helpful, though I feel there are simpler methods of producing U.V. light. The U.V. sources he mentions are expensive because they are designed to produce so-called "black U.V." (Visible light is filtered out). For the purposes of making PC boards, visible light is no embarrassment, and hence there are cheaper ways of doing it. Domestic sun-ray lamps produce a powerful beam of U.V. (unfiltered) and can be obtained for less than £15. The bulbs require no external ballast and at a distance of 12" require an exposure of no more than 15 seconds using Kodak KPCR resist. The only snag is that your wife may want to borrow the lamp!

Finally, on a point of safety, I believe Trevor Brown understates the dangers of U.V. light, particularly at the intensities needed for PC work. Headaches are the very least of the side-effects of looking directly at a U.V. lamp; permanent damage to the conjunctiva resulting in impaired vision is also likely. Always wear goggles just as you would do when welding. John Wilson G8KIS  
Amersham,  
Bucks.

Dear Sir,

I write concerning the article "A Microwave Vision I.F.", by John L. Wood, which appeared in C Q - T V No. 105. Mr. Wood reproduces a circuit similar to that which I have used for experimental satellite TV reception, but unfortunately he has perpetuated certain errors which appeared in the book from which the circuit was drawn. These may be misleading to readers and should I believe, be corrected.

The most important point is the value of the video coupling and decoupling capacitors, which are shown as "In", i.e. one nanofarad or 1000pF. This is of course quite inadequate and the correct value should be 1000 microfarads, electrolytic. The I.F. side of the diagram would work satisfactorily, but a better method of adjusting the PLL drive would be by means of a small 100 ohm potentiometer close to the input of the NE561B, or preferably a PIN diode attenuator in the I.F. feed. It should be pointed out that the circuit is intended to operate below the limiting level of the IC, thus obtaining drive-dependent tracking range, for recovering useful video at low carrier/noise ratios.

Weston (not Western) Publishing is no longer in business, and the latest edition of Roger Bunney's book is published by Bernard Babani Ltd. The demodulator circuit is also discussed in some detail in Community Antenna TV Journal (Oklahoma), October and December 1978.  
S.J. Birkhill  
128 Cross House Road,  
Grenoside, Sheffield,  
S30 3RX.

Dear Mr Hughes,

I am a member of B.A.T.C. and work for Thames TV at Teddington, and over the past two years or so have been collecting together a selection of tv cameras from the past. So far I have acquired the following:

Marconi Mk 3 4 $\frac{1}{2}$ " Image Orthicon

Marconi Mk 4 4 $\frac{1}{2}$ " Image Orthicon

Pye 2028 3" Image Orthicon

EMI 203 4 $\frac{1}{2}$ " Image Orthicon

all of which have been made to work!

Whilst this project is being undertaken on my employers premises, and they are footing the bills where they occur, the amount of money is strictly limited.

The main reason for this collecting mania is that we at Thames feel that if somebody does not collect examples of these cameras now, then they will disappear without trace. It is intended that they will be kept in good condition until such time as some form of tv broadcast museum is established where they can be displayed for posterity.

Naturally the range of cameras that we would eventually like to have would be greater than those that

we have acquired so far. We are looking for the following:

- 1) A high velocity camera (Emitron or Pesticon)
- 2) The early RCA 3" Image Orthicon cameras used at Wembley Studios in the mid-1950s. (These were sold to the Northern Poly in about 1963, and about five years ago the Poly gave them away to Science masters in the ILEA area, but where they are now, heaven knows!)
- 3) A 3" Image Orthicon colour camera, eg RCA TK41 or its Marconi derivative.

Since one of the most likely sources of this vintage of camera is the lofts, garages and garden sheds of tv enthusiasts who are members of B.A.T.C., can I make a plea to readers of CQ-TV who own anything that may be of interest to contact me on:  
01-977 3252 x 289 during working hours, or  
01-979 4193 at home.

"Market prices" can be paid, if the equipment is suitable.

Many thanks in anticipation.

R. W. Warren  
90 Tudor Road  
Hampton  
Middlesex.

**EDITORS NOTE** During the preparation of this issue, I inadvertently threw a pile of B.A.T.C. correspondence into the fire - to my surprise it caught fire and disappeared! Therefore, if YOU have written to me, or sent me an article, and I have been rude enough not to reply, you now know the reason. Sorry!

## Adverts

### ADVERTISING RATES

Back page	£20
Inside full page	£18
Half page	£10
Small adverts	10p per line (but free to all members of B.A.T.C. provided they enclose the address panel from the last C Q - T V envelope)

B.A.T.C. possesses a Marconi Sideband Analyser which was donated to the Club some years ago. If anyone wishes to use this equipment, could they contact Ian Waters at 39 Stow Road, Stow-cum-Quy, Cambridge. They will need to provide their own transport.

CAN YOU HELP ?

One of our members has been unable to locate a source of PYGMY SIZE NEON LAMPS. (miniature of sub-miniature types are unsuitable but normal mains lamp size would do at a pinch). If you know of a source, about 12 are required or even have the odd one or two in the junk box, please contact Paul Kaminskyi GM3PIB, 5 Tytler Street, Forres, Morayshire N36 DEL Scotland. Tel. 0309 72019.

FOR SALE

Cintel 21" multistandard monitor, good working order £15  
New Mullard 17" crt type AW43-80Z. Suits many older monitors. Scratch on face, could be polished out. £4.50  
J. Borin  
50, Bonnersfield Lane,  
Harrow  
Middx HA1 2LE  
Tel. 01-863 2880

FOR SALE

Marconi b'cast coders, 7" rack mounting, No 3170 RGB or YGRB plus alternate input £50 o.n.o.  
Marconi b'cast aperture correctors, 5" rack mounting, No 3371. Vertical plus horizontal correction. £50 o.n.o.  
All semiconductors and pcbs in both units.  
E.E.V. Leddicons P80001 Y, R, G & B £20 each  
Mullard Plumbicons 55875 as used in W7ABW slow scan monitor in SSTV Handbook £15 each  
E.M.I. vidicons 9677 £10  
Scope tube D67/36, new, plus base £5  
Pye Lynx camera £25  
Rank 19" b'cast colour monitor CV3136, RGB, £40  
Rank 26" mono monitor MR769 £15  
L.O.T.s, pcbs, scanning coils, crt etc, spares for CV3136 and Decca colour monitor CM19A  
ELC1043 tuner and I.F. pcb £5  
and decoder pcb £6  
Allen McMurtry  
20 Towerview Crescent  
Bangor, Co. Down,  
BT19 2BA N. Ireland Tel. 61946

WANTED

Line output transformer for Pye monitor type 7101  
Jim Alderbert  
8 Manse Road  
North Mount Vernon  
Glasgow  
G32 0RA  
Tel. 041-778 2978

WANTED

I am in need of a 1" vidicon 5" long for a Ness camera. I have plenty of 1" standard vidicons, and even a 2/3" dia. 5" one. Anyone any ideas where there is a spare one?  
J. Brown G3LPB  
1, Silverdale Rd.,  
Falmouth  
Cornwall.

WANTED

Slow scan camera to use with Robot 70A monitor.  
J.H. Palmer G2DJA  
23, Silverhill Ave.,  
St. Leonards-on-Sea,  
Sussex.

FOR SALE

Japanese "C" Mount lens 12.5 mm £8.50  
Video filters 3.6 MHz and 6 MHz cut-off, ex BBC equipment £2.00  
Dichroic mirror light separation unit £50 o.n.o.  
Ferguson spg broadcast quality triple standard transistorised, manual £20  
Pye Lynx camera poor condition, with circuit £30 o.n.o.  
Selection of Image Orthicon cameras, studio type, with viewfinders & all mod-cons. Please enquire. From £25.00  
E.M.I. viewfinder vidicon camera with PSU and zoom lens. Will split £45.00  
Mixer, exBBC 10 channel A & B bank, with faders, special effects, cues and all mod. cons. Enquire.  
C Mount lens, Japanese, wide angle, no iris control £8.50 inc post.

B. Summers G8GQS  
13, Church St.,  
Gainsborough,  
Lincs. Tel. Gainsborough 3940

FOR SALE

JVC U-Matic Type CR6060 with TU20 tuner, remote control etc. All in as new condition £950  
Sony portable Rover 1/2" b&w VTR complete with latest type camera, perfect working order, spare batteries, charger, etc. £600  
JVC mixer-fader unit Type TKC300, brand new £100  
JVC effects unit Type TKE-1, perfect working order £100  
All the above with service manuals etc., and can be seen working at any reasonable time.  
Please contact Peter Lindsley G3UDV,  
9am - 5pm 01-874 9054  
6pm - 9pm 01-998 6225  
24, St. Peters Way  
Ealing  
London W5 2QR

# B. A. T. C. SALES

## CAMERA TUBES

	Price	Post & Packing
EEV Leddicon -----	£82	nil
$\frac{1}{2}$ " E.M.I. 97777 Ebitron -----	£28	nil
$\frac{3}{4}$ " E.M.I. 9831 amateur grade vidicon -----	£11	nil
1" E.M.I. 9677 amateur grade vidicon -----	£11	nil
1" E.M.I. 9728 amateur grade vidicon -----	£11	nil
1" English Electric P849 amateur grade vidicon -----	£12	nil
$4\frac{1}{2}$ " E.M.I. 9565 Image Orthicon -----	£10 for two, buyer collects.	

## COILS

1" B.A.T.C. -----	£11.54	54p
1" ex-industrial (limited number only) -----	£ 6	54p
$\frac{3}{4}$ " E.M.I. -----	£11.50	54p

## ACCESSORIES

Paxolin sockets for 1" or " vidicons -----	.32	8p
C mount for lens -----	£ 2.50	10p

## STATIONARY

B.A.T.C. headed notepaper and envelopes -----	£ 1.75	
Lapel badges -----	40	8p
Adhesive badges (for equipment) -----	15	8p
Windscreen stickers -----	6	8p
Reporting charts -----	12	8p
EEV Camera charts -----	£ 1.65	30p
B.A.T.C. Test Card -----	50	10p

## PRINTED CIRCUIT BOARDS

C Q - T V SPG printed circuit board ready drilled -----	£ 3	10p
C Q - T V SPG Genlock Unit printed circuit board ready drilled -----	£ 3	10p
Project 100 printed circuit boards ready drilled, each -----	£ 4	10p

Rapidly increasing postal charges have compelled us to quote the above post and packing charges. Will overseas members please ask for a quotation before sending cash. Obviously, for small items such as badges & stickers etc, one can send several items for the same postal charge - please try and estimate the correct amount. Our thanks go to those members who estimate on the high side and suggest that any balance be put to Club funds.

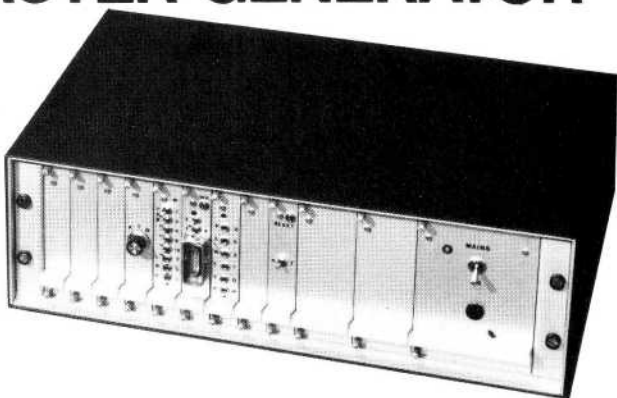
Please send your order to C. G. Dixon (B.A.T.C. Club Sales)  
 Kyrles Cross  
 Peterstow  
 Ross-on-Wye  
 Herefordshire.

Project 100 printed boards are available from Tom Mitchell at 30 Old Farm Close, Hounslow, Middlesex, at the prices quoted above. Suitable Xtals are also stocked by him at £2.60 each. (4fsc and 5 Mhz)

PLEASE NOTE THIS LIST CANCELS ALL PREVIOUS ONES.

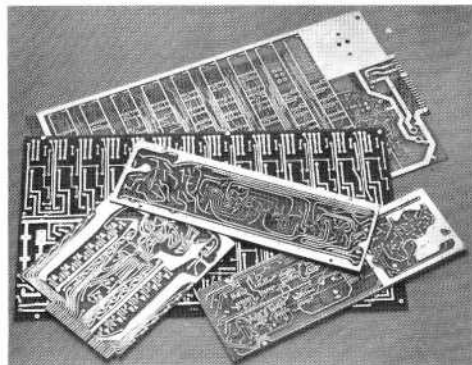
# T.V. CHARACTER GENERATOR

The Crofton character generator has been designed to produce upper case alpha, numerics and sundry symbols. The standard keyboard having 60 keys. The equipment will lock to a standard mixed sync source and provide a composite output of 1.4v p-p into 75 ohms.



The standard format provides 3 pages of 16 characters by eight lines. Page select is by simple rotary switch.

This inexpensive instrument will find many applications within the video field for both the professional and semi professional user. Price on application.



## The Crofton PCB Service

The Crofton P.C.B. service has been set up to offer a service to both the small and medium sized electronics company.

Being fully aware of the pressures on most engineers today, we have set up a specialist operation capable of producing P.C.B. designs and boards from the most scanty information.

You give us the circuit and we will do the rest. Whether you want high quality or low price commercial boards we can offer you a competitive service. Prototypes can normally be provided within 2-3 days from receipt of artwork.

So next time you're in the market for this type of service just give us a ring.

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