CQ-TV

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The Journal of the
British Amateur Television Club

The British Amateur Television Club.

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WHO TO WRITE TO

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Membership enquiries should be sent to the Membership Secretary.

Advertisements and articles for C Q - T V should be sent to the Editor.

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From the Editor

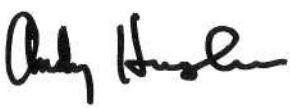
I'm still finding it difficult to come to terms with the fact that, after twelve years I am no longer the Editor of C Q - T V. But it is true ! The Chairman has officially accepted my resignation, and here I am trying to say goodbye to all of you. Thank-you for your help, and all the best for the future ... ...

It had to come. No Club journal can be run by the same person for too long, or the danger of either a " personality cult " or stagnation rears its ugly head. Choose for yourself which it is in this case; too many members appear dissatisfied with my performance for me to believe that it is anything other than staleness on my part. A new " live " Editor is required, and there are many contenders for the job ! I am leaving before the pressures of work (yes I do have a full time job too !) and domestic life have too deleterious an effect upon the magazine.

Where to start thanking all who have helped me over the years I just do not know ! Contributors, draughtmen - and women, typists, printers, advisors, and those who have just shown an interest; to all of you I offer my heartfelt thanks for all you have done to make the twelve years so enjoyable. To those who have been " difficult ", complaining, moaning, expecting too much, spreading slander behind my back - a plague on you ! You try the job !

To my successor, whoever you may be, I wish good luck ! It is fun. You will need a thick skin, perserverence and an ability to read the unreadable, spell the wrongly spelt ...

Cheerio all,



AN ELECTRONIC CAPTION GENERATOR

By D.J. Long G3PTU

This unit will produce 'titles' (captions) or 'subtitles' for insertion on to 625 line video drive, providing up to 8 lines, each of up to 14 characters, per picture 'page'. Human 'input' to the system is by means of a keyboard.

All characters normally found in a type 2513 ASCII character generator device are available, together with the ability to present the display as black lettering on a white bachground, or vice-versa; to make the letters "flash" at a suitable rate; or to have the letters twice normal height. Additionally, where external 'special effects' unit is used, the characters may be presented in a 'box' cut into a picture from another 'source'. More than one page can be provided, if a suitable'memory' is used.

The design thus provides flexibility and allows all 'options' to be considered, though individual constructors remain free either to provide or not provide these additional facilities. It is based primarily on the well-known 74-series of TTL IC devices, other than for the memories and the basic character generator which are CMOS devices. For the original unit, Veroboard construction was adopted. As is common with all 'clocked' circuits, a degree of discipline is required during construction in order to ensure that the various bus runs of data bits or pulses are kept in order.

Memorising of the control data is facilitated by making the sixth bit of the data stream a logic '1' for alphanumerical characters or a logic '0' for the 'controls'. This provides the facility of five 'controls' using each of the remaining bits in a simple arrangement; although clearly it would be possible to provide 25 controls by adopting BCD coding. As all controls have their sixth bit at logic '0', this bit can be used to blank the video output and the controls appear as 'spaces' in the display script.

Control bit 5 is used as 'black/space/reset' and not only provides a space but also resets all other controls, except the control for 'double-height' characters. Double height, once set on a particular line, makes the entire line twice normal height and is reset automatically at the end of the line.

All lines start set for white letters on black background and with no controls operative. Bit 7 on the data is not used; it could be used for parity check but this was felt to be unnecessary for this sort of system.

The keyboard was originally constructed using surplus calculator 'push-to-make' buttons; these addressed the ASCII code bus by means of diodes, a diode lowering the rail to a logic'0' state, using diode program cards from computers. However, now that 'UV Proms' are available cheaply, some resoldering of diodes was necessary.

For alphanumerics, in order to keep the number of push-buttons to a reasonable quantity, bit 5 was taken from a bistabe circuit; this enables this bit to be used to provide a form of upper3lower case arrangement as on a typewriter keyboard, the letters and major symbols being in the upper case mode, the numbers and minor symbols representing the lower case. Since bit 5 is used also for control (with bit 6 always at level '0') a circuit arrangement ensures that bit 5 is steered appropriately whenever a control key is depressed.

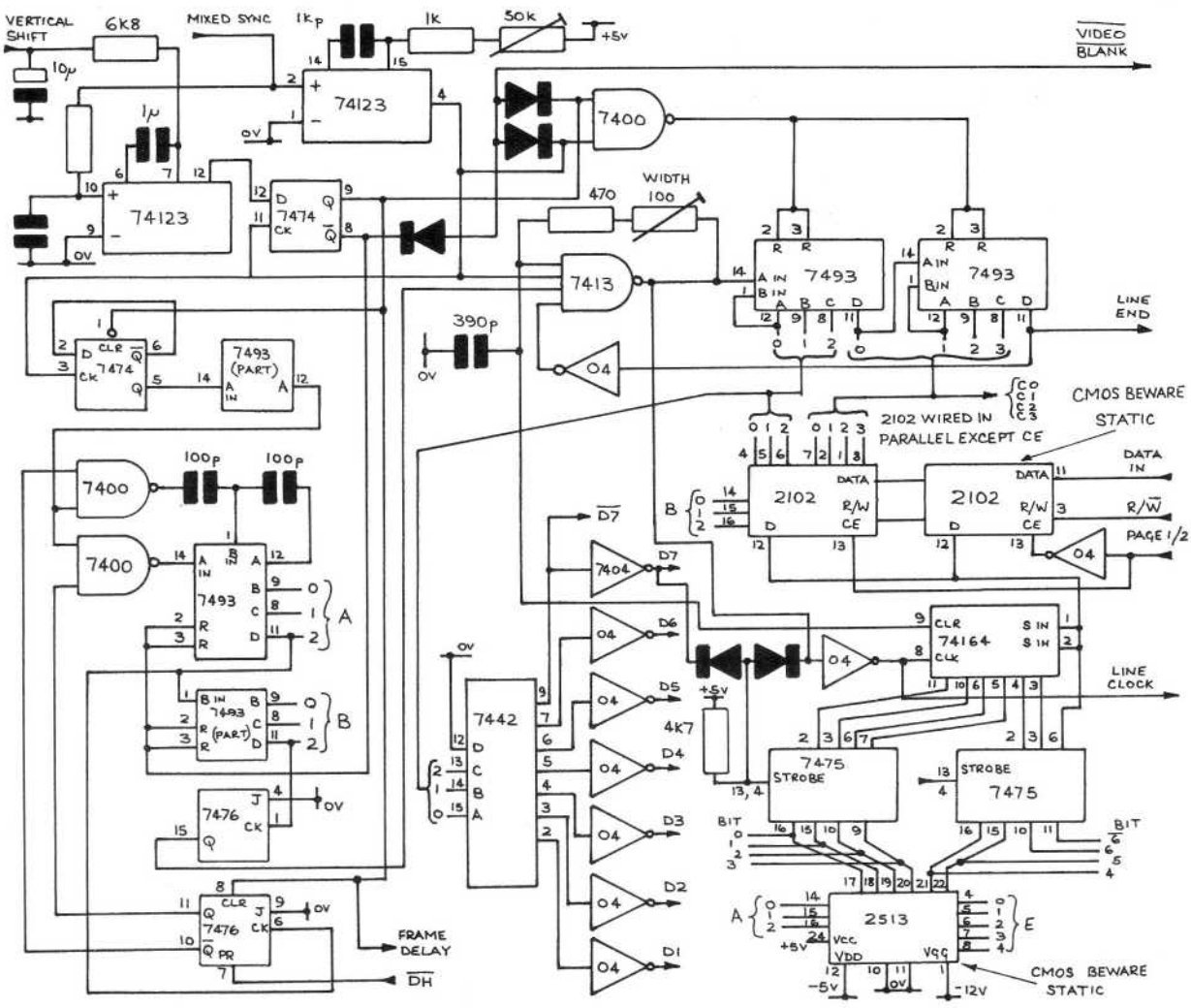
An electronic 'cursor' is provided to indicate the next charater location; a carriage feed steps along the cursor without overprinting.

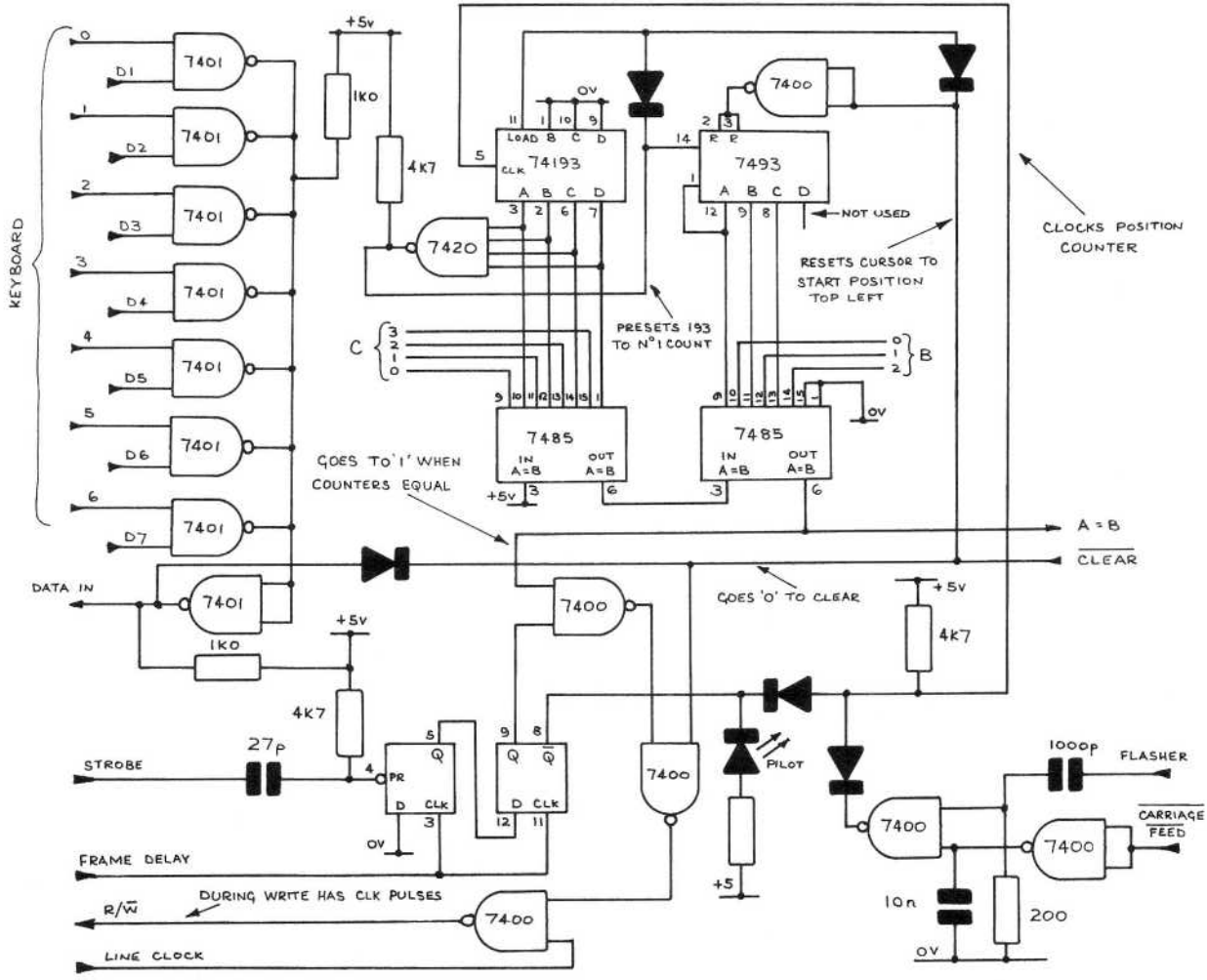
Supply lines to the unit are: voltage rails of 5V and -12V; mixed syncs; and mixed blanking. Outputs are 1v dap video sync negative; Inlay, 0 for cut to this source, TTL standard.

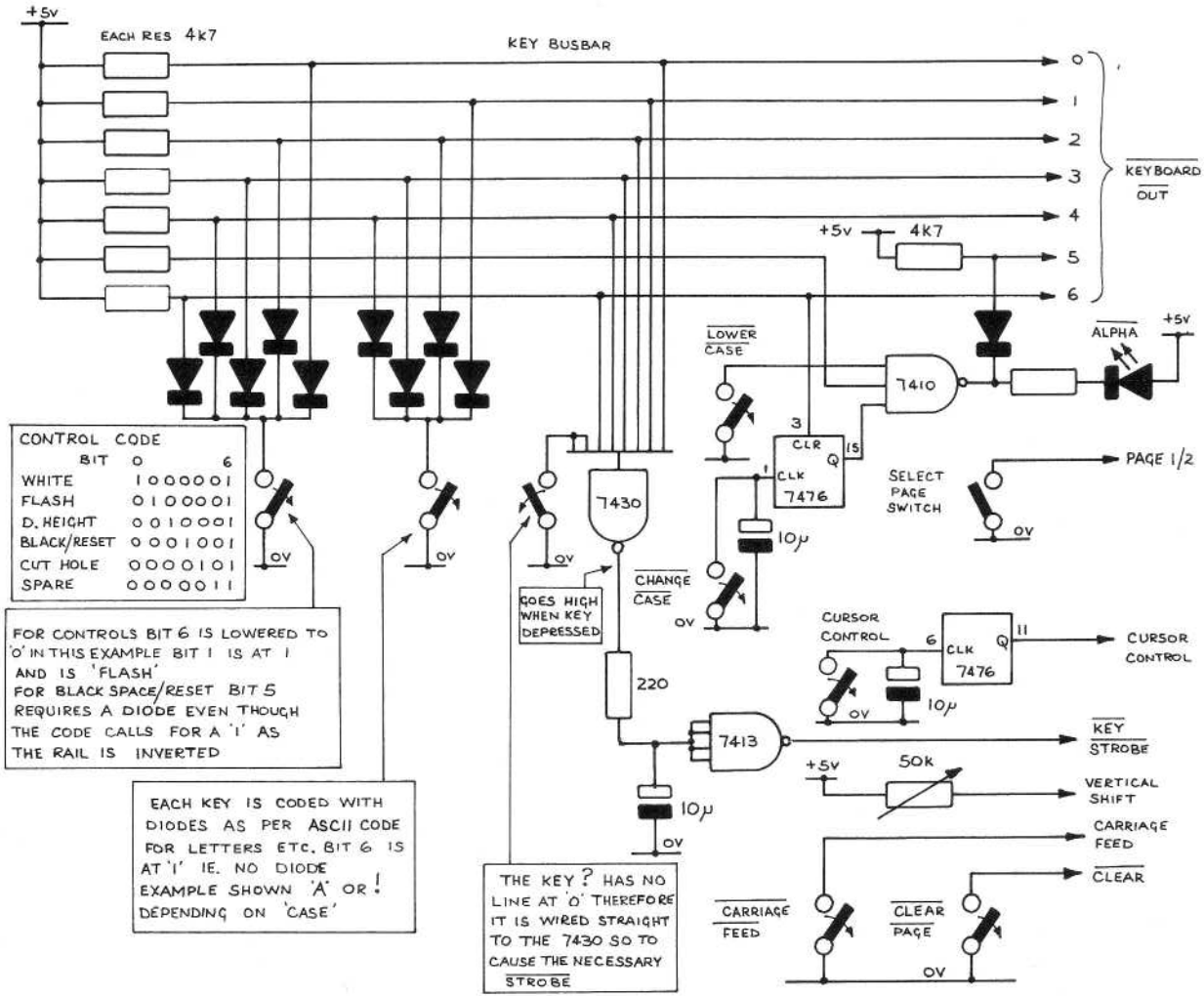
The incoming mixed sync is level-changed and inverted, and then triggers a 74123 monostable device to provide an adjustable delay used to centre the display withing the raster.

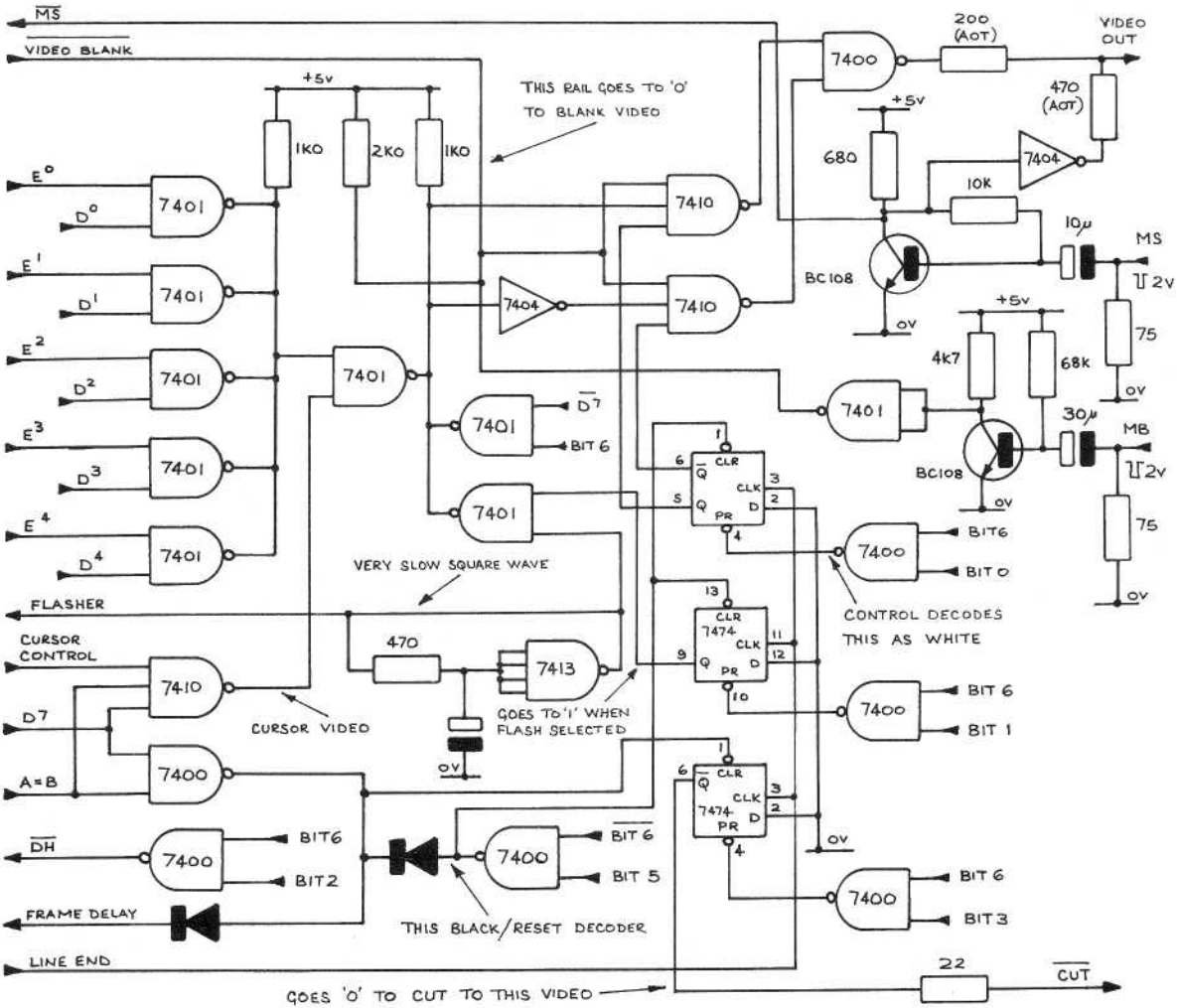
The ouput of a high-speed oscillator, built around a 7413 device is fed to a series of twin-cascaded 7493 counters. Signals from the first three of these bistable devices are fed to a 7442 decoder so as to provide discrete intervals. Numbers 1 to 5 provide the strobe for the 2513 horizontal outputs. Number 7 provides the store for each character; it follows that the display is always one character after the appropriate memory location.

Numbers 1 to 6 are also used to strobe the 'write' bits, while the remaining 7493 bistables provide the character row count. The last output is arranged to stop the oscillator, thus preventing more than one 'read' of row before line-sync has occured again.


VERTICAL SHIFT
6K8
10µ
1µ
MIXED SYNC
1K
1K
50K
+5V
74123
74123
0V
7474
7400
7413
04
470
WIDTH
100
390P
7493
7493
LINE END
VIDEO BLANK
CMOS BEWARE STATIC
2102 WIRED IN PARALLEL EXCEPT CE
2102
2102
DATA IN
R/W
PAGE 1/2
100P
100P
7404
D7
D6
D5
D4
D3
D2
D1
7442
4K7
74164
LINE CLOCK
7475
7475
STROBE
BIT
2513
CMOS BEWARE STATIC
FRAME DELAY
DH
-5V
-12V


KEYBOARD
0
1
2
3
4
5
6
D1
D2
D3
D4
D5
D6
D7
7401
+5v
1KΩ
4K7
7420
OV
74193
LOAD B C D
CLK
A B C D
7493
R R
NOT USED
7400
CLOCKS POSITION COUNTER
RESETS CURSOR TO START POSITION TOP LEFT
PRESETS 193 TO N°1 COUNT
C
B
7485
IN A=B
OUT A=B
GOES TO '1' WHEN COUNTERS EQUAL
A=B
CLEAR
GOES '0' TO CLEAR
DATA IN
27p
STROBE
PR
D CLK
Q
FRAME DELAY
DURING WRITE HAS CLK PULSES
R/W
LINE CLOCK
PILOT
+5
1000p
FLASHER
CARRIAGE FEED
10n
200


+5v
EACH RES 4k7
KEY BUSBAR
0
1
2
3
4
5
6
KEYBOARD OUT
+5v
4k7
LOWER CASE
7410
ALPHA
+5v
3
CLR
Q
15
CLK
7476
1
10μ
SELECT PAGE SWITCH
PAGE 1/2
0V
7430
0V
CHANGE CASE
0V
GOES HIGH WHEN KEY DEPRESSED
CURSOR CONTROL
6
CLK
Q
11
7476
CURSOR CONTROL
0V
10μ
220
7413
KEY STROBE
+5v
50k
VERTICAL SHIFT
10μ
0V
CARRIAGE FEED
CLEAR
CARRIAGE FEED
CLEAR PAGE
0V
CONTROL CODE
BIT 0 6
WHITE 1000001
FLASH 0100001
D. HEIGHT 0010001
BLACK/RESET 0001001
CUT HOLE 0000101
SPARE 0000011
FOR CONTROLS BIT 6 IS LOWERED TO '0' IN THIS EXAMPLE BIT 1 IS AT 1 AND IS 'FLASH' FOR BLACK SPACE/RESET BIT 5 REQUIRES A DIODE EVEN THOUGH THE CODE CALLS FOR A '1' AS THE RAIL IS INVERTED
EACH KEY IS CODED WITH DIODES AS PER ASCII CODE FOR LETTERS ETC. BIT 6 IS AT '1' IE. NO DIODE EXAMPLE SHOWN 'A' OR ! DEPENDING ON 'CASE'
THE KEY ? HAS NO LINE AT '0' THEREFORE IT IS WIRED STRAIGHT TO THE 7430 SO TO CAUSE THE NECESSARY STROBE


MS
VIDEO BLANK
+5v
1KΩ
2KΩ
1KΩ
THIS RAIL GOES TO '0' TO BLANK VIDEO
E0
D0
7401
E1
D1
7401
E2
D2
7401
E3
D3
7401
E4
D4
7401
7401
7401
7401
7410
7410
7404
7400
200 (AOT)
VIDEO OUT
470 (AOT)
+5v
680
7404
10K
10µ
MS
BC108
0V
2V
75
0V
+5v
4k7
68k
30µ
MB
BC108
0V
2V
75
0V
7401
D7
BIT 6
VERY SLOW SQUARE WAVE
FLASHER
CURSOR CONTROL
D7
A=B
7410
7400
CURSOR VIDEO
470
7413
GOES TO '1' WHEN FLASH SELECTED
0V
CLR
CLK
PR
D
Q
7474
BIT6
BIT0
CONTROL DECODES THIS AS WHITE
BIT 6
BIT 1
BIT 6
BIT 3
DH
7400
BIT6
BIT2
FRAME DELAY
7400
BIT 6
BIT 5
THIS BLACK/RESET DECODER
LINE END
GOES '0' TO CUT TO THIS VIDEO
22
CUT

Note that this signal, together with others, is made to lower a video-blanking bus which, throughout the equipment, inhibits video signals from appearing during the appropriate periods by means of a diode negative OR gate. The same mixed sync signal is fed via a low-pass filter to the appropriate half of the 74123 monostable to provide the 'margin' delay at the top of the display. It is useful to make this delay adjustable by the operator. The delayed signal is fed to a 7474 device to remove any interlace problems, and then to a series of counters. The output of these counters is used to provide a signal in BCD form to the 2513 vertical address and memory address. By extending the division ratio of this series by a factor of 2, we can accommodate the 'double height' facility in response to the appropriate control.

Serial data from the 2102 device is fed to a 74164 shift register clocked in inverted form by the master clock. At the appropriate moment, the information contained in the 74164 is stored in the latches provided by the 2-off 7475 devices. These are useful in that they provide on-chip true and complimentary outputs. It is from these outputs that the decodes (both character and control) are fed.

The alphanumeric instructions are decoded in the purpose-built 2513 device; controls are decoded using a section of a 7400 device for each control. The opportunity is taken at this point to blank the video with bit 6 except during the cursor interval. Each control action is stored in a latch (mainly formed using 7474 devices) with resetting accomplished as already described. A spare control function is available for future use.

The video output is formed by strobing the output rails of the 2513 character generator. The blanking bus action is added, and flashing accomplished by a similar oscillator built around a second 7413 device. This oscillator is also used to provide the stepping action on the carriage feed.

So far it has been assumed that the memory already includes stored data to form the required characters; it is the function of the 'write' circuits to insert this data. Another counter chain is compared to the sync-timed character count and row count in the 7485 computer chips, output being in the form of logic '1' when coincidence occurs. This output is used to provide cursor information in order to reset the control latches and so providing a running control as information is typed in and to define the location in which information is to be written into the memory.

Whenever a key is depressed a strobe signal is formed , timed slightly after the key is struck. This information presets a 7474 which in turn is clocked into another 7474 by a 'frame-start' pulse from the 74123. On the next frame, the '1' state is dumped from the 7474s follwed by an '0' state. Thus for a single frame a '1' state exists to gate with the desired location and to write clock pulses to form the read-write input to the 2102. These pulses, it should be noted, form only the instruction, the data being dependent upon the particular ASCII code that has been keyed. The instruction signal is stobed by a series of 7401 devices and fed to the data in the memory. Since the read-write signal occurs once only, the appropriate character/control signal is put into the memory and will be immediately displayed or acted upon. The back edge of the second 7474 latch increments the location counter by one step.

It is impossible to overprint a page to alter or amend the display but a more useful arrangement is to be able to erase the complete page. This is done by feeding a supply of 'write' pulses to the memory, while holding the 'data-in' rail at level '0' for a period exceeding one frame. This instruction also resets the location counter to the top left-hand corner of the raster. The location counter runs from Count 1 to 14; because the display is always one character ahead of the memory it is not possible to use all possible 16 locations across each row. A 74193 presetting counter is used for this purpose.

The above description covers the basic unit but it is hoped later to provide an article covering some other features and facilities which can be added. However in the interim period the circuit arrangement, as described, will permit much time to be spent exploring all the many permutations of possible effects.

To conclude, a brief note on debugging the unit may help constructors. In common with other VDU-type displays, many pulses happen quickly and briefly and can be difficult to detect on an oscilloscope due to triggering problems. As a more practical alternative, the author adopts instead the principle of mixing into the complete video (a 2KO series resistor will suffice) the pulse or point to be examined. The monitor will then display the output video plus the pulses to be examined. It has been found that with a little practice, this technique allows a very accurate estimation to be made of exactly what is happening in the circuits concerned.

continued on page 10

From the Treasurer

Dear Member,

I should like to take the opportunity of expressing thanks to Alan Pratt for his untiring work on the financial affairs of the Club over many years, on which he must have given many long hours of effort on our behalf.

As your new Treasurer, I must bring to your attention the following changes :

1. The Committee at its last meeting resolved that the subscription should remain at £2 for 1980 only, and that it shall be increased to £3 from January 1981.
2. Due to the change of the bank account to Lloyds Bank Ltd., 67 Kingsway, London WC2B 6SX (a/c 0271204) all previous standing orders are cancelled. Members paying by this method are required to complete new bankers' order forms, for 1981. Those members due to pay for 1980 will have noted the bankers order form in CQ-TV No 108.
3. Members who have paid £3 for 1980 will be credited, or repayment will be made on request. Please let me know.
4. Giro arrangements remain unchanged. Overseas members draw cheques payable on London banks as bank charges are very high on your subscription. The amended bankers'order form will be in CQ-TV in due course.

73s

Arthur Rix G3RYF

Letters to the Editor

Dear Sir,

I note from the last issue of CQ-TV that your correspondent Mr D. J. Long has suggested that the frequency of 145.250 MHz (S10) could be allocated for the use of atv sound common talk - back and vision drive for the 70 cm transmitter. This matter has been discussed with the RSGB VHF Committee and myself as VHF Manager, and it is our considered opinion, bearing in mind the VHF community as a whole, that the allocatoin of this channel on an atv priority basis would not be justifiable at the present time. The committee feel that if there is a need for a 2 metre talk - back channel for atv purposes of coordination then the present allocation in the " all mode " sector would be the right place to have this facility. We would expect that the normal " sound " channel for atv purposes would be on 70 cms as is the "vision" content, rather than splitting the transmission between two bands.

The use of a conventional commercial transceiver of the usual 10/15 w rf output on 2 m to be used as a vision frequency driver would be fraught with problems in keeping the 2 metre radiation within acceptable limits. The use of this same equipment for 70 cms FM sound would also be quite a problem because of the need to keep to the same deviation parameters in both bands.

Now that synthesised equipment and stable VXO/VFO's are the order of the day, S10 has become quite a well used channel for normal 2 metre simplex operators and regular users of this channel would not take kindly to yet another frequency being given to atv enthusiasts when their observations of the existing 144.750 MHz frequency show it to be very infrequently in use.

The VHF Committee has the needs of all VHF amateurs at heart and your representative on this committee is Mike Crampton G8DLX and he will always keep us up to date with your problems.

T. P. Douglas
VHF Manager
RSGB

Dear sir,

I note that G8PTH is using the American TV Transmitter reviewed in CQ-TV No 107. I am sure that I will be by no means the only amateur

who would value an account of how he has done this legally. The reason that I still use 405 line operation is that it would be necessary to rebuild the whole of my rf equipment were I to change to 625 lines

My existing equipment is the usual valve multiplier chain starting with a crystal at 36 Mcs and finishing with a QQV03/20A which is screen grid modulated. Given a decent 405 line signal this produces a signal 6 Mcs wide (double side - band, remember !). With a 625 line signal of similar quality, 11 Mcs would be occupied in an amateur band only 8 Mcs wide so far. This of course is not on. I would not mind, but I am sure that the Home Office would.

To avoid this would mean having to scrap all my existig rf and following the DJ4LB path by generating a VSB signal at around 30 Mc/s, where VSB shaping is feasible, and converting it up. Hence the 405 operation.

Now I note that Andy is, from the list of his gear, probably using 625, and even intends to add a 6 Mc/s modulator. I assume from this that he is not band-limiting his video to 3 Mc/s or so, and I would very much like to know how the rf response of the transmitter is kept within bounds. I might be able to use his method on my Tx, or even go barmy and buy the American Tx AFTER the W.A.R.C.

A. Jaques G3PTD
(ex G6ACW/T)
Manchester.

Dear Folks,

The Editor has kindly allowed me the opportunity to comment on Mr Jaques' letter and while I'd like a whole article to discuss this important subject, I shall content myself with a couple of paragraphs.

First of all, I am using 625 lines and so are the other seven stations currently using PC transmitting equipment in this country. Having struggled to get my licence and built up a useful collection of video gear I'd be a fool to risk exceeding the band - limits. But is the average 625 line atv er likely to exceed the band ? Let's get this in perspective. Most tv amateurs I know use pensioned off surveillance cameras which give, realistically, a video output little better than 3 MHz (sorry, 3 Mc/s !). Double this and you get a rf signal 6 MHz wide, which is not difficult to keep within an 8 MHz band. Don't forget the amount of power in the sidebands is very small, milliwatts and microwatts. Nearly all the energy of your signal is in the first 1 MHz of spectrum from the carrier. Only about 2 % is spread over the remainder of the frequencies of your sidebands. Thus the liklihood of your signal bothering anyone removed from your carrier frequency by more than 1 MHz is slight, and you will be using a directional aerial, which further limits the risk of interference. So even if you put out double sideband (DSB) colour bars, the splatter and interference outside the band would be minute !

But hang on, that's not good enough - any excursion from the allocated band is illegal. So any station which is capable of putting out a DSB signal more than 8 MHz wide must take measures to prevent illegal operation. Now, before we go any further you can virtually rule out the DJ4LB Tx as the solution, it's not the answer. Part of the June 1979 issue of " Der TV Amateur " a German magazine equal in stature to VHF Comms wasdevoted to an unhappy rejection of the vestidial sideband IF plus linear amplification concept. It's fine in theory but during all that amplification from 100 mW to 50 or 100 W the suppressed sideband tends to be restored and wierd intermodulation products appear in the 420 and 450 MHz regions. Several German stations have received the dreaded 'blue QSL card' from the Post Office warning them to close down. Simply stated, there is no point in spending fortunes on VSB transmitters unless you have a lab. quality spectrum analyser and the means to alter the response of your filters. The solution is a pair of tuned interdigital filters in cascade inserted in the transmitter chain around the 5 to 10W level. These filters can be made to have an attenuation of 65dB at 4 MHz below the carrier. We have had four of them made up in a microwave lab. and they work well, almost exactly to spec. They are not cheap - a firm advertising in Rad. Comm. charges about £25 each - but neither in a DJ4LB or the prospect of losing your licence. I could say a lot more on the subject but there isn't the space.

In closing, let me just repeat: the average ATVer need not worry unless he is regularly putting out high resolution video or sound. I hope this puts Mr. Jacques' mind at rest. Perhaps you have ideas on this subject, perhaps you disagree with me. Why not write to C Q - T V and explain?

Andy Emmerson G8PTH

P.S. Anyone wanting constructional details of filters and translation of the article can have reams of photocopies if they care to send £1 to cover the cost of copying and postage. They are not a kitchen table construction job, and you still need a spectrum analyser to set them up.

Dear Andy,

Thanks for publishing my " Super NBTV " article in the October CQ-TV. I have had several letters applauding the idea and confirming that it is perfectly feasible. Maybe someone will have a go at the actual job one day !

Two errors crept into the text:-

1. In the drawing on page 8 T.R. (Tape Recorder) appeared as TX (Transmitter) ! which may have caused some head - scratching.
2. The 6K bit RAMs were described (top of page

9) as " about 6 bits ". Even my memory's better than that !

However thoughtful readers probably worked these two errors out for themselves.

Doug Pitt
Wollaton
Nottingham.

(Editor's note: Sorry, Doug ! I proof read the manuscript quickly so as not to miss closing time ... . Mea culpa.)

We regret that the minutes of the last B.A.T.C. committee meeting had not reached the Editor when this issue closed for press. Hopefully a precis of them will appear in the next issue.

POSTBAG

Mr. R. Thurlow G3WW writes to complain about the 'unsatisfactory' nature of items in the last issue of C Q - T V. This is not the first time he has made such complaints, so we hope he reads the note about the resignation of the Editor and volunteers his services; he can so obviously do the job better.

Alan Watson who runs B.A.T.C. Registry writes with a plea to members who may be able to help potential SSTV enthusiasts. The Registry gets many requests for SSTV cameras and monitors but only a few appear in the 'for disposal' lists. Also there are literally dozens of requests for 5FP7 c.r.t.s, a demand which is much greater than the supply. Can any members help? Please let Alan know if you can - his address is inside the front cover.

Grant Dixon G8CGK has sent some literature on "Visionpack" modules for building up television monitors. Different modules exist for many c.r.t.s, and there are amplifier, line and field timebase, and transformer modules, and yoke and hardware packs. Grant points out that prices are rather high - just a video amplifier is over £10 - but the simplicity of the system has big advantages. Literature from your stockist, or Digivision Ltd., 82 Cannock St., Leicester LE4 7HR.

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continued from page 7.

All chips have + 5v supply on pin 16 (14) and 0v on pin 8 (7).
except:-

2513	as shown
2102	+ 5v on pin 10 0v on pin 9
7493	+ 5v on pin 5 0v on pin 10
7476	+ 5v on pin 5 0v on pin 13
7475	+ 5v on pin 5 0v on pin 12

A Letter from Scotland

by Norrie Macdonald GM4BVU

I have long been a devoted video fan, having worked in closed circuit tv, both on the engineering side and on production within educational tv. But my progress has been painfully slow towards radiating my own pictures, but I am nearly there now ! About eighteen months ago I decided that no one really wants to see pix of bare rafters in my attic, so I decided to forego all construction and operation to allow all available resources to be channeled into a proper shack once and for all. Architect designed and professionally built, it is now virtually finished, and I have been able to turn my attention back to the name of the game, atv. The shack is divided into two areas, a work area with bench and storage space, and an L - shaped operating area with all equipment such as monitors and VTR etc " built - in ", adequate clearances being planned in for the many mains, rf, video and sound cables to be mainly concealed.

Pressure on the domestic authorities allowed the Pye monochrome reciever to find its way into the shack, and within hours of changing the ELC1043 - 05 in the 173 chassis to a basic 1043 I was receiving perfect pictures from John, GM3YLD, over a path length of some ten miles. My aerial is an 88 - element Multibeam on top of the house, where it looks " very big ". But it works well.

Flushed with this success, I also took pictures from Angus, GM8PSM, over a much longer path. Pictures were ' 2 ' on the A5 scale, but intelligible nonetheless.

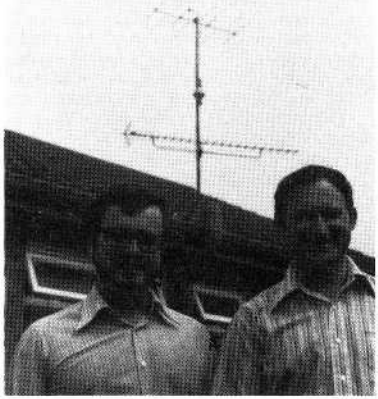
The next step of course is to line up my DJ4LB Tx which has been built and gathering dust these two years now. To aid this I have built the Manor Supplies Colour Bar Pattern Generator, which will provide a video source till I get my camera (ancient valve type) operational.

So pictures are on the cards from 4BVU this side of eternity after all folks !

My appeal for comments on a repeater for tv in the Central Scotland area in CQ-TV 104 met with a poor response i.e. none. However, now that I have seen the critical beam headings required for good pix, I'm more convinced than ever that this will eventually happen. Let's speed it up, lads. Any takers ?

During the summer I ha d the pleasure of visiting David GW8PBX and his XYL Valerie, along with my family. We found that we had much in common, and talked tv to a standstill.

David had completed his DJ4LB just before my arrival, but had not transmitted further than across the room. That was soon rectified with the rig hooked into his 2m cubicle quad, hardly an ideal load. However Anglesey was treated to the unusual spectacle of a radio amateur driving around, periodically leaping out of the car to hold up a battery portable tv, and report back via 2m talkback. Since all this was happening in semi - darkness, I got some very strange looks from the passers - by.



In the accompanying photograph, David is shown on the left, with yours truly on the right. By the way, we got about $1\frac{1}{2}$ miles with 100mW into the quad. Very noisy, though.

As a final comment, let me say that in addition to CQ-TV, I now take the American equivalent, " A5 ", which although not as well presented as CQ-TV is neverthless good reading. I heartily recommend it, some of the repeater activities reported make me quite jealous.

I trust that soon I can provide photos of my shack, and incoming video.

TV ON THE AIR

By John L. Wood G3YQC

TUNERS AND THINGS

I have recently been noticing a lack of "that certain something" and a distinct fraying round the edges in the quality of incoming TV signals. Since it was the same on all signals the trouble seemed to be at my end. What to do ? Check the aerial ? - yes, that was still there, how about the coax ? Well, apart from sagging a bit it checked out OK, it can't be water in a solid dialectric cable. Right! Must be the tuner. I couldn't find the thing at first but following the leads from the tuning pot I discovered it down the back of the bench dangling at the end of a host of connecting leads, I thought the poor thing must be chocking to death ! However, after blowing clouds of dust away, plus a few dead flies and spiders, I decided that perhaps it had had it's day and was due for retirement. (This consisted of being turned into an RF modulator for use with a TV pattern generator). Orders were speedily issued and in due season there arrived a shiny new ELC 1043/05 tuner, posh box, Modular Electronics pre-amplifier (thought I'd try out a commercial one for a change) together with sundry pots, switches and even a LED for a front panel indicator. So far so good. The first thing was to modify the tuner to 70 cm, I tried the usual method of padding the oscillator and mixer tuned circuits but this time it didn't work ! Perhaps the latest '05 tuners have changed a bit. After much muttering and head scratching - inspiration ! Since I couldn't pad the capacitors how about increasing the inductance ? An inspection of the lines showed about a sixteenth of an inch protruding through the print side of the PC board, a quick touch with the soldering iron at each end whilst carefully pulling the line out a bit effectively made the line longer. I did the oscillator and mixer at first. On went the UHF sig' gen' and bingo ! There were signals at 70 cm in fact +0.1 volt on the tuning diodes gave me a frequency around 428 MHz. So much encouraged, I did the same to the other lines and re-tuned the whole converter using the sig' gen'. The result was a very sensitive receiver. One point though, unless you have a decent sig' gen' I'd advise leaving the RF stages alone since you will almost certainly upset the tracking of the tuned circuits, and as these stages are pretty wide they are OK left alone. Once the tuner was done, I quickly installed it in the posh box, fitted the pre-amp', added certain touches of luxury like input and output coax sockets, front panel on/off switch and a tuning knob. I even went so far as to letter the front panel and calibrate the tuning. The result ? Pure one-upmanship. The Modular Electronics amplifier certainly gives a good account of itself and considering the price, was in my opinion, a good investment. The overall improvement both aesthetically and functionally in my shack is quite considerable and I can now see bits of G8ABD's monoscope test card that have previously looked like an arctic blizzard.

Enough of this, on to business. I now present the concluding part of the story of TV in a Welsh valley.

THE GW STORY Part 2

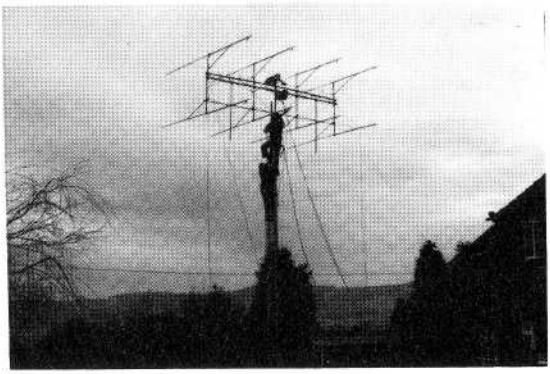
The following is a description of Ray's (Gw8GKF) equipment and activities. Ray you will remember is the one who penned the original narrative of which this is the condensed version.

Situated in Caerphilly at about 650 ft. ASL, the shack is a converted garage, panelled and soundproofed and divided into two rooms, a workshop and a studio area. Two National Panasonic viewfinder cameras and a Phillips LDH 50 form the basis of the video sources but there are one or two others which could be pressed into service if needed. The transmitter consists of a home brew ring mixer type IF generator with inter sound capability, a Microwave Modules transverter drives a home brew linear amplifier consisting of a lightly-run 4CX250 driving a pair of 4CX250s in a cavity and easily capable of running the legal limit. The aerial has 168 elements! made up of 8, 21 element beams having a total theoretical gain of 27dBi. The method of phasing the array is rather interesting in that instead of the usual coaxial phasing harness two 4 port and one 2 port power splitter/combiners are used. Ray finds this method more accurate and certainly more convenient to use. If anyone would like further details of this type of phasing he would be pleased to pass on the gen. (Looks like a good idea for an article). The complete array is shown in the photo. The boxes at the top are a Phillips TV camera with remotely operated zoom lens ! and a masthead aerial changeover relay and pre-amp'. This system includes an isolation relay which dumps the pre-amp' input into 50 ohms on transmit. The pre-amp' consists of an untuned MRF901 amplifier into a TP491 tuned input amplifier. Ray finds the low noise head amplifier indispensable for weak signal working. There are two receivers in the shack,

the mark 1 uses a Mullard 1043 tuner and a modified GEC 2100 series IF panel and the mark 2 uses the latest U321 tuner and a Redifusion IF panel, this having a restricted bandwidth of 2 MHz. Also featured is an automatic band scanner which saves a lot of manual tuning. Noise-free signals are copied from all the locals as well as G8GLQ and G4BVK in Bristol. Video has been received from G8DTQ in London, but best DX to date are two way with F1EDM and F3LP. Best directions are East towards London where the Crowborough beacon is always audible. To the north is also good yielding regular contacts towards Liverpool on 70 cm SSB. Ray is always willing to set up skeds with other stations, the address and phone number are given at the end of this column.

Lastly the studio set up where tapes are made for clubs, rallies and exhibitions etc. comprises an auto-programable edit controller for use with two $\frac{1}{2}$" video tape recorders which uses the VTR control pulse counting for a digital tape position counter, once a digital counter is available it enables programming of the edit point both in and out by means of a comparitor, this saves much time and enables a preview of the edit without performing it by the use of 4016 bilateral switches and it will abort the edit if it is outside a pre-determined window 1 - 10 frames which is selectable and is indicated with seven segment displays, one for the replay and one for the record machine.

Well, that just about concludes the description of ATV in the Caerphilly area which you must surely agree is most impressive. My thanks to GW8GKF for taking the trouble to set all this down on paper. The address to which to write is: 13 Gelli Dawel, Energlyn, Caerphilly, Mid Glamorgan. Tel. Caerphilly 88752.



STRANGE HAPPENINGS ON 70

The other day I was taking some excellent pictures from G4DYP (nr. Cannock) over a 65 Km path, John was running about 12 watts from a home designed solid-state amplifier. Signals were still good when the power was turned down to 3 watts and the signal strength throughout the transmission was steady, then G8DIR from Shrewsbury called in and after a while started transmitting video running about 80 watts. Good pictures were instantly received but after about twenty seconds these faded out, I thought Ken was tuning up since a few seconds later up came the picutres again stronger than ever (vision strength 4). The transmission went on like this for nearly half an hour with the pictures fluctuating between nothing and vision strength 4 at about 15 - 20 second intervals. Now I've seen smoe deep QSB on 2 meters but never to such an extent on 70 cm., the talkback on 2m SSB was indeed fading a fair bit but not in synchronism with that on 70 cm and not so deep either. This was the evening of the 31st October. I wonder if anyone else noticed anything strange around that date.

G5KS writes to say that his new transmitter project is coming on a pace and is working well up to 3 watts output. At present Arthur is doing battle with a transistor linear amplifier.

An aerial has now been erected at the Midlands Video Group meeting place and Arthur gave a two-way video demonstration on the 12th November.

G8UID has recently become interested in the fast-scan TV and is being helped getting a receiver going on 70. G8GUN is continuing to make progress on his station and hopes to be fully operational shortly. Ernie G8MTF (ex G6MXW/T) has been seen on the air recently, and G4DYP put out his first colour transmission on the 20th October to G5KS who reports good quality pictures.

That's nearly it for this time but just one last item. In the October issue of "Radio Communication" magazine I noticed an ad. by Videotec Electronics of Ayrshire. They were advertising all sorts of equipment for TVers and they invited you to send a large SAE for further details. I sent for mine about three weeks ago and at the time of writing have heard nothing at all from them. This doesn't give one much confidence in a firm does it ? However, I will keep an eye on this one and will report my experiences in future magazines.

The address for copy is 54 Elkington Road, Yelvertoft, Northampton, NN6 7LU Tel. (0788) 82350.

Finally, may I take this opportunity of wishing you all the best in the New Year, and indeed the New Decade. Who knows what that will bring !

CONTEST NEWS

Contest Organiser Graham Shirville G3VZV

INTERNATIONAL ATV CONTEST SEPTEMBER 1979

Regrettably a lower level of activity than in the June contest but was enjoyed by all the participants.

Conditions appeared to be average plus but comments from many stations would argue this point - suffice it to say then that they were not as good as they were in June.

There were however, some similarities. Firstly both contests seem to have only happened in the southern half of the country - indeed in this contest the farthest north activity appears to have been G8DLX in Rugby! There was also zero activity from East Anglia (Essex excepted). Your scribe is most intrigued and welcomes any suggestions as to the reason why ? Complaints were made by some stations about well sited portable stations giving long scenic shots of their site which blocked out weaker stations.... and also about the use of FM on 2 meters. Some stations believe that SSB is much better (less QRM) and feel that TV Contacts were missed due to this.

As promised there was plenty of activity on the other side of the channel, but in most cases although many stations tried few were successful in making vision contacts. The best DX was ON5FF in Ghent contacted (2-way) by G4CRJ at 300 Kms.

Again zero activity on 23 cms. or 3 cms. - see later.

So to the U.K. results in full.

POSITION	CALLSIGN	POINTS	QSO'S	QRA	POWER IN	ANT	RX
1	G4ARD/P	2170	24	ZL18H	100	18P	1043
2	G8DTQ	1914	20	ZL60E	100	2x21	TP491
3	G8MNY/P	1878	16	ZL26F	100	19	-
4	G4CRJ	1337	15	ZL38B	120	88M	BFR34A
5	G8IWX	590	5	AL52H	100	88M	BFR90
6	G8EIM	581	11	ZL39H	25	88M	1043
7	G4AKG	546	8	ZL60B	140	18P	1043
8	G8CIU/A	454	5	AL41J	0.25(out)	46M	BFR90
9	G8DLX	434	2	ZM54B	60	18P	1043
10	G8PTH	162	3	AL56G	125	48M	RIGONDA
RX ONLY							
	G8CTT	212	5	AL41J	-	46M	BFR90

Obviously it will be a little while until all the European scores are amalgamated - as soon as I receive the combined results I will ensure they are published.

In the meantime I am pleased to see that the Dunstable Downs Radio Club have just made first position and their bottle of champagne and certificate will be presented at their dinner dance early in January.

Now to the future - to start with some dates for 1980 - put them in your new diary now.
February 10-16th 20.00 - 22.30 GMT Daily B.A.T.C. Activity Week - (rules below)
June 1st 09.00 - 19.00 GMT Gwent Amateur TV Contest (Rules to follow).
September 13/14th 18.00 - 12.00 GMT International TV Contest (Rules to follow).
??? 1296/10Ghz Activity Day.

1980 B.A.T.C. ACTIVITY WEEK

DATE: FEBRUARY 10-16th
TIMES: 20.00 - 22.30 GMT Daily
SCORING: 2 POINTS PER KILOMETRE ON 70CMS.
8 POINTS PER KILOMETER ON 23 CMS.
16 POINTS PER KILOMETRE ON 3CMS.
(One-way contacts count for $\frac{1}{2}$ above points).

EXCHANGES
1. A code group of 4 non consecutive numbers chosen by each entrant. The code group must be different on each day and must be exchanged on video only.
2. Call sign, QTH locator, report (as B.A.T.C. chart) and serial no. (starting at 001 for each day) to be exchanged in video or sound if necessary.

ELIGIBLE STATIONS Single or multi op - fixed /A or /P. N.B. the same location must be used for the whole contest.

LOGS To include all information exchanged plus own QRA, station details, points claimed, full address of entrant.

AWARDS A certificate will be awarded to the station with the highest score and special prize will be given to the most northerly entrant.....

CONTACTS Contacts may be made with the same station on the same band only once per session. The best 4 sessions will be counted for points, but if you are active for more please enclose all logs for checking purposes.

ENTRIES: TO BE SENT TO:-
G.P. Shirville G3VZV
18 Church End,
Milton Bryan,
Milton Keynes,
Bucks.
POSTMARKED NOT LATER THAN 3RD March 1980.

FEEDBACK

By Tom Mitchell G3LMX

Sorry for the lack of feedback in recent issues, I have moved out of London. Will you please therefore note my new address as letters sent to my old QTH have on occasion taken as much as a month to find their way through the Post Office redirection service.

T.W. Mitchell G3LMX
27 Hanmer Road,
Simpson
Milton Keynes,
Bucks. MK6 3AY

In response to my request last time, Andrew Emmerson G8PTH, ahs provided information on the connections to the multi-way connectors on Video recorders, see table 1 for details.

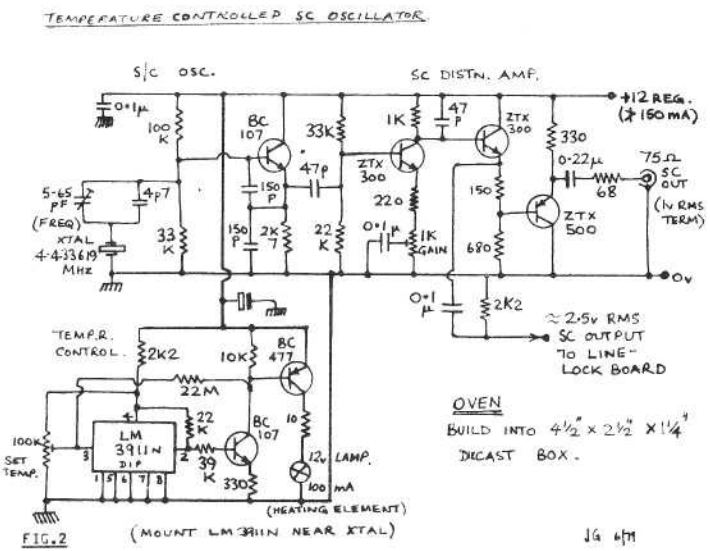
While on the subject of VCRs I was pleased to discover that the tuner on a recently purchased JVC VHS recorder covers 70 cms. without modification - due to a lack of aerials I have not yet been able to test it out on a remote source of R.F.

FIG. 1

John Goode of St. Albans has developed his proposed subcarrier to 1 MHz system reported in C Q - T V 105 into the circuit shown in Fig. 1. This unit which can be built up on a piece of Veroboard of the same dimensions as the P100 and C Q T V 75 boards, not only produces 1 MHz and twice line pulses locked to station subcarrier, but also line and field drives plus Industrial (i.e. single field pulse) type mixed syncs. John has provided information on board layout, not quite up to quality for publication without redrawing so if you would like details, please send stamps to cover the cost of postage and a couple of copies.

FIG. 2 STABLE SUBCARRIER SOURCE

This circuit also provided by John Goode, is for a crystal oscillator in a diecast box, the temperature being controlled by a small bulb and a LM 3911 IC (the IC is available from Maplin and others, and is designed for temperature control).



CONNECTIONS TO VIDEO RECORDERS (Courtesy of '*Der TV Amateur*')

In video systems the uniform level for the colour video signal is set at 1Vss $\pm$ 3 dB with an impedance of 60 or 75 ohms. BNC connectors are common on European equipment. On recorders of the VCR type the six pin connector to DIN 45 322 has become standard. The pin assignments are laid out in DIN 45 482:

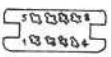
Pin 1: On replay +12V switching voltage (max. 100mA) via a protection diode for changing the horizontal deflection in the TV set. On record 0V.
Pin 2: On replay video output. On record video input.
Pin 3: Ground (shielding)
Pin 4: On replay audio output; on record audio input (up to 1V, high impedance).
Pin 5: Not assigned.
Pin 6: +12V switching voltage from the video adapter of the TV set for video sources without internal switching; on replay switched to pin 1.

☞ *The assignment of pins 5 and 6 can in fact vary according to manufacturer. On some older VCRs the Burst could appear on pin 6 (80mVss $\pm$ 3dB, 75 ohms). The Philips N1500 has +12V on pins 1 and 5, luminance out (1V, 75 ohms) on pin 2 and chrominance out on pin 6 (80 mV p-p).*

The five pole audio socket according to DIN 41 524 is wired as follows:

Pins 1 & 4: Low impedance mic. input, 0.1mV 1kΩ.
Pin 2: Ground (shielding).
Pins 3 & 5: High impedance in/out 0.1mV 1M5Ω in, 1V 20KΩ out.

The eight pole Honda connector is wired thus:



Pin 1: Audio input.
Pin 2: Video input.
Pins 3, 5, 6, 7: Ground.
Pin 4: Video out.
Pin 5: Audio out.

Table 1

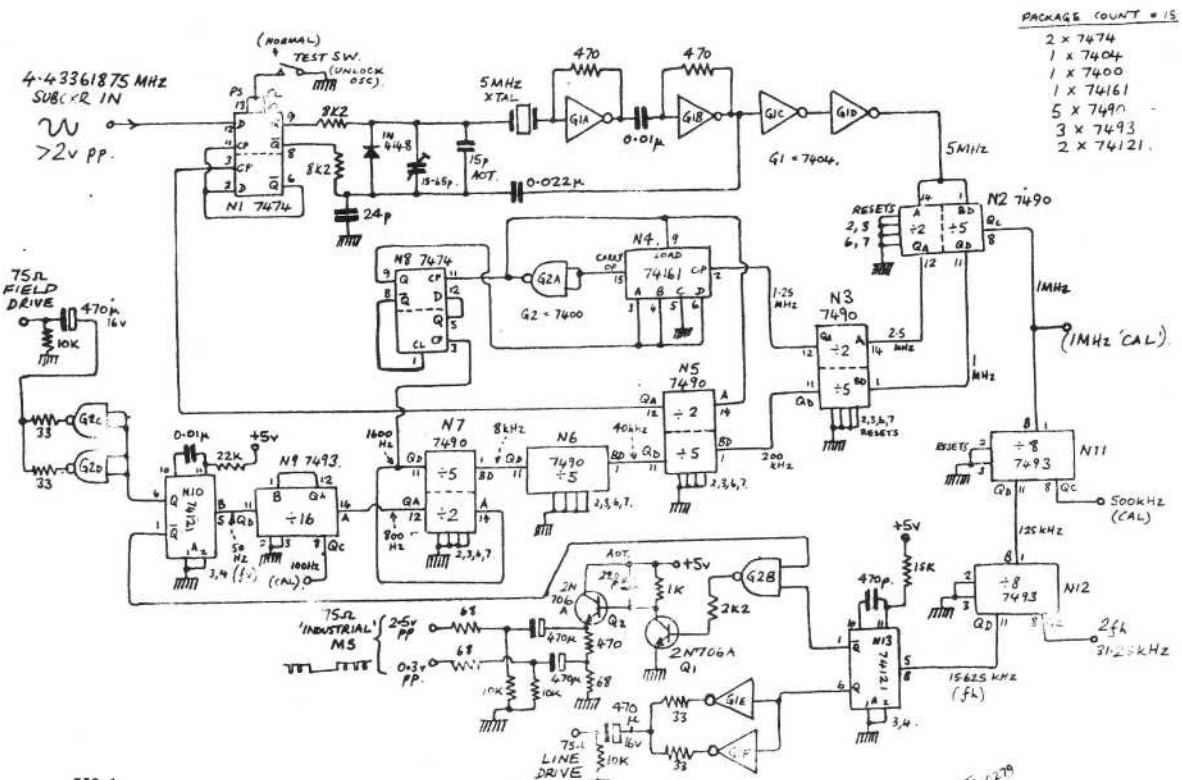

PACKAGE COUNT = 15
2 x 7474
1 x 7404
1 x 7400
1 x 74161
5 x 7490
3 x 7493
2 x 74121.
4·43361875 MHz
SUBCKR IN
>2v pp.
(NORMAL)
TEST SW.
(UNLOCK OSC).
5MHz XTAL
470
470
0·01µ
G1 = 7404.
5MHz
N1 7474
8k2
8k2
IN 4148
15p
15-65p.
ADT.
0·022µ
24p
N2 7490
RESETS 2, 3 6, 7
÷2
÷5
1MHz
(1MHz 'CAL')
N4.
74161
LOAD
G2A
G2 = 7400
1·25 MHz
N3 7490
2·5 MHz
1 MHz
N5 7490
÷2
÷5
200 kHz
N8 7474
75Ω FIELD DRIVE
470µ 16v
10K
33
33
0·01µ
+5v
22K
N9 7493.
÷16
1600 Hz
8kHz
N7 7490
÷5
÷2
800 Hz
N6
7490
÷5
40kHz
2,3,4,7.
N10 74121
50 Hz
100Hz
(CAL).
3,4 (fk)
N11
÷8
7493
500kHz (CAL)
125 kHz
N12
÷8
7493
2fk
31·25kHz
15625 kHz (fk)
N13 74121
3,4.
470p.
15K
+5v
ADT.
2N 706 A
Q2
1K
2k2
2N706A
Q1
G2B
75Ω 'INDUSTRIAL' MS
2·5v pp
0·3v pp.
68
68
470µ
470
68
10K
10K
470µ
75Ω LINE DRIVE
470 µ
16v
10K
33
33
G1E
G1F

FIG. 1

FIG. 3 INTERFIELD SWITCH LOGIC

This circuit, thanks again to John Goode, is similar to that published by Jeffrey Borin in C Q - T V 104, but has been refined to include selection at switch on and button priority to prevent double selection. John uses the open collector outputs to drive 4066 CMOS switches (Vss = 0v, Vdd = 12v) these are used in tandem pairs to give sufficient HF rejection in the "off" state.

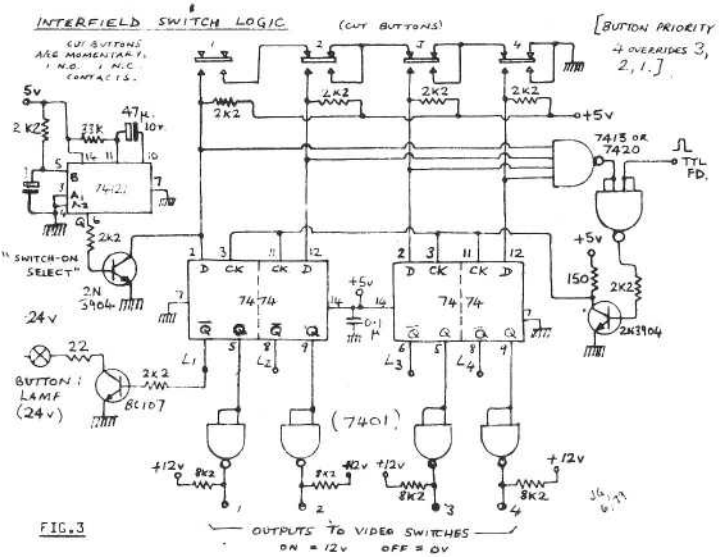


FIG. 4 UPDATING THE C Q T V 75 SPG

There must be dozens of these SPGs designed by Arthur Critchley still in service. In fact Club Sales still has a few boards in stock if anyone requires a siple multi-standard SPG and Genlock system. John Goode's circuit given in Fig. 1 shows how to derive a subcarrier derived 2L. F. if required.

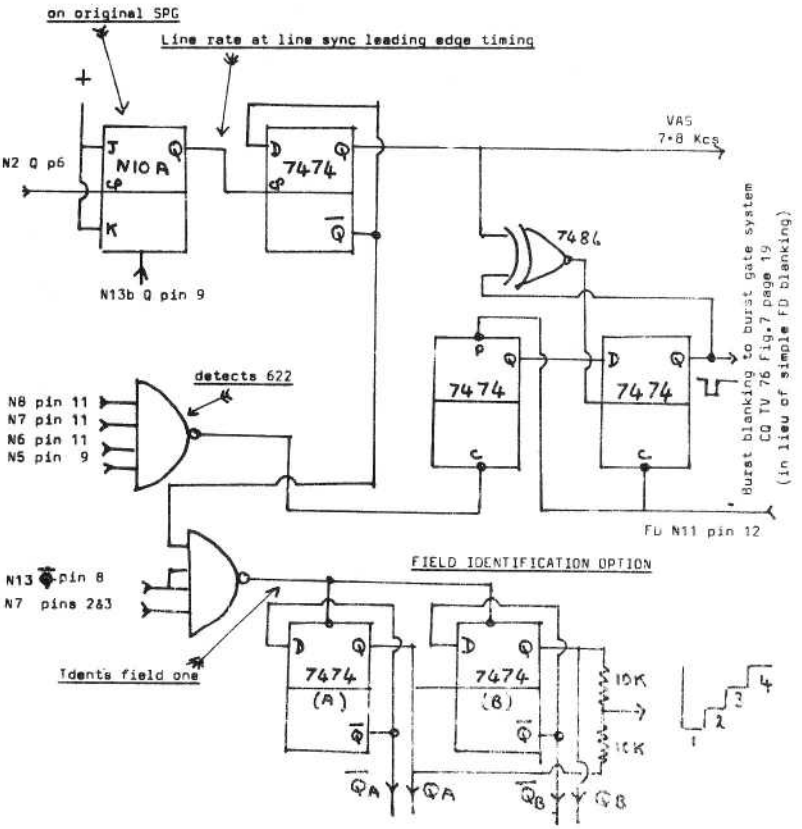
David Ellis-Jones GW8PBX has written from Angelsea with details of a circuit which gives full Bruch Blanking and a four field staircase which can be used for level shifting an oscilloscope to enable each of the four field groups of the PAL sequence to be inspected, see Fig. 4.

"The circuit is for use with the simplified (not 405 line) version of the C Q T V 75 SPG using the simplified field divider of Fig. 7 (C Q T V 75 page 9). IC and pin numbers refer to the original SPG designations. The small board with 6 ICs can be mounted piggyback style on the main board using stand-off pillars.

To achieve the full Bruch sequence part of the P100 SPG circuit can be modified as in the diagram, a further addition, a 7474 generates 25 Hz and 12.5 Hz. These are combined to give separate identification of each of the four fields, a rising staircase over four fields is also produced. This can be used for beam-shifting an oscilloscope giving, for example, a simultaneous display of the field sync group of each of the four fields one above the other".

That's all I have for this issue, however, feedback is bi-directional. I need to hear from you. I can prepare any hint, modification, useful circuit, request for information etc. for publication and reduce the load on our editor's time.

BRUCH BLANKING FOR THE CQ TV SPG



To detect fields use 7400 to gate as under

Field 1	gate	Q_A	Q_B
" 2	"	$\overline{Q}_A$	Q_B
" 3	"	Q_A	$\overline{Q}_B$
" 4	"	$\overline{Q}_A$	$\overline{Q}_B$

FIG 4.

POSTCRIPT

Iunderstand that a group of members have developed a colour bar unit to go with Project 100, will they please contact me.

P 100 stop press news

by Tom Mitchell G3LMX

Although I did not meet the deadline for this issue, work is well in hand for a board containing the 25 Hz offset circuit, and simple pulse output stages. Boards should be available before the end of January, and details will be in the next issue. If anyone is interested, I can let them have advance information if they write to me at the address below.

Due to rising costs we have had to increase prices of pcbs and crystals. A new list is printed here.

Sync pulse board	£4.50
Pattern generator board	£4.50
5 MHz crystals	£2.75
4 fsc crystals	£2.75

orders should be sent to my new address;

T. W. Mitchell G3LMX
27 Hanmer Road
Simpson
MILTON KEYNES
MK6 3AY

Please include an allowance for postal charges (crystals go at the basic letter rate, but boards are heavier and cost more)

I regret that a number of errors found their way into the information published last time. I reproduce the corrected version of the last part of the article below;

2. iii) Fit alternative link from IC 3 pin 11 to IC 23 pin 6 shown on wiring diagram.
   iv) Fit a new link from input from edge connector to pin 1 and 2 of IC 23; there are several suitable holes in the board.

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
14 Lilac Avenue
LEICESTER
LE5 1FN

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 COLOUR CONTROL & PROCESSING AMPLIFIER

By John Goode

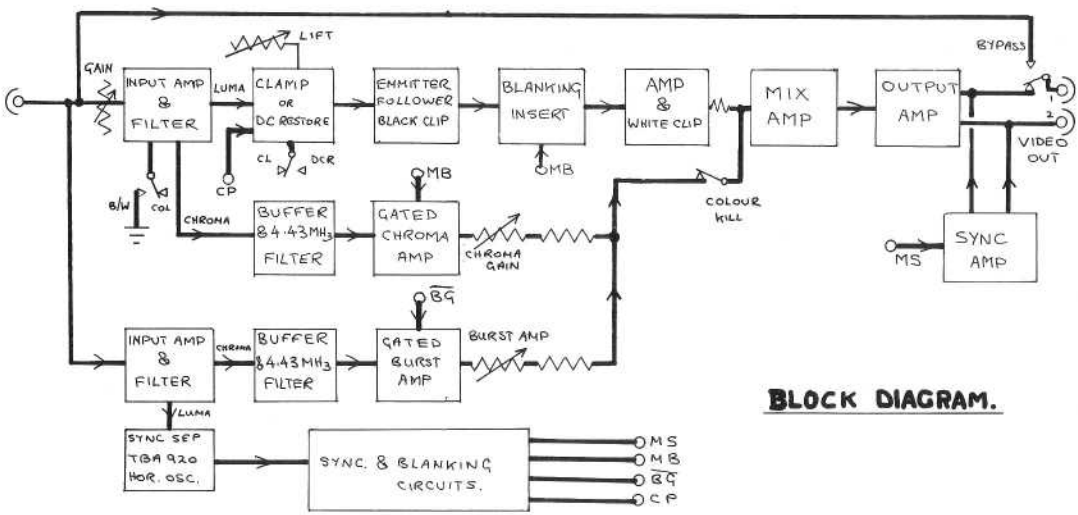
This apparatus was developed for use in an Educational T.V. Unit to allow some degree of signal correction to be available when copying between low-cost $\frac{1}{2}$" colour V.T.Rs. Adjustment of black-level, gain and colour saturation are possible, and the signal is reblanked with new burst and syncs added. This removes any potential disturbances that can occur due to head-switching noise causing false field triggering in subsequent equipment.

The prototype unit is normally used at the input of an Electrocraft 478 Tunebase Corrector, which adds SPG syncs to the signa; consequently there was no need for the Proc. Amp to regenerate full spec. CCIR syncs - a single broad-pulse field-sync is all that is necessary. Because of this, two versions of the sync circuits are shown - .

Option I, simple field-sync, as in the prototype;
Option II, full spec. CCIR sync. This is of course, much more complicated, and has not been built and tested by me, although the circuits are based on my V.T.R. Genlock System, (see C Q - T V 103) and should work.

Colour proc. amps. can take one of three forms, (1) Mixed Chroma and Luma; (2) Chroma and Luma seperated; (3) Decode to RGB, and re-encode.

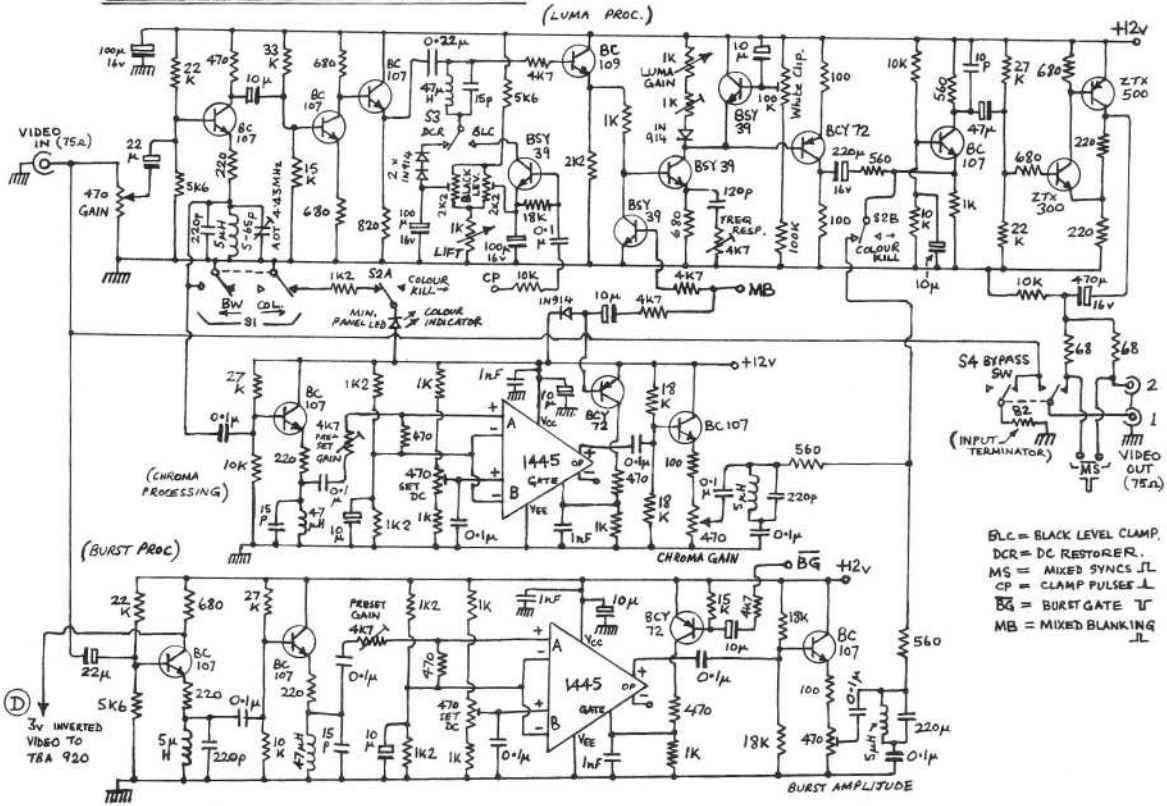
(1) is the type used at the output of vision-mixers and is essentially a high speed switch keyed by a blanking signal. This allow through the active video signal, and then switches over during the blanking period to inject clean syncs and burst. Adjustment of the signal is limited, as white and black-clipping are not possible because of the presence of the chrominance signal. Type (3) is probably the most flexible arrangement, but re-encoding requires a colour SPG - all very complex and expensive. This leaves type (2) where we seperate the chrominance sub-carrier, and then treat luminance, chrominance and burst all seperately. This is the method adopted.



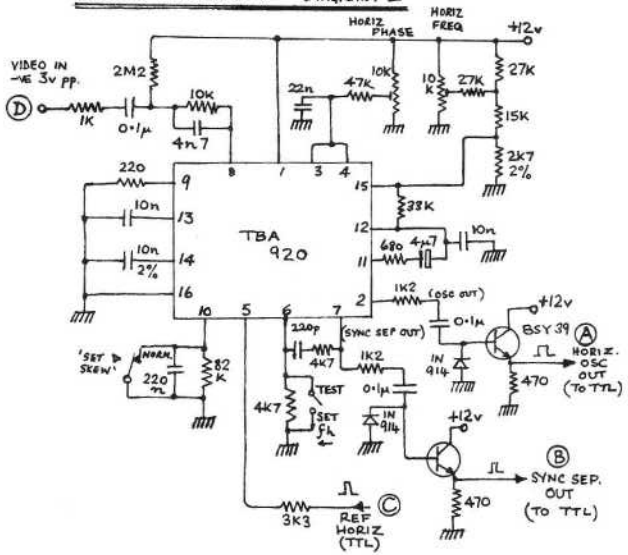
BLOCK DIAGRAM.

DIAGRAM 1

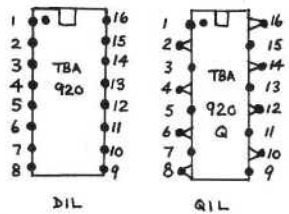
COLOUR PROCESSING AMP. — VIDEO CIRCUITS



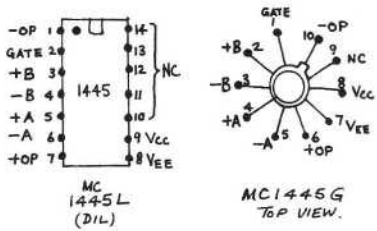
COLOUR PROC. AMP. — DIAGRAM 2



SYNC SEPARATOR & HORIZ OSCILLATOR.



TOP VIEWS OF PACKAGES.



MC 1445L (DIL)

MC1445G TOP VIEW.

NOTE :—

+A = NON-INVERTING A INPUT

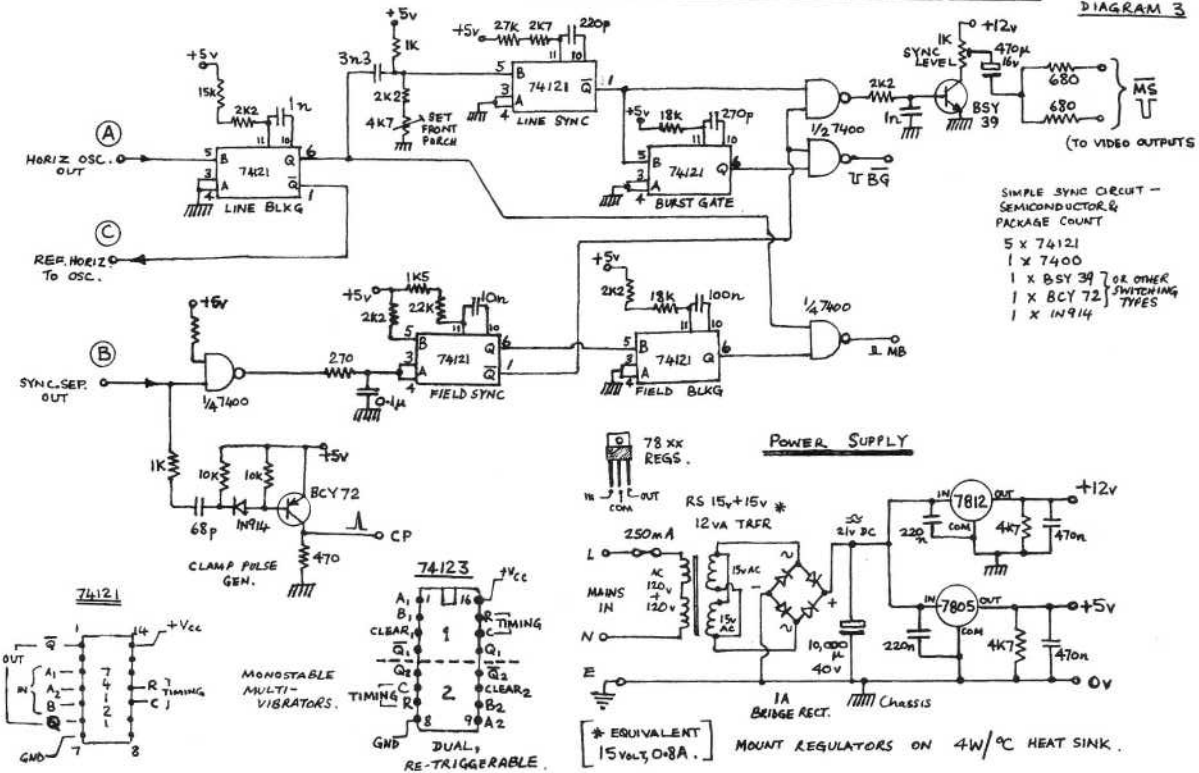
-B = INVERTING, B INPUT

+OP = NON-INVERTED OUTPUT

ETC.

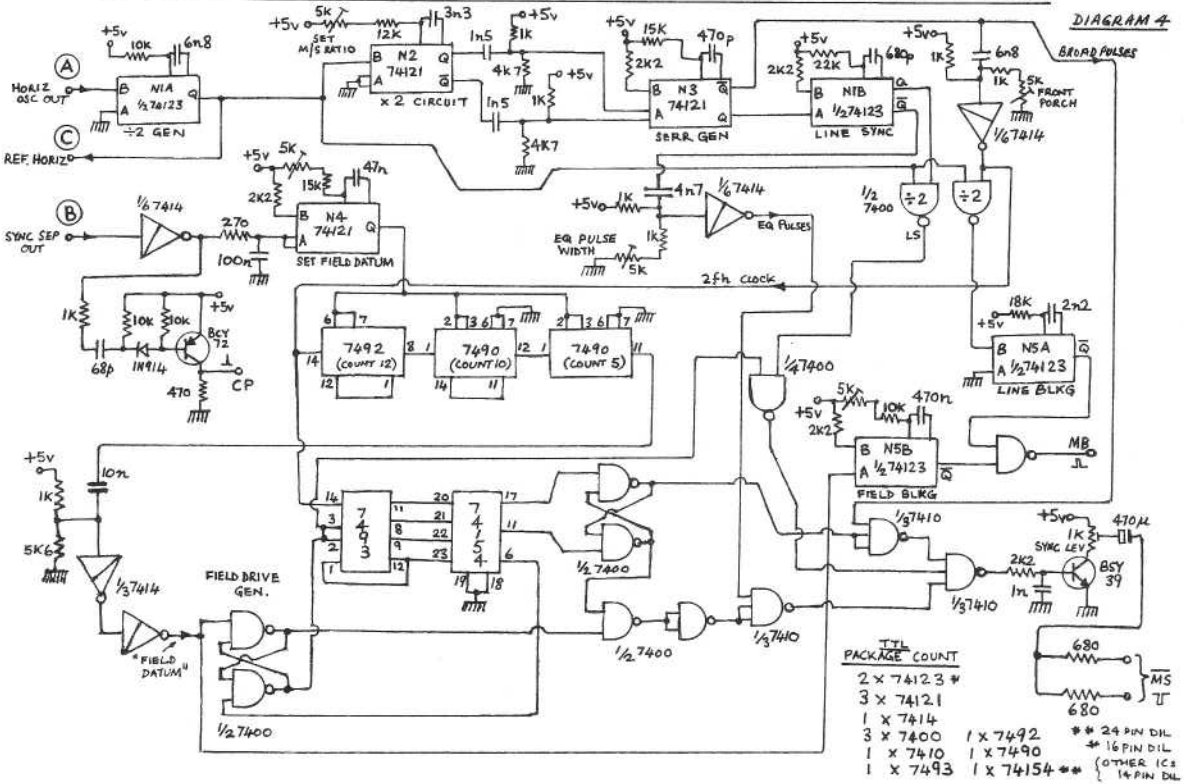
COLOUR PROC. AMP. — OPTION I — SIMPLE SYNC REGENERATION (SINGLE BROAD PULSE FIELD SYNC)

DIAGRAM 3



COLOUR PROC. AMP. – OPTION II – FULL SYNC. REGENERATION – (5 EQ + 5BROAD + 5EQ FIELD SYNC)

DIAGRAM 4



Seperating out the colour sub-carrier should theoretically be done using a comb-filter so that interleaved luma and chroma side-bands above 3.5 MHz are resolved without crosstalk. This, of course, only applies to signals having the full PAL SC to line-frequency relationship. With colour-under V.T.R.s and low-cost colour cameras this does not apply, and a simple LC tuned circuit is used in the Proc. Amplifier. Once the SC is extracted it is necessary to seperate chrominance and burst signals. Once these are seperated it is essential that they are passed through identical circuits so that there is no relative phase-shift (causing hue errors) between the two. The 1445 ICs used as chroma amplifiers are wide-bandwidth (50 MHz) gated differential amplifiers, with a fixed gain of about 10. The set DC pots are adjusted so that the chroma lies symmetrically about the DC output volts. These ICs are available from A. Marshall & Sons, Cricklewood, London.

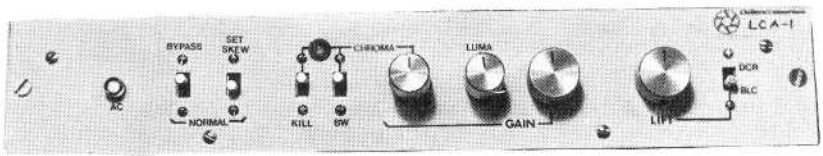
The sync. regeneration circuits are built around the TBA 920 sync. seperator and line oscillator IC. This is switchable from short to long flywheel time-constant by means of the "set skew" switch. A test switch that allows the oscillator to free-run is used to set the horizontal frequency. Horizontal Phase is adjusted so that there is no shift between input and output signals. The "front porch" should be set to $1\frac{1}{2}$us.

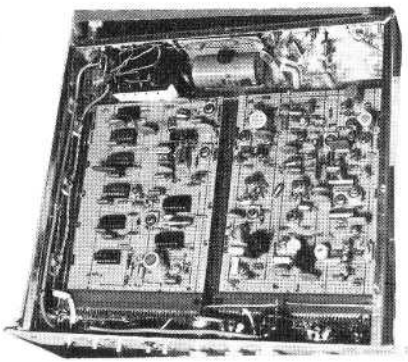
To adjust other presets, set front panel controls to 12 o'clock (centred). Apply a colour bar signal to the input, and 'scope the output signal (terminated with 75 ohms). Make sure colour-kill switch is off and Col/BW switch is to "Col.".

(1) Adjust "sync level" to give 0.3v sync.
(2) Adjust "burst amplitude" to centre of travel; then adjust "burst gain" to give 0.3vpp burst.
(3) Switch BLC/DCR switch to BLC; adjust appropriate black level preset so that signal agrees with input; then select to DCR and repeat adjustment with other preset.
(4) Adjust "preset gain" so that output agrees with input gain. Then increase input gain (on front panel) and adjust "white clip" to colour at about 1.2v pp. Restore input gain to 12 o'clock.
(5) Adjust "chroma preset gain" (input of 1445) so that chroma amplitude (bars) agrees with input signal.

For those puzzled by the inclusion of both a colour/b-w switch and a colour-kill switch, the difference is as follows; the b-w position gives maximum bandwidth, removing the chroma filter from the circuit; the colour kill switch prevents the chroma and burst from being added to the luminance signal.

The unit could also be useful as a control amplifier for low-cost colour cameras, as the newer small ones do not have CCUs.





AN APPLIANCE OPERATOR'S GUIDE TO /T OPERATION.

By Andrew Emmerson G8PTH

The title of this short article is a bit of a joke because I am a bit of an appliance operator myself. Nonetheless, it is a fact that there are a lot of TV amateurs who are not on the air and are a little hesitant to start building RF equipment even though they are perfectly proficient at video. This is because good constructional practice for UHF is not easily learned from a book and you can easily spend a lot of time and/or money trying to build something which in the end does not even work. (I did). And this is not for the lack of effort or time spent, but purely knowledge which is not easy to aquire for a first timer. Up to now, though, there was no alternative if you wanted to go on the air with ATV, since off-the-shelf equipment just did not exist.

The situation has changed in the last couple of years, however, and a variety of products are now available. You won't find them in every shop of course, but they can be obtained. I must point out immediately that the equipment is not cheap, and you would be worried if it was! It is made commercially by people in order to make a living, so it is obvious you could make the same equipment yourself at lower cost, if you could. But assuming you cannot or you don't have the opportunity and still want to get on the air, what do you need? Well, the diagram shows what by local experience is necessary for the basic ATV station. It is the sort of system we recommend in our Kent group to people starting up, and there is no commercial bias in the choice of equipment. I do not hide the fact that I am a British agent for PC Electronics, but it is good stuff and I have had no complaints from any of my customers. Here then is the key to the diagram.

1. Source of video. Essential. A camera is the most satisfying. Look for ex-surveillance ones, preferably of a well-known make e.g. Pye, Ikegami, so that you can get spares and manuals. Expect to pay £50 to £60 for a good one with lens. You'll save a lot of later heartache if it is switchable internal/external syncs. Also make the Project 100 SPG and pattern generator.

2. Oscilloscope . Essential. Use for monitoring outgoing signals (RF) and fault finding in general. Monitoring your own signal on a TV receiver or by watching the power meter is a waste of time. Adjusting video gain and sync level on the air with another station watching is OK, but you really do need a good scope. Try and get a good one, preferably from someone you know and trust. Price £20 to £100.

3. Good 70 cms. aerial, mounted as high as possible. Essential. This means a J-beam 8 over 8 or a MBM48/70. Both of these have the badnwidth necessary for TV which a Parabeam does not. Secondhand (look in Rad Com) is OK if you clean the elements with wire wool and varnish the assembly really well.

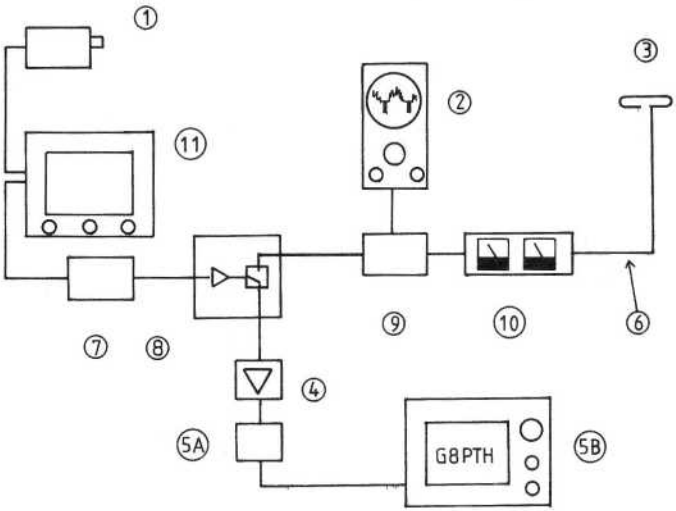
4. Good preamp. Advisable. Masthead mounting is best but this brings in complications with remote controlled relays. If the coax feedline is fairly short and of good quality you can get away with fitting it in the shack. Practical tests show (a) Modular Electronics to be better than SEM, and (b) if you use a MMC 435/51 converter a preamp will not improve reception noticeably.

5A. 70 cms. Converter. Optional. If you have a 625 line TV which has a VHF tuner (old dual standard or modern Continental) one of these is an attractive proposition. If you are pumping ATV down long lengths of coax it makes sense to do it at VHF rather than UHF. You can even use a cast-out upverter to get it back to UHF to watch it on a normal UHF set. Price in the £25 region.

5B. TV set which tunes 70 cms. Optional. As we have said before a lot of modern TVs tune 70 cms. anyway. Otherwise an old banger with the tuner changed for a 1043 varicap will do fine.

6. Good coaxial feedline. Essential. UR67, not UR43 or 70. Ask around, you might get it secondhand from someone in the Club, otherwise Westlake is recommended for low prices.

7. Transmitter. Essential. PC TX-A5 and PA5 combination is practical and effective. Bias and Gain presets should be removed and replaced by rotary pots on the front of the cabinet you install the modules in. Next to the pots you can also put a PTT (push to transmit) switch and a big red 12V 'on air' 1 amp. Price about £75 plus duty.



8. High power linear. Nice but not essential. The EDL432P by SOTA will give you as near the legal maximum of power as makes no difference. Those solid state megawatts from Liverpool are rumoured not to be very successful in TV use (prove me wrong!) and require big, expensive power supplies. The EDL on the other hand is compact, remarkably linear and self-contained. Despite denials from the manufacturer its longterm availability may be in doubt (they don't advertise it any more) but it is good (not perfect) and I'd advise you to get it sooner rather than later if you intend to. Price £135. Incidentally, don't run 10W into it. Five is closer to the mark and you can adjust the bias and gain pots on your TX-A5 to get the best-looking output waveform. For this you will also need:-

9. Inline Video Detector. Essential. You cannot send a good TV signal if you cannot see what it looks like. PC Electronics do an assembled PCB module but homebrew is cheaper and simple. See page 10.42 of the RSGB VHF/UHF Manual.

10. Power and SWR Meter. Useful luxury. Good ones were very expensive until recently but you can now get an accurate, premium quality one for around £30 from Lee Electronics. It is called the Toyo 435N and has N type connectors, so it must be good!

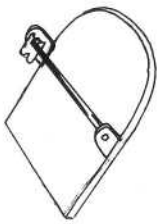
11. Monitor (s). One is essential, two are nice, more than two is very nice. Obviously you need to see what you are putting out, and once you have more than one source of video it is useful to have a switchable preview monitor. Compact transistor monitors are pricey (£45 upwards), old valve ones hot and bulky but fairly cheap, say £10 to £25. Take your pick!

12. Connectors. For RF use BNC or N according to the size of the cable (slight oversimplification) and for video use UHF (PL259) simply because nearly all professional equipment does or used to. Rally prices seem to even out at 40p to 50p for BNC and UHF, 60p for N type. When buying BNC and N type connectors check the markings to ensure that they are 50 ohm, not 75 ohm.

13. Two meters communication link. Essential.d It's been said before but many people have become interested in TV through hearing technical chat over the air. Round here we always use 144.75 and it is just tough that it happens also to be a French repeater input channel and the Dover Club net frequency. Actually we live and let live very successfully.

SUPPLIERS MENTIONED

Lee Electronics, 400 Edgware Road, London W2.
PC Electronics, 4 Mount Pleasant, Blean Common, Canterbury, Kent, CT2 9EU.
W.H. Westlake, Clawton, Holsworthy, Devon.
SAE with all enquiries, it gets you a quicker reply.



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MORE VISION MODS TO MICRO WAVE MODULES TRANVERTERS.

By Trevor Brown G8CJS

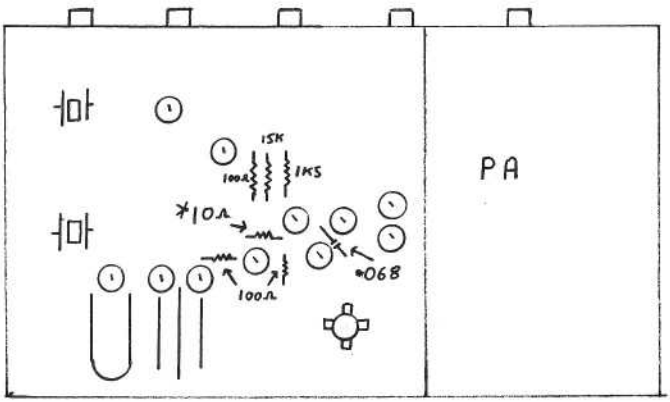
Since my original article in C Q - T V 104 I have received some correspondence from members with problems and comments.

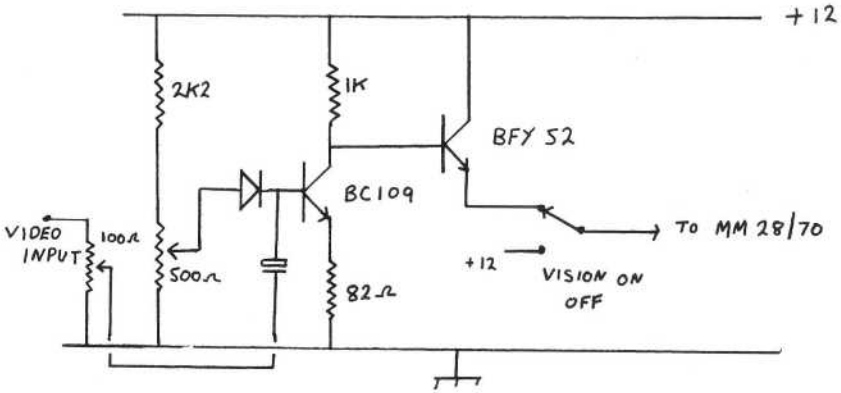
The biggest problem seems to be that although the part of the circuit that carries the mods is common to all the 70 cms transverters, the layouts differ. So problems in locating the components result. Unfortunately, I do not have access to all the Microwave Modules Transverters in order to analyse them with a view to making them work with video. My original layout description was for my own transverter which is an early model MM144/432 before repeater shift.

I did however receive a layout sketch from G3PUU for modifying the MM28/432 and it is reproduced here in the hope that it will help some of you with component location . G3PUU has also simplified the circuit down to two transistors although the BFY52 does require a heat sink.

Locate the 10 ohm resistor marked * on the PC layout diagram. Disconnect it from the board by cutting it at the end nearest the P.A. Box and connecting the modulator to the board instead at this point.

The 0.068 capacitor indicated also requires removal in order to stop the video high frequencies being rolled off. This is done by disconnecting its earthy end which is soldered on the top of the printed circuit board.





From the April 1950 CQ-TV

" The main momentary modulator is a crossed arctode, with a berginthorpe in the main reentrant reherostat, and double diversity doobefactors in the teeperframes. A manual aotosnitch controls the ferkin-binders, near the daggery rack. Under the splatterphones a pair of resonant scharboscopes in push-pull (actually diametrically opposed in quadrintal Class B) cause the supersonic sound system to be selectively switched in a grounded grid gonfobbulator for continuous monitoring. Should the mains supply fail, a reversible gubbinsnark shorts out the beeroids, so bringing the coolumpers into operation. "

From a description of a TV Transmitter
by Sutton McColdfeet.

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B.A.T.C. Equipment Registry exists to help members of the Club who have equipment for disposal, or who wish to purchase some specific

item. Send a list of your " wants " or " disposals " to the address inside the front cover of this issue and during the six months for which your application is valid, the Registry will allempt to put you in touch with someone who will buy your surplus, or sell you your needs.

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, Cambridgeshire. They will need to provide their own transport.

FOR SALE

Monochrome Sony camera, and monochrome tape recorder, CV2000 series. £100
B. Shevlane
Tel: 01 864-7496

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FOR SALE

Pye Broadcast quality viewfinder. Image Orthicon camera, control unit, power supply, cable, lens, control panel and circuits. £100
Second camera as above but not so clean. £75.
Lots of other stuff. S.A.E. or phone for details.
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Blean Common,
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1" B.A.T.C.	£11.54	60 p
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B.A.T.C. Test Card	.50	10p
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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)
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Peterstow
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Project 100 printed boards are available from Tom Mitchell at 27 Hanmer Road, Simpson, Milton Keynes, Bucks. MK6 3AY at the prices quoted in the article " P100 Stop Press News ".

PLEASE NOTE THIS LIST CANCELS ALL PREVIOUS ONES.

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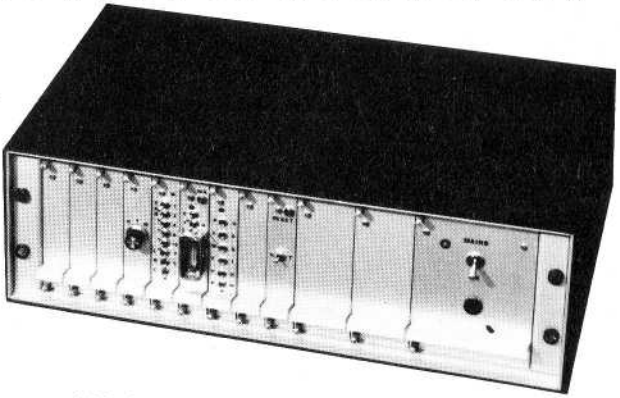
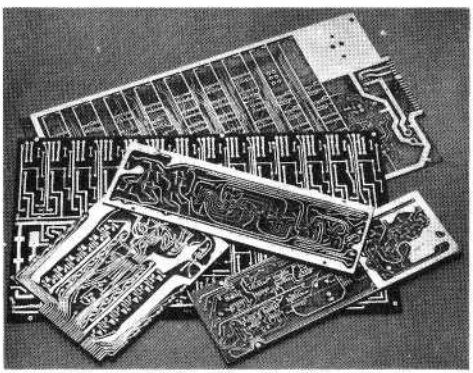
T.V. CHARACTER GENERATOR



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.

CROFTON ELECTRONICS LTD

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