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CQ-TV 179

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BATC at IBC Europe's leading Television equipment exhibition will have for the first time a BATC stand located in the New Technology Campus. The stand will be an exhibit of Pye and Marconi MK4 cameras along with what we hope will be the star of the show an Image Iconoscope camera, using an original 1949 tube. The rest of this extinct camera has been designed and built by Paul Marshall, and Bob Robson specifically for IBC. At the press date for



CQTV (late June) construction is still underway, the tube has not been powered up yet, but EEV are on standby to give the tube any attention required, thanks EEV and good luck Paul and Bob, I hope to see the camera at IBC.

Membership. In the centre of this issue is a membership application form, this does not mean that your subs have run out already, but extra copies of CQTV have been printed to encourage new members at IBC. The form can be removed without disturbing any articles or page numbers (its been engineered that way). If you are an existing member please remove it and pass it along to anyone you think might be interested in receiving CQTV. If you are reading this magazine for the first time I hope you will take advantage of the form and take out a years subscription.

batc.org.uk is the new club web address, the move is to provide a larger site with improved access for this new club venture. The use of this site is growing rapidly and delays were becoming inevitable. I hope this speeds up communications within the club and fills in the gaps between CQ-TV's.

ATV Repeaters. The RSGB microwave committee has recently introduced a new 23 CMS ATV repeater specification that is giving concern (copies available from Clive Reynolds G8EQZ). Clive is also co-ordinating the official club response so any feedback please get it to Clive as soon as possible. **Trevor Brown, BATC Chairman.**

BATC at IBC '97

By Paul Marshall

This year the BATC will be participating at the INTERNATIONAL BROADCASTING CONVENTION (IBC) in Amsterdam.

For those not familiar with the event, IBC is the leading European Broadcast Equipment conference and exhibition. It is a huge event, taking place in the RAI Exhibition Centre in Amsterdam between the 12th and 16th of September 1997. It will be the first time the BATC has attended such a prestigious event and we are pulling out all the stops to make sure that it is success.

Links with the industry are still very important, giving the BATC a higher profile with influential organisations and encouraging new members on a wide front. It is also an opportunity for some very positive publicity.

We have been invited to attend by the IBC Organising Committee, a number of our early members and an ex-President serve on this committee. Our former President, Prof. Ray Hills, approached the BATC committee earlier in the year to enquire whether we would be prepared to attend in the stead of the National Museum Of Photography, Film and Television (NMPFT). The Museum has for the past two years put on an enviable stand at IBC showing older television equipment with the technical assistance of myself and Bob Robson.

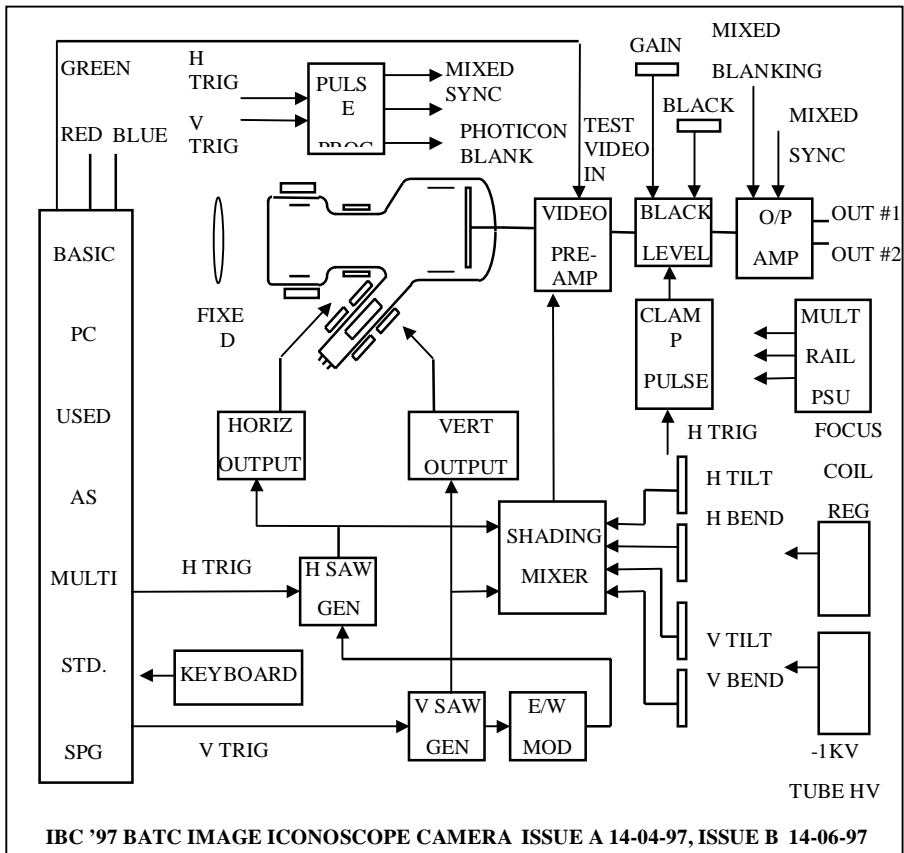
This year, due to a major expansion program, the Museum is unable to participate and hence the invitation to the BATC to put on an exhibit highlighting our skills in the old TV area. We will also be featuring exhibits of microwave work and modern 30 line Television. For these we are indebted to Hans Dekker PE1ECO, and Grant Dixon respectively.

The Exhibits.

We have been allocated a stand on the New Technology Campus (see plans opposite) and it will be 6 metres long by 3 metres deep. This gives us a comfortable working size in which to arrange our wares. The central theme of the 'museum' part of the exhibit will be how electronic black and white television developed through the 40's, 50's and 60's. The three television cameras shown on the plan will be:

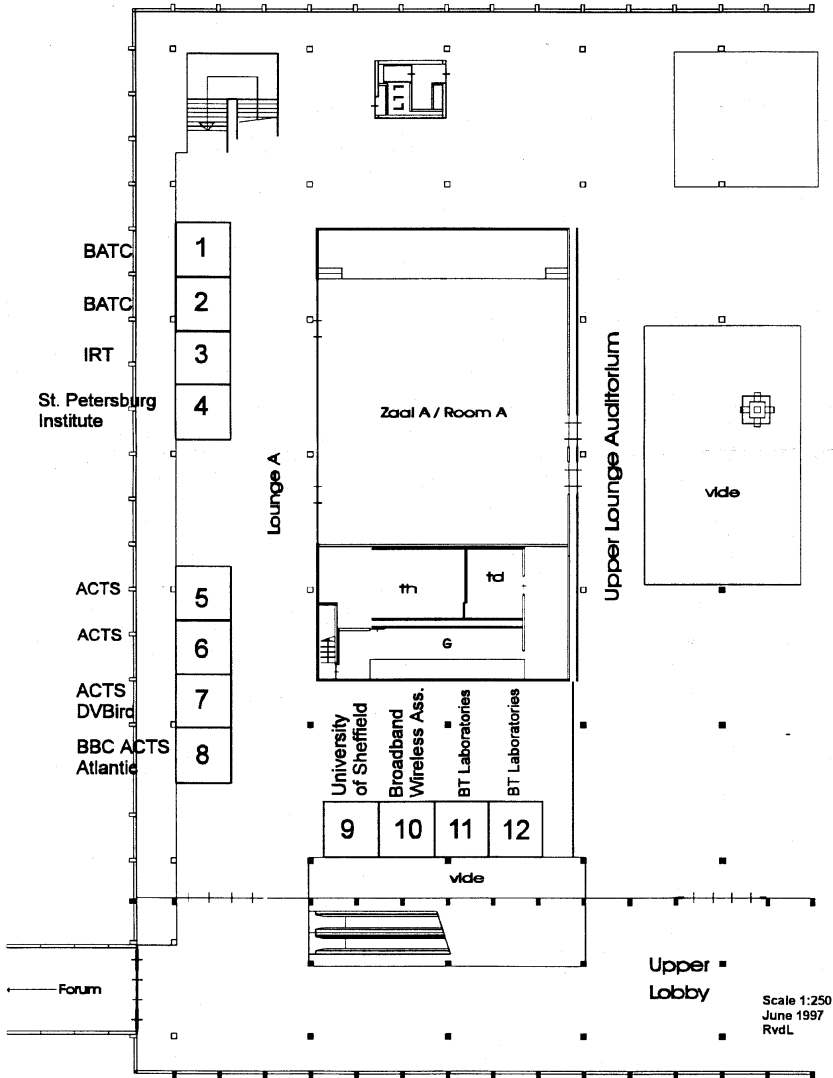
1. Representing the 'first age' of electronic television, an Image Iconoscope. Although actually a pre-war development of the original Iconoscope class of camera (of which the British 'Emitron' was one), the Image Iconoscope continued in use until the early 1950's. The example to be shown is a modern version using an original 1949 tube.

Specifically, the tube is a Pye / Cathodeon Photicon. Image Iconoscope pictures have not been seen for many years, for many years, so it will be interesting to see how this unique camera works. It will be using modern circuit techniques, so the pictures will probably be better than those seen originally.



2. The next chronological development after the Iconoscope was the Orthicon (and Image Orthicon) class of tube. This will be represented by an original working Pye MkIII 3" Image Orthicon Camera shown by Andrew Emmerson. This little camera was well known around the world and clocked up sales of around 250 worldwide. It was produced from the early 50's through to 1960.
3. The final chapter (not counting monochrome CCDs) is covered by the best 997 units world-wide and set a standard for monochrome television that was second to none.

IBC97 - New Technology Campus



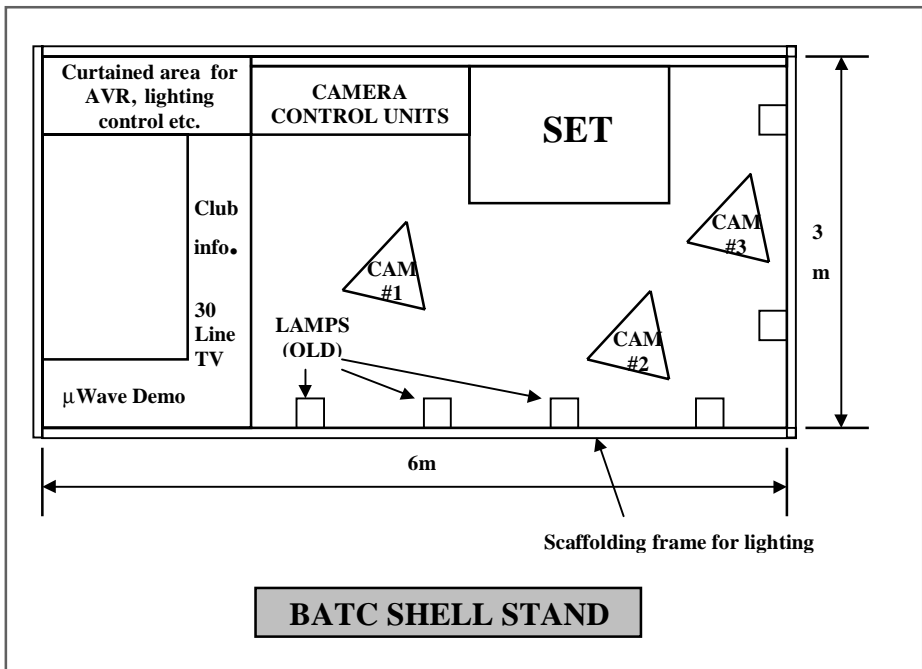
The cameras will be trained on a set representing 'Space'. Besides Television, Space was the other hot technological topic of the era and it also ties in with our President (Arthur C Clarke, inventor of the Geostationary Satellite) and through to another of our key areas of interest, satellite TV.

Paying for it all.

Many things are coming free, the remainder is being paid for either by sponsorship or out of people's own pockets. Only the cost of some extra publications is being borne by the BATC, and this should be re-couped from new members and sales at the show. This is the largest show we have ever attempted, and it has to be good.

Visiting the show.

Anyone who would like to visit the show should contact me on (01522) 703348, e-mail 101573,2170@compuserve.co.uk or write to me. If sufficient interest is shown, we can send a coach party at reasonable cost via the Channel Tunnel. Please contact me before mid-August, if interested.



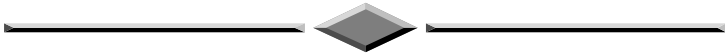
Further details about IBC can be found at <http://ibc.org.uk/ibc/>

We still need help with:

1. Refurbishing the old GEC 'Polestar' Lamps - they need re-painting, checking for operation and safety.
2. Metalwork for the Image Iconoscope camera - much of this is done, but odd bits of lathe/milling machine work still need doing and the whole thing has to be professionally spray painted. Anyone who can make a

cylinder out of sheet aluminium (about 6" diameter) would be a candidate for having several drinks bought!

3. We need to BORROW some substantial packing crates - everything will be packed into crates for transportation to Amsterdam. Large wooden ones about 1m³ would be lovely.
4. Someone to re-case a modern viewfinder in old style metalwork to sit on top of the Image Iconoscope camera.
5. Someone to organise member transport to/from the show - if sufficient interest is shown.



The National Vintage Communications Fair

The National Vintage Communications Fair is an antique-type collectors fair specialising in early technology and featuring thousands of rare and collectable items such as early radios, television receivers, gramophones, telephones, classic valve hi-fi and all manner of electrical and mechanical antiques and collectables.

Established in 1992, the Fair is now held twice a year, in May and October at the N.E.C. in Birmingham, and is supported by a pool of over 300 specialist dealers from the UK, the continent and the USA. For the seasoned collector, attending the Fair is a must, and not only useful for seeking out that special elusive item, but also for buying materials, circuit diagrams or spare parts to complete a restoration project.

For newcomers thinking about starting a collection, help and advice are always on hand from many of the country's leading collectors' clubs, societies and specialist magazines.

This is the premier event of its kind for anyone who appreciates old radios, televisions, hi-fi, telephones, tape recorders and similar hardware -- this is where you can find the real junque (that's high-class junk) that no longer turns up at radio rallies;

It's a good place to bring stuff if you want to sell, and this time it's going to be bigger than ever!

Sunday, 26th October 1977 in Hall 11 at the National Exhibition Centre, Birmingham. Early entry from 8am. For full details telephone: 01392 411 565

Circuit Notebook No. 61

By John Lawrence GW3JGA

Over the years readers of CQ-TV have contributed, and continue to contribute, simple circuits for the interest and use of other amateur TV enthusiasts. In the days of 405-line monochrome TV, transmission was on 70cms by means of a valve transmitter. Adjusting the output stage for best linearity required a sawtooth or staircase (grey scale) generator.

CQ-TV published an almost continuous supply of simple but ingenious grey scale generator circuits. These eventually petered out, but with the advent of colour came the need for its equivalent, the colour bar generator circuit. CQ-TV readers once again showed their ingenuity and a range of simple designs appeared.

Then, with the colour camera/camcorder, the colour caption generator and the VCR came the need for a fade-to-black circuit, so that one picture could be faded to black before switching to another and then faded up again. We have seen a number of such circuits over the last few years, so Circuit Notebook makes no apology for this offering of "Not another fade-to-black circuit".

The circuit uses the usual LM1881 sync separator IC to provide a line clamp pulse, a line blanking pulse and from this, an inverted blanking or active video line pulse. These pulses control three of the analogue switches, contained in the 4066 CMOS device.

As is usual, the sync pulse and blanking with colour burst are routed straight through to the output stage during the blanking period, in this circuit by switch (c). For the rest of the active line (the picture part), the signal is taken from the slider of the fader control through switch (b) to the output stage. This means that if the fader is taken to black, the sync, blanking and burst pass through switch (c) and are unaffected.

To match the black levels of the direct and faded signals, switch (a) is used as black level clamp. This is controlled by the clamp pulse output from the LM1881 and effectively joins the two signal routes during the clamp period. An RF choke is included in series to avoid shorting out the colour burst.

Device	LM1881	4011	4066	EL2020
Maplin Code	UL75S	QX05F	QX23	AUR06G

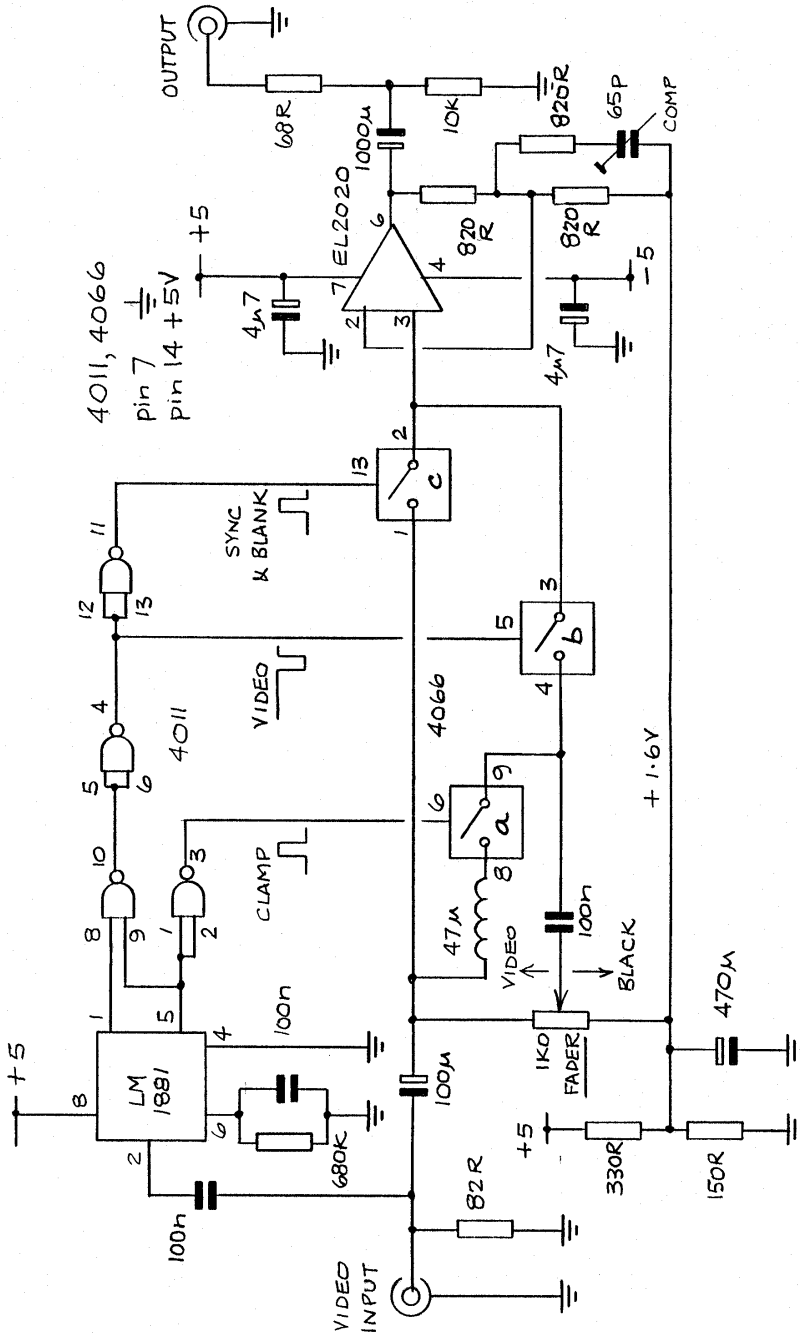
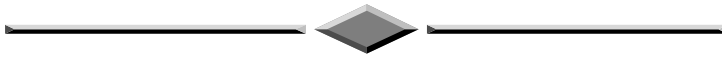


Fig.1. Not another Fade to Black circuit

The potential divider bias circuit, which provides +1.6 V, is necessary to ensure that the video signal remains within the operating window of the 4066 CMOS switch. The 1k0 fader control must be connected to the circuit with short leads to minimise stray capacitance. A frequency compensation trimmer is included in the output stage to compensate for losses in the 4066 and thus provide a sensibly flat frequency response to beyond 6 MHz.

The EL2020 makes an excellent output stage and I would strongly recommend any constructors to use this IC rather than an emitter follower or the usual discrete NPN-PNP transistor circuit, neither of which will work well in this application.



Anyone able to help?

I was recently burgled and had my computer (amongst other things) stolen. The data on the hard drive was obviously lost with the computer, the thieves also stole my floppy disc case with all my backups on! I am now attempting to rebuild my software catalogue and one of the things I am trying to find is the source code for the IIC (Teletron) project. I know I sent a full copy of the source code to someone, but I cannot remember who, if that person would like to get in touch, I would be very grateful. Also, anyone I sent copies of the repeater source code to, if you could forward a copy back to me, please!

How to contact me, well as many of you are aware I tend to move an awful lot, so to help minimise the effects I have invested in a permanent telephone number and e-mail address! The telephone number is 07050 136361 this will re-direct your call to my 'real' telephone wherever that might be for life! My E-mail is Chris.Smith@Earthling.net again, mail sent to that address will re-direct to my current mailbox, for life. So no more excuses about not being able to contact me!

Thanks in advance to anyone who can help with the above.

73's G1FEF -- Chris Smith

Feeder cable fed Pre-amp PSU Protector

By D. J. Long, G3PTU

Pre-amps and LNB's are most economically powered via the RF Feeder and such An arrangement does actually have some merit. The DC for instance follows the RF connection wherever it goes. The number one disadvantage is when the feeder comes to folded dipole aerial, a fluffy plug, a short circuit, as the RF connection is made, so a dead short is placed across the PSU.

A series mopup resistor is not always advisable because of voltage drop, heat and smell. A fuse always blows at a panic moment and when it is least opportune. Dis jucteurs are expensive and also drop voltage. This circuit drops no voltage when operational, is cheap and tolerant of the junk box availability.

This circuit tests the loop resistance of the RF feeder before connecting the Raw PSU to the RF choke. A LED warning is provided that indicates a faulty state.

RL1 is driven via the BC107 which is arranged to just nicely saturate with the base feed of 100k ohm + 1k ohm.

If the feeder is not short circuit, as the 10 μ F charges (a short interval), the BC107 conducts and RL1 engages. RL1/1 bridges the LED + 10k ohm and feeds the full raw PSU straight to the feeder.

If the feeder is short circuit the diode starves the BC107 and RL1 remains released, the LED is lit and only a small acceptable current (say 10mA) passes down the feeder. A value that it is hopped will not cause damage. The RF chokes in "satellite" 24cm front ends are particularly vulnerable in this respect.

Ideally the device should be made use of every time the receiver is put to work from cold, i.e. always switch the PSU off before making the RF feeder connection. However, even if bad practice does creep in and should a short circuit connection be made, the diode conducts and the charge on the 10 μ F is removed smartly and so is raw PSU volts Probably before the smoke begins.

For those who may use other than the original Relay (a DIL component) the bias components must be capable of saturating the BC107 and may require adjustment. So may the 10K ohm, bleed, depending on the load presented (however, remember the I_{fwd} max of the LED with the feeder shorted). A 0A91, 100/1kohm where selected to make the Volts on the feeder for Switch on as low as possible (heavy loads).

Feeder cable fed Pre-amp PSU Protector

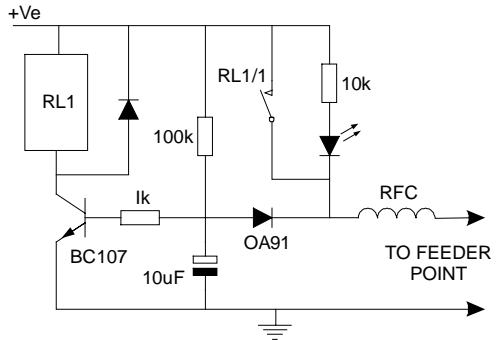
But not to switch with just a few Ohms I.e. near short. The $10\mu\text{F}$ was chosen to give a small delay on power up.

Reduce to 1000pF if not required.

If absent mindfulness is your forte. Concerning switching off before making the RF connector, maybe a small push button situated next to the RF input point, to be held pressed while connecting would assist.

Use normally open contacts to bridge the $10\mu\text{F}$ when the button is pushed.

The $0.1\mu\text{F}$ is arc prevention. The RF decoupler and RFC are the usual components found at the feed point.



Drusillas TV Rally 1997. From Steve Woodgate, G6ZZX

We are holding an Amateur TV Day on Sat August 16th 1997 at Drusillas Zoo Park, Alfriston, (Near Eastbourne), East Sussex.

It is hoped to provide demonstrations of all aspects of Amateur Television including satellite as well as outside broadcast vehicles rigged up and working, and a small studio.

This is a unique opportunity to film the animals and have a fun day out at the best small zoo in the country.

This is not a trading event but primarily at attract enthusiasts and those who wish to see themselves on TV!

Press and local TV stations have been invited to cover this event.

If you have equipment to show, or display at this event (working or not) please call us.

For more details contact: Steve G6ZZX or Sue Woodgate at SVI on 01323 849211 (Eves) Email messages welcome to: interc@globalnet.co.uk

A 13cm Power Amplifier

By Ian F Bennett G6TVJ

Having built a simple synthesised 13cm ATV exciter my thoughts turned to what could be used as a power amplifier. The exciter produces about 10mW perhaps enough to drive some sort of MMIC or hybrid amplifier. The problem with 13cm is that at 2.3 GHz and beyond devices, either discreet transistors or amplifiers get very expensive. After researching a number of manufacturers and suppliers I eventually came up with an IC amplifier costing about £40 and producing almost a watt, at these frequencies not a bad power to price ratio.

The PM2104 manufactured by Pacific Monolithics is a GaAs MMIC amplifier device intended for ISM applications centred on 2.440 GHz. The device is relatively wide band, so covers the whole of the 13cm amateur band. The IC has a gain of 24 dB and runs on a supply of +5V, it also requires two negative bias supplies similar to other GaAs fet amplifiers. The 2104 is a surface mount device housed in a SOT8 package and heatsinked via its metallised base, it's pretty tiny so not recommended for newcomers to surface mount techniques.

A complete amplifier can be made by mounting the device on an enclosed PCB and supplying it with negative bias and a positive supply.

Amplifier Circuit

All the clever stuff is done inside the PM2104 IC, fig 1 shows the circuit diagram of the amplifier. The bias supplies and positive supplies are decoupled, some 50R matching resistors and a 33p cap are also required.

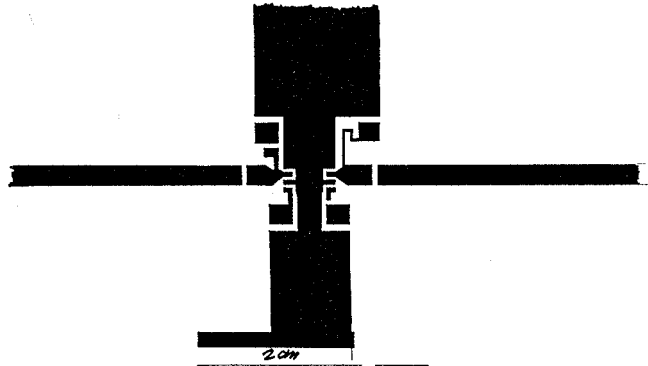
The device is nominally pre-matched to 50R but a 33p matching cap is needed at the input pin.

The device is powered on pins 4 and 8 with 5V. Negative bias is supplied to pins 2 and 5. An ICL7660 DC to DC converter chip is used to generate the negative supply in a similar manner to that used in some of the Microwave Committee 3cms units. A simple comparator circuit is used to detect the presence of the bias supplies and then switch on the +5V V_{dd} supply to the IC. If the bias voltage fails, the IC may be destroyed so the comparator is needed to protect it. As a second measure, the L200 5V regulator incorporates a current limit, set to about 600mA. I have not proved the action of this circuit but after the touch and go action of soldering the IC in and the £40 hole in my pocket, I thought I would put it in.

Construction

The bias generator, comparator, and regulators can be built on stripboard as convenient, only mild heatsinking is required.

A standard fibreglass double sided PCB is etched to the pattern shown. The layout comes from the manufacture's data sheet. The base of the IC is



metallised and must be soldered down to the board to form a heatsink. First tin the underside, solder down the pins and finally solder down the base by applying the iron to each side. The operation of mounting the IC is very tricky so not recommended for people without previous experience of working with surface mount devices. The other components can be added including several via pins, which help earth the device. The PCB is then mounted in a tinplate box and fitted with SMA connectors in a similar way to how the Microwave Committee 3cm amplifiers are constructed.

Alignment

The data sheet suggests that pin 2 should be set to -1.2V and pin 5 set to -1.5V, it is best to start with more negative bias and reduce them carefully while monitoring the supply current and power out. It is worth checking the action of the L200 current limit first with a dummy load. The protection circuit can be set up by adjusting the protect pot until the V_{dd} supply just switches on (Best done before connecting the V_{dd} supply to the 2104). I found that I could get the best efficiency with slightly different values of bias. By comparing the DC power in and RF power out the bias can be tweaked for minimum power dissipation of the PM2104. The values I ended up with were -1V and -2.2V for pins 2 and 5 respectively. The attainable output power should be up to about 800mW, +29 dBm with 5 mW of drive. The PM2104 runs warm to the touch in operation.

Components

The PM2104 is available from Richardson Electronics on 01522 542631. It is also worth obtaining the Application note on the device No. 2494A. Richardson Electronics also have a web site at <http://www.rell.com/>

A 13cm Power Amplifier

The tinplate box, type 7752, came from Piper Communications on 01235 834328. The other surface mount bits came from Mainline including the 50R resistors. It is best use ATC capacitors if available.



These pictures were received P5 at Win Green near Shaftsbury, in October 1994 using a Cal-Amp "Arabsat LNB".

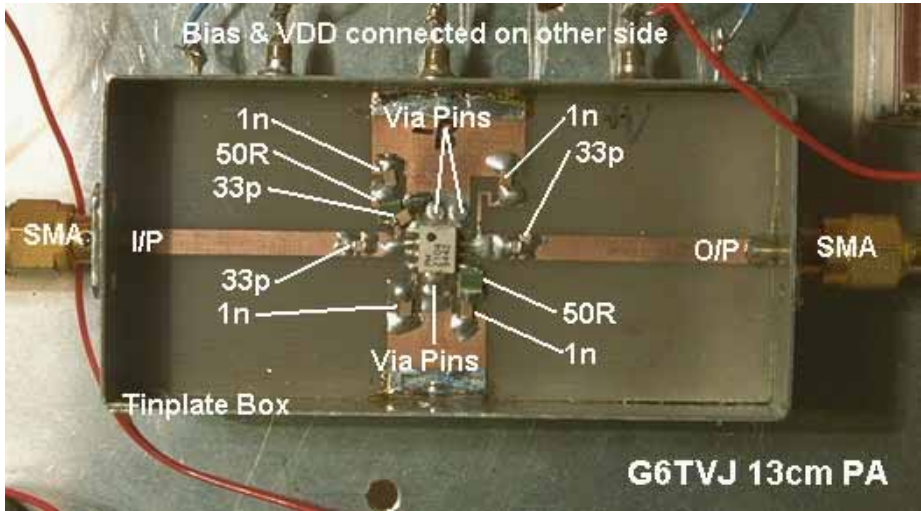
Conclusion

In the absence of a better solution for attaining medium levels of power at these frequencies the PM2104 does OK. The amplifier has provided good service facilitating P5 pictures over a few miles and some 50 miles on last years' ATV contest. At £40 not a bad mW per £ ratio at these frequencies.

It is a tad awkward to use and mount, so if anyone has a simpler solution please share it with us.

For further information about the Severnside ATV group, this and other G6TVJ projects check out our web site at - <http://wkweb4.cableinet.co.uk/severnsideTV/severnside.htm>

E-mail severnsideTV@cableinet.co.uk



Inside view of the completed PA



LNB used for the DBOTS pictures.

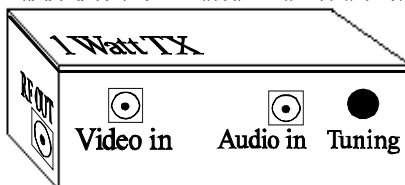
Worthing & District Video Repeater Group

GB3VR & GB7VRB

1Watt FM-TV 24cms Transmitter

The 1 watt transmitter generates its signal at the wanted frequency which can be set anywhere in the band, colour or B/W. On board intercarrier sound and fixed pre-emphasis are standard features. The kit includes the PCB all the on board components, pre-drilled heat sink, an Eddystone Di-cast box and full and comprehensive instructions. Building time is three evenings work. The new price for this kit is £80.00, P&P £2.50. Over 650 units sold to the Amateur market alone.

This is probably the biggest selling TX kit in the world!!!



Two channel phased locked loop kit.

This add-on kit vastly improves the overall stability of the 1 watt transmitter. Two crystal locked channels and a third free running tuning position are available. Kit price £30.00

Amiga ATV Program-2

The New Amiga ATV program has more features than ever, up to 56 testcards, 20 wipes, superb text control, 30 screens of text messages, QRA calc, Testcard music, selectable displays, and this version has a DTMF tone pad to control your repeater. All testcards are over-scan i.e. the whole screen is used, Load in your own customised testcards, Extra large text, scrolling text, clock, callsign extensions, Hot key operation, Doc reader, ATV Cli, Cross Hatches, Purity and a comprehensive section for genlock users. For any Amiga with 1meg or more, state callsign and QRA (if known) when ordering, this three disk set is now only £10.00 P&P 75p

Spectrum ATV Program

Still selling after all these years, why, its good, its cheap and it works on all spectrum based machines. The 48k version has over 60 commands which include 7 Testcards, Memo pad, clock, maps, tones, QRA locator, various size printing, plus disk transfer routines and much more. Now only £5.00 P&P 75p

PC ATV is coming.

Orders should be sent to:-

Treasurer of GB3VR, R.Stephens, 21 St. James Ave., Lancing, Sussex,
BN15 0NN. Cheques payable to "W&DVRG" Tel (01903) 765760 7 to 8pm.

World Wide Web

The BATC web pages have moved yet again. This time we have taken space with a commercial web service provider. We hope that this will be a permanent address. The URL is:-

<http://www.batc.org.uk>

A feature is a software download area. This page contains programs, data and code from articles in CQ-TV as well as other programs related to amateur television.

17 Years of the Gelsenkirchen ATV Repeater DB0CD

by Georg Boettinger DH8YAL.

Annual Report 1996. Weather conditions led to extraordinary reception of DB0CD during 1996. For instance, on the 23cm there appeared -- noise-free - - the Hornisgrinde ATV repeater DB0OFG, at a distance of 344km. The 10GHz output of DB0CD was received at a distance of 127km by PA0BOJ. And the Ruhr region ATV Network set DB0RWE in Essen-Karnap into relay operation.

The frequency generation section of the 13cm transmitter has been revised. With the assistance of DL9EH and a spectrum analyser, the transmitter output spectrum has been optimised again.

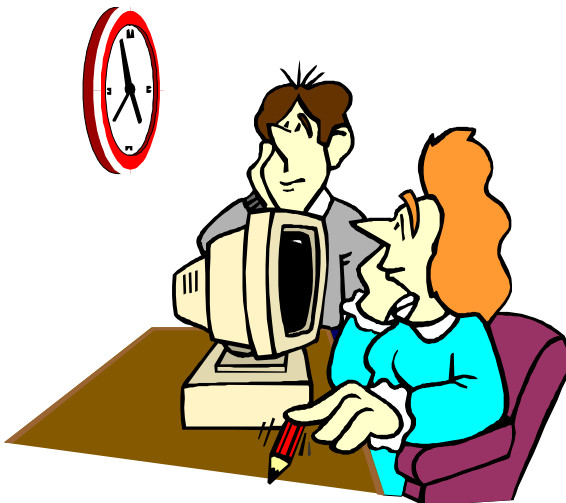
From the repeater site, I have been able to fix up duplex ATV connections to DB0TEU in Osnabrueck. On 10GHz, I have received DB0RWE for instance and DB0TT (Dortmund) on 13cm. I then transmitted them on 23cm to DB0TEU. The output from DB0TEU was then received on 13cm and patched through to the 70cm and 3cm outputs of DB0CD. In this way ATV links were created between Lower Saxony and the Ruhr region.

No alterations were made to the repeater's operating hours at the Ruhr ATV conference of 1996. The next conference takes place on 24th May 1997, once again in Gladbeck.

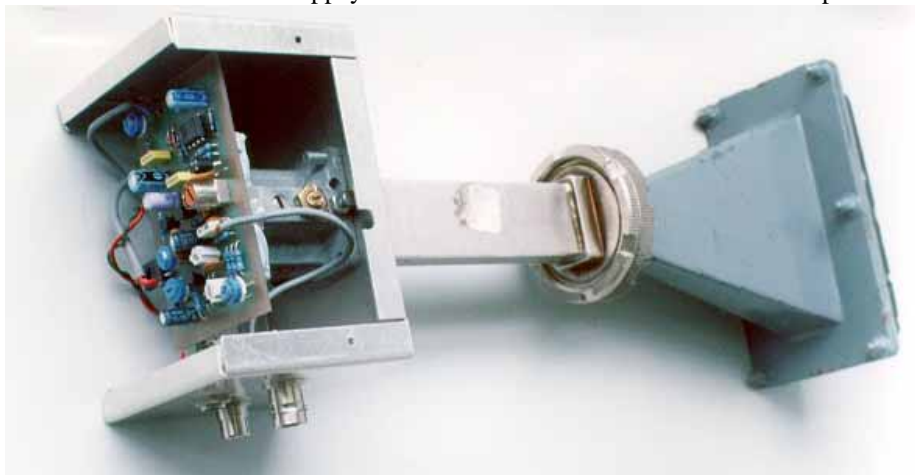
TV on the Air

By **Graham Hankins G8EMX.**

Yet again, I am able to open with news of another new 24cm Amateur TV repeater in the UK. GB3KT (East Kent) was given the 'go ahead' to begin service from May 17 1997, a substantial achievement for members of the Kent Television Group in the Medway region of the UK.



ATV Repeater GB3KT is located on the Isle of Sheppey and radiates an omni-directional 25W e.r.p. on 23cm.



**Gunmod 2 3cm transmitter mounted on horn antenna. Seen at GB2BP
ATV station, Bletchley Park**

The allocated output is at 1310MHz from a Solent transmitter and SC1040 modular power amplifier. A test card and news pages are transmitted in

beacon mode; when accessed by an ATV station, the Z80-based logic puts a 'received signal-strength' bar graph into vision. The repeater can be accessed on the input frequency of 1249MHz.

Andy Parnell G8SUY (Faversham) is Keeper of 'KT and Chairman of the Kent Television Group (no connection with the Kent Repeater Group). Further repeater and KTG news can be downloaded from the internet at <http://ourworld.compuserve.com/homepages/BJenkins-2>.

News of yet another new ATV repeater, but a Canadian one this time. After four years of planning, VE3TVA was built by the Seniors' Video Repeater Committee of the Pioneer Amateur Radio Club (PARC) and is now operating in Ottawa. "Here in the frozen north", writes Bill Westbrook VE3EKA, "we have only one ATV frequency in the 70cm band. 439MHz was chosen as the AM input, with an FM output on 914MHz. We plan to add an FM input in the 1.2GHz band later on".

The specification of Ottawa ATV repeater VE3TVA quotes an output power of 1.5kW (yes, 1,500W!) e.r.p., with plans to increase this to 200W into the antenna. Remote control and monitoring via packet radio will also be incorporated. Funding of 'TVA has been helped by government grants, and the regional Emergency Measures unit has donated some equipment.



The three through-reflector antenna used by Dartmoor repeater GB3WV

Having built the repeater, the Pioneer ARC has many uses for 'TVA. Organisers of public events can be provided with live video coverage; the local Emergency Measures Organisation (like

RAYNET in the UK?) recognised how useful pictures could be; kids in the local Childrens' Hospital will 'see' Father Christmas at the North Pole. How about a camera at Amateur Radio Club meetings? All these ideas are, presumable, possible in the UK too? Thanks to Jim Hatch G3OOL (Somerset) who sent this report.

“Long-established ATV repeater GB3HV (High Wycombe) has undergone an almost entire re-installation”, says Mike Sanders G8LES. “HV shares a mobile phone site and the company wanted to replace the mast with a stronger structure”. This caused the Home Counties ATV Group two site trips and several days work to temporarily remove their system.



Andy Parnell G8SUY proudly monitors GB3KT at his home QTH

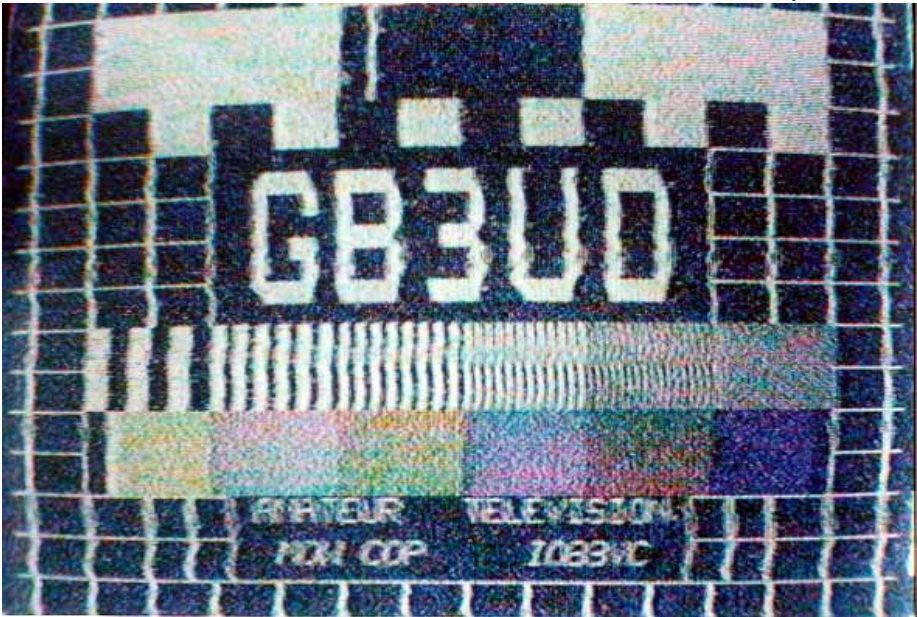
The electronics of GB3HV had developed numerous faults which needed to be fixed; an overload trip (monitoring antenna s.w.r.) was not firing, r.f. output power was low, a 70cm receiver had drifted and a power unit was intermittent.

Mike adds: “GB3HV had developed hardware problems too. A faulty power splitter; a loop-antenna needed attention and a 2M/70cm dual-band antenna was measured to have a high s.w.r. on 430MHz”. The repeater group's 'antenna expert' G8CKN attended to these little jobs, so GB3HV is now back in service.

Later this month there will be an attempt to achieve a new ATV distance record. Peter Johnson G4LXC will be in Peterhead, Scotland on Saturday and Sunday August 16/17 to send pictures over to PE1ECO/P in Holland - a distance of more than 750km. Peter will be using 435MHz, 1.3GHz and 10GHz. All comers are welcome to join in.

Now some welcome news of 70cm. Ian Waters G3KKD (Cambridge) still has serviceable 70cm ATV equipment, although not used much recently. Ian is trying to get the local 23cm 'net' in Cambridge to kit up with 70cm receivers so that duplex QSOs could be achieved. Ian would welcome some fresh picture exchanges on 436MHz and can be contacted on 01223 811477.

Please bear in mind that material used in 'TV On the Air' may also be used



Stoke on Trent 24cms repeater GB3UD received P4 at QTH of Arthur Bevington G5KS, near Dudley West Midlands

as part of the 'Focal Point' ATV column in 'Practical Wireless'. If you do NOT wish a contribution to appear in 'PW', please make that clear when submitting. Because of differing copy deadlines, material may be used in 'Focal Point' BEFORE 'CQ-TV' magazine.

On the basis that you are more likely to remember the last thing that you read, can I urge ALL ATV REPEATER GROUPS to send me a copy of their newsletters? Surely, this just means adding my name and address to your computer list? I do not wish to, indeed cannot, phone around more than 20 contact names.



Members of the Welland Valley ARS enjoy (?) a talk and demonstration of Amateur TV from Grahm Hankins G8EMX

I have been asked to keep this TVOA shorter to keep room in CQ-TV for an IBC report so, that's yer lot for now!

Activity News from Mid and South Wales

Submitted by John Lawrence GW3JGA

ATV activity in mid-Wales has always been sparse, almost the only active station being Derek Whitehead GW3FDZ at Dyffryn Ardudwy near Harlech. Derek has, until recently, maintained a weekly sked on 70cm ATV with Craig Robinson EI3FW near Dublin.

Patrick GW0GZQ, who moved recently to a new QTH near Cardigan, South Wales, contacted John GW3JGA at the recent BATC Rally, to see what the possibilities were for getting ATV contacts from his new location.

John '3JGA and Derek '3FDZ are old ATV mates from the 1960s and after discussions with Patrick, Derek loaned his 70cm receiving gear to Patrick so that he could test out the path on this band first, before moving to 24cm. The results were very encouraging, with Derek's signal on 70cm being received at P5.

On Sunday May 25, fired with enthusiasm, John took his portable 24cm ATV gear from North Wales down to Derek's QTH near Harlech with the intention

of testing the 60 mile path across Cardigan Bay to Patrick's QTH (Cardigan). After a fair amount of fiddling, due to breakthrough from Irish TV and other technical problems, pictures came up from the noise and by the afternoon P4/5 pictures in colour were received in both directions with the usual talkback on 144.750MHz. Patrick was running 3 watts to a Severnside long yagi, John and Derek were running 16 watts to a 3JVL loop yagi.

Derek is now fervently building kits for 24cm (from the Bob Platts stable) so that in addition to the proven path down to Cardigan, he hopes to reopen the sea path across to EI on 24cm. The intention is to increase ATV activity in this quiet part of Wales where the sea paths should provide some interesting propagation conditions.



(Left to right) Tony G8Ceq, Frank G0GSR and Brett G6URM at the opening of dartmoor 24cm repeater, GB3WV.

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The Prehistory of ATV

By Andy Emmerson, G8PTH.

The British Amateur Television Club, the oldest organisation in the world devoted to amateur activity with television transmission, was founded nearly fifty years ago, in 1949 and interest in the subject goes back even further for several of its members. But the roots of amateur television extend back even further, as Andy Emmerson G8PTH now reveals.

It is very difficult to say categorically who the first ATVer was: indeed if you take Marconi to be the first radio amateur, then perhaps Baird deserves the title of first amateur television experimenter.

However, although the work of Baird (and his assistants) was experimental it was certainly not connected with the amateur radio hobby. During the era of mechanical TV and televisors several hams got involved and indeed there is one fast-scan ATVer in the USA who claims continuous involvement in amateur television of one kind or another since



Fig 1. The first amateur television transmitting station in Britain - G2AO, Owen Relly, based near Eastbourne. Photo taken 1934 or 1935. Copyright Ray Herbert G2KU.

those early days.

His name is Mel Dunbrack W1BHD and he has been “fooling around with television reception and transmission since 1923”. At the last report he was still active on ATV, FAX and the HF bands, as well as being a member of AMSAT, having watched the Russian Sputnik fly over the USA.

Once television experimentation started on a commercial basis in Britain, the



Fig 2. Amateur television transmitter by Owen Relly G2AO. This picture shows the 30-line scanning gear, with a photocell in a saucepan! The wavelength is 160 metres. Photo copyright G2KU.

USA and Continental Europe, these activities began to attract public attention and a number of companies sold kits of parts for constructing electromechanical receivers for the experimental transmissions. Magazines published constructional articles and many enthusiasts became amateur television experimenters. The vast majority of them were not radio amateurs and because they were involved only in receiving, not transmitting, we do not count them as true amateur television operators, at least in the sense that this article is concerned with.

Here is a chronology of amateur television transmitting activity in the early days.

- 1926. The callsign 2TV, later G2TV, was issued to Television Ltd (later known as Baird Television) and was the callsign used by the world's first television transmitting station. This was a commercial venture and 2TV was not an amateur callsign. All the same, many radio hams (including G2KZ, G2KU, G5PV, G5 VG, G6HP, G6NA and G6OP) were involved with the design and construction of the 250W 200-metre transmitting equipment used at the station.
- 1927. Vision signals transmitted across the Atlantic from 2KZ. No pictures in New York as TV receiver not available. See Daily News 22nd April, 1927.
- 1928. February. World's first transatlantic television transmission of live pictures from amateur radio station G2KZ at Warwick Road, Coulsdon. received by Robert Hart W2CVJ and Ben Clapp G2KZ in New York. Detailed write-up with photographs in RTS Journal Jan. 1988.
- 1928. March. Live TV pictures received on SS Berengaria in mid-ocean. Video recordings made on a gramophone record by W2EB and W2BUO.
- 1928 or 1929. A Mr Jack Porter built a closed-circuit 30-line television system and demonstrated it at his shop in Worcester. This is recalled by Grant Dixon G8CGK, who knew Mr Porter.
- 1932. Australia. Amateur station VK2KI transmitted 30-line pictures on 136 metres. This was a Waverley Radio Club project.
- 1934. January. G2AO of Eastbourne was transmitting 30-line TV on 160 metres. See RSGB T & R Bulletin July, 1934, page 31. "I received amateur TV signals on 40 metres on 15th and 22nd July at 22.00 but could not get a picture."
- 1934. December. 30 and 60-line transmissions made by H. Bailey G2UF of Denton, Manchester, on 10 metres. See Practical Television Jan. 1935. The Royal Television Society has a photo.

The next mention of ATV this country appears to be a note in *Wireless World* (3rd April, 1936) entitled 'Amateur Television in Yorkshire'. The text is one tantalising sentence and reads "The Yorkshire Television Association is applying for a licence to erect an ultra-short wave station at Gilderstone, near Leeds, for television experiments." It would appear that not a great deal came of these, although closer scrutiny of subsequent issues of *Wireless World*, the RSGB's *T&R Bulletin* and the local newspapers might bring something to light.

More 10 metre ATV activity followed. In Portsmouth station G6PU radiated experimental transmissions using a 25-watt vision transmitter on 10 metres; it

was located at the Portsmouth Municipal College. There is a photo of the station in the 28th July issue of *Wireless World*.

A short paragraph entitled ‘Amateur Television’ appears in the January 1939 edition of *Television and Short Wave World*, and reads as follows:

“Some American amateurs have recently installed a fairly high definition television transmitter which they are operating on a frequency of 57 megacycles. Members of their society have built their own receivers with miniature tubes, and considering the difficulties, results, it is stated, are quite satisfactory. British amateurs are limited as to the amount of work they can undertake, *for television licences are difficult to obtain with transmissions restricted to a frequency of approximately 29 megacycles, while only one picture per day can be transmitted*” [author’s emphasis; this may well be incorrect].

This paragraph would imply that the amateur television mode was permitted here in 1939, but I have never seen any evidence of such transmission being made. The only non-broadcast television transmissions mentioned in published literature were of the Baird company’s airborne surveillance experiments on 51MHz under the company call sign G2TV: these were described in *Radio & Electronics World* (February 1985 issue) by Ray Herbert G2KU, who was present on those flights.

The story now moves to the USA and the New York World’s Fair of 1939. Dave Ingram writes in *Video Electronics Technology* that ATV was demonstrated in the ham station there. “The managing director of W2USA, Art Lynch W2DKJ (now W4DKJ), after seeing a successful demonstration of amateur television equipment at a radio show in Chicago in June, was convinced that television communications should be added to the station at W2USA, “the most visited amateur radio station in the world”. Since the World’s Fair was scheduled to close at the end of October time was short, but Art lined up the necessary talent, and with some help from industry, the group built two complete television systems in an effort to establish the first two-way television contact.

“Their goal was accomplished on September 27, 1939 when amateurs at W2USA and W2DKJ/2 at the New York Daily News building in Manhattan began exchanging fair quality television pictures on the amateur 112MHz band. Accompanying sound was transmitted on 56MHz. Distance between the two stations was about eight miles.

“The television equipment at each end of the circuit consisted of a camera-modulator unit, a receiver and a transmitter which were duplicates of equipment described earlier in QST. The system used 30Hz vertical scanning, 3600Hz horizontal scanning and a 120-line raster. Considering that the pictures were viewed on a CRT with a P1 phosphor, the results were quite

gratifying. Each station boasted the very latest in electronic equipment, including electro-magnetically deflected cathode ray tubes, free-running sweep tubes synchronised by external pulses, and iconoscope camera tubes. The equipment was donated by RCA, national, Hallicrafters, Hammarlund, Thordarson and Kenyon. The station at W2USA used a single 1000 watt lamp for subject illumination, while W2DKJ/2 had a battery of smaller lights with reflectors.

“A number of amateurs in the vicinity of New York were working on their own television receivers, and on October 15 W2AOE put on a demonstration of members of the Northern Nassau Radio Association by receiving TV signals from the 20 watt station at W2DKJ/2, seventeen miles away. The range was increased to 29 miles on October 19 when good quality TV signals were received at W3FRE in Denville, New Jersey.”

Another description of pre-war amateur operation in the USA is to be found

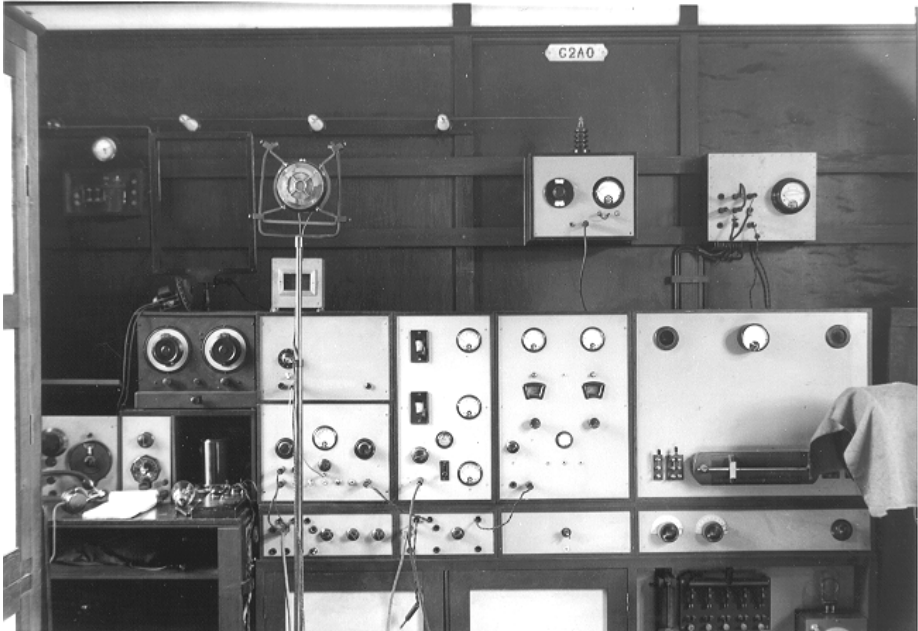


Fig 3. The radio room and mast of Owen Relly G2AO in 1934 or 1935. Photo copyright G2KU.

in the December 1942 issue of *Electronics* magazine, where Robert Mautner and Frank Somers (calls not given) describe their extremely professional camera, monitor, sync pulse generator and transmitter. This equipment, they say, was constructed just before the war and used successfully in the 114MHz band for several months. The comprehensive list of references also

mentions a couple of articles on ATV in the May and July 1940 issues of *QST*. All these transmissions were on the then-current American standard of 441 lines, with 60Hz vertical frequency.

The war put paid to further ATV development and the next mention of this subject occurs in 1948, in the British magazine *Mechanics*. The 15th October issue devoted its centre spread to an Australian ham, VK3LN, who had built his own television camera and receiver. The system's line standard is not mentioned but the illustrated article stated that he proposed to transmit speech on 144 megacycles and that clear vision reception was expected within line of sight.

We move on to the year 1950, when W2LNP in the USA published a three-part article in *Radio and Television News* describing his home TV station. This conformed to the very same standards used by American broadcasters, namely 525 lines, 60 fields, audio subcarrier and transmitted on the 420-450MHz band. The article is extremely progressive for its time and set the scene for all subsequent development, which can be traced in *QST*, 73 and A5 magazines.

It is now 1951 and we take a visit, remarkably, to the Soviet Union.

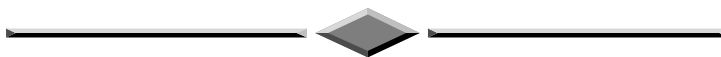
Amateur construction of television station and receiving equipment is highly developed in the Soviet Union. According to the OIR Bulletin of 15 June 1951, the initiative in the construction of a television centre was taken by radio amateurs of Kharkov, one of the greatest industrial and cultural centres of the Ukrainian SSR. While constructing this television centre, the amateurs had to overcome many technical difficulties such as the elaboration and perfection of different parts of this complicated system. The initiative of the Kharkov radio amateurs was supported by the authorities, and workers in many Kharkov enterprises devoted their leisure hours to making free of charge. transformers, transmitters and rectifiers, aerials and other accessories.

The television centre constructed by the Kharkov radio amateurs is operating successfully. The "stable zone" of this centre is 20 to 25 km. Its sound and picture transmissions can be received not only on the KVN and Leningrad T1 sets manufactured in Soviet radio workshops, but also on receivers built by amateurs. Radio amateurs, in many other towns of the country, inspired by the successful experiments of the Kharkov centre, are also beginning to build television centres.

Continued operation of this centre was reported by OIR in February 1952, in an article which said that amateurs had been constructing "television distribution centres, relay stations, simple and inexpensive amateur television sets, devices for relief and colour television, television apparatus requiring a small number of valves intended for mass production and many other apparatuses and devices".

Various publications aid the amateur in his work, including the following books: 100 Answers to Questions by Amateurs on Television; Television Receivers and How to Control Them; The Technique of Demonstrating Television; Amateur Television Receiver LTK9, by A. Kornainko; Amateur Television Receivers, by J. Bardah and L. Troitzky. A note about the last book states: "The authors give a survey of peculiarities in the construction of amateur television receiving sets; they describe receivers equipped with cathode ray tubes of 5, 7 and 12 in. The book is written for readers with technical knowledge of television."

(This fascinating excerpt is from a UNESCO (United Nations) handbook entitled *Television, A World Survey*. It was published in 1953.)



Deadline

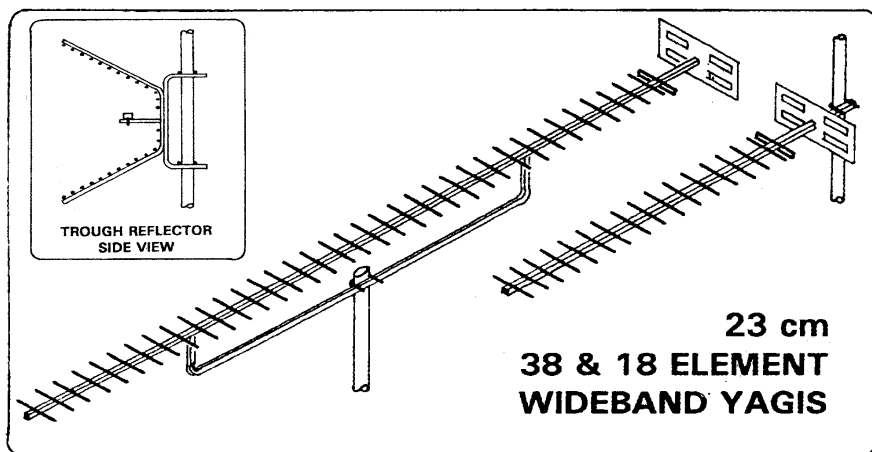
Will all contributors please note that the deadline for articles for CQ-TV 180 is August 15th 1997. Please send your contributions in as soon as you can *prior* to this date.

If you would like to contribute an article for publication in CQ-TV, then please send it to the editor, either by post, or preferably by email. If you don't use a word processor, plain ASCII text is fine. Please see page 2 for address details.

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Betamax PALs

By Alan Barnett, G7OLH

I have always been a fan of the Betamax video format and was pleased to find some Betamax related web sites on the World Wide Web. If you have access then there is a community of Betamax users on-line who regularly exchange news and information.

Here's a list of some Betamax Web site:

- <http://www.demon.co.uk/room101/betamax> - The Betamax Chat Page
- <http://www.imag.net/~altered/beta.html> - Kevin's site
- <http://videos.net/betamax> - Absolute Beta
- <http://www.leland.stanford.edu/~whitew/Beta> - Beta Lore
- <http://condor.lpl.arizona.edu/~vance/betaphile.html> - BetaPhile Club
- <http://www.geocities.com/CapeCanaveral/6263> - Beta Video Info
- http://www.urbanlegends.com/products/beta_vs_vhs.html - Beta vs VHS
- <http://ourworld.compuserve.com/homepages/hamid/betamax.htm> - Hamid's site
- <http://home1.gte.net/spsmyth/index.html> - The Beta Chronicles
- <http://www.elekratec.demon.co.uk> - Betamax PALsite

After a while of lurking I decided to have a go at setting up a site myself. It seemed to me that most of what was already available was predominantly American dominated and so I decided to try to cover things from a UK perspective. Hence, I created the Betamax PAL site which I hope will provide a source of contacts and information covering PAL system Betamax VCRs. So far, there are details on over a dozen machines and work is under way to include many more. I hope that it will become a place where people can exchange Beta news, information, repair tips and also make the odd appeal for those more elusive spare parts.

I thought that some of the information that I have pulled together for the site could be of interest to CQ-TV readers.

Betamax Repair Guide, why not have a go yourself?

These days with the dominance of VHS it is possible to pick up second hand Betamax machines at modest prices. They can be very reliable and give many years service and so maybe worth thinking about renovating.

Assuming you have bought an old Betamax VCR from a boot sale what do you do next?

The first question that should be asked is: “Would you want the machine if it were working?” This may seem a silly question, but there is little point fixing up a unit if it’s not going to be of any use afterwards. (I exclude fanatical collectors from such mundane considerations of course). Betamax VCRs come in many different types, from the old-fashioned mechanical ‘piano-key’ type to the sleek hi-fi model.

Once you have decided to have a go at doing up that bargain machine where should you start?

There are some checks that are universal. The first thing to do is to take a good look at your video. Check that it is not damaged in anyway that may make it an electrical hazard. Look the unit over and check for any signs that it may have been dropped or smashed. Next remove the lid and look over the insides. Here look for any loose wires, especially any that might be connected to the live mains. Also look carefully for any signs of corrosion such as might be produced by a liquid spillage. If you see anything that makes you suspicious that the VCR may not be electrically safe then do not connect it to the mains supply.

Assuming that all is well then take a careful look at the mechanics inside the VCR. These will vary enormously. The early models will contain numerous belts, idlers and tyres and the later models may just have one belt inside them. In the case of idlers and tyres examine the rubber items carefully and if there are signs of age then you are going to need to replace them. Spares are still available for most models and can probably be obtained through your local repair shop.

Next examine the tape transport, including, the pinch roller. If the VCR has been in someone’s garage for the last few years then it’s certainly going to need replacing. Do not be afraid to have a go at cleaning the rollers and guides around the tape path. This is best done using some cotton buds soaked in methylated spirits.

Before lashing out and spending money on replacement pinch rollers and idlers it is advisable to check that the electronics in the video is working properly.

To do this plug the video in and watch what happens. On some models there may be a mains on/off switch which will need to be switched over before things come to life. With power applied most videos have a flashing clock display. If you do not see this then the power supply in the VCR is faulty.. Different models use different power supply arrangements. The later models will have a switched mode power supply (SMPSU) while earlier machines will use a conventional transformer and rectifier.

At this point, you should see some activity from the mechanism as the video performs some self-checks. If things go wrong then the VCR will probably

shut down at this point. If this is the case then there is probably a fault with the sensors or in the servo circuits.

If all is OK then plug the video up to a television and try to tune it so that you can view off air broadcasts through the video. This is known as E to E mode. (This stands for electronic to electronic which isn't particularly informative). If all works as it should then next try to insert a videocassette.

Try winding the tape forwards and backwards first to check that the mechanics is functioning, then try to play the tape. If you are lucky then you'll see a nice picture on the TV. If not then you'll need to take a closer look to and see what is going wrong. Of course, this can be a very technical job and best left to the experts but again there are some points which you can observe. Look at the picture you see when the tape is playing. If the picture appears all noisy or streaky then you may have a clogged, or worse a worn, video head. If you suspect the video head may be clogged then you can have a go at cleaning it. This is best done by using a special head-cleaning tool such as those available from Maplin Electronics.

Be very careful if you decide to attempt this job. The head tips are extremely delicate and can be easily broken.

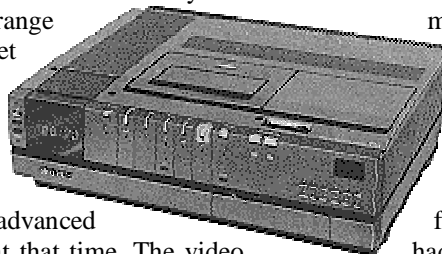
Finally, try making and playing a recording. If you get a distorted picture with black streaks across it then the video head is definitely past its day and will have to be replaced. Replacement heads are available for many models. For suppliers try looking through the pages of Television magazine.

So much for generalities. Here are a few comments and repair tips for some specific models.

Sony SL-C7.

The SL-C7 was a remarkable video for its day. It came on to the market in 1979 as the top of the range machine and was an instant market leader.

With a stylish hi-tech design which put the controls under several tuck flaps, the C7 boasted advanced features not seen in domestic video at that time. The video had full infra-red remote control, multi-event 4 event 2 week timer, APS index marking, microphone input. Also there was full colour in cue/review modes!



Fault Guide:

E to E sound

For no sound from the tuner, check the TBA120 FM demodulator IC

No Playback audio

Suspect the audio changeover relay on the AS-3 board.

Problems setting clock or timer

The switches used on the clock and timer section are prone to failure. When they begin to stick, they can cause all sorts of erroneous behaviour. The only reliable cure is to replace them.

Machine stops intermittently in rewind

Check that the APS and or memory function is not switched on.

VCR is sluggish in or fails to rewind

Internally the C7 contains many drive belts, which are used in the mechanics of tape transport. With age, these belts become slack causing malfunctions and when this happens the whole lot should be replaced. In particular for the rewind function you will need to replace a tyre on the supply reel. A 'rewind' kit of replacement parts is available from many sources. The Sony part number is A 670634A.

Strange behaviour of capstan or drum servo

The first thing to check is the tantalum capacitors in the servo circuit. Look for the 2.2 micro farad ones first.

Sluggish threading and capstan problems

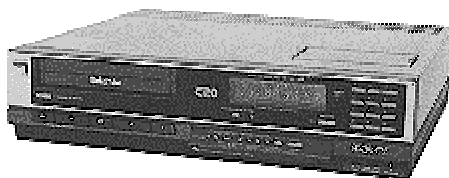
The bottom bearing on the capstan motor is prone to wear and because this motor also drives the threading mechanism, threading can become sluggish. When this happens you will hear a horrible squeaking noise! It is possible to strip down the motor and replace the bearing but an easier option is to replace the entire motor if you can find a replacement.

Picture drops out in playback

This can be caused by lack of CTL pulses from the Audio/Control head. One remedy is to modify the CTL amp circuit to give it more gain. Alternatively, a worn head can be polished up using a metal polish.

Sony SL-C20

The SL-C20 was a stylish slim looking basic Betamax model. It was the brother to the SL-C30. The



The SL-C20

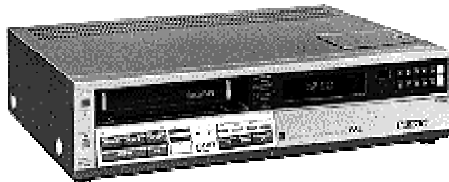
difference is that the C20 had no remote control and was silver in colour whereas the SL-C30 was black and had remote control. Other than this the two were indistinguishable.

These machines incorporated many features of the mechanism used in the earlier SL-C9, albeit stripped down presumably to save on manufacturing cost. Today these machines are beginning to show their age, however they are well worth maintaining as spare parts are still obtainable.

Fault guide:

Stops in play or record

This is becoming a more common problem these days. The first thing to check is that there is adequate torque on the take up spool. If there isn't much then the cause is usually down to two contributing factors. The first is the drive pendulum which can seize up and the second more serious factor, is wear on the reel motor bottom bearing. The pendulum is simple to replace but the bearing is moulded into the chassis and replacement necessitates that the entire chassis be replaced. One possible compromise is to fit a small piece of plastic into the bottom bearing to raise the rotor and allow it to move freely. Sony supply a repair kit for this purpose.



The SL-C30



The pendulum drive assembly of the SL-C20, which seizes up.

Patterning on picture

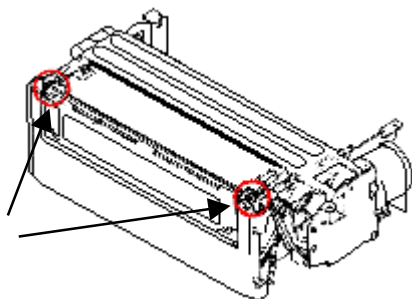
If you experience a patterning on the picture irrespective of whether you are viewing a tape or not then the most likely cause is that capacitor C319 in the power supply has dried up.

No head drum rotation

You may find that the head drum fails to rotate. This is due to a problem with the Hall effect device on the head drum motor, which is secured by a blob of glue, which tends to become conductive especially if it absorbs moisture. The best remedy is to remove the glue from the device. To do this first remove the

rotor from the bottom of the drum by undoing the lock nut. Sometimes, however, it is enough to wait for the damp to dry out.

Sony SL-C9



The carriage of the SL-C9, showing the loading gears which break.

The SLC9 is a very special machine in the range of Sony Betamax machines. It first came on to the market in 1982 and was the 'top of the range' model for many a year afterwards.

What makes it so special? Well to put it simply, it is because the C9 incorporates so many advanced features. Features that even today still put many current video recorders (non Beta included) to shame. From the technical point of view the most amazing achievement of this machine

is the tape transport. This uses two separate direct drive dc motors, one for each of the supply and take up reels. The result is that the tape transport is simply beautiful. The ability to change from normal speed playback to trick speeds of one tenth, a fifth, with near frame accurate advance in both forward and reverse is incredible for a domestic VCR.

From the consumer point of view the C9 is a stylish front loading machine which has a 9 event 14 day timer, Beta Noise Reduction (BNR), audio dubbing facility, a camera input and perfect picture in pause mode not to mention a real-time counter and APS indexing system.

Fault guide

Irregular tape transport during rewind/review.

This is caused by the tape, which sticks to the upper drum when it is worn. It can be fixed by replacing the upper drum. Sony now supplies an improved type, which is made of a harder wearing alloy.

Defective loading

It often happens that the plastic gear on the cassette carriage breaks. This usually leaves the tape trapped in the machine. However, if eject is attempted, it can result in more broken parts, such as the inner and outer cassette flaps. Sony supply a 'carriage modification kit', which contains an improved set of gears which, are made of metal as opposed to plastic. To fit this kit the carriage must be removed from the deck. This can be quite tricky, as the front

panel has to be removed first. Pay special attention to the rod, which connects to the bottom of the carriage, before removing.

Grating noise during tape threading/unthreading.

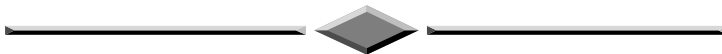
This is caused by a split plastic to crack. It is also advisable to replace the threading belt at the same time.

No fluorescent display

This is caused by failure of the DC to DC converter in the power supply. This is a sealed contained unit and can seldom be repaired if successfully opened. Sony supplies an improved replacement, which can be identified by the air holes it has along the sides. The original unit was completely sealed. It has been known for these replacement units to fail after a few years operation. However, unlike the original ones they can usually be repaired by replacing the reservoir electrolytic capacitors inside.

The DC to DC converter also supplies the tuning voltage, hence when it fails no channels can be received.

The author can be contacted via email: Alan@elektratec.demon.co.uk



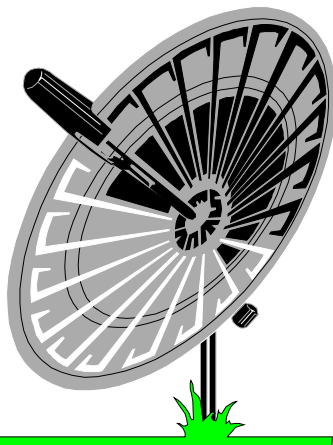
The electronic editions of CQ-TV cost £2.50 each (2 disks), including postage. The CQ-TV articles index costs £1.50 (1 disk), including postage.

Copies of the Adobe Acrobat reader V3.0 are available at £4.00 each (3 disks), including postage. Again, only IBM PC format is available. Credit card orders can be placed via our web site at <http://www.batc.org.uk> or by post from: CQ-TV Magazine, 14 Lilac Avenue, Leicester, LE5 1FN, England.



By Paul Holland G3TZO

This is a shortened version of Satellite TV News this time around due to the usual pressures of work, home and editorial deadlines. For those like me who have yet to make the investment in digital receiving equipment the news looks increasingly like an obituary for analogue TV. Indeed the post this time bag reflects the growing interest in digital services, which are now increasing at a similar rate to those analogue services, which are closing.



From the Post Bag

A bumper post bag this time comprising both snail mail and E-mail. First up was Thomas Wratten from Aberdeen who wanted information on the possible move away from Astra of Galavision. No definite date is yet known but it seems clear that Galavision will leave Astra and may only be available in the future on Hispasat. Galavision is on HISPASAT now but in MPEG2. Details are; Freq 12.592 Ghz, Pol H, FEC 3/4, SR 27.5. PID 4207/4291.

John Jaminet, W3HMS from Mechanicsburg PA, wrote to enquire on the availability of French language programming in the US and availability of equipment to view digital TV signals. With regard to his latter point I was able to refer him to equipment sources quoted in the last Satellite TV News and pointing out that equipment for digital TV services now available in the US are incompatible with digital services in Europe (and vice versa). The best bet for reception of French language programming in the US is Canal France International on 3.766 Ghz (RHC) from Intelsat 601 at 27.5 Deg W. John is now busy fixing up his new Uniden C/Ku receive set up to see if he can receive the channel at his QTH.

Ian Roberts, ZS6BTE, from Randpark Ridge in S. Africa writes to say he has a home-brew solid fibreglass dish of 3m with 4 Ghz and 12 Ghz front ends. Ian can receive RTL2 and VOX using an 0.7 dB LNB although using "severe bandwidth reduction". Ian's main query was the availability of smart cards for the various digital bouquets. As ever with digital the answer is not straightforward. Receivers are currently "leaking" out of their target sales

areas complete with official smart cards. The problem of course will come when it is time to renew subscriptions and you do not have the right address. To date (and this will change at any time) there are no pirate smart cards for the current digital services available.

E.V.C Perera of Nugegoda, Sri Lanka and John Gaut, GOCCV, of Mansfield both wrote in enquiring about use of the Nokia "D" Box for digital reception. Information has been passed on. Mr Perera has obviously got the digital bug having already invested in a Pace DVR 501 to receive the European digital multiplex of Deutsche Welle, MCM, RAI, TVE Spain and TV5 with superb pictures but variable sound levels. He is however unhappy at the inability to retrofit another CA module and the lack of an SCPC capability - hence the interest in a D Box !!

One reader I could not help was Tom Bratton who wrote asking for any technical information on recovering the audio from Sound-in-Sync satellite channels. Tom has been playing around with a sync re-inserter for the SiS channels and could see the SiS pulses on his 'scope. His mind then got to thinking about decoding the SIS pulses. He says "I have some scrap PCBs that look as though they were used in PCM with some expensive looking chips on them. Unfortunately they are just the chips the manufacturers don't have PDF format data sheets on". Does anybody have information - if so Tom is on E-mail at thb@thegle.demon.co.uk or send via myself at the usual address.

New Channels

Zomer TV This temporary Dutch summer service was scheduled to return on 1st July after its winter absence from Astra 1D No transponder details are available .

SVT Europe During the summer the Swedish public service company Sveriges Television, SVT, will start marketing it's first pay TV channel. The channel is named SVT Europe and is intended for Swedes abroad. The channel will be digital and will probably be positioned at 13 degrees East or at 5 degrees East (new SIRIUS 2-bird).

TV8 a new Swedish business channel plans to start broadcasts on the upcoming Sirius 2 satellite in digital with a parallel feed from Tele-X, probably on Kanal 5's current transponder on 12.475 GHz, after Kanal 5 moves to Sirius 2. The new channel is scheduled to launch in October, and the PAL broadcasts will continue until the end of the year. Sirius 2 is scheduled to launch on Ariane flight V99 on August 28.

Launch News

Hispasat 1C

Hispasat 1C will be launched at the end of 1998, and will provide 22 digital transponders for Spain and South America.

Panamsat 6

PanAmSat Corp has announced that the launch of its PAS-6 Atlantic Ocean Region satellite has been rescheduled for late summer. The delay is at the recommendation of makers Space Systems/Loral, which is investigating changes to the power systems on the craft. PAS-6 is an FS-1300 model satellite with 36 Ku-band transponders. It will be located at 43 degrees West Longitude.

ASTRA 2A

SES Luxembourg has confirmed a delay for the launch of ASTRA 2 A. This satellite will occupy the second orbital position for Astra owners SES at 28.2 degrees East. According to the latest report ASTRA 2 A will be on-air in the middle of December 1997 (instead of October) just in time for tests of the new British Interactive Broadcasting (BIB) 200 channel service in Spring 1998. A new satellite uplink station to serve Astra 2A will be built for BIB at Chilworth by the Anglo-French company Matra Marconi Space. The two planned antennas will have diameter of over 8 metres each.

Thor 2A

Norway's Thor 2 satellite finally made it into orbit on a Delta-2 rocket from Cape Canaveral in late May. Thor 2 is an HS 376 spin-stabilised satellite built by Hughes. The satellite will join Thor 1, Intelsat 707, and the ageing former German TV-SAT at 1.0 Deg W. Thor 2 will deliver direct-to-home television by means of 15 active Ku-band transponders, powered by 40-watt travelling-wave tube amplifiers (TWTAs).

The satellite uses gallium arsenide solar cells to generate more than 1400 watts of spacecraft power at end of life, and will rely on nickel-hydrogen batteries for power through eclipses. Thor 2 is designed to operate for more than 11 years. Thor 2 effectively adds about 75 digital and analogue channels to the system run by Norway's Telenor at this position. The satellite was supposed to launch in February, but a Delta 2 explosion the month before delayed the launch. Then the US Air Force pushed back the date again while it studied the results of the successful Delta 2 launch of the first Iridium satellites.

Telenor has already ordered a Thor 3 satellite from Hughes. It will be co-located with the other satellites at 1 degree West by August next year. Sweden's Kinnevik is one of the companies which has already booked capacity on Thor 3. Thor 3 will have 14 active 47-watt Ku-band transponders with a minimum service life of 11.5 years

Transmissions from Thor 2 to Scandinavia are expected to begin in early July. Among the analogue offerings will be three channels from British Sky Broadcasting: Fox Kids, and two specially created combination channels, one called SkyNews and Documentaries, the other Sky Entertainment (mainly composed of material from Granada's channels, and not BSkyB).

The Sci-Fi Channel, whose TV-Sat transponder failed earlier this year, will be moved to Thor 2. The Dutch music channel TMF will also be carried as part of the expanded digital offerings from Nethold, now Canal Plus, and their package called Canal Digital which starts in September.

Thor Frequency Plan

Tp	Pol	Freq (Ghz)
1	H	11.215
2	V	11.288
3	H	11.246
4	V	11.260
5	H	11.278
6	V	11.292
7	H	11.309
8	V	11.325
9	H	11.340
10	V	11.357
11	H	11.371
12	V	11.389
13	H	11.403
14	V	11.421
15	H	11.434

Proposed Launch Schedule

Satellite	Date (all 1997)	Position	Launcher
Panamsat 6	Late Summer	43.0 Deg W	Ariane
Hot Bird 3	July	13.0 Deg E	TBA
Astra 1G	Jun 97	19.0 Deg E	Proton
Sirius 2	Aug 97	5.0 Deg E	Ariane
Nilesat 1	End	7.0 Deg W	Ariane
Astra 2A	December	28.2 Deg E	Ariane
Intelsat 804	Nov	21.5 Deg W	Ariane
Hot Bird 4	Oct 97	13.0 Deg E	Ariane
Eutelsat W24 F1	Jan 98	10.0 Deg E	Atlas
Hispasat 1C	4th Qtr 98	30.0 Deg W	TBA

Transponder News

TURKSAT 1 C 42 Deg E

Flash TV has launched a digital service at 11.129 Ghz v. Parameters are SR 4200, FEC 3/4, V-PID 4021, A-PID 4022.

Astra's 1A, 1B, 1C, 1D, 1E, 1F 19.2 Deg E

The Box, a English music-programme, is now available on Tp3 11.244 Ghz (H) from 03.00 - 07.00 CET nightly. The signal is "soft encrypted" in Videocrypt with reception of the program requiring only a video-crypt-decoder and no smartcard.

The Chinese Channel has left transponder 54 in favour of a Viaccess encrypted MPEG2 feed on Astra 1E 11.837 (H). The Chinese Channel is re-launching under the name TVB Superchannel Europe. Receivers are available at £430 with an annual £300 subscription please form an orderly queue !!

The Adult Channel has restarted transmissions on 10,788 V (Tp 54) and as I write in parallel (ie: same times/encryption) as on transponder 11. It is expected that TAC will abandon transponder 11 as it has been reported that the German pay-movie channel Premiere 2 will take the vacant Filmnet transponder, in PAL, using Syster Nagravision encryption.

Expect to see National Geographic Channel (NGC) with an initial 6 hr per day service expanding to 12 then 24 hrs with the launch of BIB's 200 service. No transponder details were available at the time of writing but candidates include tp 7, subject to future of Sky2 or tp 44 - subject to closure of Galavision (see post bag).

Eutelsat II F3 16.0 Deg E

Libya's Jamahirya Satellite Channel has started an analogue service on 11.617 Ghz (V) in clear PAL with a parallel from Arabsat 2B on 4.167 GHz also in clear PAL. Italy's Magic TV has opened in clear MPEG-2 on 12.572 Ghz (H) VPID 05B4, APID 05BC I. The Ukrainian Satellite Channel started a limited service on Wednesdays plus Weekends on 11,575 Ghz (V) in clear PAL. Check between 1300-1700 hrs.

Eutelsat's II F1 & II F6 (Hot Bird 1) 13.0 Deg E

The new BBC/Discovery Channel owned Animal Planet started on Hot Bird 1 11.304 (H) Ghz, in clear PAL on July 1. The Arabic News Network (ANN) is now transmitting news programming in clear PAL every evening on Hot Bird 2 on 11.766 Ghz (V). The Arabesque digital channels on 12.015 GHz (H) are now encrypted. Muzzik has started on Hot Bird 1 11.304 GHz (H) in encrypted MPEG-2.

Fashion TV launched on 14 May as part of the digital multiplex carried on Hotbird 1 tp 5 (11.304.75 Ghz H)

The following tuning details are reproduced to illustrate the typical channel data required in order to recover digital services:

Symbol rate 27.5 Msymbol/s

FEC 3/4

Transport Stream ID 500

Service ID 103

PID Video 123

PID Audio 133

The channel can be seen by anyone with a DVB compliant receiver.

Amos 1 4 Deg W

A new erotic channel for Eastern Europe has started on transponder 11.345 Ghz (H). "Babylon Blue" broadcasts on Saturdays between 23.30 - 2.00 CET in clear PAL.

Telecom 2B,2D 5.0 Deg W

Rumours are circulating regarding closure of RTL9, LCI - La Chaine Info, and TMC - Tele Monte Carlo. Canal+ and RTL9 are supposed to be leaving soon, LCI and TMC at the end of August.

Telecom 2A 8.0 Deg W

Cine Cinemas has ceased its service in D2 MAC Eurocrypt on 12.692 Ghz (V). The only other D2Mac service Canal Plus is also likely to close its D2Mac service soon from this position. Cine Cinemas is now only available in Nagravision/Syster on 12.669 (H) at this position, or from the CSN digital package on Astra.

Hispasat 1A & 1B 30.0 Deg W

A new digital multiplex from Spain's Telefonica has started on 12.592 Ghz (H). Tuning data is as follows (all SR 27500, FEC 3/4):

V-PID 5010, A-PID 5011 testcard

V-PID 5020, A-PID 5021 Catalunya

V-PID 5030, A-PID 5031 TVE 2

V-PID 5040, A-PID 5041 TVE 1

V-PID 5050, A-PID 5051 Catalunya

V-PID 5060, A-PID 5061 Sistemans de Satellite testcard

ORION 37.5 Deg W The Italian Cinquestelle channel has started in clear MPEG-2 on 12.603 GHz.

New Services

High Speed Internet Service

EUTELSAT--Eutelsat and COM.NET (part of Italy's Gruppo STET/Telecom Italia) have announced the first satellite service in Europe providing access to the Internet, with speeds of up to 40 Mbps per transponder, based on the DVB (Digital Video Broadcasting) open standard for digital television. The service will be operational this Summer, and will be marketed by Telecom Italia. The required reception equipment will be a DVB-MPEG-2 card for the user's PC and a 60 cm antenna, which can be the same as already used to receive satellite television. For the return path a normal modem and telephone line are necessary.

NDS SimulCrypt System

Given the current state of open systems for conditional access it is interesting (but not necessarily hopeful) that News Data Systems (NDS) demonstrated its prototype SimulCrypt system at one of the major trade shows recently. Simulcrypt is designed and produced to integrate conditional access systems from multiple broadcasters.

NDS' SimulCrypt objective is to allow multiple broadcasters using different conditional access (CA) systems to access a single set-top-box by commercial agreement. The company's SimulCrypt system meets the standards outlined by the DVB and is designed to be secure, inexpensive, provide broadcasters with choices in conditional access systems, enable subscribers to use only one decoder and card to receive all channels, and allow a single transmission to be received by all receivers. In addition, the NDS system meets the agreed DVB standards for a common scrambling algorithm, allowing a single transmission of data to be scrambled alongside any number of proprietary conditional access streams.

Earlier this year NDS demonstrated its SimulCrypt system, designed and produced to integrate conditional access systems from NDS, Canal+ (SECA) and Irdeto. The demonstration to European Commission officials, government officers and broadcast customers enabled them to see a real live SimulCrypt system in action.

We await with interest the form of CA system to be used by British Interactive Broadcasting (and the successful digital terrestrial licensee when appointed) for the new digital TV services scheduled to go live in the second quarter of 1998.

Web News

WEB sites worth a visit include;

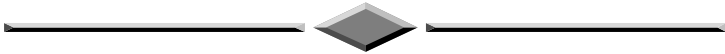
http://www.sat-net.com/sat-uk/Sat-UK_Web

<http://www.TELE-satellit.com> TELE-Satellit Magazine

<http://www.satcodx.com> SATCODX

Conclusion

That's it again for another edition of Satellite TV News. Please keep the letters and E-Mails coming and I will look forward to bringing you all the latest news from around the Clark Belt in the next issue. All E-Mails to paul.holland@btinternet.com.



3cms Sea Surface Ducting Tests 97

Bob Platts G8OZP

Another series of 3CMs tests have been arranged for the weekend of August 16th – 17th. At least four stations will be active from the south western Dutch coast.

If conditions are similar to the last two years very strong signals are to be expected along parts of the east coast that have a clear sea path to Holland. Previous tests have shown that only low powers and standard size dishes or horns are required. The strongest signals are to be found down at sea level.

For my part, I shall be travelling up to near Peterhead in NE Scotland. Due to the distances involved, this will prove a challenging path to work. I shall not be taking 2 meter talkback as the distance is to great. Instead, I shall be taking a mobile phone.

Please telephone me 7PM - 9PM weekdays on 01283 531443 if you wish to join in and try working across the water on three.

Starie's Stories

Dicky Howett talks to retired BBC engineer Joe Starie about Lime Grove, Riverside Studios, Television Centre and a few television cameras.

Joe Starie is of the old school of television engineer. During the nineteen fifties he worked for the BBC at Lime Grove in the technical 'back room'. His job was to make sure that the pictures leaving the studio reached the home receiver in a clear, viewable condition. This wasn't easy. In those days, BBC television equipment was of valve-driven prototype design and hence quite difficult to balance. In addition, some of the equipment had done the rounds of outside broadcast. Witty stories about BBC engineers fixing cameras with bits of string and frying eggs on amplifiers are true! In addition, early Image Orthicon picture tubes used to get (amongst other things!) dynode burns. If the tube lasted 50 hours, you were doing well. 300 hours and it was a marvellous tube. However, often the picture quality from live cameras was variable to say the least.

In those days, the major problem was that there were no proper line-up signals or controls. Each TV camera (at LG in 1956, EMI CPS 10764 and Marconi Mk 3's) had a mind of its own and would drift out of spec at the drop of a diaspope. Joe recalls, "The only thing guaranteed (if at all) was that before a show the engineering operators had just about managed to set their monitors up properly. We didn't even have proper 'scopes. We had to make them ourselves out of spare parts. And when we did get some test kit it was bloody awful, which matched the rest of the stuff we had to work with!"

Prior to joining the BBC in 1956, Joe Starie worked in defence radar. "I got out because of a 'peace scare'. I then contacted ATV and asked them for a job. I was advised to apply for a post at the BBC, get a good training and then re-apply to ATV. As it turned out, I stayed on at the BBC. Actually, the BBC couldn't teach me much about electronics. It was fifteen years before I even visited their training establishment at Wood Norton Manor".

At one point Joe served a modest stint in Lime Grove Presentation Studio P. "That was a little studio at the top of the building used for announcing and captions. It had two Pye Pesticon cameras, with Photicon tubes and light bias. It was all tilt and bend with the picture, like going back to the Middle Ages. We got the feeling that studio had all the junk equipment left over from elsewhere. Terrible".

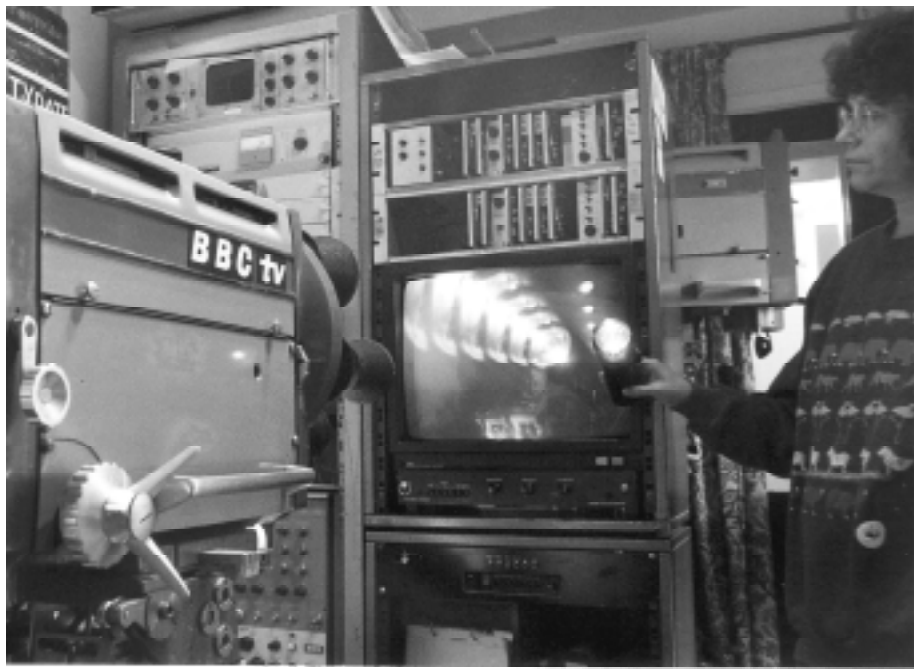
Joe remembers one incident that brought him a bit of notoriety. "As engineers, we couldn't track or move the cameras. This was some silly union rule. Only proper cameramen could track. Not that you could do much in that studio. The cameras were sitting on Debrie mechanical pedestals, lumpy

things that you could catch your feet under. Anyway, at the last minute, a cameraman fell off his bike or something, and I took over one of the cameras. My task was to pan between three captions; the middle one of which was the BBC clock. Unfortunately, when I panned over just before 6 o'clock, I saw that the cameraman had left the wide angle lens in position so all I got was a tiny little clock miles away in the middle of the screen. It looked as small as a wristwatch. As my camera was 'on air', I couldn't swing the turret, so I just tracked in pulling focus. This worked fine, but oh, what a commotion afterwards! I was reprimanded for tracking the camera. It was against the rules you see."

Joe Starie also worked at the BBC's Riverside Studios, down by the Thames at Hammersmith. This studio was the BBC's experimental test-bench for new techniques and equipment. As the TV Centre at White City was nearing completion (Studio 3 was the first to open there), all sorts of labour-saving and new-fangled electronic ideas were being tried out at Riverside. Amongst one of the schemes developed by Ben Palmer was a revolutionary system called 'one man vision control'. This, as the name suggests, enabled the picture quality from all the studio cameras to be controlled by one man using a joystick arrangement. In the past each camera had to be constantly monitored and adjusted whilst on air. In practice, this meant that in a four-camera studio, at least four engineers were occupied, just twiddling sweaty knobs. By the late nineteen fifties, with the introduction of better designs of camera with much clearer picture tubes, all the studio cameras could now be controlled by just one man. Anyway, that was the theory.

Once, in order to try out the system, Joe Starie was asked to help control the 'one man' pictures in Riverside Studio 1. The show in production at the time was a programme called 'Quatermass and the Pit'. Unfortunately, the BBC chickened out at the last minute. It was judged that the series was too important to risk on prototype and fancy techniques. Joe was quite disappointed. He had worked for a long time making a vision control joystick out of bits of scrap tin and wood.

Joe Starie then moved to Studio H at Lime Grove and worked on the famous 'Tonight' programme. In those days, the studio cameras were 10764-CPS (Mk 3) Emitrons. These bulky machines gave quite good pictures but their orthicon pick-up tubes were unstable. The tubes had a habit of 'peeling' on highlights. For example, if a bright reflection hit the camera lens, the picture would blob into white for a few seconds. Down in Engineering Control, (called 'Racks') Joe Starie had a constant battle to keep the cameras in order. As 'Tonight' was live, the cameras sometimes were tangled up and crashed into each other, upsetting delicate controls. Also, Joe's job wasn't helped when a Scottish singing duo called Robin Hall and Jimmy McGregor kept tilting their shiny guitars at the lights, causing the poor old cameras to 'peel' live on air!



Positive feedback. An EMI 203 and Mrs. Howett demonstrate

In August of 1963, Joe Starie was shift engineer when Studio 4 at Television Centre was booked for an 'experimental session'. The designer Bernard Lodge was searching for a special effect in order to create a title sequence for a programme called 'Doctor Who'. One electronic 'special effect' was called 'positive feed-back' or 'howround'. As is well known, the howround effect is caused when electronic cameras 'see' their own picture in a monitor and then repeat it, endlessly, in a closed loop. The shape and size of the 'effect' is determined by the exact positioning of the camera and the focus. Nowadays, this sort of effect can be digitally conjured. However, back in the 1960's, it all had to be done optically and physically, down on the studio floor.

To get the howround effect, Joe Starie lined up in front of a monitor, one camera (an EMI type 203 image orthicon) equipped with a five-inch lens. He describes the result.



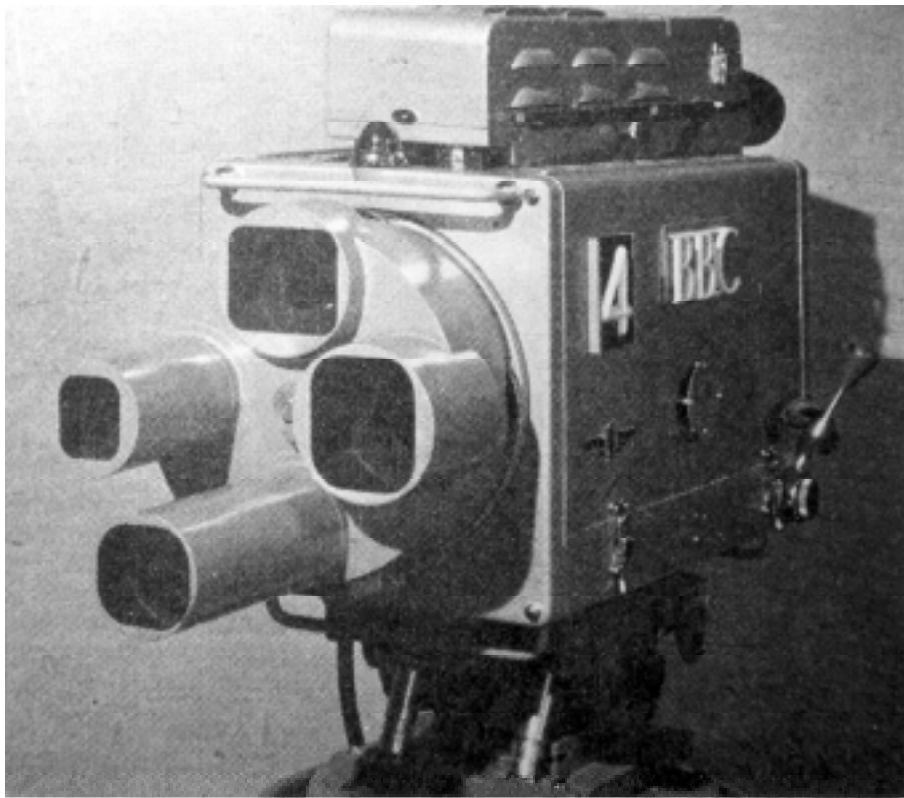
Joe Starie and his “Dr Who’ pen-torch

“I began the effect by keying the camera in on my pen torch light. I waved it about for a few seconds and checked in the monitor to see the results. The image started to show positive feedback. From then on I threw in everything I could offer. The most significant effect came when we reversed the scans in the camera. Everything the camera saw, it reversed. This gave the familiar twisting, swirling effect with a split down the middle. We achieved other effects, which looked like headlights moving down a dark road, or blobs jumping about. There was a lot of stuff. I had nothing to do with what was selected. I just made sure we got something.”

The session, which lasted just an hour, was recorded continuously onto videotape in the basement at Television Centre. Afterwards, several of the best effects were chosen by the designer and mixed in with the title. The title lettering ‘Doctor Who’ was filmed later.

Joe Starie was there at the introduction of colour TV. In fact, down at Riverside they had briefly experimented with a system much used in American TV, of using a multi-film camera set up. The BBC got hold of four proprietary film cameras each equipped with built-in vidicon pick ups. The plan was to start a colour TV service using this film system. (This was before

the EMI 2001 camera arrived on the scene). Ultimately, all electronic colour camera studio work prevailed.



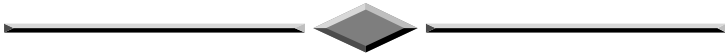
Emitron 10764 circa 1956

“The EMI 2001 made colour TV”, Joe says. “We did have some Marconi Mk 7’s installed at Television Centre but they were unsuitable for serious production and soon departed. They were sent to Alexandra Palace for the BBC2 News. All our cast-offs went there.” Joe adds, “There’s a story that Granada bought some Marconi Mk 7’s which they didn’t like and they relegated them all to a little room. They then dreaded the day when Sidney Bernstein might walk in and say, ‘Who’s the idiot who bought all these and who’s the idiot who couldn’t repair them!’”

Joe Starie later installed Link 110 three-tube cameras in Studio 6. “These three-tube cameras were quite good if you got enough light and not too much red in the picture, otherwise the definition suffered. Four-tube cameras like the 2001 were definitely best. The picture quality was like the difference between Kodak and Agfa. Anyway, we had these Links running, and some

Americans came visiting. We quickly switched to RGB monitor mode (as opposed to the coded image, which lost clarity,) and the Americans were so impressed they decided to buy Link cameras

Joe Starie, now 73 years old has kept no souvenirs of his time at the BBC. "I just didn't think of it at the time. I suppose I should at least have kept a script from the opening night at Television Centre. That was in 1960 from studio 3 with Arthur Askey. We had many problems with the so-called new equipment there, especially the Marconi Mk 4 cameras. They'd sold the BBC a load of prototypes that didn't work properly. Things were fraught. It ended up with the Chief Engineer getting overheated and literally throwing the Head of Light Entertainment out of the control room. It was all part of the job."



Poor Frame Lock on Ferguson TX9s

By G8MNY

I have seen several hams suffering consistently poor frame locking problems with this model for ATV work, after they have spent time and money doing the published chassis isolation for video in and out, only to be disappointed with the result on ATV grade signals.

The problem appears to be that the timebase chip circuit was designed for P5 pictures only. The slightest noise, low or high video level, or incorrect sync size immediately results in frame roll.

Here is my solution/bodge to solve it. Locate the timebase chip IC54 a TDA9503 (near the Line Freq. and Phase presets). Place in series a capacitor of 10 μ F and a resistor of 68ohms, from the IC ground, pin 1 (-ve of cap) to Sync amp pin 7.

This bodge has the effect of reducing the very good line hold slightly while greatly increasing the frame lock capture range. These were the best values I found by testing with a weak signal. So a P1 gives slightly wobbly line lock but the frame stays in lock.

How to Convert the SRX200/100 for ATV 23cms

By Peter Johnson G4LXC.

Ensure that you have a working receiver before carrying out these modifications.

Remove three self-tap screws to release the top cover, remove the transformer and six-pin plug, also the single black earth cable to the PCB. Put the tranny in your spares box

Remove the centre retaining screw on the main PCB. The front panel is removed by prising up the tabs top and bottom, which exposes the front folding PCB. To lift out the main PCB, there are two plastic clips at the left-hand side. Push back to release. Place on a cleared bench, and put the top cover, front and base to one side.

Fold down the front PCB, remove the screws retaining Q506 and Q503, both are on heat sinks. Turn the PCB over, desolder Q506 and Q503, and remove them. Locate Q501's middle pin and connect an insulated strap to IC505, the third pin from the left, with the main PCB facing you. This is the 5V output of IC505. Fit a vero-pin to the middle hole of Q506, & Q503. These pins are to be connected to the +12V rail. Remove the strap at R101 on the right hand side of main PCB just behind the led digit display, (see drawing). Put in two vero-pins - the right hand one is the new connection to the driver and latch IC UAA2001 (IC105) and the left one is the old regulated feed from IC503 (Max volts 18V). For ATV, only 9.1 volts is required, but if the receiver is to be used for other bands, such as 3cms, then a higher voltage must be generated with the circuit shown in fig 4. For ATV 23cms, 9.1V is taken from the new local oscillator PCB, fig 1.

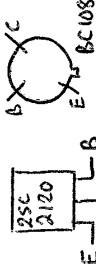
Solder a red wire to the positive end of the D511, D510 junction. This connects to the 12V terminal pin (see drawing) and enables the switching logic to function.

Remove the connection to G2 Q301 at R432 leaving R432 in place. Remove the two xtal PCB or the two xtals (which ever is fitted). PCB TE0607A, if fitted, has 5 pins to desolder in order to remove it. Pins 1 & 4 are ground, pin 5 is the output to G2, Q301, so the new oscillator vero-pcb may be fitted in the same place. Pin 5 will connect the oscillator output to G2.

Now construct the new oscillator board (see drawing) also construct the audio PCB, or purchase the Maplin kit. This may add to the cost.

TRI & TR2

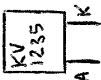
BC108
2SC1815 etc



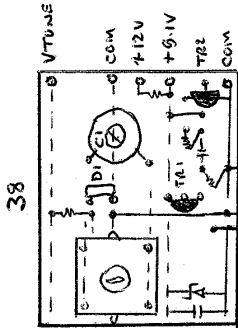
LI MIKANSKI1731

6 mhz COLL MAPLIN CIRKIT

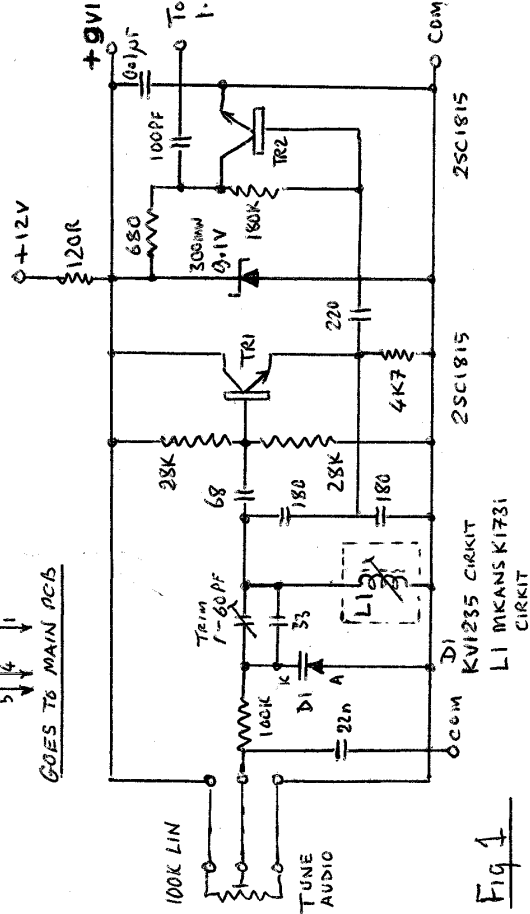
"CIRKIT"



VERO PCB LAYOUT



GOES TO MAIN PCB



G4LXC AMSTRAD MOD
SOUND RX LOCAL OSC
FOR AMSTRAD SRX100/200
WHEN PCB TEO 607A
IS REMOVED
15.5 TO 18.5 mhz

Fig 1

How to Convert the SRX200/100 for ATV 23cms

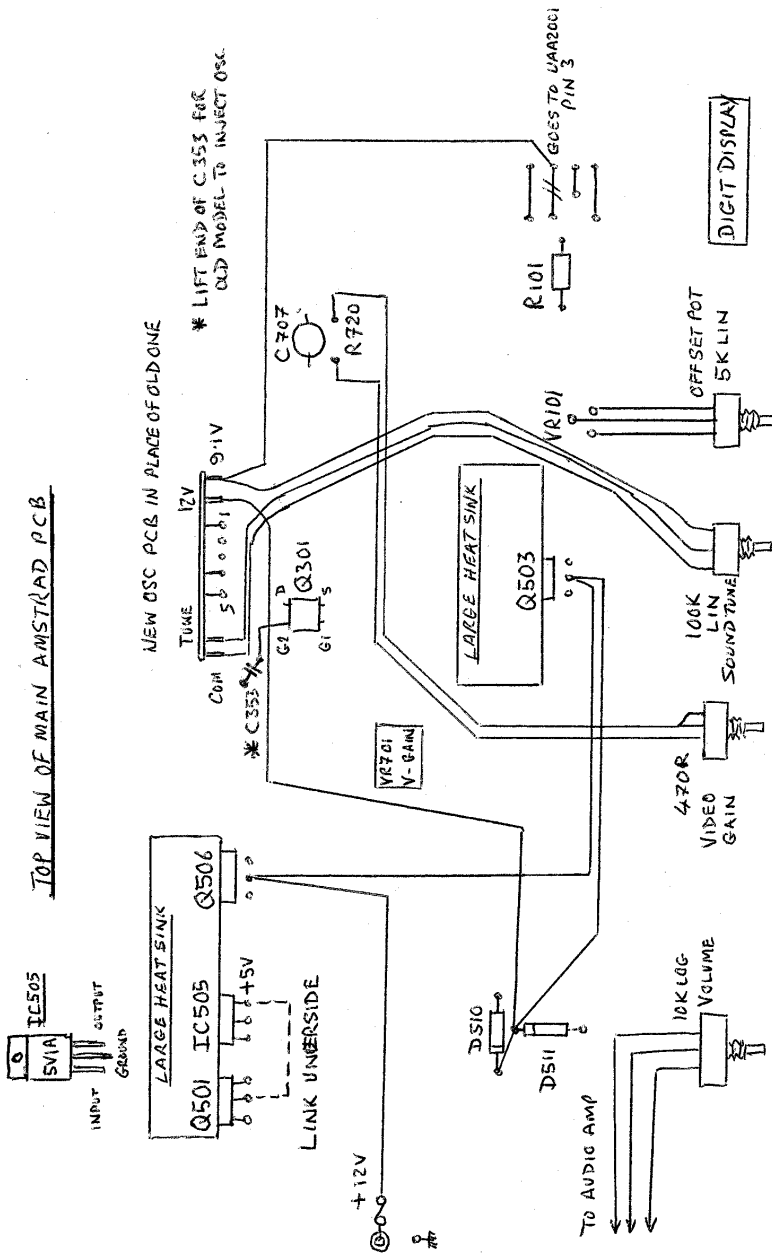


Fig 2

Make the metal bracket and fit to it the DC input sockets and BNC video socket, fuse holder and 1A fuse (see drawing). Wire up as shown, then fit it to the plastic base. You will need a Stanley knife to tailor the plastic in some odd places. (Try fitting the top cover to find out where). The rear of the top cover is cut away to allow the new plugs and sockets to protrude at the rear.

The front panel is drilled in the places shown, to fit the new pots for volume, offset tune, video gain, and audio tune. These need to be carefully spaced to avoid contact with components on the front PCB! Be extremely careful when marking out to allow enough room for the tags on the pots - miniature Maplin ones were used in the original unit, with plenty of clearance.

The standby LED's and H/V are not bright enough with the windows in the plastic front panel due to opaque inserts. These may be cleared by drilling out. If you drill very carefully **not** fully through, a bump will appear on the front surface, so that the LED's will be seen in daylight.

To remote control the video gain, find R720, remove it and replace it with two vero-pins. Connect a twisted pair of wires about 20 cms long, ready for connection to a 470R pot on front panel.

Remove offset preset pot VR101 4k7, replace it with vero-pins and connect three wires to a panel mount pot of the same value. This will provide ± 5 MHz control.

Connect a BNC with 75 ohm miniature co-ax to the SCART pins 21 earth, and pin 19 video, connect audio screened cable to pin 1 and earth pin 5, this should go to the audio amp via a 48K resistor in series. The loudspeaker should be 8 ohm 1 watt and mounted on the left where the transformer had been. A bracket to support it can be fixed to the old tranny screw holes. (Do not fix to top cover). See the drawings for details of mods.

Replace the main PCB into the base and wire up the pins for the 12V connections, connected as shown in drawing. Fit the front panel controls and wire to the main PCB, mount the audio PCB in LHS of chassis front compartment, connect dc cable and the volume control. Remove the cover from the tuner and locate the SL1255 decoder chip at the end nearest to the tin box there is a 220 ohm resistor - remove it by use of solder wick, and soldering iron.

Warning: *You must use an earth strap from the iron to the tin box*

Now replace it with a surface mount 330 ohm for ± 10 MHz deviation, or 470 ohm for ± 8 MHz deviation. Do not adjust the internal trimpots.

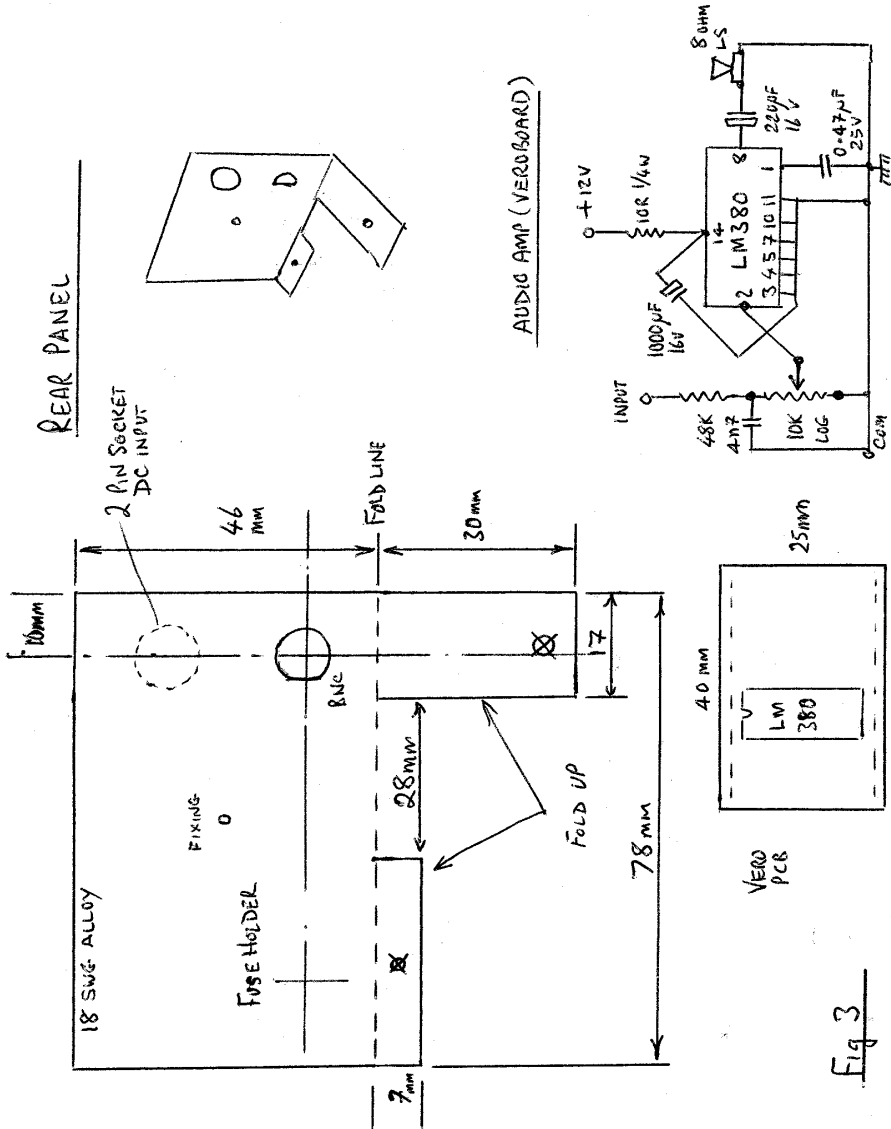


Fig 3

Mine has 330 ohm fitted for 3 cms and 23 cms as the video new gain pot has plenty of swing to accommodate variations in modulation levels.

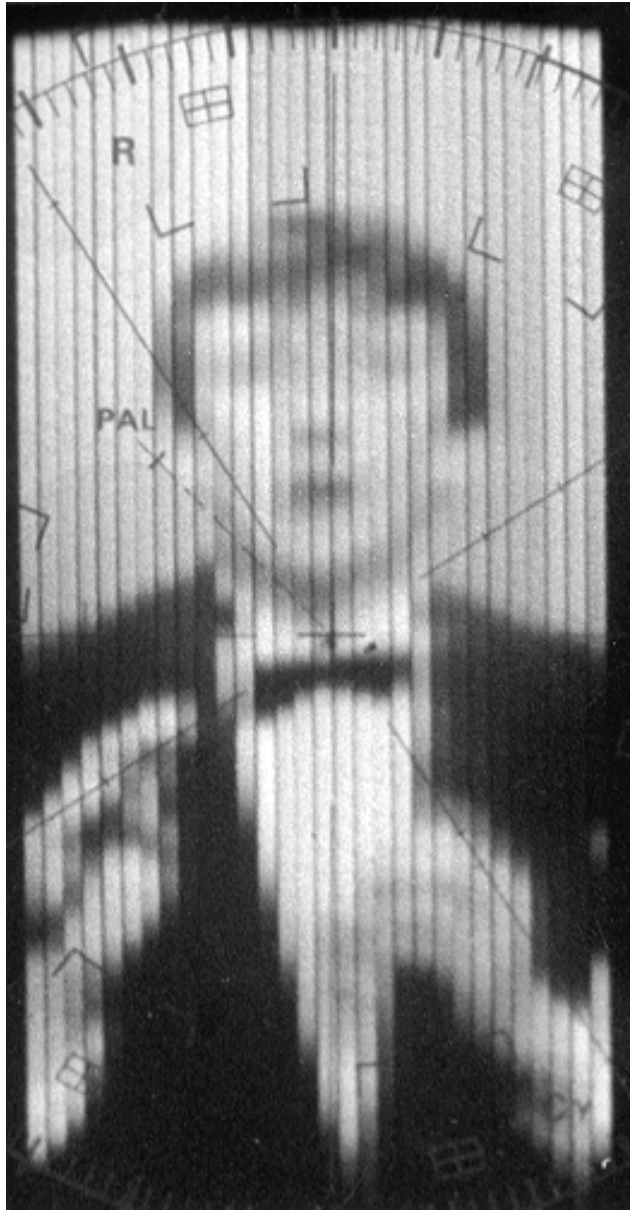
Some plastic will need to be removed with a Stanley knife at the rear of the top cover inside two triangular fillets and rear vents either side of the old mains entry point.

NBTV Annual Convention

By Jeremy Jago, NBTV association.

30 line replay by Pete Smith of a signal from Compact disk. The recording, part of a reconstruction of Baird TV for the National Film, Photo & TV Museum, Bradford, consists of a performance of a Noel Coward comic song in sound and vision.

The display uses a vectorscope unit whose graticule was impossible to remove.





Don McLean reviews his digital restoration job of an amateur direct disc recording of a 1933 BBC 30 line program featuring the Paramount Astoria Dancers.



Above: Grant Dixon shows his 32 line images, still and moving, replayed from EPROMs.



Left:

Graham Lewis pictured on his PC display of 32 line signals from his electronic camera, using interlaced scan on a Staticon tube. All flicker from the original 12.5 Hz frame rate is eliminated, and various scan interlace modes are selectable for comparison.

The Story of the Radio Microphone

By Reg Moores, G3GZT

The history of the radio microphone goes back to before the 2nd World War, when I was experimenting with small Radio Transceivers, using the old battery valves, i.e. HL2, PM220 etc., mostly used as “Superegeneration Oscillators”. Although frequency shift occurred between Rx. and Tx modes, making 2-way contacts difficult, it followed that nevertheless a lot of experience was gained.

One of the greatest thrills was with a simple one valve unit, and high resistance headphones listening to Police Cars in New York and Philadelphia, and only using about a 3 feet long piece of wire as an aerial, and indoors at that.

The war put a bit of a brake on further work. Even before the war, components were difficult and expensive to obtain and from my pocket money whilst during the war almost nothing could be got, except from dumped radio sets. To buy valves, even say a PX4, special permission had to be obtained from the Government, even if only possibly obtainable!

After service with the RAF during the War, when I was demobbed I had several different jobs, mainly in show business, as an agent, and artiste, and even when in uniform during the latter part of the conflict, appeared in several charity ice shows and exhibitions. During these, the idea came to mind about putting “voices” to what were “dumb” shows using “wireless” microphones, to get the spoken word over to the P.A. system.

I then set about designing what were to be super-small transmitters, with what materials and components could be got, mostly from ex Government Surplus equipment. Many problems presented themselves, such as the frequency to be used, modulation, and battery life, remembering that at that time only valves were available, being long before the advent of the transistor.

Several designs were built, but the final one was based upon the same style of microphone in use at that time, the “Frame” type, in which the microphone was suspended from the corners of a square metal frame, as today can be seen on some of the old films, such as “Pathé Newsreels”, but in this case, the “Frame” was the actual aerial, with a socket in which could be put a “Whip” for longer range.

Originally, the smallest valves available, were “Acorn” such as the 954, 955, and 957, with connections to them being made carefully by soldering direct

The Story of the Radio Microphone

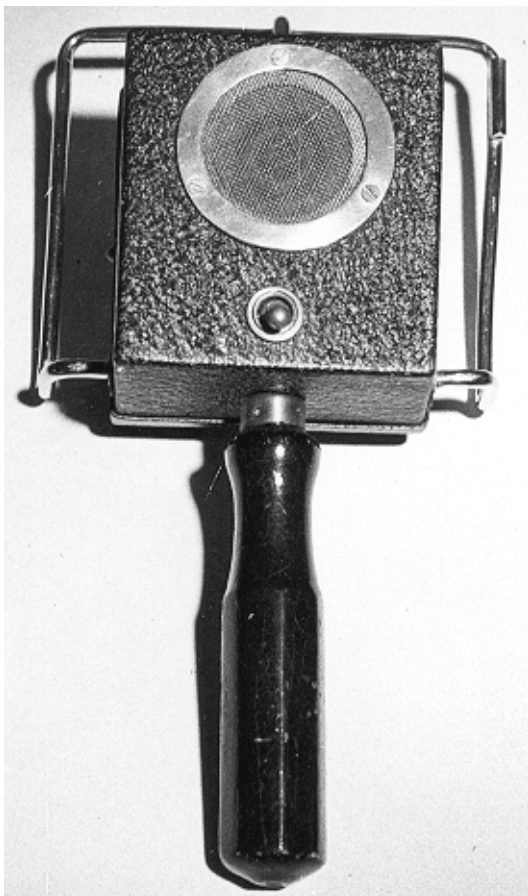
on to the actual contact pins, as space could not be found to accommodate the holders.

As for frequency, well, short waves were out, for obvious “QRM” (interference) reasons. The first models worked on the 27 MHz band, later used by the first Japanese models, but this was discarded and instead, the 70 to 60 MHz band was employed.

Many experiments were carried out on this frequency, and many problems came to light, a main one being that as the RF generator was “self-excited” any slight capacity even near the aerial would cause a massive shift at this frequency. This problem was solved by putting the aerial terminal down to chassis, via a small RF choke, which produced a high degree of stability.

A.M. Modulation was decided upon as at that time, FM was very new and almost unknown to me, but I had studied many American publications, so got a good idea of what was involved, but sticking to A.M. proved to be the best solution!

The invention details were sent to a BBC Television Programme, called “Inventors Club”. A letter of reply was received from the secretary of the producer, written using “Gas Light and Coke Company of West Kensington” envelopes, saying that the producer was on holiday but my letter would be put before him upon his



First Radio Mic. Completely self contained, using Acorn 1.4V valves.

return, but nothing further was heard, as has been with all other inventions I've sent to the BBC since!

This was around 1947/8, and at that time, I was in contact with the Tom Arnold organisation, and their producer, "Major" Gerald Palmer (why do ex officers always have to use Rank?). He was a great producer and saw in the invention a wonderful idea to put musicals on ice, but said that although the hand held unit was excellent it would give problems to the skating artistes having to use it. I re-designed the unit, as a belt carried model, with each costume having it's own microphone attached to a specially designed "voice" funnel, which was sewn into the underside of the costume, a small split being cut in order that the semi-circular funnel unit could catch the voice and direct it to the moving coil microphone. This was easy for most of the costumes, but one which was used by the "Slave of the Ring" was a tight body costume, fully sequined, the wardrobe mistress having a fit, when being told to cut through the sequins threads, as anyone who knows about this will understand.

The musical to be produced was "Aladdin on Ice" not really a musical, but a pantomime with only a few songs, mostly speech, but ideal to test out the capabilities and reliability of the system.

The microphones were, as already stated, "belt" mounted, and the aerials were also mounted on the belt, a rough quarter wavelength, "zig zagged" on the remaining belt space available. The "Slave of the Ring" having a very tight costume and very small waist posed more problems.

A special slim copper cased unit was designed, using mains type valves, 6C4s in Oscillator and Modulator, audio amplification using a 6AK5, these were selected for small size and low heater current, total 0.45 amperes at 6 volts.

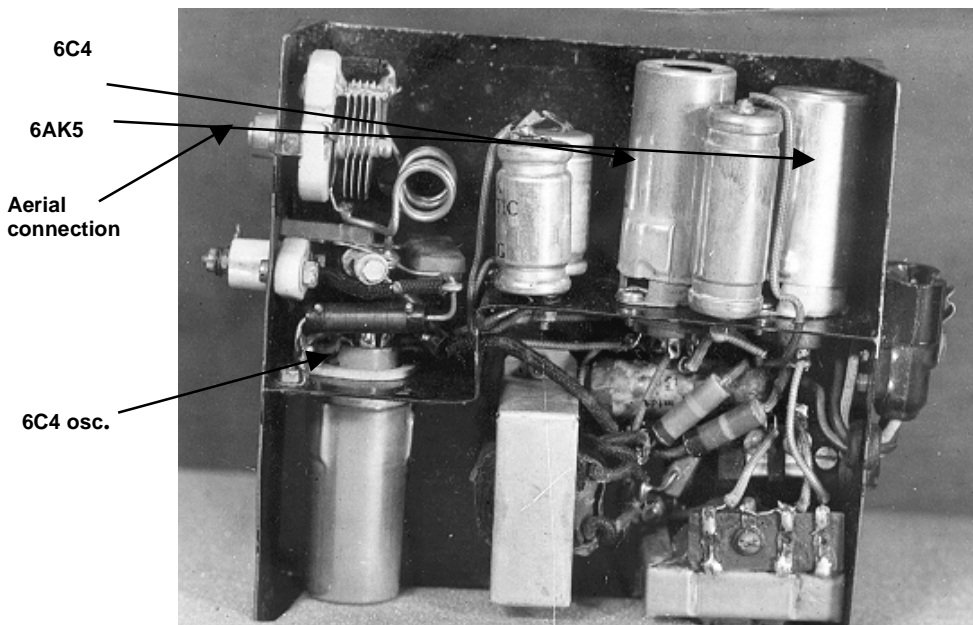
The modulator valve needed bias (6V) and as only around 60V (2x30V deaf aid batteries) H.T. was used, return line bias was not ideal, due to the loss of voltage, so separate 1.5V AAA batteries were used, but as these lasted for months, would not need replacing, hopefully. Heater voltage came from 4 x U11 batteries, the complete unit built in two cases, one for the transmitter, a smaller one for the batteries.

This was the only model built this way. The other character using a radio microphone was "Abanazar", who wore voluminous costumes, having plenty of room for a larger transmitter unit, and another design was used. The case used, being an ex-army spare valve case suitably drilled and painted, had compartments for the sections of the transmitter. Several units were built, and the originals plus these are now in the Science Museum, London.

The whole unit was mounted on an ex. A.F.S. belt, which while being very sturdy and easy to fix on, had the advantage of width, taking up the antenna wire with fewer zig zags required.

The Story of the Radio Microphone

Having now the radio microphone transmitters, the receivers, one for each microphone's frequency, using R1481s, covering the 65-85 MHz band the next consideration was what type of aerial to be used. As the belt carried the antenna, was the signal horizontally polarised, or, as the artiste using it would also radiate, could it be vertical?



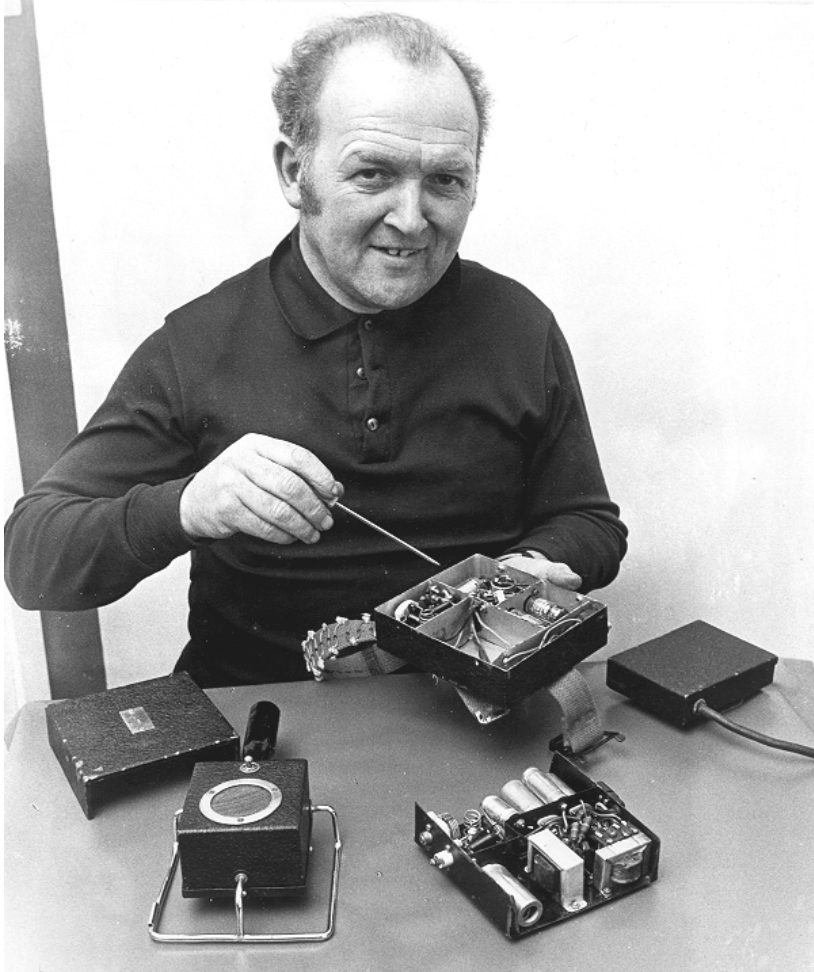
Inside the 6AK5 2x6C4 6V valve unit.

A half wave antenna with reflector was built, "H" configuration, mounted horizontally on a tripod, pivoted to track the artists, but with a 90° bend half way along each quarterwave length element, the final result looking as a "U"- "U" arrangement.

This worked fine, but it would require an operator to track the transmitters each having its own receiving antenna.

Another problem arose, that of reflection causing variations in the received signals, and as much interference was generated during the show, (from all the electric's and switching - not least, the carbons arc spot lamps used), it seemed an impossible situation.

The present latest very expensive radio microphones use double diversity receive systems to overcome these problems, but not always successfully, as viewers of TV today notice.



However a system was devised of using a continuous loop of 7.029 insulated electrical cable, fixed all around the arena area of the rink, to edges of the balcony, end tribune seats and backstage. A wire coming from this and taken to the aerial inputs the receivers used.

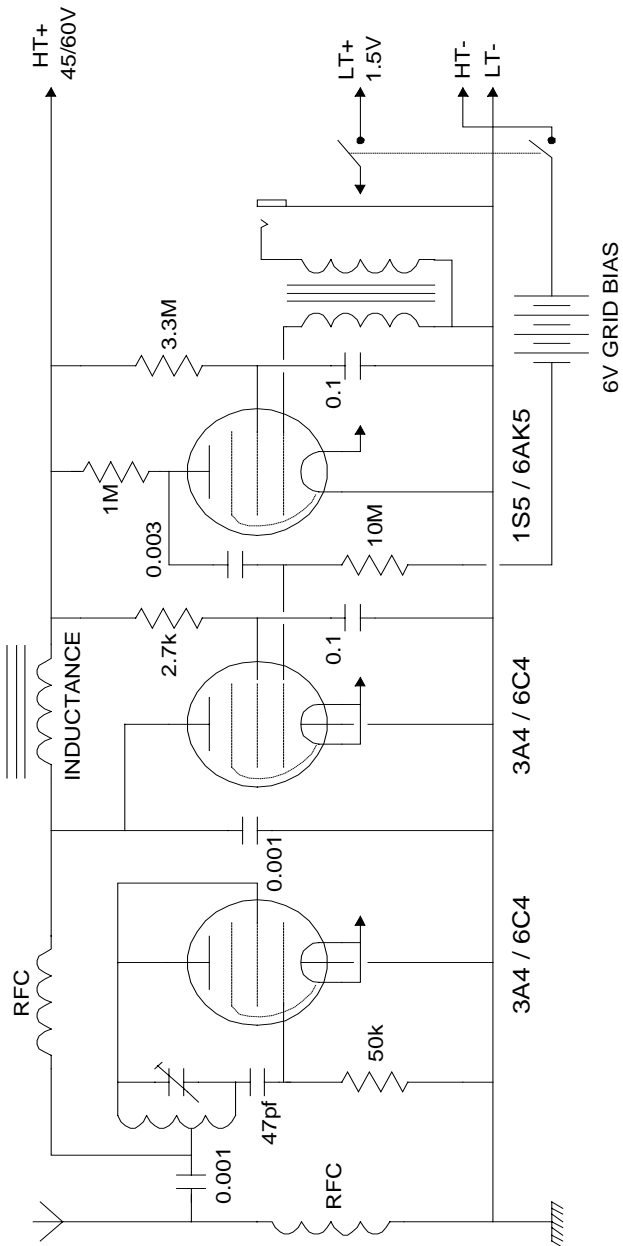
This system was based upon the fact that “wireless” relies upon the capacity between aerials so the theory of this system that wherever within the “loop” the radio microphones were, the same identical capacity existed.

The Story of the Radio Microphone

This worked 100% during the whole run of the pantomime, without any problems either from loss of signals or interference, something which, even today, still doesn't happen.

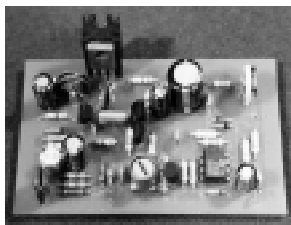
During the run, LT Batteries were changed daily, HT ones weekly, whilst the GB lasted without replacement.

The final chapter to this story, is the fact that this microphone performed faultlessly, giving excellent dynamic (moving coil) quality to productions that could never operate without this novel invention. Today, how many branches of the media, theatre, television etc could manage without it, not least of all the 'bug' application.

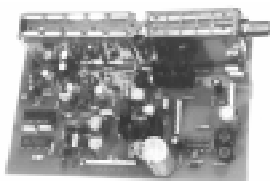


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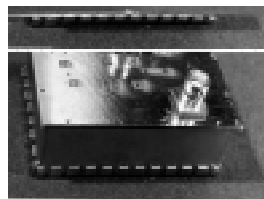
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A Mechanical Monitor

By Doug Pitt



The above photo shows a disk-type mechanical monitor built by Steve Ostler of Evesham. The monitor is an elegant polished wood structure in the style of the 1930 Baird “Televisor”. The viewing window is on the left; the loudspeaker aperture on the right. The small peephole, upper centre, is for setting up the sync initially.



The photo left shows a typical test pattern produced by a diffused, compound, red/blue/green matrix of LED's fed by three parallel signals.

An equally elegant colour camera has been built, to make a “matched pair”.

Live at Studio Five!

Dicky Howett traces the history of a unique television project.

In the beginning there was Associated-Rediffusion. Then London Weekend Television, then Lee International, then Limehouse. Today it's Fountain Television. They are Britain's largest independent facilities operator, who now own the UK's largest television studio, known previously as 'Studio 5'.

Fountain's Managing Director Julian Kossick explains, "In 1993, we at



Studio 5 as it is today. Fountain Television's Wembley Studios.

Fountain decided to expand. We already have one reasonably sized studio at New Malden in South London. By acquiring the old Studio 5 site at Wembley we can now, as a combination offer the largest and most modern TV studio facility anywhere in Britain."

That precisely was the thinking back in 1959 when the original London weekday ITV contractor Associated-Rediffusion (part owned by Associated

Newspapers hence 'Associated') planned to expand it's production base at Wembley Park. Previously, in 1934 Wembley Park was the home of the (20th Century) Fox Film Studio. The most obvious problem was that the Fox lot was of an awkward triangular shape between Wembley Park Drive and Empire Way and situated in a built-up area near Wembley stadium. These factors severely constrained the Associated-Rediffusion architects. They had to devise a means of squeezing a brand-new studio facility into the existing lop-sided site.

Historically, during the period from 1955, AR-TV had three studios at Wembley Park, all originally converted from film use. These were designated as studio's 1, 2 and 4. (Studio 3 became a telerecording suite). Dimensionally, Studio 1 was 80' x 55' working height 16'. Studio 2 was 80' x 41' working height 16' and Studio 4- 74' x 42' working height 11'. Even by the standards of the day, the studio proportions were laughingly small. To add to the congestion, the Wembley site housed also all the ancillary apparatus of a busy studio; fuel stores, carpenter's and paint shops, scenery stores, workshops, a boiler house plus A-R's four Pye and Marconi o.b. units. Even fully utilising their other three small studios at Television House in Kingsway, A-R was soon struggling to feed a five day-a-week live programme schedule.

Undaunted, the A-R planners drew up an impressive scheme. They decided to go for broke and build the biggest TV studio ever constructed. Space was found on the Wembley site next to the three other studios. This was achieved by demolishing some old film vaults and adjacent redundant areas. When complete, the new studio was named (logically because it was the fifth studio on the lot), 'Studio 5'.

For a mere television studio, Studio 5 was truly enormous. It had a floor area of 14,000 sq. ft. (100' x 140') big enough, as the gleeful A-R publicity put it, to simultaneously 'contain a complete circus ring, a dance floor, a full-scale orchestra and an audience of 500'. That wasn't journalist hyperbole. In 1959 that could actually have happened. The nineteen fifties was still the time of mostly 'live' TV when actors and crew had to perambulate from scene to scene in scripted sequence and shoot the whole show in real-time with only a couple of short breaks for commercials. It wasn't uncommon to leave a visibly sweaty actor at the end of part one, and return to him in part two freshly made-up and mysteriously sweat free.

During the nineteen fifties as technical equipment became more sophisticated and reliable, productions were all the time becoming more elaborate and complicated. Old creaky film studios with wooden floors and tin roofs were frankly inadequate. The BBC was building at White City and Granada had it's own new studios in Manchester. Other ITV companies weren't faring so well, relying mostly on converted theatres or cinemas. What was required

urgently were modern television studios with proper ventilation, lighting rigs, technical areas and above all, floor space. By conceiving 'Studio 5', the TV studio designers attempted here more than just producing a spacious box, they also incorporated a special design feature that was unique.

Prior to the opening of 'Studio 5', Associated-Rediffusion aired a nice little film purporting to show a live scene from the popular police series 'No Hiding Place'. The film showed Inspector Lockhart sitting in his office. As the 'programme' ends, the camera pulls back to reveal a scene of utter clutter. Cameras, dollies, cables, mics, lights, scenery, all artfully bunched so that the actors have to climb over things in order to escape the set. As he leaves 'Inspector Lockhart' expresses to a fellow actor his delight at the prospect of working in the more salubrious and spacious surroundings of the new 'Studio 5'. We, the viewer heartily agree. Concurrent press advertisements showed a photograph of a darkened Studio 5 with a long line of cameras, lights, and mic booms, complete with a Guardsmen in the foreground. This publicity picture was shot cleverly from a low angle giving the impression of a TV studio with good height and almost infinite technical length. As indeed it had.

When Studio 5 was opened in 1960 the real ingenuity of the place was at last revealed. It transpired that Studio 5 was not one but two studios. A double studio that, by simply lowering a central acoustic wall, could be converted quickly into two separate production areas. With the wall in place, Studio 5 then became Studio 5a and 5b, each of 6,700 sq. ft. with a height of 40ft. Both studios had also their own cameras plus full production, vision, sound and lighting control galleries.

'The Wireless and Electrical Trader' described studio 5 in June of 1960 thus: Headlined, "A-R OPENS WORLD'S LARGEST TV STUDIO", the magazine continued, "One of the most important features of the studio is the duel partition wall which is of lattice girder construction with external bracing on the cavity side. The acoustic slabs consist of two mild steel sheets 4in apart with 3in rock wool filling, one sheet is suspended free and connected to the main frame at the edges only. The two partitions, when lowered, are designed to provide an acoustic separation of 60dB over the range of 50c/s to 4.5kc/s. The lifting and lowering of the doors, which weigh 25 tons each, is done by four specially designed units consisting of an electric motor coupled through a reduction gear to a wire rope drum from which the door is suspended. The doors take about 30 minutes to raise or lower. The control rooms which are big enough to carry any extra apparatus required for colour transmissions are built along the northern side of the studio with the vision, sound and lighting control rooms at 12ft level and the camera control rooms, make-up and service rooms at ground floor level. The entire studio is being equipped with eight new EMI 203 4½in image orthicon cameras and the vision system can be operated on 405, 525 and 625-line frequency. Each vision control room will have fourteen 21in picture monitors to allow the

monitoring of ten sources, in addition to transmission, off-air and two previews.



Scenery dock at Studio's 5a and 5b. Now called simply A and B!

On the evening of June 9th 1960 Studio 5's inaugural live programme was a lumbering concoction entitled 'An Arabian Night' narrated by Orson Welles. The programme was designed to exploit fully the entire studio space with lots of Arab 'extras', and camels wandering between tents, market squares and bits of reproduction Sahara Desert. But, of course the real value of Studio 5 was not in attempting to reproduce Hollywood epics--which never amounted to much on the small home screen anyway--but rather the sheer flexibility that the studio offered. On one day a modest discussion programme could be mounted, the next, big variety productions like 'Hippodrome' which was a circus-style audience show utilising the entire double studio floor area. 'Hippodrome' a mid-1960's show was shot in monochrome on 405 lines and simultaneously in colour on 525 lines for the American network CBS. This production meant double the amount of studio technical kit, some of it enormous. For example the Marconi colour 'coffin' camera hired for the occasion were twice the size of the monochrome EMI 203's, and the lighting--typically 120 foot-candles--had to be raised for colour to at least 700 foot-candles. But all that posed no problem for Studio 5. The studio was designed for it and naturally it took it all in its stride.

In 1968, Rediffusion (as it was then named) lost its franchise. Subsequently, the company merged with ABC TV to form Thames TV and production moved to the three studios at Teddington. Studio 5 was leased for a few years to newcomer London Weekend Television, who used the studio successfully until their own South Bank Upper Ground site was complete. Some of the early 'Upstairs, Downstairs' and 'On the Buses' shows were shot at Studio 5.

In 1978, after many years empty, Lee International bought Studio 5 plus the other three Wembley studios. During Lee's time, several feature films emanated including Terry Gilliam's 'Brazil' and John Lynch's 'The Elephant Man'. After Lee's vacated, in 1989 Limehouse Productions (on the move from Canary Wharf) bought Studio 5 and decided to demolish the remaining original 3-studio block. The plan was to develop the site as a new production area along side Studio 5. The old studios were duly razed but the scheme foundered and nothing further was built. Trillion, owners of Limehouse crashed and once again Studio 5 became empty, this time as a lone building next to a 'Wembley Events' overspill car park.

Fortunately in 1993 Fountain Television came to the rescue, and the Company instigated some long-overdue studio refurbishment. Fountain found the main structure of the studio sound. Internally, it was a different matter. Fountain MD Julian Kossick explains, "The whole place had a run-down look to it. Technically it was a mess. Old video systems proliferated, some incompatible within the same building! In fact we spent 6 months converting and re-building. For example all the dressing rooms had out-of-date fittings. Some even had baths coloured in that 70's trendy Avocado shade. Now we have dressing rooms with modern showers and fitted carpets. In the technical areas we junked miles of studio cabling. We completely re-fitted VT and Engineering. We added a covered bay to the scene dock and vastly improved the restaurant facilities and general access."

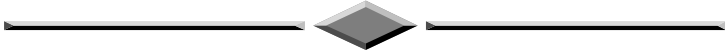
These days Studio 5 (now referred to as the Fountain Television Wembley Studios) is host to such shows as Rory Bremner, Talking Telephone Numbers, The Girlie Show, Back Date, and Nothing But The Truth, to name a few. Recently a corporate video was made for A. T. and T.

The single large studio can still be converted using the original central acoustic wall and lifting equipment, but these days the two studios are called simply 'A' and 'B'. Julian Kossick adds, "We're not a 'four-wall' outfit or film studio with a big shed calling itself a TV studio. We can offer our clients on-site expertise, full facilities with state of the art pictures and sound, fed live if needs be via our fibre link to the BT Tower. Our in-house technical staffs rigidly maintain picture and sound quality. Our nearest competitors are The London Studios (LWT) on the South Bank."

Back in 1972 the empty Studio 5 was in real danger of demolition. A supermarket was planned to fill the site. If that had happened it's conceivable

A Shocking Story

that by now the supermarket might itself have been demolished leaving a nasty hole in Wembley. Luckily, Studio 5 survives. Whatever it's name in the future, it's past is secure. Studio 5 was originally the largest and most modern TV studio in the world. Technologically, the 37 year-old studio is still in the forefront. Indisputably, it remains the biggest television studio anywhere in Britain.



A Shocking Story

By G8MNY

GB3HV at High Wycombe was re-fitted with a new mast on 23/4/97, and a new mast camera facility was added to the aerial system at 60 ft. With it a few days later, we saw what looked like a horror picture with two dead!

This was the nail-biting conclusion after the mains failed twice on 1st May 1997. So when the repeater switched back to full power, we looked with the mast camera to see if there was any external cause. In addition, we saw two of fence workmen at the site lying motionless on the ground.

This conclusion of an electrical incident involving them follows a history of two mains failures this year, due to installation work at the site. One was a due to a contractor's soil drilling rig, drilling just one test bore hole on the site, but right through the armoured mains cable feeding the site. The two men we saw were apparently laying prostrate in the yard by the new metal fence near to where the mains cable break had been. In addition, they may have been working on the heavy site earth bonding straps to the new fence with its metal ground posts.

After several phone calls by the repeater keeper, the men eventually moved, and finished their morning tea break/sun bathe. The power failures were later found to be down to the electricity board doing work in the nearby street.

IMPROVE YOUR TV RECEPTION

SPECIAL DX GRID

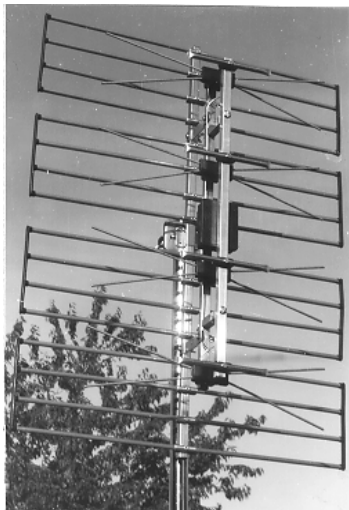
Wideband UHF Grid with Directors

For receiving extra ITV programmes, or even Continental TV, the wideband UHF JJB/4 BILBOARD GRID provides the answer, Its wideband response means that a single grid can be used to cover the entire UHF spectrum,

The JJB/4 GRID is a special type of aerial consisting of FOUR STACKED DIPOLE assemblies which can provide improved results over a conventional 'Yagi' TV aerial. In some difficult reception areas where local signals are scattered and arrive at slightly different heights (with ghosting, signal imbalance, etc) the use of a grid can improve results,

For even better results we can now supply this array with our own unique add-on director assembly which provides further signal enhancement, A single grid is ideal even for Continental reception in the UK during a tropospheric lift but two grids can be positioned side-by-side for even higher gain; this also makes the system more directional,

The JJB/4 is ruggedly constructed and features a 16-element reflector (not a mesh as found on other makes) providing excellent front-to-back ratio characteristics,



JJB/4 WIDEBAND GRID + NS ADD-ON DIRECTORS (13.5db approx.)	£34-95
TWIN GRID (with add-on directors, stacking kit and combiner)	£69-95
SUPREME HI-GAIN LO-NGISE WIDEBAND UHF AMP (2SdB gain, 1,9dB noise).....	£23-95
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A Video AGC update

CQ-TV 172 contained an article by Eric Edwards, GW8LJJ, on a video AGC system. Well, Bob Barns has come up with a PCB design for this project. For those who do not have easy access to CQ-TV 172 (*no longer obtainable from the publications department - ED*) part of the article follows.

I needed a circuit to give me a constant 1 volt of video for inputs between 1/2 - 2 volts. Looking around the shack i.c.'s I came across a useful "chip" usually found in older VHS machines. It was designed for the purpose I had in mind. Because I wanted the circuit to be repeatable as far as construction is concerned, I did not want to use any "special" components.

In Theory

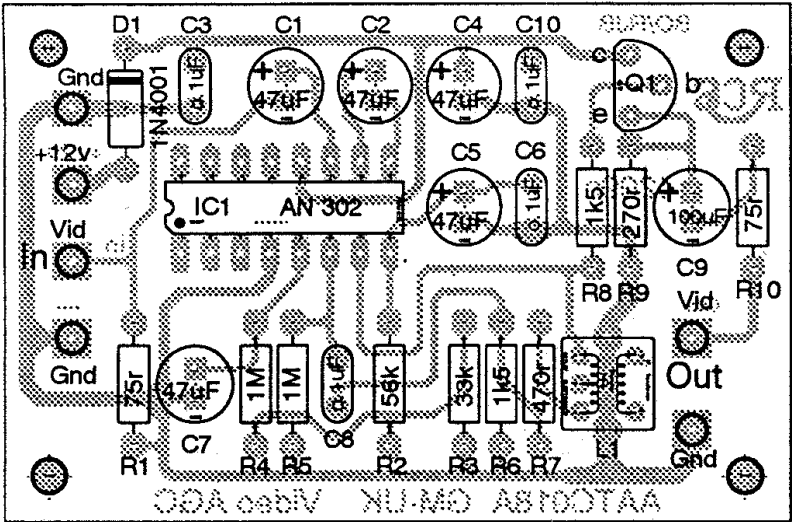
The heart of the circuit is an AN302 i.c. available from most suppliers of video spares at around £5 each. It is a 16-pin device and fits 0.1" stripboard, or PCB mounting. It contains other circuits as well, but I was only interested in the AGC at this time.

The video I/P is fed into pin 11 (AGC amp) the O/P taken from pin 7. This O/P is 2v at high Z, so to make it useful for our needs it is fed into an emitter follower via a suitable resistor. The components around the i.c. have been selected to give the required 1V o/p at 75 ohms.

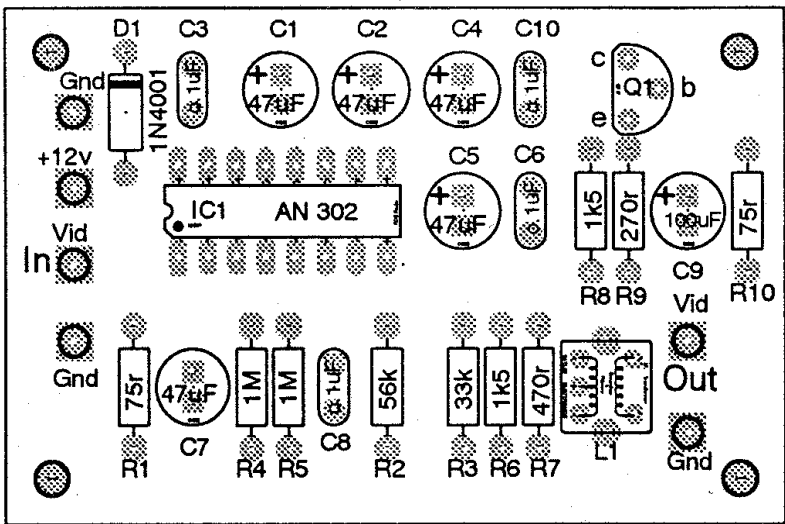
Parts List

R1	75R	C1	47 μ F	L1	4-4.7MHz OATLEY
R2	56k	C2	47 μ F		
R3	33k	C3	0.1 μ F	D1	1N4001
R4	1M	C4	47 μ F		
R5	1M	C5	0.1 μ F	IC1	AN302
R6	1k5	C6	47 μ F		
R7	470R	C7	47 μ F	Q1	BC108
R8	1k5	C8	0.1 μ F		
R9	270R	C9	100 μ F	PCB1	4209s RCS
R10	75R	C10	0.1 μ F		

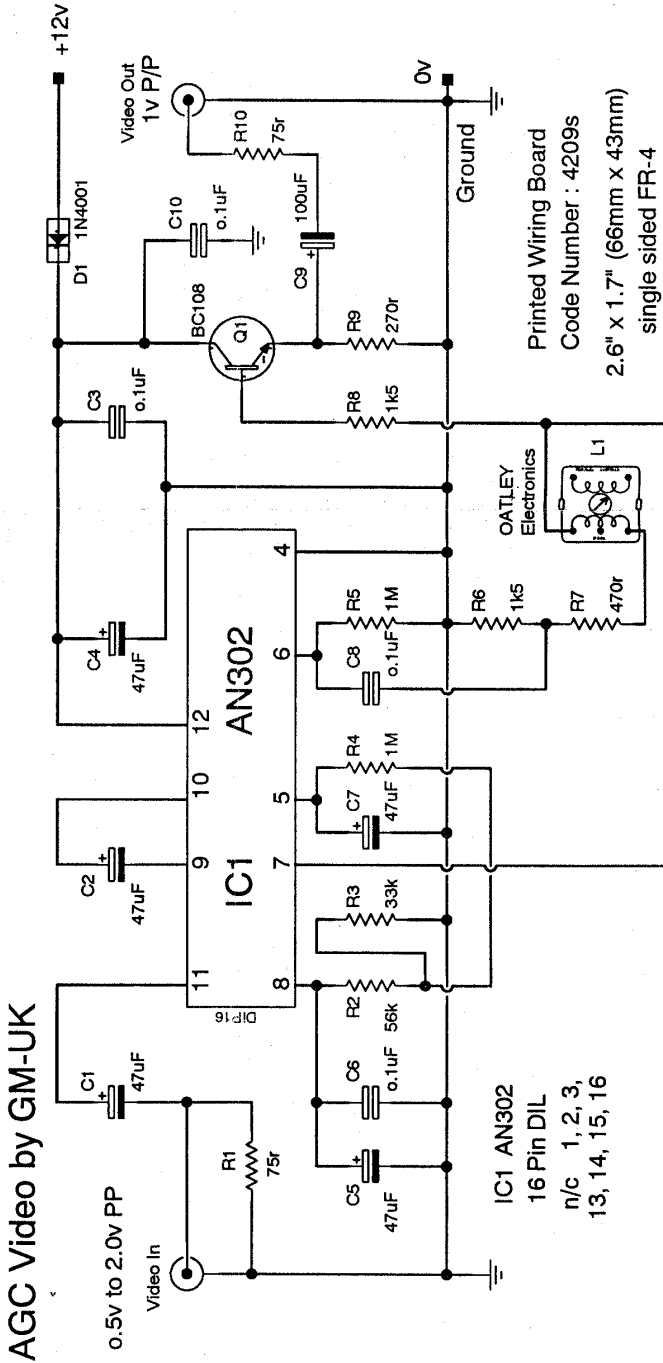
The PCB is obtainable from: RCS Radio Pty. Ltd., 65 Forest Road, Bexley, N.S.W. 2207, Australia. Email: rscradio@cia.com.au



PCB layout



Component overlay

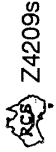


Artwork and Printed Circuit Board by VJ2R Bob Barnes - 651 Forest rd. BEXLEYNSW 2207 AUSTRALIA

Schematic correction by B.Orbell. ROSELANDS

Based from a design by the BATC for the Australian Amateur Television Club Inc

rcsradio@cia.com.au



Z4209s

Post and News



Please send all correspondence for **Post and News** to the CQ-TV Editor. Ian Pawson, 14 Lilac Avenue, Leicester, LE5 1FN, England.

Tel: 0116 276 9425.

E-mail ian@ipawson.cix.co.uk

Members sales and wants, and trade adverts should be sent to the advertising manager,

Dave Hemingway, Ivanhoe, Glen Road, Hindhead, Surrey, GU26 6QE. Tel: 01428 604645

The GB3AT ATV repeater is alive at last!

After three years of fighting bureaucracy, buckets of red tape and a large portion of plain stupidity in some camps we have finally received our repeater licence and switched GB3AT (Amateur Television) on.

The repeater was designed and constructed by members of SCART (Solent club for Amateur Radio Television). I would like to thank all of those who put in long hours slaving over masts, aerials, PCBs, transmitters, receivers etc. etc. etc.. and all who supported us during its construction.

Repeater Information

The repeater is located at Park Gate just outside Southampton National Grid Ref: SU 514 083 Long/Lat: Long +50.8714 - Lat -1.2694 IARU Locator: IO90IU(79).

- Height: Base of mast above MSL (ie OS Datum): 52 Metres
- Highest point of antenna system above msl (i.e. above ground level): 65 Metres
- Transmitter: SCART TX/LMW PA Module

- Receiver: Astec 1020 xtal locked down converter and demodulator
- Antenna: 4 x stacked twin eight arrays
- Gain of antenna: 8 dBd
- Direction of max radiation: 0-360 degrees (omni)
- Polarisation: Horizontal
- Transmitter power: Peak power fed to antenna (PX): 6 dbw - Peak effective radiated power (PXE) 14 dbw
- Type of emissions: F3F + 6 Mhz carrier (19M0F3WWN)
- Transmit Frequency (output) 1316 Mhz
- Receive Frequency (input) 1249 Mhz

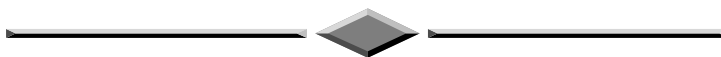
The use of a suitable modified computer (Amiga 1200) has enabled us to add a number of unique feature to the repeater.

At the current time the repeater is working in BASIC mode and most of its enhanced features are switched off. Once completed, the repeater will have the following features:

- Auto aerial selection
- Computer driven menu and information system
- On board VCR to record and play back video on command.
- Self diagnostics and status reports.
- Auto P-Grade reports
- Remotely operated cameras.
- Weather station showing data in an easy to read graphical form.
- Repeater Linking
- Wide Band Data pass through.

And anything else we can persuade the computer and logic racks to handle.

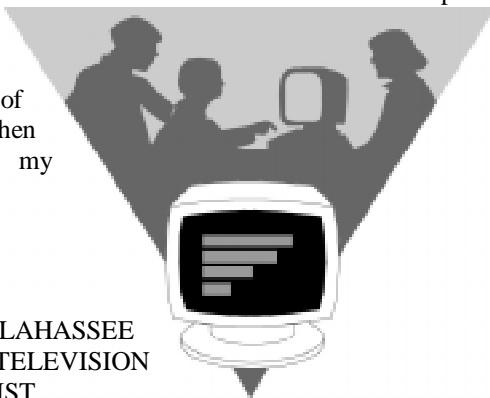
We would be very grateful for signal and picture reports. If you would like any additional information you can reach us at: SCART@inside.co.uk



Email

The following items were plucked from the Internet or sent to me directly as email.

If you have any snippets of news of information, then please send them in to my mailbox.



[Last update 04/15/97 0947]

WELCOME TO THE TALLAHASSEE ON-LINE AMATEUR TELEVISION DISCUSSION MAILING LIST

This service distributes mail to hams that are interested in Amateur Television (ATV). The intent is to provide a forum for hams to share and discuss information relating to all aspects of Amateur Television. Items for sale or trade are always welcome. Please keep commercial ads to a minimum please.

Please note: This system is NOT case sensitive. I just use caps for EMPHASIS!

TO SUBSCRIBE TO THE ATV LIST

To subscribe to the list, address your email to:

listserv@TALLAHASSEE.NET

or

majordomo@TALLAHASSEE.NET

In the body of the message:

subscribe ATV

TO SEND MESSAGES TO THE ATV LIST

To send a message to EVERYONE on the list, address your email to:

atv@TALLAHASSEE.NET

Do not send file attachments through the list. Some email systems (like juno.com) do like like attachments and some even have a limit on the size of the message (juno.com is 64k). If you need a file that you think would benefit

the ATV community, I will post it on a web page or ftp server for you. Sent mail to doug@tallahassee.net

TO REPLY TO A MESSAGE

ATV mail is formatted so the return address is the ATV list. If you use your email REPLY function, your response goes to EVERYONE on the ATV list. The sender will likely always be ATV-Clerk since he "owns" the list.

At times, you may want to reply to the actual sender. Most email programs will let you change the reply-to: address to the individual instead of the mailing list. You should check your Email program docs on the defaults of the program.

There are times when others would like to write you about your post to the list. For this reason you should ALWAYS sign your email with a line at the bottom with your name and email address. This helps someone write back to you personally instead of the entire list. The accepted practice is to have a signature line no more that 4 or so lines in length. An example of a signature file:

Doug Ferrell, KD4MOJ doug@tallahassee.net

Phone: (904) 555-5555

blah blah blah etc

Tallahassee, Florida

CHECKING OUT THE LIST OF ATV MEMBERS

You can check the actual member ATV member list by sending email to listserv@TALLAHASSEE.NET and type in the body of the message:
review atv

HOW TO UNSUBSCRIBE TO THE ATV LIST

We hate to lose you but.....

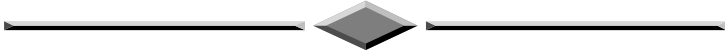
Not that anyone would ever commit such a heinous act, but you can send such filthy email to listserv@TALLAHASSEE.NET with the following line and NO SUBJECT.

unsubscribe ATV

If you have questions about the ATV list, contact Doug Ferrell

(KD4MOJ), doug@tallahassee.net

ATV RULES!



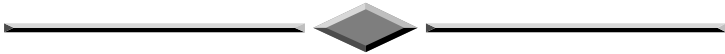
It's a new site entirely dedicated to ATV: <http://www.cmo.ch/swissatv>

You will find a lot of news because we update at a minimum rate of one week. You will find also news of the ATV Dx-pedition in France-Spain that has established a new world distance ATV record on 10 GHz: 701 kilometers! (with a translation in english by W3HMS). **micel vonlanthen hb9afo**

AITech has just announced they will offer a \$400 set top converter to Receive any of the Digital TV signals and convert them to NTSC for your existing TV set.

If others offer a similar unit, the price can be expected to be less, Perhaps \$200 after the first year! **Henry KB9FO**

To access the Southern Ca. ATV Sights and Sounds ATV web page please use: <http://www.qsl.net/wb6izg>



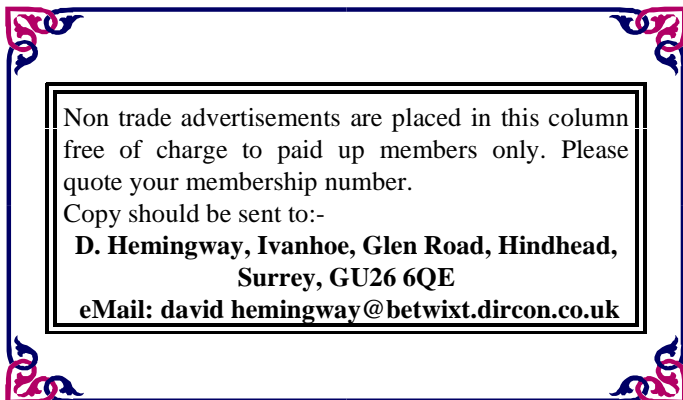
Here's another WEB site of some cool ATV projects:

<http://www.murphysoftware.com/dats/>

An RC Car, home remote ATV system, ATV repeater, pan tilt 35mm/video camera ATV balloon platform, ATV rockets, and a 13' ATV kite are the documented projects. The repeater and RC car pages are not quite done but I've wanted to show you guys what we have for a while so what the heck.

If you get a chance to take a look let me know what you think.

- Chris N8UDK



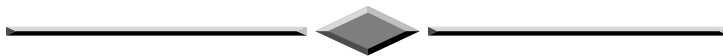
For Sale

FOR SALE: Shibaden SV-700 open-reel video recorder with 140 reels of tape, all recorded. *Contact Gordon Tew, Chard, Somerset; telephone 01460-64376.*

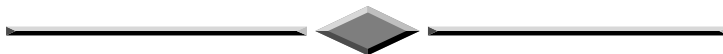
4x PPM meters (no drivers), 2x Studer B62 1/4" twin-track recorders (inc manuals), 2x ITC triple stack audio cart players, 1x BE cart recorder/player, Loads of audio carts, Loads of 1/4" tape, 1x Waveform/picture monitor, 1x Alice 4ch mono audio mixer, 2x 7" b&w monitors, 1x 19" 5 row audio jackfield, 1x 25u 19" cabinet. All reasonable offers accepted. *Jeremy Power GIWVK (01442) 384716*

Dallmeyer C-mount lens, 36" focal length (yes!). Now you can see into the future! Lens is about 3 feet long and comes with platform for mounting camera, can be motorised, As new, £100. Videonics PAL video equaliser. Comprises video enhancer, contrast adjustment, colour adjuster, colour bar generator, solariser, video inverter, digital paintbrush, audio mixer. S-video and normal phono connectors - quite an up-market machine and handy for the videographer. As new condition. Cost well over £200 new, yours for £150. Buyer collects or pays carriage. *Andy Emmerson G8PTH, Northampton, 01604-844130.*

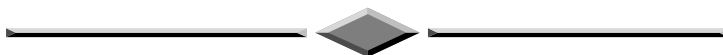
APPEAL: About ten years ago some kind soul lent me a 35mm filmstrip of various test patterns originally issued by Pye. I need to have it copied again; would the owner please contact me? Thanks! **Andy Emmerson, G8PTH (01604-844130)**.



Tektronix 521 PAL measuring vectorscope, 19" rackmount, by 4U high. with handbook in good order. Quantity of handbooks for broadcast equipment for swaps or barter. Glass BBC test transparency No. 52 (12" * 10" test slide) Swap for something of equal interest. .. TV lens, the sort you used to hang in front of your 1952 tele to make the pictures bigger offers. Much other stuff to dispose of after a house move please phone for a list or a chat. **Brian Summers Not QTHR 01276 677879**



FOR SALE: Maplin Electronics Videobox kit, with documentation and all parts. Takes PAL video and provides fade-to-black, sync separator, inverted video, etc etc. Unassembled kit, costs about £30 new, yours for £10 post-paid. Elktronics VDG-1 NTSC video ident generator. Provides standard NTSC colour signal with a choice of two pictures stored in EPROM. Takes 12V at 160mA, approx. 4" x 3" PCB. £10 post-paid. One only of each; please send cheque and SAE (latter will be returned unused with goods if you are first, else used to return your cheque if you are not first customer). **Andy Emmerson G8PTH, 71 Falcutt Way, Northampton, NN2 8PH.**



Forty years of Amateur TV: Complete set of 'CQ-TV' from Issue 21 (June 1954) to Issue 176 (Autumn 1996) Offers for complete set or individual issues.

BETAMAX SPARES

New, boxed BETAMAX vcr heads : Two off Nihon Sanyo AHAA. One off Konig type 2546, ø20 each. Substantial quantity of Beta cassettes; mostly L-750 (3 hour). All need rewinding but still ok 50p each. Sony C5 Beta VCR £10

Microvitec 895 'Cub' video display monitor. 13" (or 33cm if you prefer!) £50, Gould Advance Pulse Generator PG 58A £10, Venner Frequency Counter 1000F Mk 2 10Hz to 32MHz £20

On behalf of a Silent Key BATC member sale:

Yaesu FT-290R 2m All-Mode Transceiver. POA, Electronic Organ, home-brewed (but looks professional) Two 4-octave keyboards, 15 - button rhythm generator, 13-note pedalboard. Fold - away metal 'legs' so fairly portable. Works, sounds ok into Hi Fi system, but I cannot play a note! Probably took ages to construct, should be worth three figures; reasonable offers ? **Graham Hankins G8EMX, 11, Cottesbrook Road, Acocks Green, Birmingham, B27 6LE Tel: 0121-707 4337 or 0585 792239**



16 x SVHS E180 tapes £25, 10 x SVHS E120 tapes £15,

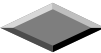
9 Metres of multi-core video cable (6 cores of PSF1/3M) £10,

8 Metres of above £8,

9 metres of 4 pair audio multi-pair £5,

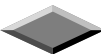
Sony SL8000 Beta VCR and Commodore 1820 computer free to any caller.

Will swap any of the above for Hitachi FP C2 camera spares and workshop manual. Also looking for Philips LDK 14 camera, CCU, OCP, and workshop manuals. **Contact Nigel Phillips, 80, Johnston Road, Oakdale, Poole Dorset, BH15 3HT Tel. 01202 670733.**



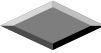
Philips Video 80 Plumbicon Camera, Single CCU and Power Supply £100
Philips Video 80 Plumbicon Cameras x 3, Triple CCU and Power Supply £200 . Boom Microphone Trolley System, Excellent condition £500. JVC U-matic Edit Suite 8200/6600 £300. JVC GRC3 colour camera and supply £50. Various Assorted lenses; enquiries welcome.

Most of above have full service manuals and are fully operational. all are open to offers **Contact Ronnie Gibb, 20 Douglas Street, Hamilton, ML3 0BP. Tel. 01698-421480(Evening);0141-330-4141(day); E-Mail=r.gibb@gla.ac.uk**



1 x CCIR PAL 625 SPG broadcast spec £20. 1 x CCIR Its gen and inserter £10. 3 x PAL encoders full spec £10. Each. Grey scale gen with subcarrier £5. Gain and delay test set £5.

Contact David Long G3PTU 697 Halifax Rd., Hartshead moorside, Cleckheaton W. Yorks BD19 5QT. Tel 01274 877211



Chokes 10H 250mA: 5H 250mA: 20/5H 100/250mA Offers? Pair of Partridge D6831/C A-A 8000 ohm UL 43% Sec 3.8-15 ohm £15. Valves EF37A,6J5,6V6,6X5, ECC35 £2. Each Pair 12E1 £15. CRT's A47-18W, A34-510W, 7BP7A, VCR90 £5. Each. Weare & Wright tape drive £15. Transformer etc. for associated valve amplifier also available. Postage extra but most items rather heavy or fragile so prefer collect.

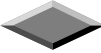
Contact John Kanaar, 41, Wellesley Drive, Crowthorne, Berks. RRG45 6AL Tel. 01344 776342



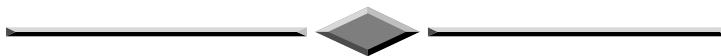
WOOD & DOUGLAS 24CM EQUIPMENT

1250 DCS 50 Receiver, VIDIF 1 Video Demodulator, SCR-2 FM Sound Demodulator, VP/D1 Video Pre-emphasis / De-emphasis 2 No., 1240 TVT Mk11 Transmitter 150mw, 1250 FM1 Driver Amp. 1 W, TVMOD1 Channel 1-36 Modulator

The above equipment is all factory assembled and has never been powered up or modified in any way. Complete with circuits and data sheets. This would make a complete 24 CM station The current new price for the above equipment is £510.00. *Serious offers only to C. Sewart 148 Hibbert Lane, Marple, Nr. Stockport, Cheshire. SK6 7NU Tel: 0161 427-3057 or E-MAIL clive@marple.demon.co.uk G0HHR*



URGENT DISPOSAL due to imminent emigration! Assortment of ex-broadcast TV odds and ends, including B&W monitors, a nice but large vision mixer, various modules, colour tube, VDA's, etc. etc. Too much to list, and all at give away prices, for quick disposal. Anything left goes to the tip! *Please send SAE for list, or e-mail or fax. Tony Marsden, c/o Talbot's Cottage, Pleck Lane, Higher Ansty, DORCHESTER, Dorset, DT2 7PT. Fax 01202 861176. e-mail: NCGoudge@aol.com*



BBC Year Book 1944. D/w slightly torn at edges £8.

BBC Year Book 1949. D/w quite tatty but intact £6.

Television & Radio 1982 (IYV Yearbook £6.

Anglia Television: The first 21 years. Large format souvenir book 1980
Many vintage pictures £8.

Television and Short Wave Handbook. 4th/revised edition F.J. Camm. Well
illustrated with pre war 405 line telly. No d/w Covers faded £5.

Wonders of the waves. Edward Rhien 1940 The Scientific Book Club
Illustrated. Sections on Radio and TV. No d/w. £5

Sportsview grandstand 1960 annual lots of TV sports pictures, one signed by
Billy Wright! No d/w. £2

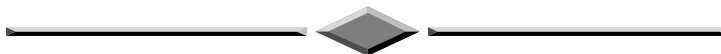
TV BOOK. Ed Judy Fireman. 'The ultimate TV Book' includes a pictorial
history of American tv. Workman publishing. NY 1977. £5

TELEVISION CHILDRENS HOUR. Michael Westmore. The Heirloom
Library. 1957. Lots of pictures of The Appleyards, Mr. Pastry, Sooty, The
Bumblies, Billy Bean. £5

BBC TV CRACKERJACK ANNUAL 1969. Win a pencil £5

MICROPHONE. Ex-BBC. Moving coil. STC style 4017c. Circa 1950. Big,
brass and heavy. No stand. £20.

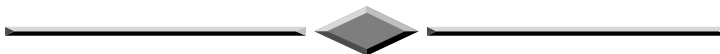
All items clean and intact. Postage £1.00 per book. **Contact Dicky Howett,
23, Micawber Way, Chelmsford Essex. Tel. 01245 441811. Fax 0125
442816**



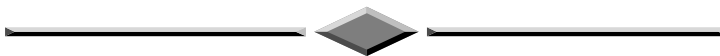
Sony DXC3000 3CCD CAMERA, big Fujinon lens, gen-lockable, the
works.A3750/offers, Merlin VISION MIXER, 4 inputs, 2 framestores, loads
of features. A31100/offers. **Jeremy Power (01442) 8384716**
jjpower@media68.nildam.co.uk

Wanted

To complete restoration of NEC 100 camera; A pal encoder board No.11 and a suitable lens. A scrap camera or any other bits would also be most welcome. Bosch KCN portable camera circa 1975 to match the CCU I have already got. A Marconi MKIII camera or parts to make my incomplete camera whole again, any bits most welcome. A Nagra VPR5 portable Video recorder. I am always interested in Items of old broadcast equipment of my collection. **Brian Summers Not QTHR 01276 677879**

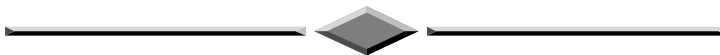


ARE YOU A HOARDER? Did you squirrel away a 3" image orthicon tube, which you never actually used? If so, may I buy it from you as standby for my camera (as seen in colour in last time's CQ-TV!)? Also looking for lenses for the Pye Mk 3 and a couple of Pye 2823 8.5" picture monitors. As ever, your price paid cheerfully. **Andy Emmerson, 71 Falcutt Way, Northampton, NN2 8PH (01604-844130).**



Wanted dead or alive

Old broadcasting equipment, Cameras, lenses, microphones, Your junk could make me happy by filling a gap in my collection or a part going towards a restoration project. Old manuals and books to go into my reference library. **Brian Summers Not QTHR 01276 677879**



Books Wanted

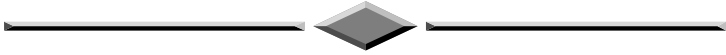
Early Pye, EMI, and Marconi television product catalogues for 1946 - 1960 wanted for research for article / book. TV related books wanted, in particular; "Electronic Motion Pictures" by Albert Abramson and any of the "Fink" TV series published by McGraw-Hill, WHY?. I have a nice book on microphones available for barter. Wanted: - Circuit for Cossor Scope CDU130. Phillips Colour analyser PM5539.

B. Summers G8GQS NOT QTHR 01276 677879 /0850 014892 The moblie is subject to battery and not being down the tube.

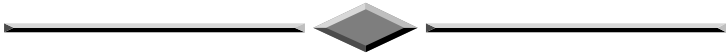
Wanted

WANTED FOR SPECIAL BATC PROJECT:- 300 Volt 200 m/a Power supply – Please contact The Chairman if you have one to spare!

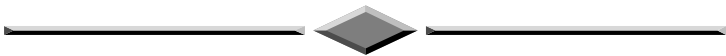
WANTED FOR SPECIAL BATC PROJECT:- 300 Volt 200 m/a Power supply – *Please contact The Chairman if you have one to spare!*



LARGE TURRET LENSES :for TV cameras required. Lenses such as the ‘folded 40’ range or anything of that ilk. Also International TV Technical Review. Any copies? *Contact Dicky Howett 23, Micawber Way, Chelmsford Essex. Tel. 01245 441811. Fax 0125 442816*

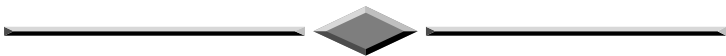


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WANTED URGENTLY for demonstration. Transformer, AC mains in, UHT out, as used in early 405 line TVs, ionizers, etc. Alos, three new (or newish) copies of “Television Baird” by Margret Baird, or info on where to obtain.

Doug Pitt, 1 Burnwood Drive, Wollaton, Nottingham, NG8 2DJ. Tel: 0115 928 2896



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