CQ-TV no 65.

The Journal of the British Amateur Television Club

THE BRITISH AMATEUR TELEVISION CLUB

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Cover Photo

Transmission from G6ADC/T, G3MPS
received at G3ILD six miles north of Darlington,

CONVENTION 68

The 1968 Amateur Television Convention will be held on Saturday 14th September from 10 am. to 6 pm. in the I.T.A. Conference Suite, 70 Brompton Road, London, S.W.3. There will be demonstrations of amateur T.V. equipment - but this depends on the kind co-operation of members willing to bring their gear along for display. If you can help in this way, please be sure to complete and return the form enclosed with this issue of CQ-TV.

A General Meeting of the Club will be held at 3 pm.

Members living outside the U.K. may be interested to note that the Convention takes place on the day after the end of the International Television Conference, which will be held in London from 9th to 13th September.

& GENERAL MEETING

VIDICON YOKES

(Now available ex stock from B.A.T.C. Hon. Treas. @ £6.10.0 post paid U.K.)

These coils have been designed for use in transistorised cameras and are intended to meet the requirements for a low priced coil for experimental use.

CONNECTIONS

Field Coil (a centre tap is provided on this winding).

Code	Inductance	Resistance
Blue/Green	52mH	150 ohms

Line Coil

Code	Inductance	Resistance
Red/Yellow	1mH	2.6 ohms

Focus Coil

Code	Inductance	Resistance
See below	130mH	65 ohms

On the focus coil a connection is brought out at the end of the first layer of the winding. These three connections are on tags at three corners of a square, the complete winding is brought to tags on diametrically opposite corners. The purpose of the tap at the end of the first layer is to enable the first layer to be used as an electrostatic screen. To do this the tap is taken to earth via a 0.1uF capacitor. With normal voltages on the vidicon tube a focus current supply of approximately 100mA is required.

Alignment coils are not provided. Alignment is not essential with vidicon tubes but if desired a small alignment magnet may be employed.

COLOUR RECORD?

The first P.A.L. colour transmission on 70 cm by amateurs?

This is the claim of G6ACW/T Tony Jacques and G6LEE/T Gordon Sharpley.

G6ACW/T modified his modulator to accept negative modulation and bed it with the output of a Philips P.A.L. colour pattern generator. This produces fully standard luminance step colour bars as well as other patterns.

At G6LEE/T's end, a 70 cm converter (all transistors) was modified to 38 Mc/s I.F. to suit the colour receiver. This was a much modified G.E.C. 21" fitted with a transistor decoder. The path length between the two sites was 1½ miles and an eight over eight antenna was used at both ends.

Transmission commenced at 1945 on the 18th April, 1968 and a chequer board pattern was received immediately; colour bars followed and were quite satisfactory except that transmitter losses had reduced the saturation to rather pale colours. Burst lock was quite good.

Several photographs were taken and show the results quite well.

The authors hope to improve on the transmitter end and more fully equalise the modulator for sub-carrier operation. They were however, quite surprised how little modification was needed to achieve these first results.

If any other members have achieved results in this field, the editor would be very pleased to hear from them and publish their work.

VIDICON CAMERA

This camera was designed to give results of similar quality to off-air signals as received from the broadcast stations. Solid state circuitry was chosen for economy of weight and size, and as few components as possible for minimum cost. Portable operation from a 12v battery was made possible by using only one supply rail of -11 volts, and provision was made for driving the camera from a pulse generator.

405 line operation was decided upon for simplicity of the video circuits which were then designed for a band width of 3MHz. Random interlace is used with the field frequency locked to the mains.

The power supply components were kept separate in the prototype and consisted of a standard series stabilized L.T. supply of -11 volts at 800mA (using a 95mA vidicon heater) and a transistor inverter giving 420 volts at 1mA. The latter is still being developed and we hope to publish details later. The negative side of the supply is stabilized at -120 volts by two neon tubes.

Composite video is provided at the output at the standard 1 volt level.

HEAD AMPLIFIER

The all important first stage uses an ST140 (Sinclair Radionics Ltd.) in common emitter mode, running at 200mA collector current. Bias current comes via the two 100KΩ resistors which also provide signal feed back to stabilize gain. The total value will need adjusting to suit the beta of the first transistor, but should not be taken below 180KΩ or the overall gain will not be high enough. Two components of equal value are used to reduce shunt capacitance.

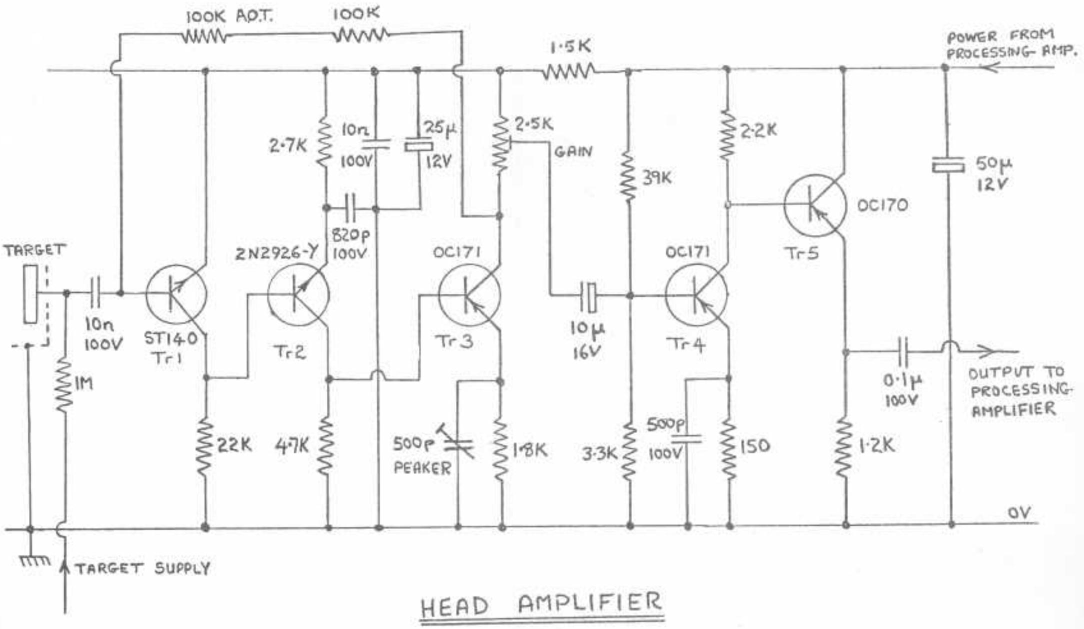
The second stage is directly coupled and employs a 2N2926 (yellow gain classification) this being used because it was to hand. Another ST140 should work just as well but has not been tried.

The third stage is also directly coupled and employs an OC171 which runs at about 1mA when the feed-back resistors are correctly selected. Peaking is provided in the emitter circuit and gain control in the collector circuit. This control should be a linear carbon skeleton type for best results.

The fourth stage is capacity coupled and uses another OC171. The collector drives an OC170 emitter follower which feeds the processing amplifier clamp at low impedance.

In the prototype the first three stages are built in a small tin close to the target connector. Whilst this is not necessary when operating with the cover on the camera, it does prevent pick up of stray signals when adjustments are made.

The head amplifier output is set by the gain control to about 200mV.



HEAD AMPLIFIER

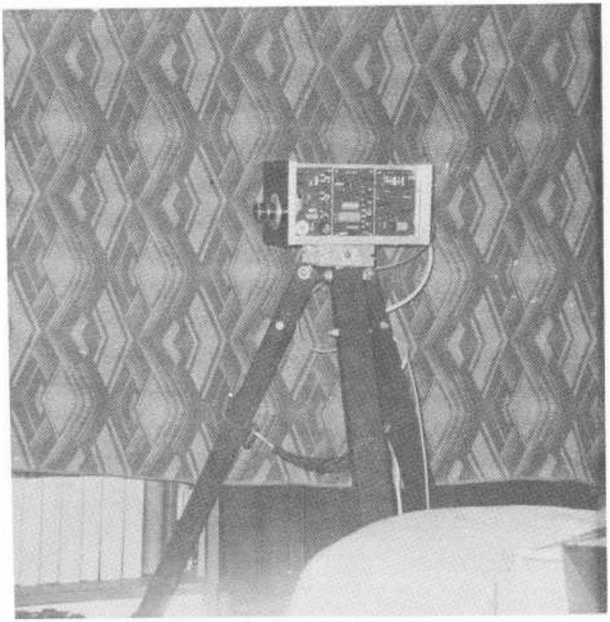
PROCESSING AMPLIFIER

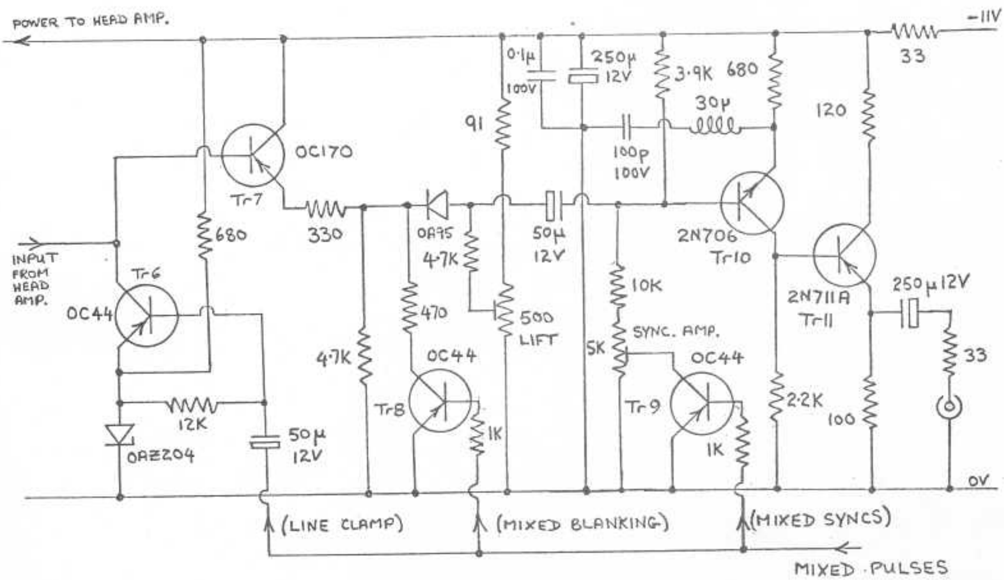
This circuit is a modification of that published in CQ-TV 49. Video arriving at the input is clamped to a zener reference driving fly-back by Tr.b. An emitter follower TR7 is used to feed the blanking circuit which employs a diode switch. The switching level is controlled by the lift pre-set potentiometer. Sync. pulses are added in the base circuit of the following transistor TR10. Emitter h.f. compensation is given by a series tuned circuit, the inductor being 30 turns of 34 s.w.g. enamelled copper wire on a quarter inch former. Another emitter follower, TR12, feeds the output, this being padded out to 75Ω.

SCAN AND FOCUS COILS

The yoke which is described in this issue is ideal for this camera, but the prototype used a modified version of that published in CQ-TV 33. Perspex and rolled paper were used for the construction. The rear face of the front check was covered with copper foil (obtained by hours of peeling laminate!) for target screening.

The wire used in the prototype was 2000 turns of 30 s.w.g. (8 oz) for the focus coil (requiring 140mA) and 28 s.w.g. for the scan coils.





PROCESSING AMPLIFIER

FIELD TIME BASE

The field generator is a Puckle circuit giving a 5 volt sawtooth of about 13:1 fly-back ratio across the 1.6mF capacitor. The 33KΩ resistor was selected to lightly saturate the OC71 in the quiescent state, to avoid amplitude drift with temperature. The value is not unduly critical, but may need lowering if the transistor has a low beta. The pulse wave form at the collector is used, after shaping, for blanking and syncs.

The constant current transistor is silicon (Motorola 2N4125) but a low leakage germanium (OC44) could be satisfacotry. A.C. feedback to the base is used for linearity control. An emitter follower presents a high impedance to the circuit and drives the output stage. The D.C. stability of the latter is adequate with the circuit showing the ommission of the emitter components giving a larger output swing and reducing size. The low input impedance of the stage necessitates a large coupling capacitor. Collector current is 56mA and collector voltage swing in the prototype is 3 volts peak to peak.

When operating from the mains, a frequency lock is applied from the A.C. side of the bridge rectifier (18 volts r.m.s.)

LINE TIMEBASE

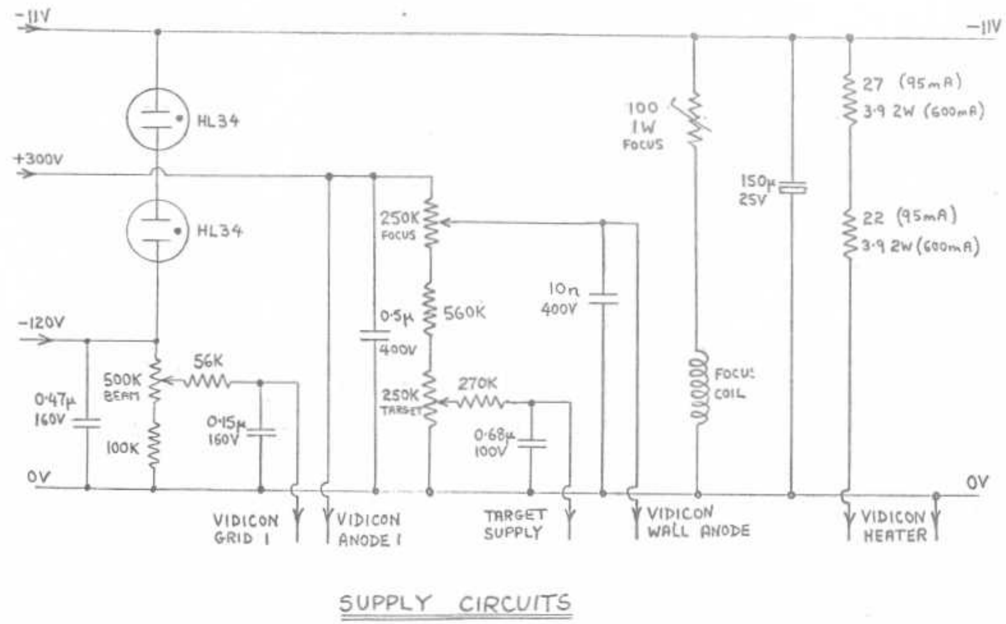
This does not operate in the conventional manner where the magnetic energy stored in the line coils after each scan is controlled by the efficiency diode and associated components to form the first part of the following. Instead, for simplicity, the stored energy is absorbed in the output transistor. The "efficiency diode" merely serves to prevent ringing.

The generator is a multi-vibrator, using OC71s. Although these are only low frequency types the switching speed is more than adequate. Separate pre-sets are used for scan and flyback times. Frequency stability with temperature is fairly good, but may be improved by using OC44s. An OC81 is used as a buffer and drives a V60/30P. Replacement of this by a faster transistor able to take a 250mA would give greater efficiency, but has not been tried as at present the performance is good. The modification would need a reduction of 68nf capacitor and possibly an increase of the 680Ω resistor.

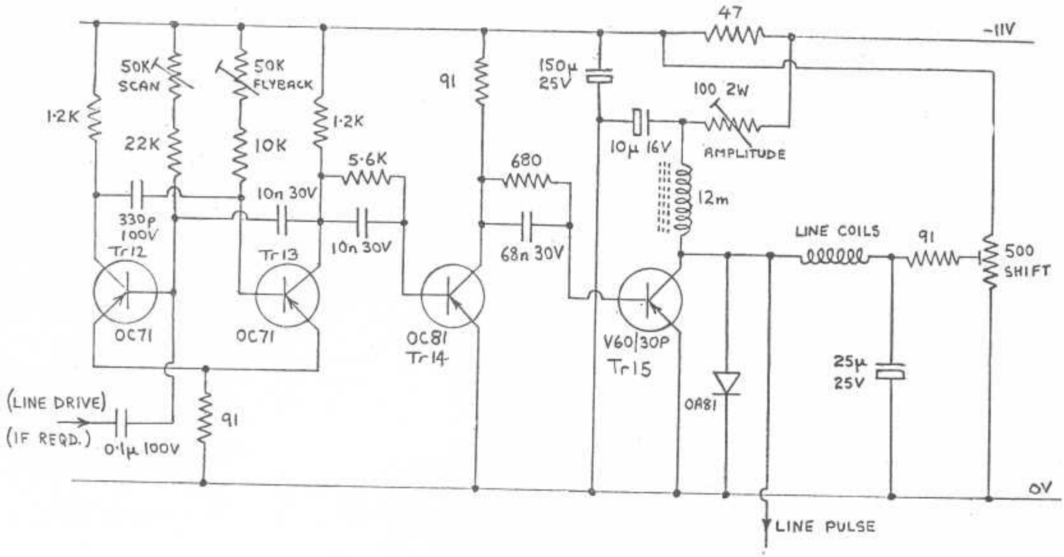
A surplus ferrite pot core was used for the output choke which was wound to 12mH (not critical) using 28 s.w.g. enamelled copper wire. The LA2 is a suitable commercial core for those who can afford it, when the winding should be 230 turns.

The electrolytic capacitor decoupling the line coils should be at least 25 volt working, as it handles a large ripple current.

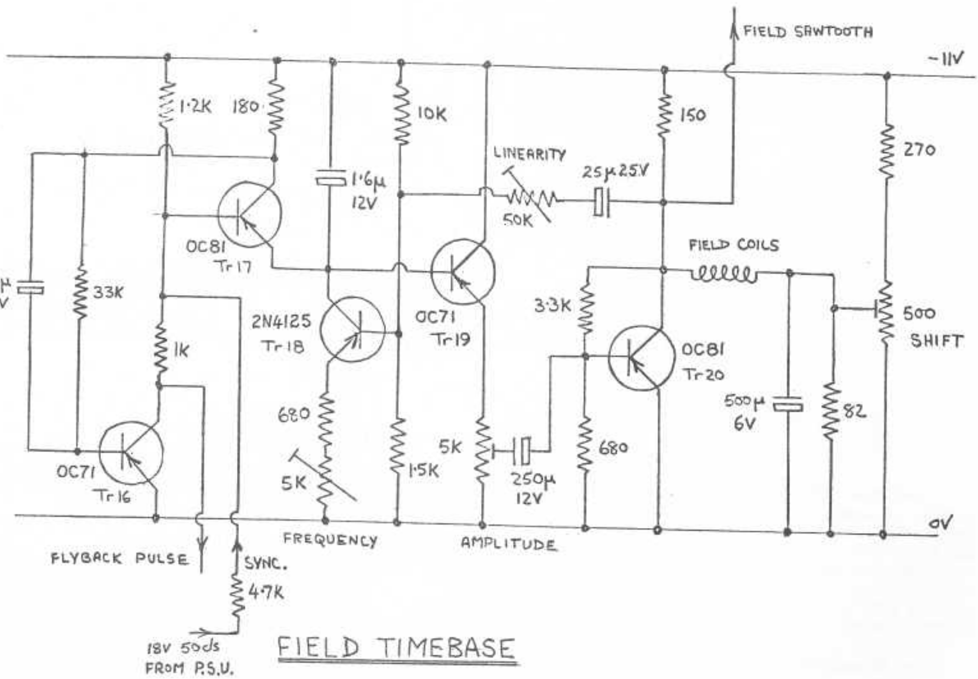
The waveform at the collector of the V60/30P is a round top red negative going pulse of 16 volts amplitude and 15nsic duration.



SUPPLY CIRCUITS



LINE TIMEBASE



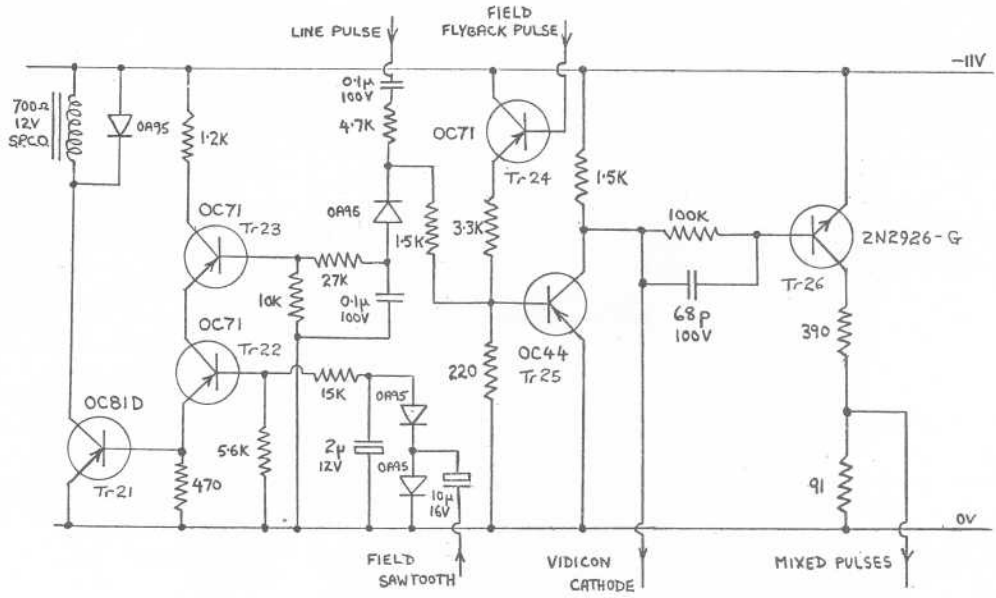
FIELD TIMEBASE

SCAN FAIL PROTECTOR

Although not essential, this circuit was added as vidicon targets are easily damaged by scan collapse. The circuit rectifies samples of scan coil voltages and applies the D.C. to a transistor AND gate, which drives a relay via an OC81D. The 2mF and 15KΩ smoothing in the field input is the optimum value for adequate smoothing and minimum turn off time, but may need adjusting to suit the relay used. The prototype was a balanced armature 700Ω relay, which switches the high voltage line.

PULSE AMPLIFIER

Negative line fly-back pulses are fed via an attenuator to the base of an OC44 where they are mixed with negative field fly-back pulses. The collector drives the cathode of the vidicon directly (the cathode being at -11 volts during scan) and an inverting amplifier. The latter drives an attenuator giving a 2 volt output at 75Ω. Since the processing amplifier is designed to accept this standard level input, the camera may be driven from an external pulse generator if required.



The author wishes to thank John Tanner for his assistance and interest, and also for the use of some of his equipment, and would like to hear from anyone building the camera or any part of it.

FAIL SAFE UNIT AND PULSE AMPLIFIER

postbag

Dave Woodfall of Blackpool writes to say he will be operating G6ABY/T and G8ANY from the Isle of Man between the 27th of June and the 2nd July. T.V. will be radiated in the early evening and probably Saturday and Sunday afternoons and evenings. The call GD8ANY/P will be used on 70 cms and 2 meters and GD3WGU/P on all bands up to 2 meters.

The transmitter standards are:-

VISION

Frequency: 437.4 MHz
Lines: 405 +ve Modulation
Random Interlace
Power o/p approximately 18w Peak White
Aerials - not decided on but may be a parabeam.

SOUND

Frequency: 433.9 (the sound and vision frequencies can be reversed to allow people to use UHF tuners into a band one Am Modulation tuner with frequency changer)
Power o/p approximately 4w.

Price List of Components available to Club Members

All prices include postage costs, for U.K. only. Overseas postage extra. Orders may be placed with the Hon. Sec. or the Hon. Treasurer.

E.M.I. Vidicon scan and focus coils......	£ 6.15. 0
Paxolin vidicon bases............£	3.
Second grade separate mesh vidicons	£10. 0. 0
Monoscope tubes..................£	7.10. 0
'C' mount lens flanges............£	8. 6
B.A.T.C. lapel badges............£	3. 6
B.A.T.C. lapel badges with call sign. (6 weeks delivery)..............£	5. 0
B.A.T.C. stick-on plastic emblems.£	1. 0
B.A.T.C. members notepaper and envelopes........................£ (per 100 sheets)	15. 0
35mm. filmstrip of 10 editions of CQTV............................£	15. 0

Membership subscription 10/- ($2.00) per annum. Due to increased printing and other costs, the subscription may be increased next year. Overseas members may receive CQTV by airmail for an additional 10/-

Back copies of CQ-TV still available are:- Nos. 40, 48, 56, 57, 60, 61, 62, 63 & 64 £ 2. 0

Wanted:-

Monitor/receivers of 625 (or higher!) line standard.
R.R. Buckley, 32 South St., Titchfield, Nr. Fareham, Hants.

Wanted:-

Slow-scan monitor, standard 120 lines AM or FM in good working order with circuit diagrams.
P. Sado, 11 Stanhope Gate, London W.1.

Wanted:-

C.R.T. type AW17-20 or similar.
Contact - Peter M. Delaney,
Royal Holloway College,
Englefield Green,
Egham, Surrey.

For Sale:-

931A photomultiplier with base 25/-
20.25 KHz crystal 10/-
Phillips Projection TV parts, write for details.

Tony Glazier, G6 PEG/T G8ABQ,
8 Ombersley Road,
Worcester,
Worcestershire.

For Sale:-

Transmitters

1. 4 x 150A Power Amplifier with spare valve coaxial anode and flat line grid circuit. 19" Bay Panel with anode/screen and grid meters Cathode follower screen supply and blower for cooling.
800V D.C. Power supply ½ Amp for P.A. included.. £30. 0.0

2. Control Grid Modulator for above P.A. Transistorised. Provision for Sound, video positive and video negative modulation. Inputs 1V into 75Ω for video and Xtal Microphone level for sound.
Requires -150V at 150 mA and 12V at 250mA as in CQ-TV No. 60. £10. 0.0

Receivers

70 cm convertor Xtal controlled (R.S.G.B. Bulletin) and Pre-amplifier. £10. 0.0

Video

14" Picture monitor, clamp, internal/external sync., Regulated E.H.T. £ 5. 0.0

625 line S.P.G. based on article in CQ-TV48 Xtal controlled, Mains P/P. £ 5. 0.0

Vidicon Camera with separate control unit and P/P complete with camera cable, as on cover of CQ-TV No. 59. £20. 0.0

For above adverts. contact Hon. Editor G6ABA/T

For Sale:-

Cosser 1035 'Scope with handbook £15.0.0

234A power unit £2.0.0 (as new)

Control panel for three Telecine machines and camera. Includes multiple legend indicators, relays and connectors, stud fader etc. Pye £2.0.0 o.n.o.

Mr. A.K. Barnes,
21 St. Peter's Avenue, Woodford New Rd., London. E17.
01-954-2311 ext. 338 day.

For Sale:-

Cossor 339 oscilloscope, price £12.0.0 O.N.O.
R.L. Dowdell, 150 Chadaere Rd., Stanleigh, Epsom, Surrey.

FSS HEAD AMP

by J. Thornton Lawrence GW6JGA/T

Introduction

This photo-cell video amplifier is easy to build on Veroboard, it provides afterglow correction (de-streaking) and simple gamma correction with the minimum of components.

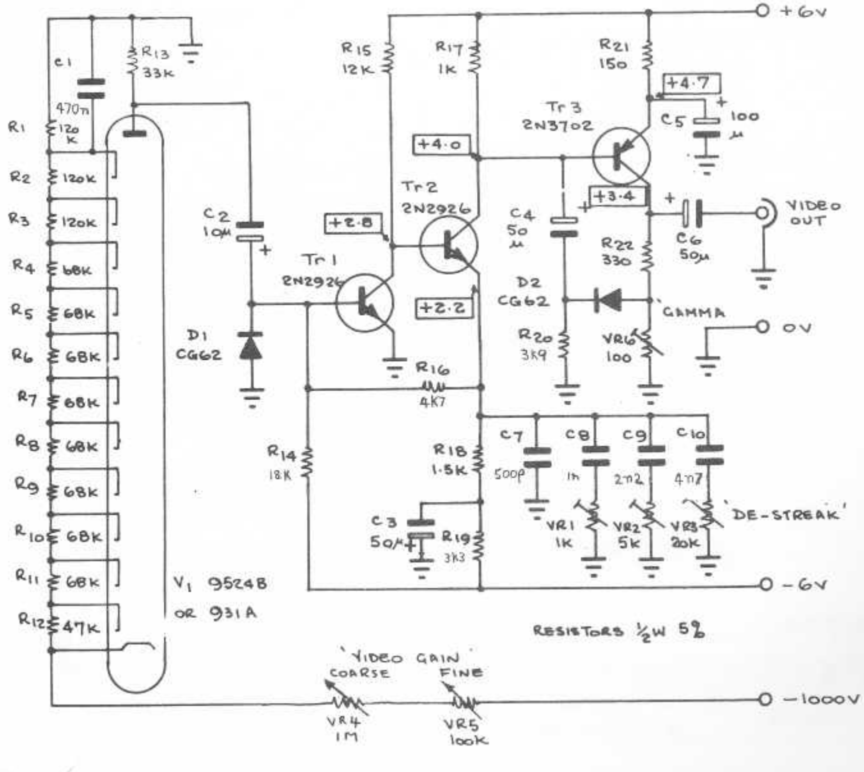
Circuit Description

The photomultiplier cell V1 provides a video signal, in the form of a current, having an amplitude of about 100 microamps peak to peak. This signal is A.C. coupled to the input of the current amplifier pair TR1 and TR2. The input impedance of this amplifier is very low and thus avoids the usual problems of stray capacitance shunting the photomultiplier anode load R13. The value of R13 is chosen so as to provide a reasonably long time constant with C2. D1 is included to protect TR1 should the photo-multiplier inadvertantly be exposed suddenly to excessive light. The low frequency current gain of TR1 and TR2 is determined by the ratio of the current feedback resistors R16 and R18 and is about X3. At high frequencies, the gain increases due to C7 and the afterglow correction circuits associated with VR1, VR2 and VR3, which shunt the feedback resistor R18. The time constants are adjusted to compensate for the phosphor afterglow of the scanning C.R. tube. Details of the adjustment are given later.

Amplified current signals at the collector of TR2 are directly coupled to the base of TR3. The normal current gain of this stage is dependent mainly on the beta of TR3 (60-300). Negative shunt current feedback is fed to the base of TR3 via C4 and D2. The amount of signal fed back is determined by the setting of VR6. Due to the curvature of the V/I characteristic of D2, a simple form of gamma correction is provided and can be adjusted for best results.

When operating normally, the complete circuit provides 1v p-p into 75 ohms for an input signal current of 100uA p-p. For simplicity, no video gain control is incorporated in the video amplifier itself, but the overall sensitivity may be adjusted by varying the EHT voltage to the photomultiplier dynode chain.

FLYING SPOT SCANNER VIDEO AMPLIFIER.



The two variable controls VR4 and VR5 may conveniently consist of a 1 megohm and a 100 Kohm potentiometer giving course and fine control. For easier adjustment VR4 may be replaced by a single pole 11 way switch with Qty 10-100 Kohm fixed resistors, arranged so as to increase the total value in steps of 100 Kohms.

Construction

The complete amplifier is built on a 4" x 1⅞" piece of 0.2" x 0.2" matrix Veroboard. The potentiometers VR1, VR2, VR3 and VR6 may either be miniature skeleton preset types mounted on the Veroboard panel, or if a considerable amount of knob twiddling is intended, the potentiometers could be standard T.V. pre-set controls mounted on a nearby control panel. VR4 and VR5 have the full EHT voltage on the resistance element and it is advisable to mount these controls on an insulated panel and to use control knobs having adequate insulation and concealed grubscrews.

Setting Up

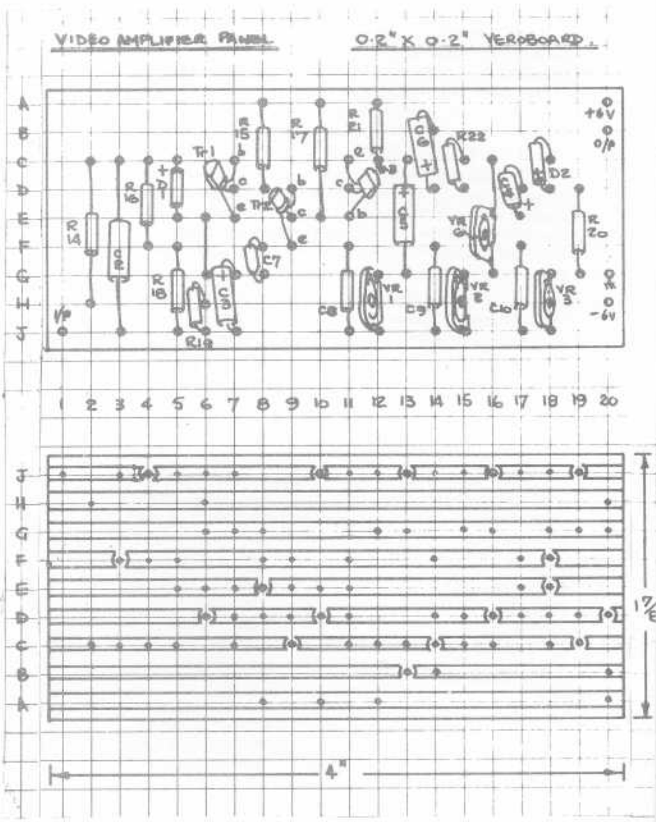
Check the D.C. voltages to see that all is in order. With no EHT applied, inject a test signal of about 10K Hz to TR1 base via a 10 Kohm resistor. (1 volt p-p via a 10 Kohm resistor equals 100uA p-p input signal). The output signal across a 75 ohm load resistor should be in excess of 1 volt p-p.

The adjustment of the "de-streak" controls VR1, VR2, VR3 and of the "gamma" control VR6, must be done with the flying spot scanner running and with test card "C" as the source of signal.

The overall gain should be set by adjustment of VR4 and VR5 to give about 1 volt output signal, with VR1, VR2 and VR3 at maximum resistance and VR6 at minimum resistance.

Allow about 15 minutes for the F.S.S. tube to settle down before commencing other adjustments.

When viewing test card "C" on the monitor, VR1 should be adjusted for best definition of the higher frequency definition bars, VR2 for best definition of the lower frequency bars and VR3 for minimum line streaking. Excessive compensation will cause ringing and overshoot and should be avoided. The value of C7 was chosen empirically and may, depending on circuit tolerances, cause slight ringing on the high frequency bars, if necessary the value may be reduced in the range of 500pF to 100pF. When observing the grey scale blocks on the monitor. VR6 should be adjusted to give approximately equal steps of brightness change between the blocks. For all adjustments, the end of the output cable must be terminated in 75 ohms.



POSTBAG

Harold Skelhorn G6SOG/T of Macclesfield has built the cathode modulator published in CQ-TV No. 63, modified for positive modulation. He reports very good results and thinks it well worth the effort put into building it.

Together with G6LEE/T and G6SOG/T, Harold has made up a circuit to go intercarrier sound at 3.5 MHz and tests are being conducted now. Circuit details are, of course, sent over the air.

G6SOG/T has built up a station consisting of an F.S.S., a QQV08/40 Tx feeding a four 8 + 8 slot aerial 50 feet high. The receiver has a modified UHF tuner and a pre amp from CQ-TV. Normal time for transmission is Wednesday evening and Sunday morning.

SLOW SCAN

An expansion of some of the points noted by Messrs. Plowman and Macdonald in CQ-TV As slow scan television is concerned with video tape recording and bandwidth compression, the following explanation may be useful in slowing the approach adopted and in contrasting 60Hz and 50Hz mains supply frequencies.

Basically, the problem is to find a way of compressing the bandwidth of a normal video signal so that it may be passed through audio channels, either in tape recorder or radio link equipment. Video bandwidth can be compressed in three general ways:-

1. By elimination of information redundancy
2. By sacrificing picture quality
3. By exchanging bandwidth for time.

The first method is very complex, since it depends on using the fact that there are only minor differences between successive fields or successive lines, and also that the brightness variations along a line are not random. A fair amount of circuitry is involved in removing the redundancies and in storing and restoring the information at the receiver. A bandwidth reduction of 7:1 is possible in this way.

The second method involves sacrificing definition in the interests of speed. Tests show that a 405 line picture of nominal 3mHz bandwidth is still of entertainment value when the bandwidth is reduced to 1MHz, ie: a factor of 3:1. Of course the horizontal definition is then 1/3 of the vertical.

The third method, upon which the whole Slow-Scan system is based, depends on slowing down the information rate in just the same way as in slow-motion photography. If a given TV picture, originally scanned in 1/25 sec., is slowed down to a repetition rate of once per second, then the bandwidth required will be reduced to 1/25 of its previous value. Of course at this rate the picture flicker will be bad and long persistance CRT's and interlacing are called for.

How Much Bandwidth is Available?

Messrs. Plowman and Macdonald have suggested some standards, and it is instructive to repeat the calculations they must have performed to reach these figures.

A normal amateur radio channel should have a speech bandwidth of 300Hz to 3000Hz to the -3dB points - using a long-persistance CRT such as the 5FP7 to display the picture. The maximum picture repetition period usable is about once every six seconds. If the radio signal is recorded on a standard tape recorder at 3¾ ins/sec. and played back at 15 ins/sec. then the picture rate will be once every 1½ seconds, which is becoming of entertainment value. Of course the tape recorder bandwidth must be 4 times larger than the radio path bandwidth, say 12KHz, but this is easily achieved with modern recorders. If we pick standards suitable for radio transmission, it is apparent that we can get a more interesting picture by recording and playing back at a faster speed and the faster picture is compatible with reasonable Hi Fi equipment.

AM or FM?

The video signals extend right down to DC and, since we are scanning slowly, the LF components are of much more importance than in a "standard" TV signal. Since frequencies below 300 Hz cannot be handled by the radio transmitter (nor lower frequencies by the tape recorders) it is necessary to introduce a sub-carrier, and to modulate this with the video signal. The modulation may be either AM or FM.

Some tapes suffer from random changes of level, or complete "dropouts", so if an amplitude modulated sub-carrier is being used, the picture will suffer. If the tape speed is high and the scanning rate low, the interference will be less apparent than might be at first thought. Mr. Macdonald's results would be interesting here.

By using the FM system, changes of level can be overcome by amplifying and limiting in the usual way, although dropouts will still be apparent.

Since signal-to-noise ratio is no real problem, it is possible to use a narrow-band FM system whose bandwidth is no greater than for the AM system.

Choice of Standards

The available transmitter modulator bandwidth is 2700Hz, starting at 300Hz. The middle of the band is 300 + 2700/2 = 1650Hz. This therefore is the desirable sub-carrier frequency for either AM or FM. The maximum video bandwidth is then 2700/2 = 1350.

For equal horizontal and vertical definition and a 1:1 aspect ratio -

$$\text{Video Bandwidth } B = \frac{\text{No. of lines}^2}{2 \times \text{pict. period}}.$$

Taking B = 1350, period = 6 seconds, the number of lines per picture is about 127 maximum, and so the required line frequency is 127/6 = 21. The precise picture period is unimportant, but it may be convenient to obtain the line frequency by simple division from the mains frequency. There is no compulsion about this, for it may be simpler to build a mechanical pulse generator. However, if we take 1/25 sec. as the line period for 50 Hz mains, and 120 lines to the picture as a round figure, the picture period becomes 120/25 = once every 4.8 seconds. The video bandwidth is then 1500 Hertz from the above equation, so there will be a slight reduction in horizontal definition if we pass this signal through our 1350 Hz passband.

For 60 cycle operation and a 1/30 second line period, the loss of definition is retained at a picture repetition rate of once per 6 seconds.

Note that the above equation is for definition equivalent to 3MHz at 405 lines, ie: extremely good. If we agree to divide this by 3 times, the picture repetition rate could be increased by 3 times, or the number of lines by root three, ie: 1.7 times.

This agrees well with Mr. Macdonald's round figures of 2K sub-carrier, 1K video band, 120 line picture every six seconds.

Vestigial Sideband Operation

For AM operation only, the video bandwidth available can be considerably increased by moving the sub-carrier to one end of the modulator passband, and using vestigial sideband transmission.

B.B.C. transmissions are 3dB down at -075MHz and + 2.75MHz for a 3.1MHz video bandwidth, ie: from -25% frequency. The total passband required is therefore 115% of the video band instead of 200% required for double sideband operation, or FM.

Taking the original 2700c/s passband, the maximum video bandwidth now becomes 2700 x 100/115 = 2350 Hz and the sub-carrier would be at 3000 - 2700 x 15/115 = 2650Hz (for vestigial upper sideband).

The video band has been increased by 2350/1350 = 1.74 times, so the picture period could be reduced by this factor, or the number of lines could be increased to 120 x 1.74 = 160 approximately. This is a well worthwhile increase in the vertical definition. By introducing the factor of 3 again, we could go to a 275 line picture.

It is suggested that a reasonable compromise would be to use a 180 line picture repeated once every 3.2 seconds for a line frequency of 50Hz and a 180 line picture repeated once every 2.6 seconds for a line frequency of 60 cycles. The respective horizontal definitions would be 85 lines and 70 lines. The sub-carrier would be at 10600Hz and the 180 line picture would be repeated every 0.8 or 0.65 seconds, giving entertainment value.

Conclusions

Writing the figures down shows the reader how the various numbers can be interchanged. We should not overlook the fact that with present techniques we could make an LP record, stereo style, with sound on one channel and picture on the other. But one picture a second is too slow, and to be ideal we must convert the signals so that they can be displayed on a standard TV set, even if still in slow scan form. By extending all the compression methods to the limit, it must surely be possible to improve the compression.by a factor of 16 times - and we know that 16 pictures per second makes for a very entertaining result. Can you devise a scheme for reducing the bandwidth simply?

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CAM TV

Distant Early Warning Line (DEW Line) site Cam Main is situated close to Cambridge Bay on the south east corner of Victoria Island, approximately 177.33 miles above the Arctic Circle in the North West Territories of Canada.

Two years ago, the author succeeded in interesting the site Entertainment Committee in installing a closed circuit T.V. system as an additional entertainment. Thus CAM T.V. was born.

Having the not uncommon problem of lack of funds a general beg, borrow and scrounge search was initiated across the northern wastes which resulted in the surprising collection of one battered "Dage" vidicon camera, (the relic of a fire) and a gift of two T.V. sets, (very old and not considered worth repairing under normal circumstances). Anyway, it was a start and work on a suitable waveform generator began.

Many hours were spent thumbing through previous editions of the BATC bulletins, the results of which were a fine waveform generator producing mixed blanking/mixed sync/ line and frame drives for the camera and a locally designed transistorised master oscillator, all functioning together to produce a 525 line fully interlaced system.

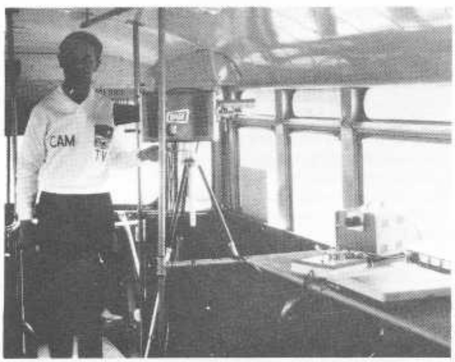
A low power vision transmitter complete with modulator stage for negative modulation was built and also a low power frequency modulated transmitter for the sound. For practical purposes, the North American frequency of Channel 7 was used and the whole lot was piped down a piece of RG-59U coaxial cable to the bar where it produced some rather startling results to the amazed captive audience on that first production night.

Since then, there has been no looking back and CAM T.V. now feeds a cable system with sixty two outlets on it, four of which are located in our local Eskimo employee houses. To serve a dual purpose, when not handling T.V., the cable distribution system is fed from a wideband antenna and amplifier which covers the entire broadcast band (medium wave) which during the hours of darkness permits individual reception of broadcast stations by those people who have their radios connected to the system.

With the success of the first night, interest began to grow and the station now consists of two cameras, an Ampex 6075 Video tape recorder, four picture monitors, (hastily modified his'n her sets on sale at a bargain price in Winnipeg) a video and sound control centre and a shiny new (yes, with an aluminised tube!!!!) 21" set for the bar.

Programmes are produced twice a week on Thursdays and Sundays, consisting of newscasts, local and general weather reports, items of general interest and a full length movie.

The total number of T.V. sets on the site is now ten, so that many more people feel more at home now than they ever did before. The biggest asset (and cost) was of course the video tape recorder which permitted the telerecording of the first softball game of last year's season down on the beach. The fact that the sea was still frozen solid didn't bother anyone and gave a good light background to the players. For this mobile masterpiece everything was loaded into our bus complete with a portable A.C. generator that had a will of its own at running at any frequency except sixty cycles.



Since the acquisition of the V.T.R., many interesting V.I.P.'s visiting the north have been interviewed for posterity and a surprising collection of events and personalities has been gathered.

Whilst not on an Amateur frequency, the station is amateur built and amateur run. Films are shown by projecting them on a screen and aiming our best camera at it. Reel changing periods are filled in with captions and items telerecorded prior to commencement of the programme.

The sound system is very basic, consisting of two tape recorders, (one of which is used as a microphone amplifier) and a turntable.

Line and frame drive/video and audio cables have been installed permanently between the studio and the main lounge so that one camera can be operated remotely from the studio to televise and/or record anything of interest that might be held there.

The photograph shows a general view of the present studio with the racks on the righthand side containing the video and sound transmitters, waveform generator, vision processing amplifier and associated power supplies. The four "His'nHer" monitors can be seen on the shelf on the rear wall and they are used for previewing the VTR, Camera "A", Camera "B" and the extreme righthand one is used as a system output monitor. (If what we see on that one we don't like, it is too late as it has already gone out to the viewers). The VTR is in the centre with the Video switching panel by the side of it. Our best camera can be seen in all its glory on its home made trolley between the VTR and the equipment rack. A rear view of the second camera can be seen close to, on the left.

Our T.V. station has had honourable mention in two newspapers having North American distribution and we make the proud claim of being the most furthest north Amateur built and operated T.V. station now known.

EDITOR'S NOTE

Derek is the Supervisor of Communications & Electronics for the CAM Sector of the DEW Line which is operated and maintained by Federal Electric Corporation. He was the westernmost half of the historic first Welsh Amateur T.V. two way transmission between his home at Llandudno and J. Lawrence GW6JGA/T of Prestatyn as reported in CQ TV # 38.

Radio Society of Great Britain

HELP

The Radio Society of Great Britain is desperately in need of an Editorial Assistant to work on its monthly journal, Radio Communication. This is full-time employment, and the right person, in his (or her) late teens or early twenties, will receive a salary of £600 to £800 for his efforts, depending on age and experience.

He should hold a call-sign, and have had some experience in journalism or editing. The work is varied, and he will be called upon to compile regular features such as Club News, edit contributions, proof-read, and be bright enough to work on his own initiative.

A sense of humour would be a valuable asset!

Applications should be in writing, and posted to the General Manager, Radio Society of Great Britain, 28 Little Russell Street, London, W.C.1. Mark the envelope "Confidential".

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