CQ-TV MAGAZINE No. 135

BRITISH AMATEUR TELEVISION CLUB

AUGUST 1986

A NEW TVRO RECEIVER

BUILD THIS LATEST PROJECT

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MEMBERSHIP

FULL YEAR: £5 or £1.25 for each remaining quarter of the year. All subscriptions fall due on the first of January. Membership application forms are available by sending a stamped addressed envelope to Dave Lawton, whose address may be found on page 2 of this magazine.

OVERSEAS MEMBERS are asked to send cheques bearing the name of the bankers London agent. Postage stamps are not acceptable as payment. Overseas airmail is extra - please enquire from Dave Lawton.

The British Amateur Television Club is affiliated to the Radio Society of Great Britain and has representatives on the committee of the European Amateur Television Working Group.

The BATC is registered under the DATA PROTECTION ACT, all queries to Dave Lawton.

CQ-TV is produced by the British Amateur Television Club as its official journal and is sent free to all members. It is not for general sale.

The BATC maintains many pages of news and information associated with amateur television on the Prestel Information Service. Club pages may be found within the ClubSpot section and full details were last published in CQ-TV 134. Copies (two pages) may be obtained from the Publications department.

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CLOSE FOR PRESS DATE FOR THE NOVEMBER 1986 ISSUE.....20th September

WHO TO WRITE TO

Members of the BATC committee are available to help and advise club members on any ATV related subject. Remember that all such work is done in their spare time so please try to keep such queries to a minimum.

GENERAL CORRESPONDENCE - Club affairs; video tape library; technical queries, especially related to handbook projects: TREVOR BROWN G8CJS, 25 Gainsbro Drive, Adel Leeds LS16 7PF. Tel: 0532 670115

MEMBERS SERVICES - PCB's; components; camera tubes; accessories etc. (other than publications); queries related to such supplies: PETER DELANEY G8KZG, 6 East View Close, Wargrave, Berkshire RG10 8BJ. Tel: 073 522 3121

MEMBERSHIP - Anything to do with membership including new applications; queries about existing membership; enquiries from prospective members; Non receipt of CQ-TV; subscriptions; membership records; data protection; Prestel: DAVE LAWTON GOANO, 'Grenehurst', Pinewood Road, High Wycombe, Bucks HP12 4DD: Tel: 0494 28899

LIBRARY - Any queries relating to the borrowing or donation of written material to the BATC central library. PAUL MARSHALL G8MJW, Fern House, Church Road, Harby, Nottinghamshire NG23 7ED: Tel: 0522 703348

PUBLICATIONS - Anything related to the supply of BATC publications. CQ-TV back issues and other publications are normally only available if listed on the Publications order form at the centre of this issue: IAN PAWSON G8IQU, 14 Lilac Avenue, Leicester LE5 1FN. Tel: 0533 769425

EXHIBITIONS AND RALLIES - Also arrangements and information about lectures and talks to clubs; demonstrations etc: SITUATIONS VACANT - any volunteers should contact Trevor Brown.

CLUB LIAISON - And anything of a 'political' nature; co-ordination of ATV repeater licences: GRAHAM SHIRVILLE G3VZV, The Hill Farm, Potsgrove, Milton Keynes, Bucks MK17 9HF. Tel: 0525 25 343

ACTIVITY REPORTS - And information about groups and general ATV gossip for 'TV ON THE AIR' column in CQ-TV: Andy Emmerson G8PTH, 71 Falcutt Way, Northampton NN2 8PH. Tel: 0604 844130

CQ-TV MAGAZINE - Anything destined for publication in CQ-TV magazine (except 'TV ON THE AIR' column) or forthcoming BATC publications:
EDITOR: JOHN WOOD G3YQC, 47 Crick Road, Hillmorton, Rugby CV21 4DU. Tel: 0788 69447 - articles; review items; advertisements; other material; queries on the content of past issues.
ASSISTANT EDITOR: MIKE WOODING (see next item).

CONTESTS & AWARDS - Mike Wooding G6IQM, 3 Perkins Grove, Rugby CV21 4HU. Tel: 0788 74494.

Where possible it is better to telephone your query. Please do not call at unsocial hours. As a guide, try to call between 6.30 and 9.30 evenings and not before 11am at weekends.

EDITORS POSTBAG

Dear Ed,

A word of thanks to the committee of the BATC for another excellent rally/show. Surely next year they will want an extra marquee and improved parking space though, as by 11am the "ample car parking facilities" extended well towards the M1!

I was delighted to witness three versions of colour SSTV demonstrated by G3CCH with his G4EQD hi-res scan converter; G1OZH with the latest Volke Wraase SC-1 showing 24 and 48-second line sequential colour and G4ENA (plus twin brother G4ENB) with his G3WCY/G4ENA colour converter.

I was also delighted to meet the active SSTV'ers: G3LEE, who actually met Cop' MacDonald in the U.S.A.; G8CGK, still going well despite his recent accident although his usual SSTV demonstration was sadly missing; G3WXI with his handful of G30QD colour photo's and my "locals": G0BDD, G4VYG and G6HFS. G3NOX and G8PX were only spotted in the distance but a brief word was had with your Andy G8PTH.

Catering was excellent during an enjoyable day. Thanks again.

Richard Thurlow, G3WW

Dear Ed,

There seems to be a number of TMS4030 D-RAMS on the market, although these are pin-for-pin compatible with the TMS4060 beware, there is a difference on pin-1.

TMS4030 access time = 300nS, pin-1 VBB -3v (nom).
TMS4060 access time = 300nS, pin-1 VBB -5v (nom).

The Robot 400 series SSTV system uses a -5v rail for the memory supply. On pin-1 VBB is the substrate voltage and damage may occur when using the 4030 as a replacement.

The only remedy or suggestion would be to zener the rail down or make a separate -3v rail.

Keep up the good work Ed.

Les Bradley Jnr, G6ZWA

Dear Ed,

I would like to mention what an excellent service Bonex Ltd offer to the constructor. They really do sympathise with those who have only one hard-to-get component remaining to finish a project and realise that that project is, for the constructor, more important than anything else and needs to be finished yesterday.

On one occasion I rang Bonex for the price and availability of just such a component to be told "It would be sent as a sample - free of charge". I duly received the component the following morning - absolutely marvelous!

In fact I again telephoned for a small number of components, the total of which was quite small. They were again sent to me and I was told to pay "sometime in the future when the total warrants a cheque". I'm quite sure that if they could 'tele-port' the components they would!

Thank you Bonex.

Jonathan Gudgeon, G4MDU

Dear Ed,

I have a problem with a modification to a Wraase fast-to-slow SSTV converter. The normal line speed being 8.5, I wish to extend the facility to 16, ie; dual speeds. I am also interested in a 'snatch frame' mod.

The relevant PCB is described as 'normwandler-6' and uses a shift register for fast-to-slow conversion. I have rebuilt this unit and have had trouble-free use so far. Now I wish to modify it I have tried slowing down the line speed counter at recombination point - L/F buffer to VCO - but it doesn't work.

I have been told that this mod can be done although not how and it is at this point that I approach CQ-TV in desparation. Is there any reader who might be able to suggest how the above modifications might be accomplished please? Any expenses etc will of course be met and I would be most grateful for any assistance which will enable me to expand my SSTV capabilities.

Mike North, EI7CL,
135 Downpatrick Road,
Dublin 12,
EIRE. Tel: 01 751 909

Dear Ed,

Following my appeal 'In The Studio (feedback)' (CQ-TV134) for further information about the specification of Field Drive in the CCIR system-I Television Standard, I have been "blitzed" with information by Peter Vince, G8ZZR. Peter works at Television Centre, and is therefore in a position to check these things!

It would seem that the member who claimed that the duration of Field Drive is 7.5 lines was correct. The start of Field Drive should be coincident with Field Blanking, that is, a "front porch" before the first equalizing pulse. So, despite my attempt at logical justification, it seems that I was wrong!

One of the documents sent to me by G8ZZR was a copy of the joint BBC/ITA (as it was then) system I specification. I am enclosing this for your perusal, in case it may be a useful addition to the Club Technical Library.

John Goode

Dear Ed,

I have a little problem and wonder if any reader may be able to assist in solving it.

I sold my Pye Lynx due to RF getting into it and brought a Sanyo VC1600X. Now that too has RF getting into it.

I have a DL2RZ SC160 which will 'snatch' the caption output from a BBC micro, but when I snatch a picture from the camera I get a screen full of diagonal lines. Has anyone any ideas as to how to clear this please?

Eric Simpson, G3GRX
16 Monnington Way,
Penrith,
Cumbria CA11 8QJ Tel: 0768 64890

NEWS ROUNDUP

10GHz ATV

By the amount of personal lobbying at the show, as well as some letters, it seems that, now that FM-TV is firmly established for microwaves, more people are becoming interested in ATV operation on 10GHz.

Accordingly I have arranged with G4WTV to have the 10GHz equipment which was on display on the Worthing ATV Repeater Group's stand, written up for the magazine. In case anyone can't wait for the next issue though, Roy has kindly offered to send a photocopy of the draft article to anyone sending a large (A4) SAE, plus £1 to cover the cost of the copies to: Roy Humphreys, G4WTV, 106 Willow Crescent, Worthing, West Sussex BN13 2SY.

I also have another 10GHz article promised from the West Country and hope to publish that soon as well. Meanwhile anyone with anything relating to microwave TV operation (including 13cm) is urged to contact either of CQ-TV's Editors.

By the way, we are trying to put together a map of those stations who are active on 10GHz ATV. So, if you are, would you please send details to Andy Emmerson, G8PTH (address at the end of 'TV ON THE AIR').

MICROWAVE COMPONENTS

Talking of microwaves; the RSGB's Microwave Newsletter is a very valuable publication for those working these bands. RSGB HQ is the place to enquire about subscriptions.

The January '86 Newsletter carries a list of microwave items available from the RSGB which these includes; MGF-1402 GaAsFETs; microwave mixer devices; chip capacitors; 24GHz doppler modules; UHF source PCB's; diodes; waveguide and flanges etc. Well worth investigating.

CROPREDY TEST CARD

This popular digital test card, available from Cirkit, has a couple of flaws in it.

A design fault means that many boards fail to work correctly in that they often provide no sensible output at all, or sometimes just loss of line sync. There is a technical explanation for this which I shan't go into here. The easiest way to solve the problem is to fit a small capacitor of between 100 and 600pF from the 1MHz line to ground (from IC1 pin-12). A convenient place to mount the capacitor is beside C13.

The second problem involves the width of the sync pulses and subsequent positioning of the test card on the screen. It seems the line pulse is too wide (by quite a lot) and a simple cure is to connect a 180-ohm pulldown resistor from the base of Q2 to ground.

These mod's have been suggested by the Worthing ATV Repeater Group and my thanks are extended to them.

You will see from their advert that the Worthing group can now supply custom E-PROMS for the Cropredy board and they have developed patterns such as a BATC test card and an IBA look-alike card (not dissimilar to the original Cropredy), as well as a large number chip for contests and a single-page fixed message chip. Expansion boards carrying either two or eight extra E-PROMS are also available.

70cm RUMOURS

The BATC has had many enquiries from members who are concerned for the future welfare of 70cm. It seems that Glen Ross, G8MWR, writing in 'Amateur Radio' magazine started it by discussing the likely loss of all or part (for instance the ATV and spaceband parts) of the 432MHz band.

At the time of writing the BATC has had no official word on this but we have sent a firmly worded Telex message requesting clarification of the situation to David Evans of the RSGB.

Rest assured that your committee will be monitoring the situation constantly and taking any action which may become appropriate as a result.

TVRO ENTHUSIASTS PLEASE NOTE

A BATC member is reported as experiencing considerable problems with a company trading in TVRO equipment and advertising in other journals. The company is L & S Bear Electronics of Bridgewater in Somerset.

Apparently, according to our member, a quantity of TVRO equipment was ordered in January 1985 for which he paid a large sum of money, and was promised delivery in 5 weeks.

Since then no equipment has arrived despite numerous letters, phone calls and telegrammes, so, in desparation, he approached a senior BATC committee member for assistance.

A number of phone calls were made to the proprietor, Mr.Barnwell, but he never seemed to be available. A letter followed enclosing a SAE; still no response. More phone calls still and, so far (early June) nothing can be got from the firm or its personnel in the way of equipment or undertaking. Our member is naturally somewhat put out, especially since he is £1,395 out of pocket!

Although it is not the club's wish to get too involved in disputes of this nature, we are nevertheless here to help and advise our members. Accordingly members may like to bear this unfortunate experience in mind when considering the purchase of similar equipment.

BATC EXPAND PRESTEL SERVICE

The club, having provided 21 frames of ATV information on the Prestel's ClubSpot service, have now expanded this to 55 frames.

As well as news and topical items of ATV interest, the service now includes more information of a fundamental nature, mainly intended to encourage readers to take up ATV as a hobby.

Clubs and societies should not forget that information on forthcoming events, meetings etc (with ATV connections) can be publicised on the BATC service. Items should be sent to Dave Lawton whose address can be found on page-2 of this issue.

CAN YOU HELP IN NEWHAVEN?

G4FZS is active on 2-metres but, being disabled, requires practical assistance with the setting-up of an amateur TV station. If anyone living in the area could offer some help, he would be most grateful.
H.S.Bulmer, G4FZS, Searchlight, Claremont Road, Mount Pleasant, Newhaven BN9 0NQ

CQ-TV EXCHANGES WITH 'WESTLINK REPORT'.

The BATC is pleased to announce a publications exchange deal with the popular amateur radio newsletter 'Westlink Report' from the U.S.A.

In a letter from the Editor, Bill Pasternak, WA6ITF, says that they are the oldest continuous amateur radio news publication in the world, and that Westlink Report is the only amateur newsletter providing regular worldwide news in addition to coverage of North America. They are accessible 24-hours a day for filing news stories by telephone (805) 251-7180; Modem (805) 251-5558 - 300 Baud, 7-bit, 1 stop bit, no parity - Bell 103 standard. Type WLR at "Entry ()" prompt; CompuServe - 76337,1331. Also on MCI Mail.

Westlink report is published 26 times per year and costs $42.50 a year airmail.

Westlink Report, 28221 Stanley Ct., Canyon Country, CA 91351, U.S.A.

COMPUTER BUFFS

Following my request for help with future programs and queries concerning the various personal computers, I am delighted to say that several of you have offered your services in this field.

Of course now that I have experts available material on computers has slowed down to a trickle, so I have not yet had cause to call on many of you. Don't despair though, I'm sure things will improve and members will start writing more about computers and their applications within ATV. Many thanks to you all.

GB3UT ON AIR AT LAST

After a considerable delay we are pleased to announce that GB3UT, the Bath ATV repeater, went on the air on June 15th. Reports so far are encouraging and it will be interesting to follow its progress, since it is the only AM-TV repeater in service in this country.
The channel to monitor is RMT-1; 1276.5MHz input and 1311.5MHz output.
I hope to be able to publish more details in the next issue (that's if anyone sends them to me!)

LOSE A MANUAL AT THE SHOW?

Whilst clearing up after the BATC convention in May we found a couple of manuals which had been left behind:
1. Operating instructions for an AVO Valve Characteristic Meter type 163, (left behind the BATC stand).
2. Service manual for Sony HVC-3000P colour TV camera, (left on Andy Emmerson's 'bring-and-buy' stand).
Both books are here in the CQ-TV office and may be claimed by refunding postage. Anything not claimed will go to the club's library.

NEW AWARDS MANAGER

Upon the retirement from committee of Rod Timms, G8VBC, Mike Wooding, G6IQM has taken over as awards manager. All applications for the CQ-TV award should now be addressed to: 3 Perkins Grove, Abbotts Farm, Hillmorton, Rugby, Warks CV21 4HU.
The BATC committee would like to express its thanks to Rod for all his work and its hope to welcome him back on committee sometime in the future.

THANKS FOR THE THANKS

Many thanks to the many members who took the trouble to express their appreciation of CQ-TV magazine, the 1986 show and the general running of the BATC. It makes all the hard work worthwhile and makes us happy that we seem to be getting most things right.

BONEX CATALOGUE

As you know we often suggest Bonex Ltd in CQ-TV articles as suppliers for components. Many of you have commented that they don't produce a catalogue or take out large detailed ads in the radio press and it is thus not easy to ascertain whether certain items are stocked.

Bonex are regular exhibitors at BATC conventions so at this years event we decided to work something out. The result is that Bonex are to take regular four-page advertisements in CQ-TV in the form of a centre-page pullout, the idea being that these pullouts be kept safely for use as a catalogue, which will be added to and/or modified as appropriate in future issues.

Bonex offer a superb mail order service so why not try them and see for yourself?

NEED A CAMERA TUBE?

Hugh Wynne of 103 New City Road, UK Glasgow G4 9JX (Tel: 041 332 7153) has kindly offered to supply used 1" Newvicon and Vidicon camera tubes, free of charge, to BATC members. The tubes are ex-equipment and will be supplied as they become available.
Interested members are invited to contact Hugh to make suitable arrangements.

BATC IN SWITZERLAND

At least two members of the BATC committee are to travel to Basec in Switzerland during late summer to attend a meeting of the European Amateur TV Working Group. The results of that meeting will be reported in CQ-TV later this year.

A TVRO RECEIVER

By John Wood, G3YQC

Project

In CQ-TV134 we announced two new modules by ASTEC intended for use in satellite TVRO (TeleVision Receive Only) receivers. Thanks to the valuable assistance given by Rob Nicholls of Astec Europe, CQ-TV has had the opportunity of evaluating the units and has produced a complete receiver module design. It includes not only video processing, but also a single-chip intercarrier sound demodulator, which can be configured for any of the broadcast sound systems. A printed circuit board and layout diagram is available from Member's Services (see order form for details).

AT-1020 TVRO TUNER HEAD

This unit is a dual input TVRO tuner which accepts a standard 950 to 1450MHz signal from a block down converter (LNB) and produces a 612MHz IF output. The AT-1020 is intended for use in a block conversion satellite receiver.

FEATURES:

950 to 1450MHz block IF, minimising UHF/VHF interference from other services.
612MHz IF, eliminating image and in-band interference problems.
VCO on 1564 to 2060MHz eliminates interference between receivers.
Dual inputs for horizontal and vertical polarizations, or C and Ku IF signals.
Built-in ÷256 prescaler for external frequency synthesizer.
Conversion gain of 30dB min.
7dB typical noise figure.
Wide range for input signals.
Standard TVRO 'F' connectors for RF input, 'Belling-Lee' output connector.
External gain control for cable loss compensation.

30dB (typ) gain control range can be achieved by applying between 0 and +12v to pin 7, maximum gain being achieved at 12v. The VCO operates in fundamental oscillation mode and a tuning voltage applied to pin 4 can tune the VCO from 1564 to 2060MHz. The dual RF inputs (A/B) are provided for both horizontal and vertical polarization signals and are switched by an internal relay; +12v on pin 2 selects A and 0v selects B. A LNB supply pin is provided which conveys the voltage applied to it up the coaxial cable centre conductor in order to power the block down converter (max +35v). The AT1020 pin connections are shown in Fig.1.

SPECIFICATION: *

DESCRIPTION	MAX	TYP	MIN	UNIT
RF input level (@VG=0v)	-25	-	-45	dBm
RF input level (@VG=12v)	-40	-	-70	dBm
Dual input (A/B) isolation	-	28	24	dB
IF output frequency	-	612	-	MHz
Conversion gain	-	36	30	dB
Gain control range	-	30	28	dB
3dB IF output bandwidth	-	45	24	MHz
Image rejection (950-1450MHz)	-	60	-	dB
Noise figure	9.5	7	-	dB
VCO tuning voltage - 1582MHz	-	2.4	0.8	V
2042MHz	17.5	13.0	-	V
VCO output frequency - VCO=1582MHz	-	6.18	-	MHz
VCO=2042MHz	-	7.98	-	MHz
Prescaler O/P level	1.2	1.0	0.8	Vp-p
Polarity switch voltage 'A'	13	12	10	V
'B'	1	0	0	V

B+ supply = 18v +-5%
Vcc Supply = 5v +-5%

* According to ASTEC specification details - 1985.

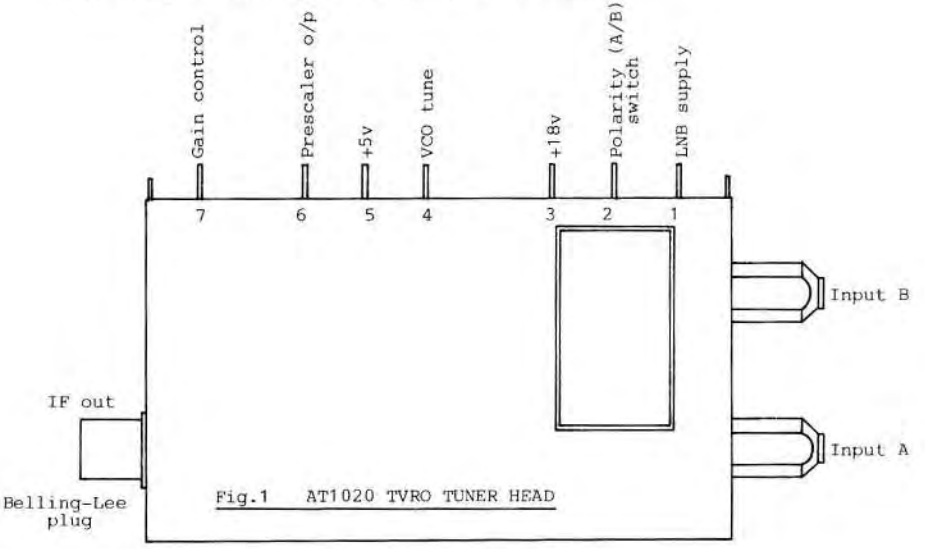


Fig.1 AT1020 TVRO TUNER HEAD

AT-3010 TVRO IF/DEMODULATOR

The AT-3010 is a TVRO IF/Demodulator which accepts a 612MHz IF input signal and provides a composite baseband signal output. The unit is intended to be used in conjunction with the 1020 tuner head. The module incorporates a Surface Acoustic Wave (SAW) IF filter which provides excellent adjacent channel rejection. The IF filter switch can extend the noise threshold by

suppressing the 602MHz and 622MHz signal frequency by at least 5dB, this results in an improvement in noise threshold of around 2dB and is a very useful facility for assisting the reception of weaker signals. IF demodulation is achieved by the use of a single-chip quadrature FM discriminator and a level limiter, the input of which is at the IF frequency of 612MHz. The baseband video output level at pin 6 is dependent upon the deviation of the received transmission; typical amplitudes lie between 0.5 and 1v p-p when terminated in 75-ohms.

SPECIFICATION: *

DESCRIPTION	MAX	TYP	MIN	UNIT
IF input frequency	-	612	-	MHz
602 and 622MHz suppression	-	7	5	dB
....at IF filter "ON"				
IF demodulator bandwidth				
at IF filter "OFF"	-	-	24	MHz
(-35 dBm IF input)				
....at IF filter "OFF"	-	-	18	MHz
(-30 dBm IF input)				
Noise threshold				
....at IF filter "OFF"	11	9	-	dB
....at IF filter "ON"	9	7	-	dB
Video demodulation sensitivity	60	50	40	mV/MHz
Video output level	3.0	2.8	2.6	Vdc
(at no modulation)				
Signal sense output	4.5	2.5	0.5	Vp
(at IF filter "OFF", AGC=12v)				

B+ supply = +18v +-5%

* According to ASTEC specification details - 1985.

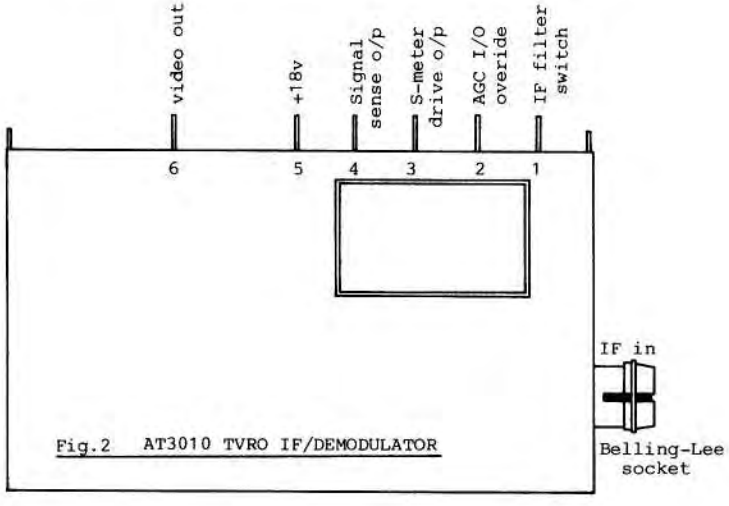
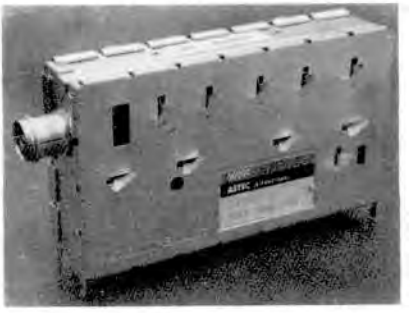


Fig.2 AT3010 TVRO IF/DEMODULATOR

Wideband operation is achieved with +18v applied to pin 1 whilst 0v switches in the threshold extension filter. The automatic gain control voltage on pin 2 rests at around +12v with no signal applied and reduces depending on signal strength. The signal strength meter drive output rests at around +17v with no signal which again reduces depending on signal strength. The baseband video output impedance is 75-ohms. Constructors should note that applying more than +5v to this pin could result in damage to the demodulator, therefore it is recommended that ac coupling be employed. The AT3010 pin connections are shown in Fig.2.

CIRCUIT CONSIDERATIONS

In deciding on suitable circuitry to use with the two modules several considerations had to be borne in mind. First, the video circuits needed to be kept reasonably straightforward but without sacrificing essential facilities. Since the receiver could be used with a variety of signals (commercial, amateur, wide/narrow deviations) a wide range of video amplitudes from the demodulator could be expected, therefore it was considered essential to provide some form of video gain control. Since it is also desirable to have a video invert facility I thought that the obvious gain controllable amplifier to use would be the NE592 (uA733).

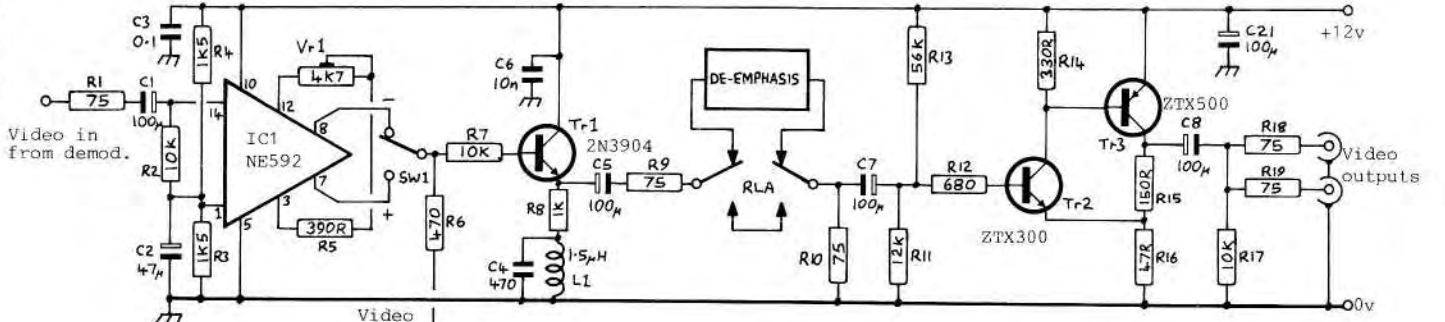


AT 3010 IF/DEMODULATOR MODULE

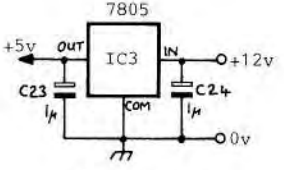
Of course CCIR de-emphasis facilities should be provided and this has been included on-board and controlled by a changeover relay. It is often required to drive more than one display device from the video output therefore an output driver has been used which has two outputs on-board, although a couple more can be added if necessary. each output will provide 1v p-p across a 75-ohm termination.

There are several sound systems in use and skysearchers will no doubt have their own preferences for intercarrier sound demodulators. Nevertheless I thought it was essential to provide an on-board sound demodulator. The choice of the TDA1035 was made mainly because it is well known in domestic TV circles, is widely available and does the entire job in a single chip. To use it for different standards only the input ceramic filter and quad tuned circuit need be altered, however there is a sufficient margin of signal amplitude to permit the connection of a second demodulator to the sound take-off point on the PC board if this is required.

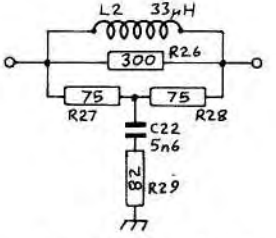
The whole unit requires +5v, +12v and +18v rails. The +18v, and more particularly the +12v draws a fairly high current and need heatsinks on the regulators. There is insufficient room on the board for all the regulators, but since the +5v rail draws a modest current, its regulator is mounted on the board and driven from +12v. This 5v rail is only needed to power the LO prescaler in the tuner and may be omitted if this facility is not required.



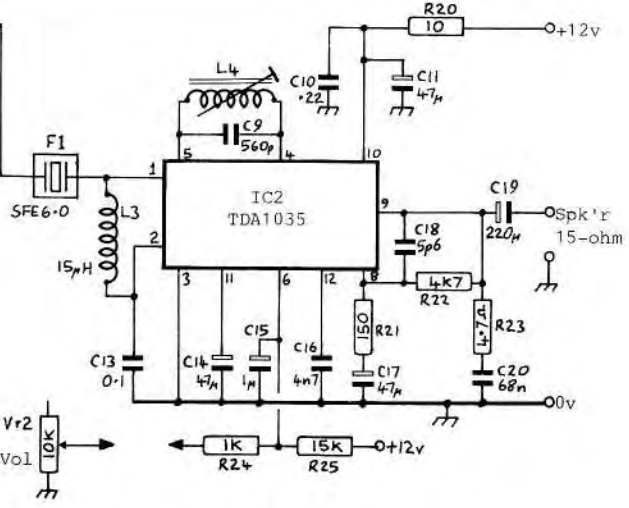
(C12 omitted)



+5v Regulator



De-emphasis network



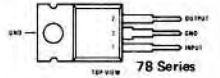


Fig.3

TVRO RECEIVER CIRCUIT DIAGRAM

CIRCUIT DESCRIPTION

The complete circuit diagram of the receiver board is shown in Fig.3 (excluding module connections). Composite video from the demodulator is applied to the input of a NE592 wideband video amplifier via a 75-ohm matching resistor. Since the level applied to this amplifier is relatively high the range of gain has been restricted to between 1.0 and 15.0. Either positive or negative-going video is available at IC1's output and the selected signal is passed to an emitter follower (Tr1). This stage provides a low impedance output to the de-emphasis network and it has also been provided with a sound trap in its emitter circuit. The values shown are for 6MHz but other frequencies can of course be used instead.

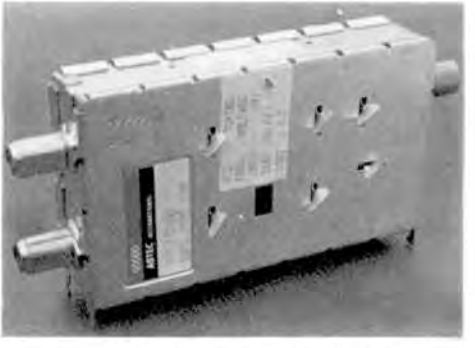
The De-emphasis network is a well known circuit and this is switched in or out by a miniature relay. In theory an attenuator equal to the loss through the de-emphasis network should be provided for 'straight through' video, on test though the difference in output level was considered to be not worth the effort, thus the component count is kept down. Video is then passed to a distribution amplifier which has a gain of four. A number of independent outputs can be taken from this circuit although only two are provided on board.

The intercarrier sound signal is extracted from the output of IC1 and passed to a ceramic filter via a matching resistor. IC2 is a limiter, amplifier, audio pre-amplifier and audio power amplifier all in one package. A single ceramic filter provides adequate selectivity and a fairly non-critical quad tuned circuit are the only frequency determining components. Audio gain control is accomplished electronically by a 10k linear potentiometer. The audio output voltage drives a 15-ohm loudspeaker and more than sufficient volume for normal needs is available (around 1W).

In the interests of simplicity and versatility no extra circuitry associated with the various facilities provided by the two modules has been incorporated, with the exception of an optional resistive potential divider for range setting the tuning control.

PRINTED CIRCUIT BOARD

A printed circuit board has been designed for this project which should be available from Members Services by the time this article is published. The board measures 8.4" x 3.9", is single-sided and comes complete with a layout diagram. The two modules are intended to plug directly into each other via the IF input/output connectors, one being a plug and the other a socket. This method of construction obviates the need for a coaxial coupling lead and ensures a loss-free transfer of signal from tuner to IF with maximum screening. The modules are mounted on edge and soldered into the PC board (see photo). However they should not be installed until after



AT 1020 TVRO TUNER HEAD

preliminary checks have been carried out. Each of the pins to which access may be needed (with the exception of the LNB supply pin) is brought to a 12-way PCB connector plug. The +5v supply is connected on-board and an external terminal is therefore not provided, the same goes for the demodulator output.

All other components are mounted alongside the modules and 1mm circuit pins installed for the various external connections.

It will be necessary to cut slots in the board to accommodate the four earth tags at the corners of each module and the earth tab/heatsink lugs on IC2. Some holes will probably need to be opened out before fitting such components as VR1, L4, IC3, P11 and the module pins and Vero pins.

COMPONENTS

There are no 'special' or hard-to-get components used in this design and suggested sources for the various parts are detailed at the end of this article.

Most of the component information is contained in the accompanying parts list, however there are one or two points which should be mentioned:

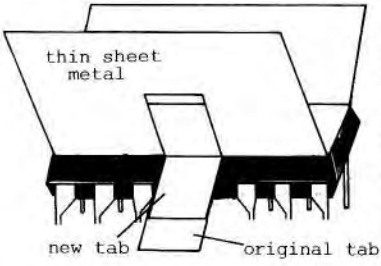


Fig.4 SUGGESTED HEATSINK

The Signetics NE592 (IC1) may be directly replaced by a uA733 - these are pin-for-pin compatible. L1, L2, L3 are fixed axial-mounted chokes. IC2 MUST be a suffix 'S' or 'T' version which has two large metal lugs protruding from the IC for heat sinking. no extra heatsinking was found necessary on the prototypes ('T' suffix) however if it is required then a simple shape may be formed from a piece of tin, copper or brass sheet and soldered to the ic's metal lugs (see Fig.4). The legs of IC2 are formed in staggered groups of three. A Toko coil is specified for L4 however other coils, even home-made ones, may be used just as effectively. Remember that the loaded Q of this tuned circuit should be quite high. The 4.7-ohm resistor at the audio output may be formed by wiring two 10-ohm resistors in parallel. The SFE 6.0 ceramic filter is the flat type with three inline legs.

TUNING CONTROL

As you can see the tuner will cover 500MHz with a tuning pin voltage range of 0.7 to 18v and, as an aid to determining frequency against voltage, Astec individually mark each tuner with the tuning voltage required for both 2042 and 1582MHz. Obviously if a single-turn potentiometer were connected between ground and +18v (Fig.5a) then the tuning rate would be very fast. If the full band is required it is much better to use a good quality 10-turn potentiometer or, for even more precise tuning, a range switch could be provided as well (Fig.5c,d). Some constructors may not wish to tune the whole 500MHz range of the tuner, amateur TV enthusiasts for example, therefore positions for two resistors have been provided; one returned to +18v and the other to ground. The purpose of these is to enable a potential divider to be installed to restrict the tuning range to only that required (see fig.5b). In fact it has been found that both tuners tried in amateur service covered the complete

1.3GHz allocation with an applied tuning voltage between about 9 and 11v, therefore a 12v rail could be used in this application if required.

The DC current to the 'tune' pin is of the order of 1mA and it is therefore necessary to choose the total resistance of the potential divider such that it draws around 10-times the pin current, ie. 10mA. This is achieved by making the total resistance (tuning control plus two padding resistors) about 1.8k. Choosing this value has the added advantage of easing calculation - the volts drop across the potential divider is then 1v per 100-ohms.

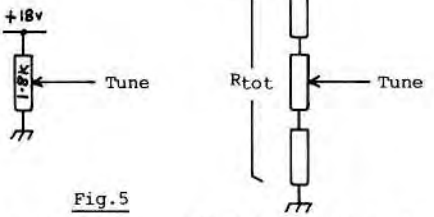
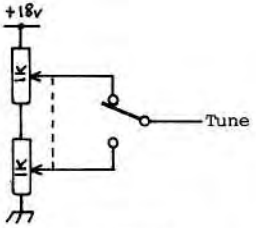


Fig.5

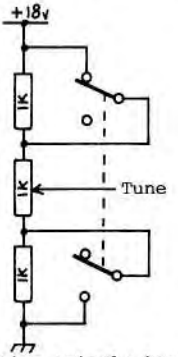
(a)Basic circuit covering the full tuning range.

(b)Modified circuit to give restricted range. (R_{tot} = 1.8k)



(c)Double range circuit. Twin-gang control for 'single knob' operation or two separate coltrols for 'twin VFO' operation.

Fig.5



(d)Alternative 'single knob' circuit covering 250MHz per range.

POWER SUPPLIES

Power requirements for the two modules are: +5v, +12v and +18v. As previously mentioned +5v is derived on the printed circuit board from the +12v line using a 1-Amp 3-terminal voltage regulator. However there is insufficient space on the board for the other regulators therefore they must be arranged separately. The total current drawn from the supplies (under 'normal' audio level conditions) is: +5v = 100mA, +12v = 900mA and +18v = 750mA. The +12v supply can rise to almost 1.5A at maximum audio volume. A suggested power supply is shown in Fig.6.

ADJUSTMENT

The modules should not yet be installed. Connect the video output to a monitor terminated in 75-ohms; a gain control for the audio stage, a loudspeaker and a +12v supply. Switch on and check that +12v is available on all ICs. Check that +5v is present at the output of IC3 (if fitted). Turning up the audio gain should produce noise and adjusting Vr1 should produce noise on the screen.

Now install the two modules. Connect an input signal to RF input B; a +18v supply; A tuning control (around 2k); and take the tuner pin 7 (gain control) pin to +12v. Upon switch-on you should now be able to tune in to a TV signal (the modules may take a few moments to 'warm up' from cold). When one is found monitor the video output on an oscilloscope (making sure that it is terminated) and display a couple of lines of composite video. Adjust VR1 for a total amplitude of 1v p-p. The video inverting switch should be set so that the displayed video is positive-going, this may be either by a front panel switch (use short leads) or a wire link on the appropriate board pins.

Once a signal has been tuned in, turn up the volume and adjust L4 for best sound. Check that the de-emphasis switching relay operates correctly by grounding the relay pin.

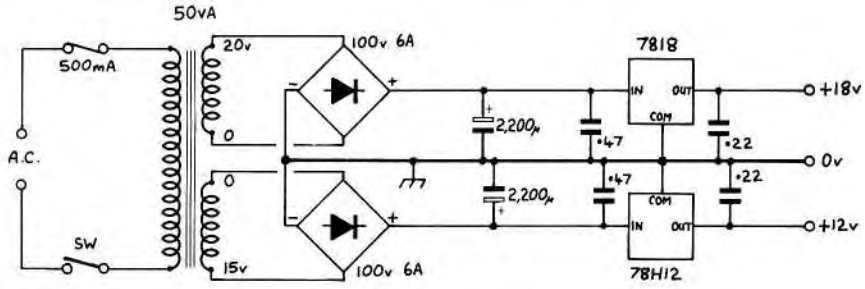


Fig.6 SUGGESTED POWER SUPPLY

EXTERNAL CONTROLS

To aid constructors the following external controls and provisions are necessary:-

Main tuning control.
Video IF filter switch.
De-emphasis select switch.
Audio gain control.
Loudspeaker.
Video output coax socket(s).

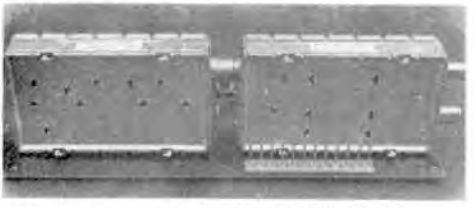
The following are optional:-

RF input polarity (input A/B) select switch.
Gain control potentiometer (tuner pin 7).
Signal strength meter.

Of course one doesn't necessarily need to use the relay for de-emphasis changeover; wire links could be used for semi-permanent operation or, since the network has 75-ohm input/output impedences, short lengths of coax could convey the signal to and from a front panel switch.

RESULTS

Here I must make a confession: I do not own a satellite receive system and therefore most of my work with the modules has been conducted using amateur TV signals in the 1.3GHz spectrum and bench test equipment. Nevertheless I have briefly tried the unit on one TVRO installation and found the results to be first class; equal in performance to a receiver costing many times more than this unit. I have also received reports from others using the Astec modules for satellite work and their findings support my own. One user however did suggest that the passband of the IF/demodulator was a little narrower than that normally used to receive 'European' satellites in the 12GHz band. The modules seem to have been designed more for 4GHz operation in the U.S.A. Nevertheless two independent comparisons which have been carried out indicate that any degradation of signals which may be caused by a narrower passband cannot be detected by eye, in fact a narrower system is likely to produce a rather better noise threshold.



REAR VIEW SHOWING CONNECTOR PLUG

The quality of recovered video is very high indeed, good colour and sound being received even on quite weak transmissions. The receiver is very smooth in its tuning and noise and 'sparklies' disappear quickly as signals become stronger. The local oscillator is remarkably stable considering its high frequency and fundamental mode of operation. At first I thought of designing a frequency synthesiser but, certainly for general use, the stability is such as to render such a system rather unneccessary.

AMATEUR TELEVISION APPLICATION

The AT 1020 tuner head comfortably covers the complete 1.3GHz amateur TV allocation making it virtually ideal for amateur applications. There are however one or two points which should be considered:

Although the tuner's conversion gain is high (around 30dB) the overall noise figure, compared to custom designed amateur tuners, is quite poor (around 7dB). The reason for this is primarily the fact that these tuners were not designed for low-noise, direct aerial connection applications. They are in fact intended as a first IF following a microwave block downconverter, therefore since the system noise performance is largely governed by that of the block converter there is no need for the tuner noise to be kept low. Coupled to this is the wideband capability of the RF circuitry. The result therefore is that for ATV use a good low-noise pre-amplifier must be provided ahead of the tuner for best performance.

The 612MHz IF output is almost ideal if the unit is to connect to a conventional varicap TV tuner. The tuner can be set to around channel 37 and left (band tuning being accomplished by the Astec module). This system is likely to find favour with existing stations since a FM-TV demodulator will already be available with an IF of around 36MHz. Of course if just the tuner is purchased then the PC board will not be necessary.

The use of the AT 3010 IF/demodulator as well, together with the PCB, will provide a complete 24cm receive system needing no extra equipment (except for

a RF pre-amp and a display monitor) and will give very high quality results with the added bonus of being able to double for satellite TV use.

COMPARISON TESTS

I consider the Wood & Douglas combination of a 1250DC tuner and VIDIF IF/demodulator to be probably the most sensitive 24cm ATV receiver in popular use. I have therefore based my tests and observations on comparisons between the W&D and Astec systems, using a common 26-element JVL Loop Yagi and a Comex systems low-noise wideband pre-amplifier. I must however state that I have incorporated one or two modifications in my W&D IF/demodulator board mainly in an attempt to reduce the noise produced within the circuit. Modifications have also been made to the video amplifiers to produce a standard 1v p-p output with minimum distortion. The IF has been carefully adjusted using sweep equipment and optimised for best overall noise performance, therefore it may be that my particular unit performs slightly better than a 'standard' system.

The first thing I noticed when tuning in to a weakish (P2 - 3) picture was that the Astec system appeared to be slightly less sensitive than the W&D; an estimation of around half a 'P' point being typical. This apparent lack of sensitivity continued until signals became stronger (above P4) then the noise and 'sparklies' on the picture diminished somewhat earlier on the Astec system than the W&D. In fact when all trace of noise had just disappeared using the Astec, only a P4.5 report could be given on the W&D since there was still a significant amount of noise discernable on the picture.

I use the word 'apparent' when referring to a lack of sensitivity since that is the effect one sees on the screen. however the reason can almost certainly be attributed to the TRULY wide-band performance of the Astec IF system which, as a consequence, produces a somewhat noisier IF. Coupled to that the use of a quadrature discriminator, which doesn't have the benefit of threshold extension as is possible with phase-lock loops, does nothing to improve or enhance the noise performance.

This properly tailored wideband IF and superbly linear demodulator, which is designed specifically for FM-TV reception, makes the quality of the recovered video signal very high indeed. Even when receiving quite weak amateur pictures good colour is still obtainable well after it has disappeared on the W&D. The same can be said of the audio: You know how annoying it is when you tune in a weak commercial broadcast station on a domestic TV set and can still receive perfectly good sound, and then you try the same thing on an amateur signal; it's just not there. Well, with the Astec system the sound remains almost to the point of sync loss caused by a weak picture.

Now that the new system has been in use for some weeks I must conclude that (at least in my case) the Astec receiver is slightly worse at receiving weak signals. So if you are a DX'er and like dredging around in the noise, or if you don't have fairly local stations from whom you regularly receive stronger signals, or a repeater, then the new receiver is unlikely to better your existing receiver, (assuming of course, that your existing system is up to scratch!).

If however you own a questionable receive set-up or mainly receive stronger signals (perhaps from the local TV repeater), then you will certainly appreciate the sheer quality of reception by the Astec receiver. Don't forget of course that it doubles as a satellite TV receiver as well.

COMPONENT LIST

R1,9,10,18, 19,27,28	75R
R2,7,17	10k
R3,4	1k5
R5	390R
R6	470R
R8,24	1k
R11	12k
R12	680R
R13	56k
R14	330R
R16	47R
R20	10R
R21,15	150R
R22	4k7
R23	4.7R
R25	15k
R26	300R
R29	82R
VR1	4k7 hor preset 10mm
VR2	10k lin carbon
Tr1	2N3904
Tr2	ZTX300
Tr3	ZTX500
IC1	NE592N, uA733N
IC2	TDA1035T or S
IC3	7805

C1,5,7,8	100uF 16v vert
C2	47uF 16v vert
C3,13	0.1 ceramic or mylar (5mm)
C4	470pF polystyrene 5%
C6	10n ceramic or mylar (5mm)
C9	560pF polystyrene 5%
C10	0.22 tant
C11,14,17	47uF 25v tant
C15,23,24	1uF 25v tant
C16	4n7 ceramic or mylar (5mm)
C18	5p6 plate ceramic
C19	220uF 16v vert
C20	68n mylar (5mm)
C21	100uF 25v vert
C22	5n6 polystyrene 5%

(numbers in brackets are lead spacings)

L1	1.5uH axial fixed inductor
L2	33uH axial fixed inductor
L3	15uH axial fixed inductor
L4	Toko MKANSK1731HM (6MHz)
SW1	SPCO toggle
F1	SFE 6.0
P11	0.2" PCB connector 12-way
Rla	12v DPDT (OUB)
	Maplin YX95D
	Bonex 46-70030

AT 1020 TVRO tuner head - £30.25p
AT3010 TVRO IF/demodulator - £47.00
Type 'F' coax plugs - 0.50p each
UK customers should add £1.50p postage plus 15% VAT. Overseas customers should enquire for postal charges.

Available from: COMEX SYSTEMS Ltd.,Comet House, Unit 4, Bath Lane, Leicester LE3 5BF. England. Tel: (0533) 25084

The TDA1035 and probably F1 (check first for correct style) is available from: Sendz Components, 63 Bishopsteignton, Shoeburyness, Essex SS3 8AF (Tel: 0702 332992.

Other components from Bonex Ltd.,

Printed circuit board from Members Services (see order form in CQ-TV)

Since this article was written and typed-up ready for the magazine there have been certain developments regarding the project as well as some further information:

The circuit and parts list gives component details for the U.K. 6MHz intercarrier sound system, however it is possible to change these components for other frequencies. The table below suggests some alternative components:-

FREQ	C9	C4	F1
5.0MHz	800pF	680pF	SFE5.0
5.5MHz	650pF	560pF	SFE5.5
6.5MHz	470pF	390pF	SFE6.5
7.0MHz	400pF	350pF	SFE7.0
7.5MHz	350pF	300pF	SFE7.5

(capacitor values are to the nearest 10pF and are calculated only)

It is not certain whether SFE ceramic filters are available for all the above frequencies therefore constructors must ascertain this for themselves. In order to retain the use of the specified inductors only the capacitor values need be changed.

A version of this article is published in the August issue of Radio & Electronics World and acknowledgement is made to the Editor, Duncan Leslie, for allowing this article to appear.

Printed circuit boards only are available from BATC Member's Services. The Comex version (below) is a later version, silkscreen printed and with some alterations and extra features.

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A RANGE OF BRITISH MADE PROFESSIONAL QUALITY MODULES FOR AMATEUR TV AND RADIO ENTHUSIASTS.

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MITSUBISHI FO-UP11KF MICROWAVE GAASFET HETERODYNE RECEIVER, wideband front end covering 10 to 12GHz. Fixed local oscillator at 10.465GHz....£47.00

SCALAR HORN for above receiver....£42.00

CX250WB WIDEBAND PRE-AMPLIFIER covering 60 - 1700MHz. Bipolar active device and PTFE board for optimum performance and reliability. GAIN: 13dB average; NOISE FIGURE: 2dB average; SUPPLY: 10-15v @ 1mA....£35.00 (kit)

1.3GHz FM-TV TRANSMITTER. 1W output; sound and vision modulators; truly wide band amplifiers for superb linearity and wideband deviation. Built and tested with internal preset controls; BNC output....£180.00

1.3GHz FM-TV TRANSMITTER. As above in a smart cabinet with front panel controls for Video and Audio Deviation and Switchable CCIR pre-emphasis. This model has two frequencies available at the touch of a switch; set for 1249MHz and 1255MHz (FM-TV repeater input and European ATV simplex) although other frequencies (having a 6MHz split) available to order....£199.00

1.3GHz POWER AMPLIFIER. 1 Watt in for a guaranteed 6W out; wideband and very stable; 13.8v supply....KIT: £62.00, BUILT & TESTED: £145.00

1.6M SPUN ALUMINIUM DISH, with polar mount and horn mount. This dish is a very high quality product manufactured to exacting standards and is perfect for TVRO reception on 4 and 12GHz....£365.00 complete.

AVAILABLE SHORTLY

LED tuning display for the TVRO receiver project.
Tunable sound IF (giving the kit stereo sound capability).
TVRO portable PSU - 13.8v input for 18v out.
Iambic CW keyer kit.

Phone or SAE with enquiries please.

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CQ-TV GETS ASSISTANT EDITOR

The Editor

It is with the greatest pleasure (not to say relief) that I announce the appointment of an assistant Editor for CQ-TV magazine.

As you know the magazine has been steadily growing over the last few years and you can imagine just how much work is entailed in assembling the whole lot almost single-handed. Of course the Editor's task also includes virtually all the club's artwork (leaflets, forms, letterheads, advertisements, posters, certificates etc., etc.) as well as, to a large extent, handbooks. So you can see how important it now is to have an assistant. Who is it? Oh yes; Mike Wooding, G6IQM, our present Contest Manager and, more recently, Awards Manager as well.

Born in 1947, Mike's first introduction to radio was as a very young teenager, when he used to tune over the shortwave bands on his father's communication receiver. Mike left home during his early twenties when he was employed as a TV repair engineer. Now that contact had been lost with the receiver, not to mention the acquisition of a wife and the start of a family, the earlier interest in radio was forgotten.

Then came a change in employment where his work switched to microwave communications. Now at GEC Coventry, Mike is a Principle Test Engineer in their microwave division, and it was largely due to this move that the old urge returned. Amateur radio was discovered and a licence followed in 1982.

Living at that time just to the North of Coventry, Mike worked both FM and SSB on 2-Metres, particularly in the DX part of the band. A good deal of mobile operating was accomplished (usually via GB3CF) and a small amount of work on 70cm also. Much was then heard of amateur TV both on 'CF and by listening-in to 144.750 and he was hooked! It wasn't long before a complete ATV station was set up and good contacts were being made on a regular basis.

Then came a move of QTH to Rugby (just down the road from me in fact!) where (it must be told) Mike was persuaded to join the BATC, (the truth is that upon his first visit to my shack he was not allowed to leave without parting up with the necessary!). Since then Mike has been closely involved with the local development of 24cm ATV and has been instrumental in air-testing two new versions of ATV repeaters for GB3GV, which have been built in my own shack.

When a new Contest Manager was required last year Mike was quick to respond and it is through that (I suspect) that an interest in writing has emerged. No one was more delighted that I when, several weeks ago, he volunteered his services to CQ-TV. The club has duly re-located a BBC computer and word-processor system in the shack, and the result is that several of the articles in this issue have been edited and put together by our new Assistant Editor.

Of course, far from easing the burden, we have now been obliged to take over responsibility for BATC handbooks! Ah well, you wins some and you loses some!

CONTEST NEWS

By Mike Wooding, G6IQM

Firstly I would like to thank all those who I met at the convention for their expressions of appreciation and support, and I shall certainly consider all the points mentioned. In fact below is news of a new SSTV contest which is the result of suggestions received at the show.

As you may already have read in this magazine the International contest is now being run by the club, so please let me have a large U.K. entry, don't leave it to the next guy I want your entry as well! The other news - mentioned above - is that on Sunday November 16th I have organised a Slow Scan TV contest. General contest rules and conditions will apply (CQ-TV 133) and conventional signal reporting should be used. There will be four sections; tranceive on 28MHz and below, tranceive on 144MHz and above and the same for listeners with half points (1 point/Km) for correctly identified stations. Those using both HF and VHF should enter separate logs. Right then, there is your contest let's see you use it!!! I may even be QRV myself.

WINTER CUMULATIVES

Owing to the bringing forward of the publication date for the last magazine, I decided to run the results programme early to provide some copy for the column, unfortunately this precluded an entry from G6MPE which arrived just after the magazine had gone to the printers. The certificates that you have received for that contest are correct in the placings given on them and the corrected list shows G6MPE in 12th place in the 70cm section and 1st place in the 24cm section, so congratulations John for your win and commiserations to G4CRJ who did not after all. Please accept my apologies for this mix up but I could always blame the editor (if I had the nerve).

APRIL FOOLS FIESTA

It appears that eventually a lot of activity was generated by this new contest and certainly within my receive area I am pleased to say a lot of fun as well. When I say eventually I mean that until midday I was still being asked over the air if it was a serious contest and I also received several telephone calls to the same effect.

The weather was generally pretty poor and I heartily applaud the portable stations for their endeavours. The level of entries is very encouraging and I will certainly take note of the overall opinion that this event should become a permanent fixture, but it will have to be renamed as the majority of you thought that it should be held again on Easter Tuesday. Please let me have your ideas for a name, for example G4ROB reckons 'Easter Bunnies Rummage'!

Congratulations to John, G8MNY who entered the contest as a mobile station, much to the disbelief of some of his cotacts until they received live pictures on the move! - sorry John no bonus points but a nice try. Also I would like to thank our Scottish friends and I was pleased to receive their entries, the first from Scotland during my managership. I look forward to future entries from you all.

And so to a few of your comments:

G8PX - it seems that Jeff is in trouble again "I missed G3YQC and one or two others as the wind caused a 45 degree angle of elevation to the multibeam" - pity it's not the season for meteor scatter Jeff.

G1COI - Peter had to retreat from the shack at 1800 due to his receive monitor going up in flames.

G8BWC - Richard suggests an Easter Bonnet contest and he also appears to know who would win!

G4ROB (the one with the bonnet?) - heard over the air by Rob "...thanks for the report OM, you are P5 but could you put your numbers up again as I could not make out the last two, better still can you put the linear on?"

A little bird tells me that a station in Brindsley has a quantity of slightly damaged aluminium for sale or would part-exchange for a winch!

Heartiest congratulations to G8DIR/P and his team for their success in winning the contest from their location on the Clee Hills.

1986 APRIL FOOLS FIESTA RESULTS

Posn	Call	Points	Contacts	Best Dx	@	Km
1	G8DIR/P	4031	20	G4HMG		169
2	G1GST	2565	27	G4VDB		107
3	GOAVG/P	2343	23	G8DIR/P		85
4	G6SKO	1751	22	G8DIR/P		108
5	G8BWC	1583	22	G8DIR/P		112
6	G6YKC	1550	18	G3UMF		134
7	G6IQM	1505	13	GOAVG/P		87
8	G1COI/P	1464	7	GOAVG/P		171
9	G3YQC	1337	11	G8DIR/P		90
10	G4ROB	1309	19	G8DIR/P		112
11	G4EUF	1302	14	G3UMF		102
12	G4ZXI/P	543	10	G8MNY/M		46
13	G8MNY/M	535	7	G8CYE		117
14	G4LXC	474	9	G4CRJ		52
15	G8PX	328	4	G8LES		72
16	G6MEN	243	6	G1GST		44
17	GW6BDM	230	2	G4HMG		90
18	GM3WML	14	10	GM4PWR		2
19	GM4OPU	14	6	GM1SMF		3
20	GM4PWR	14	6	GM1SMF		3
21	GM1SMF	8	3	GM4PWR		3
22	GM1IKQ	5	3	GM4PWR		2
23	GM1IBQ	5	3	GM4PWR		2
24	GMOCVI	4	4	GM3WML		2

MAYDAY MICROWAVE

The weather wasn't too bad, the band was reasonable and there seemed to be quite a few stations operating, so where are all the entries? The answer to this question seems to be that there is not yes sufficient activity for a separate microwave contest. Next year the Easter contest (yet to be named) will be a joint 70cm and 24cm event, but I have yet to discuss with G8VBC

about his donation of the prize as previously advertised.

Your comments are obviously few and far between but here goes:

G4HJD - Andy (see photo), assisted by his wife Shirley, travelled down from Hull for the convention and the contest. He is the only station QRV in his area which in his words; 'proves that I am very keen or daft'....no comment.

G3YQC - John had problems with his mast head pre-amp which resulted in reduced receive capabilities and much wailng and gnashing of teeth.

G4EUF - George after several weeks of preparation went portable, with amongst other things a 6ft dish, but after only a few contacts suffered a breakdown in his tripler and went home much disgruntled.

I, for my part, ended up working with only 1 Watt of output on 1249MHz thus resulting in my vast score of 2.

Well deserved congratulations to G6MPE for his resounding win, not only of the contest, but also of the 5" Rigonda TV generously donated by G8VBC.

Posn	Call	Points	Contacts	Best Dx	@	Km
1	G6MPE	878	17	G6TVX		80
2	G3YQC	522	8	G8BWC		78
3	G4HJD/P	325	5	G4DVN		68
4	G8MMF/P	264	3	G4CRJ		67
5	G1GST	191	4	G3YQC		65
6	G1OTO	33	2	G6SKO		19
7	G6IQM	2	1	G3YQC		1

Don't forget the SUMMERFUN contest on the revised dates, 1200Hrs (local) Saturday 12th July to 1600Hrs (local) Sunday 13th July; the INTERNATIONAL from 1800Hrs (local) Saturday 13th September to 1200Hrs (local) Sunday 14th September, the AUTUMNVISION whole day contest on Sunday 9th November not forgetting the SSTV WHOLE DAY contest on Sunday 16th november. Please remember that if you require a contest certificate then a large (A4) SAE should be sent with your entry. Contest forms and log sheets (large A4 SAE please), contest entries and any other contest correspondence to:
BATC Contests, Mike Wooding,
3 Perkins Grove, Rugby CV21 4HU.

G4HJD in action during the May Day Microwave contest.

SSTV - SOME NOTES AND OBSERVATIONS

By J.C.Pennell, G3EFP

During my activities on SSTV I have discovered a few things and realised some others and I feel that some notes in CQ-TV may be of interest to those similarly occupied:

G3WCY SCAN CONVERTER

With the use of an oscilloscope and a FET voltmeter, among other things, and a great deal of measurement and analysis, I have discovered the following:

1. C117 - 4.7uF tantalum is reversed in Fig.1 of Radcom for Feb. 1983, on the PCB layout in Radcom for March '83 and the BATC receiver analogue board. This causes incorrect size sync pulses on receive, which in turn causes erratic line sync and each line to be incorrectly located giving ragged edges on the picture.

2. C216 - 220uF reversed in Fig.2 of Radcom for Feb.'83, on the PCB layout in Radcom for March '83 and the BATC digital memory board.

3. An improvement can be effected if C113 on the low-pass filter on the receiver analogue board is changed to a 0.22uF. This cures slight raggedness on received lines due to some incursion of the picture content on the leading edge of the line sync pulses.

4. On the G4ENA transmit board on 14-seconds 256-lines black and white, produced when the link is joined a to b, only the green memory is loaded. This appears to be due to point 'a' of the link giving a reset pulse to IC20 via IC19 when the red memory is sequenced. A temporary cure was made by swapping the leads going to pins O with P and also K with I, although a full investigation of the problem has not yet been made. The line sequential 21-second operating with the link from b to c appears to be good.

Myself and two other locals - G3VXA and G3WGM - have each constructed the BATC system and we have all found the following:-

1. We changed TX board C19 and C20 to 470pF which appears to cure the problem as mentioned by G4ENA regarding the unreliable (or non-existant) vertical and/or horizontal sync on this unit.

2. We each made up the small frequency-to-voltage converter board and found the 'patterning effect' on all but the most carefully set input level, whether it be higher or lower than optimum, and have discarded it as the original G3WCY design appears now to be satisfactory. It appeared to be very frequency critical as the ballance is lost rapidly at a small difference away from the set point. The extra VOGAD unit as described in CQ-TV134 has not yet been tried.

3. The picture on transmit appears to be rather noisy and cluttered with dots. Some appear to be produced if the external composite video input source does not have clean sync pulses. It appears that random 'junk' is produced if the syncs are 'crushed' and is passed through as noise to the comparators IC1

to IC8. Also, some high-frequency components from the input video cause a noisy picture if they appear on line 'D', as well as RF floating around the boards, mainly from the internal oscillator IC23.

4. A displayed picture on the monitor goes white on 'continuous' snatching mode if the picture width control (RV202) on the digital memory board is set much above the minimum, although the transmitted picture is almost unaffected when attempted using these settings. No immediate cure for this problem has yet been found on any of our units.

I have found the 'reversed tantalum syndrome' to be quite common and is one to be carefully examined, especially in circuits in which the polarity is not immediately obvious - such as sync circuits.

Even the Wraase SC1 was at fault in this respect with C41 and C42 being reversed on board 72 (and on the circuit diagram), even though on first examination they appear to be logically connected - see manufacturer's notes regarding use of the 74LS221 monostable chip and polarity of the capacitor used - and also by measurement with a scope/meter set on DC under operating conditions. This error caused my unit to fail after about a week from new with the transmit sync pulses intermittently stopping.

I do not find that many Wraase units are in use in Europe as a percentage of the total I hear on the bands. There appear to be a variety of unit types being used ranging from home-designed, through micro's and kits, to 'black boxes' of various types such as the Wraase, but only a few Robots.

It appears that when using the Robot 400C or Robot 1200C very few of the transmissions are able to be received using the 8-second B&W SSTV picture standard, such is the intolerance of the Robot units with the software as written for other than between Robots, which I might add works very well. It is with that in mind that to my knowledge at least one amateur has successfully re-written the software used in the Robot 1200C to broaden its receiving tolerances, and to imitate the parameters used in the Wraase SC1 for line-sequential colour transmission and reception as well as B&W. The results are excellent and were demonstrated to me at my QTH.

It also appears true to me that many U.S. stations will be disappointed that they will not be able to receive pictures from many European stations due to the Robot's intolerance on receive. I was told, on a visit to Robot in the Midlands, that in fact the tolerance of the 450C and 1200C is in fact kept fairly tight to allow the best picture reception, and in fact their commercial units have very little tolerance at all in this respect.

I personally find the variety of signal types produced by the different units makes the mode more interesting. To me it is the case that the simple exchange of pictures between predictably good units soon tempers my interest, as I am very keen on the experimental 'on-air' side and find variety an added stimulus.

THE 1986 BATC SHOW

British Amateur Television Club Show Report for the Crick Convention
Sunday May 4th 1986 By John Hirons, G6TGJ and Jen Hirons.

Well here we are again, same place, same weather but.....Lots more activity. The first thing I noticed this year was a large marquee, which I found, upon closer inspection, to be packed with all sorts of bargains too good to resist. Oh by the way I had to bring my wife this year, she said I spent to much last time so she offered to look after the cheque book. Anyway on with the report: First thing spotted; an ex computer power pack modified for 13.8 volts at 25 amps must have one of those, then there was.....

Lots of goodies in the marquee

Hi I'm Jen G6TGJ's XYL, at present G1... again, but by the time this report gets printed I may have better news, May the 12th is nearly here! Well as you may have gathered John has gone off bargain hunting so I am going to do the press report, AND keep the cheque book in my handbag!

This, the third BATC exhibition to be held at Crick, was promised to be the best yet and, sure enough, it was. It was again well represented by manufacturers and retailers, together with an enormous number of bargain stalls and special attractions.

The Worthing Group with (l to r): G8XEU, G8KOE, G8DHE, G4WTV

I thought I would start in the Stanford suite and here I found the Worthing and District repeater group with a good range of aerial kits, an ATV graphics program for the Spectrum computer plus IBA and BATC style test cards supplied on eproms for use with the 'Cirkit' test card generator. Alistair McArthur was displaying his WW teletext decoder whilst RICHARD's TV's had a range of Second-hand TV's and vcr's. The Home Counties ATV group advised that they are currently working on GB3HV, a new ATV repeater to be licenced later this year, and they also showed off a Pioneer PX-7 A/V computer (more on that

Photo's G3XKX

The Home Counties Group (l to r): G4CRJ, G8UAV, G8MNY, G6XVT

in the next CQ-TV). Moving into the lobby the BATC stands displayed Prestel pages including the BATC's pages on 'ClubSpot'. A good supply of books, magazines, PC boards and members requisites were available as well as the opportunity to chat to some of the committee.

On into the Albany suite where JAYBEAM ANTENNAS informed me that they have re-introduced the popular D15 aerial for 23cm and have now dropped the corner reflector. WOOD AND DOUGLAS presented their long awaited 1240TVT 24cm exciter which provides 20mW frequency locked directly at 24cm which was on offer at a special show price. Plug-in filters for TV systems by AKD were available from the EMC stand together with excellent advice on all kinds of interference. BONEX LTD were much in evidence with a wide range of components including Toko coils and Amidon ferrites and attracted a lot of attention. The impromptu BATC members sales stand, ably manned by G8PTH, was well supported and demonstrates for the first time a real need for such a stand. I understand that next year the club hopes to organise an official 'bring-and-buy' stall. Well I tell you what I'm glad I came but with all this walking and chatting I must stop off for a coffee or perhaps something stronger.

The Crick room, I nearly missed that. NBTV was the first encountered and of course Doug Pitt and the Narrow Bandwidth TV association attracted a lot of interest as usual. A slow-scan TV group gave a super demonstration using home brew equipment designed and built by G8EQD, G8IYI & G3CCH. It really did look complicated. A new one now: the Remote Imaging Group from Bedfordshire were there and their secretary, Phil, G8XTW advised that they now have some 600 members. BATC member G4ENA, along with his brother demonstrated their excellent slow scan equipment based on the G3WCY scan converter and their own modifications and additions which have been printed in CQ-TV.

Bonex had a super range of components and kits

The ITN van with mast extended

G8DPH (G6ITN) in the ITN news van

Some Interesting lectures where given in the lecture theatre. First at 12:30pm a lively TV Repeater Seminar conducted by G3VZV & G4MQS was followed at 1:45pm by a talk on Microwave TV by G8PTH and at 3.00pm G8CJS delivered a lecture on Micro and T/V projects.

Outside even the kids had been catered for this year with a jumping fun castle, swings and a climbing frame. I was just about to go into the marquee when I was chased by a model radio control car, on which was mounted a camera and 24cm TV transmitter. Pictures were being received in the marquee at the Solent Scientific stand. Dick Wallinger Models of Hinckley demonstrated some excellent model aircraft flying and, in conjunction with Brian Parkin, (G1EGD) sent back Aerial shots from an on-board Hitachi VKC2000 CCD camera to Alan Latham, (G8CMQ) of Solent.

Moving around the marquee I was suprised to see so many stands, In addition to Solent Scientific MICROWAVE MODULES displayed their new 50Mhz multimode transverter the 144/50Mhz. DAVTREND LTD, with their Slow scan T/V system, were giving some excellent demonstrations. From there I moved round to BARENCO who had a very good selection of hardware for Aerial systems, everything you could possibly need in the way of mounting brackets, guy ropes, mast supports etc. Then there was BRIAL SERVICES of Telford, (must buy the kid's a personal stereo each), seriously though they had a very good selection of bits and pieces. COMEX SYSTEMS LTD had on display their exciting new range of ATV modules as well as Satellite dishes & mounts at a Show Special price. On the stand in the afternoon was G3YQC's prototype of the new TVRO receiver described elsewhere in this issue. I understand that Comex are to market kits of parts for this project along with other associated items of hardware - at realistic prices - which is great news for satellite enthusiasts.

Getting ready to launch the model aircraft

Live pictures were sent back from both buggy and aircraft

G1EGD with his mobile TV buggy

DC TO LIGHT, who specialise in video products for the amateur, had several units on display as well as other products for amateurs in general. Jeffrey Borin had a good "junk" stand with all the usual bargains. MECHANELEC - the computer junk shop - from Widnes had DC power supplies at discount prices and ex-computer modules. P.L.M.COMMUNICATION SUPPLIES from Oldham had some interesting reconditioned CCTV equipment. A.KELLY, G3LVK from Bromsgrove, a member of the B.A.T.C, had a good range of ALINKO Amateur radio equipment to show and ASTLEY VIDEO SYSTEM'S, also a B.A.T.C member, are suppliers of new and second-hand equipment at competative prices. POOL LOGIC's stand of components and second hand equipment was well worth a visit and J.A.CREW from Milton Keynes had more than just a supply of nuts and bolts, it's well worth getting their new catalogue. Paul Sargent G4ONF from Norwich had an interesting range of mechanical test equipment and SJC VIDEO from Ilkeston had a good range of blank and pre-recorded video tapes. This completed my tour of the marquee (phew) which certainly seemed to have something for everyone.

A car boot sale outside is always an attraction, and this led me to, who else, but Brian Summers, G8GQS's O.B. Van which he has rebuilt to accommodate three extra colour monitors. Brian, also the treasurer of the BATC, was covering the lectures from inside the hotel, the video feed from his van was supplied to an I.T.N. OB van, thanks Brian for pointing out that video was also carrying inter/sync'sound. New committee member Bob Robson had his 'Carascanner' in use with cameras patrolling the lecture hall.

Now that the BATC annual show is getting so large I can only give a very brief mention of each exhibitor in these pages, the Editor reckons that twenty pages of show report might upset the balance or something! I hope I got everybody in though and, who knows, you might find yourself in one of G3XKX's super photographs.

(l to r) G6JFN, G8XTV, G3REH

Paul Elliott, G4MQS shows off the new ASTEC TVRO modules on the Comex Systems Ltd. stand

Slow-scan from (l to r): G3CCH, G3MSB, G8IYI

One word sums up the BATC show "CIVILISED". None of this pushing and shoving here, there was plenty of room to move around and everyone had the opportunity of seeing everything. Nice surrounding, good catering and hotel facilities, something for the kids to do but we could have done with a multi-story car park!

Lets hear it for the organisers: Frank Elliott, Trevor Brown, Paul Elliott, Mike Crampton and the BATC team not forgetting the 'official' photographer Deryk Wills and all those who helped make this 1986 BATC show the best yet. The lads from the Rugby Amateur Transmitting Society did a great job on the talk-in and, although they didn't get that many takers (we not being used to talk-in for BATC shows) they certainly smoothed the way for a number of members - thanks guys, hope you come again next year.

Oh hello John, I wonder who has spent the most, lets find the bar. 73 to you all and hopefully, by the time you read this, I too will be on the air.

Cheers Jen.

1986 GRANT DIXON AWARD

In 1984 the BATC introduced the GRANT DIXON AWARD' in order to pay tribute to a man who has, over many years, done a great deal for the club and amateur television. The award is made biennially at the regular general meeting and convention and is for the best article or articles published in CQ-TV between conventions.

G4ENA (left) talking to G4VYG at the BATC show at Crick this year

This year the prize went to Peter Asquith, G4ENA for his excellent series of slow-scan TV articles which described various modifications and add-on units for the popular G3WCY scan converter. Peter not only writes his work down so that others may benefit but also gives practical advice and encouragement to constructors as well as furthering the interests of SSTV.

Peter regularly exhibits his equipment at BATC shows and the photo shows him hard at work at this years event. An engraved trophy was presented at the BGM by CQ-TV's Editor John Wood, G3YQC and his name was added to the club's own commemorative shield.

THE PNP/NPN AS AN OUTPUT PAIR

By Bryan Dandy G4YPB

The use of a PNP/NPN output stage as shown in Fig.1 and Fig.2 is a very popular configuration, exhibiting, as it does, good linearity due to the high level of feedback as well as being easy to design for a particular gain. There are however a few points which must be taken into account for the circuit to work at peak efficiency.

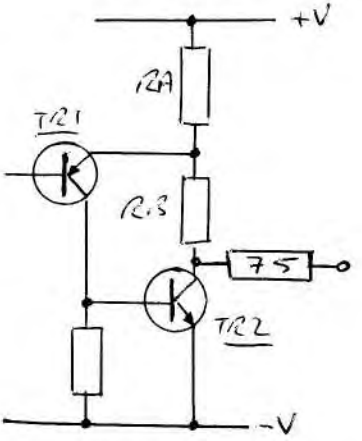

Fig.1

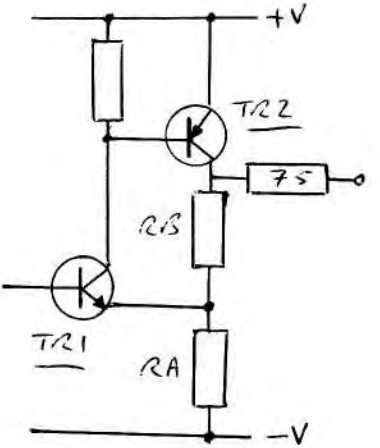

Fig.2

1. The output swing is not symmetrical. In the circuit shown in Fig.1 for example the output can be driven almost down to the negative rail, but the positive swings are limited by RA and RB in series with the load (see Fig.3). The same will be true for the circuit shown in Fig.2, where the output will swing from almost the positive rail to the negative rail minus that limited again by RA plus RB.

2. Dissipation in RA, RB and TR2 can be a problem, especially if using the circuits at +/-12 volts and driving several loads. One should remember that for the desired zero volts output half of the available HT voltage is across TR2 and half across RA/RB. Standing current needs to be limited to approximately 17mA for each 75-ohm load, thus four loads require a current of 68mA, causing a power level of 816mW (68m x 12v) to be dissipated in TR2 and also across RA/RB. It is my view that for small signal use such as video signals it is better to power the circuit from +/-5 volts. Also it is important to choose the correct circuit, video signals require a larger positive swing so the circuit shown in Fig.2 should be used.

3. The circuit has a finite source impedance Zo, albeit low, so all outputs must be terminated when adjusting overall gain. If it is required that the output voltage should not vary when connecting or disconnecting loads then one

must consider using paralleled output stages, if necessary one for each load, this will enable dissipation to be reduced accordingly.

CALCULATIONS AND CIRCUITS

The overall gain of the circuit can be calculated using the following equation,

$$\text{Gain} = (RA + RB)/RA$$

The values of RA and RB can be easily calculated as shown from the rail voltage and standing current. TR1's collector load resistor should carry at least as much current as that flowing through the base of TR2.

$$R = (0.65 \times H \times 1000)/Io\ (mA)$$

Where H is the minimum HFE for TR2 and Io is the standing current flowing through TR2 in mA. RA = RB = R/2, choose the nearest value for RA and RB to the preferred values available.

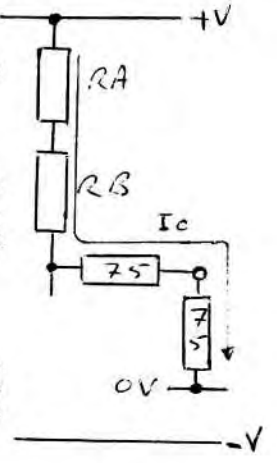

FIG. 3

BATC TAKES ON THE INTERNATIONAL

By Mike Wooding, G6IQM

As I mentioned in the last issue's contest news it has now been agreed with our European counterparts that the BATC shall take over the organisation of the International ATV contest.

For any of our newer members who may not be aware, this is the most important of the ATV contests held each year and the club is producing a special certificate which will be available to all entrants. At present the participating countries are Germany, Belgium, France, Holland and Great Britain and, subject to propogation conditions during the contest, many stations in these countries can be worked.

This year the contest is being held from 1800hrs on Saturday Sept.13th to 1200hrs on Sunday Sept.14th (local time) and is for stations transmitting Fast Scan TV on 70cm, 24cm and 3cm. There are separate sections for both transceive and receive only stations, so don't be put off if you are receive only. General contest rules apply (CQ-TV 133) and should you have any queries or suggestions then please contact me at the address given at the end of the contest news.

Remember, now that your club is running THE INTERNATIONAL your views and, even more importantly, your entries are vital if we are to continue the administration of this contest to the same high standards.

TV ON THE AIR

By Andy Emmerson G8PTH

A nice bulging file of letters means you have been busy sending in news and photos of activity on the air - thanks! Please keep it up, I'd much rather be forced to sub material down to make it fit in than be having to make it up ... In fact the slow-scanners among you seem to have taken my past remarks to heart because this time your news far outnumbers the remainder. Fine!

So down to business straightaway and we start with a detailed letter from Steve G4DVN in Werrington, Stoke-on-Trent. He says quite a few new ATV stations have sprung up over the last few years and some nights are quite busy with ATV pictures flying all over the place. Stations active most nights include G6IUH, G1DDA, G1OLX, G6UKP, G1DIP, G3OGD and G8KUZ. Steve has recently got back on 70cm and runs 100 watts p.s.p. to an 18 element parabeam. Best DX with this setup was a P3/P4 two way with F3YX back in December 1983.

From the most northerly tip of north Nottinghamshire, on the borders of Lincolnshire and Yorkshire, comes a letter from Dave Higginson G8JET. He is on the air "at last" and has a Fortop transceiver and a 48 element Multibeam. Stations worked so far include Ted G6HMS (North Hykeham), Dave G4DUB (Clowne) and Frank G3OS in Sturton-by-Stow. All these contacts were P3, over 20 miles or more.

Further afield lives Jose ON7TP in Liege - or Luik if you prefer. He has been involved with ATV since 1979 and in 1984 "had the bright idea of joining the BATC, giving me through 'CQ-TV' a lot of good material and infos. Pretty good mag!!!" I'm sure the editor feels flattered and in fact showing the magazine to others in his local ATV group led to their joining up as well. They are building a number of BATC colour test cards and note the circle is better than anything produced by a home computer.

Another long-distance letter comes from Michael ZL1ABS in Albany, Auckland (New Zealand). Alwyn ZL1TZV is (re-)building for 70cm ATV - and converting from 405 to 625 lines in the process! Nice to hear some people can still transmit 405 lines - can anyone else? In all there are eight new stations under construction in Auckland using the TV for Amateurs/CQ-TV 122 transmitter and an EPROM-based callsign generator. PCBs are provided by ZL1TVW (TV Wayne!), a leading ATV man in New Zealand.

Ian ZL1TOQ is in charge of the appeal to fund a TV repeater in Auckland, which is now nearly paid for. Its proposed site is the Klondyke Road Tower. Still on repeaters, the Wellington ATV repeater has just had its RF equipment renewed (all solid-state), in time for the national VHF Convention. The output incidentally is on 614 MHz and viewers need converters since most domestic TVs are fitted only with VHF tuners. When not in use the repeater sends an electronic ident, with a seven minute teletext bulletin of ham radio, ATV and propagation news every half hour. Longer monthly bulletins also go out over the repeater, as well as on 3.9MHz LSB.

From St. Leonards (Sussex) writes Tim Anderson G1JWR with news of the local Fun Day. Because most people were at work on April 1st they postponed their activity until the following Bank Holiday Monday and used the customary contest site, Fairlight Helipad. This is 160m a.s.l., just east of Hastings and right on the coast. Thanks to prior publicity they had plenty of contacts, of which 22 were two-way TV (all on 70cm). Best DX was Welwyn Garden City, though the French could not be raised on .750 or .170.

For a fun day the weather was appalling - torrential rain, snow, and three inches of hailstones at close of play. And then the van would not start! The G6HH/P team will be at it again from the same site during the September contest, and let's hope they have more luck next time ...

Back up to Staffordshire and activity on 24cm is gradually increasing thanks to GB3UD which is in beacon mode at present. Several stations are either building or buying equipment with activity already seen from G1DDA, G1OLX, G6UKP and G4DVN. Steve's equipment is 10W from a tripler into a Jaybeam (1296) 15/15 antenna; he intends to supplement the latter with the 1240-1280 MHz version for the bottom end of the band as soon as possible.

Steve has also been busy constructing a twin 2C39 P.A. and is just waiting for a video QSO to prove it can pass vision. Currently it is producing 70 watts out for 10W in, but Steve expects to improve on this. He will then be looking for a little more DX: at the moment semi-DX regulars include G3DFL, G8MTF and G6EHJ, all around P3/P4.

The "other Steve" G8JMJ should be installed in his new mountain-side location above Malvern by the time you read these words and looks forward to working the world from there. He - like Garry G4CRJ (High Wycombe) and Jeff G3CPP in Mildenhall - is getting very interested in 10 GHz FM video. Steve asks for suggestions for a good frequency to settle on - he is thinking of building a simple fixed-frequency transmitter and receiver. Drop me a line with any suggestions and we can have a forum of ideas. Garry says it's about time we knew where all the 3cm operators are - that way they might get to work each other! I'll willingly produce a map if you write in and identify yourselves ...

Keith Miles G1OTO is a new(ish) station in Mapperley (Nottingham) and is keen to make contacts. His equipment includes Solent 1W transmitter, Wood & Douglas complete receive system and 20 turn helical antenna. A 10W P.A. is under construction. There is not much activity locally and even GB3GV is not visible. However, G6YKC and G4ROB are constructing transmitters so things are looking up.

During April he went /P at Dorkett's Head to work Richard G8BWC. This was his first 24cm TV contact and was rewarded with P5 reports in both directions. The power was just 1.25W and G6YKC assisted, making recordings and playing them back on 70cm. Another new station is Dave McQue G4NJU in Bletchley; he is receiving the Dunstable repeater.

Participation in the May Day microwave contest was a little patchy, but one person who got out and about was Ivor G1IXE from Bristol. He took his 24cm gear to a high spot in the Quantocks near Minehead. Best DX was Roger G4ZQF back in Bristol, with a P4 report over the 62 km path.

Repeater news now, from G1JWR.The Sussex TV repeater is to be called GB3VI as GB3SX is still in use for the Crowborough beacon. The transmitter is virtually complete, while work will shortly start on the rest, G4BGQ making the hardware and G4BCO doing the software. As soon as the licence is received they hope to have the repeater in beacon mode.

First of all, I was delighted to see Grant Dixon around and about at Crick after his earlier fall. Steve G4DVN gets another mention under the SSTV heading and gets full marks for a very detailed letter on activity in his part of the world (the Potteries). He writes that Chris G4UDG, Paul G4UDH and himself will soon be active using homebrew Robot 400s. He intends to operate on 20M and 2M FM whilst Paul and Chris will be mainly on the HF bands (20-10M). Both Paul and Chris have built the G3WCY scan converter and although these work very well, pictures are slightly better when viewed on a 400. Incidentally it is possible to construct a 400 quite cheaply as most of the chips are still readily available. The trick sems to be in getting hold of the PCB for it: Robot UK say the 400 is now a discontinued line. Steve's own Robot lookalike is now almost finished.

John Feely G4MRB is making slow-scan contacts with the aid of an Oric 1 computer, which he says can be picked up very cheaply now. He uses a French program which he has modified somewhat - it does not seem to transmit with the Atmos though.

In the past I have covered the Essex SSTV Net, and now I have been sent details of a similar Middlesex net. On Wednesdays you are likely to pick up at least six people - Philip G1MOG in Ruislip, Roddy G3CDK in Wallington (that's Surrey!), Jim G3WGM in North Harrow, Vince G4WDF in Staines, Jack G3EFP in Pinner and Barry G4SJH in Hillingdon. They may also be found on the air at other times. Equipment in use includes Robots, Wraase SC-1s, the DRAE transceiver and software packages involving the Commodore 64 (RX4 prog by GW3RRI) and the BBC micro (using G3LIV's program and interface). There are lots of colour pix flying around, mainly space orientated! Some of these people also use the SC-1 for FAX type reception including weather pictures on VHF.

Yet another net, this time on South Humberside. John G3CCH reports activity most nights on 144.5 MHz involving GOCUI, G4NJI, G4SZX, G4KZQ, G6YBC, G1OZH, G4MWU, G8IYI, G4DMU and himself. The Wraase SC-1 seems to be the most popular converter in use, though Spectrums are also used. John's own SSTV equipment is all home-made to the designs of G4EQD (G8IYI). The mark 2 version, of which John can supply a detailed information sheet, receives Robot 1200 colour pictures as well as fax and weather satellites - a most versatile and economical unit. Sending and receiving SSTV by packet radio is also now being considered.

Dave Probert G4JBU had an unexpected contact when he took his slow-scan gear on holiday. His first CQ call was answered by Jouko Kytosaho OH5ZJ in Finland, who just happened to have some newspaper people in his shack researching a story on amateur radio. Dave sent me a photocopy of the resulting piece from the Finnish newspaper: it looks like a lengthy article complete with on-screen photo of Dave as received in Finland. Well done, we need publicity for our hobby! The transmitter was a TS520S incidentally, sending 80 watts to a long-wire strung between two trees. Frequency was 14.230 MHz.

Our usual SSTV stalwart, Richard G3WW has not failed us with information. He mentions the Sunday morning 3730 kHz SSTV net, which has been joined by G3IAI "after dusting off his Robot 400". Interesting DX worked by him included SM5DAJ, I0EMU, I7BNX, OE3JKA and HA5SX. On Mondays at 1930 we have the Fenland net on 144.5MHz and this has seen newcomers GOBNR (Ramsey St. Mary), G4WJB (Stanground, Peterborough) and G6SCD (Chatteris). All are welcome to join in, says Richard. Stations in Avon and Salop take part, as well as Cambridgeshire, Norfolk and Suffolk. The Wednesday evening Essex net has gone quiet - Richard hopes this is only temporary.(Richard sent in some more reports but space ran out - I'll run them next time if there's room.)

Dennis G6YBC writes from Atherton (Manchester) that eleven stations are active SSTVers in the north-west using WCY/ENA or Robot 400s. They have fairly regular skeds with G3CCH and G1OZH and have even managed to work G2BAR (when the local FMers honour the bandplan SSTV frequency of 144.500).

That's it for this time. We can do with a few more letters for the next roundup, so don't keep all the news to yourselves. Drop me a line at 71 Falcutt Way, Northampton, NN2 8PH or leave a 3 minute message on 0604-844130.

G6HH/P, the Hastings and Electronic Radio Club out mobile at Fairlight (Sussex). The clouds show typical contest weather!

SOFTWARE NOTEBOOK

7 - VIDEO FREQUENCY TESTING BBC

by John Goode

This program uses the red function keys to provide various frequency grids or a "multiburst" type of signal. Mode 0 is used to generate the grids as this gives the best resolution. The actual frequencies were calculated from the fact that the active line period on the Beeb is given as 40uS in the technical literature. They should only be taken as a guide, as the clock frequency on free-running micros can vary quite a bit; nevertheless, they should be within 5%. The nominal frequencies are (in MHz):-

0.5; 1.0; 2.0; 3.2; 4.0; 5.3; 8.0.

(Multiburst does not include 8MHz, and has 2.9 instead of 3.2 MHz).

The screen format includes a peak white reference at the bottom of the raster.

Unfortunately, there are a couple of restrictions that must be observed when using the BBC Micro for frequency-response testing. Obviously, the video output from the micro must be 'flat' up to 8MHz if the test is to mean anything. This is not the case if the UHF colour output is used; neither is it if the BNC output has been modified for encoded colour by linking across socket S39. The answer, if colour from the BNC is required, is to link S39 via a miniature toggle switch mounted on the rear of the computer, so that the monochrome mode can be re-selected for frequency testing. An alternative might be to take either the R,G or B outputs, but then some sort of arrangement for adding sync would be needed. An external coder is no good either, as it restricts bandwidth and adds subcarrier.

A further mod. that I have carried out to my Beeb is to add a 1000u,6v capacitor to the BNC output to remove the standing DC (about +2v) from the video output, as I have found that this can affect the biassing of some amplifers that have DC-coupled inputs.

THE LISTING

```
  10 REM FTEST
  20 REM Version 12-85
  30 REM by John Goode
  40 REM A video freq-response
test program.
  50 MODE 7
  60 *KEY0 MODE0|M PROCgrid(32) |M
  70 *KEY1 MODE0|M PROCgrid(16) |M
  80 *KEY2 MODE0|M PROCgrid(8) |M
  90 *KEY3 MODE0|M PROCgrid(5) |M
 100 *KEY4 MODE0|M PROCgrid(4) |M
 110 *KEY5 MODE0|M PROCgrid(3) |M
 120 *KEY6 MODE0|M PROCgrid(2) |M
 130 *KEY7 MODE0|M PROCburst|M
 140 *KEY8 MO.7|M PROCmenu|M
 145 *KEY9 RUN|M
 150 PROCmenu
 160 END
 170 DEFPROCmenu
 180 PRINT TAB(3,1);CHR$(141);
"A VIDEO FREQUENCY TEST PROGRAM"
 190 PRINT TAB(3,2);CHR$(141);
"A VIDEO FREQUENCY TEST PROGRAM"
 200 PRINTTAB(0,3);"N.B.- The signal
must be taken from the"
 210 PRINTTAB(0,4);"monochrome BNC
output.This must not have"
 220 PRINTTAB(0,5);"been  modified
for colour.  By the same"
 230PRINTTAB(0,6);"token, the UHF
output is not good enough"
```

```
  240PRINTTAB(0,7);"for frequency
testing."
  250 PRINTTAB(5,9)"KEY
f0.............0.5MHz grid"
  260 PRINTTAB(5,11)"KEY
f1.............1.0MHz grid"
  270 PRINTTAB(5,13)"KEY
f2.............2.0MHz grid"
  280 PRINTTAB(5,15)"KEY
f3.............3.2MHz grid"
  290 PRINTTAB(5,17)"KEY
f4.............4.0MHz grid"
  300 PRINTTAB(5,19)"KEY
f5.............5.3MHz grid"
  310 PRINTTAB(5,21)"KEY
f6.............8.0MHz grid"
  320PRINTTAB(5,23)"KEY
f7.............Multiburst"
  330 PRINTTAB(5,24)"(To return
to Menu...press f8)"
  340 VDU23;8202;0;0;0
  350 ENDPROC
  360 DEFPROCgrid(P%)
  370 CLS
  380 FOR X= 0 TO 1280 STEP 2*P%
  390 DRAW X,1024: PLOT85,X+P%,
1024:MOVE X,0 :PLOT85,X+P%,0
  400 MOVE X+(2*P%),0
  410 NEXT X
  420MOVE 0,0: MOVE 0,200:
PLOT85,1280,200
  430 MOVE 1280,0 : PLOT 85,0,0
  440 PRINTTAB(35,28);
"FREQ="16/P%"MHz"
  450 VDU23;8202;0;0;0
  460 ENDPROC
  470 DEFPROCburst
  480 CLS
  490 FOR X=0 TO 224 STEP 64
  500 DRAW X,1024: PLOT85,X+32,
1024:MOVE X,0 :PLOT85,X+32,0
  510 MOVE X+64,0
  520 NEXT X
  530 FOR X=240 TO 440 STEP 32
  540 DRAW X,1024: PLOT85,X+16,
1024:MOVE X,0 :PLOT85,X+16,0
  550 MOVE X+32,0
  560 NEXT X
  570 FOR X=456 TO 656 STEP 16
  580 DRAW X,1024: PLOT85,X+8,
1024:MOVE X,0 :PLOT85,X+8,0
  590 MOVE X+16,0
  600 NEXT X
  610 FOR X=661TO 880 STEP 11
  620 DRAW X,1024: PLOT85,X+5,
1024:MOVE X,0 :PLOT85,X+5,0
  630 MOVE X+11,0
  640 NEXT X
  650 FOR X=881 TO 1079 STEP 8
  660 DRAW X,1024: PLOT85,X+4,
1024:MOVE X,0 :PLOT85,X+4,0
  670 MOVE X+8,0
  680 NEXT X
  690 FOR X=1080 TO 1280 STEP 6
  700 DRAW X,1024: PLOT85,X+3,
1024:MOVE X,0 :PLOT85,X+3,0
  710 MOVE X+6,0
  720 NEXT X
  730 MOVE 0,0: MOVE 0,200:
PLOT85,1280,200
  740 MOVE 1280,0 : PLOT 85,0,0
  750 PRINTTAB(0,25)" (4sp)
0.5MHz (8sp) 1MHz (10sp) 2MHz
(8sp) 2.9MHz (10sp)          4MHz
(7sp) 5.3MHz (4sp) "REM see NOTE.
  760 VDU23;8202;0;0;0
  770 ENDPROC
```

NOTE that in line 750,(which labels the multiburst frequencies), the instructions in brackets "(8sp),etc" are the number of spaces required between the legends, and are NOT part of BASIC.

MORE ON THE "HANDBOOK-2" CHARACTER COLOURISER

By B. J. Dandy G4YPB

Having built the character colourizer from Handbook vol.2 (also featured in the revised Amateur Television Handbook) I have made a few modifications which may be of interset to other constructors.

The circuit as shown in the handbook uses a line-locked oscillator. Whilst this performs satisfactorily it does have the disadvantage of causing the first of the colour bars to be too wide. A solution to this problem is to put a monostable with an adjustable period, shorter than that of line blanking, into the Mixed Blanking feed to the oscillator. This allows the oscillator to start earlier and, by selecting a value for R1, the length of the first colour bar can be adjusted (Fig.1).

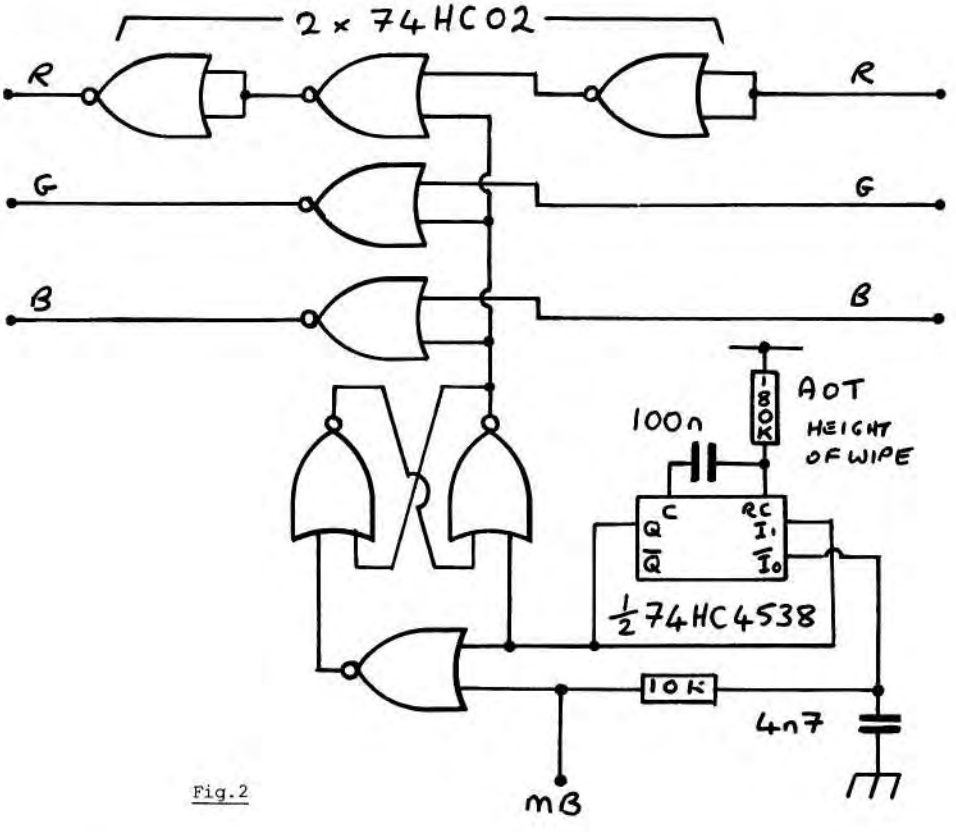

Fig.2

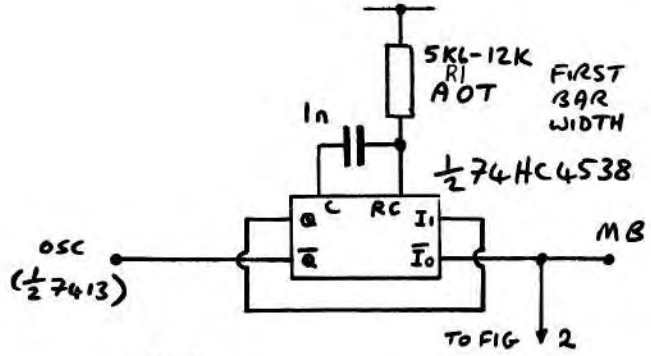

Fig.1

A second modification was to correct the order of the colour bars, starting with white on the left of the screen. In order to achieve this, as well as replacing the lower 74157 with a 74158 as described in the handbook, it was found that the background colour switch needed to have complementary outputs. Also it was thought useful to have a red 'wipe' at the bottom of the screen for superimposing captions.

If the network shown in Fig.2 is inserted between the 74193 and the lower 74157 then the colour bars will be corrected and the wipe' added, the latch being line-locked for a tidy transition from bars to wipe. Fig.3 shows the circuitry for adding the modifications shown in Figs.1 & 2.

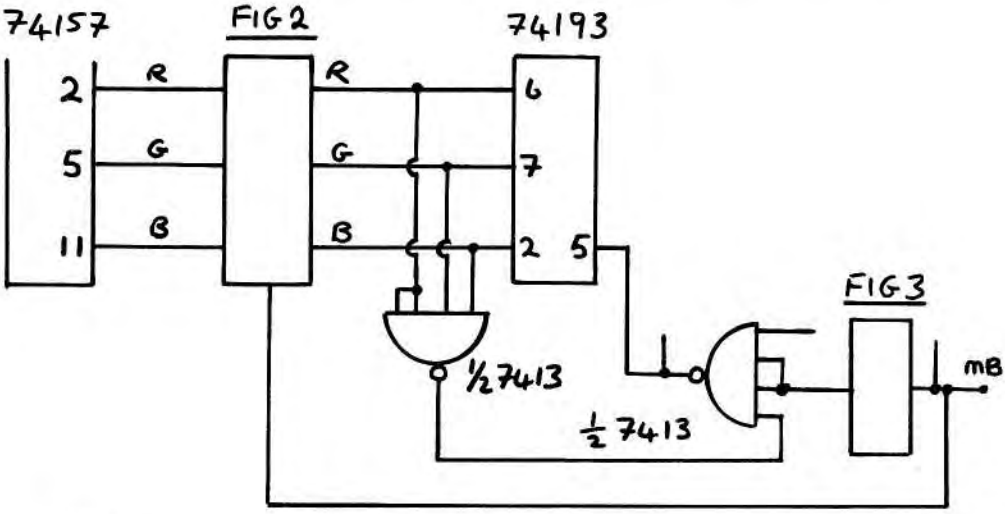

Fig.3 PART OF CHARACTER COLOURIZER

24CM JOTTINGS

Editor

As part of my general correspondence with readers I sometimes manage to glean helpful hints, suggestions or ideas from them. Though they are not always enough to use by themselves in CQ-TV I nevertheless put them to one side for later consideration.

This item is a collection of such notes, mainly from LA8AK and John Goode, which may provide food for thought and the basis for practical experimentation for those working in the field of FM-TV.

PRE/DE-EMPHASIS

Several readers have enquired or commented on whether the full CCIR pre-emphasis system is appropriate for use by amateurs. I don't really know the answer to this but I suspect that it rather depends on the signals being used (narrow or wide deviations etc) as well as the expected level of received signals.

John Goode suggests that around +6dB lift at 5MHz is probably more appropriate. For those wishing to try this out a circuit for a de-emphasis network is given in Fig.1 which simply replaces the conventional CCIR values with new ones. Don't forget that a corresponding pre-emphasis network must be used at the transmitter.

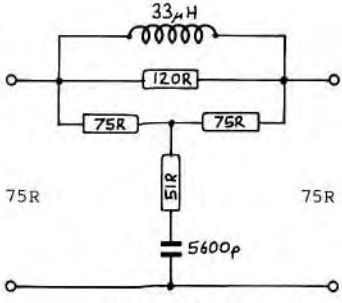

Fig.1 DE-EMPHASIS NETWORK TO GIVE +6dB AT 5MHz.

LA8AK suggests that some modulator circuits may in fact produce frequency boost or rolloff at certain frequencies due to the amplifiers not have a wideband linear response. He suggests that the circuit shown in CQ-TV132 (pp11) has a 6dB falloff at 5MHz due to the 1k resistor and effective parallel capacitance of around 30pF at the output of Tr2. (In fact a later issue recommends that the 1k be replaced with a RFC). Compensation for this may be achieved by the addition of a series resistor/capacitor combination from TR2's emmitter to ground, although LA8AK does mention that a certain amount of compensation will be made by the preceding CCIR network.

Fig.2 shows LA8AK's suggestion for an alternative circuit which does away with the CCIR network and provides an adjustable alternative network instead. The reason that the pre-emphasis should be adjustable is so that correction can be made to suit the particular circuitry in use.

A 'TURNS CANCELLING' OSCILLATOR

This oscillator is a version of one by GW3JNA which appeared in Rad Com (8/72) and has been modified for FM-TV by LA8AK who describes the modulator as 'flat band'. The circuit is shown in Fig.3.

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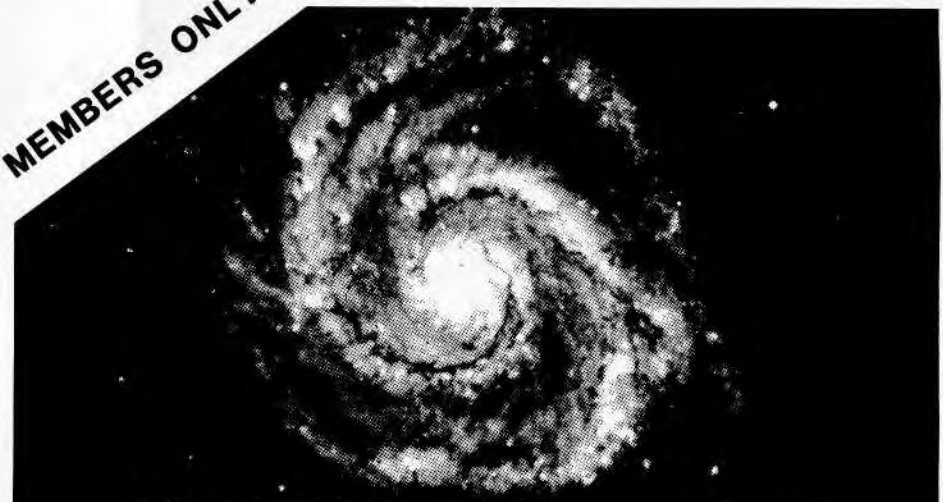

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4054	0.80
4059	3.00
4060	0.60
4063	0.85
4066	0.40
4068	0.25
4069	0.25
4070	0.25
4071	0.25
4072	0.25
4073	0.25
4075	0.25
4076	0.70
4077	0.25
4078	0.25
4081	0.25
4082	0.25
4093	0.40
4099	1.00
4175	1.00
4502	0.60
4503	0.40
4504	1.00
4506	1.00
4507	0.40
4508	1.20
4510	0.50
4511	0.50
4512	0.50
4514	1.10
4515	1.10
4516	1.10
4518	0.50
4520	0.60
4521	1.10
4522	1.00
4526	0.70
4527	0.80
4528	0.70
4529	1.00
4531	0.90
4532	0.70
4534	3.60
4536	2.50
4538	0.80
4539	0.80
4543	0.70
4549	4.00
4553	2.40
4554	1.90
4555	0.35
4556	0.50
4557	2.50
4558	1.20
4560	1.40
4561	1.00
4566	1.40
4568	2.40
4569	1.70
4572	0.45
4581	1.25
4582	1.00
4583	1.00
4584	0.50
4585	0.60
4599	1.50
40014	0.50
40085	1.00
40097	0.40
40098	0.40
40100	1.50
40101	1.30
40106	0.50
40161	2.00
40162	1.00
40174	0.80
40175	0.80
40192	0.80
40193	0.80
40195	0.80

TRANSISTORS & FET's (numeric order)

VN10KM	0.60
MPSA12	0.60
MPSA13	0.60
BSX20	0.20
TIP31A	0.30
TIP32A	0.30
BLY33*	2.95

(* while stocks last)

BFR34A	1.20
TIP41A	0.50
TIP42A	0.50
BFY50	0.25
BFY51	0.30
BFY52	0.30
2SJ50	5.95
2SK55	0.32
MPSA63	0.60
VN66AF	1.80
BCY72	0.25
3SK85	0.80
3SK88	0.60
TIS88A	0.30
BFY90	0.90
BFR90	1.00
BFR91	1.00
BLV91	10.53
BFW92	0.60
BLV93	17.97
BFT95	1.00
BFR96	1.20
BFR96S	1.80
BLU98	2.18
3SK124	3.95
2SK135	5.95
BD139	0.30
BD140	0.30
BD165	0.30
BD166	0.30
2SK168	0.30
J176	0.60
BD179	0.30
BD180	0.30

– THE RADIO PEOPLE –

(Transistors cont.)

BC182	0.10
BC183	0.10
BC184	0.10
BC184L	0.15
3N201	0.85
3N211	1.00
BC212	0.10
BC214L	0.15
MRF237	3.95
BC237	0.10
BC238	0.10
BC239	0.10
BF241	0.20
BF244C	0.30
BF245	0.30
BF256L	0.20
BF256S	0.20
BF273/4	0.20
BC307	0.10
BC308	0.10
BC309	0.10
J310	0.60
BC327	0.15
BC328	0.15
BC337	0.15
BF362	0.30
BF368	0.20
BF395	0.20
BC413	0.10
BC414	0.10
BC415	0.10
BC416	0.10
BC440	0.25
MRF475	3.95
BF479	0.60
BC546	0.15
BC547	0.15
BC550	0.15
BC556	0.15
BC558	0.15
BC560	0.15
BC639	0.20
BC640	0.20
BF679	0.60
2N918	0.85
BF960	0.99
BF961	0.70
BF981	0.85
MGF1202	16.00
2SC1306	1.95
MGF1402	18.00
PT1811	17.00
2SC1945	4.10
2SC1971	4.10
2N2222	0.30
TP2320	17.00
2N2369	0.30
2N2905	0.30
2N3053	0.30
HXTR3645	10.28
2N3819	0.30
2N3866	1.20
2N3905	0.30
2N4427	1.65
2N5179	0.60
40238	0.80
NE41137	3.95
NE85637	3.53

VOLT. REGULATORS

LM317T	1.95
LM723	0.50
7805	0.40
7806	0.50
7808	0.50
7812	0.40
7815	0.40
7818	0.50
7824	0.40
7905	0.50
7906	0.50
7908	0.50
7912	0.50
7915	0.50
7918	0.50
7924	0.50
78L05	0.40
78L08	0.50
78L12	0.40
78L15	0.40
78L18	0.40
78L24	0.40
79L05	0.50
79L12	0.50
79L15	0.50

DIODES

1N4001	0.05
1N4002	0.05
1N4003	0.05
1N4004	0.06
1N4007	0.10
1N4148	0.05
1N5404	0.10
BA244	0.20
BA479	0.30
PW02	0.60
OA91	0.10
W005	0.30

VARICAP DIODES

BB105	0.30
BB109	0.30
BB204	0.36
BB205	0.30
BB209	0.30
BB212	1.92
BB405B	0.32
KV1225	2.57
KV1235	2.57
KV1236	2.12

LINEAR IC's (numerical)

MF10	5.10
S041P	1.69
S042P	1.89
TL071	0.49
TL072	0.84
TL074	1.10
TL081	0.40
TL082	0.48
TL084	0.86
L149	1.85
U237	1.50
U247	2.50
U257	1.25
U267	1.25
LM301	0.40
LM308	0.60
LM311	0.45
LM324	0.40
LM339	0.65
LM346	3.50
LM347	1.20
LM348	0.60
LF351	0.50
LF353	0.80
LM380(8-PIN)	1.20
LM380(14-PIN)	1.40
LM381	1.80
LM382	1.80
ZN419C	1.80
ZN423	1.40
ZN425	3.50
ZN426	3.00
ZN427	6.00

TELEX ORDERS - 936263 BONEX G

(Linears cont.)	
ZN428	4.50
ZN429	2.50
ZN432	25.00
ZN433	22.00
ZN450	7.50
NE542	2.50
NE544	1.80
NE555	0.25
NE556	0.60
SL560C	2.20
NE565	1.20
NE566	1.50
LM567	1.30
LM571	4.00
U664	2.27
U665	3.16
U666	2.43
LM709(14)	0.90
LM741	0.25
UA741	0.75
LM747	0.75
LM748	0.40
TBA820M	1.00
TDA1028	2.00
ZN1034	2.00
LM1035	6.00
TDA1054	1.50
TDA1062S	2.00
TDA1072	2.50
TDA1074	5.00
TDA1083	1.80
HA1196	0.80
HA1197	1.00
LA1240	1.00
HA1388	2.50
MC1458	0.45
MC1495	2.10
MC1496	1.20
SL1610	4.00
SL1611	3.07
SL1612	4.60
SL1613	2.06
SL1620	2.17
SL1621	P.O.A
SL1623	3.50
SL1625	2.90
SL1630	1.62
SL1640	4.50
TDA2002	1.50
ULN2240A	3.25
ULN2242	3.00
ULN2283	1.40
CA3080E	1.50
CA3089	2.50
CA3123	1.50
CA3130E	0.80
CA3140E	0.80
CA3189	2.50
MC3357	2.85
MC3359	2.95
KM3701	85.00
KM3702	89.00
ULN3859	2.50
LM3900	1.00
LM3914	4.10
LM3915	4.10
KB4400	0.90
KB4412	1.80
KB4417	1.80
KB4420	1.50
TDA4420	1.50
KB4424	1.00
KB4431	1.50
KB4432	1.50
KB4436	2.50
KB4437	1.50
KB4438	1.50
KB4441	1.20
KB4446	2.50
KB4448	1.50
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SD6000	3.50
SL6270	2.75
SL6440	4.00
SAS6610	1.50
SL6640C	2.50
SL6691	3.50
SL6710	1.48
ICM7555	1.00
SP8629	3.85
SP8647	6.00
SP8793	7.70
MSL9362	1.75
MSL9363	1.75
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TK10321	1.85
TK10350	1.95
TK10420	1.99
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HD44752	8.00
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MC145152	12.00
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SBL-1	5.95
SBL-1-8	11.10
SBL1X	12.00
SRA1	13.50
SRA1.1	19.75
SRA1H	23.00
SRA3	21.00

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T50-2	0.40
T68-2	0.40
T94-2	0.60
T37-6	0.30
T50-6	0.40
T68-6	0.40
T130-6	1.20
T50-12	0.40
T37-12	0.36

This list shows only some of the components normally in stock. Other items include: INDUCTORS; HELICAL FILTERS; CERAMIC FILTERS; VIDEO FILTERS; CRYSTAL FILTERS; TOKO COILS; VARIABLE INDUCTORS; KITS; MODULES etc. Please phone for items not shown here.

ORDERING DETAILS:

U.K.customers; please add 15% VAT to the total plus 0.30p post and packing.

Orders should be sent to:
BONEX LTD., 102 CHURCHFIELD ROAD,
ACTON, LONDON W3 6DH

Tel: 01-992 7748 01-993 7631

VISA

Access

QTY	SLOW-SCAN TV	EACH	P&P	TOTAL
.....	G3WCY SSTV to FSTV RX converter & reprint	£10.set	0.60	.....
.....	G4ENA mods for above (CQ-TV127) - set of 4	£5.set	0.30	.....
.....	G4ENA SSTV transmit board (CQ-TV129) (Add-on to G3WCY converter) NB: Incorporates LSC and width circuit as in G4ENA SSTV mods. PCB set (above).	£6.00	0.30	.....
.....	G4ENA SSTV aux board (CQ-TV130)	£2.00	0.20	.....
.....	G8CGK SSTV pattern generator - inc. notes	£3.00	0.30	.....
	STATIONERY, ACCESSORIES AND COMPONENTS			
.....	BATC test card - with data sheet	0.50	0.24	.....
.....	BATC reporting chart (illustrated)	0.12	0.20	.....
.....	BATC lapel badge - diamond - button hole	0.40	0.17	.....
.....	BATC lapel badge - round - pin fastening**	0.50	0.17	.....
.....	BATC callsign badge - pin fastening (Please print callsign clearly)	£1.50	0.17	.....
.....	BATC key fob	0.60	0.17	.....
.....	BATC equipment stickers - 1" round	0.15	0.17	.....
.....	BATC windscreen stickers - 2.5" round	0.10	0.17	.....
.....	Surplus delay lines (not KT-3) **	0.40	0.20	.....
.....	13.14MHz TV TX crystal (HB2)	£5.00	0.17	.....
.....	108.875MHz TV TX crystal (TVA)	£7.00	0.17	.....
.....	5MHz SPG crystal for P100 (CQ-TV 100)	£2.75	0.17	.....
.....	2.5625MHz SPG crystal for ZNA134 (HB2)	£2.75	0.17	.....
.....	4.433618MHz PAL colour subcarrier crystal	£2.75	0.17	.....
.....	TBP28L22 PROM for test card circle.	£10.00	0.25	.....
.....	2732 E-PROM. SSTV program (HB2)	£12.00	0.17	.....
.....	2716 E-PROM - programed as a substitute for 74S262 (see mod in CQ-TV132)	£5.00	0.17	.....
.....	2716 E-PROM - programmed for Teletron VIU	£5.00	0.17	.....
		TOTAL THIS PAGE		£.....

TOTAL FOR GOODS £.....

TOTAL POSTAGE £.....

TOTAL ENCLOSED £.....

*SPECIAL NOTICE - Some of the PROM's for the test card circle have been incorrectly programmed by our suppliers. If you have purchased a TBP28L22 from the BATC between Oct 84 & Aug 85, please contact Members Services as soon as possible.

ORDERING INFORMATION

OVERSEAS MEMBERS should ask for a quotation of postage costs and acceptable forms of payment BEFORE ordering from Members Services. Please enclose an International Reply Coupon for reply.

PUBLICATIONS must be ordered SEPARATELY from the Publications Department on the form provided in this magazine.

CHEQUES should be made payable to "BATC" and should be for English banks only please, in £ sterling.

ORDERS PLEASE TO:- Mr. P.Delaney. 6 East View Close, Wargrave, BERKS RG10 8BJ, England. Tel: 073 522 3121 (evenings/weekends only please)

BLOCK LETTERS PLEASE

name	callsign
address	
	post code

HB1 = ATV Handbook (blue); HB2 = ATV Handbook vol.2, or revised edition; TVA = TV for Amateurs; MTP = Micro & Television Projects.

All Club crystals are HC18/U (wire ended).

Items from these lists can ONLY be supplied to CURRENT members of the BATC. These lists supercede all previous ones. Components for club projects are not available from Members Services unless contained within these lists.
Items marked thus: ** are available only until present stocks are exhausted.

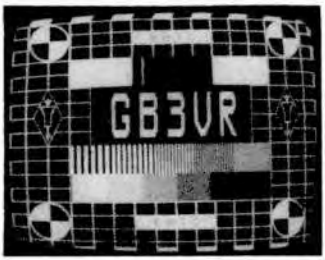
BATC INCOME AND EXPENDITURE ACCOUNT - YEAR ENDING 31 DEC.1985

Expenditure	1984	1985	Income	1984	1985
CQ-TV Printing	4172.57	5561.12			
CQ-TV Postage	2625.89	2524.91	Subscriptions	6859.27	8657.00
General Office exp.	591.22	722.25	Advertising	271.50	238.28
General Post	1038.81	1193.07	Interest	825.11	793.98
RSGB Aff. Fee	8.70	9.90	Miscellaneous	17.33	48.50
Comm. Expenses	247.58	94.96	Members Services	1829.73	2159.16
EXHIBTION & ADVERTS	1676.63	1267.06	Publications	1848.61	2318.29
Insurance & AWARDS	169.99	260.98			
Depreciation	827.22	3097.28	EXHIBITION INCOME		208.00
AWARDS (1984)	38.87	0.00	POSTAGE RX.	643.25	908.90
Prestell & Hot Line	99.49	28.91	DONATIONS	218.00	109.18
	11496.97	14760.44		12512.80	15441.29
Surplus	1015.83	680.85			
	12512.80	15441.29		12512.80	15441.29

BATC BALANCE SHEET at 31 DEC. 1985

liabilities	1984	1985	Assets	1984	1985
Accumilated fund	13897.15	14912.98	Stocks M. S.	2164.01	3374.67
Add surplus	1015.83	680.85	Stocks Publications	1771.40	2004.50
	14912.98	15593.83	Debtors	485.00	186.50
			Office Machines	827.22	3097.28
Current Liabilities			Depreciation	-827.22	-3097.28
			Investments	11582.30	10876.28
			Cash at Bank	3824.27	4360.13
Subs In Advance	4914.00	5308.25	CASH IN HAND & STAMPS	0.00	100.00
	19826.98	20902.08		19826.98	20902.08

THE WORTHING AND DISTRICT VIDEO REPEATER GROUP

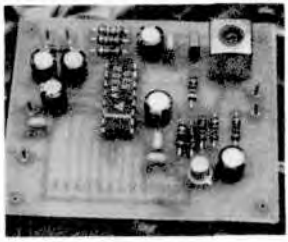


BATC TYPE

TEXT

IBA TYPE

VIDEO AGC KIT THIS UNIT WILL CORRECT VIDEO SIGNALS IN THE RANGE OF 0.15 TO 2.00 VOLTS PEAK TO PEAK TO THE STANDARD 1 VOLT LEVEL. THIS DESIGN TO OUR KNOWLEDGE IS UNIQUE AND WILL COMPLIMENT YOUR STATION. £16.00 inc P&P. SEND AN SAE FOR MORE DETAILS.



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EPROM SERVICE FOR THE CROPREADY TEST CARD GENERATOR. A FAST RELIABLE SERVICE AND A RANGE OF EPROMS INCLUDING BATC TYPE, TEXT, IBA TYPE. THESE EPROMS ARE TO THE FULL (I) STANDARD SEND FOR AN ORDER FORM OR PHONE GEOFF ON (0903) 32161 BETWEEN 7PM AND 8PM ANY DAY. THE COST OF THE EPROM SERVICE IS ONLY £5.00.

THE "NEW ATV" PROGRAM FOR THE 48K SPECTRUM. THERE ARE NOW OVER 60 COMMANDS ON THIS VERSION, WHICH INCLUDE 7 TESTCARDS, MEMOPAD, CLOCK WITH ALARM, MAPS, TONES, QRA CALC, FLAG CROSS HATCH, SCREEN PRINTING, PLUS MANY MANY MORE FEATURES. ALL THIS PLUS A SMALLER 16K VERSION ON SIDE TWO FOR ONLY £6.00.

THE WORTHING AERIAL KIT
THE KIT HAS ALL THE DIFFICULT PARTS PRE-DRILLED AND IS IDEAL FOR ATV REPEATERS. THIS AERIAL HAS BEEN USED FOR OVER THREE YEARS BY MEMBERS OF THE GROUP AND HAS PROVED MOST SUCCESSFUL. THE AERIAL KIT COMES COMPLETE WITH STAIGHT FORWARD INSTRUCTIONS AND SHOULD ONLY TAKE AN HOUR OR SO TO BUILD. THE AERIAL KIT COSTS £14.95.

ORDERS SHOULD BE SENT TO MR. R.STEPHENS (TREASURER OF GB3VR) TOFTWOOD, MILL LANE, HIGH SALVINGTON, WORTHING, SUSSEX.

ALL PRICES INC P&P. IF MORE DETAILS REQUIRED PLEASE SEND AN SAE.

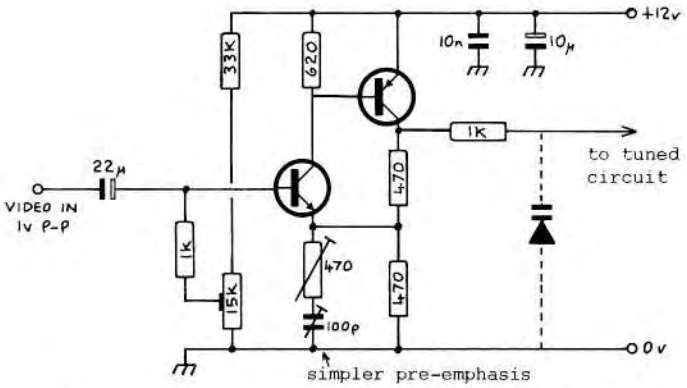


Fig.2 ALTERNATIVE VIDEO AMPLIFIER FOR CQ-TV 132 FM-TV GENERATOR.

The Oscillator operates on a nominal frequency of 35MHz and has a maximum peak frequency deviation of +/- 4MHz at 35MHz. This is sufficient in a system where the IF is mixed with a local oscillator and multiplied at least 4 times up to the output frequency.

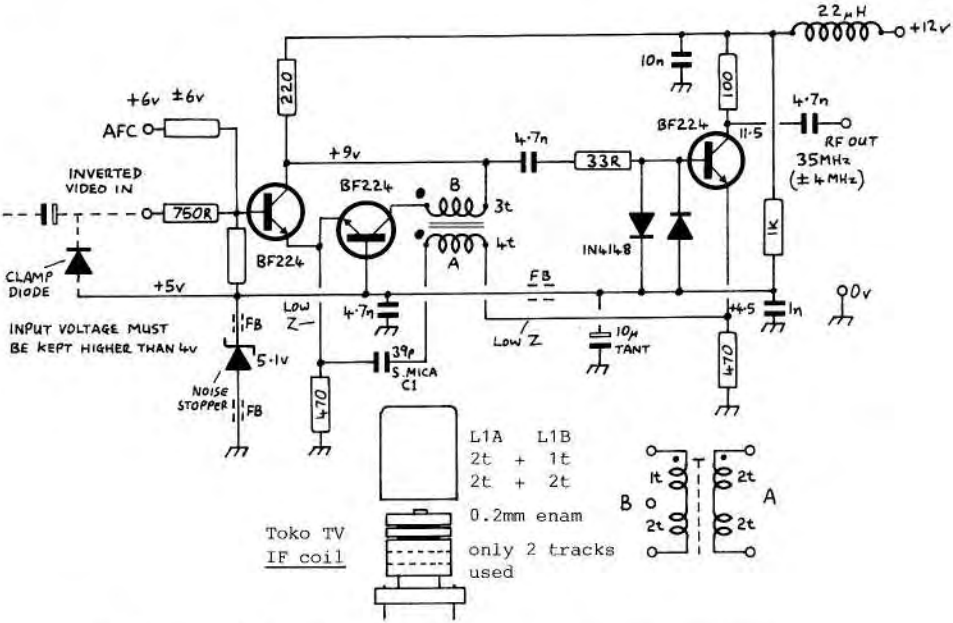


Fig.3 FM ATV MODULATOR FOR 35MHz ("reduced deviation")

A Toko IF coil former (pot core) was used for the prototype, since it is easy to tune. Some sort of trimming capacitor might be used for C1 but this would increase the component lead length. To change the frequency C1 may be reduced to around 27pF where the circuit will oscillate between 70 and 90MHz. The use of an iron dust core would increase the mutual inductance, hence the tuning ratio. This is believed to be necessary for 70MHz use.

Modulation sensitivity with a 750-ohm input resistor was not too high so another amplifier must be used and the resistance value altered for minor RF isolation. An inverted signal should be fed to the input, but it is also possible to connect the modulation input to the second transistor. LA8AK believes that it is better to use an inverting/matching transistor (PNP) to drive the modulator. The input voltage must be kept higher than 4v (5v being typical).

One problem when designing the prototype PCB was to make leads short at high-frequency carrying points through the oscillator to prevent it from spurious effects or instability, this would be made worse if a trimming capacitor with a parallel silvered mica capacitor were used.

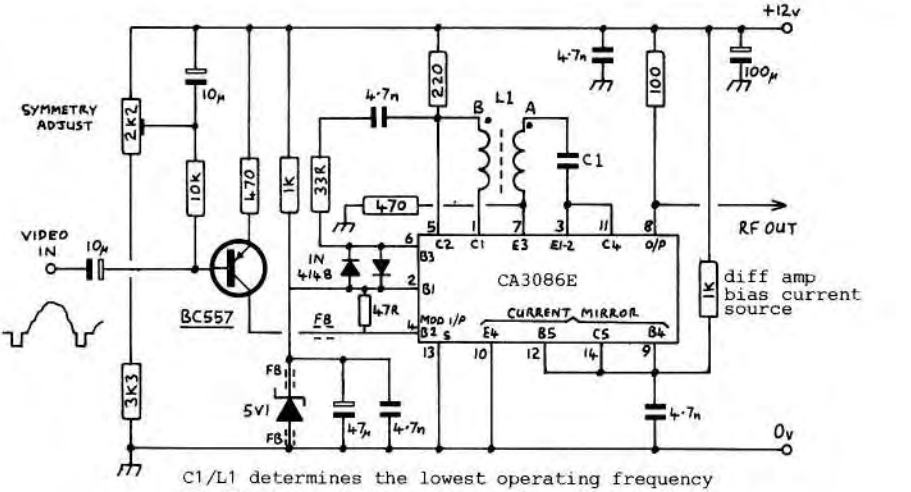


Fig.4 FM ATV IF MODULATOR (proposed)

Perhaps it might be better to use an IC such as the CA3046 or the CA3086 (Fig.4)? Neither was available so it has not been possible to try the circuit yet. The CA3086 contains discrete transistors arranged in a differential pair and 3 separate transistors, where one transistor must have the emitter connected to ground (substrate), therefore it was found reasonable to use a diode as a current mirror.

The frequency response is probably not linear down to the lowest operating frequency, so some sort of biassing for the input signal must take care of some voltage centering (symmetric modulation). The use of the PNP transistor seems to have only one disadvantage; that the signal reference is +12v, but

when some preceding amplifiers use NPN transistors, a well regulated power supply unit is a must.

LA8AK also mentions that the use of varactor multipliers for 24cm is a very inefficient and old-fashioned way of increasing frequency. Surely with all the members experimenting in this field someone has come up with a suitable transistor multiplier? Anyone with such a design is invited to send details to CQ-TV magazine.

A RADIO MIC'

By Cyril Chivers

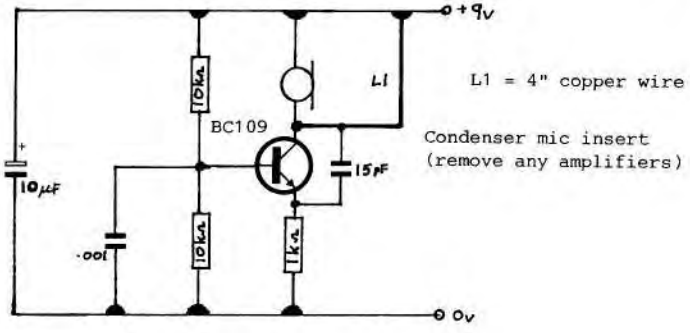
This little circuit only takes an evening to build from components which can probably be found in the junk box. A radio microphone is a very useful device for ATV'ers since it allows freedom from trailing wires as with a conventional mic.

This unit is intended for short-range use in the domestic VHF broadcast band so that any VHF transistor radio can receive the high quality audio it produces.

The circuit uses a straightforward series-resonant oscillator employing a high frequency transistor such as a BC109 or BFY90 etc. L1 is a 4" length of copper wire, around 18 or 20 guage, which may be bent to a suitable shape if required. It should be rigidly supported for stability. The required frequency is simply set by altering the length of this wire. The microphone insert is an electret type having any pre-amplifier stages removed prior to use.

In its simplest form L1 serves as the radiating aerial, however, if you want to put it in a small box, possibly housing a PP3 battery as well, then it should be quite easy to attach an aerial either capacitively from L1 or (preferably) by inductive coupling. A quarter-wave length of wire should then be sufficient as an aerial.

Be careful when setting the frequency that it does not interfere with any broadcasting stations receivable in your area! Range should be around 50 metres.



HORIZONTAL OR VERTICAL..?

THAT is the question

Was it such a good idea to go for horizontal polarisation for 24cm ATV repeaters?

When TV repeaters were first mooted several years ago the decision to use horizontally polarised aerials was based on existing practices, namely: Compatibility with existing 23cm aerials hitherto used for speech communication, and an attempt to standardise ALL ATV aerials to horizontal, probably in order to allow a single installation to be employed for both simplex and repeater working. The question now is "have we now boxed ourselves into a corner?"

Some repeater groups, particularly those situated inland, are keen to increase their area coverage and, to that end, are looking at available aerial systems. The Leicester Group, for example, have spent considerable time in examining such systems and have concluded that the Alford slot seems about the only practical way of providing omni-directional coverage whilst exhibiting some gain. The use of beam aerials, even three or four pointed in strategic directions, poses considerable problems with matching and phasing etc, not to mention 'holes' in the polar pattern.

Now if we were to use VERTICAL polarisation then we could draw on the experience of narrow-band repeater groups. We would then find several designs to choose from, each one capable of good area coverage and with considerably more gain than the Alford slot.

Of course there will be something of a conflict with existing repeater users in that some are using horizontally polarised aerials at their station. Yes of course this will inevitably happen but, considering the ralatively few stations affected, it would surely not be a reason to stop the implementation of such a significant improvement. Many existing stations though use helical aerials and they of course will notice no difference whatsoever.

Of late there has been a considerable increase in mobile and fixed mobile operation into the repeaters; have you ever tried fitting a horizontal aerial with omni-directional coverage to the roof of a car?

If we are going to make a change then NOW is the time to do it. At present there are only two repeaters permanently on the air, the others being in various states of readiness or awaiting the official go-ahead. Many more are only yet being planned so there would be very little upheaval if we changed now. The Leicester Group, for instance, would welcome such a move and they are one of the two operational repeaters.

Repeater groups and users (prospective and active) are urged to consider this proposal and voice their feelings on the matter. Letters and phone calls can be directed to CQ-TV magazine (G3YQC - address at the front of the mag.) where they will be passed on the the appropriate personnel.

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SQUARE ONE

Part-2

by John Lawrence GW3JGA

In Part 1, two basic methods of interconnecting video equipment were discussed, one using a central Sync Pulse Generator (SPG) to synchronise all the picture sources by 'looping through', and the other using a video camera as the source of synchronising signals and 'slaving' other picture sources to it, using using its sync and colour burst - generally called 'black & burst' or 'colour black' synchronising.
The SPG arrangement in Fig.4 (CQ-TV134), which provides four signals (MS, MB, HD & VD), is for monochrome TV. The same system for colour would require three additional signals; Burst Gate (BG), Vertical Axis Switch (VAS) and Colour Sub-carrier (CSC). It is the extra problem of having to distribute these seven separate signals which makes the single 'colour-black' signal an attractive alternative for colour. No matter which method or mixture of methods is used, all picture sources will need synchronising and all video signals will need to return to the switcher or mixer.

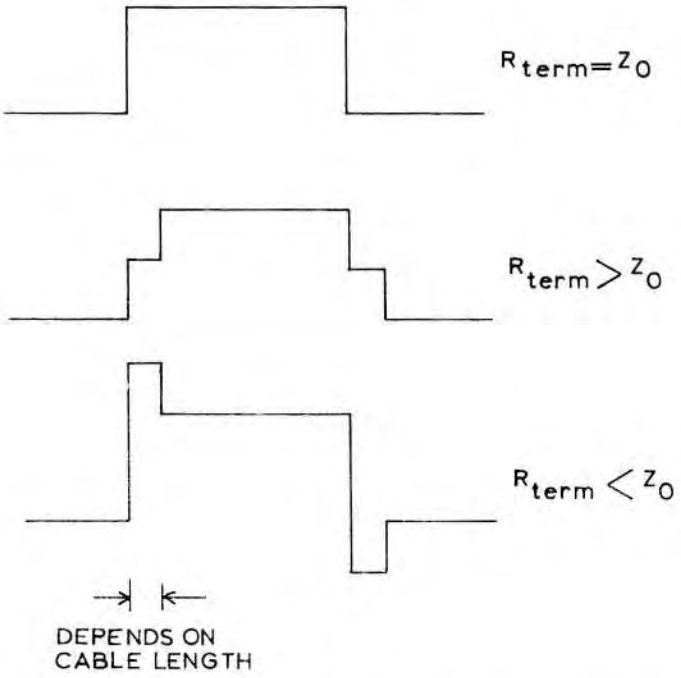


FIG.6. DISTORTORTION CAUSED BY INCORRECT TERMINATION

COAX CABLES AND CONNECTORS

When distributing pulse and video signals you must remember that you are dealing with a wide range of frequencies, from zero (d.c.) up to about 5-MHz, and you cannot just lash things together with any odd bit of wire and expect it to work satisfactorily. You must use proper coax cables with coax plugs and sockets. The plugs must be fitted correctly and the connections soldered (or crimped). Poorly soldered coax plugs, particularly the braid connection, can play havoc with video signals, frequently causing hum bars and intermittent flashing on the picture. The offending faulty plug can sometimes be very difficult to trace. Moral - Always fit coax plugs correctly - get the makers data sheet (see 'Coaxial Connectors' CQ-TV 122/3/4/5/6) and make it a right-first-time job.

TV Amateurs tend to use whichever type of coax connector is most cheaply available to them. I had a mixture of Belling-Lee, UHF (PL259) and BNC connectors in use around the shack, but gradually I have changed everything to BNC as this is now the standard connector for video equipment. A lot of surplus equipment is fitted with UHF connectors and if you wish you can either physically change these to BNC (remember the hole size is different), fit additional BNC sockets or just make up BNC-UHF adaptors. The point being to try to standardise all your coax leads with BNC plugs at each end.

SIGNAL LEVELS AND IMPEDANCE

To make video equipment interchangable and capable of working with other video equipment the signal levels and impedances must match. To this end, video equipment is designed to work at the following signal levels :-

Sync (pulse) signals	2	volts peak-to-peak into	75-ohms
Video (non-composite)	0.7	volts "	"
Video (composite)	1	volt "	"
Colour Subcarrier	1	volt "	"

The output (source) impedance of each coax outlet is arranged internally to be 75-ohms and the input impedance at the receiving socket is arranged so that it too is 75-ohms, if necessary by switching in a 'terminating resistor' of 75-ohms across the input. When the equipment is connected together using a coax cable having a characteristic impedance of 75-ohms, the result is an electrically correct transmission system.

TERMINATING COAX CABLES

Every coax cable has a Characteristic Impedance Z0 (Zed Nought) which arises from the distributed inductance of the conductors and the distributed capacitance between them. As stated, all video equipment is designed for use with coax cables having a characteristic impedance of 75-ohms. When a coax cable (or any transmission line) is terminated in it's characteristic impedance, in our case by connecting a 75-ohm resistor across the end, then all the energy (signal) put into the cable at one end, will be absorbed in the terminating resistor at the other. This is the ideal condition. (R.F. equipment and aerials are usually designed for 50-ohm cables, but the principle is the same). Should the coax cable not be terminated correctly, by connecting a completely wrong value of resistor or omitting it altogether, then some or all of the signal will be reflected back along the cable and then possibly reflected again at the source, so causing the signal to travel backwards and forwards along the cable several times before being absorbed.

The effect of this mis-termination on a sync or video signal is to produce distortion on the waveform, as shown diagrammatically in Fig.6. In a video signal, and depending on the length of the cable, this will be noticeable on the picture as narrow vertical lines to the right of any sharp transition from light-to-dark and dark-to-light, it is particularly noticeable when viewing a test card. Another symptom is 'smearing' and poor picture definition. On sync signals the distortion may cause unstable horizontal locking with the possibility of some vertical edges in the picture tearing and being displaced horizontally. Moral - do not leave coax cables unterminated.

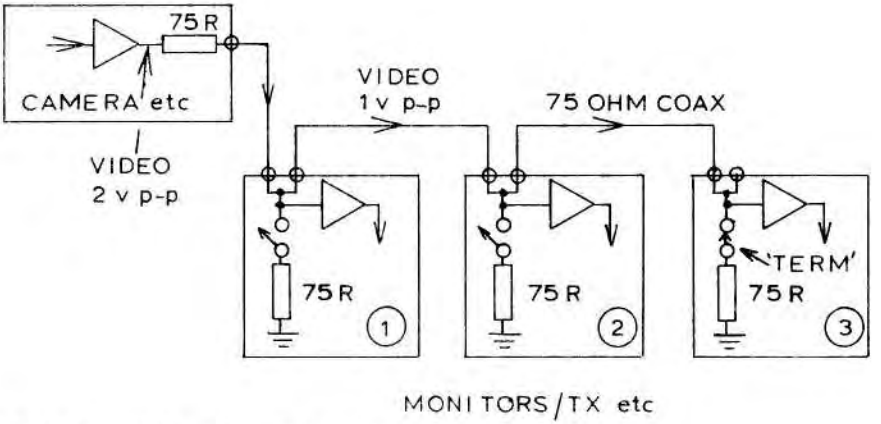


FIG.7. LOOPING THROUGH

LOOPING-THROUGH

In this method of distribution the input on each piece of equipment has two coax connectors, 'in' and 'out', for each signal. The connectors are linked across inside and usually a 75-ohm resistor can be switched in to 'term' (terminate) the coax cable. This is switched to 'term' in the last piece of equipment in the line. The signal is picked off inside the equipment using an amplifier with a high input impedance (greater than 10k-ohms) so as not to 'load' the cable. A typical looping-through arrangement is shown in Fig.7. where three monitors are being fed from a TV camera. The camera has a source (output) impedance of 75-ohms, the cable is 75-ohm coax and it is terminated in 75-ohms in monitor No.3. by switching it to 'term'. Note that the video signal is initially 2-volts p-p and only becomes 1-volt p-p when the output is terminated in 75-ohms.

Although the correct termination of coax cables is important - especially if the length is more than a few metres - it has become common practice to use short (1 to 1.5m) 50-ohm coax leads with BNC connectors for interconnecting equipment, mainly because these made-up leads are readily available. In practice, the mismatch caused by using a short 50-ohm interconnecting cable, is slight and for most amateur purposes can be neglected. However, the 75-ohm termination is still essential or the signal level will be incorrect and may cause overloading or low signal problems in subsequent equipment.

Next time: video and sync distribution and a look at a simple ATV station.

WHY FM-TV FOR MICROWAVES?

By Peter Johnson G4LXC

Whilst Amplititude Modulation is the only mode suitable on 70cm the microwave bands available to us give the option of employing Frequency Modulation. From a cost point of view FM is by far the preferred method at frequencies above 1000MHz and also from a construction point of view it is certainly the easier to achieve. There are also other points to consider when choosing a modulation system and I offer the following thoughts about the value of making FM the standard mode for use on frequencies above 1000MHz.

Consider the construction of an FM TV receiver built especially for the 1240 to 1350MHz amateur band. The cost of home construction, including all parts and hardware, is approximately £120, based on using the Wood & Douglas front end and sound demod and BATC FM demodulator & video stage. Having built this system it would be silly not to make full use of it, for example as an IF stage in a 10 or 24GHz receiver or as part of a satellite receive system.

24GHz RECEIVER

At 24GHz there is no way we could generate AM signals to any effect but producing FM television is extremely simple, this also applies at 10 and 1.4GHz. Generating Vestigal Sideband television signals at any of these frequencies is only possible with very expensive devices and, bearing in mind that AM signals are linear in nature and maintaining linearity at SHF powers necessitates the use again of very expensive devices, then FM appears to be the obvious choice as non linear devices and circuits can be used.

Simple mixers are extremely effective with FM signals and linearity does not matter too much. At 24GHz it is possible to construct very simple down converters, the requirements being a Schottky diode mixer and GaAsFET local oscillator, it being very easy to get a GaAsFET to oscillate at 24GHz (in fact it is often quite a problem to stop them oscillating at SHF frequencies!). The advantage in using this system is that the circuit can be made to tune over several GHz thus a lot of band is covered.

SATELLITE RECEIVER

Satellite TV uses FM transmissions at 11.6GHz, so again our receiver may be put to use as the IF for the front end converter, of which commercially made units are now available at realistic prices.

Bands below 10GHz may also be covered by the use of GaAsFET amplifiers and Schottky mixers using GaAsFET local oscillators, these we could make ourselves quite cheaply at approximately £30 for a 10GHz front end converter. If they are mounted on a dish and remotely tuned the IF losses can be minimised by the use of H100 or similar good quality feeder. Front end gains at 10GHz are about 10 to 12dB plus dish gain which would be in the order of 20 to 30dB dependant on size. A 2-metre diameter dish will work from 10GHz to 1GHz and only the tuning head would need changing as the focal length would remain the same. Constructing a dish is not as formidable a project as would at first appear, marine plywood formers may covered in tinned copper wire and soldered to form a mesh, alternatively fine guage galvanised chicken wire can be used.

TRANSMITTERS

If you have constructed a 1240 to 1350MHz FM-TV transmitter then again you have the basis of outputs up to 24GHz. Mix 1240MHz with 1000MHz and the outputs are 2240MHz and 240MHz, the 240MHz component can be easily filtered out leaving a transmitter output of 2240MHz. A simple diode mixer and printed circuit filter driven with 1 watt of 1240MHz and 1 watt of local oscillator could produce 0.5 watt at 2240MHz.

Mixing 1 watt of 1240MHz FM-TV with the output of a Gunn diode oscillator would provide about 50mW via a waveguide filter at 10 to 10.5 GHz. The Gunn oscillator would be tuned over the range 8,76 to 9.26GHz and mixed with the 1240MHz using direct injection techniques. A simple three stage waveguide filter, built using waveguide-16, would eliminate the unwanted frequencies. Since the linearity of devices used for mixing and amplifying is really of little importance, cheap ones may be used.

At 24GHz similar techniques may be used. 1240MHz at a power level of 100mW mixed with a local oscillator running at 22.760GHz (USB) or conversely running at 25.24GHz (LSB) at a level of 20mW, would produce an output at 24GHz of 10mW, again using direct injection mixing. Simple mixer operations provide good results which are practical and cheap by comparison with AM or Vestigal Sideband transmissions where linearity is of paramount importance. Mixer results also keep the bandwidth of the transmitted signals consistant on all bands, however one must keep in mind that multiplication of an FM signal must imply an increase in bandwidth. That is to say; if FM-TV at 1250MHz with a deviation of 1 MHz is multiplied up to 10GHz (i.e. x8 multiplication) then the resultant bandwidth would be 9.2 to 10.8GHz, in other words the bandwidth would increase from 2MHz to 16MHz. If Varactor diodes were used in the multiplication units, then an input of, say, 1 watt would be expected to produce an output in the order of 30mW at maximum efficiency. The spurious outputs from such a multiplication system could account for something like 10mW of this signal, thus after filtering, the output at the desired frequency would be in the order of 20mW. Clearly this is the hard way to achieve transmission at 10GHz and higher, but in terms of cost it is by far the cheapest and probably the easiest for amateurs to construct. Any leakage of harmonics that must obviously occur being at such low levels as not to cause problems.

A point to notice at this stage is that the FM-TV transmitter described could be followed by a single MRF511 to provide a x2 multiplication stage giving an output in the order of 350mW at 2.25GHz if desired. Or a varactor tripler would provide 3.75GHz at approximately 100mW, these being examples of the sort of multiplication powers that can be achieved.

AERIAL RECOMMENDATIONS

Constructing Helical antennas for use on the microwave bands is very much easier than on lower frequencies, and I would propose that we adopt right-hand circular polarisation as the norm for the range of frequencies 1.24 to 10GHz. It is possible to obtain gains of the order of 20dB with this type of aerial and although this is lower than that of a dish it is still a very acceptable level for a home produced antenna at these frequencies. If the receive down converter is mounted at the rear of such an aerial then no cable losses other than in the IF feeder to the tunable IF would be experienced.

The transmit converter likewise would be mounted directly behind a helical aerial thus also reducing what can be considerable losses at SHF.

With these techniques all the microwave bands could be used a lot more by Amateur TV, albeit over short distances to start with, but just think that even short hops provide good TV natter bands which would be very private and be highly unlikely to cause any interference whatsoever. Another point to consider in using helical aerials is that very little interference, if any at all, is caused to other band users employing Yagi or other types of linear polorization aerial. Finally, on the point of standards, as I am proposing that helical aerials be the norm then I will further propose that Clockwise - or RH circular - polorization be the standard, clockwise as viewed from the rear.

So to summarise my proposals:

(1) - FM transmissions only, positive or negative video.
(2) - 6 MHz and 5.5 MHz intercarrier sound.
(3) - RH Circular polarization, clockwise as viewed from the rear of the aerial.

These proposals would not only ensure that all amateurs are using the same standards but would also reduce interference to other band users.

Here is a simple suggestion for building a 10GHz helix:

A 0.5 inch diameter plastic rod with 30 turns of 16 SWG copper wire wound around it would give a projected gain of 20dB with a bandwidth of 1 GHz at 10GHz and a beam width of 10 degrees. This is a really cheap way of producing an aerial for these frequencies and by phasing four of them together, using a printed circuit stripline matching unit and GaAsFET amplifier, then a gain of 30dB could be obtained before the mixer, all this with the overiding advantage of a much reduced wind resistance when compared with a dish antenna.

CONCLUSIONS

The above ideas are just a way of saying that we need to forget waveguides and dishes for ATV, let us go it alone and pioneer the use of helical's for 10GHz and work down, instead of allowing the handy walky-talkies of working up to 10GHz as surely they will as the years go by. So get out the computers and calculators and get cracking on designing some helical aerials for these bands, combining units, oscillators using GaAsFETs, mixers etc, there must be a way to crack these problems and provide a lot more room for two-way ATV.

There is talk of a geostationary satellite especially for ATV at around 27GHz, multi-standard and multi-channel, so do we have to wait for the Americans to show us the way or shall we establish ourselves as the pioneers once again?

INTERNATIONAL ATV CALLING 144.750 MHZ

THE YAESU FRG9600 FOR TELEVISION

By Paul Elliott G4MQS

Having recently purchased the new FRG9600 receiver from Yaesu, I got to wondering how to extend the frequency range and make use of the TV facility of the set. The receiver as supplied tunes from 60 to 905MHz and the interesting area I was wanting to extend to was 900 to 1500MHz, so the job was to design the converter stages.

It was found that useful gain with good image rejection could be achieved over a 300MHz bandwidth, so the converter was split into two halves; one tuning from 900 to 1200MHz and the other tuning 1200 to 1500MHz, this would give access to the bands incorporating 934MHz CB, Cellular Radio, 23/24cm Amateur band and Cellular links. If the set were required to cover the weather satellite band or give full coverage on satellite TV then a third converter would have to be built covering 1500 to 1800MHz. The block diagram of the converters is shown in Fig.1, and a suggested mixer is the MCL MA-1 double-balanced device.

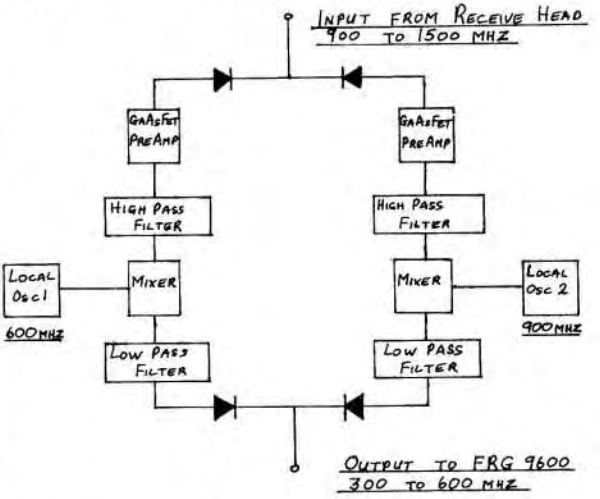


Fig1 DOWN CONVERTER SYSTEM

AMATEUR TELEVISION

The next stage, having extended the range to cover the 23cm Amateur band, was to see if the set could be used to receive Amateur TV via the inbuilt TV output stage. The main difference here is that amateurs use FM and the add-on TV board is designed to demodulate AM, so it would be of no use other than to slope detect the signals. I needed an IF output suitable for feeding one of the two FM demodulator boards available, one being produced by the BATC the other by Wood and Douglas. It was decided to bring out the first IF of the FRG9600 directly as this, although non standard at 45.754MHz, is quite suitable for an IF demod using the NE564 Phase Lock Loop device. The BATC board only required the PLL tuning capacitor changing to a 1-5pf type and this enabled the PLL to be tuned-up which produced superb results being certainly more sensitive than anything I had used before. The Wood and Douglas board needed a little more work, like the BATC one the tuning stage had to be altered and the stages prior to the NE564 needed re-tuning. In general the Wood and Douglas VIDIF (FM demod) produced better results having a better carrier-to-noise ratio and greater frequency response.

The way the IF was taken off was very straightforward, a small board was made having four pins that would fit the socket into which the NTSC board once fitted (see receiver layout diagram for the position of the socket J1013), the pin numbers used were: (1) IF input, (2) Ground, (11) IF output, (this was the video output pin for the TV board) and (12) Ground. The IF input and output pins were connected together via a 0.01uF ceramic disc capacitor, this is required due to the normal DC coupling of the TV board. This modification has been in use for some time now and has given excellent results not yet bettered by other methods.

SATELLITE RECEPTION

The next development for the FRG9600 was the result of doing some practical tests on the previous modifications. Using the GB3GV Amateur TV Repeater (Leicester) I compared the receiver with two satellite receivers which use 900MHz to 1700MHz as the input frequency range from an 11GHz head assembly.

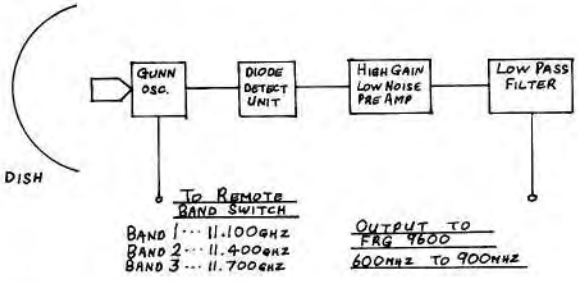
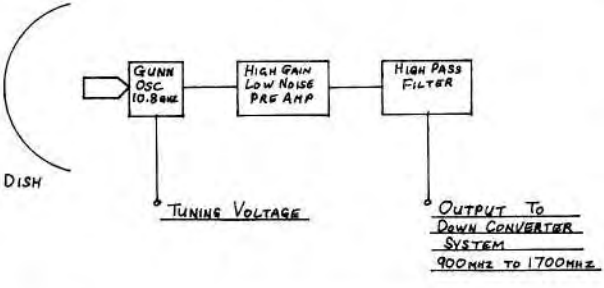


Fig.2 SATELLITE BAND TO FRG9600 DIRECT

The first of the units was unable to 'see' the repeater and the second was two 'P' points down on the FRG9600, which, for a unit costing over £1000, was very surprising. So it appeared that along with the previous modifications all that was needed to receive satellite TV signals was an 11GHz head assembly and a suitable dish aerial.

The 11Ghz head was constructed using a Gunn Oscillator and horn mounted onto the dish. The difficult and most expensive part of the system would be the Low Noise Amplifier which would be required to cover the If from 900MHz to 1700MHz and have an extremely low noise figure due to the very small field strengths at which the satellites are received. A more preferable alternative would be to do as I did with the converters for the FRG9600 and arrange to change the frequency of the Gunn oscillator in three steps, and use a 300MHz wide IF, a block diagram of this method is shown in Fig.2.



What has not been looked at yet is just how much gain with low noise that can be obtained with reasonable bandwidth to allow us to convert down from 11GHz directly to somewhere between 300MHz and 800MHz, thereby cutting out the need for converters as used before.

Fig.3 SATELLITE BAND TO DOWN CONVERTER SYSTEM

A block diagram of a proposed system is shown in Fig.3.

With all the systems used so far it has not been found necessary to add any IF amplification as the front end of the FRG9600 is sensitive enough. The total system gain is fairly low but so is the noise figure and excessive gain would cause its own problems, i.e. cross-modulation and instability. The initial prototype was just the higher frequency converter and has given very good coverage of 23cm and is still in use for Amateur TV reception, which brings me to the last modification:

The FRG9600 was designed to give a video output as well as all its other modes, but unfortunately the manufacturers seem to have overlooked the fact that the U.K. version of the receiver should have a PAL TV board fitted and not the NTSC board that is supplied, these however are still not generally available yet but I managed to get hold of one and duly set about modifying it to receive 625 line PAL TV transmissions.

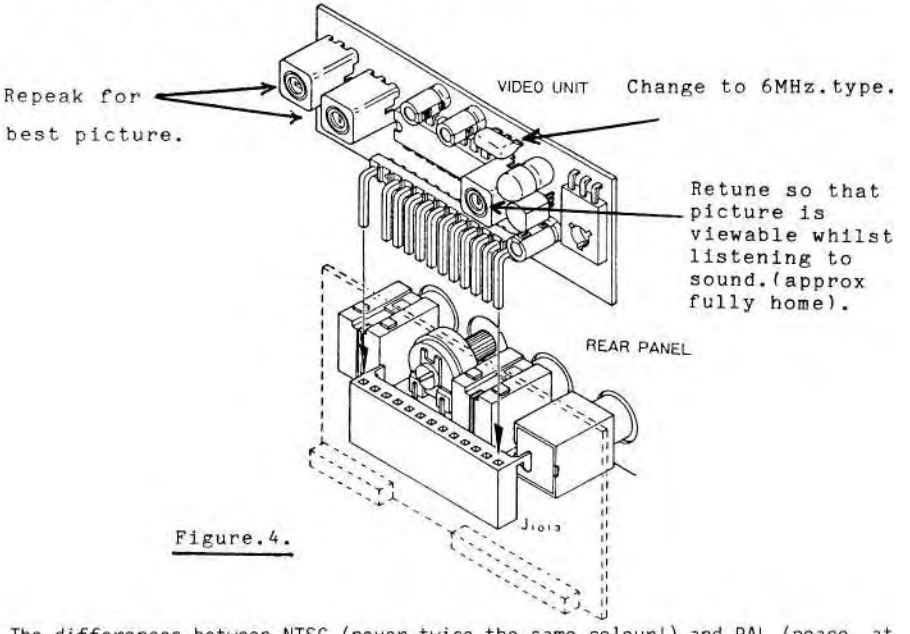


Figure.4.

The differences between NTSC (never twice the same colour!) and PAL (peace at last!) are that (1) the sound sub-carrier is set at 4.5MHz above the vision carrier, whereas on PAL the sub-carrier is at 6MHz above and (2) that the colour sub-carrier is at 3.58MHz instead of the PAL standard of 4.43MHz. To enable the sound to be received the filter must be changed to a 6MHz type and the AM detector retuned so that it is 6MHz lower than the vision carrier, this is best done whilst viewing a picture, once the sound has been tuned in the two-stage filter needs to be tuned for the best picture quality, see Fig.4.

The video response of the circuit is not brilliant but as it is more sensitive than a normal TV it is more than suitable for DX television. One word of warning however; the video output is DC coupled so do not short it to earth or fit leads whilst the set is switched on.

CONCLUSIONS.

In all the performance of the FRG9600 as it stands is very good but with a few additions it can be made very versatile. In terms of cost a good satellite receiving system should be able to be built for around £600 provided a dish could be found, this compared with £1800 for a typical installation.

This article is reprinted from issue-1, 1986 of LENS magazine, the journal of the Leicestershire Repeater Group, with the kind permission of their Editor Deryk Wills, G3XKX.

BBC CEEFAX STARTS 6-LINE WORKING

BBC Engineering Press Release

From February 2nd last BBC CEEFAX started providing a much faster service to the estimated 10 million viewers in the United Kingdom. This BBC teletext service of news and information is now broadcasted using six line periods of the TV signal rather than the four periods it was using before, this enables CEEFAX to broadcast its wide range of 600 pages at a much faster rate, giving the viewer the advantage of a much shorter wait for pages called up for viewing.

This improvement has been brought about by new computer software which will also relieve the CEEFAX journalists of some of the more trivial time-consuming tasks, also the whole computer system should also give a more reliable service. The new software used in the production of the CEEFAX service is one of the world's most up-to-date systems and gives the U.K., where Teletext was invented 13 years ago, another example of its world leadership in this field. The new system called 'WORLD SYSTEM TELETEXT' is now being used in 19 countries around the world.

The new subtitling system generates the Teletext signals at the point of programme origin in the videotape or telecine suites and bypasses the CEEFAX transmission computers. It also enables the various regions of the BBC to block out the nationally broadcast subtitles when they reschedule programmes or opt from the network. The subtitles can be recorded in the regions for later transmission when the network programme is rebroadcast.

CEEFAX has been broadcasting up to now on four lines: 14,15,16 & 17 (also repeated on lines 327,328,329 & 330) in the field blanking intervals, the system now in use adds lines 13 and 18 (326 and 331) to the Teletext signal.

BAND SCAN DISPLAY

By Geoff Mather G8DHE

This circuit was created in response to a need to visually display the output of a band scanner for the 24cm amateur band. Originally the scanner output was displayed on an oscilloscope in the form of a simple spectrum analysis, but this resulted in the oscilloscope being permanently tied up, whilst the normal TV monitor was idle.

The generated display from this unit consists of horizontal bars across the screen for each signal present in the band. The lowest frequency is at the bottom of the display, whilst the top represents the highest. Even very low levels of signal are discernable on the display often resulting in PO grades when they are viewed directly. A thin white marker band is provided to indicate the position of a manual tuning control so that tuning can be set to the correct frequency before coming out of the scan mode to view the signal.

The circuit breaks down into 3 sections: (1) The scanner and power supplies, (2) Video processing of the resulting scan and (3) The audio alarm circuitry.

1. SCANNER AND POWER SUPPLIES (Fig.1)

The converter used was a Wood and Douglas 1250DC50 which requires a tuning voltage in the range 0 to 8.5 volts to cover the band 1240MHz to 1320MHz. To generate this voltage half of a CMOS NE556A (IC2) connected as an astable oscillator at 50Hz is used, the ramp waveform from the timing capacitor (C2) being picked off and fed to the inverting input of an op-amp (IC3) which provides the necessary gain and level shifting required. In this design the gain of the op-amp is fixed to provide a ramp of about 10 volts whose DC offset can be varied by VR1. A frequency of 50Hz is used as the resulting scan is displayed on the screen in a vertical direction. A measure of overscan is provided in the ramp waveform to allow the 1240 to 1320MHz limits to be fitted within the display. The frame synchronisation pulse which is required by the video processing stage is derived from the normal output of the astable, as this goes low during the flyback period.

The second half of IC2 is used for two purposes: to generate a negative supply rail for the op-amps and to generate the line sunc pulses required in the video processing stage. The normal output of the astable is used in a charge-pump operation and produces approximately -7 volts, the actual level is not critical and provided that at least -5 volts is produced then the other circuits will operate satisfactorily. Due to the loading of the normal output by the charge-pump operation it cannot be used to generate the required level of sync pulses, so the source of the pulses is taken from the discharge output (pin 5) of the integrated circuit. The two potentiometers, VR2 and VR3, allow the line and frame periods to be adjusted to 15625Hz and 50Hz respectively.

The final stage in this part of the circuitry generates a marker 'pip' to be added to the video signal to represent the position of the manual tuning control. The ramp waveform is compared with the steady voltage from the tuning control, and a positive going pulse is generated whose rising edge is differentiated by C1 to provide the 'pip', indicating the position of the tuning control relative to the scan.

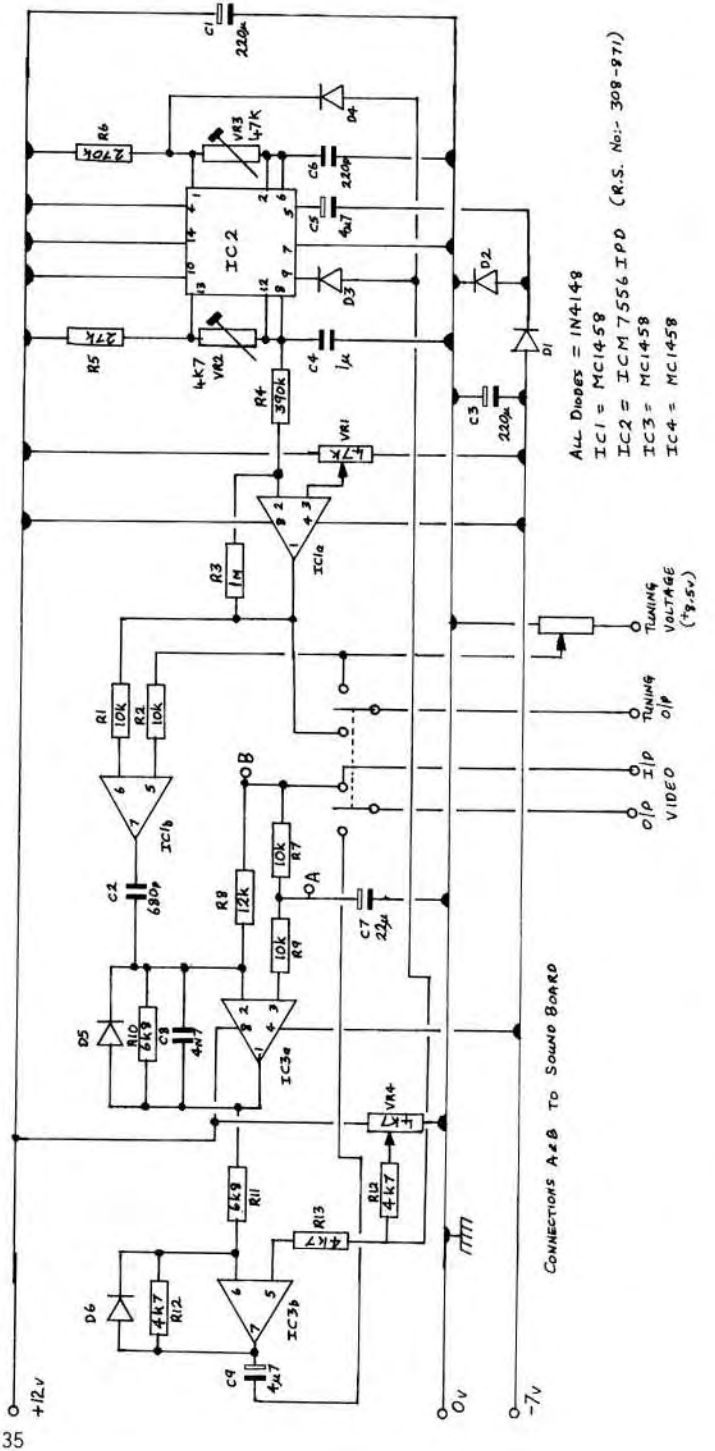


Fig.1 POWER SUPPLY AND VIDEO PROCESSING

2. VIDEO PROCESSING (Fig.1)

The video processing stage is divided into two parts: the first part (IC3a) provides for removal of the DC component from the video waveform to be displayed (R7, R9 and C7), attenuation of the signal to within the range 0.5 to 0.7 volts p-p (R8 and R10), limiting of the waveform to prevent the black level being crossed, as this would have the effect of causing spurious sync pulses (D5) and for filtering out of the high frequency content of the scanned signals (C8). The resulting output is centered around 0 volts and will not exceed +0.35 volts (black at this stage). The marker 'pip' is also fed to the inverting input of this half of the op-amp (pin 2), to provide a thin white line on the display indicating the position of the manual tuning control.

The second part of the video processing stage provides inversion of the video signal and mixes in the line and frame sync pulses. Due to limitations in the slew rate of the op-amp the sync pulses tend to have a triangular appearance if a pulse level exceeding 0.5 volts is attempted, so care should be taken in setting this level.

3. AUDIO ALARM (Fig.2)

This circuit was designed as an extra, but could equally well be used on its own if a video output is not required; however the audio output is rather harsh, so filtering may be required to suit personal tastes.

The first stage (IC4a) squares up the positive swings of the video waveform to provide a constant amplitude pulse when signals are detected, the resulting waveform (50Hz for one station, 100Hz for two stations etc.) is smoothed by R18 and C9. D7 and R19 exhibit a long discharge time-constant and R20 and C10 form the timing elements of a sawtooth oscillator whose frequency varies with the voltage appearing across C9, thus providing a relative indication of the number and strength of signals being detected in the band. With no signals present there will be no voltage generated, hence no audio output at all.

The second stage (IC4b) provides the active element of the oscillator. By comparing the voltage across C10 with zero volts it switches to a negative state when the capacitor charges, thus discharging C10 via D9 in the process. D8 and C11 hold the op-amp negative long enough to ensure that C10 discharges to a reasonable depth before switching back to the positive state.

4. CONSTRUCTION AND TESTING

A printed circuit board has not been designed as yet, the initial three units having been built satisfactorily on Vero-board. However if there is sufficient demand a board and possibly a kit may be made available by the Worthing and District Repeater Group. Please contact the group if you are interested and keep an eye on our advertisements in future issues of CQ-TV.

After the circuits have been built and checked for short circuits etc. the potentiometers should be set to the following initial positions: VR1 = 50%, VR2 = max, VR3 = max and VR4 = 10%. Connect the 12-volt supply rail and check that the negative supply rail appears at the junction of D1 and C3 within the range -5 to -9 volts, also check that the current consumption from the 12-volt supply is of the order of 30 to 60mA.

Connect the video output to a monitor and adjust VR2 and VR3 for a stable display. If difficulty is experienced then adjust VR4 in small steps whilst

readjusting VR2 and VR3 until stability is achieved. If an oscilloscope is available the sync pulses can be set to the correct level of 0.3 volts with VR4 before setting the frequencies with VR2 and VR3.

Connect the manual tuning control and set it for the lowest freqency. A single white bar should appear towards the bottom of the display moving upwards as the control is advanced. Return the control to the low frequency end and adjust VR1 to place the bar at the bottom of the display, turning the control to the high frequency end should place the bar at the top of the display. On completion of these adjustments the tuning voltage output may be connected to the converter.

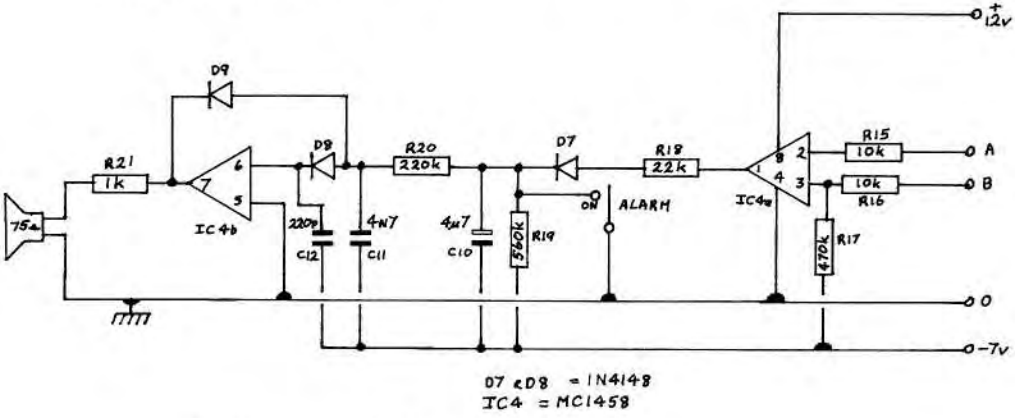


Fig. 2 AUDIO ALARM

With the converter now scanning the band the resulting video output can be connected to the scanner. If signals are present then with an FM IF a bar will appear for each carrier (this band may appear black or white). If an AM IF is being used then a broad white band will appear for each carrier detected; if the audio circuit is connected it should also produce tones indicating the presence of the carriers.

In operation the number and variety of signals detected across the band will be surprising. Marine radar shows up as a rapidly moving streak across part of the band whilst morse and phone stations in the all-mode sections will occasionally appear, and if the eye can cope the morse can quite easily be read!

5.MODIFICATIONS

For converters that do not use a tuning voltage in the range 0 to 8.5 volts the offset control VR1 may be adjusted to provide the range required. If the gain of the ramp needs increasing resistors R3 and R4 may be varied to suit. If the converter requires more than 12 volts for tuning, either the supply rail can be increased (if this option is used the maximum operating parameters of the devices in circuit must be taken into account), or an additional buffering stage on the output of the ramp could be added; supplied from a higher supply rail.

IN FRONT OF THE TUBE

Part 3

By Peter Delaney, G8KZG

In parts 1 and 2 we looked at the different types of lens that can be put in front of the television camera tube. There are several other ways in which the picture can be processed before it reaches the tube.

Firstly, for any colour system, the light entering the camera has to be split into the separate colour signals. For a broadcast camera using three or four tubes these will normally be the three primary colours (red, green, blue) and possibly a separate luminance 'signal'. There are two ways to split the beam of light up. In the first a set of mirrors is used to reflect part of the light, and transmit the rest. They are coated with a colour selective reflecting layer, and are known as dichroic mirrors. These are used with a further colour filter to produce the required colour image on the camera tube. (Fig 1). The filter is a 'band-pass' type, i.e. it allows through one frequency (colour), but not those above or below the wanted colour.

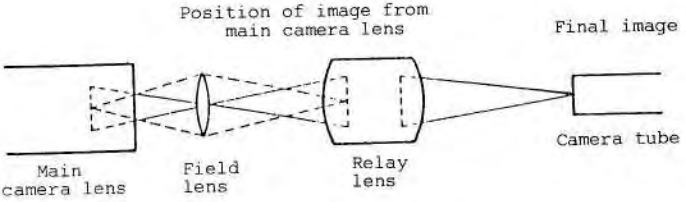


Fig.1

This kind of beam splitter has the advantage that the three (or four) sets of camera tubes and coils can be placed approximately parallel to each other. This ensures that the effect of any stray magnetic fields, including the earth's, is the same for all the tubes, which helps to keep the three primary colours in register with each other. The disadvantage, however is that the mirrors take up space, which makes the camera fairly long. More importantly, the camera tube target (i.e. where an image is wanted) is some way behind the lens. An extra set of lenses, called a relay lens, is therefore added between the main camera 'taking' lens and the mirror system. (Fig 2). The field lens is placed where the main camera lens image is formed, so that as little of the light is lost as possible. Despite this, some light is inevitably lost - as mentioned in part-1 extra pieces of glass are extra attenuators, just as for aerial coax.

Later generation broadcast colour cameras use a different method to split the light up. This uses a set of dichroic prism blocks. When light passes from one material to another, it is bent. (Try looking at a screwdriver placed into a bucket of water - it seems to bend at the surface). If the conditions are correct this refraction can cause the light to be reflected. It is the same physical process, at a different frequency, that causes radio waves to be reflected back to earth by the upper atmosphere. The first prism is arranged to reflect the blue light from its back surface, which is then reflected

internally so as to appear in front of the blue camera tube. (Fig 3). In a similar way, the second prism reflects red light from its rear surface. In order for it to then internally reflect this towards the red camera tube there must be air outside the reflecting surface - hence the thin air gap between the two prisms. Typically this gap is about 10 times the wavelength of the light. A third glass block then ensures that the green image has the same overall optical path through the prism glass.

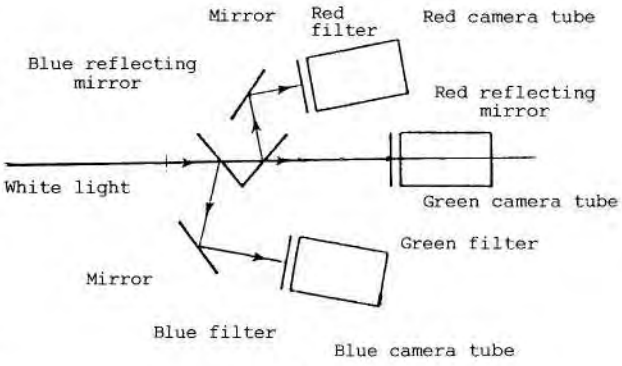


Fig.2

The glass blocks are usually some 50 -60mm thick. This means that the lenses required to work on such cameras need to produce the image rather further back than a standard lens. The large block of glass is also heavy, and a major part of the weight of this type of camera.

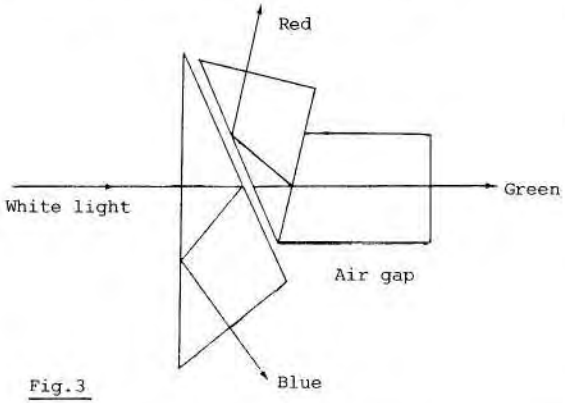


Fig.3

To make the dichroic mirrors or prisms used in these systems is beyond the resources of the amateur, although a set of half silvered mirrors used with suitable filters might work for those wishing to experiment - say to split the light from a 'white' crt to three photomuliplier tubes for a colour slide scanner.

In single tube colour cameras, such as those used with home videos, the colour splitting is achieved in a quite different way. The vidicon camera tube has the colour filters inbuilt ahead of the target. The filter is striped, so that the stripes run vertically across the image. In most cameras (Fig 4) these stripes are green, cyan (green and blue) and white (green blue and red). The camera electronics demodulate the resulting signal to recover the conventional colour difference signals for feeding the PAL coder. In the Sony trinicon tube, (Fig 5), the stripes are red green and blue, and an indexing electrode is placed so that again the electronics decode the resulting signal to colour difference signals.

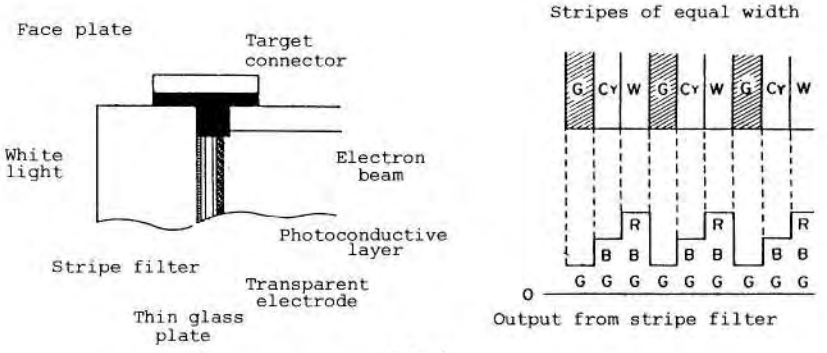


Fig.4

In this type of camera the main advantage is reduction in size, weight and cost. The three colour images must stay in register at all times, unlike the multi-tube cameras. However, there is always a penalty to pay - in this case it is the picture resolution. To avoid strange patterns which would arise by the interaction of the fine picture detail with the tube stripe filter, a 'low-pass' optical filter is placed in the light path to limit the detail reaching the camera tube.

Before continuing, in part 4, to look at the addition of other filters etc - this time in front of the main camera lens - a word or two about cleaning optical glass. A cloth, duster, handkerchief, or similar should NEVER be used. Far from 'cleaning the lens, it is likely to end up dirty, and may be irrepairably be scratched and these will impair its performance. A light use of a suitable soft brush is usually adequate, although in difficult cases a proper lens cleaning tissue may be needed. Extreme care is required to avoid removing the special coating on the lens surfaces, designed to prevent stray reflections.

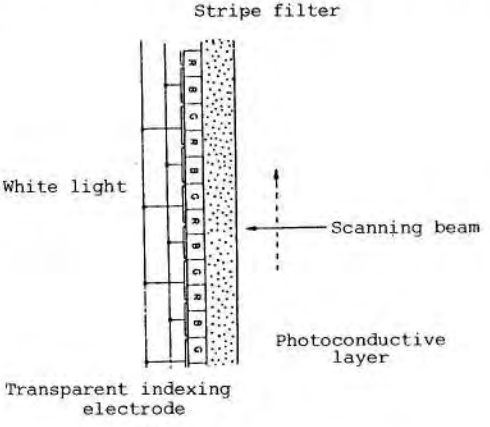


Fig.5

The inner surfaces of multi-element lenses are best left, as more dust is likely to enter if the lens is dismantled than was there in the first place. Remember that a camera lens is a precision instrument. If in doubt, leave to an expert - it is cheaper than a new lens! Suitable brushes and lens tissues can be purchased from any good photographic store.

FREQUENCY CONVERTER
for mathematical PAL

By Pete Carliell.

Having described a colour sync pulse generator in the last issue, Pete Carliell continues with this description of a frequency converter for mathematical PAL colour. The article first appeared in 'Radio & Electronics World' for December 1985 and grateful acknowledgement is made to the Editor for permission to reprint the article here.

NOTE: Readers of the article 'A Colour Sync Pulse Generator' on page 52 of the last issue should note that there are one or two corrections under the 'In Retrospect' column of this issue.

Any system for generating the subcarrier and sync pulses required for PAL TV transmission comes up against the problem of the PAL equation, which states:

$$f_{subcarrier} = \left(\frac{567}{2} + \frac{1}{4}\right) \times f_{line} + 25c/S.$$

Conventional methods of locking the subcarrier frequency to line frequency may require complex filtering and modulation processing to get round the 25c/s offset.

The system described in this article is quite straightforward to construct, very reliable, and easily set up using a dual channel oscilloscope. The idea could also be applied to changing other frequencies in some cases, as will be described later.

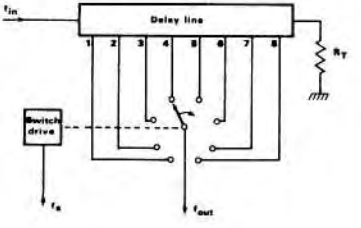


Fig.1 THE BASIC IDEA

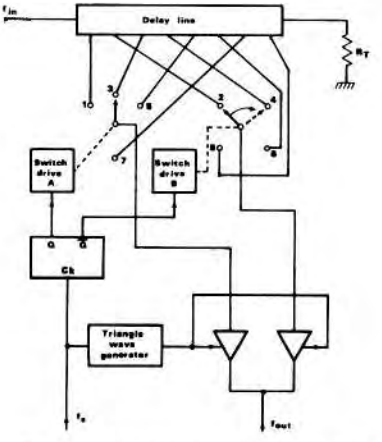


Fig.2 IMPROVEMENTS FOR A SMOOTH OUTPUT

The idea is shown diagramatically in Fig.1. A sinewave of frequency f_{in} is applied to a delay line terminated in R_t. The line has a delay of one cycle of f_{in} and is tapped evenly for at least four taps. If the taps are selected by a continuously rotating switch, the output of the switch will be the input waveform either stretched or compressed in time, depending upon the direction the switch is rotating. The idea that a sinewave which is constantly changing in phase is the same as a sinewave of another frequency may be slightly difficult to grasp, but it works.

It will take 8 cycles of f_s to step the switch through 8 taps and thus 360° of f_{in}. Hence with a clockwise rotation of the switch,

$$f_{out} = f_{in} - \frac{f_s}{8}. \quad \text{If } f_s = 200c/S, \; f_{out} = f_{in} - 25c/S.$$

Of course, the simple scheme shown in Fig.1 would result in definite phase jumps - 45° with the 8 taps shown. With jumps of more than 90° the waveform will no longer be consistent, which is why there must be at least 4 taps on the delay line.

To achieve a smooth continuous sinewave output with the simple scheme of Fig.1, an infinite number of taps would be necessary. The alternative that I have adopted, however, is outlined in Fig.2. Here the taps are selected by two switches driven by anti-phase squarewaves and the outputs of the switches are fed to a pair of modulating amplifiers. The modulators have balanced inputs and are fed with the same modulating triangle wave in such a way as to achieve opposing results.

The modulating amplifiers constantly mix linearly between the two switch outputs. The modulation depth is virtually 100%, and when one output is 100% on, the other switch will be changing over to the next tap. The outputs of the switches leapfrog each other by 45° and the final output is a smooth, constant change in phase.

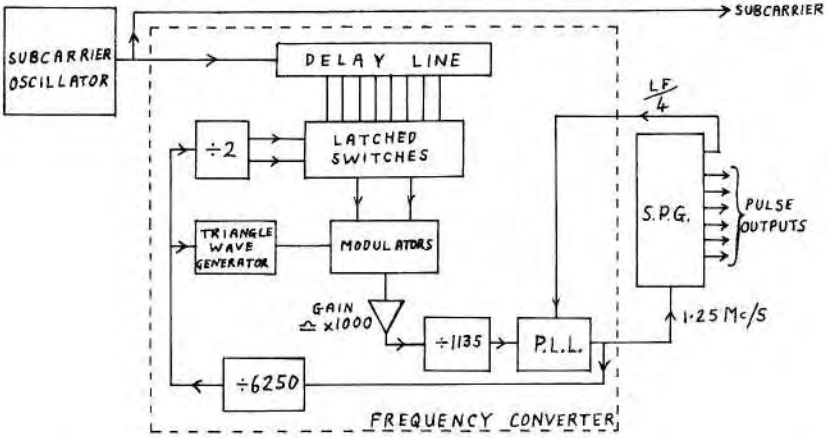


Fig.3

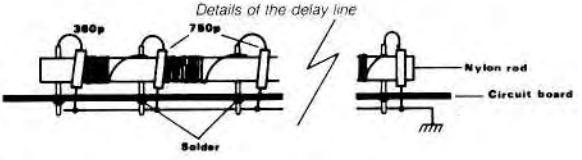
The resultant sinewave signal can be amplified and divided by 1135 to make 1/4 x line frequency. When a PLL is added, as in Fig.3, an SPG can be mathematically locked to subcarrier frequency. My SPG can run from 1.25MHz

drive and so a C-MOS 4046 PLL is ideal. An LF/4 squarewave is so easy to obtain that any SPG could be used even if the converter's PLL has to be changed (the maximum oscillator frequency of a 4046 PLL is typically 1.5MHz).

It must be admitted that the ÷1135 stage is actually a ÷1134. The configuration of counter and AND gate in C-MOS clocked at 4.433.593.75Hz results in one clock edge being missed before the reset pulse has ended. The amplifier driving this stage is very simple but must be a 4011UB type.

The prototype was built on Vero 'VQ' board of approximately 6x3 inches, but this led to a very cramped unit. An area of roughly twice the above is recommended and a suitable layout is shown in Fig.4.

THE DELAY LINE



Prospective constructors should not be daunted by the delay line. A 5-inch length of 1/4" diameter nylon spindle is pierced by a 0.8mm PC drill every 1/2" starting 1/4" from one end (this is the only difficult part) and wire-wrap or similar long pins inserted. The pins support the line and form tap connections for 24swg enamelled copper wire close-wound in 14 turns between each one. Eight 750pF and two 360pF polystyrene capacitors (one at each end), all returned to a common ground, complete the line.

The modulators used were MC1496G with 10-lead bases, although 14-pin DIL packages are available. All other ICs were mounted in holders.

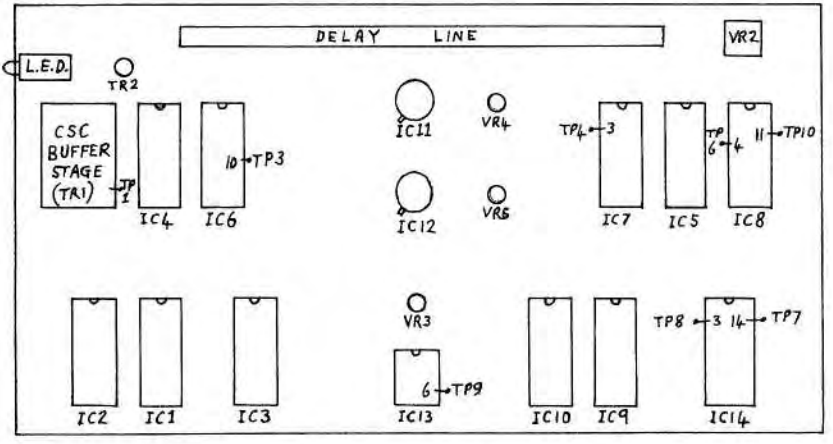


Fig.4 COMPONENT LAYOUT

ALIGNMENT

Apply a 1-volt subcarrier input. Monitor the level at the input of the delay line TP2 and adjust RV1 for 0.6 volts (the level will be modulated by the system's switching action).

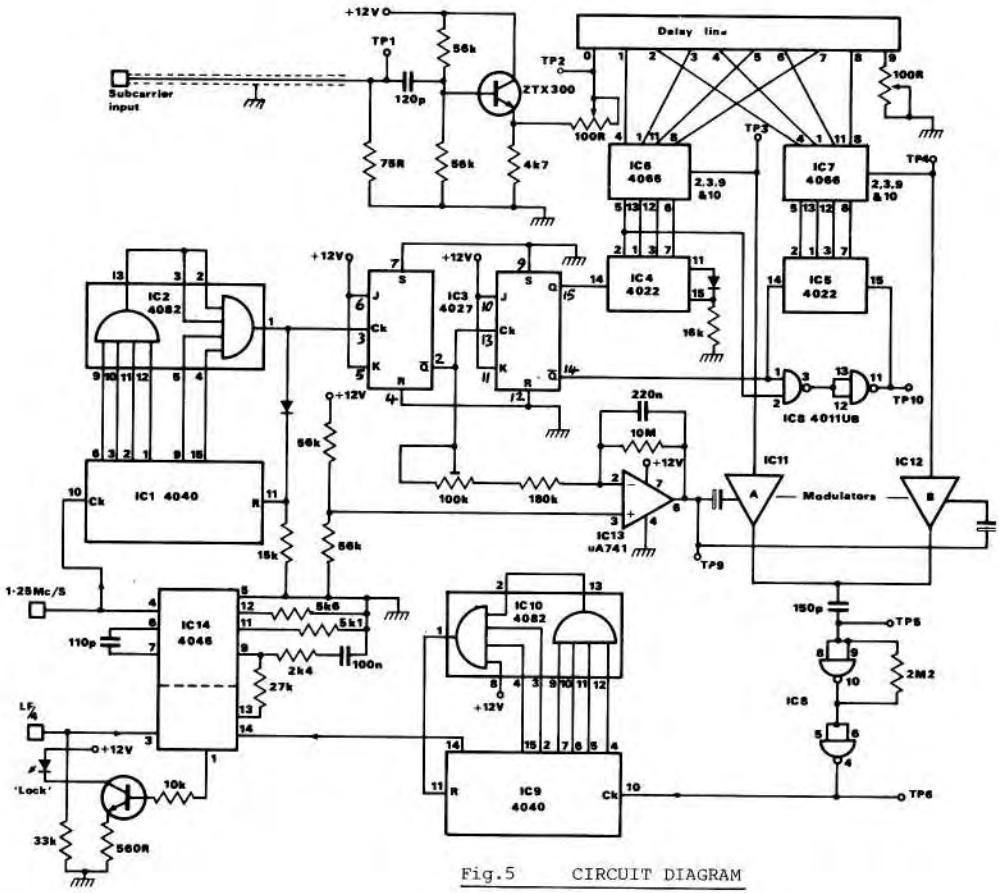


Fig.5 CIRCUIT DIAGRAM

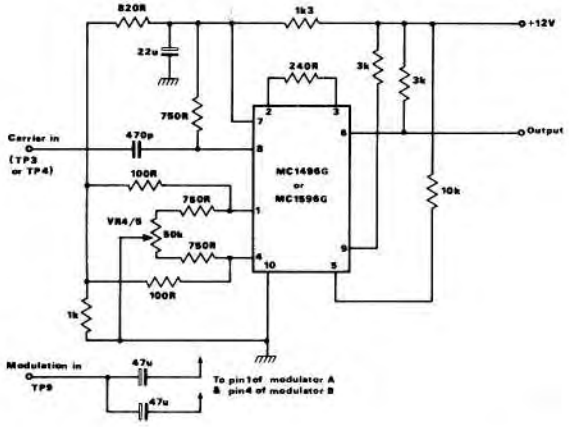


Fig.6

DETAIL OF MODULATORS

Trigger the oscilloscope from TP10 (IC8 pin-11) at 5ms/div and monitor TP3 (IC6 pin-10). Adjust RV2 for the minimum variation of signal amplitude with switching. RV2 will have much more effect on TP3 than TP4. The residual variation of signal amplitude will be about 20%.

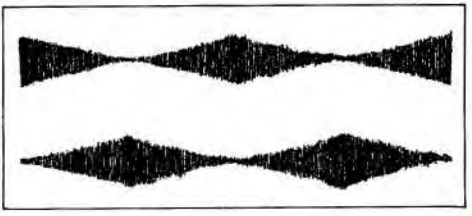


Fig.7

Still using TP10 as the trigger source, display 2 cycles of the triangle wave at TP9 and set this to 0.4v with RV3. Check for a DC of half supply voltage at this point. Now monitor dual-channel IC11 pin-9 and IC12 pin-9. Set RV4 and RV5 fully clockwise, then back off to obtain the sort of trace illustrated in Fig.7, just less than 100% modulation is ideal. Finally check for 500mV of sinewave at TP5 and 8 volts at TP6.

As mentioned before, this frequency converter could be used on frequencies other than PAL subcarrier. One constraint is that the delay from tap-0 to tap-8 of the line must be one cycle of f_{in}. If f_s is altered then the amplitude of the simple triangle wave generator will change and must be corrected by altering the feedback capacitor. A frequency increase could be achieved by wiring the taps to each of the switches IC6 and 7 in reverse order.

As well as its TV application, the device offers a reliable method of creating small frequency offsets to signals in a range of probably 1 to 10MHz.

FCC - "NO" to ENG on 70cm

CQ-TV 133 (pp 24) carried an item from 'Westlink Report' giving details of a proposed waiver of the amateur rules to permit the use of amateur TV for news gathering purposes by K6ADA.

The subsequent findings and ruling of the FCC are re-printed here with acknowledgement to 'Westlink Report' number 466 for March 7 1986:

PRB-2 IS DEAD. PRB-2 was an FCC rules change proposal based on a Part 97 waiver request from an Arizona broadcaster who wanted to use frequencies in the 450MHz amateur band for electronic news-gathering purposes. In his original request, Lee Shoblom, K6ADA, President of London Bridge Broadcasting of Lake Havasu City, had noted that his station served a resort community that was isolated from other areas, and therefore it was not economical to produce high-priced commercial microwave ENG equipment for the outlined purpose. Whilst K6ADA did have the support of local amateurs in the Lake Havasu City area, amateurs elsewhere believed that permitting such a waiver would set a bad precedent and filed in opposition to it. Among those filing in opposition to PRB-2 was the ARRL, whose presentation before the FCC was adamant in its refusal to accept such a shared spectrum concept, even in as isolated a region as Lake Havasu City. On February 4th, the FCC issued a Report and Order that essentially agreed with opposition filings and denied PRB-2.

(W9JUV)

IN RETROSPECT

A COLOUR SYNC PULSE GENERATOR - CQ-TV134

Pete Carliell has notified me of one or two small errors in the last article: Firstly, on page 52 paragraph 2, line 5. The sentence stating that "Broad pulses are more than 122uS long....." should read: "Broad pulses are more than 12uS long....."

The first paragraph on page 54 has a problem with some missing bits which means it doesn't make sense. The words in brackets should read as follows:

(The 4ELF waveform differs from 4LF in that its active negative edge is 1.6uS earlier. Switch IC6 is therefore changed over before the vital edges that it has to pass).

The diagram on page 53 has two unlabelled IC's. The analogue switch just to the right of centre is IC6 and the similar one at centre bottom is IC8, both chips are type 4052 (Pete's letter actually said 4502 but I don't think that can be right).

There is another constructional project from Pete Carliell in this issue and he has kindly offered to answer any questions which you may have on either project. The address is: 12 Huntsmoor Road, Ewell, Epsom, Surrey KT19 0JJ. Please send a SAE with all enquiries.

ROBOT & WRAASE SSTV - CQ-TV133

In the first paragraph of this article line three should have read: .....compatible with the FRAME sequential formula .....

A TUNABLE SOUND DEMODULATOR - CQ-TV132

No actual corrections on this one although some have found it a bit deaf.

The value of the 1k resistor connected between pins 6 and 7 of the NE564 seems to have a considerable effect on the overall sensitivity and performance on some units, this is possibly due to a spread of tolerances within NE564 chips, but is more likely to be the result of too small a level of 6MHz input signal. Try experimenting with various take-off points along your particular video amplifier, a good point is directly from one of the output pins of an NE592 (uA733) video amplifier. Try replacing the 1k with a 4.7k preset and adjusting for best audio; a fixed resistor of suitable value may then replace the temporary control.

The original loop filter capacitors (pins 4 and 5) should be increased from 1n to 10n and a post-detection filter added by installing a 0.1 from pin-14 to ground.

24cm FM-TV TRANSMITTER - CQ-TV133

ON7TP has pointed out some funnies from this project, so I have tried to answer them myself (well they don't seem too technical - even for me):-

Page 9 Fig.1 shows R7 as 275-ohm (300 AOT). AOT means Adjust On Test. For correct CCIR performance however R7 should be 300-ohms (assuming that reasonably close-tolerance components are used for the rest of the network).

Page 13 Fig.3. It seems that C's 14 to 20 are missing! Don't know where they could have got to, still, so long as the're not there I shouldn't worry about them. C21 has no value but I guess that a 1n will suffice.

Page 15 Fig.4. C16 is not shown on the circuit diagram although it is on the PCB layout on page 20. In fact this seems to be shown in the wrong place on the layout; according to the latest information from G4LXC C16 is a 0.1uF and connects in parallel with C9 to ground. Its purpose is to stop LF oscillation.

The varactor diodes described as "from a 1043 tuner" are BB105 types (white tip).

G4ENA - SSTV EXTRA - CQ-TV134

This one omitted to state what IC2 is. It is a 741 Op-Amp.

A 70cm TV TRANSMITTER - CQ-TV122
A 70cm TRANSMITTER - "TV For Amateurs"
A 70cm TRANSMITTER - "The Best Of CQ-TV"

Let's get this one right shall we? As previously published there is a modification to the oscillator and now I have to detail another modification which never was!

It all started in CQ-TV122 where the circuit showed the oscillator output as being taken directly from the collector of Tr1. As originally designed an occasional oscillator persisted in going off on its own frequency rather than that of the crystal. A modification was recommended whereby L1 was increased to 10-turns with a tap at 3-turns from the supply end. The 5.6pF coupling capacitor was then taken from this tap.

Then the circuit was re-printed in "TV For Amateurs", unfortunately before this modification was made, therefore that circuit also needs updating.

Now it's out again (positively the last time - but it's so popular!) - in "The Best Of CQ-TV" and yes, the oscillator modification has at last been drawn in. Now the disaster: A 470-ohm preset and 68pF decoupling capacitor has appeared in the emitter of Tr3! and shouldn't be there!! The emitter goes directly to ground as in the previous circuits and according to the PC board.

The problem came about long ago when material for the "Best Of CQ-TV" was being gathered. The original (or so I thought) drawing was taken from CQ-TV archives and the oscillator modifications carried out. What I failed to realise was that the drawing was in fact a slightly earlier version (un-published) and I didn't spot the rogue components - sorry folks.

ONE IN - THREE OUT - CQ-TV133

G4LXC advises that in order to improve field tilt, increase the output coupling capacitors to 1000uF and reducethe emitter resistors R8, R9, R10 to 220-ohms. This reduces a slight (2%) sync crush to nil. With these mod's fitted the current consumption goes up to at least 150mA causing the transistors to get rather warm, it is therefore advisable either to fit the output transistors with small heatsinks, or replace them with BFY50 TO-5 can types.

BIENNIAL GENERAL MEETING

The BATC's biennial general meeting, held at the Convention on May 4th was poorly attended. This was thought to be attributable to the new experimental time slot - after the main show and lectures - of 4:30pm. In view of this it is probable that the next meeting will revert to the previous time around midday.

The Chairman reviewed the club's progress over the last two years, pointing out that membership is levelling off after several years of rapid growth. Comment was made regarding the expansion of CQ-TV and the production, during the period, of two new publications. A brief description of the new Prestel service was also given.

The Treasurer reported a healthy surplus but pointed out that subscriptions barely covered the cost of producing and mailing CQ-TV.

Mr. E.Davis, G3SXY proposed that the committee should be given a mandate to increase the annual subscription, as and when it sees fit, to a maximum of £10. (NOTE: The committee does NOT foresee the need to increase subscriptions to anything like that level for some time yet). The motion was seconded by G4NJU and carried.

Owing to the increased workload on the committee the meeting approved an increase in the number of full committee members to twenty-two. The existing powers of co-option remain.

Mr.Cox and Mr.Timms retired from the committee this year and did not seek re-election. A vote of thanks to those members was proposed and carried.

Mr.Crampton, Mr.Brown, Mr.Shirville, Mr.Summers, Mr.Chivers, Mr.Delaney, Mr.Elliott and Mr.Marshall all retired from committee under the constitution's four-year rule and were all duly re-elected. Mr.Marsden and Mr.Wooding, both previously co-opted members, were elected to full members as were Mr.Edwards (re-joined) and Mr.Robson. The committee was thus brought to its full strength of twenty two.

NEW VIDEO SWITCHES

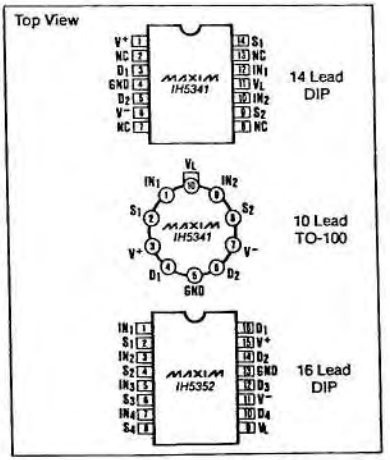
The IH5341 and the IH5352 are dual and quad, single pole single throw (SPST) switches designed specifically for switching RF and video signals. Maxim's IH5341 and IH5352 incorporate an enhanced series-shunt-series structure, providing 70dB of OFF isolation and cross coupling rejection.

Both devices can be operated with supplies ranging from +/-5v to +/-15v. The switches typically have a t_{on} = 160nS and a t_{off} = 70nS, assuring break-before-make switching. The channel throughput resistence of 50-Ohms provides excellent matching to video impedances. In the D.C. state, with switches being either on or off, power supply quiescent currents are typically 100nA, This limits the quiescent current drain to 3µ Watts - ideal for portable equipment.

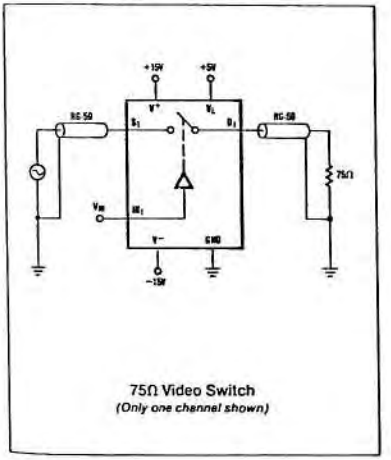
The devices are used in applications requiring the routing, blocking or switching of video or RF signals such as: Disc drives; TV cameras; Video special effects generators; low-power RF switching; space communications, and should certainly find numerous uses in amateur TV shacks and equipment. Anyone using these devices is invited to write up their findings for publication in CQ-TV.

The devices are available from: Thame Components Ltd., Thame Park Road, Thame, Oxon OX9 3XD. Tel: 084 421 4561

Pin Configuration



Typical Operating Circuit



ELECTRICAL CHARACTERISTICS

(V^+ = +15V, V_L = +5V, V^- = -15V, T_A = 25°C unless otherwise specified)

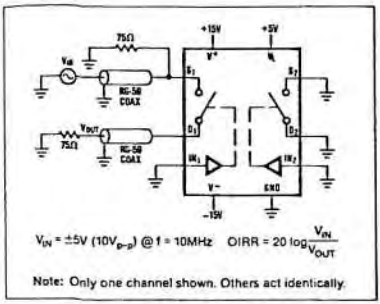
PARAMETER	SYMBOL	CONDITIONS	TYP	M GRADE DEVICE			I/C GRADE DEVICE			UNITS
				-55°C	+25°C	+125°C	-20/ 0°C	+25°C	+85/ +70°C	
Supply Voltage Ranges Positive Supply Logic Supply Negative Supply	V^+ V_L V^-	(Note 3)	4.5 > 16 4.5 > V^+ -4 > -16		5 to 15 5 to V^+ -5 to -15			5 to 15 5 to V^+ -5 to -15		V
Switch "ON" Resistance (Note 4)	$r_{ds(ON)}$	V_D = 5V to +5V		75	75	100	75	75	100	Ω
		I_S = 10 mA, V_{IN} = 2.4V V_D = 15V to +15V		125	125	175	150	150	175	
Switch "ON" Resistance	$r_{ds(ON)}$	$V^+ = V_L$ = 5V, V_{IN} = 3V V^- = -5V, V_D = ±5V		250	250	350	300	300	350	
On Resistance Match		I_S = 10mA, V_D = ±5V	5							
Switch "OFF" Leakage (Notes 2 and 4)	$I_{D(OFF)}$ or $I_{S(OFF)}$	$V_{S/D}$ = +5V to -5V V_{IN} = 0.8V		0.1	0.1	20	0.5	0.5	20	nA
		$V_{S/D}$ = +14V to -14V		0.2	0.2	50	1.0	1.0	100	
Switch "ON" Leakage	$I_{D(ON)}$ + $I_{S(ON)}$	V_D = +5V or -5V V_{IN} = 2.4V		0.3	0.3	50	1.0	1.0	40	
		V_D = +14V to -14V		0.5	0.5	100	1.0	5.0	100	
Input Logic Current	I_{IN}	V_{IN} > 2.4V or < 0	0.001	1	1	10	1	1	10	µA
Positive Supply Quiescent Current	I^+	V_{IN} = 0V or +5V (Note 5)	0.01	1	1	10	1	1	10	
Negative Supply Quiescent Current	I^-	V_{IN} = 0V or +5V (Note 5)	0.01	1	1	10	1	1	10	
Logic Supply Quiescent Current	I_L	V_{IN} = 0V or +5V (Note 5)	0.01	1	1	10	1	1	10	

AC ELECTRICAL CHARACTERISTICS

V^+ = +15V, V_L = +5V, V^- = 0V, T_A = 25°C

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Switch "ON" Time	t_{ON}	See Figure 1		160	300	ns
Switch "OFF" Time	t_{OFF}	See Figure 1		70	150	
"OFF" Isolation Rejection Ratio	OIRR	See Figure 2 (Note 6)	70	80		dB
Cross Coupling Rejection Ratio	CCRR	See Figure 3 (Note 6)	70	80		
Frequency where $r_{ds(ON)}$ = 0.7 x DC		(Note 6)	100			MHz

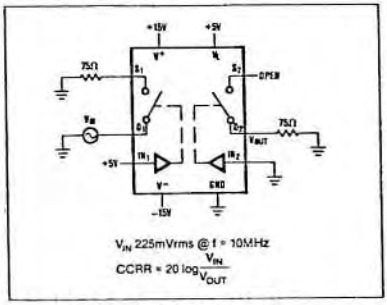
Note 1: Typical values are not tested in production. They are given as a design aid only.
Note 2: Positive and negative voltages applied to opposite sides of switch, in both directions successively.
Note 3: These are the operating voltages at which the other parameters are tested, and are not directly tested.
Note 4: The logic inputs are either greater than or equal to 2.4V or less than or equal to 0.8V, as required, for this test.
Note 5: Maximum values shown are for the dual (IH5341). They are doubled for the quad (IH5352).
Note 6: All AC parameters are sample tested only. Test circuits should be built on copper clad ground plane board, with correctly terminated coax leads, etc.
Note 7: All pins are designed to withstand electrostatic discharge (ESD) levels in excess of 2000V (Mil Std 883C Method 3015.2 Test Circuit)



V_{IN} = ±5V (10V_{p-p}) @ f = 10MHz OIRR = 20 $\log \frac{V_{IN}}{V_{OUT}}$

Note: Only one channel shown. Others act identically.

OFF Isolation Test Circuit



V_{IN} 225mVrms @ f = 10MHz

CCRR = 20 $\log \frac{V_{IN}}{V_{OUT}}$

Cross-Coupling Rejection Test Circuit

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BASED ON THE SUPERB ASTEC MODULES,THIS 24 CMS.FM TV RECEIVER FEATURES A 2 WATT AUDIO AMPLIFIER,WITH VOLUME AND SQUELCH CONTROLS,TUNABLE SOUND SUBCARRIER FREQUENCY,DE-EMPHASIS AND A FULL TUNING RANGE.

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COLOUR FROM A "NO COLOUR" SHACK

By John Goode & John Wood, G3YQC

This is one of those useful circuits resulting from an idea sent in by a member. It seems that some of you don't have a colour TV set in the shack - probably because the wife insists on viewing her favourite 'soaps' in colour - and yet you want to be able to reply to the often asked question "are you locking my colour old man?".

Well now you can! John Goode - CQ-TV's resident expert - has come up with this ingenious little design to light a LED only when a colour signal is present on the input; the light being extinguished on B&W. The circuit works very well and can be built in an evening.

CIRCUIT DESCRIPTION

Tr1 amplifies the composite video signal and passes it to the mono/colour filter amplifier (Tr2). A tuned circuit, resonant at the colour subcarrier frequency, filters off the chroma signals which are passed to the non-inverting input of the comparator IC1b.

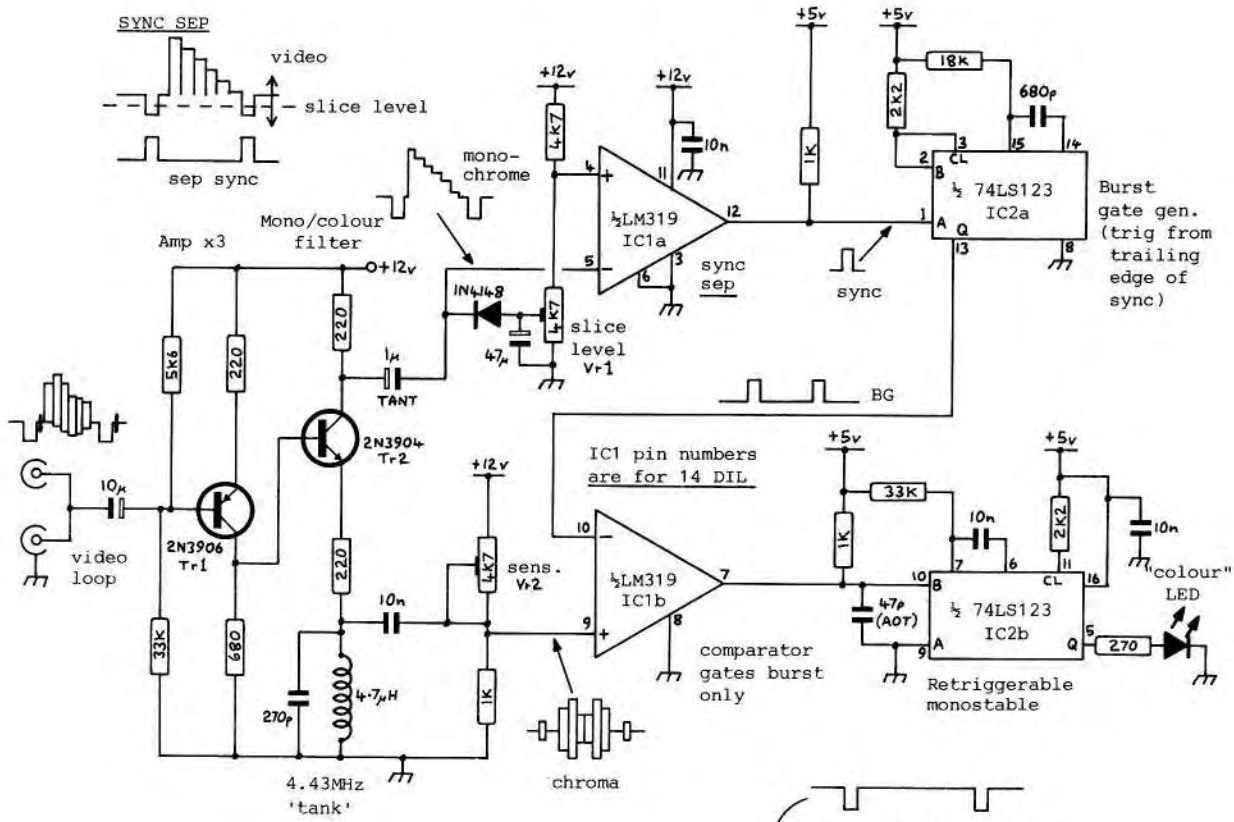
Tr2 also passes the remaining monochrome signal to the inverting input of the sync separator comparator IC1a. The non-inverting input is held at +6v DC. The 'slice level' control varies the DC component on the video signal, and is adjusted such that only the negative-going sync signals will cross the 6v boundary and be passed through the sync separator to the burst gate generator.

The burst gate generator (IC2a) is a retriggerable monostable multivibrator which triggers from the trailing edge of the sync pulse and produces a burst gate pulse of around 4uS duration. The pulse is timed to occur during the back porch period coinciding with the colour burst signal.

The chroma signal applied to the comparator IC1b, is gated by the burst gate pulse such that an output only occurs if a colour burst signal is present. This signal is passed to a second retriggerable monostable IC2b, which produces an output pulse lasting for more than one line period. The monostable is retriggered before it times out and thus the LED remains illuminated. A monochrome signal will have no chroma information so there is no signal applied to IC1b, therefore it produces no output and IC2b is never triggered so the LED remains extinguished.

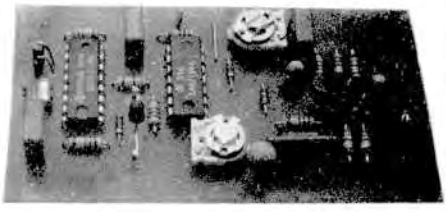
ADJUSTMENT

Connect a normal composite colour signal to the input and, using an oscilloscope, check that a monochrome signal is present at IC1 pin 5. Check also that a chroma signal is present at pin 9 (it may be necessary to adjust VR2 to verify this).



COMPLETE CIRCUIT DIAGRAM

Turn VR1 to its '+' (pin-4) end and monitor pin 12 of IC1 on the scope - it should display a clean line sync pulse. Turn the control until the pulse just starts to break (this indicates that the slice level is rising into the video portion of the picture), then back off the control again until just after the pulse becomes clean. In practice the slider is likely to be close to the '+' end. Check that a burst gate pulse appears on IC2 (pin 13) and that this reaches IC1 pin 10.



ONE OF THE PROTOTYPES

Connect a MONO signal to the input and monitor pin 7 of IC1 to observe the burst gate pulse. Adjust the 'sensitivity' control (VR2) until the gate signal JUST disappears, and then move the slider a touch further to take it clear of the threshold; note here that the LED is extinguished. Connect a colour signal and the LED should light.

'NO SCOPE' ADJUSTMENT

For those without the use of an oscilloscope: turn VR1 slider to the '+' (pin-4) end. Connect a MONO signal and adjust the sensitivity control until the LED just lights, back off the control a little until the LED extinguishes. Now connect a colour signal and the LED should light.

USE IT -

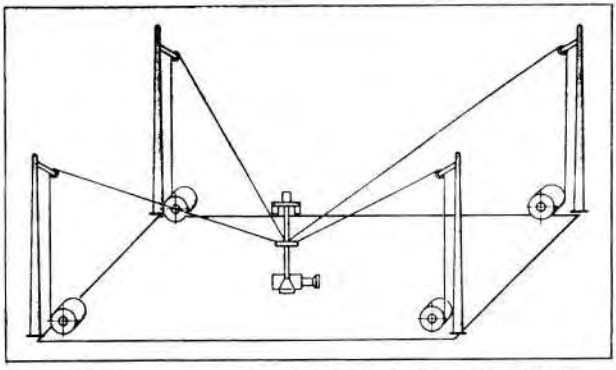
OR LOSE IT

Keep their fingers off our bands

SKYCAM

By Trevor Brown, G8CJS

Byte magazine for October 1985 carried a most interesting article describing a new TV system for sports coverage. Although not really in our field I thought that readers might be interested so have prepared this synopsis to outline the principles.



The physical support and positioning system for Skycam. On a football field, this setup requires several thousand feet of cable

Skycam is an interesting development in the field of professional television coverage of sporting events. The concept is simple and

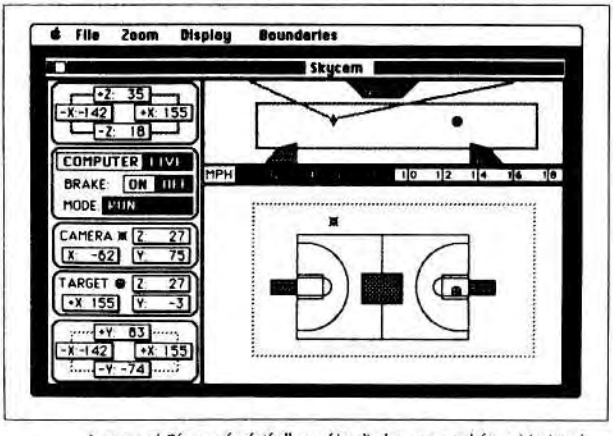
revolutionary and consists of four support towers, situated at the four corners of the field. In the case of a football pitch these towers often already exist as lighting supports. Situated at the bottom of each tower is a power winch which is used to take in and pay out four steel camera support cables (see figure). Each cable is routed up its respective tower and, at the top, passes over a pulley block and out to the centre of the pitch. In the centre the four cables are attached to a steel support ring which is used to mount a small remote operated TV camera. If all four cables are allowed to go slack the camera will just sit on the grass in the centre of the pitch, and if the winches each take up the support cable equally the camera will risa vertically. Now it gets interesting: If two adjacent winches pay out cable and the other two take in cable at the same rate the camera will travel across or along the pitch. The camera can in fact trvavel in any direction to any part of the pitch at any height simply by controlling the power winches. The four winches must be computer controlled to achieve smooth reliable control over the camera position and there are many complex calculations to be made in order to compute a camera position into commands to the power winches.

The first (abortive) attempts were made in March 1983 by a group of technicians at Haverford High School, in a suburb of Philadelphia. The computer used was a Z80 based Osborne-1. After 19 hours of trying the camera could be made to lurch around but it soon became obvious that the computer was not fast enough so it was back to the drawing board.

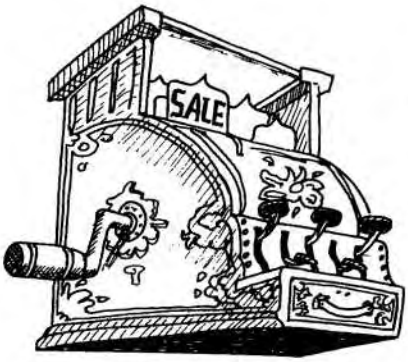
18-months later Skycam re-appeared in San Diego, this time controlled by a Sage computer using a MC68000 central processor (the Sage computer has since been re-named the 'Stride'). For three hours the camera provided viewers with television coverage of a football game, the like of which had never been seen before. The camera was fully remote controlled via a radio link with the pictures being fed out on a separate microwave link. The system takes two people to operate it; one being the remote cameraman and the other the Skycam pilot. They sit side-by-side at a console equipped with joystick controls for positioning the camera, and the more traditional controls for zoom pan and focus.

The computer routines which control Skycam are all written in FORTH; the language of processor control. The sage-II computer uses a MC68000 CPU running at 8MHz with no wait states. The TV camera weighs 40-pounds and the system was invented by Garrett Brown, who won an Oscar for his previous invention, the 'Steadicam', which was used in many films including "Return of the Jedi" and "Indiana Jones and the Temple of Doom".

Watch out for some unusual camera angles on your television sports programmes, I'm sure it won't take long for this invention to cross the Atlantic.



A proposed Skycam basketball graphics display generated by a Macintosh used as an intelligent terminal attached to Skycam's computer.



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All ads should be sent to the Editor at 47 Crick Road, Hillmorton, Rugby CV21 4DU. Tel: 0788 69447.

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CRT's type D13-51GH and AW17-20...£10 each. New and unused photomultiplier tube, with base, in original sealed packing, similar to type 6097 ...£5 Lengths of ex-broadcast camera cable - suit Marconi Mk3 etc. Please enquire. Peter Delaney G8KZG, 6,East View Close, Wargrave, Berkshire.RG10 8BJ. Tel 073522 3121.

ATARI 800XL COMPUTER SYSTEM FOR SALE. Only a few months old this machine has 64k of RAM, 6502 processor, built-in basic and superb graphics. Complete with matching data recorder; Atari assembler/editor/de-bugger ROM; Centronics printer interface; complete hardware manual, operating system manual, technical reference notes; Basic manual, Atari XL handbook; 'Mapping the Atari' book, Graphics and arcade game design manual plus lots of other documentation and a small amount of software. In 'as-new' condition. Genuine reason for sale and a bargain at only £70. If you're short how about a swap? Any ATV gear considered - try me. PHILIPS G7000 Videopac Computer; This is a games machine which takes Philips videopac cartridge programs. Complete with a shop type display cartridge with several modes/options; ideal as a caption generator for ATV idents etc. Membrane keyboard, modified for 1v p-p composite colour output. Service manual but no documentation on the software (except my own user notes), c/w two joysticks...£15. (Buyers inspect and collect or carriage extra).
John Wood, G3YQC, 47 Crick Road, Hillmorton, Rugby CV21 4DU Tel: 0788 69447 (evenings/weekends).

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BROADCASTING EQUIPMENT: Audio jackfield units for 19" rack mounting; (1) 3 rows of 20 jacks, legend strip on each row, 3 lacing bars at rear, wiring to very short multicore. Modern unit in satin aluminium finish, BBC ref. No: JF2/15C; (2) AS ABOVE but with clean tags (no wiring), ready for use, older design paint finish, BBC ref. No: JF/113; (3) ONE ROW 20 jacks, legend strip, clean tags, ref: JF/111; (4) as (3) with same wiring and tie bar; (5) as (3) but only 20 jacks in bakelite without metal plate for 19" rack mounting.
Offers invited. K.Baily, 40 Seymour Close, Selly Park, Birmingham B29 7JD. Tel: 021 472 3688

SHARP MZ-80k micro computer and software. M.Gynane, 164 Stockbridge Lane, Huyton, Liverpool L36 8EA. Tel: 051 449 2044

10GHz PRECISION glass vane attenuator by W.H.Sanders Ltd; micrometer head, WG16 waveguide, round flanges (with rings), in lined box and in perfect condition...£30. ELLIOTT 10GHz precision RF short; micrometer head type A, WH16 waveguide, square flange. In excellent condition this is believed to be still a current item...£15.
John Wood, G3YQC, 47 Crick Road, Hillmorton, Rugby CV21 4DU Tel: 0788 69447 (evenings/weekends).

SC-77 - Japanese version of Robot 400 PL3; complete and working, graphics and 4-picture modifications fitted. ALSO NTP memory board; partially completed with set of memory chips...£120 plus postage.
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Paul Chamberlain, G4XHF, 9 Goffs Close, Southgate, Crawley, West Sussex RH11 8QB. Tel: 0293 515201

TEKTRONIX 555 35MHz true dual-beam dual timebase sweep delay oscilloscope mainframe, with timebase plug-ins type 21 and 22. PSU (separate unit) needs repair so sold as seen...£30 plus carriage. UNUSED SURPLUS components; post free but minimum order £1 please: Rank manufactured LOPT for Bush A823 chassis colour TV...£3 each or 2 for £5. ELECTROLYTICS, axial leads...2p each: 3.3uF 63v; 6.8uF 40v; 3.3uF 63v, leads pre-formed for PCB. WIREWOUND resistors...4p each: 12R 2W standoff PCB mounting; 33R 7W axial leads; 33k 3W 'on end' PCB mounting. CARBON resistors 1W...1p each: 330R, 4.7k, ditto 0.5W...0.5p each: 18k, 470k, ditto 0.25W...0.5p each: 6.8k. DISC ceramics 50v...0.5p each: 470pF, 560pF. 4mm T&E cable plastic clips with pin...0.5p each. SET OF samples of all resistors and capacitors will be enclosed with order or, for samples only, send 20p coin.
G.Turner, 111 West Malvern Road, Malvern, Worcs WR14 4NG

WAYNE KERR 022B video oscillator...£12. BBC PAL coder, GEIM/526...£30. BBC PAL decoder GEIL/528...£15. BBC NTSC coder...£15. BBC sawtooth, step and PLUGE, in frame...£25. PYE 082 solid-state 8.5" monitor...£12. MARCONI V6114 monitor 14"...£8. EMI Mk9 vidicon camera...£30. CAMERA CABLE, with 19-way connectors...P.O.A., (suit Marconi V322). E55L VALVES, used in many Tek scopes...P.O.A. PROWEST PM14/1A, without CRT...£5. BRANDENBURG 470 PSU, 2.5kv, 5mA...£12. BBC pulse DA's, AM4/506A...£2. each.
Jeffrey Borin, 50 Bonnersfield Lane, Harrow, Middx HA1 2LE. Tel: 01 863 2880

- EXCHANGE & WANTED -

RS style 19" sub-rack - NOT the Eurocard variety. Information on the AFC output (pin 10) of the Plessey SL437 i.c., or application circuit, still required. Peter Delaney G8KZG, 6,East View Close, Wargrave, Berkshire. RG10 8BJ. Tel 073522 3121.

REMOTE CONTROLLED pan & tilt head of the type found at traffic surveilance installations wanted. The unit will probably have been made by the Dennard company and fitted to the underside of a containment with a Pye Lynx camera on it. Collection arranged on U.K. mainland, reasonable price offered.
Clive Collins, GW3WEQ, 21 Bron Wern, Llanddulas, Abergele, Clwyd LL22 8JD. Tel: Colwyn Bay 517500

WRAASE SC422 alignment details wanted; with 'scope drawings if possible please.
M.Richards, G3WKF, Wayside, Penwithick, St.Austell, Cornwall PL26 8UH

DISC INTERFACE for Oric/Aimos computer wanted. M.Gynane, 164 Stockbridge Lane, Huyton, Liverpool L36 8EA. Tel: 051 449 2044

CIRCUITS FOR THE FOLLOWING WANTED: IKEGAMI B/W camera type CTC4500 Type M plus information for modification to enable external line and field drives; SANYO B/W camera VC3300X; ALSO any information on Sony camera wiper CMW-110CE. All expenses paid.
Jonathan Gudgeon, G4MDU, "Endways", Stoke Bruerne, Towcester, Northants NN12 7SJ. Tel: 0604 862627

U-MATIC head drum wanted, part No.PU30234, as fitted to JVC 6060E (the same drum is probably fitted in other machines).
John Hoare, G3PJI, 4 Thrush Close, High Wycombe, Bucks HP12 4RJ. Tel: 0494 22108

SONY HVS2000 special effects generator wanted, also U-Matic recorder with assemble and insert facilities.
Graham Lear, 13 Pear Tree Close, Marple Bridge, Nr. Stockport, SK6 5ER. Tel: 061 449 8632

PHILIPS N1700/15 workshop manual required, short loan or whatever.
James McNab, GM2CQI, 166 Kingswood Drive, Glasgow G44 4RB.

MAINTENANCE MANUAL or circuit wanted for National Video model NV 1020 E(K). mono' 7" open-reel helical scan VTR with audio, solid state 625-line. Manufactured by Matsoshita Electric Co. Japan.
Mike North, EI7CL, 135 Downpatrick Road, Dublin 12, Eire. Tel: Dublin 01 751 909

PAST ISSUES OF CQ-TV MAGAZINE wanted for private collection. All issues prior to No.123. Also 'TELEVISION' magazines prior to 1983 wanted urgently. Good prices paid.
David Norrell, 51 Cairngorm Walk, Larne, Co. Antrim, Northern Ireland BT40 2JP

VECTORSCOPE wanted, any type considered. Also PROWEST PM11/3A monitors; to buy or swap for PM14/3A.
Jeffrey Borin, 50 Bonnersfield Lane, Harrow, Middx HA1 2LE. Tel: 01 863 2880

IF YOU WANT a super graphics computer, cheap, almost new and with lots of accessories and literature, and you havn't any money, then why not try swapping some gear for mine (see ATARI ad under the 'For Sale' section). I will consider many things: 24cm gear, 70cm gear, VHF, UHF and microwave gear (sound or vision), satellite gear, video recorders and cameras, monitors, test gear, other computers, why not phone and haggle?
John Wood, G3YQC. Tel: (Rugby) 0788 69447.

HELP! I am building the CQ-TV115-116 ABC colour vision mixer and I need the 1800 series faders to finish it off. Can anyone help? I have contacted Penny & Giles direct, but they no longer make them. Has anyone got a couple to spare? They are 500-ohm lin, fade-up, microswitch at zero end and fade-down microswitch at zero end.
A.M.Goy, G4HJD, 264 Willerby Road, Hull, N.Humberside HU5 5JR

WANTED FOR E.M.I. WAVEFORM MONITOR type 302: EHT unit or transformer, would consider complete monitor if price is OK.
George Mayo, G4EUF, "Carlton House", Broad Lane, Markfield, Leicester LE6 0TB. Tel: 0530 242378

WANTED FOR VIEWDATA/TV receiver: Bush model BC6482A; full circuits etc. of the Viewdata unit only. Particularly test point functions and waveforms, voltage/signal analysis, stock faults etc. The unit is designated type 138A and consists of four panels: T137A interface 6620/4884/04; VDP11 T.I. Viewdata panel, issue-4; LTU11 MkII GEC modem panel, DPA 1166/06/79; LTU11 GEC barrier panel, 04/79. WOULD ALSO be interested in: T138A assembly complete or individual panels; any details for adapting the VDP12 for this application. All expenses paid and info quickly returned after copying.
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To reduce your VTR sound or microphone background noise
£150

Vision Mixers – For special effects between pictures

Type VMAB-80
More complex 2 channel mixer with 11 effects and "Audio follow Video"
£695

Type VMC-85
2 channel compact mixer with cut, mix, 2 effects, key and fade to black **£199**

Horizontal Picture Crispener and Video Distribution Amplifier
Type HPC-82
To sharpen up your camera or VTR pictures, 3 outputs
£199

Gen-Lock PCB for BBC Computer
Type 284
A printed circuit board to synchronise your computer to camera or VTR for mixing pictures
Kit £82
Fitted £105

Colour Processor
Type CP-185
Wideband Colour Corrector to correct your picture colour and contrast errors
£295

Video Distribution Amplifier
Type VDA-5
To distribute your picture signals, 5 outputs.
£80

VAT and carriage extra

Send for details:

ELECTROCRAFT

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