CQ TV

AUGUST 1970

71

THE JOURNAL OF B A T C

THE BRITISH AMATEUR TELEVISION CLUB.

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HAVE YOU SENT YOUR REGISTRATION FORM BACK YET?

THERE'S STILL JUST TIME; IF YOU WANT TO STAY AT CHURCHILL COLLEGE COMPLETE THE FORM PRINTED IN C Q - T V 69 AND SEND IT TO THE PUBLIC RELATIONS OFFICER TO ARRIVE BEFORE JULY 17.

EXHIBITORS REMEMBER YOU CAN ENTER THE " EXHIBITOR'S RAFFLE " AND WIN PRIZES.

Come to CAT - 70, a two day amateur tv convention at Churchill College, Cambridge.
WHY? To mark the 21st birthday of the British Amateur Television Club.
DATES: Saturday 25th and Sunday 26th July. Come as a visitor for one day or stay at the College for the whole Convention. Rooms are available from Friday night.... IF you send your registration form before July 17th.

FRIDAY	Registration Get-together.
SATURDAY	Registration. Exhibition (Amateur and Professional). Lectures and films. Visits to tv equipment manufacturer. Visits to amateur tv stations. Convention Dinner in the evening.
SUNDAY	Registration. Exhibition. Films and videotapes. BATC Business meeting. Visits to amateur tv stations.

COME TO THE " BRING AND BUY " STALL IF YOU WANT TO SELL OR BUY EQUIPMENT. THERE'S ALL SORTS OF GEAR TO BE HAD!

EDITORIAL

We often receive letters from members saying "I'm just about ready to go on the air /T, is there anyone active in my area?" Well, it's very difficult for us to know just what the situation is; so to help us answer queries like that could you let us know if you are on the air at all, or if you intend to be soon. Just send a postcard to Ian Lever, the Club Secretary, whose address is printed on page 1, giving your callsign, details of where you are and when you transmit, and stating whether you are willing to help new members by looking out for their signals and reporting back about them. Thanks.

We would like to draw your attention to Suhner Electronics Ltd., a firm who are willing to supply members with coaxial cable and with no charge for post and packing! Write for a catalogue to: Suhner Electronics Ltd.,
172-176, Kings Cross Rd.,
London, W.C.1.
01- 278 2941.
if you intend buying cables or plugs and sockets.

Some recent correspondence to the Club mentions the lack of equipment available on the second-hand market. However, we think that some of you may have at home some useful bits and pieces you no longer require. Since someone else is bound to have a use for it, why not slip an advert in C Q - T V ? No charge to members, of course.

The BATC Amateur Television Reporting Chart is a stiff card photographic wall-chart depicting the number system of describing received picture quality. Copies will be on sale at CAT - 70, or for a small charge from the Club Sales Officer afterwards. A very useful chart which every /T and 70cm man should have in the shack.

If you noticed that in the last issue we said this issue would contain a picture report of CAT - 70, then our apologies. Just as soon as CAT has been and gone, we'll produce a photographic record - it's a bit difficult before then!

See you all at the Convention,

THE EDITOR.

ERRATA

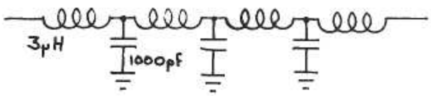
We regret that the G.P.O. Radio Branch address was given incorrectly in C Q - T V no 71.
The correct address is:

G.P.O. Licences
Radio and Broadcasting,
Ministry of Posts and Telecommunications,
Waterloo Bridge House,
Waterloo Road,
LONDON, S.E.1.

Cheap and Cheerful Delay Lines Further measurements have been made on the simple delay lines which David Taylor G6SDB/T wrote about in the last issue. They are as follows:

delay	1.45 μs	(50% points)
risetime	0.70 μs	(10% - 90%)

The circuit of the delay line, which we omitted to print, is of course quite standard, as shown here.



S U B S C R I P T I O N S

Did you receive a subscription reminder with this issue? Or the last one?

Have you sent it back yet?

Please do.

We cannot send you any more issues of C Q - T V until you have.

A VIDEO PLUS SOUND MODULATOR

By A. Maurer HE1TA
Groupement TV Amateur, Switzerland.

To avoid a separate transmitter for sound channel, with the difficult problem of central frequency stability required in intercarrier systems, we decided to mix video and sound in the modulator. Black level clamping of course imposed high level signal mixing.

This has been easily achieved with a toroidal transformer, the secondary winding of this transformer being in series with the grids of our 4 x EL34 cathode follower modulator output.

The transformer characteristics are:
Ferrite Core type 4C4. 19-29mm diameter.
Primary winding 8 turns of 0.4mm enammelled copper wire.
Secondary winding 6 turns of 0.4mm enammelled copper wire.

Due to the high damping of this transformer, frequency modulation does not, practically, affect the 5.5 MHz amplitude.

Signal levels are approximately as given below:

Video signal	100 volts peak to peak
Audio signal	20 - 40 volts peak to peak.

The 5.5 MHz F.M. oscillator is a Clapp type with the tuning capacitor paralleled by a Varicap diode. The two 1nF capacitors are used for d.c. separation, as d.c. bias through the 10KΩ potentiometer allows central frequency adjustment.

Static measurements a

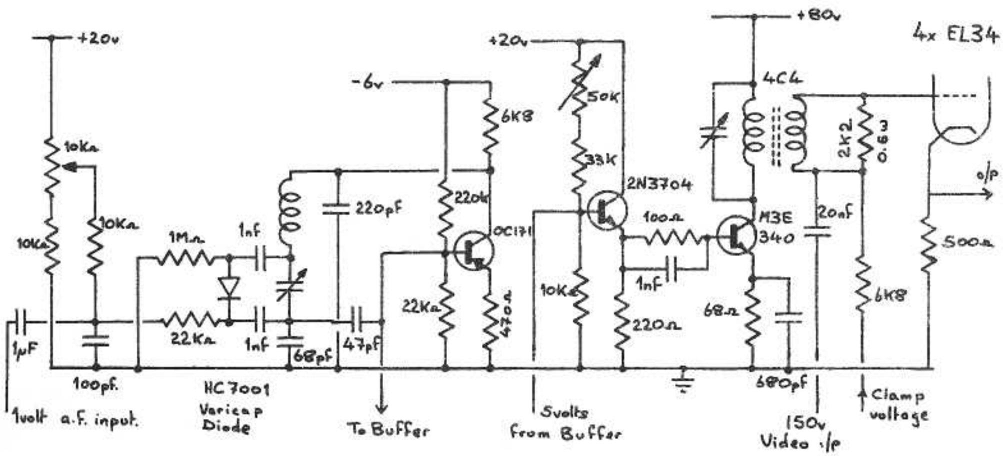
Static measurements gave:

+10 volts	5.2 MHz
+15 volts	5.5 MHz
+20 volts	5.8 MHz

This gives 60KHz per volt and allows a maximum 2.5 volt peak to peak signal at the a.f. input.

The sinusoidal output signal being frequency and amplitude dependant, a limiter and buffer amplifier has to be used, as shown on the circuit diagram.

The high voltage Motorola transistor type M3E340 has to be air cooled.



TELEVISION CAMERA AMPLIFIER USING A FIELD EFFECT TRANSISTOR

Copyright Mullard Limited, 1969

The output of the Plumbicon camera tube can be considered as a current generator of value I_s in parallel with a capacitor C_p (approximately 12pF) as shown in Fig. 1.

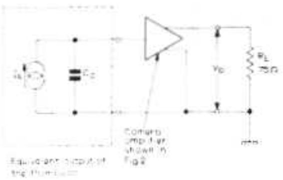


Fig. 1 - Requirements of camera amplifier for Plumbicon camera tube

In the amplifier circuit shown in Fig. 2 the BFW10 field effect transistor is used in the input stage. The d.c. drain current of the BFW10 is stabilised as 4mA by means of d.c. feedback to the gate, using a BCY 71 transistor TR_2. The first stage is followed by three stages using BF184 transistors.

The available power gain of the first stage decreases as the frequency increases, and thus at high frequencies the noise figure of the second stage contributes to the noise figure of the amplifier. Transistors BF184 have low noise figures at high frequencies. The variation of the effective noise voltage at the output with frequency is shown in Fig. 3.

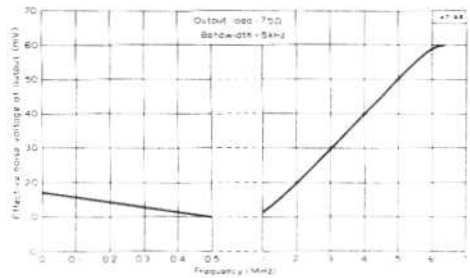


Fig. 3 — Variation of effective noise voltage at output with frequency

PERFORMANCE

Transimpedance V_o / I_s from 40Hz to 5MHz,	5 x 10^5 V / A
with 75Ω load	5 x 10^5 V / A
Output impedance	75Ω
Maximum peak-to-peak output voltage, duty factor ≤ 0.05, with 75Ω load	1.3V
Input impedance (mainly determined by the feedback and input capacitances of TR_1 and wiring capacitances)	40kΩ in parallel with 15pF
Signal-to-noise ratio: ratio of peak-to-peak output voltage (at peak-to-peak signal current of 0.3µA) to total effective noise voltage, for frequencies between 0 and 5MHz	approx. 42dB see also Fig. 3

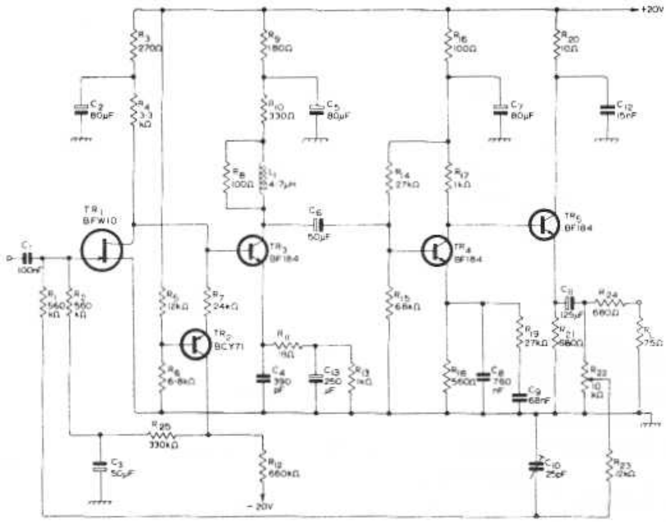


Fig. 2 — Camera amplifier using BFW10 field effect transistor in the input stage

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WHO YOU WILL MEET AT CAT - 70

Some more faces to look out for at the Convention this month are printed below. Like those printed last time, they are committee members who will do all they can to make you feel at home at Churchill College. So if you have any ideas, problems etc. about the Club, these are the men to see.

Treasurer Malcolm SPARROW

Chairman Gordon SHARPLEY

Secretary Ian LEVER

B. A. T. C. LIBRARY

The B.A.T.C. Library contains a lot of magazines, circuits, tapes and a host of interesting material. " Mullard Technical Communications " provide many articles useful to members and as copies of this publication are available on loan from the Librarian, here is a list of issues of particular interest.

No.	Mullard Technical Communications
60	Valve Series Stabilizers.
	AFZ12 as a mixer at 170MHz.
61	30MHz wideband transistor amplifier (OC171's).
62	4W transmitter for 8MHz.
65	Thermal resistance of semiconductor devices.
68	Power rectification with Silicon Diodes.
69	Oscilloscope timebase generator using BSY10's.
70	D.C. inverters using ADZ11 & ADZ12 transistors.
71	Automatic focus circuit.
72	Use of PFL200 for video amplifier stage in receiver.
74	Transmitters in the 156-174MHz mobile band.
	6 watt 480MHz transmitter using quick heating valves.
76	Field output stages for TV receivers.
	Field timebases for 20Kv deflection.
78	Design of high power UHF trebler (varactor) (40 watts in - 80 watts out).
80&84	Thyristor speed control of D.C. motors.
81	Soldering and solderability.
	Voltage stabilizers for mains/battery TV sets.
	Industrial RF oscillator for 150MHz.
83	M.O.S. Transistors.
85	Hybrid colour difference decoding circuits.
	AGC for monochrome and colour.
86	Dual standard I.F. amplifiers for monochrome and colour.
	Luminance, AGC and sync circuits for PAL-D receivers.
89	Transistor field timebases for colour and monochrome.
	Speed control for electric drills.
90	Colour difference amplifiers using BF179.
	Luminance output stages using BF186 & BD115.
	Power gain prediction for VHF class B transistor amplifiers.
	Parasitic oscillators in VHF power amplifiers.
91	VHF transistor transmitters (AM & FM) operating from vehicle batteries.
	Mobile 166MHz Communications receiver.
	Electronic aerial switch for mobile transceivers.
92	Junction FET's structure and operation.
93	Closed circuit Improved TV system (mechanical scanning).
	Also other articles on infra red.
95	Deflection amplifiers for 150MHz oscilloscope.
	The Schmitt trigger - use of Integrated Circuit FCL101.
96	Transistor video amplifier for monochrome TV sets.
97	Pincushion correction and convergence for 625 line colour receivers.
98	Single system IF amplifier for U.K. 625 line system.
	Plumbicon camera tubes and their application.

INTEGRATED CIRCUITS

by A.W. CRITCHLEY Dip. El., C. Eng., M.I.E.R.E.

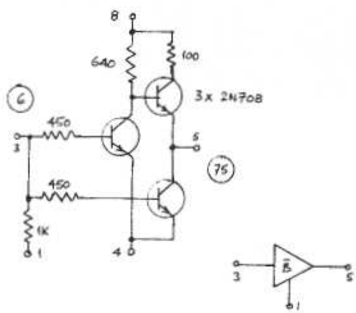
USING RTL DIGITAL INTEGRATED CIRCUITS FOR T.V. PULSE GENERATION CIRCUITS

Various digital integrated circuits have been released to the amateur market over the last year or two at reasonable prices. This series of three articles describes some applications for the U.S.A. Fairchild µL900, µL914 and µL923 - or the Motorola MC700P series which are electrically identical. It should be understood that these differ from T.T.L. devices in the respect of the logic and T.T.L. IC's will not work in the following circuits.

PART 1 - The µL900 and µL914

Two of the devices are shown in figs.1 and 2 together with their logic diagram representations.

Fig.1. - µL900 Buffer



After this, the internal workings need not be bothered with a min. Supplies are +3.6v to pin 8 and earth to pin 4, at ≏ 15mA

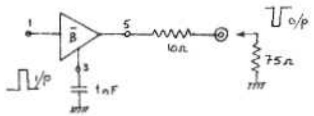
The µL900 Buffer

The µL900 has two inputs - the normal input (pin 3) and one via a 1kΩ resistor. This second input is for use when the buffer is used as part of an oscillator and the 1kΩ then forms part of the timing network.

The µL900 buffer can feed 75 loads and its main use is to feed many gates or bistables, however it can be used to drive 75Ω coaxial cables quite successfully, but only for pulses.

Its output impedance is approx. 65Ω when ON, and much higher when OFF. When used as in fig.2 it will provide 1.5v pp into 75Ω or 3.1v pp o/c, with a rise time of 15ns.

Fig.2



This can be slowed down to approx. 300ns (625 spec.) by means of the capacitor. However, pulses are widened by up to 1µs by doing this.

It is much better not to slow them down at all and to use pin 3 for the input pulses instead.

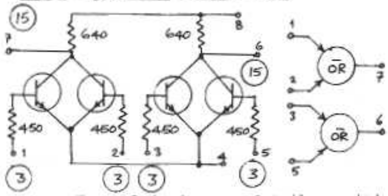
This buffer gives rings,to any reflections from a badly terminated load,after positive-going edges because the output is no longer 75 Ω when the buffer is OFF. However, under normal conditions the rings are only of the order 15mV for a few μ-secs duration.

A snag with negative-going pulses and these buffers is that between pulses, the output is connected via 100 Ω to +3.6v and thus to any supply spikes and noise. These may give imperfections in camera pictures, but integration of the blanking pulses will remove most of it. Careful attention should be paid to decoupling the supply to these buffers and,in fact,to making their supply via a wire direct from the power supply used for the rest of the unit - i.e. the same technique as for earth loop problems.

2v pulses can be obtained from these buffers if the supply is made +4.9v but the temp. tange is reduced accordingly - an absolute maximum of 12v is allowable.

Of course if positive-going pulses were standard, there would be no problems with supply rail noise - but a safe technique is to clip the pulses both top and bottom in any unit following a buffer output stage. However 9 times our of 10 this is completely unncessary for Amateur work.

Fig.3 - μL914 Dual Input Gate

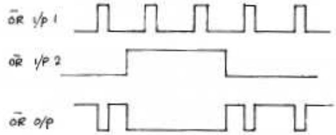


The μL914 Dual 2 Input Gate

The μL914 is shown as $\overline{OR}$. This means a NOR-gate which in turn means that for positive logic inputs, the action is that of an OR-gate with inversion of the input.

To explain in more detail, positive logic means input signals that go from approximately earth volts up towards positive supply rail voltage i.e. 'high'. If one such positive logic pulse is applied to input 1, only, of the μL914 then clearly the output on pin 7 will be a negative pulse - if pin 2 is earthed; - i.e. 'low'. However, if pin 2 is taken high also there is no change to the output potential - it is still low, but it will then remain low as long as either input is high. Fig.4 shows the waveforms.

Fig.4.

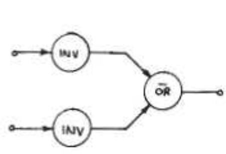


This clearly has applications in adding line and field blanking together.

But what happens if both inputs are negative-going?

We can predict this from the relationships shown in any book on logic where input inversion makes AND into OR, OR into AND, NAND into NOR, and NOR intoNAND.

Fig.5.



If we have the same signals at the inputs to the inverters (Fig.5.) (which are merely uL914's with only 1 input used) then the signals are inverted at the inputs to the NOR-gate into Negative logic-giving the NAND-function.

This means that both inputs have to be low (earthy) for the output to be high - i.e. low coincidence is required.

Fig.6.

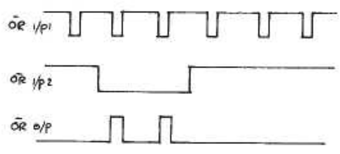
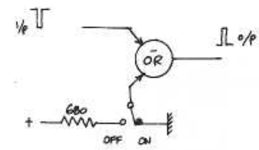


Fig.6. shows the waveforms for this - the output is totally different from the NOR-function in Fig.4.

This is in fact a most useful arrangement, the NOR-gate is used here as a switch with input 2 controlling the output - and not appearing in the output.

Fig.7.



So far we have the two functions NOR and NAND.

This property enables us to **string** together chains of these gates if required.

Fig.8.

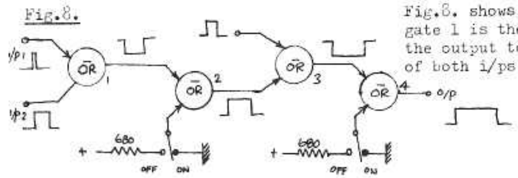


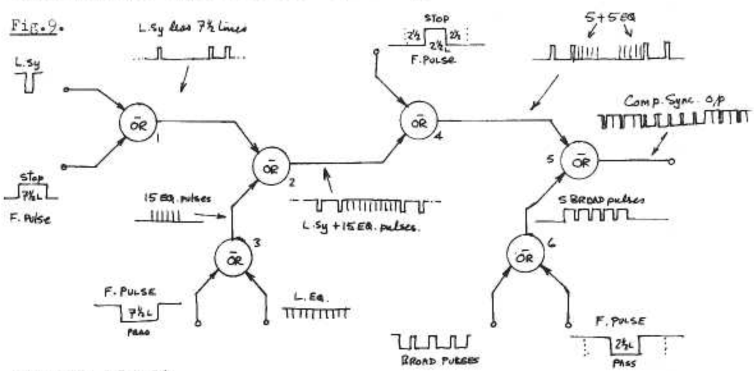
Fig.8. shows such a chain where gate 1 is the NOR-function and the output to gate 2 is the sum of both i/ps to gate 1.

Gate 2 is a NAND-function and its second input passes the output of gate 1 only when both inputs are low. Gate 3 is a NOR-function and gate 4 is a NAND again. Note that NORs and NANDs go alternatively; but that each device is shown as a positive **logic** NOR-gate because, although the logic changes, the device does not.

Such an arrangement can be used to make-up Composite Syncs where the Line Syncs are removed for $7\frac{1}{2}$ Lines during the Field Period (on 625) and replaced by Equalizing Pulses and Broad Pulses.

This can be done by using a $7\frac{1}{2}$ lines-long pulse to remove the Line Syncs in a NAND-gate followed by another NAND-gate to add the Equalizing Pulses instead. Fig.9 shows how Composite Syncs can be made.

Fig.9.



Note- gates 1,3,4 & 6 work as $\overline{\&}$-gates.

This may look complicated, but in actual fact nothing could be simpler because there are no components other than the IC's.

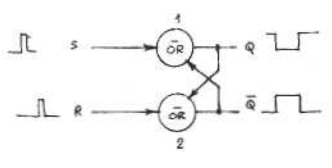
The waveforms required are Line Syncs, Line Equalizing and Broad Pulses and both polarities of field-rate pulses of $2\frac{1}{2}$ and $7\frac{1}{2}$ lines wide. This needs 4 generators and 2 inverters.

Other Uses for the µL914

So much for logic - what other uses are there for the µL914?

The simplest arrangement is to cross-couple two gates (Fig.10).

Fig.10.

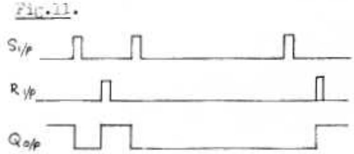


This forms an R-S bistable which is a two-input bistable or a latch; it requires one input to set it and the other to reset (or clear it). More than one pulse in succession, to one input, has no further effect - the first one does the work.

When S-input is taken high, gate 1 output goes low, this in turn makes gate 2 output high which ensures that gate 1 stays ON, and the system is stable. R-input now is 'live' and a high input to it will cause a change of state to the other stable state of gate-2 ON and gate-1 OFF.

This circuit is useful for turning short pulses into rectangular pulses. It works on voltage level rather than edges, and the output pulses are equal to the difference in time between R and S inputs.

Fig.11.

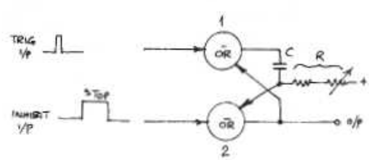


Note: Both R and S inputs must not be made high together or the system works as a NAND-gate and not as a latch.

The $\bar{Q}$ output is the inverse of Q.

Making one cross-connection into a differentiating time constant turns the bistable into a monostable.

Fig.12.



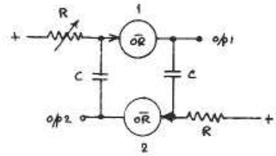
R is usually 1 to 10KΩ total. (640 ohms min) C may be almost any value.

270pF +2.7KΩ gives about $\frac{1}{2}$ µS pulse
0.1µF +2.7KΩ " " 220µS pulse
10µF +2.7KΩ " " 12 mS

The input trigger pulse may be longer, or shorter, than the output, - it does not make any difference to the normal output. However, if the trigger pulse is longer, then the alternative inverted output from gate-1 becomes the inverted trigger pulse instead of the inverted output.

If both cross-connections are made into differentiating time-constants we have a multivibrator - in which case the 2nd inputs to each gate are earthed and therefore not used.

Fig.13



This multivibrator will work up to 5MHz - no mean feat for square waves!

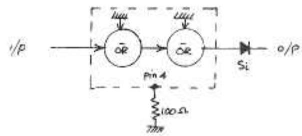
2.7K +56pF gives about 5MHz

3.3K +100nF " " 2KHz

It may not always commence oscillating at 5MHz though, and the frequency is very dependent on supply voltage.

There is an other way to use the µL914 and this is as a Schmitt trigger. For this, positive feedback is applied by inserting a resistance in the common feed to the µL914 - pin 4.

Fig.14.



A Schmitt trigger gives an output which rapidly switches from low to high when the input potential crosses a threshold value, and vice-versa - the two values being different. The output changes rapidly no matter how slow the input.

This is used to clean up rough waveforms, and the following application shows this in Fig.15. The diode shown in Fig.14 is essential because the 100 ohm lifts up the 'low' voltage to above the turn-on potential of any following gates. The diode is forward biased and drops about ½v under all conditions - rather like a zener diode does.

Fig.15 - Field Sync Separator

For 625 lines the Field Sync output is 4.7µS wide with 25nS rise-times and gives perfect interface. The 10K/180pF removes a trailing-edge spike from the output.

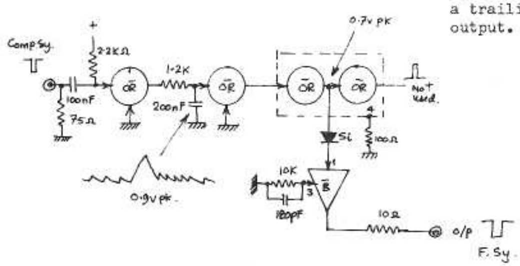
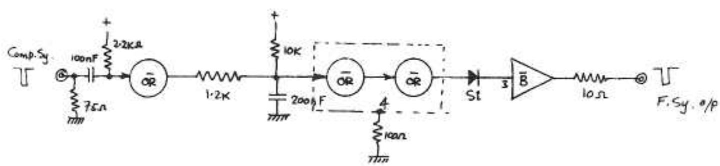


Fig.16. shows an even simpler Field Sync Separator. The 10K ohm corrects for the voltage drop across the 1.2Kohm into the Schmitt trigger.

Fig.16.



So much for applications, but there are some rules to be obeyed for running these devices.

The supply should be +3.6v ± 10% preferably regulated. The IC's get slightly warm as they take up to 15mA or about 50mW - depending on type and condition.

Supplies should be decoupled by means of a 47µF polyester, or disc, capacitors to every four IC's and the capacitors should be mounted reasonably close to the IC's with short leads. This is because these devices are very respectable from the frequency point of view having rise times of some 15nS, or being capable of handling 50, or so, MHz, and one has to be a little careful despite the low impedance. Even so the devices do not mind a foot, or so, of ordinary wire between them. It is not necessary to have any further L.F. decoupling for most IC applications! 47nF is adequate.

They are reasonably tolerant of short-circuits too, the only one likely to cause damage is to connect an output to +3.6v.

Loadings are the only other important feature. Figs. 1 and 2 show circled numbers - these are the loading factors. For µL914's, the inputs have 3 and the outputs have 15. This merely means that one µL914 output can feed up to 15/3 µL914 inputs i.e. 5 other µL914's - or up to 15/6 µL900 inputs. i.e. 2 µL900's; or 2 µL900's plus 1 µL914. The loadings should not be exceeded if the devices are to give reliable operation over the temperature range quoted of +15 to +55°C. the reason being that more load means more dissipation in the collector load resistors.

Output level swings are normally +3.6v down to +0.5v = 3.1v pp when not loaded. When fully loaded this becomes approx. 1v pp.

Input resistance of the µL914 is about 820 Ω .

The second part of this article will describe the uses of the bistable µL923 and will give circuits for a simple grille generator and for bistable counters of various counts for use in S.P.G.'s.

The author has constructed an S.P.G. to give 625 P.A.L. Colour Pulses of standard B.B.C. specification from only 30 MC700P type IC's at a cost of less than £20. It requires +3.6v at 900mA, and takes 2.4" of a 5¼" G.P.O. rack. There are two versions of this generator in existance, both of which are trouble-free, and have been so for well over a year. The generator has been written up for publication in a leading magazine as a constructional article - but has not yet been published.

The circuitry is digital and the only control is the on/off switch. This generator will be shown at the 1970 Cambridge Convention together with other IC projects for B.A.T.C. use - as it was at the last Convention.

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The author wishes to thank the directors of E.M.I. Electronics Ltd. for permission to publish this article.

HELP WANTED

The Club would be pleased to hear from members who would care to lend a hand with any of the Club's book-keeping and secretarial duties. Offers of assistance, which would be greatly appreciated, should be made to the Secretary, at the address on page 1, or to any committee member at CAT - 70.

A LOW POWER TRANSMITTER.

CIRCUIT NOTEBOOK NO.5

J. T. Lawrence.

GW6JGA/T.

In this edition of Circuit Notebook the intention was to describe a simple T.V. modulator for a low power 70cms. or 23cms. transmitter, but for the sake of completeness the R.F. circuits have also been included.

These are of conventional design and are based on the circuits published in the G.E.C. Application Report on the A2521 valve. The complete circuit is shown in Fig. 1.

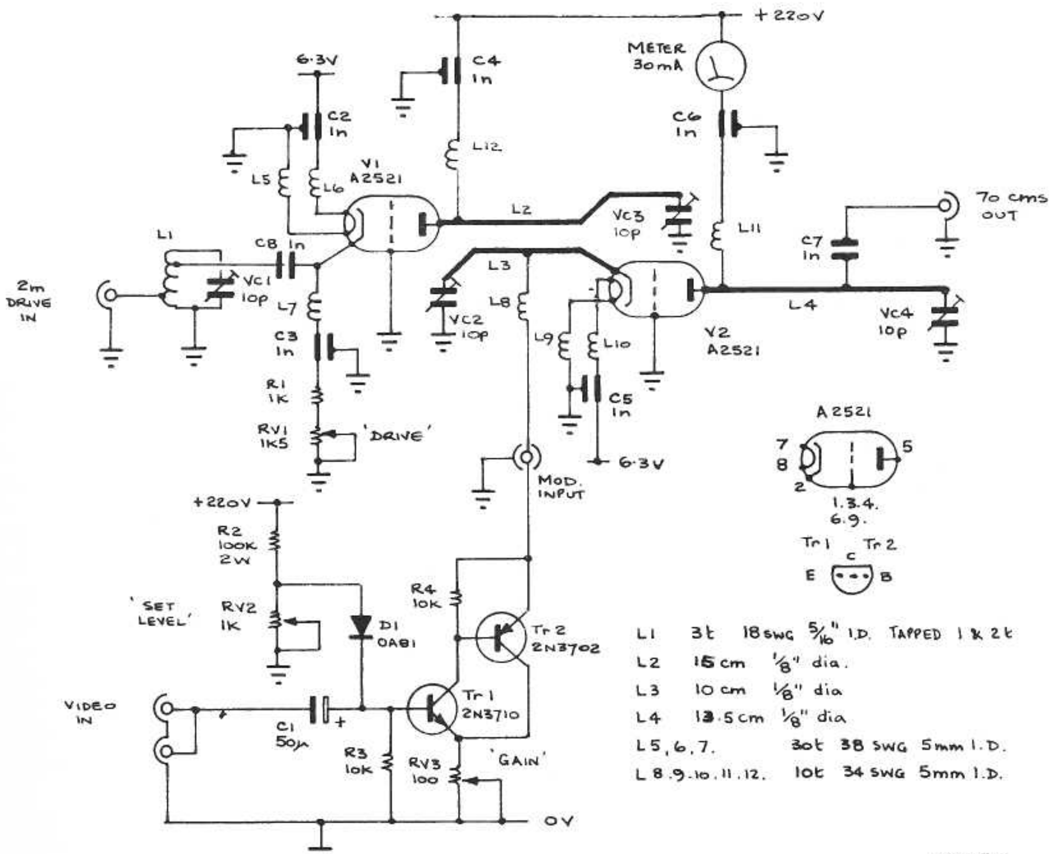


FIGURE 1

LOW POWER 70 CMS VISION TRANSMITTER GW6JGA/T

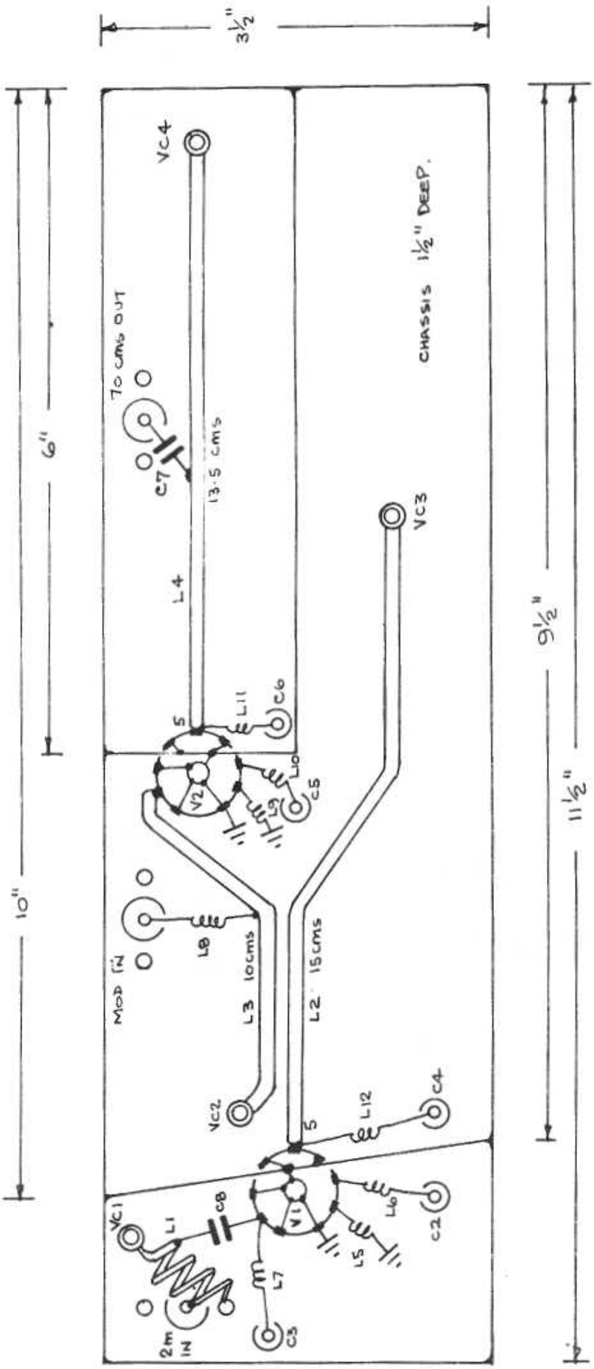


FIGURE 2

The main feature of the modulator is that it modulates the current to the cathode of the transmitter power output stage, instead of the grid voltage, and thus eliminates much of the non-linearity normally associated with grid modulation.

The R.F. section of the transmitter consists of V1 operating as a power tripler from 2 meters to 70cms., and driving V2 running as a straight power amplifier.

Both stages use A2521 valves in grounded grid configuration. These valves have an anode dissipation of 2.5 watts and in the circuit shown are capable of providing an output of about 1 watt on 70cms. for an input of about 1 watt on 2 meters. The 2 meter input circuit L1, VC1 matches the input impedance of V1 cathode to the 75 ohm input and is tuned for maximum drive.

The grid bias for V1 is set by the drive control RV1 so as to give best efficiency as a tripler. The anode current in these conditions is typically 12 mA. The output from V1 is coupled to V2 by L1, VC3 and L3, VC2, both circuits are tuned to 70cms.

The output from V2 is coupled to the aerial by a tapping on L4, the optimum position being determined experimentally.

The modulator is virtually a D.C. restorer followed by a voltage to current convertor.

Input signals of positive-going video are passed through C1 to the base of Tr1. D1 acts as a D.C. restorer, conducting on negative-going (sync) signals to produce a positive-going signal, sitting at a potential determined by R2 and the Set Level control RV2.

Tr1 and Tr2 are a complimentary pair of transistors, with RV3 providing adjustable negative current feedback.

Positive-going video signals at the base of Tr1 cause an increase in Tr1 collector current and this is fed to the base of Tr2 which operates as an emitter follower through L8 to V2 cathode. As the cathode current of V2 must flow through RV3 and as the voltage drop across RV3 is fed to Tr1 emitter, adjustment of RV3 enables a particular peak voltage to Tr1 base to produce a defined peak current in V2.

Setting up

Set RV1, RV2, and RV3 to minimum positions,

Connect a mA meter in the H.T. feed to V1.

Feed in about 1 watt of 2 meter drive to L1.

Tune VC1 for maximum anode current in V1.

Set RV2 to give about 10mA of anode current in V2.

Tune VC2 and VC3 for maximum increase in V2 anode current.

Connect a dial bulb load or aerial to the socket and tune VC4 for maximum output.

Adjust RV1, VC1, VC2, VC3 and VC4 for maximum output and adjust the tapping point of C7 on L4 for optimum matching with the aerial connected.

Set RV2 for about 0.5mA of anode current in V2.

Connect a video signal to the video input and set the Gain control, RV3, for best modulation, as shown on an R.F. monitor receiver.

Construction

The R.F. section is built in a copper or brass chassis, size 3½" x 11½" x 1½" deep, with a fitting bottom.

The layout of components is shown in Fig. 2.

The modulator is built in a small die-cast box which is mounted on the end of the R.F. chassis.

For a typical off-air picture, please see the front cover of C Q - T V 70.

LETTERS TO THE EDITOR

Dear Sir,

Inquiries on SSTV from members of BATC would be welcome; please enclose a stamped addressed envelope. I also have slow scan test tapes available. Please send a reel (3 ins. preferred) and specify the tape speed you use; 3¾ r.p.s. is normal. If you desire certain materials put on tape, please forward to me. Black lettering or drawings on a white background is best, and the size of the material should be about 8 ins. x 8 ins. Return postage for all material and tape would be appreciated. Thanks!! See you on SSTV???

T.J. Cohen W4UMF
6631 Wakefield Drive,
Apartment 402,
Alexandria, Virginia 22307,
U.S.A.

Dear Sir,

C Q - T V no. 68 mentioned the subject of international TV standards.

I and fellow members of the B.A.T.C. who have set up stations in the past 6 or 7 years have used 405 lines, and all the stations I have worked in the North and North-West have used 405; it would be a major rebuild to go to 625 for all of us, and to no advantage whatever. The increased bandwidth on 625 would give us nothing as most ATV signals are weak and bandwidth is usually only 2-2.5Mc/s, with a good deal of noise.

Therefore I have a standard to offer- 405. Sound on 3.1Mc/s intercarrier FM, which has been tried out and shows much promise; the advantages of this for ATV need not be pointed out.

The other advantage of 405 is of course, cost. Now that it is out for broadcast use, there is much gear for sale, and the abundance of obsolete 405 receivers available for conversion as monitors.

H.R. Skelhorn G6SOG/T G8BPU
School House,
Bollington, Cheshire.

Computer Processing of SSTV Pictures

One of the most interesting computer applications today is the processing of pictorial information. In this regard, Theodore J. Cohen W4UMF (assisted by Howard L. Husted and Paul R.Lintz) has been experimenting with the processing of slow-scan television pictures. The source for the picture processed below was a transistorized SSTV camera employing a WL-7290 SSTV vidicon. The picture was recorded on mylar tape at 3 and 3/4 ips, transferred to 1" telemetry tape, and digitized at 2000 samples per second. The digitized picture was then fed to a Control Data 1604B computer, which was used to strip off the sync and process the video information. The picture to the right shows t the results of dynamic range compression and image enhancement. Briefly, the brightness at a given point in the picture (x,y) can be represented as the product of an illumination term and a reflectance term:

$$B_{xy} = I_{xy} \cdot R_{xy}$$

We wish to reduce the effect of the illumination term, making it more uniform in nature. On the other hand, the reflectance term contains the picture information, and we wish to enhance this information. This can be done as follows:

Assume the best estimate of the illumination term is a plane, E_{xy}. That is,

$$E_{xy} \cong I_{xy}$$

Now, take the Log of the picture elements

$$\text{Log } B_{xy} = \text{Log } I_{xy} + \text{Log } R_{xy}$$

and subtract the Log of the illumination plane:

$$\text{Log } B_{xy} - \text{Log } E_{xy} \cong \text{Log } R_{xy}$$

Multiply what remains, Log R_{xy}, by γ , and add back in the product of ϵ and Log E_{xy}, yielding:

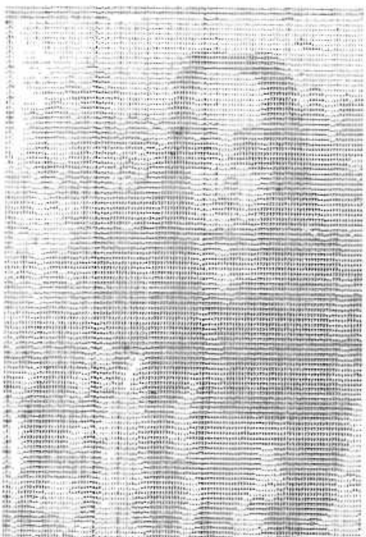
$$\text{Log } B_{xy} = \epsilon \text{Log } E_{xy} + \gamma \text{Log } R_{xy}$$

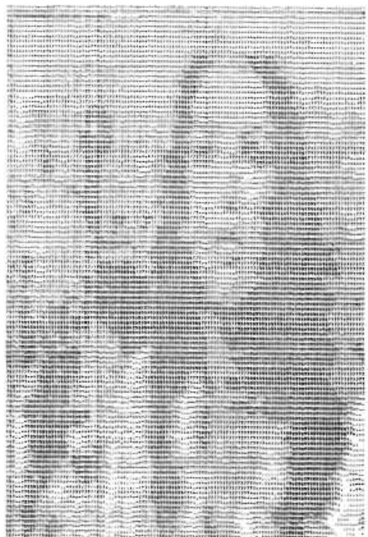
Taking the antilog of the picture elements, we obtain,

$$B_{xy} = E_{xy}^{\epsilon} \cdot R_{xy}^{\gamma} \qquad I_{xy}^{\epsilon} \cdot R_{xy}^{\gamma}. \qquad \epsilon < 1, \ \gamma > 1$$

In the pictures below, the one on the right was processed with $\epsilon = 0.5$ and $\gamma = 2.0$.

For details on computer processing, the interested reader is referred to July 1970 Ham Radio .





POSTBAG

John Hudson G6AGA/T of Blackburn has written in to say he's active on 70 in both sound and vision. Using 405, John has an 80 transistor S.P.G., a vidicon camera using F.E.T.'s and Uni-junctions, and a vision mixer with solid state sync/vision mixer, and an F.S.S. The transmitter is a transistor G1 modulator feeding a 4X150A cavity Box P.A., then to a 4 x Parabeam aerial, John is looking for SKEDS - video leaves QTH most evenings, so anyone near Blackburn?

Tony Smith of Ealing writes to tell us of the gear he has built for amateur tv. A vidicon camera, home design with an FET head amp using a BATC yoke, and an F.S.S. feed a home design vision mixer. The Tx is not yet completed, but as Tony is not yet licensed this doesn't really matter! However, when completed it will be based on the C Q - T V no 64 design, but using the modulator from C Q - T V no 60. Tony is also interested in telecine and asks if we are going to run an article on it. Anyone care to write up an article on his telecine gear......?

J.C. German GM6ADU/T GM3VBB of Balerno, Mid-lothian, has built his own battery or mains 625 vidicon camera, using circuits published in C Q - T V and elsewhere. Transmitter uses a QQV03/20 tripler producing 7 watts r.f. on 435.8Mc/s, negative mod. A 4CX250B P.A. was planned last we heard.

Doug Ingham ZL2TAR of Lower Hutt, New Zea-land, is a keen S S T V enthusiast with a mon-itor and FSS as his equipment. He does a lot of watching on 20m and 15m, and notices that transmissions using pictures from slow scan vidicon cameras have the edge on performance over others. However, he asks if anyone knows of a source of 7290 vidicons now that official sources can no longer supply.

ADVERTS

CLUB SALES

Vidicon Yokes for transistorized circuits.	£6- 10s
Please include post and packing	
Paxolin vidicon bases	3s
Second Grade Separate Mesh Vidicons	£10-10s
Monoscope Tubes pot luck, no choice of patterns.	£7
"C" mount lens flanges	8s6d
BATC Lapel badges	3s6d
with call-sign (6weeks delivery)	5s6d
Reporting Chart	1s4d
BATC Stick-on Emblems	1s3d
Notepaper and envelopes per 100	15s
35mm filmstrip editions of C Q - T V each nos. 1-10, 11-20, 21-30, 31-40, 41-50, 51-60, 61-70.	15s

The above are available from the Club Sales Officer whose address is printed on page 1.

For Sale

Two "Staticon" camera tubes in almost perfect condition. £7. 10s. each.
A.W. Critchley,
70, Sussex Road,
Ickenham, Uxbridge,
MIDDX.

WANTED 4X150 with aerial tuning unit for 430MHz, or anything similar.
T.W. Luxford G6MUB/T
29, Devonshire Road,
Walthamstow,
LONDON, E.17.

READ

CQ·TV