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Chairman's Column

Well we got CQ-TV 188 to the new printer (Clipper) and pleased the Honary Treasurer no end. We did pick up one or two problems. The black and white pictures went as colour and suffered in the conversion, where as the true black and white pictures, came out better.

Ian has this in hand, the fold was not so good and Clipper have promised to improve on this issue so fingers crossed for the next print run. Whilst on the subject of picture problems, sorry for the picture of me in the last column, I do not know who took it, but it looks like a bad moment at IBC, any more pictures like that and I will be putting a reward out on the mystery photographers head.

Dave McQue started his bi-Monthly column in December Radcom and did us all proud if you want to see it continuing then Dave needs your help with copy both words and pictures of what is happening around you.

The emails poured in (both of them) over my comments on the 70cms band. It would seem not all of you are keen to use digital transmission techniques, on this or any other band, and a new expression seems to have been born "coming down to broadcast standards". Mpeg2 seems to have done for picture quality what Henry the VIII did for monasteries was one view. When the rest of the world is going HDTV we seem to have made a duff move in standards, too much emphasis has been placed on freeing up band space for mobile phones. But as the broadcasters try to fill more channels from probably the same programme budgets then perhaps it is all-academic, as no one will be watching.

The members only section of the web is now up and running with only 76 out of 155,000 visitors finding their way in there. If this is the case then we have a lot of non-members who like to visit our web sites but don't want to subscribe to our magazine. Perhaps we can encourage them by moving more of the web to inside the member's only section.

I was also reminded on the radio last week that it was Arthur C Clarke Birthday (Happy Birthday Arthur I will not print your age). Arthur agreed to stand as our president for two years and that was back in August 91, so thinking caps on who would you like to see as the next BATC president.

By the time you read this we will be in the next millennium and, all the millennium bug fuss will be behind us, I think CQ-TV escaped unless all the staples fall out of your back issues on the stroke of midnight. Perhaps this is a good time to look back and see what we accomplished.

The biggest change to CQ-TV was the format change and those that originally expressed doubts about the new format now sing its praises so it would seem that A4 rules ok. Not only the format of CQ-TV changed but also the content the most noticeable was the introduction of Dickey Howetts contributions to CQ-TV with his unique view of past television milestones.

The Introduction of CQ-TV on CD seems to be taking off with Radcom and the Dutch magazine repeater following in our footsteps and introducing a CD with acrobat format back issues. I would love to have all the back copies of CQ-TV right back to number one available in this format. At the moment they exist as paper magazines only, so if anyone knows where we can get the conversion done please let me know. The Web has gone from strength to strength, it started by pooling spare web space among several members CompuServe accounts, and then we took the plunge and moved it to a commercial site and took out domain registration, with this www.batc.org.uk was born and attracts 15,000 visitors every month. The satellite side seems to have grown not only with the introduction of Satellite news, but with the uplink of this years Shuttleworth 99 events and the appearance on PI6ALK. BATC appearing live on two satellites at the same time must be a first.

While still on the higher frequencies Bob G8OZP has spanned the North Sea



on 3cms on the 19 August 1995 and exchanged P5 pictures with Hans PE1ECO, over some 154 Km this distance record soon passed to F1JSR and HB9AFO when they achieved 592 Km between Corse Island and Spain. It would seem that 10GHz activity would pass safely into the new millennium

Not all the milestones were on fast scan in 1998 SSTV pictures were received from the Mir space station. NBTV also got a boost when Don Mclean restored some original Baird disc recordings; the discs have been laying around waiting for the computer technology to recover what were previously unseen pictures.

Paul Marshall also produced some unusual TV pictures by successfully building an Iconoscope camera from scratch using state of the art electronics but an original 50-year-old Pye Photicon tube.

The BATC was also asked to put on a stand at IBC and this now seems to have become an annual event although hard work involving lots of members not just those reported and seen in CQ-TV

Just some of the things that have happened in the last part of the second Millennium on a little blue green planet some 92 million miles from a small unregarded yellow sun far out in the uncharted backwaters of the unfashionable end of the Western Spiral arm of the Galaxy.

Trevor Brown, BATC Chairman
email: Chairman@batc.org.uk

Subscription rates

By the Membership Secretary

The subscription rates to the BATC for the year 2000 are shown below. This is the first price rise in many years but, with the continuing rising costs of production, printing and postage, a price rise was inevitable.

However we hope you will agree that we have continued to improve the magazine with the change to the A4 format and use of colour within the magazine and agree with us when we say that this still represents excellent

value for money. I quote from the VHF/UHF column in The Radio Society of Great Britain's journal, "As ever, this 60 page magazine is one of the finest amateur publications you are likely to find".

Years	Surface	Airmail
One	£15.00	£21.00
Two	£29.00	£41.00
Three	£43.00	£61.00

Please note that the 'Surface' rate cover postage within the EEC.

We have also continued to improve our web site at www.batc.org.uk and this has proved to be very popular and is now attracting many new members.

If your subscription is due shortly you will find a renewal letter enclosed with this magazine.

You hope you will continue to support the Club and we look forward to receiving your renewal.

CQ-TV Commercial advertising rates



Size	Mono	Colour
Quarter page	£20	£25
Half page	£40	£50
Full page	£80	£100



Discounts of 5% for 2-3 insertions and 10% for 4 and above apply to the above prices.

If you would like to advertise in CQ-TV, then please contact our advertising manager, Trevor Brown, 14 Stairfoot Close, Adel, Leeds, LS16 8JR. Tel: 01132 670115. Email: adman@batc.org.uk

Free Internet Dial-Up Accounts for BATC members

Caladan Communications, a UK based Internet Services Provider are pleased to be able to offer BATC members free dial-up access to internet e-mail and news services. Contact Chris Smith (G1FEF) for more details:

E-mail: sales@caladan.co.uk Fax: 01933 666972, Web site: <http://www.caladan.co.uk/batc>

Or write to: 'Free BATC offer' Caladan Communications 25 Dando Close, Wollaston, Northants, NN29 7QB

Deadline

CQ-TV is published quarterly in February, May, August and November each year. The deadlines for each issue are as follows: -

February - 20th December, May - 20th March, August - 20th June, November - 20th September.

Please send your contributions in as soon as you can **prior** to this date.

Will all prospective contributors please be sure to read the 'Notice to Contributors' on page 1 so that you understand the implications of submitting an article for publication.

The CQ-TV A4 size Word 97/2000 document template can be downloaded from our web site. Select the CQ-TV magazine link from the home page at <http://www.batc.org.uk>

Commercial adverts should be sent to Trevor Brown, the advertising manager, at 14 Stairfoot Close, Adel, Leeds, LS16 8JR. Tel: 01132 670115. Email: adman@batc.org.uk

Members' sales and wants should be sent to the Editor. Email: editor@batc.org.uk

In Retrospect

Ian, Could you pass on my regards to Dicky Howett as I always enjoy his writing. There is a huge error on page 10 of CQ-TV 188. SYDNEY not Melbourne is hosting the 2000 Olympics. This might seem a minor detail to others but to the folks of New South Wales who no doubt will be paying off the debt for the rest of their lives, it is quite an issue.

Manchester was also in the running when Sydney was selected, or was it Leeds?

We have a very run down police force, hospitals and school system, but we have a world class Olympic stadium. If you know of anyone who is coming to see the Olympics, could you warn them not to get robbed or get sick because

there is a long waiting list for both services.

I always look forward to receiving the magazine. keep up the good work

John Lukey - member no 717

IARU Region 1 1999 Lillehammer Conference Report

By Graham Shirville G3VZV

The International Amateur Radio Union Region 1, which is responsible for all of Europe and Africa, holds a Conference every three years. This year's Conference was held in Lillehammer in Norway and included debate on over one hundred different proposals and ideas that had been received from most of the member Societies. Subjects covered included VHF and HF contest rules, amateur satellite and space stations frequency allocations, band



our BATC website already for some weeks.

There were two subjects which had a particular bearing on ATV operation were discussed by the C5 VHF/UHF/Microwave Committee. Firstly a proposal to modify the bandplan on the 432MHz band and secondly a proposal to change the existing FM ATV standard.

Many Nordic countries only have access to 432-438MHz and are suffering from increasing levels of QRM from other legal users such as ISM, Short Range Devices and Low Power Devices around 433 -434MHz. They had proposed that IARU should approve additional terrestrial use of the satellite and ATV segment. This proposal would have risked increased QRM to 70cms ATV activity but, after some long debate, was not accepted. It was agreed that the whole 70cm

Opening Plenary Meeting

plans in general, plans for the future defence of amateur bands and even the vexed question of keeping the morse tests for HF licences. Full information on the Conference proceedings is available from the following website: <http://my.genie.co.uk/g3znu/iaru/conference.html>. This has been linked from

bandplan should be reviewed in advance of the next interim Managers Meeting in 18 months time so we need to follow this subject carefully in the future to ensure our position is not compromised.

C5 Chairman – PA0EZ



The existing FMATV specification was written and accepted in Torremolinos in 1991. At the last Conference in Tel-Aviv in 1996 it was agreed that it needed amendment so that it could be shown to our PTT's and regulators that we are keen to ensure the most efficient use of our allocations. In a number of mainland European countries there is much pressure to restrict the number of sound sub-carriers on ATV repeaters to reduce the quoted system bandwidth. This requirement needed to be balanced by not preventing the use of multiple

sub-carriers where there is sufficient spectrum available. The resulting recommendation has, hopefully, satisfied this need!

FM-ATV standard for IARU Region 1 September 1999

Video Bandwidth 5MHz

Pre-emphasis According to CCIR 405-1

Frequency of colour sub-carrier
4.433618MHz

Maximum instantaneous deviation \pm
3.5MHz

Frequency of sound sub-carrier 5.5MHz

Modulation index of sound sub-carrier
0.07

Signal bandwidth at -40dB_c 12 MHz

Signal bandwidth at -50dB_c 18 MHz

A 5MHz lowpass filter shall limit the video. In order to maintain the maximum deviation, the baseband amplitude must be amplitude limited after pre-emphasis but before the 5MHz low pass filter. The carrier frequency shall be maintained independent of the image content

Note: The above specification shall be adhered to on all bands from 1.3GHz to 10GHz inclusive, unless particular National allocations allow systems having a greater overall bandwidth.

This new specification will NOT affect the operation of our ATV repeaters in the UK as we are fortunate on 23cms to have 25MHz than any other country and we do not, for the moment, need to apply these constraints on 10GHz. It does however show the sort of pressures that continue to build up on the use of microwave spectrum. As an aside, it was announced at Shuttleworth, the Radio Communications Agency will shortly be circulating to all Repeater Keepers, for their comment, a draft of a new specification for repeaters. This will, for the first time, specify only a spectrum "mask" and therefore allow more than one sub-carrier.

Finally it was also agreed that the IARU ATV Contest should be organised by UBA (Belgium) in 2000, REF (France) in 2001 and RSGB (BATC) in 2002.

If any members wish a fuller report, I would be happy to provide additional details. Please contact me via email at g3vzv@amsat.org.

Obituary: Mike Stone WB0QCD

Mike Stone, an American ATVer with a large profile in the hobby and in life has died at the uncommonly early age of 51. For a period he published Spec-Com magazine and ran the US ATV Society. He was also a familiar figure at the Dayton Hamvention. The official notification is given below.

TIPTON, Iowa -- Services for Michael W. Stone, of 300 W. 4th St., will be 10:30 a.m. Saturday at Fry Funeral Home, Tipton. Burial will be in Glendale Cemetery, LeClaire. Visitation is 4-7 p.m. Friday at the funeral home. Mr. Stone died Tuesday, Dec. 7, 1999, at his home. He owned and operated Cedar County Computers. He was born Jan. 17, 1948, in Moline. He married Rosemarie Frutos in 1970 in Vinadelpmar, Chile. During the Vietnam War, he served in the Navy. A memorial fund has been established. Survivors include a daughter, Wendy Stone, Davenport; a son, Jeff, Wilton; a grandson; a sister, Joyce Macias, Rock Island; and a brother, Terry, Davenport. He was preceded in death by his father, Paul Stone, in 1999. K9ZK

I enjoyed meeting with him at several Dayton Hamfests and stayed a few days at his house in Iowa. Getting on the air from his shack (ATV, packet and voice) was a highlight of my holiday. I bought my first packet gear from him, a C64 and multimode terminal interface. He did a lot of work for the ATV hobby. Michael Sheffield ZL1ABS

GB3XT Kits and Bits have MOVED

The new address and phone number for Bob Platts is:

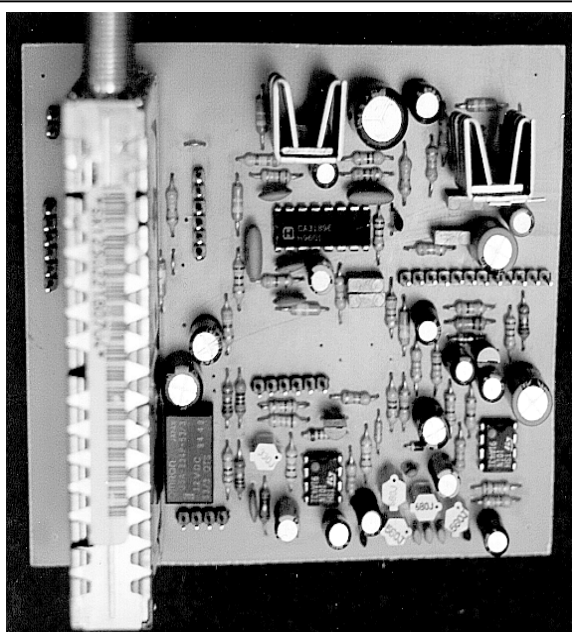
Bob Platts
43 Ironwalls Lane
Tutbury
Staffordshire
England



01283 813392



3cms LNB. 0.7db noise figure, 9.0GHz local oscillator.
New price now only £35



- The very popular Dove RX / IF kit.
- FM ATV Receiver or IF unit.
- 12vDC operation.
- Covers 925 – 1700MHz
- 6MHz (5.5, 6.5 available) intercarrier sound.
- Composite video output plus audio output to drive a loudspeaker.
- Baseband output. Pre-scalar output.
- Very simple to construct. No setting up or alignment required.

Only £42

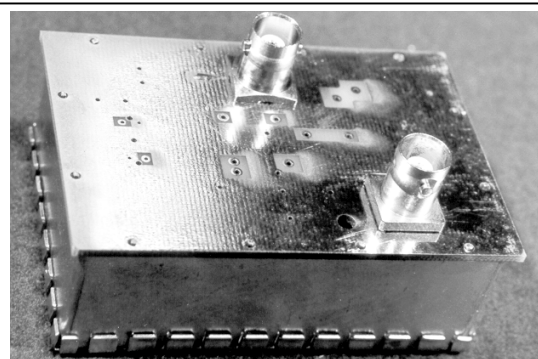
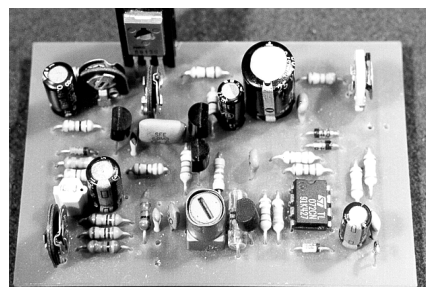
Note: For 24cms a preamp is recommended.

Look out in a future issue of CQ-TV for the synthesiser article for this kit.

Gunnmod2. The best selling Gunn diode or DRO Modulator.

- 5.5, 6.0 or 6.5MHz sound (state). Fully adjustable for video & audio deviation, output voltage & subcarrier.
- 12v DC supply.
- Easy to assemble and set up.

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24cms pre amp.

- 40db gain 1db noise figure.
- Strong tin-plate enclosure.
- Quality BNC connectors.
- 12 – 20vDC supply via co-ax.
- Idea for use with satellite RX's or Dove kit.

£60 kit, £70 assembled and tested.

All prices include postage and packing. Cheque with order please.

By John Lawrence GW3JGA

An Alternative Motorised Panning Head.

Usually all the functions of the Amateur TV Station are controlled by one person who is in turn the engineer, the camera operator and the performer. When the shack camera is a camcorder, then focus control is automatic and in later versions a handheld remote control allows zooming to be done without leaving the operating position. Panning the camera is a different matter. You either have to leave the operator's seat and move the camera yourself or invest in a security type motorised panning head.

An alternative solution.

On our lounge windowsill we have a device called a 'Solar Powered Plant Turner' (Maplin BZ49D). You stand your favourite flowering plant on the motorised turntable, the sun comes out and the solar panel alongside powers the motor and rotates the plant, simple!

The turntable is sufficiently robust to carry a camera or camcorder and 1.5 volts are more than sufficient to drive the motor. You could just rest your camcorder on the turntable but a more secure method is to use a base plate and bolt the camera to it.

I cut a 6-inch diameter metal plate of 1.6 mm (16 swg) aluminium, although plywood or hardboard would also be suitable. I stuck three adhesive feet on



Figure 1

the underside, equally spaced and just a little in from the edge, to sit securely within the rim on the turntable.

I drilled a 0.25-inch hole in the centre of the plate. This takes the 0.25-inch Whitworth threaded bolt that is the correct size to screw into the camera-mounting hole. I also used a spacing block to raise my camera slightly. The general arrangement for my simple CCD camera is shown in Figure 1.

The Maplin turntable is already fitted with a 3.5 mm jack socket for power input and a suggested circuit for a power supply is shown in Figure 2. The supply may be housed in a small box

containing the battery and switch. The switch is a centre off double-pole double-throw (DPDT) type that is non-locking both ways (Maplin FH07H). A 100R variable resistor or pre-set pot. can be included to adjust the panning speed. The panning speed on mine with the full 1.5 volts is 1 revolution in 60 seconds, which seems about right. At this voltage the motor current is approximately 20mA. With the tip of the 3.5 mm jack plug positive, rotation is anti-clockwise.

Mains Adaptor (Plug top) Power Supplies

Go to any radio or computer rally and you will find lots of second hand mains adaptor power supplies (the type that is built into the plug) with output voltages ranging from 6V to 22V, current ratings from 100 to 900mA and prices from £1 to £3. Most have an internal rectifier and smoothing capacitor but are unregulated, having been used to power or charge some piece of kit. The output lead usually terminates in a 'power connector'. This can vary in size, but is mostly a 2.1 mm type. The polarity can be centre pos. or centre neg. and is generally shown in a diagram on the ratings label.

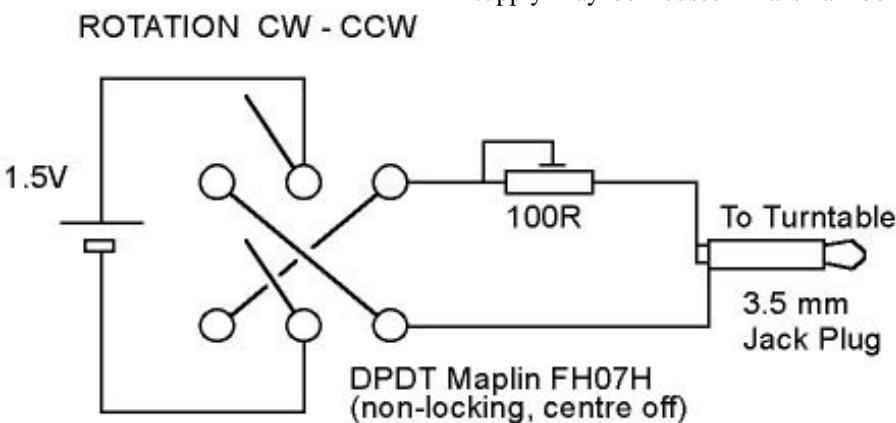


Figure 2 – Power supply for Turntable

Uses in the shack.

My main use for these cheap supplies is for powering small items that normally run from batteries when portable and is also used in the shack. For example, Gunn Mod unit (12V), sound mixer (9V), test card / caption generator (5V) etc. I normally fit a 2.1 mm power socket on the items concerned and a suitable regulator circuit inside it. Suitable circuits are shown in Figure 3.

You should allow for at least a 3V drop across the regulator, unless it is a special low dropout type, and take into account the ripple that is present on the supply.

I tested a few mains adaptors from my junk box with the results shown above.

Ericsson P1-41-356BS	Rated 6V - 700mA		No plug
No load		8.9V	
150R load	55mA	8.2V	
22R load	318mA	7.0V	Ripple 2.5V p-p
BT AC-DC Adaptor 807240	Rated 17V - 500mA		Plug centre neg
No load		21.0V	
150R load	131mA	19.7V	
22R load	714mA	15.7V	Ripple 2.5V p-p
BT Transformer 19B	Rated 13.5V- 400mA		Plug centre neg
No load		19.6V	
150R load	17mA	17.6V	
22R load	564mA	12.4V	Ripple 3V p-p
Panasonic	Rated 7V - 700mA		Plug centre neg
No load		10.2V	
150R load	65mA	9.5V	
22R load	364mA	8.0V	Ripple 2.5V p-p
Ever Glow AC/DC Adaptor	Rated 16.5V - 700mA		Plug centre pos
No load		20.7V	
150R load	130mA	19.5V	
22R load	736mA	16.2V	Ripple 2V p-p

It's a good plan to keep to one standard of plug polarity and modify any that are different.

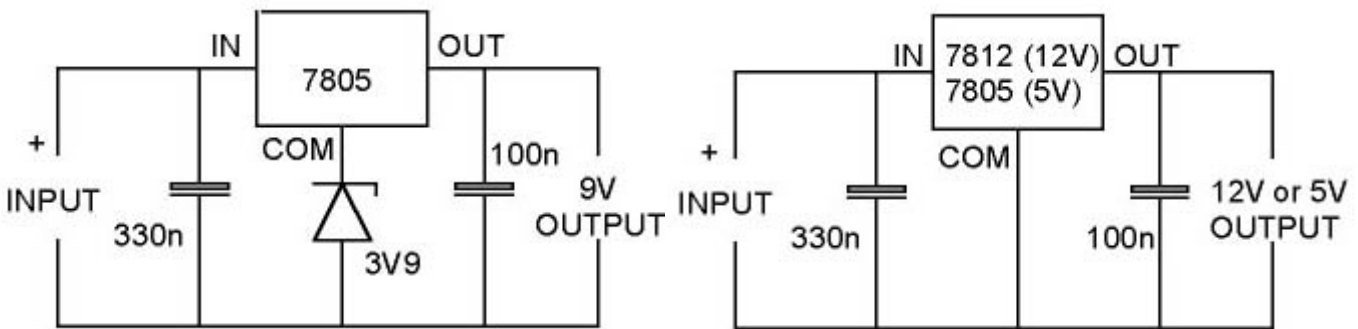


Figure 3 – 12V, 5V and 9V regulator circuits

Digital video puts 24 hours on tape

C-Cube Microsystems has announced details of a partnership with NC to create a tape-based digital video recorder, the HMDR10000. The resultant D-VHS machine can record up to 24 hours of high-quality digital video onto a single tape.

Shingo Kawata, deputy general manager of the video products division at NC, said: "Together with C-Cube, we are advancing the D-VHS market. As a result of our partnership, consumers can gain access to the most feature-rich digital recorder on the market." The MPEG2 compression algorithms implemented in C-Cube's DVxplore MPEG2 codec allow users to record video at quality ranging from

4.7Mbit/s up to 14.1Mbit/s. At 4.7Mbit/s, users gain 24 hours of video on a single tape or at 14.1Mbit/s; they can record up to eight hours.

Fermi Wang, vice-president and general manager of C-Cube's PC/codec division, said: "D-VHS is an emerging digital recording technology that leverages the installed base of hundreds of millions of analogue VHS and S-VHS devices.

"We are pleased that DVxplore's unique capabilities, and our partnership with NC, will enable digital video recording at home."

The recorder's trick modes allow high-speed fast-forward and reverse shuttle, which enables viewers to find specific scenes as well as perform such things as instant replay at the touch of a button. The high-speed scanning is done at up to 36 times the rate of normal viewing speed.

C-Cube enables this rapid scan-fling via an encoding technique that was developed together with NC specifically for the D-VHS platform.

NC says the HM-DR 10000 is expected to be available in November 1999, initially only in Japan.

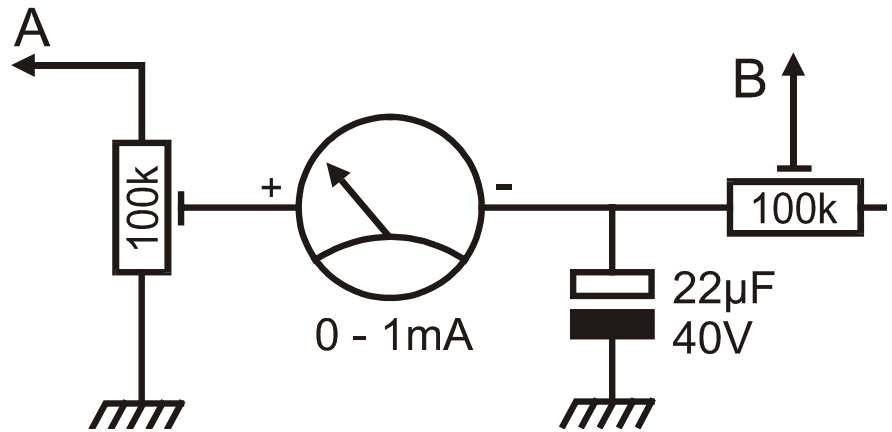
Electronics Times 27th September 1999

G35An S-Meter for TVRO

By Josê ROBAT, ON7TP

When I received CQ-TV 135 (August 1986), I went straight to page 8 where I found a TVRO described by John Wood, G3YQC. After reading the whole text, I began to search for the two main parts - the AT1020 tuner head and the AT3010 if/demodulator modules. I finally bought them for less than THIRTY pounds ... Brand new! Later, I ordered the PCB from BATC (*no longer available, Ed.*), and started construction of this TVRO. One facility, however, was missing - an S-meter.

In CQ-TV 142 (May 1988) an S-meter was described by Gef Ford, who used a 741-type i.c. I built this circuit, but could not get it to function. Once both circuits (TVRO and S-meter) had been built, I gave them to Jacky, ON5EE, our local "big brain in electronics" to test. He told me that the S-meter didn't work, and gave me another circuit to try, as shown below.



Point "A" on the first preset goes to pin 3 (+18 V) of the AT1020 tuner head and point "B" on the second preset goes to pin 3 (S-meter drive output) of the AT3010 IF/demodulator. This little circuit still works well for me.

Every morning, three of us OM use the local ATV relay on 23cm. This has an input on 1250MHz and an output on 1280 MHz. However, I am the only one who can give the "5" information (- thanks to ON5EE), as the other two fellows use commercial satellite receivers. Today, satellite receivers are

no longer expensive, but they do not have a built-in meter to indicate the strength of the received signal. The only one I found (Ham Radio Magazine of March 1985, pages 38 - 39) is the American Luxor Mk 2. Information also began to appear in September 1999 about the Radix Epsilon 2AD.

If an ATVer has succeeded in installing an S-meter in a commercial satellite receiver, then I would be interested and pleased to read how he achieved this. By the way, our local ATV relay is "ONØTVL", situated in JO2ØSP.

Profiling Parabolas

By George W. Allen, N1BEP

The focal length of parabolas to be used for antenna reflectors may be found by temporarily cementing small (one centimetre square) mirrors around the edge of the dish at the four quadrants. The dish is then aimed at the sun on some temporary mount, and a small white target is positioned so that the four mirror images coincide. This is the focal point and phase centre, at which to locate the r. f. feed. The target should be temporarily mounted at this focal point.

If the dish is distorted, one or more of the mirror images will not fall on the locus of images, but will be off to one side. A small mirror may then be moved around the dish to determine the places where the dish is not a true parabola, and whether the dish is distorted plus or minus from an ideal curve. If the dish is too flat, the image will fall outside the focus, and lifting

the mirror will bring the moving mirror image into focus. Conversely, if the dish has too much curvature, the movable image will cross the focal point to the other side of the focus. This method will allow marking the dish with deviating areas.

In order to check the results, a profile of the parabolic section can be made by locating a stiff paper template from the centre of the dish to an edge on a radius believed to be on the true parabola. The profile of the parabola is traced on the paper, and the pattern is cut out. This half-parabolic pattern can then be rotated around the centre point of the dish to observe the distortion from a true parabola. It may be necessary to refine the curvature by re-drawing the profile.

A one-meter used TV dish was obtained to be used for the low GHz. ham bands, and it was necessary to find

the focus to mount the r. f. feed system. The dish was moulded plastic, with the metal conductor embedded. This measurement technique revealed that the dish was out of focus for nearly twenty percent of its area, and would not have the predicted gain expected for the diameter. The plastic apparently had deformed with aging.

It should be noted that if a distorted parabola is to be corrected by changing the shape of the dish, the true parabolic shape must be maintained, as described by rotating the parabolic profile from the centre point. The mirror focus, while directing sunlight to the focal point, would not direct radio waves to the focus at a proper phase angle. Only waves reflected from the true parabolic contour would arrive at the focus in the correct phase so as to add to the r. f. energy and so improve the reflecting characteristics.

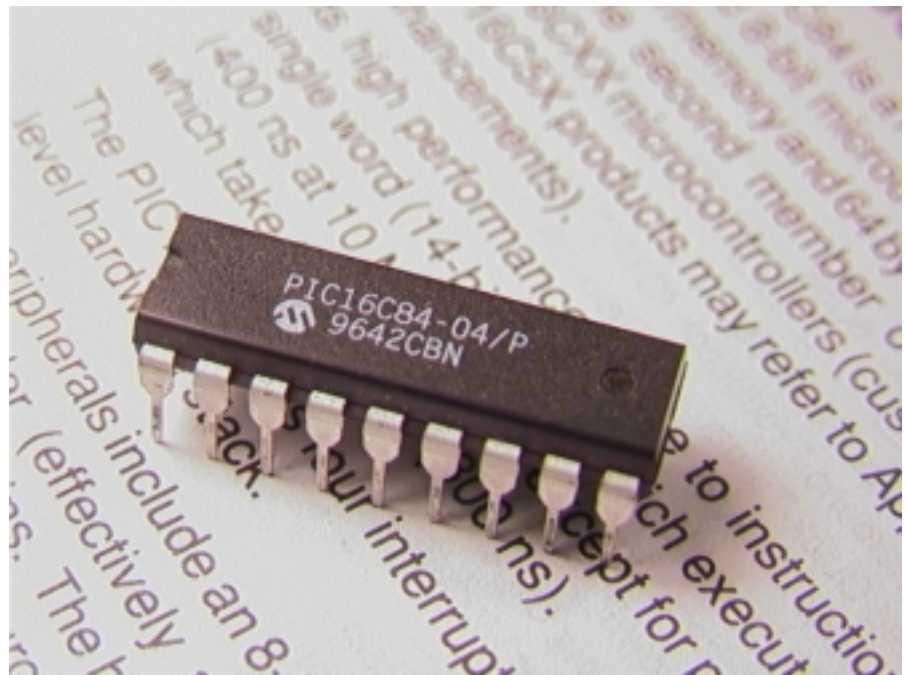
e-mail - gwa99@worldnet.att.net

An Introduction to PIC Programming. Part 1

By Brian Kelly

Based upon comments made after my PIC programming lecture at CAT'99, there seems to be a requirement for an entry level programming course. One designed for the complete novice but not demeaning to those with programming experience. In this and the subsequent articles, I have tried to cover all aspects of Microcontroller features and programming techniques, including practical instructions and examples that can be tried at home. I would like to receive feedback from anyone following this course, whether as suggestions for improvements, requests for more detail or criticism for mistakes or omissions.

I should introduce myself and declare my credentials. I'm in my 40s now, but was privileged to have been introduced to electronics while my age was still in single digits. I still have memories of my early radio designs that started with assorted glass bottles, mostly salvaged from old TV receivers, and had evolved to solid-state devices by my teens. By the late 70s my fascination with logic devices had been aroused and when Wireless World magazine announced a design for a computer based on the Z80, I decide to raid the piggy-bank and have a go at building it. I never looked back, having many hours of fun teaching myself to write programs. Of course, in those days, I had to key in hundreds of hexadecimal numbers and the frustration at the chaos a single typing error would cause was almost unbearable. Perhaps it's just as well that the computer only had 1k of memory! The 80s saw me rising through the ranks in the TV servicing trade during the daytime and becoming competent at programming in the evenings. At the turn of the 90s I was working in Chicago on complex digital radio equipment and, on my return to the UK, I became involved in the electronics manufacturing and test business, firstly as a self-employed consultant then as support engineer for a company based in Northern Ireland, a position I've held to the present date. My involvement with PIC



processors and other designs for the BATC is done solely as a hobby, although my diverse background has obviously influenced my approach to tackling design tasks.

Let's start by looking at the PIC from a hardware perspective and get to know and understand what is inside them and how they work. I'm going to base these notes on the PIC 16C84, as this is the device most favoured by experimenters, the 16F84 is almost identical and the other PIC members are similar except for having extra features built in to them. If you don't already have a 16C84 and you want to follow this course, now would be a good time to buy one, they are not expensive. There is a parts list to get you started with the projects in this series in fig. 1.1. I'm in favour of recycling old components but even if you have to buy all the parts the bill should be less than £10. You will also need a programming unit such as the

ones that have featured in several recent CQ-TV issues to store your programs inside the chip.

Before you get the soldering iron out, let's start with some technical talk. By the time the next CQ-TV is released you should be ready to try some hardware experiments. I'm going to kick off by describing some of the terms we will encounter later. I know this sort of stuff is normally at the end of an article but you won't be seeing that for a while yet!

Hardware: The physical part of a design. Sometimes described as "the bit you can kick". This will be the chip itself, its immediate support components and interfaces to the outside world.

Software and Firmware: These are essentially the same animal but software is generally accepted as a program stored on disk somewhere while firmware is a program stored on silicon where it is held even when the power is removed. The program stored in a PIC chip falls into the firmware category.

Source code: A mixture of instructions for the PIC to carry out, labels, comments and directives to tell the assembler how to behave. The

- 1 x 16C84-04 (the -10 version will work just as well)
- 1 x 18-pin DIL socket for the 16C84
- 1 x 10uF/10V electrolytic capacitor
- 1 x 470pF ceramic capacitor
- 1 x 22R 0.25W resistor
- 1 x 47K 0.25W resistor
- 1 x 100K 0.25W resistor
- 1 x push-to-make switch
- 8 x red LEDs

Fig 1.1 Shopping list:

source code is written in a language which is easy (!) to read and write and is often written in several parts to split the programming task into smaller tasks. If these tasks are organised so that each one performs a specific job, the source code is described as being modular. Modular code offers the big advantage that modules can be reused as parts of other programs. Source code is entirely conceived and written by the program author; hopefully you will be competent at doing this after reading this series.

Assembler: Clever software running on the host machine which looks at the source code and recognises its component parts. The directive parts are used to configure the assembler and to tell it if more than one file of source code is being used. Labels are used to make the assembler remember places in the source code so that they can be referred to later. Comments are just that, they play no role in the PIC itself and are actually ignored by the assembler. They are very useful as reminders both to the software author and anyone else maintaining the program later on. The instructions are the core part of the source code; they are converted by the assembler into a format the PIC can execute called object code. There will be lots more on this topic later in the article.

Compiler: Very similar to an assembler, in fact they produce almost identical output data. The difference is that while an assembler converts each instruction in the source code to a single instruction of PIC code, a compiler generates whole chunks of PIC code from more complex program functions. Writing programs for a compiler is undoubtedly easier than writing for an assembler but the versatility, size and speed of the program is compromised.

Host machine: A computer used to edit, assemble and possibly debug the source code before it is programmed into the PIC memory. Usually this is a PC and quite likely it also drives the programming unit.

Programming unit: The box of electronics that takes a file of data from the host machine and stores it inside the PIC. It provides the special voltages and control signals that are needed to activate the chips storage mechanism,

then copies the object code byte-by-byte into a location inside the PIC's program memory. I use one called a Micromaster LV from ICE Technology, because it also programs other types of chip, but the ones featured in CQ-TV are perfectly adequate for PIC devices.

Now that the big items have been defined, let's look at the terms used to describe the internal organs of a PIC chip itself. Don't expect to see these unless you have X-ray specs and a powerful magnifier, just take my word for it - they really are there.

Clock: Just like we use clocks to synchronise our eating, sleeping and work, PICs have one to synchronise everything they do. The speed of the clock tick decides how fast the chip executes its program. The faster the clock runs, the swifter the program runs. There is a penalty to pay though, as current consumption also increases with speed.

File register: Usually just called registers, these are the storage compartments where all the data being used by the chip is held. They are similar to memory addresses in a RAM or EPROM chip but in many cases the bits in the registers are connected elsewhere inside the chip to perform special tasks. The registers in most PIC chips are eight bits wide and volatile, that is, the data in them is lost if the power is removed. A list of all the registers in the 16C84 is shown in fig. 1.2; other PIC family members are very similar, especially where low numbered registers are concerned.

Program memory: PICs are built in such a way that the program is stored in a different part of the chip to the normal file registers. In contrast, most computers treat the program and data as equals, only the memory addresses are used to distinguish one from the other. By keeping them apart, there is no need for the program to occupy the same 8-bit wide format so PICs are free to use more bits to identify each instruction. Program memory is normally permanent; once programmed the information stays put for the chip's lifetime but there are two exceptions: the 16C84 which can be electrically erased and reprogrammed and the "JW" versions of other PICs which

have a window in their tops allowing them to be erased with a UV lamp.

EE memory: A block of file registers present in some PIC devices that work just like the normal registers but retain data when the power is removed. An example of a use for this would be to save a users settings so they can be restored next time the PIC is powered-up. To protect EE memory, a special sequence of instructions has to be executed before new data can be stored. This way a rogue program or power glitch is unlikely to corrupt existing memory contents.

Program counter: This is nothing more than a counter with the ability to be reloaded with a new starting number. Its job is to keep track of the instruction being executed as the program runs. Ordinarily, the count just keeps increasing by one as each instruction is carried out but if the program flow diverts because of a jump instruction, subroutine call or interrupt the new destinations address is loaded into the counter. This value in this register is used as an offset from the start of the program memory when instructions are picked up for execution. When the PIC is reset, a fixed number is loaded into the program counter; for the 16C84 this is zero, so the first instruction is taken from the first program memory address.

Stack: A reserved block of registers that are not accessible from within the program itself. The stack is used by the PIC to store the address of the next instruction to be executed, whenever a subroutine call is made or an interrupt occurs. By holding this address, when the subroutine or interrupt routine finishes, the data from the stack can be reloaded into the processor so it can carry on with its original program flow. The stack can hold several entries so that for example, a subroutine can call another subroutine with each returning back to the place they were originally called from. Each time a call is made the return address is put on the top of the stack and any entries already there are moved down one place. Each return takes the address off the top of the stack and moves any others up one place. Care has to be taken not to make so many calls that the bottom of the stack is lost. The stack on the 16C84 for example can hold 8 addresses; in programming lingo we say it is an 8 "deep" stack.

Register No.	Name	Purpose
0	IND0	(Indirect) – gives access to data in the register number selected by FSR
1	RTCC	Counts clock pulses to time events or can count pulses on RA4
2	PCL	Lowest 8 bits of the program counter
3	STATUS	Holds bits that reflect the current operating state of the processor
4	FSR	The register number placed in FSR can be written and read through IND0
5	PORTA	Bits which are connected to the pins called RA0 to RA4
6	PORTB	Bits which are connected to the pins called RB0 to RB7
7	-----	Not used in the 16C84. (The port C pins on bigger PICs)
8	EEDATA	Data input to and output from the EE memory address held in EEADR
9	EEADR	Holds the address of the EE memory accessible through EEDATA
A	PCLATH	Holding register for the upper bits of the program counter
B	INTCON	Interrupt Control. Bits to enable/disable interrupts and check if active
80	IND0	Alternative to register 0
81	OPTION	Sets various options in the way the processor operates
82	PCL	Alternative to register 2
83	STATUS	Alternative to register 3
84	FSR	Alternative to register 4
85	TRISA	Bits which decide which bits of RA are inputs and which are outputs
86	TRISB	Bits which decide which bits of RB are inputs and which are outputs
87	-----	Not used in the 16C84
88	EECON1	Bits to control access to EE memory and check its status
89	EECON2	Security features to prevent accidental write operations to EE memory
8A	PCLATH	Alternative to register 0A
8B	INTCON	Alternative to register 0B

Notes:

1. Registers numbered 0C through to 2F can be used for any purpose; none of their bits influence any of the hardware features of the chip or any other register.
2. Registers 80 through to 8B are in “page 1”, the others are in “page 0”. To access any page 1 registers it is necessary to set (make 1) bit 5 of the STATUS register. To return to page 0, the same bit has to be reset (make 0). The alternative registers in page 1 are there to minimise the need to switch banks so often, they are identical in every way to their page 0 counterparts.

Fig 1.2 The 16C84 file registers.

Prescaler: This does exactly the same job as the one in your frequency counter, it gives one pulse out for a set number of pulses fed in. A bit in one of the registers decides whether the PIC counts pulses on one of its pins or counts its own clock pulses. Another bit determines if the count is taken as is or if it should be diverted through the prescaler first. By using the prescaler, much larger counts can be reached and longer time periods can be measured. Although the division ratio can be set in the prescaler, its contents are not readable from inside a program.

Working Register (W): This is analogous to the accumulator register in other kinds of processor. It isn't accessible directly but plays an important role in almost all PIC instructions. Imagine it as being like the memory button on a pocket calculator. Numbers can be stored in it, added to it, subtracted from it and

retrieved from it but you can't actually see its contents until you use them. The W register goes a stage beyond the calculator model because its contents can also be shifted, bit by bit, either to the left or right. Most of the instructions in the PIC repertoire that manipulate data in some way can use the contents of the W register and can leave their results there.

That concludes the tour of the PIC's innards except for mentioning the remaining dedicated and general-purpose registers. We will see a lot more about them when we start writing programs. To end part one, I should explain the numbering system used in programming, it is called hexadecimal. There's nothing stopping you using normal decimal numbers if you want to but you will quickly find that they can be cumbersome to use in a binary

orientated system.

Hexadecimal numbers: Humans, at least the ones I know were all born with

Binary Bits	Decimal Equivalent	Hexadecimal Equivalent
0000	0	0
0001	1	1
0010	2	2
0011	3	3
0100	4	4
0101	5	5
0110	6	6
0111	7	7
1000	8	8
1001	9	9
1010	10	A
1011	11	B
1100	12	C
1101	13	D
1110	14	E
1111	15	F

Figure 1.3 Hexadecimal numbers:

ten toes and ten fingers, (including the thumbs). It's no wonder we based our numbering system on such readily available counting sticks. When we count beyond nine we overflow the number into an extra digit and that one we overflow into yet another and so on. We end up with the familiar thousands, hundreds, tens and units columns. Computers are no different but they work in binary; it's as though they only have one finger to count on. So instead of reaching ten before carrying to the next digit, they carry on a count of two. The sequence goes like this: 0 meaning nothing, 1 meaning 1 (note that we can't count beyond 1 in any digit), 10 meaning 2 because we carried into the next digit, 11 meaning 3 and again we've run out of digits so another carry is necessary, 100 meaning 4, 101 meaning 5 and so on. It's exactly the same as carrying after nine in each digit but carrying after one instead. That

neatly describes the binary numbering system that the PIC uses but as you can imagine, reading long strings of ones and zeroes will not only make you short of breath but is prone to mistakes. That's where hexadecimal comes in. It's not really another numbering system but just a shorthand way of speaking binary. The binary numbers are grouped into lengths of four, starting at the right side, so for example 10110111 would be split into 1011 and 0111. In most cases we will be dealing in 8-bit numbers that conveniently split into two groups of four; if there are less than four digits in a group, imagine the missing digits are all zeroes. We treat the binary counts from 0000 to 1001 in exactly the same way as decimal numbers, that is 0000 = 0 through to 1001 = 9. This leaves a gap though because some combinations of the four bits are not being used, they are 1010, 1011, 1100, 1101, 1110 and 1111.

These don't translate into a single decimal digit so we assign them the letters A through F instead. Fig. 1.3 shows a binary count sequence with the decimal and hexadecimal equivalents of the digits alongside. As an example, the minimum number that can be held in 8 bits is 00000000, which is 00 hexadecimal, and zero decimal, the maximum is 11111111, which is FF hexadecimal, and 255 decimal.

In part two we will look at how to address the registers in the chip and how to use an assembler to write a simple program. If you gather the parts in the shopping list together, you will be ready to build a small "prototyping" board to run programs that we will write later in the series.

To be continued...

Single chip video decoder

Samsung Semiconductor has announced the availability of its latest die-shrink single chip video decoder/scaler solution, the KS0127B, which increases functionality and reduces costs. The device has been developed to address the PC video ready VGA card market, but also offers increased flexibility for variety of other multimedia applications.

Features include a software bit added to detect Macrovision (standards 6.0 to 7.01) and a real time control signal to enable video encoder operation with the decoder clock. The KS0127B's I/O ring also supports 3V or 5V operation, which allows backward compatibility as well as the ability to operate with the latest VGA and MPEG silicon technologies.

Other features include superior Y/C separation, high quality down scaler and flexible vbi data processing.

The KS0127B achieves superior Y/C separation by more effectively isolating the Chroma [C] and Luma [Y] components of a composite video signal and, thereby, removing any unwanted colour striping effects.

This is achieved by providing a 2-line (3 tap) chroma comb filter. The filter improves processing performance with live video inputs and test signals when compared to existing solutions, which only provide a simple 1-line (2 tap) chroma comb filter. Additional 2-line (3 tap) luma comb circuitry also allows full bandwidth luma processing without high frequency loss. This enhancement of the "basic" decoder processing is complemented by an adaptive comb filter, which provides effective separation. This final step removes all dot crawl artefacts, while retaining full S-Video luma bandwidth.

This advanced composite video processing out performs other devices with pre-separated S-video inputs.

The KS0127B also features a high quality down scaler and is able to retain full video bandwidth with minimal to zero artefacts at any horizontal scaling ratio. To ensure an easy interface, all data retains 656 compatibility regardless of video window size. In addition, internal FIFO's eliminate any confusing data signal transfers that are common to many of today's scalars. The horizontal scaler is implemented

using an optimised 32 phase, 5 tap re-sampling filter.

For quality vertical down scaling,

KS0127B offers an 8 phase, 3 tap vertical re-sampler. KS0127B is the only decoder to combine this interpolated vertical scaling with the comb filter.

A built-in bit data slicer also enables flexible vbi data processing, allowing the KS0127B to decode Intercast, Teletext, WSS, Closed Caption and SMPTE data. The data can be accessed from the KS0127B by either enabling the ADC samples to be output for the appropriate lines or slicing the data and bursting this data out on Y output. The data can also be read from the 1²C bus or via 2 external pins that out the sliced VBI data and the time at which the slice is valid.

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www.dotelectronics.com



625-line to 30-line converter

By Peter Smith, G4JNU

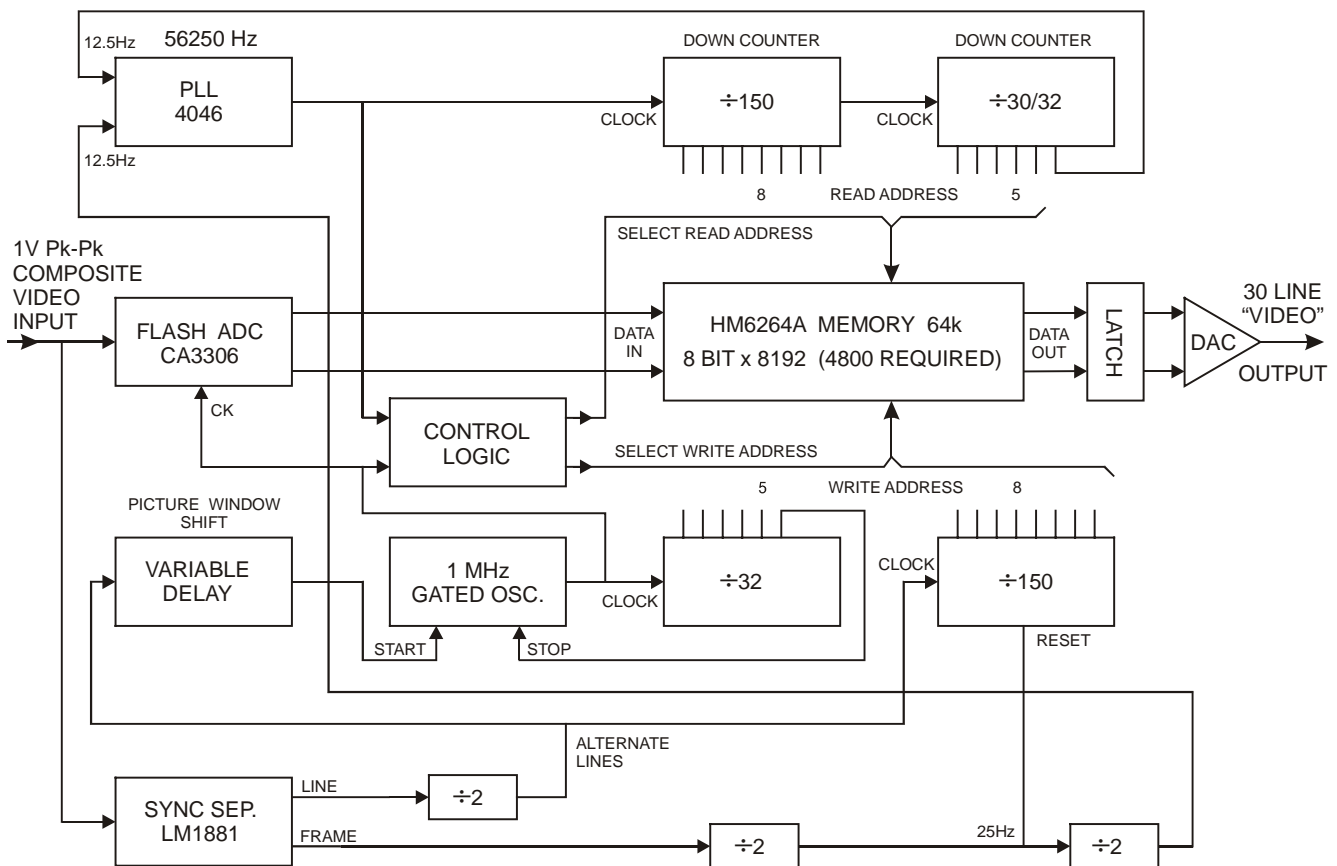
Introduction

My interest in television started in 1953 when, as a schoolboy, I completed a 405 line TV in time for the Coronation. This was based on a government surplus radar unit and the VCR97 CRT. Later, at college, my project in the final year was to design and build a 405-line valve camera using a 1-inch vidicon tube.

A few years later I built my own solid-state version. In 1985 I constructed my first 30 line mechanical television, which was demonstrated at a special event station run by the Reading and



The completed unit



Block diagram showing the converter layout.

District Amateur Radio Club. Public interest made me consider how to present a more authentic demonstration and so I decided to make a replica of a 1930 Baird Televisor.

Early in 1990 I contacted the curator of the York Castle museum with a request

to take photographs and measurements of their original Televisor. I was allowed in an hour before the museum opened to gather all the information I required. The project was completed before the end of the year. Thirty line transmissions ceased in September 1935, so for my demonstrations I used

a second-generation tape recording copied from a 1935 Baird record. Not a pretty sight! This prompted me to design the 625 to 30-line converter. Over the years I have used the converter to generate material for museums and provide many realistic demonstrations around the country.

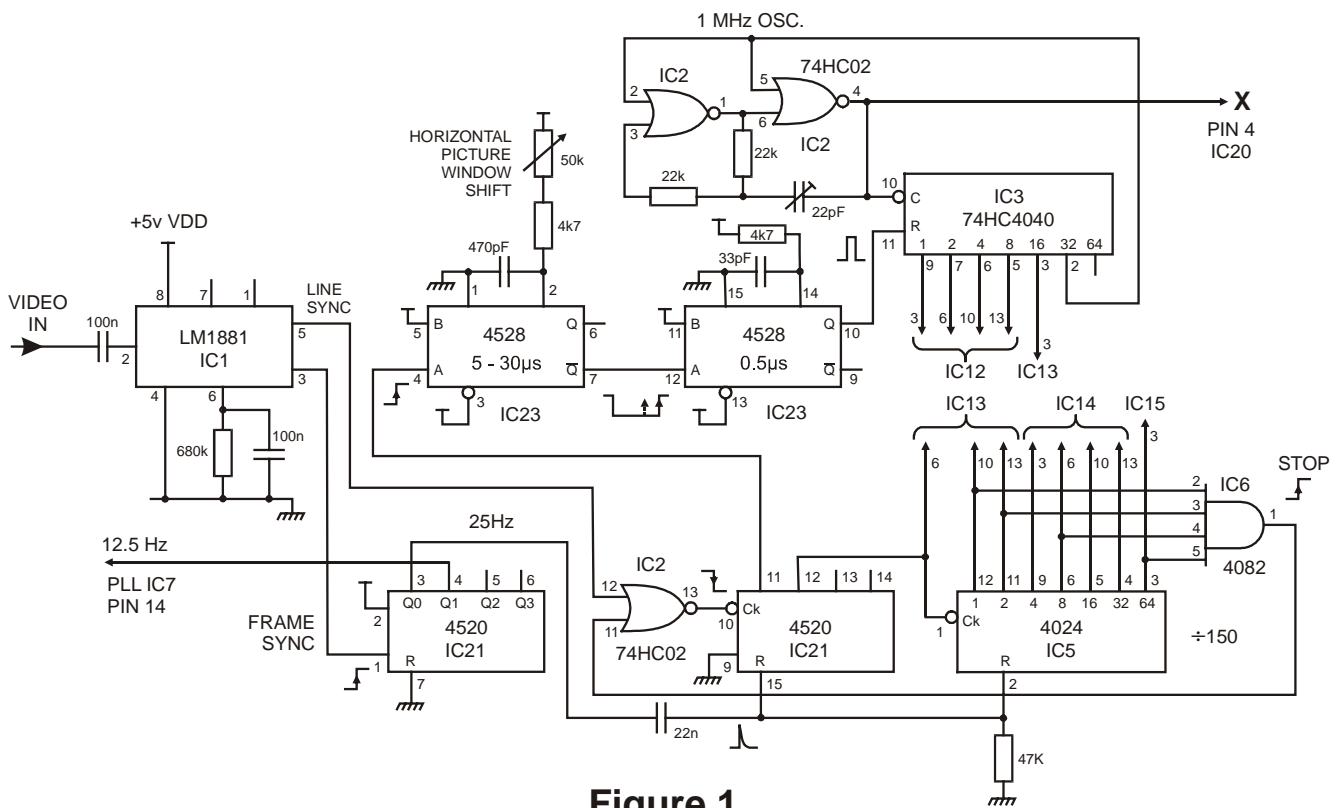
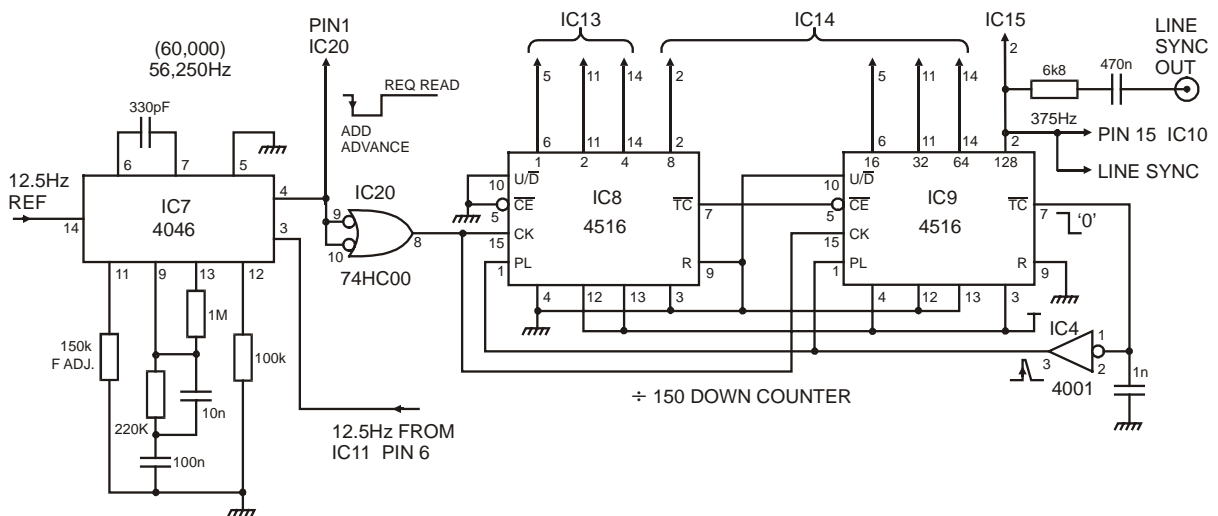


Figure 1

Figure 2



Specification

- Input - 625-line 1V p-p composite video.
- Output - 30-line 'Baird standard', but with added negative line sync. 1V p-p output, vertical scan, 3 x 7 aspect ratio, 12½ frames per second, non-interlaced.

NB. The original Baird video signal did not include line or frame sync pulses. The video was reduced to black for a short period between each line and this

black level was used to provide a measure of line sync. No frame sync was used and lines were skipped until frame lock was achieved.

The facility to output 32 lines with one line sync pulse missing to give frame lock is also included. (NBTVA standard)

Circuit description

The aspect ratio of the Baird picture is 3 x 7, so for equal resolution in the vertical dimension, 70 samples are required. This is increased to 150,

which eliminates the pixel structure and allows alternate lines of the 312½ line field to be sampled. A delay at the beginning ensures that any teletext information is not included. The Baird picture width is only about a third of the sampled horizontal line, so provision is made to shift the picture window by means of a variable delay. To cater for a 32-line output, and to simplify the write address counter, 32 samples of the video are taken across each alternate line. The CA3306 flash ADC converts the samples to 6 bit words; a 64 level grey scale is more adequate.

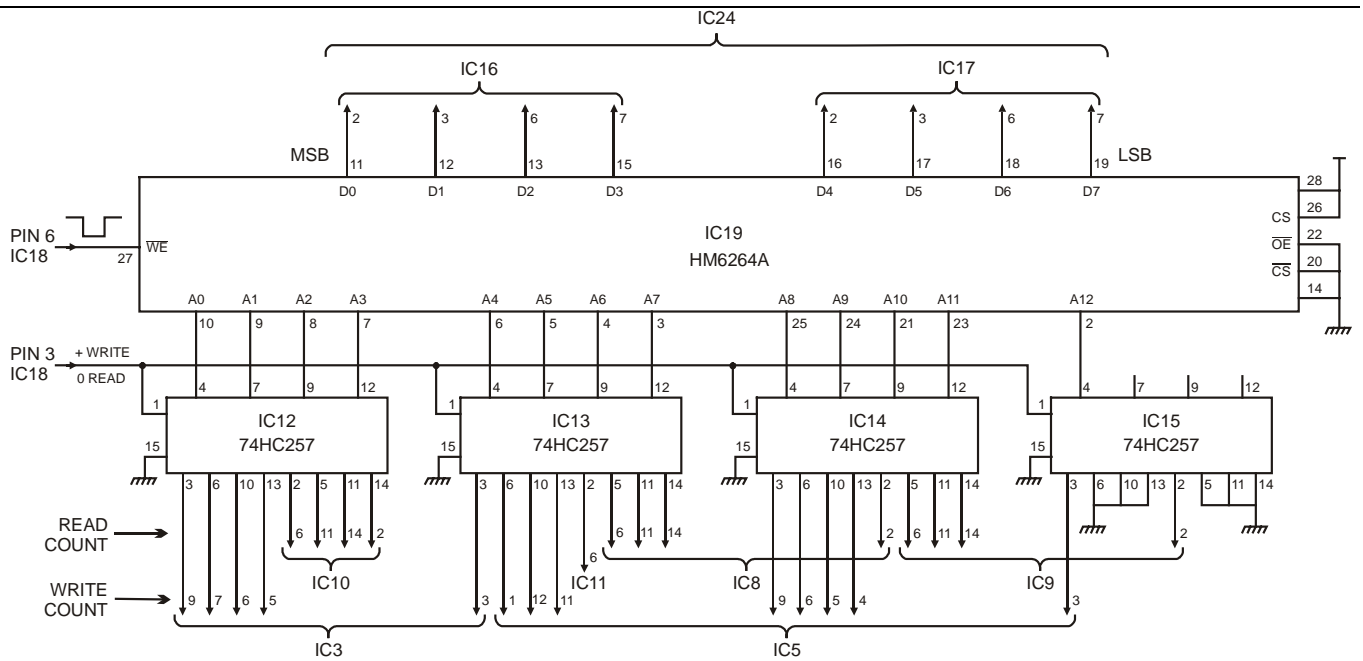
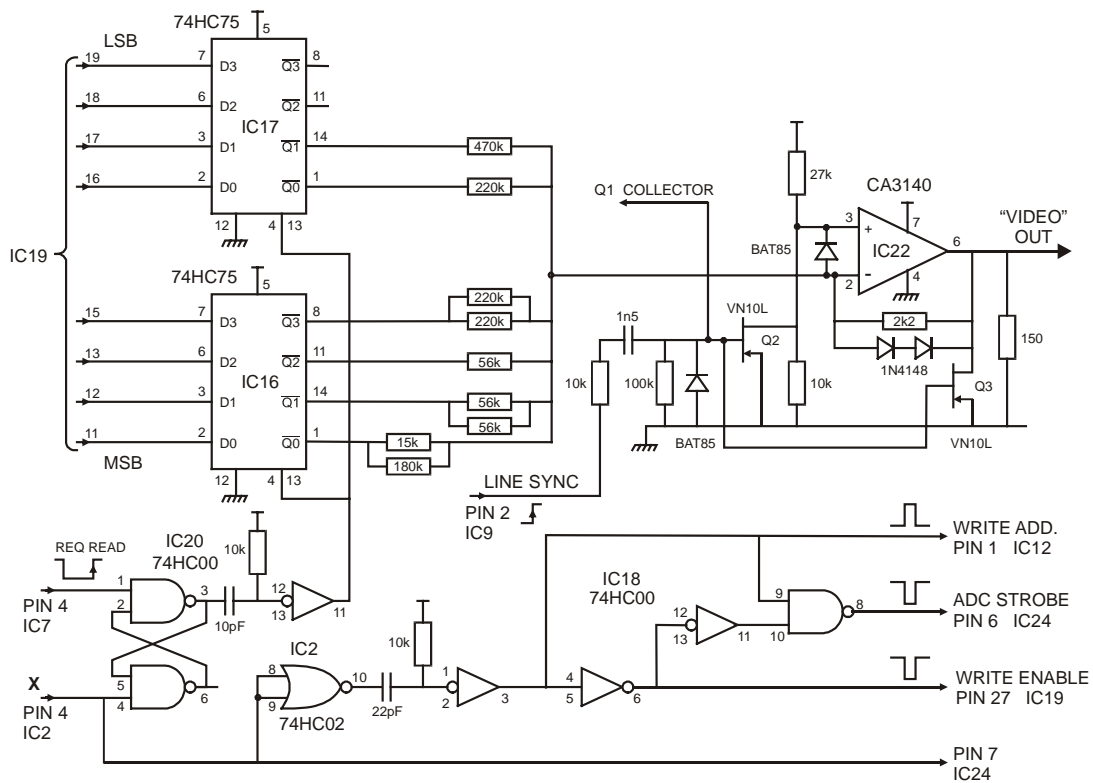


Figure 4

Figure 5



The LM1881 sync separator generates line and frame pulses from the 625-line input and all video sampling and memory write cycles are locked to this line sync. The 50Hz frame sync is divided by 4 to provide a 12½ Hz frame reference signal and to lock the 56,250Hz (30x150x12.5) clock for the

read address counters. The scan, in the Baird standard, is vertical starting at the bottom right and finishing top left which means that the memory has to be read out upside-down and backwards; hence the need for down counters. The readout latch ensures that data can be read from the memory at a time, which

does not clash with the write cycle, which must take priority.

A weighted resistor network is used to convert the output of the latch to the analogue video signal, which is buffered by the CA3140 op-amp.

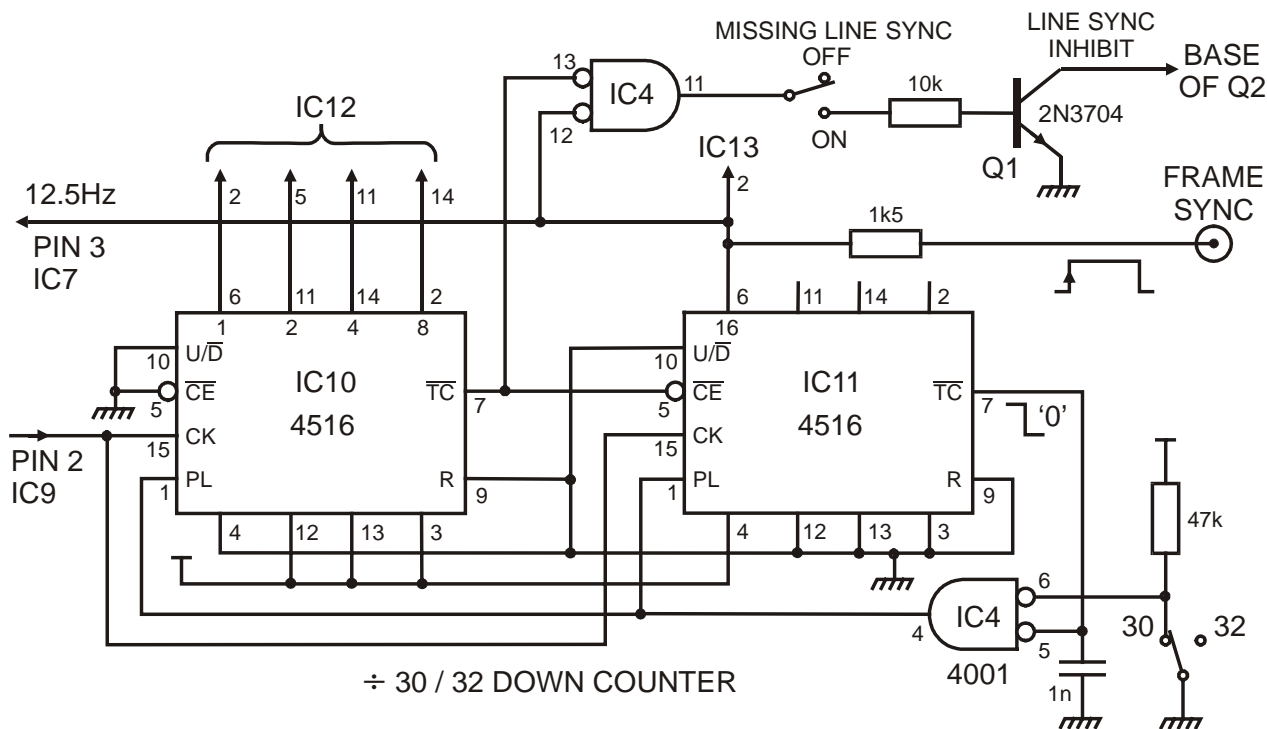


Figure 3

Conclusions

The converter was designed as a 'one off' for my own use but there is no reason why it should not be reproduced. Even though the design is nearly 10 years old, I understand that all of the components are still available. Setting up should not be a problem,

although some component values may need to be adjusted slightly to fine-tune linearity and timing. The width of the Baird picture is adjusted by altering the frequency of the 1MHz oscillator by means of the 22pF trimmer.

IC Table

10nF ceramic decoupling capacitors to be connected across each IC. Unused CMOS inputs to be connected to 0V.

To simplify the circuit diagram the connections to V^{dd} and 0V are not shown on CMOS ICs

No.	Type	V ^{dd}	0V
1	LM1881	8	4
2	74HC00	14	7
3	74HC00	16	8
4	74HC4040	14	7
5	4001	14	7
6	4024	14	7
7	4082	16	8
8	4516	16	8
9	4516	16	8
10	4516	16	8
11	4516	16	8
12	74HC257	16	8
13	74HC257	16	8
14	74HC257	16	8
15	74HC257	16	8
16	74HC257	5	12
17	74HC257	5	12
18	74HC00	14	7
19	HM6264A	28	14
20	74HC00	14	7
21	4520	16	8
22	CA3140	7	4
23	4528	16	8
24	CA3306E	12	3

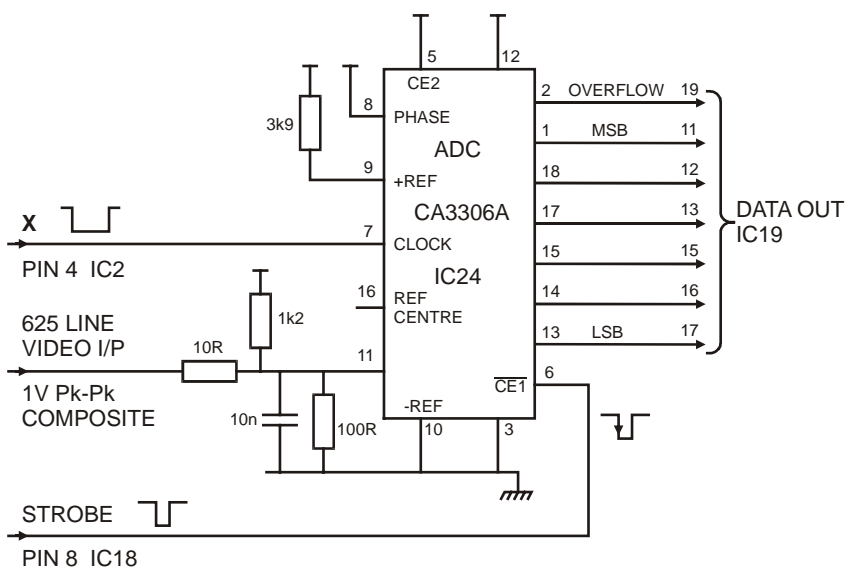


Figure 6

Station demodulator for FM-TV

By D. J. Long, G3TPU

With AM-TV, demodulation (providing both sidebands are present) is simply achieved with a diode detector and a suitable amplifier interface.

With FM-TV the problem of demodulation is more difficult. Solutions usually rely on a cheap satellite receiver running with no input connection, which has the disadvantage of being sensitive to the position of the pickup.

There is another problem that, while amplitude modulation of the FM carrier on the face of it does not matter, when the signal at a distant point is weak, this form of distortion can upset any attempt to resolve the picture.

Therefore, going back to the requirements for a station demodulator, what is required is a deaf, simple unit the shows a representation of the actual signal transmitted - a TRF Receiver.

In the early days of FM radio, before the birth of the ratio detector etc, demodulation made use of a simple circuit consisting of nothing more than an off-tune resonant circuit. The theory was that as the signal altered in frequency, it rode up and down the slope of the tuned circuit and therefore converted FM into AM. Final demodulation then consisted of a diode, as per an AM arrangement. This was known as slope detection.

The snag with this is, of course, like most other FM detectors this has no inherent rejection of the AM

components on the input signal. The deviation has to be small compared to the extent of the slope available from the tuned circuit employed and two positions of demodulation are available either side of the centre of resonance. There is also a big "out of band" resonance.

Of course with FM radio, either slope would do, as the signal on one was simply 180 degrees out of phase with the other and the audio sounds the same either way up. With FM-TV only one side would give conventional video (syncs negative) output. This feature does have a spin-off whereby - once known - it gives an indication of correct way round deviation.

For 24cms the input signal is fed to the signal tuned circuit via a small coupling loop. The tuned circuit in the prototype was constructed out of a piece of brass rod and a piston trimmer. The envisaged Q is going to be low for the required slope.

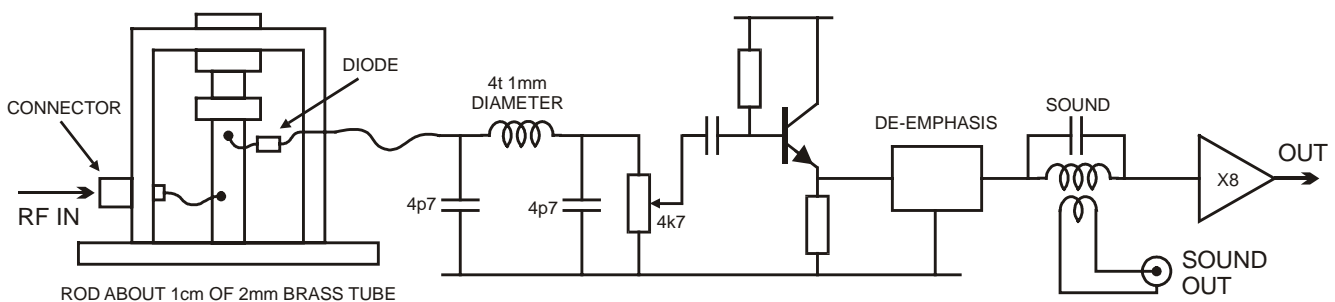
Demodulation also lowers the Q, as the detector was tapped up the tuned circuit. After suitable filtering of the RF components, video was developed across 4.7 k ohm. At this point, a sound take-off was provided. Demodulation of this can follow conventional lines. The diode is a Schottky device. Now with FM-TV we have emphasis and subcarriers to contend with, therefore it was decided to get the signal back to a flat response as quickly as possible. As the prototype was to run off 12V, this was felt important, as the available headroom before distortion in an amplifier could be limited. It may, however, be a good idea to make the

de-emphasis able to be switched in or out, if the amplitude can be handled. The available pk-pk video was about 300mV with a feed off the station's feeder, but it must be remembered that the value of this will be governed by the signal input, so attenuators and use of the level pot. will be required. A gain of about x8 is then provided to raise the signal to standard video level and a line driver used to provide an output that can be terminated with 75 ohm.

Tune the resonant circuit to give a syncs negative signal and set up the level. Remember that if there is hum etc on the transmitter output, you will see this as well as your signal. Visually at one end of the correct tuning the whites will crush at the other the syncs will be crushed or missing; the wrong side of the slope will give a "negative" rolling picture. The unit will be deaf, so it will not pick up signals "out of the ether" and will require a feed from a probe in the feeder. This should be directional so as to prevent the variable match of the load (aerial) from itself introducing AM onto the FM signal.

Developments include a preamp, so as to make the circuit just a bit more sensitive, a knob to tune the resonant point when changing frequency in the band and a built-in sound monitor. With more superior tuned circuits it may be desirable to load the line with a resistor, to lower the "Q".

I have tried the same arrangement with a cavity for 10GHz, with similar results.



Burned - In Monitoring

By Mike Cox

In CQ-TV 188, John Lawrence told us about peak level monitoring, but the indicators used were meters or an LED bar graph.

Basic Concepts

In this article, we are going to extend the principles to “burn in” the trace into the picture on a video monitor or camera viewfinder. I developed a unit nearly twenty years ago to provide level indication and white balance checking for a Hitachi GP5 single vidicon colour camera that I had acquired for the same reason that people buy camcorders today - home movies. This camera had a manual iris, and a colour temperature knob which went from incandescent to sky illumination. I also had a groove in my left shoulder from carrying the Panasonic “portable” VHS recorder that formed the other half of the shooting kit.



Figure 1 Typical picture monitor display

The concept of the waveform monitoring section is to peak detect the video signal so as to store the peak value of line n on a capacitor, for display on line n + 1. Fig. 2 shows the principle. The charge builds up on this first capacitor during line n. During sync, SW1 turns on and the charge on this capacitor is transferred to a second capacitor. During the back porch, the first capacitor is discharged by SW2, to repeat the process on the next line.

The voltage on the second capacitor is coupled to one input of a comparator. The other input is fed with a line rate sawtooth. If the comparator output is differentiated, a pulse appears whose horizontal position relative to the left

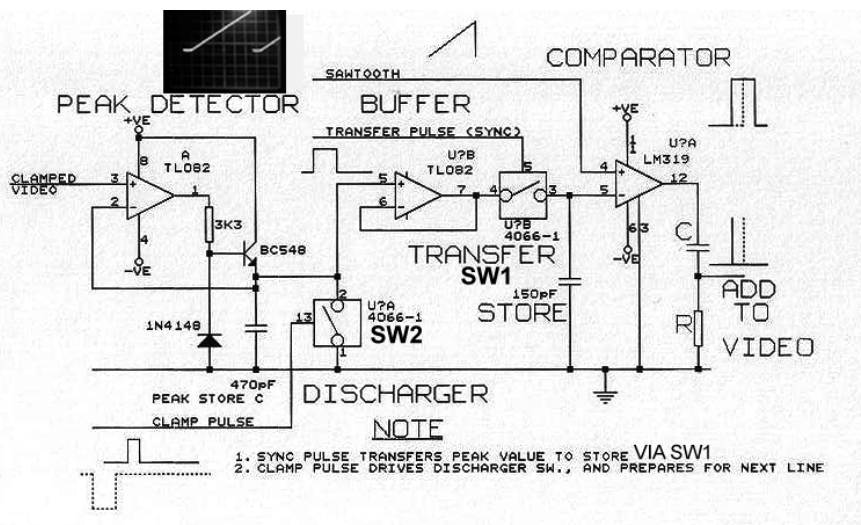


Figure 2 shows basic elements of trace generation

hand edge is dependent on the peak value of the previous line's video. We thus have a field rate waveform indicator. See Fig. 1 for typical display.

handy indicator. Using the same ramp for marker and video traces ensures that any ramp amplitude drift will not affect the basic accuracy.

Graticule

However a trace like this is not much use without some Graticule lines to indicate black and peak levels. (See Fig.1 above) A divide by 32 counter driven by sync and reset by a field pulse (74HC4040 is ideal) has an output, which is high for 16 lines and low for 16 lines. This is taken via a resistor to a reference diode (2.5 v) and a potentiometer to set a precise level (1.400 v), and then to a comparator fed with the same sawtooth as the original comparator. The 1.400-volt level corresponds to the peak white value of the video applied to the peak detector. Differentiating the output as before produces dotted marker lines representing black and peak white. Combining the two pulses gives a very

Blackest Black Trace

By ensuring that the video is blanked before the peak detector, applying a negative offset to both video and sawtooth, and using a negative peak detector, a second trace can be generated which represents the lowest excursion of the video on a line. Several cameramen requested this facility when ENG and EFP came into use in the early 80s, and so it was fitted to the original COX units.

Housekeeping

The foregoing has been a rapid canter through the basics. The housekeeping around the system is crucial to satisfactory working. The start is a

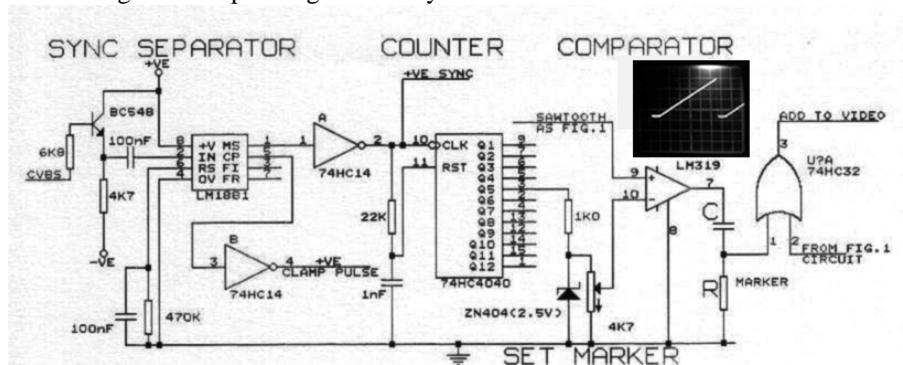


Figure 3 Marker generation

good sync separator (LM1881). Flexibility is assured by using a full SPG (Philips SAA1043 or SAA1101), as these produce blanking and other useful pulses. If we follow the SPG with a horizontal counter using the SPG's 5MHz signal as clock, and reset every line, and another counter with sync as clock, and rest every field, we have digital signals, which can be used as addresses for an EPROM.

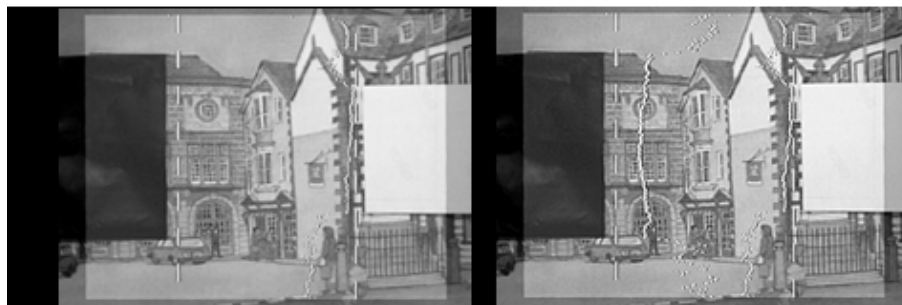


Figure 4 view of display without and with black trace

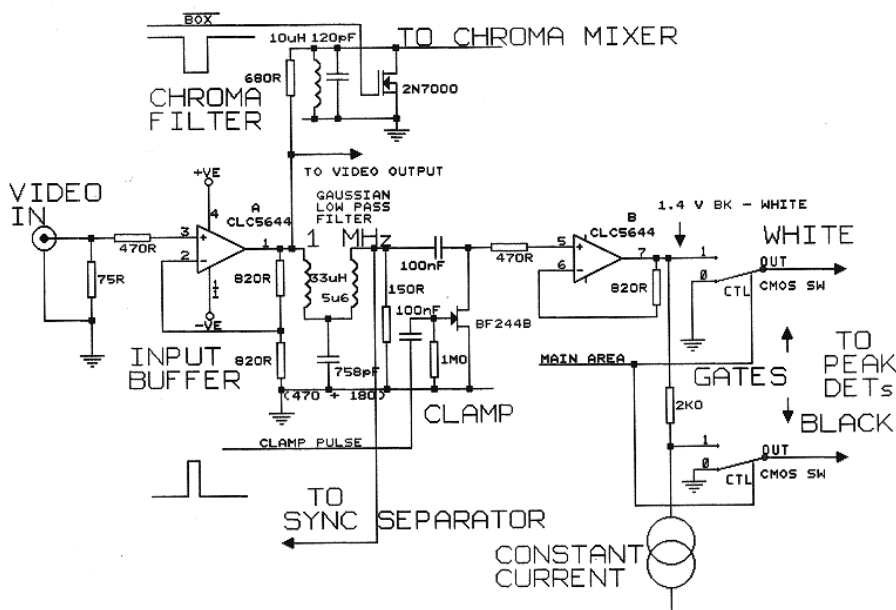


Figure 5a Housekeeping – Filter, gate etc.

Alternatively, simple decoding circuits to give the required gating signals for Main Area (or safe area) and for the white balance check patch (see later) could be used.

The video signal is low pass filtered and gated (using the Main Area signal mentioned above) before peak detection as any signal outside the action area or any chroma present may give a false peak indication.

Insertion of Trace into Video Signal

So far we have generated several traces, without consideration of perhaps a safe area graticule, or audio level bar graphs. These have to be combined, and to aid visibility, black edged and added to the video signal. There are some interesting techniques to achieve this. The trace signals are combined in an OR gate and then applied to 8 HC14 buffers in series. These are used for their propagation delay and connecting resistors from buffer output to input can enhance this. A triple OR gate combines signals from the beginning, middle and end of the array. This stretches the signal, which is then used to cut a hole in the input video. The hole is filled by the signal from the mid-point of the array. Video multiplier ICs are quite expensive and rare (Gennum GT4123 does an excellent job, at about £5 a go) but a pair of PNP transistors (BC558) act as a Negative Non Additive Mixer (NAM) and perform a satisfactory hole

cutting. A pair of NPN transistors (BC548) acts as a normal NAM and fills the hole. This “key stretching” dramatically improves the legibility of the traces on a monitor.

Further Possibilities

White Balance

An important facility for use with any camera is a simple means of checking white balance. Many of the older cameras had a knob roughly calibrated with pictures showing sun and lamps. Any composite PAL or NTSC signal has by definition zero or minimum sub-carrier on areas of the picture, which are achromatic.

One way of achieving this is to arrange a “gate” signal from the housekeeping section corresponding to a square in the centre of the active area of around 5 - 10% of frame area. This signal is used to gate the output of a band pass filter centred on 4.43MHz (or 3.58MHz).

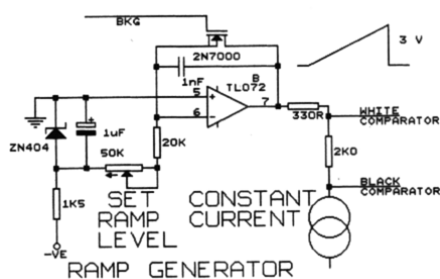


Figure 5b Housekeeping – Ramp generator

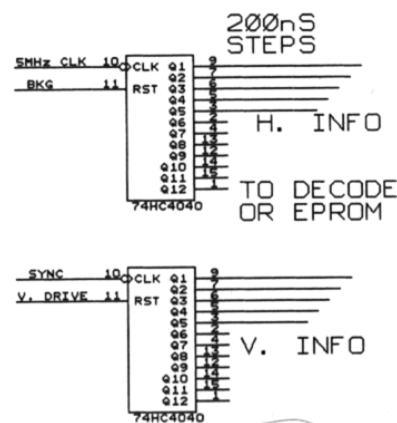


Figure 5d Housekeeping - Counters

This is applied to a 1496 or similar modulator, which carries in its lower section a crystal oscillator about 3kHz from sub-carrier. (Note that a series resonant crystal usually works about 2-

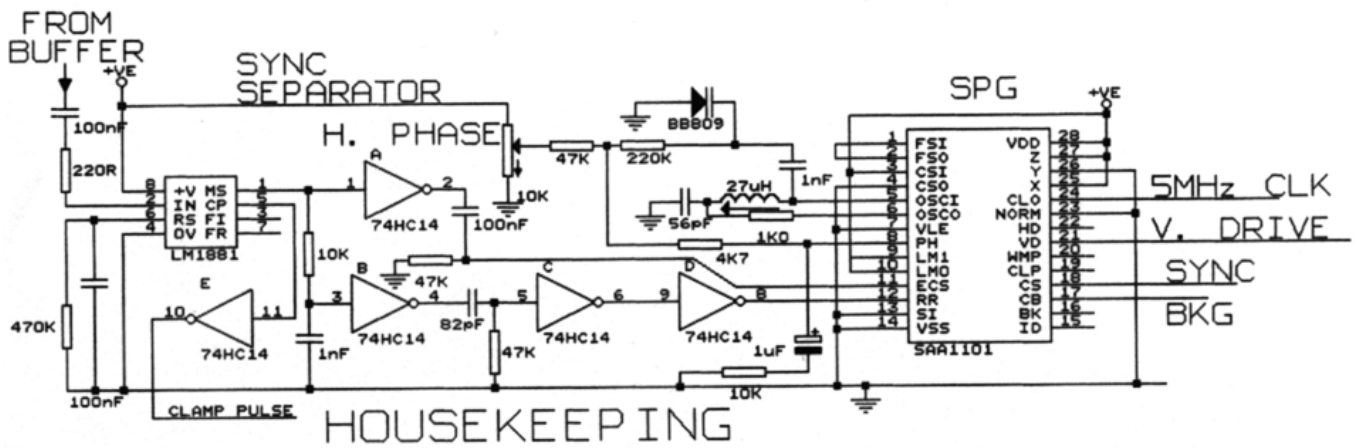


Figure 5c Housekeeping – Sync separator and SPG

3 kHz off nominal in a parallel type oscillator circuit). The output is a beat frequency, which is used to modulate a vertical line. This is simply achieved by using a comparator fed with the ramp signal used above, and a fixed voltage to which is ac coupled the modulator output. The vertical line is modulated by a sine wave whose amplitude is dependent on the residual sub-carrier during the square. One very simple way to bring in the white balance check is to modulate the ramp with the beat output. This requires minimum additional circuitry. Other uses for this technique would include using audio to modulate a dc into a comparator, with ramp fed in. This would give an audio trace like an oscilloscope turned through 90 degrees, but with a fixed 50Hz timebase.

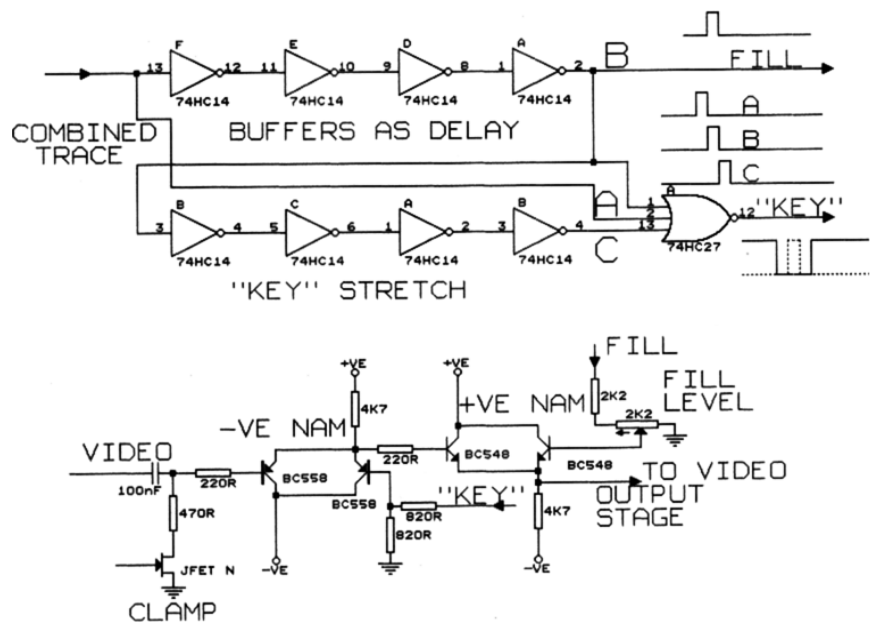


Figure 6 Insertion into the video signal

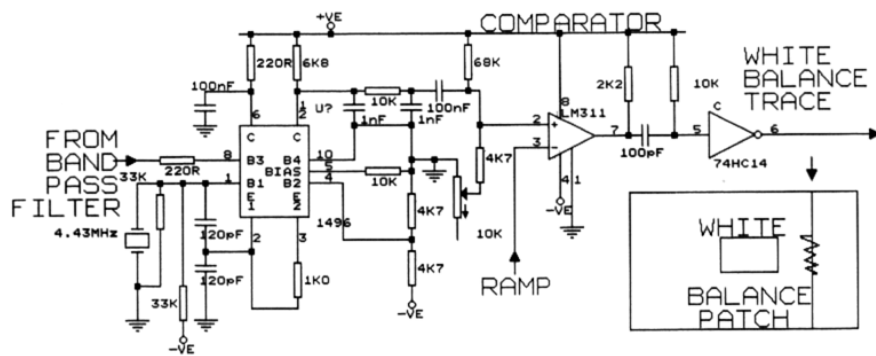


Figure 7 White balance detail – 1496 circuit

Safe Area

In the housekeeping section, it is relatively simple to arrange for a safe area graticule which can be extremely useful for framing captions, or ensuring that all action is in the right place - very

important when trying to frame for possible 4:3 or 16:9 display. In the illustrations used earlier, taken using a COX 494 indicator from the early 1980s, a crude safe area indication was to sit the active area up on a pedestal. Fig 1 was taken off air recently and

shows a 14:9 or 16:9 letterbox transmission.

Relative Timing

Some of you may recall that COX used to make a portable "suitcase" 3 input vision mixer. It was originally made for Barclays Bank. They used to make video recordings of important financial events using single camera techniques, which entailed much overnight editing before the completed master could be copied and circulated to their branches. When they had the mixer, they used two cameras and obviated most of the editing, and thus were able to distribute tapes next day. However use of two cameras involves checking their relative horizontal and sub-carrier phasing. Having to lug a waveform monitor about was not attractive.

If the housekeeping section is arranged with two sync separators and an input selector switch, then one sync separator drives the housekeeping section, while the other switches between the two inputs at frame rate. Its output drives a separate ramp generator, which is ac coupled to a comparator, with the other input at ground. The comparator output after differentiation is two vertical lines, which flicker at 12.5Hz. As the sync of the two videos come into coincidence, the lines merge and the flicker disappears. This is sensitive to below 25nS of coincidence.

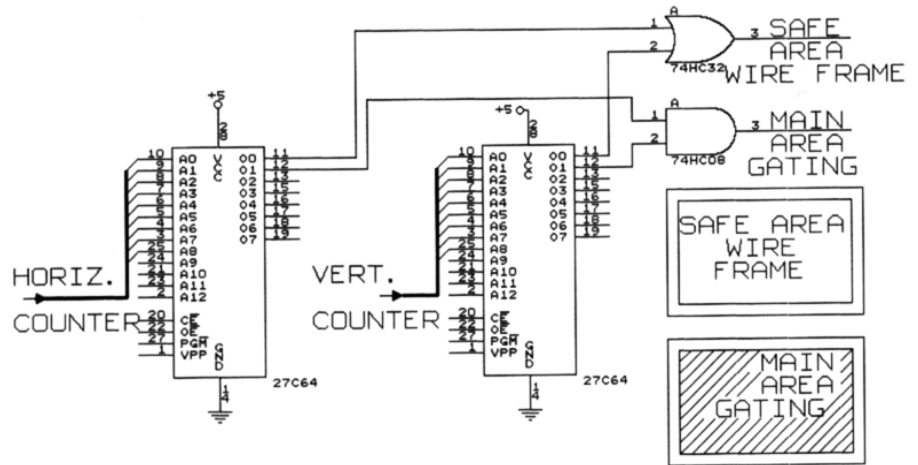


Figure 8 Main or safe area generation

Burst phasing can be checked using a centre-tapped autotransformer with the two video signals applied to either end of the primary winding. If the two burst

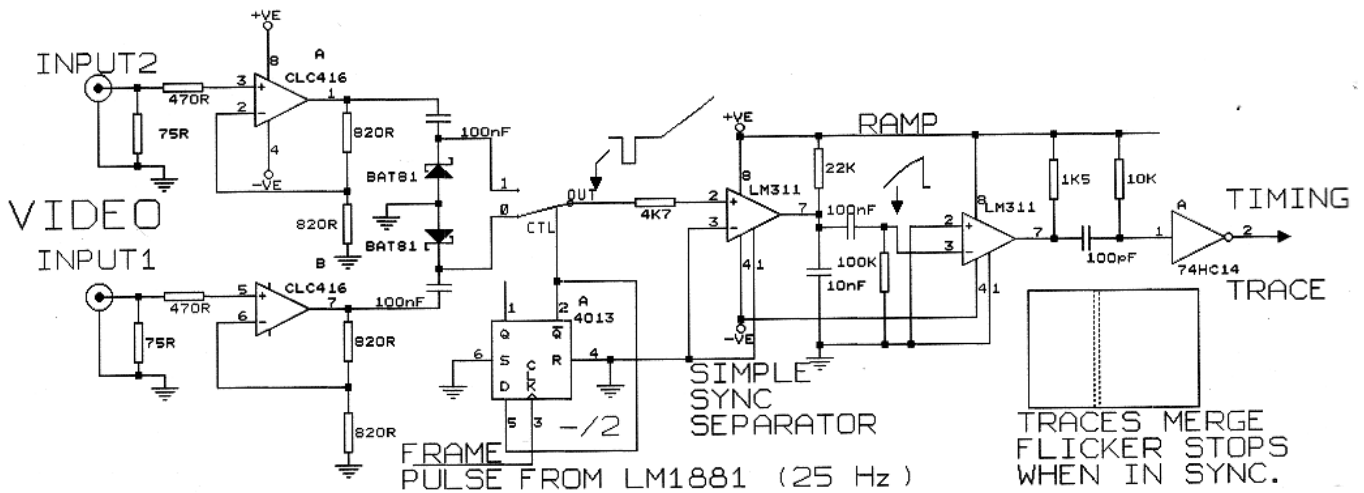


Figure 9 Timing Indication

components are in phase, the net flux in the core will be zero. Any departure from this will give increasing amplitude across the winding. This signal is gated to ensure that only the centre of the burst time slot is used, and then amplified and rectified. The resulting dc is applied to the comparator input mentioned above via a switch, which alternately connects the input to ground or to the rectifier at 7.8kHz. The display shows two lines, which approach, as the burst phasing gets closer to zero. If the two burst are similar in amplitude, the lines will touch when phasing is correct. Some may recall that the COX T8 mixer had a similar timing indicator based on this technique.

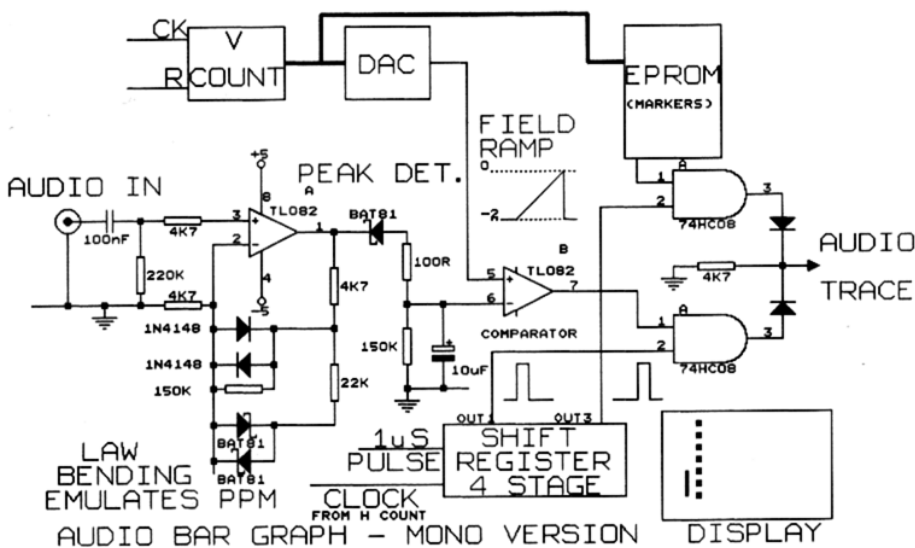


Figure 10 Audio bar detail

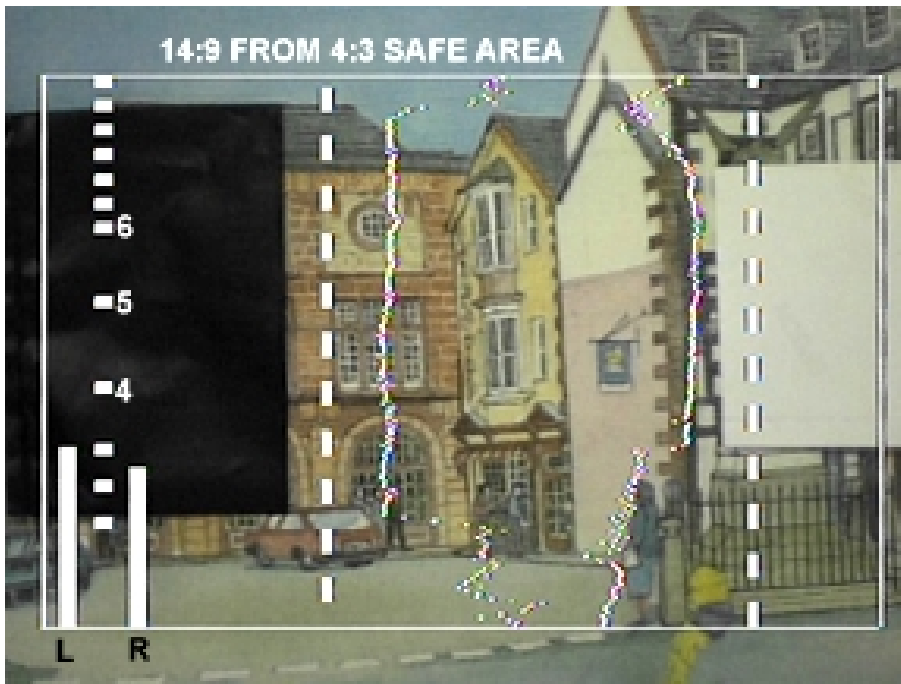


Figure 11 Showing audio bar graph, together with safe area graticule

Audio Display

An attractive alternative to VU or PPM display is an in-picture bar graph. This is particularly attractive in an edit suite.

Given that much of the housekeeping may already be available if this is to be an add-on, a relatively simple stereo audio card using 4 very standard ICs, a DAC08, an EPROM and a few diodes. The card is designed to take in standard -6dBm unbalanced feeds, but transformer or IC balance to unbalance converters can easily be added. The first IC performs some modest law bending so as to give a scaling which is similar to a PPM. The EPROM

provides appropriate marker bars corresponding to 1 to 7 marks on a PPM. The same principle is used, that of a varying voltage and a ramp applied to a comparator, except that the ramp is a field rate one, derived using a counter

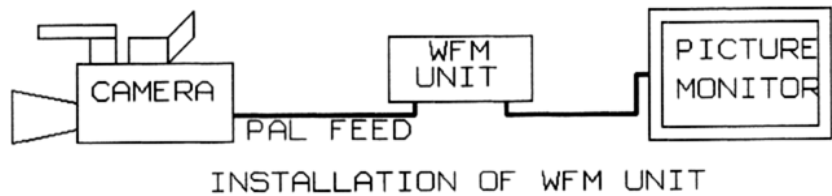


Figure 12 How the waveform unit is used

and the DAC08.

Closing Remarks

I hope this piece has been of interest. I have been looking at aspects of this type of display for the last twenty years as a bit of a break from major projects, and have got a lot of fun out of it. But please don't tell Hamlet Video! And remember that it is nice to be able to see a bit of picture through all the on-screen displays so don't make it too cluttered. It is helpful to be able to switch on or off all the elements of the display.

The housekeeping arrangements shown allow great scope for additions - appropriate text for example. At a time when the aspect ratio is changing, two different safe area graticules would be useful - one 5% in from edges for 16:9 or 4:3 shooting, the other further in at top and bottom for 14:9 shooting with a 4:3 camera.

If anyone wants any further help, or has found an old COX 494, 494MC, or 2494 unit and needs assistance, please get in touch.

TV on the Air

By Graham Hankins, G8EMX

Thanks to a few group newsletters, a couple of club talks and a personal letter, I have got (who said "never use 'got'") something to put into TVOA this time!

First, the club lectures. On 17th November, 1999, twenty-plus members of the Halkyn Radio Society of North Wales attended an ATV lecture and demonstration delivered by John Lawrence, GW3JGA.

The meeting was held at the local Prestatyn High School, which is located 38 miles (60 km) from the 24cm ATV repeater GB3TM. The signal path from the repeater is over the sea and excellent P5 signals were received at Prestatyn. The aerial was mounted inside the building pointing out through the classroom window.

The highlight of the evening was the live transmission through GB3TM of signals from Brian GW4KAZ in Bethel, near Caernarfon, Brian GW6KFH in Penisawaun and John

GW3MEO in Prestatyn. Members were taken on a live tour of each shack (all looking nice and tidy) and GW4KAZ provided camcorder video, taken earlier in the day, of the first snow of the winter on Mount Snowdon the highest mountain in Wales.

Thanks are due to all concerned, contributed by John Lawrence GW3JGA.

The following week, a member was presenting ATV to the Newbury ARS. Yes, 'twas I, G8EMX, who had boldly

offered talks to interested clubs in the 'Focal Point' column (Practical Wireless) Up had popped, by Email, club secretary Paul Stafford – could I arrange a date and come to their meeting? A night in March was agreed – then I was 'called up' for Jury Service. More Emails to rearrange, with yet more diary clashes! Eventually I journeyed down the M40 to Newbury on November 24. Going 'great guns' I was, Oxford, turn right, A34, flowing fine, might be ahead of time...aha, a bit of a hold up ahead. Then 'Gridlock' for an hour!

Found the meeting place just in time for a chat on 70cm (I always start with ATV on 70) then 24cm fm, finally repeaters. Membership details were left and they were to consider club membership at their next committee meeting.

Peter Harman G4XGD has responded to my 70cm 'survey'. In his letter Paul says: "Saw your item in CQ-TV so thought I would let you know that I do have 70cm ATV transmit and receive. In fact I only bought it earlier this year as my son-in-law G0OQK and I have been trying to get ATV working between us. We cannot use 24cm - there is a hill in the way, which also stops us going via GB3HV (High Wycombe). We have not achieved our aim yet, but this is due to not both being available at the same time so far. I have 'fired up' a couple of times and seen some rather nasty things on the domestic TV so am looking at some filters"

Many thanks for the letter Peter, and for the other info. Yes I do remember the family, and have replied to this bit via Email.

'Line Out' newsletter from the Home Counties Group, and 'P5' from Bristol gratefully received chaps! The Severnside folks have refurbished 24cm repeater GB3ZZ with a new antenna stack and stainless-steel fittings. A high-gain loop yagi has been added to help stations to the North east of 'ZZ, the original VCR has been repaired, (by Brian GQ6BWX) so has the weather satellite receiver (thanks to Jim GW3PYX).

Meanwhile, Ian G6TVJ has built a low-power 13cm ATV beacon, which can be activated on request to him.

The Severnside Group has had a good /P summer in '99. Eight stations are listed using 3cm, 13cm and 24cm during the fine weather. But for this year, 2000, the group is planning the STG Millennium Contest within the group. This will be a cumulative contest, building up scores in up to ten sessions. The page in 'P5' gives the rules, and the scoring system and even if you don't have the equipment the Group is building a set of portable equipment available for loan to any STG member! Contact Ross G0WJR or Ken G4BVK. Well done in Bristol!

Another thick newsletter, 'Line Out', comes from the Home Counties Amateur Television Group! At their AGM, all officers were re-elected en-bloc (no surprises there then). The mag briefly reports on several rallies, usage and faults on the 'HV repeater (not many faults) and mentions of 'AT (Winchester) 'EN (Enfield) and 'KT (North Kent) All appear ok. By the way, Friday Night may well be 'Music Night' to the Radio 2 audience, but it is 'Activity Night on the Enfield repeater! (Again, info via Picketts Lock)

Welcome news of two NEW ATV REPEATERS. The Cork ATV Group has been granted the first ATV repeater licence in the Republic of Ireland. Callsign is E12TVR, input 1250MHz, output 1293MHz. This info via 'P5' mag.

Finally, mid Wales is being covered by new repeater GB3GW, says John Lawrence. They really are springing up everywhere, aren't they!

73 and P5 de Graham Hankins G8EMX

BATC at the London Computer and Radio Show (Picketts Lock) November 1999

Once again I took the trusty caravan to Edmonton to give BATC at least a 'presence' at the London show, and once again I think it was worthwhile, certainly in terms of feedback and opinions from members spoken to, also from those who were not yet into ATV.

The dominant feature of my exhibition layout is a large map of northern, central and southern England (and Wales so that Brian is not left out hi) showing where most of the 24cm and

10GHz ATV repeaters are located. For many of them, I also include an off-screen photo of their ident cards. Also included on the table is the Worthing 24cm transmitter, the 'Bob Platts' Dove receiver, copies of recent CQ-TV issues and BATC application forms; a notepad for comments completes the set-up as I presently have it. After two days of 'exhibiting' I had spoken with many visitors, handed out lots of applications, taken some new subs and a renewal – but of more 'value' I think were the notes and comments.

Folks 'out there' are very reluctant to build anything, professing to a shortage of either skill, time – or both. Of the 'serious' visitors who were more than averagely interested in starting ATV, most would be fairly happy to buy the Tx or Rx if ready-constructed and my offers to build for them were favourably received – I will see if there are any takers!

Some quotes from those who came to our stand: "Good to see BATC at a rally – will you be receiving the local repeater (Enfield) next time?" (Maybe, if we are there in March 2000 and can liaise with the organisers and the local group)

"Went from 70cm to SlowScan – gave up on fast-scan....same old faces, same old shack-shots"

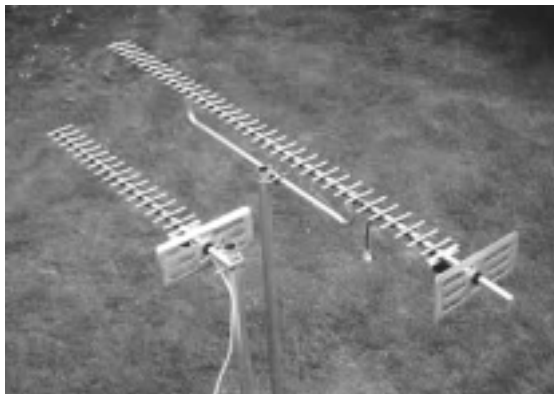
"No time to build – want 'plug-and-play".

Two members promised to send me a VHS compilation tape of ATV activity in their area.

All in all a busy two days, will gladly do again in March, if committee agrees.



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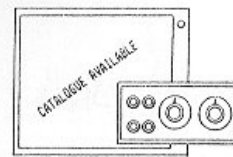
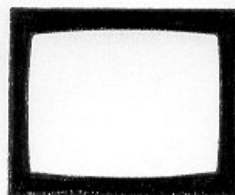
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A description of the various PCB's and components can be found in the 'What's What' guide, or on the BATC Internet pages. URL <http://www.batc.org.uk> (A printed copy available on request, if you send a S.A.E.). Components for club projects are not available from Members Services unless contained within these lists. All club crystals are HC18/U (wire ended). To avoid delay and inconvenience, please be careful to include the correct payment with your order – please do **NOT** send stamps or cash. Post and packing costs are for despatch of one item to United Kingdom members.

Circuit Details can be found as follows:

Revised ATV Handbook (vol. 2): PCB's 21, 22. **An Introduction to ATV:** PCB's 10, 25, 36, 40, 41, 47, 85, 86. **TV for Amateurs:** PCB 19. **Slow Scan TV Explained:** PCB's 59, 60, 61, 62. **Amateur TV Compendium:** PCB's 12, 27, 54, 55, 56, 57. **CQ-TV (Issue No. in brackets):** PCB's 7(174), 13(128), 20(130), 26(142), 58(139). Item 46 is supplied with circuit details, etc

CAMERA TUBES A tube guide appears in CQ-TV 149 and 150. Tubes are now difficult to obtain and members requesting information on availability, prices or other types of tubes or equivalents are asked to send a stamped addressed envelope for their reply.

BATC Publications

Publication	Each	Qty	Total
An Introduction To Amateur Television (225gm)	£5.00
The latest handbook full of detailed information on how to set up your ATV station, plus lots of new video and RF construction projects.			
The Amateur TV Compendium (155gm)	£3.50
The BATC handbook featuring construction articles on video units, 24cm and 3cm ATV, a Digital Frame Store, and much more.			
The Best of CQ-TV (150gm)	£3.50
A compilation of the best construction articles from CQ-TV's 133 to 146			
CQ-TV Back Issues:	£1.50
The following issues are still available. Please circle those required: 142, 143, 144, 147, 150, 153, 154, 156, 158 159, 162, 163, 164, 166, 167, 168, 169, 170, 171, 173, 174, 175,176, 177,178, 179, 180, 181. 182, 183, 184, 185			
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PLEASE MAKE CHEQUES PAYABLE TO 'BATC'.

Tuning Multi pole Filters

By D. J. Long, G3PTU

Multi pole filters are now available on the market suitable for UHF, some are suitable for 24cms, and items are even available for the steam amateur radio bands of 28, 50 & 144 MHz. Whatever the flavour, pedigree or even home-grown, filters can pose a terrible problem to tune and adjust.

Techniques for tuning onto frequency range from the "a feeling in the elbow to adjust this first" to the "continuous trial and error" methods.

The technique described here has never let me down.

Requirements are a sweeper of some kind to cover the frequencies involved, a detector, a good load, connectors etc and a display device (oscilloscope). Set up the filter, with the sweeper output feeding the detector via a tee piece. Display the output of the detector in the normal way with, if possible, markers. The 3rd leg of the tee piece goes to the input (or output) of the filter. Terminate the filter in the characteristic impedance by a good resistive load.

Turn all the tuning adjustments on the filter high in frequency, and the input and output couplings, say, half way (both the same).

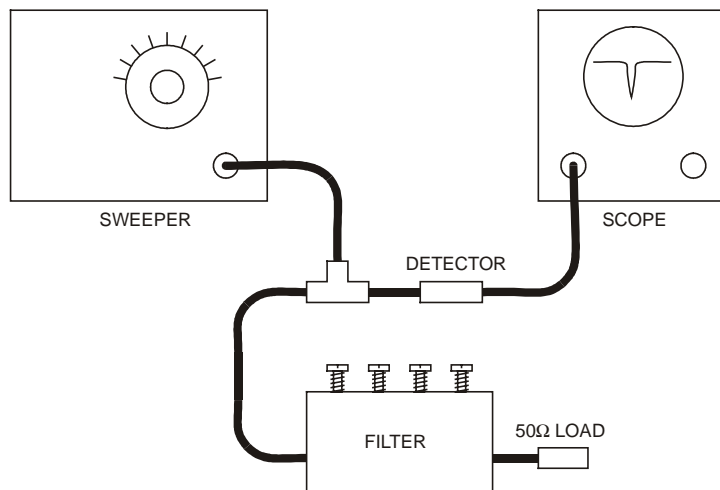
Depending on how long the cable is from the generator to the filter/load and to the detector (i.e. the number of quarter wavelengths), where the following refers to a dip it could be a peak. No matter, you will soon get the hang of it.

Adjust the first element for a dip in the display at the centre frequency of the pass band required. If the dip is not very pronounced adjust the couplings for the best (keep both couplings the same), without over doing it (too high). Adjust the 2nd element for two

symmetrical dips either side of the pass band centre.

Now look at the width of the two peaks, these represent about the 3dB points. Readjust the interstage coupling (if this is provided for) between the 1st & 2nd elements, to give the bandwidth required. Set any other inter-element coupling adjustments to be similar in capacity, or loop depth, as appropriate.

Go back to the beginning and set the tuning adjustments high.



When you have adjusted the first two elements, and got the two symmetrical dips as required, if the filter has 3 or more elements, adjust number 3 for single peak and 4th for two peaks, etc ad infinitum, always keeping the thing as symmetrical as possible and resisting the urge to adjust the elements before the one you are dealing with.

When the end of the filter is reached, transfer the configuration of the sweeper to look at the pass band, and - if you must and really find it necessary - tweak freehand slightly. Swap the thing around and look the other way it should look the same! Remember 1dB looks a lot on a linear display, and the effect of the quality of your cables and load etc. If you appear to have the adjustments not about the same for each element/ coupling etc, you have not got it right; go down the snake and start again.

Once the cables are set up, the whole process takes only minutes to complete. As the whole procedure is very quick,

if at first it does not look right, try again.

Remember if you are adjusting filters for 70cms TV use, the pass band centre is not the frequency of the vision, so work out the centre frequency before you start. Don't try and lop-sided adjust.

The added nicety of this method is that you can always see "where you are". A different story from the 'pass' methods, whereby it can be impossible at the start, or in a moment of tweekey madness, to see any signal through a badly off tune filter. The author has a 12 element band III filter in his goody box that will be impossible as it stands to see anything through at any other frequency than channel B6.

Another bit of information worth passing on. Some ex UHF-TV filters have elements before and after the input/output connection points (suckers). These are to suppress beats between the subcarrier and the 6MHz sound etc or local oscillator products. They put extra deep notches in the out of pass band response, but can be used to pull the skirts of the filter into a tighter spec (take care - vicious), or place on the local repeater /packet frequency if you wish to earn 'brownie points'. Adjust these after you have finished adjusting the main body of the unit, in the pass band mode.

With ex TV filters of a French design (low profile, connectors on top) look at the fitting of the bottom plate. Some units require the shoulders of the corner construction removing with a file, or the bottom plate RF seal is poor and intermittent. With these the input/output coupling adjustment is achieved by rotating the BNC connectors. Remember that with filters internal cleanliness is godliness.

Happy twiddling.

Special Event Station GB2VK, 22nd September 1999

By John Lawrence, GW3JGA

To commemorate the anniversary of the first transmission of radio signals to Australia in 1918, the Dragon Amateur Radio Club set up a Special Event Station GB2VK operating on HF bands. This was located on the site of the old Marconi Long Wave Transmitting Station at Waunfawr, Caernarfon, North Wales. The HF station was housed in the old Marconi building and was operated by members of the Dragon ARC.



GB2VK-ATV with GW4KAZ, GW8PBX, GW8FEY - Photo GW3JGA

The ATV section of the Arfon Repeater Group were invited to take part in the event and Brian GW4KAZ, David GW8PBX, Barry GW8FEY and John GW3JGA set up an ATV station in a caravan nearby. The caravan was ideal for the purpose, as it had been kitted out for amateur radio use by the local RAEN GROUP.



GB2VK-ATV Operating Position - Photo GW3JGA

The site is about 250m a.s.l. and has a clear path across the Irish sea to EI and GI. The ATV group arrived on site at 10.00 and the station was operational by 12.00. ATV equipment was available for 24cms, the TX consisted

of a Worthing Group unit feeding a Mitsubishi brick amplifier, a selection of aerials and several receivers were also available. 3cms equipment consisted of various Gunn systems with horns and dishes. The main talkback took place on 2m (144.750) with additional talkback on 70cms through the local 70cms sound repeater



GI0UZG received at GB2VK (24cms) 160km - Photo GW3JGA

GB3AN.

The WX was mixed, sunshine, showers and thunderstorms. During a break in the weather, contact was established with Tony GI0UZG, assisted by Mark MI1DRU, located on the SE side of the mountains of Mourne. P5 pictures were received in both directions, a distance of 160 km. Signals were so strong into GB2VK that a P5 picture was received on a Maspro Sat. RX without a pre-amp. Tests were made on 3cms but unfortunately no signals could be detected. John GW3MEO and Brian GW6KFH both at their home QTHs provided monitoring and signal reports through GB3TM, the 24cms ATV repeater some 30 km away. A welcome visitor to the site was ATV enthusiast Dave EI2HR who was on holiday in GW.



Preview monitor at GB2VK Photo EI2HR - Photo EI2HR

Skeds for 24cms ATV QSOs were set up on 2m with ATV stations in the Dublin area, but these failed to materialise due to the heavy thunderclouds rolling in across the Irish Sea. Mike EI2DJ/P, who was out portable in the pouring rain, tried several mountain locations from which to establish contact but without success. However, Tony GI0UZG reported having several QSOs with EI stations in Dublin, one of which was his first GI-



GW3JGA adjusting offset RX dish - Photo EI2HR

EI QSO on 24cms ATV.

It had been a very enjoyable day out. But, by mid-afternoon, with deteriorating conditions, thunder, torrential rain and the real possibility of being struck by lightning, the HF and ATV stations closed down. Thanks are due to members of the Dragon ARC who planned the commemorative event, which, we all hope, will be repeated on the same date next year.



GW8FEY and the GB2VK Caravan - Photo EI2HR

Satellite TV News

By Paul Holland, G3TZO

The new millennium has dawned with many predictions for the next 1000 years. Looking back over just the last 10 years of Satellite TV broadcasting reveals huge advances in technology and the numbers of broadcasters. The growth of high-powered satellites coupled with digital compression techniques has completely revolutionised the current Satellite TV scene.

So what can we expect to see in just 10 years from now? The first successful commercial launch of Ariane 5 before Xmas will allow increasingly more powerful and complex satellite systems to be launched. A quick glance at the crystal ball hints at just a few of the more predictable advances we might see;

- Increased use of onboard multiplexing and encryption with the development of systems such as Eutelsat's Skyplex. This will encourage the launch of niche special interest services.
- The development of Ka Band interactive services for business TV and high speed Internet services.
- The increased commercial viability of high-speed multi megabit satellite delivered Internet services as transponder costs continue to drop.
- The total demise of analogue TV distribution.

The last prediction is fairly safe as B-Sky-B is now confidently planning to switch off all analogue service at 19.2 Deg by the end of this year. Their initial target was 2003 only a few months ago!

In this issue of Satellite TV News we look at the prospect for upcoming launches, reflect the ever changing picture of channel changes and look at a couple of new reception goodies which may be on your shopping list during the next 12 months.

Launch News

The following launches are scheduled this year. As usual dates will change, normally drifting back as preceding

Date	Satellite	Launcher	Position	Info
000203	Hispasat 1C	Atlas AC-158	30.0 Deg W	22 Tps. 3 beams for Europe, Iberia and America.
000301	TDRS 8	Atlas AC-139	37.7 Deg W	Ku & S Band Tp's
0003	Eutelsat Sesat	Proton	36.0 Deg E	6 tps in 10.950-11.200 GHz, 6 tps in 11.450-11.700 GHz & 6 tps in 12.500-12.750 GHz It will replace Eutelsat IIF3.
000401	Eurasiasat 1	Ariane 5	42.0 Deg E	34 Ku Band Tp's
0004	Eutelsat W4	Atlas AC-201	36.0 Deg E	31 Ku tps in 11.700-12.500 GHz. Also replacing Eutelsat IIF3.
0004-06	PAS 1R	Ariane 4	45.0 Deg W	36 Ku (10.950-11.200 & 11.450-11.950) and 36 C tps & will replace PAS 1.
0004-06	Astra 2B	Ariane 4	28.2 Deg E	12 tps in 11.700-12.500 GHz, 16 tps in 12.500-12.750 GHz
000625-0715	Europe Star 1	Ariane 4	45.0 Deg E	30 Ku tps
00 mid	Eutelsat W1R	Ariane	28.5 Deg E	18 tps in 11.200-11.700 GHz 6 tps in 12.500-12.750 GHz will replace Kopernikus 2
0008	Nilesat 102	Ariane	7.0 Deg W	12 Ku Band Tp's

launches miss their dates for one reason or another.

Eutelsat News

DIGITURK, the new Turkish digital platform service will start broadcasting via the Spot beam of W3 satellite at 7 degrees East in March 2000. DIGITURK will be the first DTH

service delivering digital subscription television packages with more than 70 television channels in Turkey. DIGITURK's test platform is currently broadcasting on a free-to-air basis SHOW TV, ATV, Kanal D, Kanal 7. It is receivable on 11.596 GHz (H), via the Aegean Spotbeam coverage on Eutelsat W3, which stretches from

Western Europe to Caspian Sea and Middle East.

EUTELSAT and Loral Skynet have signed an agreement which clears the way for each of them to operate without risk of mutual interference at the new "Atlantic Gateway" positions of 12.5 Deg West and 15 Deg West. Under the terms of the agreement Loral has already begun commercial operation of its Telstar 12 (previously named Orion 2) satellite at 15 Deg.



EUTELSAT will continue to develop services at its ATLANTIC GATE position at 12.5 Deg West and will serve its customers at 14.8 degrees West aboard the Telstar 12 satellite. EUTELSAT is providing capacity for transatlantic connections in the Ku-band at 12.5 degrees West via its EUTELSAT II-F2 satellite. Its ATLANTIC BIRD 1 craft, which is due for launch in mid-2001, will add 20 Ku-band transponders to 12.5 Deg West. Coverage will be extended further into Europe and North Africa and full interconnectivity will be established between Europe and South America in addition to Europe and North America. Telstar 12, which was launched in October of this year with 36 high-powered Ku-band transponders, has commenced commercial operation at 15 Deg West under a special temporary authority from the FCC, pending issue of permanent authority. From this slot, Telstar 12 will be able to serve all of Europe, as well as the eastern U.S., South America and South Africa.

The first regular television broadcasts to North America from Europe using EUTELSAT's ATLANTIC GATE satellite capacity began this month with Digitaly, the 24-hour 'image of Italy' channel which features programmes on the multiple facets of Italian culture.



www.travel, a new digital free-to-air channel showing TV features about travel destinations around the world has joined 13 degrees East via SKYPLEX capacity on HOT BIRD™ 5. User information and reservation services are subsequently available via the channel's website at <http://www.wwwtravel.net>. Uplinking from Malta, the new channel has launched in English and plans to add French, German, Dutch and Arabic in first quarter 2000. Up to eight languages will be available by the second half of the year. www.travel can be found on 12.539 GHz, (H), FEC 3/4, SR 27.5.

EUTELSAT has launched a new digital multiplex from the W3 satellite at 7 degrees east called "The Best of EUTELSAT". The new platform is currently broadcasting on a free-to-air basis Euronews, Fashion TV, Rai Uno, RTP International, TV5, ZDF and two French radio channels from RFI. It is receivable on 11.387 GHz (H), via the Widebeam coverage on W3, which stretches from the Azores and Iceland in the West to the Gulf States and Kazakhstan in the East.

Hot Bird 6 – Eutelsat have announced that Alcatel will build HOT BIRD™ 6. Based on Alcatel Space's Space bus 3000B platform, HOT BIRD™ 6 will be equipped with a 28-transponder Ku-band payload in addition to a four-transponder Ka-band payload. The new satellite will be equipped with seven operational Skypex units.

HOT BIRD™ 6's Ku-band payload will enable EUTELSAT to provide television broadcast and multimedia services for the entire European continent, North Africa, and the Middle East. The satellite's advanced Ka-band payload design will enable the organisation to address several additional markets from high-end Internet users, small- and medium-sized businesses, and SOHOs (Small Office Home Office workers).

Under the EUTELSAT contract, prime contractor Alcatel Space will be responsible for the on-ground delivery of one satellite and its launch campaign, as well support for its operations and mission analysis.

The HOT BIRD™ 6 satellite will be one of one of the largest ever

manufactured in Europe and will have a launch mass of more than 3800 kg. Its solar panels will provide an end-of-life electrical power of around 9 kW. Scheduled for delivery before the end of 2001, HOT BIRD™ 6's lifetime is estimated at more than 12 years.



New Greek Service – This new service called entitled Nova has launched on 11.823 GHz (H) & 12.169 (H), SR 27,500, FEC ¾, on Hot Bird 2 and Hot Bird 3 at 13 degrees East. The package consists of about 20 channels including; Filmnet, Filmsat, SuperSport, BBC World, CNN, Discovery and several Greek public and private channels including ET1, Antenna and Mega. Digital radio will also be available with the transmission of several Greek terrestrial radio stations, as well as five 24-hour thematic Greek music channels to be marketed as Tempo. The package will use the Irdeto encryption system.



A rival Greek package is also expected to launch soon under the banner of OTE, the Greek State Telecoms operator. OTE has already fired up a transponder on Hot Bird 3, 12.188 GHz (v) and will use the Mediaguard encryption system.

Telstar 12

Telstar 12, was launched into position at 15 Deg W in October of last year with 36 high-powered Ku-band transponders. It began commercial operation in December. From this slot, Telstar 12 will be able to serve all of Europe, as well as the eastern U.S., South America and South Africa. Three transponders were active as we closed for press with unencrypted MPEG2 services as follows;

11,120 GHz (H) SR 13,185 FEC 3/4 carrying UPC TV, UPC Film 1, UPC

Extreme Sports, UPC Club and UPC Sports 1.

11,141 H (H) , SR 8,718 FEC ¾ carrying UPC TV, UPC Avante and Reality TV.

11,546 (V) NTSC carrying a “Welcome to Telstar 12” test card with audio at 6,20 MHz.

According to UPC both packages on 11.120 GHz (H) and 11.141 GHz (H) were likely to be encoded from about January.



UPC Extreme Sports on Telstar 12

Channel News

The following notes reflect only a small fraction of the number of changes taking place on an almost daily basis. For up to date information check out <http://www.lyngsat.com>

Turksat 1B (31,3° E)

Karadeniz TV is now on 10.990 GHz (H) in MPEG2 clear (SR 2.143, FEC 5/6). Fashion TV and Kent FM are now on 11.143 GHz (V), MPEG2 (SR 8.228, FEC 5/6).

Arabsat 2B (30.5 Deg E)

Ajman TV has started on 12,733 V, MPEG-2/clear, SR 6110, FEC 3/4.

Arabsat 2A (26 Deg E)

Bollywood 4U has started on 12,563 H, MPEG-2/clear

Astra 1A-1H (19,2° E)

ZDF's Theaterkanal has started regular transmission on 11.594 GHz (H) in MPEG2 clear (SR 27.500, FEC 3/4).

Hot Bird 1-5, (13 Deg E)

ERT Sat has started on Hot Bird 2, 11.823 GHz (H) SR 27500, FEC ¾.

Nilesat 101 (7 Deg W)

Ajman TV has replaced Jordan Satellite Channel on 11,747 GHz (V) in MPEG2 clear. EuroNews has also started on 11,881 GHz (H), MPEG-2 clear. Both are SR 27,500, FEC ¾.

Equipment News

SCM NetCast Streamer

Following on from my report on the Skymedia 200/300 Satellite PC card last time comes a new device from SCM Microsystems, which has a USB connection to a PC – thus obviating the need to use up a spare PCI slot. The SCM NetCast Streamer features;

- A Standard USB interface to the PC
- Universal Smart Card Reader for Internet, Security and e-commerce applications
- DVB-CI and OpenCable (TM) POD support for conditional access systems
- Data rates up to 6.0 Mbit/s

Check

<http://www.scmmicro.com/products/dvb/netcast.htm> for details

Echostar AD 300IP

We are slowly moving towards motorised digital receivers which reflect the kind of features and flexibility found on the better analogue systems. The new AD3000IP receiver from Echostar has the key features necessary for proper motorised operation. Although DiSEqC1.0™ switching is excellent for rapidly switching between LNB's on different antenna most people are limited to LNB's pointing at 2 or perhaps 3 satellites. Motorised systems to date have not provided the necessary skew control for polarity adjustment across the arc for digital channels – although some hybrid receivers have implemented skew control on analogue channels only. The key features that attract on the Echostar include;

- Stores up to 50 satellites, 999 transponders in C or KU bands
- An integrated Analogue/Digital Graphical User Interface
- Built-in positioner with 36Vdc, 5A control
- Automatic satellite calculating
- 2 x CI PCMCIA slots (type 1 and 2)

For a full specification check out <http://www.echostar.nl/products/hardware/dth/digital/ad3000ip/ad3000ip.html>

Conclusion

That's it again for this time. In the next issue I will revisit the basics of Digital Satellite TV reception as the postbag indicates a number of readers are keen to take the digital plunge.

Timetable to unplug analogue

Chris Smith, culture secretary, has outlined the government's time scale for switching off analogue TV signals — some time between 2006 and 2010.

But Smith says that analogue will only be unplugged once the industry had provided comprehensive access to digital TV at affordable prices.

He said: “Before the switchover to digital is completed, I want to make sure that 99.4% of the population is

covered by digital transmissions and that 95% of consumers have access to digital equipment.

“The interests of the consumer come first, and if those tests of availability and affordability aren't met, then the date will have to change.”

To date, around 1.5 million UK households have subscribed to digital TV, and industry now hopes to accelerate take-up in the wake of

Smith's comments.

Steve Cain, chief executive of Carlton Communications, part owner of ONdigital, said: “Viewers, broadcasters, manufacturers and retailers can now all make their plans secure in the knowledge that analogue will be switched off.”

Electronics Times 27th September 1999
www.dotelectronics.com

Lightning

By John Cronk. GW3MEO.

15 December 1999

Yesterday I was struck by a thunderbolt. Or to be honest I was awoken by an extremely loud clap of thunder that shook our house. The discharge must have been very close by. In the morning I looked around for damage and checked the gear and domestic items, even the telephones seemed to have survived the EMC trauma. In the evening all the gear performed normally during our weekly activity evening on GB3TM and the big spark was a topic to discuss. No damage was reported apart from the triggering of security alarms.

Later that evening when I went on line to check my e-mail the modem reported 'no dial tone' the modem had died. It is an external type that in spite of arriving in a glossy box declaring numerous virtues, "External Video Ready Modem with Speakerphone". It does not own up to having a name or manufacturer, just a number 3334av/5634rs. And it had out lived its guarantee by just one month.

So with nothing to lose I opened its case, an IQ test itself, there were no screws, just some slot shaped holes. A small screwdriver inserted into the slot and an opening pressure applied between the two halves succeeded in parting them. There was no damage to be seen and most of the components on the PCB were not really replaceable, tiny unmarked surface mounted parts and unfamiliar IC types. Near the phone connector was some unmarked diodes and three almost normal resistors. Two of the resistors were similar at first sight 1.8k and an ohmmeter test showed one was short circuit and the other open. They were



removed and retested. At this point I realised they were the five colour coded types, brown, grey, red, gold, and space, red. Not one percent 1k8 but 18.2 Ohms at two percent. [Gold in this position is dividing by ten and silver is dividing by a hundred.]

So the one I thought was shorted was actually all right, but I replaced them both with 18R, 0.5w resistors. The other resistor was marked 1k5 in the common four-colour code, brown, green, and red, had gone high.

As these three small resistors were the only parts practical to replace was I lucky or were they designed to fail and protect the other more expensive parts? The repair seems to have been satisfactory and the modem continues to work.

I do not have a circuit diagram or even any knowledge of a typical modem input circuit.

I have to confess this modem does not have the green spot type approved sticker.

As two telephones were not damaged I suggest this was because there was no ground connection to them, the damaging pulse was I suspect, between the phone lines and ground.

In the olden days phone lines used to have a terminal box with a carbon block lightning protector and a ground spike.

I wonder if there is a telephone engineer in the club who could be persuaded to write a few words on current telecomm engineering.

I hope these notes are of some interest to club members and may save the life of another modem somewhere.

Changed your address?

Please notify us before the Post Office does!

Notes from the Membership Secretary

Thank you to all of you who renewed your subscription promptly. I did receive a few comments regarding the sending out of the renewal letter several months before the subscription is due.

On every renewal letter it states "your subscription is due or will fall due before the next edition of CQ-TV is sent to members"

The problem we have is that the magazine is published quarterly but subscriptions fall on a monthly basis. We have two choices, the first to send renewal letters out on an individual basis or secondly include them with a magazine.

In an ideal world the sending of individual renewal letters would be my number one choice but there are major drawbacks to that. The first being it costs money to send the letters out,

especially postage and secondly it takes a lot of extra work to produce and mail the letters.

Please remember your Club is run by a group of volunteers working in their spare time and in this day and age spare time is a dwindling resource. Anything we can do to make the job easier is important.

Membership Number

We also receive requests for your membership number. The address label on your CQ-TV envelope contains several useful bits of information. On the bottom right hand side of the address label are two rows of information.

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The top row shows your membership number followed by a mail sort code. The mail sort code is use for mailing purposes and can be ignored by members. The first set of numbers after MemNum: are the important ones. There is no mail sort code for overseas members. The bottom row shows when your subscription expires.

If your subscription is due before the next CQ-TV is published the address label will also state "Subs Due"

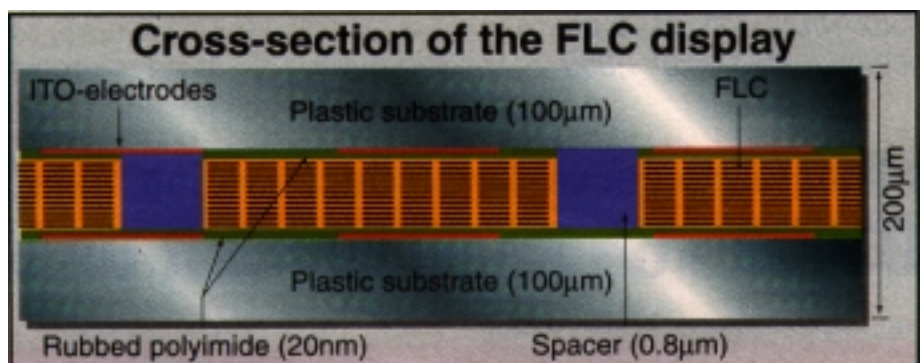
Plastic displays move apace

Several advances have been made in the development of displays on plastic substrates, bringing robust, flexible displays a step closer to reality.

Researchers at Stuttgart University in Germany had smartcard applications in mind when they developed a very thin ferroelectric LCD (FLCD) on plastic substrate.

Using only printing techniques and no vacuum step, the group made a flexible bistable reflective FLC which has a switching angle of 45° and a switching voltage of less than 5V.

The group used ITO-coated polyethersulphone film as the substrate. After structuring of the ITO electrodes, a polyimide was deposited on the substrate using flexographic printing, and a roller was used to orientate the direction of the FLC molecules. Transparent etched spacers (0.8µm) were then deposited to give a final cell thickness (without polarisers) of 200µm.



The same group of researchers also made a prototype 4.81n transmissive ferroelectric matrix LCD with ½ VGA resolution on plastic substrates. This had a cell gap of 1.5µm and again involved a vacuum-free filling method, reducing costs for mass production.

At the University of Michigan, US, researchers have fabricated a flexible organic light-emitting device on plastic substrate with what they claim are the highest external quantum efficiencies ever reported.

The heterostructure device showed a green light emission at around 570nm and has an external quantum efficiency

of up to 16.2%. It also exhibited a high luminance (up to 13 000cd/m²) and a good emission efficiency (approximately 55 to 66cd/A).

The device consisted of a hole transporting layer (amine-fluorene) and an emissive layer (benzothiadiazole-fluorene), both of which are conjugated polymers. These were sequentially deposited on an ITO-coated plastic substrate using a spin-coating technique.

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www.dotelectronics.com

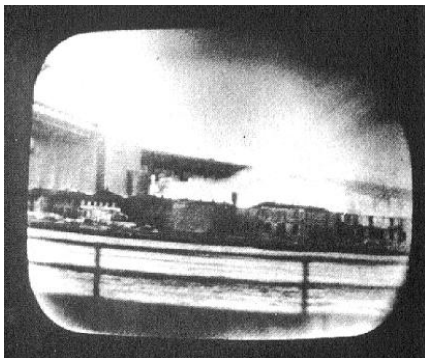
Follow the Van

Dicky Howett goes outside broadcasting and uncovers a few scanner vans in born-again guises.

The BBC's latest OB toy is a twenty-ton 48-channel digital wide-screen mobile central control room, complete with 20 Sony 550P cameras, 60 colour production monitors, a 96-channel digital audio desk, a digital video editing area and the world's biggest vision mixer (Thompson 9348). Heavyweight stuff. Today it has to be wide-screen digital component. But sixty-six years ago the 'tec was a bit lower.

OB Logie

In the early nineteen thirties, John Logie Baird was experimenting with the possibility of broadcasting television pictures from outside the confines of the studio walls. Improvements in his television apparatus meant that Baird could now shoot exterior scenes under natural light. But Baird didn't just poke a camera lens out the window. He went further. It was on the 8th May 1931 that John Logie Baird initiated outside broadcasting by transmitting the world's first television pictures direct from an outside mobile source.



An off screen image of a fire in New York City in 1938

Original

Until that time nobody had done OB's. Baird was a true original. He invented as he went along. He carted his television apparatus (it was not exactly portable) out of his laboratory and installed it in a wooden holiday caravan. He parked this caravan beside his Long Acre studio in London,



The NBC/RCA scanner van in 1939

feeding street scenes indoors to the transmitter. The caravan housed a mirror-drum 30-line scanner (hence the familiar term 'scanner van'), which spun at 750 revolutions per minute, converting the scene via photoelectric cells. Later, that same year on the 3rd June, Baird trundled his TV caravan down to Epsom and relayed live scenes from the Derby (the first sports OB) via the BBC medium wave transmitter at Brookmans Park. A bold technological feat considering the totally uncharted TV territory and the haphazard nature of the telephone lines that linked the system. The pictures of the Derby (actually just the winning post area) were barely recognisable due to electrical interference and the low bandwidth used. But a precedent had been established. OB's worked!

Coronation Time

Later, at the 1936 Berlin Olympic Games, the German experimental TV service used two OB vans feeding a mixture of 180-line electronic and intermediate-film pictures. But the first *all-electronic* high definition 405-line outside broadcast unit was built in 1937 for BBC Television. The unit comprised two Regal vans built by AEC of Southhall and equipped by the Marconi-EMI company. A third vehicle carried the 1 kw VHF link transmitter. The unit supplied all the necessary vision monitors and four microphone inputs. Three Emitron cameras supplied

the pictures and on May 12th 1937 the unit televised live the Coronation procession of King George VI. With outside broadcasts such as described, early television established an audience, and importantly, sold sets.

Mobile Telly

Catching up in America, by the spring of 1938 RCA had in New York built a 'Telemobile Unit', shaped like a single-decker passenger bus. This unit experimented by shooting scenes around New York City using two recently developed RCA cameras with miniature (4 1/2" inch) iconoscope pick-up tubes. The OB unit proved very adaptable and the operating engineers gained much experience from NBC. During a transmission from a swimming pool, the OB cameras panned away and captured a fire in a deserted army barracks along the East River. This event (which was photographed from the screen) made press headlines and was later credited as being the world's first unscheduled TV news event.

Today, whilst the old cameras and control gear may have long since disappeared into TV heaven, some redundant broadcast OB vans are still active and earning their keep. Scurrilous tales abound of scanners being re-born as mobile chip shops or camper vans. An old BBC control van was spotted on the road to Glastonbury, the new owner a New Age Traveller.



The Oz van with a Pye Mk 3 camera

And then a few years ago (so the story goes) a scheme to ship drinking water to the Greek Islands foundered when an inter-island ferry crane snapped trying to hoist ashore an adapted ex-Anglia TV MCR. This particular MCR was loaded to the roof with best Norwich tap. These days' things are slightly less exotic.

At the National Museum of Film, Photography and Television, they wheel out on special occasions their Type 2 OB colour scanner van. The van

(ex-BBC from 1970) is used as an educational resource. When parked outside the Museum's Bradford site, visitors can wander through the vehicle and get an impression of how it operated. Working displays include banks of monitors, waveforms, U-links, racks and mixing desks, all described helpfully by running video commentaries. Sensibly, all vital switches are protected from fidgety fingers by thick Perspex. A usual added refinement is an EMI 2001 colour camera perched on the roof.

Oz PYE

But the flashiest Y2K reincarnation of ancient ob stuff will take place this autumn in Sydney, Australia. A complete Pye OB van (as reported in CQ-TV last year) will broadcast live monochrome image orthicon images to the waiting world. Barry Lambert is the prime mover here. To be predictably athletic, good on yer sport!

Members only!

As mentioned in the previous issue (CQ-TV 188, page 42) we have set-up a 'members only' section on our web

site. Access to these pages requires a username and password. This quarters codes are as follows: -

Username: amember

Password: oknow

OB vehicle recollections

By Roger Bunney, G8ZMM

Opening the just arrived 'CQ-TV 188', I muttered 'I know that radiator grill' and indeed the pictures on page 23/24 confirmed what I suspected; it's the old Southern scanner! Paul Marshall is to be congratulated on getting the vehicle back on the road and looking as it was when delivered and not a trace of the 'to follow' TVS brown (Great Western Railway brown was the TVS corporate house colour). I travelled the length and breadth of the Southern/TVS region working various OBs in that vehicle - quiz shows, question time, horse racing, royal events, Miss Southern TV, Cowes week, air shows and you name it, we did it. Perhaps the two events I recall most was the time we rigged (on Christmas Eve) for the Boxing Day Wincanton Races. For those that know this God forsaken course, it's on high ground above the town and on this particular meeting it rained, sleeted, snowed, thundered, blew and the sun shone! But on Christmas Eve we huddled together in the scanner watching live off-air as fearless Apollo aviators circled the moon. On another occasion we broadcast a Eurovision Easter service from Arundel Cathedral. Being a young sound assistant, I wasn't trusted to play out the 'Eurovision March' music on 1/4in tape at the end of the service; this would be played out on cue by a trusted very senior engineering suit. And on cue, as the captions rolled up the closing wide shot and cut to the Eurovision caption, the senior suit played the 1/4in tape in fast rewind!

Towards the end of its life in real broadcasting it was always a gamble whether the scanner would actually arrive on site, such was its mechanical condition. It haemorrhaged oil and a rigger pouring oil into the engine from inside the cab as it moved completed one trip. The general practice was for Bob Wheeler, senior rigger, to follow the OB cortège as it sped onwards to the programme site. He would then be able to pick up fallen pieces or render essential first aid to the fleet when any vehicle pulled over. The usual fleet would be the maxi scanner (as 99G was known) + 1 tender (cables, etc) and a VTR truck. The links vehicle fleet by this time was no longer intact though links equipment was used through to the 'end' of TVS rigged on buildings, cherry pickers etc. I recall one of the riggers, known as 'mad George' - and previously an ambulance driver thought to have been dismissed due to his driving style - adopted the habit of using the scanner when returning from OBs as his own transport, taking it home overnight rather than the studio, which caused more than a little interest from his neighbours on the council estate...

By way of RF commentary, the Wincanton course presented an interesting radio links case. At Wincanton a very large scaffold tower was constructed atop which was the first hop, which would just reach into Purbeck, thence a straight 2nd hop across water to Chillerton.

The chassis of the 'maxi' was thought to be riddled with rust, though that is rumour - as is the story that it was exempt from MOT type examination being 'a showmans vehicle' (?). TVS had 2 scanners, a small one called 'mini' that Sony built and the 'maxi' that was locally (Southampton) constructed. Southern sought a local company (I recall Dell coach builders) to construct the maxi scanner, which led to this company entering the broadcast field very successfully.

I am sure that Paul must have found many odd wiring additions under the floor of the scanner - as with many working broadcast studios of that era 'things' are added to suit a programme's need that remain thereafter. I hope that the Clark air operated mast has been sorted; it tended to erect itself in abrupt jerks elevating itself several feet, hesitating and then leaping more feet into the sky, quite lethal.

There are many stories that I could tell of broadcasting and the OB units of Southern and TVS - but these companies actually made programmes in their region, waved the PR flag and took TV to the people in town and village alike. Come the Broadcasting Bill of 1990, then franchise loss, suddenly it was all too expensive and the OB flag was pulled down. But at least the 'maxi' lives on.

Happy memories!

Record MPEG2 on to DVD-ram

C-Cube Microsystems and Sam-sung Electronics have demonstrate a DVD recorder that will allow consumers to record video on to a DVD-ram disc in the MPEG2 digital format.

The companies say their technology is the first to provide live realtime recording using the DVD Forum's DVD Specification for Video Recording (DVD-VR). The spec defines features such as still picture, video slide show, recording and simple editing features.

C-Cube has provided both the MPEG2 video encoding and the formatting information needed for DVD-VR compatibility.

The prototype DVD recorder was developed by Samsung using C-Cube's DVxplora and ZIVA-3

MPEG2 encode and decode silicon as well as Samsung's DVD-ram drive and system design technology.

Dong-Ho Shin, director of the optomechanics lab at Samsung Electronics, said: "Consumer DVD

recorders will bring the quality, reliability and ease-of-use of DVD technology to home video recording."

Fermi Wang, general manager of C-Cube's PC/codec division, added: "This system demonstrates the power of DVD recording that will soon be available to consumers. It also illustrates how C-Cube is bringing the quality and ease-of-use of digital video to new consumer entertainment products."

Electronics Times 11th October 1999

Worthing & District Video



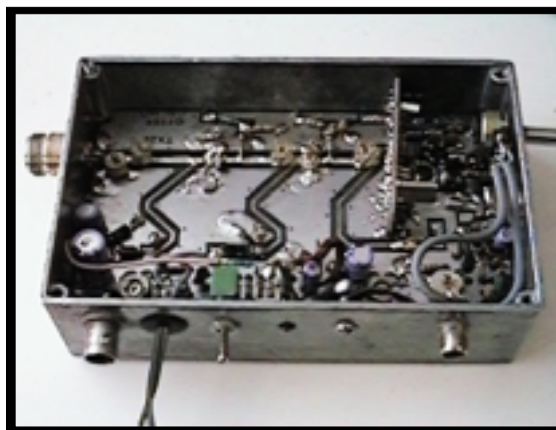
Repeater Group

GB3VR GB3RV & 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 £85.00, P&P £2.50. Only available to licensed radio amateurs.

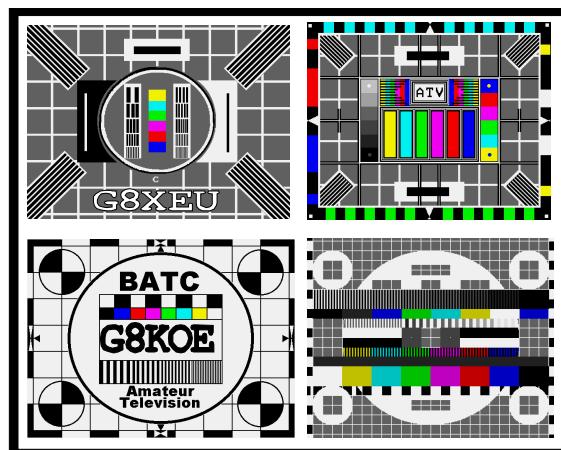


Two channel phased locked loop kit.

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



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The Amstrad Bluecap L.N.B. for ATV Modification of Local Oscillator

By P. A. Johnson, G4LXC

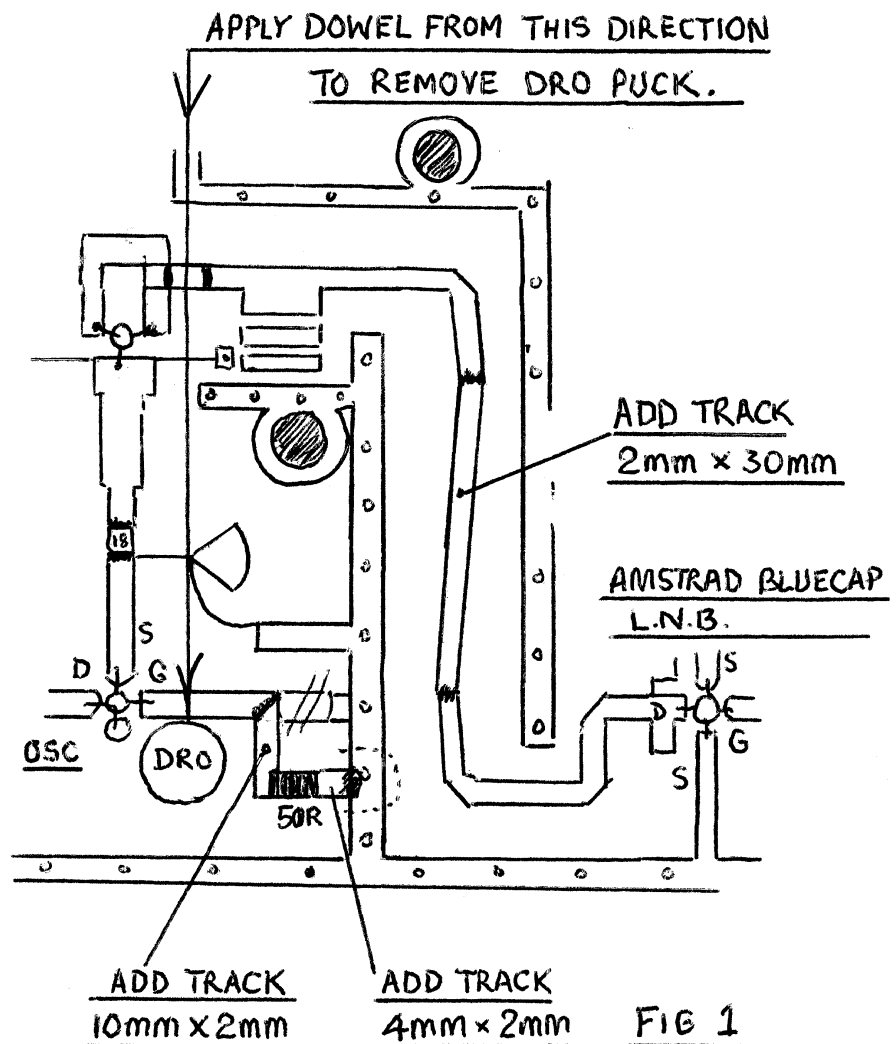
This article assumes that you have purchased a replacement 9.1GHz DRO puck.

Make sure the LNB actually works before attempting to change the local oscillator.

In order to work without damage to the static sensitive components, you must ensure that the soldering iron is earthed to the PCB and case of the LNB with a short cable about 18ins long attached to the hot barrel of the iron, at the coolest end. Bolt the other end of the wire to the case of the LNB. This will allow de-soldering and removal of components safely.

Start by drilling out the rivets. Remove the lid, using a taper star bit to remove the bolts holding the diecast shell to the PCB and carefully remove it to reveal the complete PCB. Remove the 10.0GHz DRO with a gentle but sharp tap on the end of a piece of 10mm dowel placed against it, to shear it from the PCB.

In order to make the oscillator work with the new DRO the gate tuned line must be made longer. See Fig 1. Remove the 50 ohm gate resistor as indicated, use copper foil removed from a short length of 75 ohm satellite cable, flatten it out and cut a piece 2 by 10mm, and another piece 2 by 4mm. Use Locktite instant glue to fix the foil in position as shown and leave to set. Solder the 50-ohm resistor in its new position. Solder the join at the right angle and at the earth strip of the foil. Cut a notch in the diecast cover at the same point so the cover locates above the solder joint. This ensures the cover will sit evenly on the PCB. Use very fine solder and as little as is practical. Glue the new DRO puck in same place



as the old one. Use a pinhead of clear nail varnish and give it about 2 hours to dry; clear cellulose nail varnish does not lower the resonant Q factor. Don't use Locktite instant glue! To bypass the 10.0GHz filter remove the three strips at the centre and also the thin sections at each end. Replace with a foil strip 2mm wide, solder at each end as shown in fig 1. This bypasses the filter that is not required. Free up the tuning screw on the diecast cover and replace the cover onto the PCB. If any of the hollow star screws don't hold tightly, gently make them oval, then they should hold tight. Power up the LNB

from your satellite receiver, and with a known TX source adjust the tuning until the correct frequency is displayed. I used an Amstrad SRX 200, as it has a frequency display. A good 10.0 GHz source is an old LNB with the cover removed and powered up from the bench 12 volts. The AFC in the RX will lock onto the source of RF. Beware of false tuning due to overloading the RX LNB.

A 9.1GHz DRO puck will tune to 9.0GHz without any other modifications.

Keep up to date with ATV happenings. Visit the
BATC web site at: -

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

Domestic Nokia Mediamaster satellite DVB receivers and DVB2000

By John Rainer

For those of us who turned to motorised dish installations as the sky filled with easily accessible analogue Ku band channels in the late eighties and early nineties, the dawning of MPEG2 transmissions was a mixed blessing. Having finally accessed TV signals that didn't require a dish taller than the average house, the interesting news feeds and sporadic programming that had become available increasingly passed to a new digital format and thus became invisible to analogue receivers.. With MPEG2 receivers firmly in the professional domain at first, it is only in recent years that consumer units have become available and affordable, and once more some of these transmissions are viewable again in digital format. The consumer market place now is a crowded one but Nokia, the occupier of the vanguard of the digital revolution in the satellite enthusiast market, still has a leading role through its provision of the Mediamaster range of receivers.

Nokia supplied digital boxes for a satellite package in Germany. These subsidised units, the original Mediamaster d-boxes (dream boxes), began to trickle into the wider European market when it was found



A Nokia in the raw

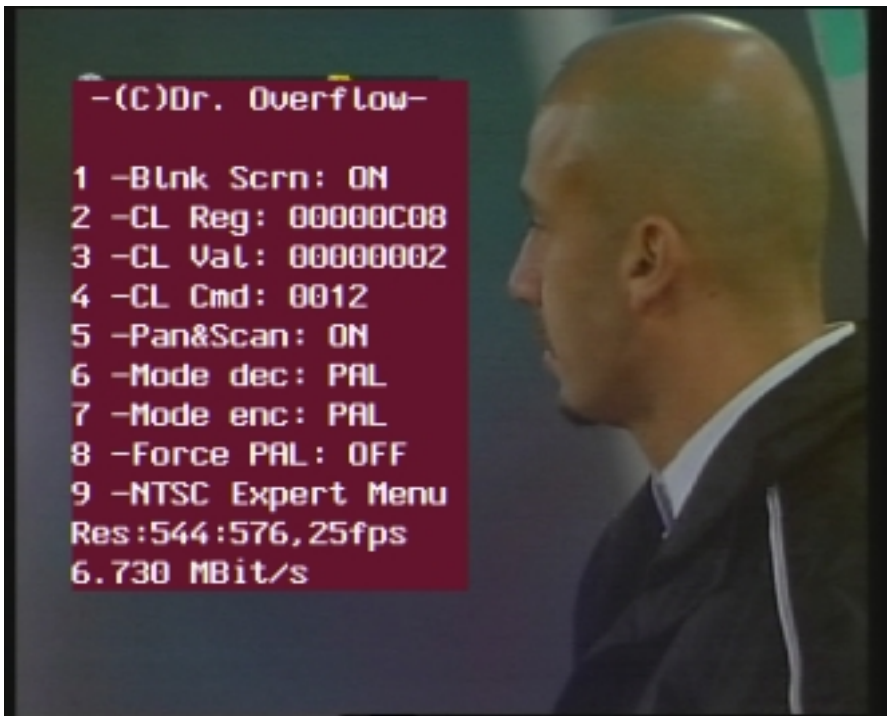
that access to hidden menus gave them the power to act as receivers for rather more programs than the manufactures intended. It was cumbersome to access them, but for the enthusiast it offered a route to DVB, which had no other affordable rival at the time. The success of tinkering with the d-box/ 9500, with its associated Conditional Access Modules (CAM), forced the release of the 9200 (a free to air version of the 9500 with improved software for SCPC reception). Nokia also realised that there was a market for in the UK for a

more generalist approach - with no digital packages of its own, British buyers fought shy of purchasing a unit that might not work with future channels (how right they were!). The (FTA) 9600 was sold here as an enthusiast's receiver, but one capable of having a CAM installed at a later date by using a plug-in CI (Common Interface) module. Whether it was developed as such for the UK is debatable - it is likely this was just a sales opportunity for a receiver which had other uses in the European and Eastern markets, but nevertheless it had SCPC tuning features and automatic reading of Package Identifiers (PIDs). However, all was far from rosy - the Mediamaster software was slow and poorly adapted to multi-satellite use. Stored channels frequently overwrote each other and weird and wonderful channel names inserted themselves, seemingly at random positions in the channel list.

While the 9600 was seen as the bees-knees here in the UK, developers elsewhere in Europe were seeing just what the closely related 9200 and 9500 receivers could do. It was apparent that Nokia was using in its software just a small part of the hardware capabilities of its receivers. Several alternative operating systems flourished, usually loosely based on modifications of Nokia's own, but one in particular started to gain an almost fanatical amount of support. DVB98, authored by Uli Herrmann with the help of a group of fellow enthusiasts and



The Expert menu



Screen 3 of the Expert menu – now the bit rate reader, resolution and frame rate

software writers, seemed to be the answer to all DVB reception and use problems. Not only could it store around 2000 channels but it could also change between them almost as quickly as using an analogue receiver. Furthermore, it seemed that every possible configuration setting of the receiver could be set or adjusted. Channel lists could be uploaded via the box's serial port to a PC using specially written programs. They could be edited, rearranged, grouped by satellite and downloaded back into the receiver. Commonplace for several receivers now, but this was a revolutionary feature then. Even bug free NTSC reception, free of frame rate catch up blinks and truncated screens, became possible on a PAL receiver and every new release brought more features. The common hardware features of the Nokia 9200, 9500 and 9600 meant it worked across all the model range.

The development of DVB98, never intended to be a commercial venture, increasingly impacted on the author's time and in 1999 DVB98 became DVB2000 and moved from freeware to, well, sort of shareware. The author requires payment, currently 49 marks (not a lot!), but the software is not crippled in any way. I urge users to pay - if nothing else, if you can afford the receiver, you can afford this! Installing the software, which once involved opening the box and using special

hardware connected to the internal connector to access the Background Debug Mode of the unit, can now be done by null modem serial cable and Transbox Pro or other software. Even the BDM interface and its associated software are now easy and straightforward to use.

What makes this software so wonderful? What does it do that still

elevates it above even the latest consumer boxes on the market? Starting with the basics, the Nokia is a high-grade unit, for domestic use anyway. Its symbol rate range starting at 1000 is better than most, if not all, boxes on the market and its audio and picture quality are excellent. In common with a few other receivers, its tuner has the ability to lock onto video streams for a given frequency with no defined Forward Error Correction (FEC) or Symbol Rate (SR) values entered. Once found, the box automatically gets the channel PIDs from the data stream.

DVB2000 does this operation far faster than in Nokia's own software implementation - search times of minutes become around 10 seconds! If the data stream is not carrying the PIDs, DVB2000 can find the video PID by a 'brute force' searching of all possible values and locking on the data stream most likely to be video. Many receivers boast an auto search function, but few have one that operates at the level of the Nokia's. Instead, their auto search tends to search data streams for channel information in a direct form, typically channel bouquets where each transponder carries details of the tuning parameters leading to all the other channels, which may be on different transponders.



A user-friendly front end, showing the image-grabbing program window (see later) The more detailed menus are accessed from item 9

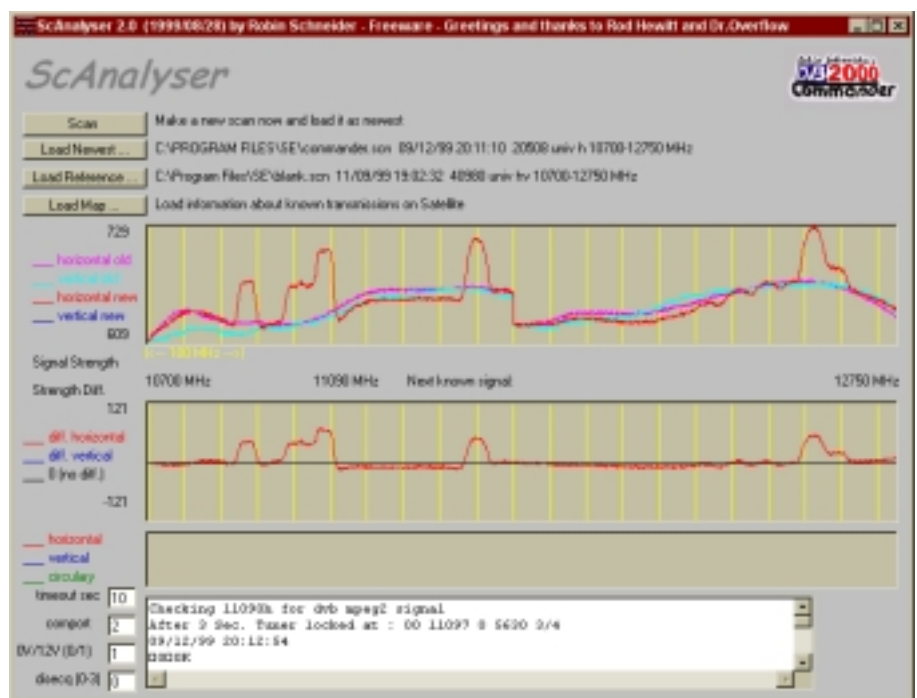


Choose your channel

If enough satellite transponder information is pre-programmed into the receiver, it is possible for hundreds of channels to be retrieved from a single satellite position search. This is not really searching, though; it is more like reading a list. If a channel, such as a news feed, is not in the list, it will not be picked up. This is where the Nokia comes into its own. Software, such as DVB Commander or DVBedit, is available for DVB2000-equipped receivers which will make the Nokia scan the entire Ku band spectrum at a given satellite position. A simple mouse click on a peak on the resultant plot that appears on your screen automatically forces the box to attempt to tune to any DVB-compliant signal. If you want more control, simply enter the frequency and polarity of the peak that you find into the receiver and play around with the variable acquisition bandwidth. The bad news is that recent Nokia boxes have lost their auto search capability, so if this is important to you, make sure you get one with an NDT tuner. This information is printed on a white label stuck to the tuner unit and is visible through the ventilation slots in receivers top cover - it will either say something like DF1ST1173 or NDT1006A - the latter is the one you want.

Pictured right is a screen shot of a horizontal scan at 36 East from 10700 to 12750MHz. A reference scan from

an empty satellite position can be loaded to eliminate tuner and LNB response variation to give the more uniform response in the centre of the picture. The scan took 95 seconds but will be much quicker if a narrower frequency range is selected. The resolution is not the best but this is still only beta software and the author plans improvements. A left click on 11090MHz (the frequency appears near the centre of the window for the mouse position on the plot) gives the signal lock shown at the bottom, which in this case is an ITN signal. The ripples at the

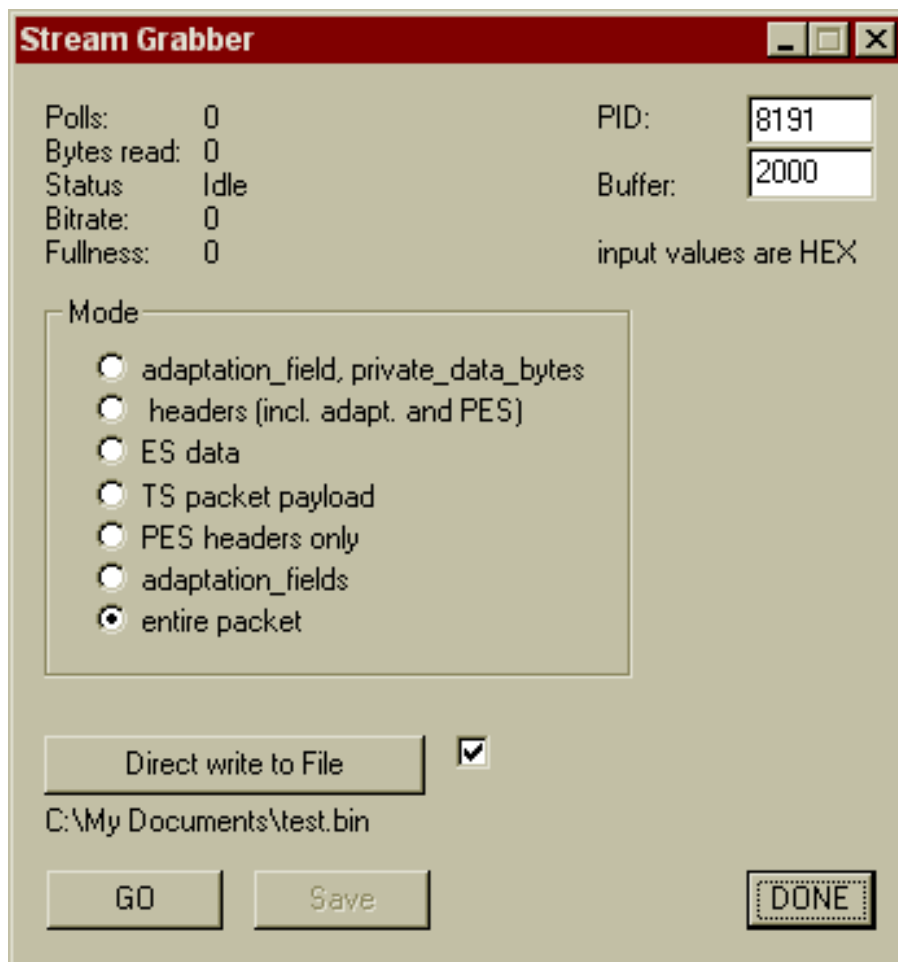
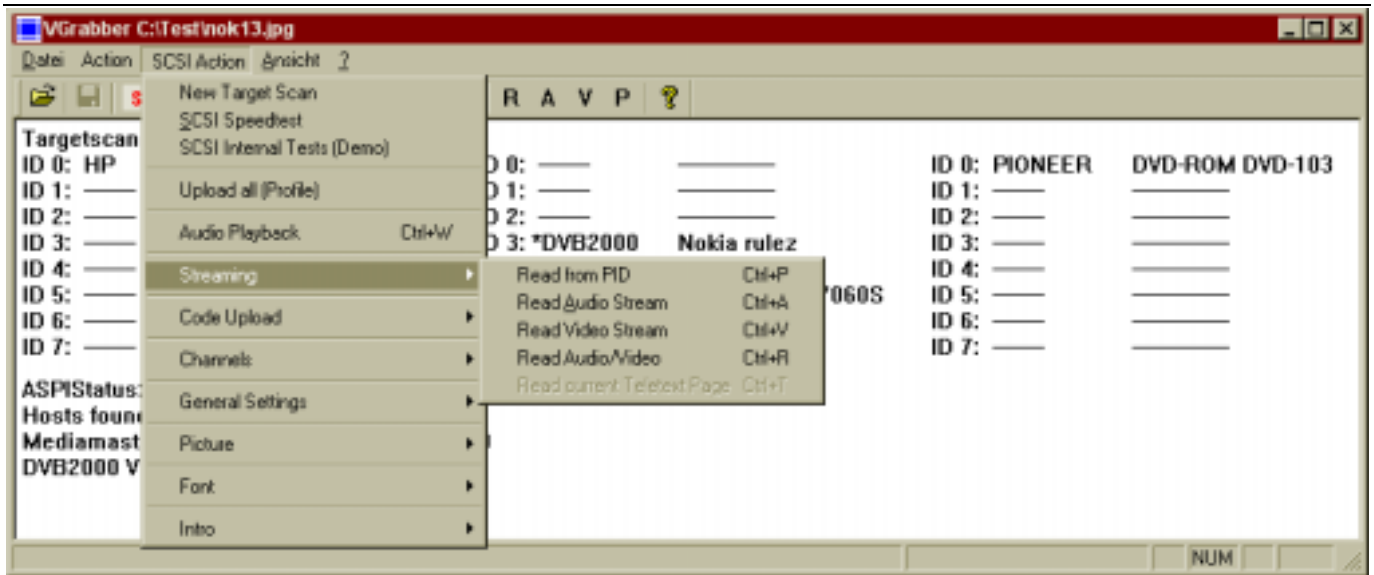


higher end of the spectrum are weak signals from a co-located Russian satellite.

Those of you who have Echostar LT8700s can use LTedit to perform a similar scanning function, but with greater resolution.

Where DVB2000 shines best is in its ability to utilise the SCSI port on the receiver, a feature largely neglected by Nokia in its own software. SCSI CD-ROM and hard disk drives can be connected to the receiver to play back MPEG1 files and video CDs, but DVB2000 goes much further than this. Using software called vgrabber developed by Uli and his colleagues, video, audio and data streams can be downloaded directly to your hard disk.

They can then be multiplexed to produce MPEG2 videos - essentially just a step away from direct MPEG2 hard disk recording on your PC. More developments are planned! In addition to recording streams, the software can grab images and transfer channel data near instantaneously, and upgrade firmware in a few seconds. It can also display any jpgs or bmps you have on your PC on your TV. While many digital cameras can display their files this way, none of them will do it in a split second - it is very easy to present a TV slide show from any picture files you may have using this method. In addition, the screen grabs are exactly that - a 1.245MB bitmap snapshot from the data stream rather than an image



The more adventurous can do direct data downloads

copied via a TV tuner card.

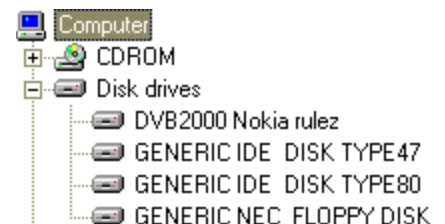
For those of you with Echostar LT8700 analogue receivers and a serial interface, the software can use that receiver's positioner to automatically swing your dish without switching receivers. To complement these features, there is software to change the menu colours and transparency, the

start-up sound, and start-up logos. There are a number of channel editing programs available and several SCSI utilities.

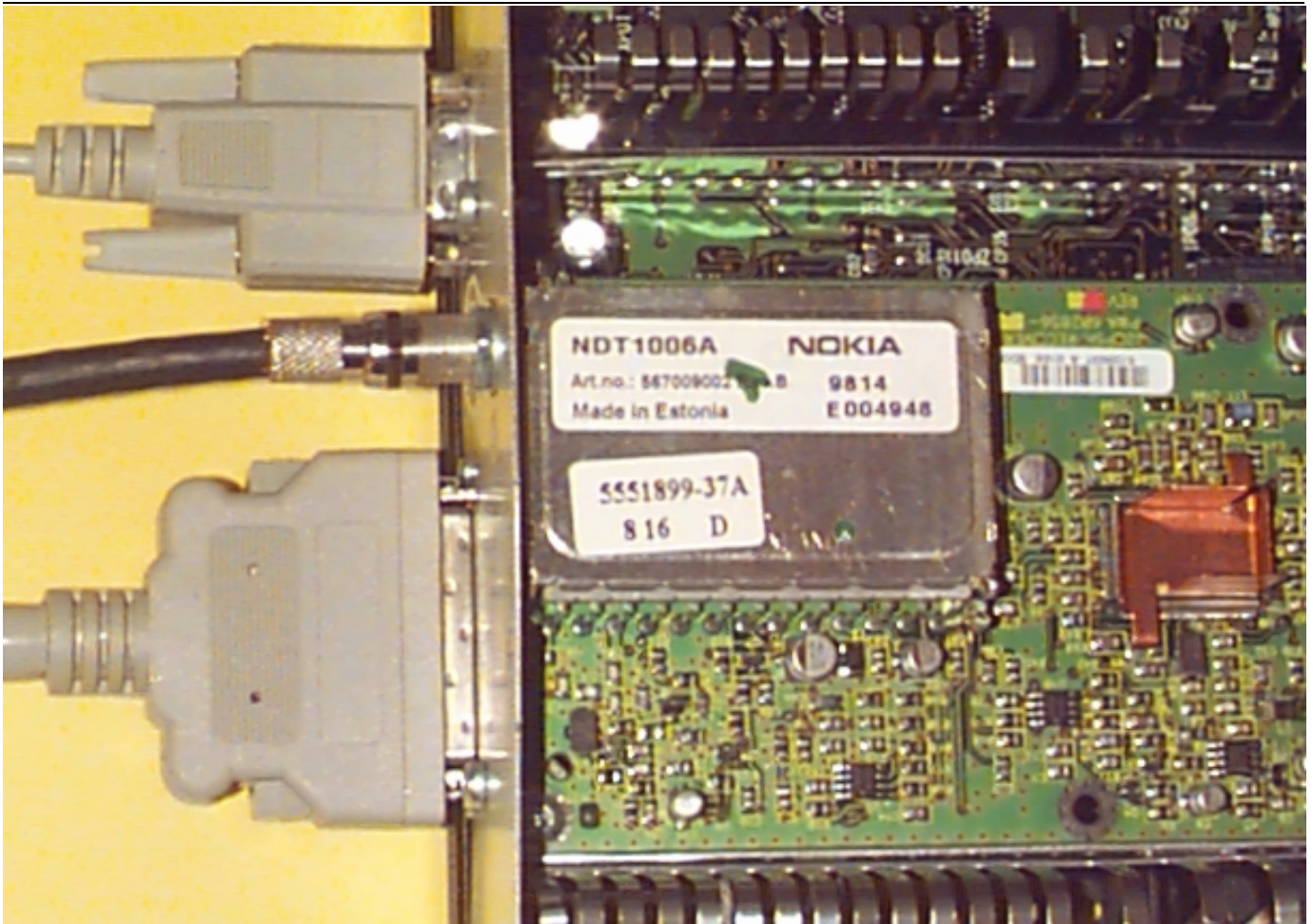
What do you need to utilise all these features? A Nokia 9200, 9500 or 9600s, preferably using an NDT-labelled tuner and not the more recent DF1-labelled one, a null modem serial cable

Transbox Pro software and a PC. Alternatively, you can use a BDM interface to load the software, which tends to be a bit less flaky than using TransboxPro. Information on upgrading a Mediamaster 9600 is at <http://www.netcomuk.co.uk/~jrainer/9600/9600.html> If you have a 9200 or 9500 and they also have Nokia's B2.00uns boot loader installed, serial upgrading using several types of software is possible without any fuss at all.

To utilise the SCSI features a basic SCSI card will do, PCI or ISA, While Adaptec is preferable, cheap Symbios and other cards will work all right, (and you will need a male to male micro DB50 SCSI cable.) There can be problems with boot locks and getting the box recognised in Windows but these are normally solved, even for non-Adaptec cards, by installing the latest Adaptec aspi layer update, aspi32.exe. This requires either Adaptec hardware or software to be present to install and a certain amount of ingenuity may be needed to accomplish this.



To obtain the latest software and utilities, go to www.dominance.net/overflow. New releases are at <http://207.176.23.119/overflow/betas> More information is at



A close-up of the tuner showing the all important NDT label as well as the SCSI and serial connectors

www.rehtec.com and there is an excellent collection of software at <http://sat-digital-tv.provider.com.pl/starte.htm> I also recommend Robin Schneider's DVB Commander at <http://members.tripod.com/RobinSchneider> Wolfgang Litzinger's Ltedit/Setedit at <http://members.xoom.com/WolfgangDownload> and Rod Hewitt's DVBedit at the first site above. A good beginner's guide to MPEG2 and satellite video is at Rod's site <http://www.coolstf.com/MPEG/index.h>

[tml](mailto:jrainer@netcomuk.co.uk) For those of you who want more advice on upgrading, please mail me at jrainer@netcomuk.co.uk and for a detailed English manual, with far more detail than appears here, see <http://www.stelco.cz/sat/dvb2000n.htm#DOWNLOAD>

Most utilities work in win95, win98 and NT4, but Transbox Pro will not work in NT4. A few Linux tools are being developed.

The only note of caution I would add is that some receivers on the market are

grey imports, intended for Middle and Far Eastern markets and may (not always) be modified in software or hardware. Generally, most people do not have problems. The 9800 series of receivers is NOT compatible with DVB2000.

The author has no connection or financial interest with any of the software mentioned above, including DVB2000, most of which is free in any case. He is merely a satisfied user.

Don't forget, CQ-TV is available, in machine-readable format, on our CD along with a copy of our web site.

The CD is updated quarterly after each issue of CQ-TV is published. You can order online from our website at www.batc.org.uk/publications or by post from BATC Publications.



‘Repeater’ is the premier ATV magazine in Holland.

Repeater is a new ATV magazine published in the Netherlands in Dutch. The 13/24cms TX in this issue is reprinted from Repeater with the kind permission of the Editor Rob Ulrich PE1LBP. I hope we can from time to time bring you other extracts as we do with all the ATV magazines.

Information about ‘Repeater’ magazine can be found on their web site at <http://www.euronet.nl/users/rulrich>, email: repeater-nl@rocketmail.com

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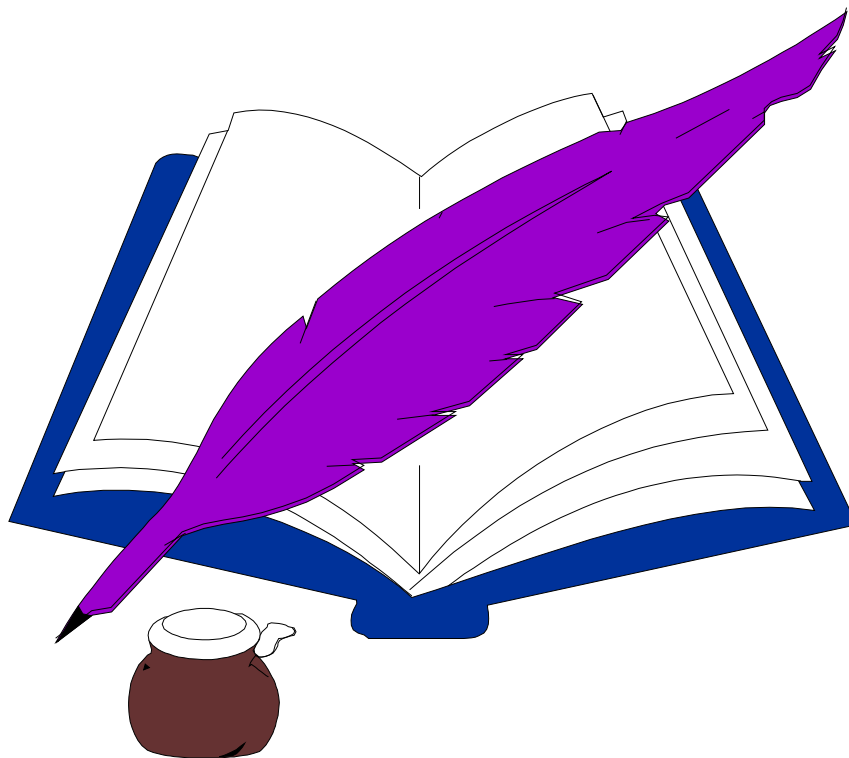
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Tel: 0116 276 9425.

E-mail editor@batc.org.uk

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Tel: 01132 670115.

Email: adman@batc.org.uk

I was grateful for G7NPE's PRD800 conversion article, (CQ-TV 188) but thought his obvious revulsion for surplus Amstrad equipment was a little unfair. In July this year, under flat conditions, I used an SRX200, Platts 10Ghz LNB and 30cms offset dish to receive P5 pictures from the GB3XY repeater at Hull at a distance of more than 70 miles. If it had not been possible to buy the receiver for a mere 5 pounds I might not even have given

ATV a go. I certainly don't consider the minimal mods I did on the receiver to have been a waste of time. But... I'll be keeping an eye out for a PRD800 anyway. :-)

Regards, Graham Galbraith M0ADR

At the AGM of the Kent Repeater Group held on 24th October 1999 the following members were elected to serve on the committee: - Chairman and newsletter editor Paul G8IXC, secretary Jose G3ZZZ, treasurer Tony G7MIM, technical co-ordinator Chris G8GHH, ordinary members Peter G4LXC and Robert G6HLE.

Jose Gibbs, secretary.

From the Internet

From: TOMSMB@aol.com

To:
atv@admin38.hartsfield.leon.k12.fl.us

I just cranked out another application note in the Arcadia cave. This one is on packaging a 1.5-watt 70cm ATV transmitter for home or portable use.

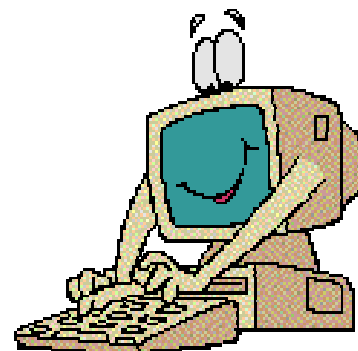
The die cast aluminium box used (same size as our down converter) is 4.7x3.7x2.1 inches, which is small and light enough for portable or mobile as well as home station. This makes a great little unit for public service events or ATV demos.

The 3-page app note pdf file is available free to any licensed radio amateur who sends us an email requesting it. It also comes with any order for the TXA5-RC board along with the R/C, balloon and Rocket app notes.

This app note has photos of the finished unit, inside view, drill templates, assembly procedures, wire list, parts list and sources. The packaged unit uses the P. C. Electronics (of course) TXA5-RC 1.5 watt transmitter board, FMA5 sound subcarrier board and TR-1b T/R relay board. You can power as well as switch the antenna to the down converter (TVC-4G) directly from this one small box.

73, Tom O'Hara W6ORG, P. C. Electronics. <http://www.hamtv.com>

I have added the 10 GHz Gunnplexer ATV application notes to the list of ATV application notes that are available by email to any licensed radio amateur upon request. It has a 5 page pdf file attached. When requesting app notes, please limit your request to



specifying one or two of those you are most interested in. I also appreciate any constructive feedback to update or improve them. Tom O'Hara W6ORG P. C. Electronics tom@hamtv.com
<http://www.hamtv.com>

23cm FM ATV Transmitter, 1300MT , module packaging 23cm FM ATV band plan change considerations 2.4 GHz Wavecom receiver construction using the WCRI-2.4 board 2.4 GHz Wavecom transmitter construction using the WCI-2.4 board 434 vs 439.25 lvsb considerations when fm voice repeaters interfere with 439.25 10 GHz Gunnplexer ATV system ATV in Aircraft ATV Balloons Bentsat 23 & 33 cm FM ATV receiver ATV adjacent channel separation requirements ATV channel spacing ATV DSB vs VSB ATV emission bandwidth - AM and FM ATV linear amplifier set up ATV in Radio Control Vehicles ATV receive sensitivity ATV Repeater construction ATV in Rockets ATV vs other modes on the 70cm band VSB 8 pole vs 10 pole filters VSB filter sources Video RFI 1 watt 70cm ATV transmitter packaging using the TXA5-RC

I have just revised our ATV catalogue and New Products pdf files on page 4 of our web site: www.hamtv.com

New for Nov 99 is the TC70-20. This is basically the same 70cm ATV Transceiver as the TC70-10 as reviewed in the Dec 98 QST but Twice the power.

We have rated this unit at 20 watts pep (sync tip) but so far they range between 22 and 28 Watts with the new power module. Peak envelope power and pedestal are adjustable down to about 2 watts pep to make it easy to drive amateur linear amps that require proper set up to stay in the linear range and maintain the video to sync ratio. The new Transceiver is pictured on page 2 of our web site and you can also download the catalogue page 1 pdf file from this web page. Price is \$529 with one crystal included and \$549 with two transmit crystals - Merry Christmas.

Tom O'Hara W6ORG, P. C. Electronics

Hello Ian,

My name is Dave Hooper, my QTH is Dublin.

I am now PRO for the newly formed 'Irish Amateur Television Club'. At a meeting on the 19th Of November the decision was made to apply for a licence for an ATV repeater to be sited in County Cavan on high ground at 800 feet asl.

On the Ordnance Survey map the site is known as Loughanlea, and is about 46 miles north west of Dublin City.

For some months Ronnie McGrane EI9ED (Chairman) has been carrying out tests with a 23cm ATV beacon at this site. P5 signals can be received in most parts of Dublin City with Ronnie's TX feeding into a corner reflector. To cover two areas of activity, Dublin and Dundalk, a signal spread of 80 degrees is required so antenna tests are going ahead with this in mind. Input and output frequencies have not been frozen yet until certain interference possibilities have been checked out. It is intended to create an IATC web site for helpful articles, news and a picture gallery.

By the way, this will not be the first Irish repeater. That honour goes to the City of Cork, who are up and running with EI2TVR sited at 600 feet asl to the south west of the City. The leading light of this group is Aidan O'Meara EI3EG who is well known to 2 mtr stations in the south west of England.

73 Dave EI2HR

Newsflash: -

A new ATV repeater, "GB3GW" located at Pentrefelin (Nr Criccieth) in North Wales was activated on full power at 14.30hrs on Thursday the 9th December 99.

At the present moment it is running in the **BEACON** mode pending receipt of the necessary input filters due for

delivery in Jan 2000. Reports reveal that this repeater is giving excellent coverage of the entire West coast of Wales.

December 12, 1999 marks the 1st Anniversary of the Historical event of receiving Amateur Radio SSTV pictures from the Mir Space Station!



For those not acquainted with this event, an Amateur Radio SSTV hardware system was delivered to Mir in October 1998. The Mir crew proceeded to install this equipment and first transmitted pictures on December 12, 1998. Many excellent and exciting live pictures were sent to Earth on this date. In the following 7 months many thousands of pictures were sent to Earth showing the cosmonauts, shots within the Mir and views of Earth and Space.

Various magazines and other media around the world published many news articles. MSNBC ran 5 stories on their web news. In fact, their 1st story with pictures is still running and may be viewed at: <http://www.msnbc.com/news/227580.asp>

This news report tells some of the background of the Amateur Radio SSTV development for Mir. The last picture from Mir was of the 3 Cosmonauts, recorded on August 27, 1999, just before they boarded the Soyuz for departure back to Earth. (The November 1999 issues of CQ-VHF pages 44, 45 and QST page 70 show these last pictures).

Mir is now running "solo" under computer control. As has been previously reported, plans are to reboard Mir in the March/April, 2000 time frame. As far as is known, the Mir SSTV equipment is still in place and hopefully will be reactivated at the

approval of Energia and the discretion of the crew during their stay aboard Mir.

In the meanwhile, "on air" terrestrial experiments are being conducted for a new type of SSTV system, which might be suitable for use aboard the International Space Station.

Stay tuned for further news. Farrell Winder, W8ZCF.



The North Wales Amateur Radio Show held at Llandudno is a two-day event that occurs on the first weekend of November each year.

Never to miss an opportunity, The Arfon Repeater Group (which has two ATV repeaters under its belt as well as packet and audio on 2 meters and 70cms) managed to put on an impressive stand for the occasion.

The ATV repeater for GB3GW was on display running the software written for it by Graham Denton G8VAT and Chris Smith G1FEF to whom the repeater group is very grateful.



It was extremely encouraging to learn from visitors to the show that our other ATV repeater GB3TM that is based at Amlwch on Ynys Mon (Anglesey) is regularly seen as far away as Bolton in an easterly direction and EI and GI land in the other direction. New members were signed up and with the advent of our second ATV repeater, GB3GW at Pentrefelin, near Criccieth coming into operation hopefully prior to the end of this year we should have the North and West coast of Wales fairly well covered for both Vision, Sound and Packet.

Summer holidaymakers please note and bring your portable equipment with you!

The picture above is of the stand with Derek, GW3FDZ holding the fort.



ATV Lecture/Demonstration

On 17th November 1999, twenty-plus members of the Halkyn Radio Society of North Wales attended a lecture/demonstration by John Lawrence, GW3JGA.

The meeting was held at the local Prestatyn High School which is located 38 miles (60 km) from the ATV repeater GB3TM. The signal path from the repeater is over the sea and excellent P5 signals were received at Prestatyn. The aerial was mounted inside the building pointing out through the classroom window.

The highlight of the evening was the live transmission through GB3TM of signals from Brian GW4KAZ in Bethel, near Caernarfon, Brian GW6KFH in Penisawaun and John GW3MEO in Prestatyn. Members were taken on a live tour of each shack (all looking nice and tidy) and GW4KAZ provided camcorder video, taken earlier in the day, of the first snow of the Winter on mount Snowdon the highest mountain in Wales. Thanks are due to all concerned. Contributed by John Lawrence GW3JGA.



Taking Amateur Radio into the 21st Century.

DTI Press Notice, 23rd November 1999

At the Radiocommunications Agency's "Making Connections 99" Roadshow held in London on 29th October, it was announced that the Agency would be allowing interconnection between amateur radio and the Internet by the end of the year. David Hendon, the Agency's Chief Executive, made the announcement in response to requests

from the amateur radio community to be permitted to link their radio equipment through the Internet. The Agency recognises the need to encourage young people into amateur radio as it provides a valuable training ground for future careers in radio and electronics. Recognising the huge appeal of the Internet to the young, the Agency has taken this decision to open up whole new avenues into amateur radio.

It is likely that the introduction of this exciting new facility will be phased in, beginning at the end of this year. The Agency would like to hear from interested licensees in order that we might determine their requirements and identify any safeguards that may be necessary to avoid abuse of this facility. Details should be sent in writing to the Amateur and Citizens' Band Radio Section, 10G/9C, Wyndham House, 189 Marsh Wall, London E14 9SX or by e-mail to amcb@ra.gtnet.gov.uk to be received by 31st November.

From Graham Shirville, G3VZV

The RSGB were surprised by this sudden announcement made by the RA at one of their recent roadshows, but have been working hard to provide a useful and constructive response back to the RA before the short deadline given.

The press release does not make it clear whether or not they are referring to the Internet to simply carry voice from one country to another or whether they are talking about the Web. If it is the latter then ATV and pictures will be involved!

It might then be "legal" for ATV repeaters to relay pictures and sounds from other ATV repeater "sites" which already exist around the world. We understand that the RSGB response makes it clear that, if this is what is intended, and then the BATC must be involved in the planning at first stage of any discussions.

Meanwhile it would be interesting to have outline proposals from existing ATV groups to gauge the level of interest and to obtain an idea of likely problems (if any)!

Members adverts

Non trade advertisements are placed in this column free of charge to paid up members only. Please quote your membership number. Copy should be sent to:-

CQ-TV Editor, 14 Lilac Avenue, Leicester, LE5 1FN, England.

E-mail: editor@batc.org.uk

For Sale

Phillips LDK 5 Camera inc. wide angle & telephoto lenses and manuals and "home made" tripod with 1950's pan/tilt head for above camera. Marconi Mk. V Picture and Waveform Monitor Type B3901 with manual. Special effects amplifier and vertical aperture corrector. Murphy Radio 1940's model type A168. Bush Monarch Record Player Type SRP.31D. 1954 Cossor TV Model 933A 17" screen complete with receipts of purchase and first licence! Bush two tone single dial portable Radio TR 82C. Ferguson VHSC video camera and separate portable recorder, Chinon 506 super 8 sound lo-light cine camera. - Condition varies depending on item. Selection of IB/TA 1970's & 80's yearbooks, also some BBC books 1940's to 70's. 1937 Radio Times. The Professionals Script "Rogue", Live from Number 10. Can deliver to the West London to good home(s). Offers: Contact - Paul Gibbs: Mobile: +44 (0) 7747 831313 Tel/Fax: +44 (0) 1749 675839 e-mail: paul@gibbs333.freeserve.co.uk

For Sale; LNB's used but working 9.75 GHz and 10GHz £10 each, BSB squarials New and boxed £20 each, BSB receivers New and boxed £20 each, 63 cms offset dishes with 9.75 GHz LNB New £28 each, Up converter 161Mhz in 1296 MHz out

£8 each. All plus carriage **Brian G3KJX 01609 772702**

LNBs, used but working 9.75GHz an 10GHz £10 each. BSB Squarials – new and boxed - £20 each. BSB receivers – new and boxed - £20 each. 63cm offset dishes with 9.75GHz LNB – new - £28 each. Up converter 161MHz to 1296MHz out £8 each. All items plus carriage. **Contact Brian Alderson, G3KJX on 01609 772702.**

(1) Yaesu FT726R Multimode Base Station.6M/2M/70CM.Boxed with mic. Nice condition. £540 ono.

(2) Small quantity of LNBs (Similar to Black Amstrad Type) converted to 10GHz. All tested on air! £10 each if collected (£15 if posted).

(3) Four 68-88 MHz (Low band AM mobiles) suitable for 4Meter convert? £60 the lot. Must be collected!(4) 50mm CCTV lense, yes 50mm!. Boxed. £10 collected £12 posted! **Contact Chris on 01782 869247. (After 10AM and before 10PM please)**

I have 2 computers for which I have no further use and which I am offering free to any interested member. One is a BBC computer complete with ST5C RTTY terminal the other is an ATARI STE. Both are complete with manuals, software etc. New owners to collect.

Contact Don Rankin Tel: 01844 346715, e-mail don.rankin@tesco.net

FOR SALE / EXCHANGE

Icom IC 290 E 10 watt 2mtr Multimode with mic and handbook. I would like to exchange this for a 23 CMS (Wothing, etc) transmitter and Linear amplifier or I am open to offers, if not £150.00 or offers for the radio. **Contact Neil G6UWI Tel 0191 4550781 or Email neil.bradshaw@southtyneside.org**

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Pluto video graphics unit, no details.

Vortex, Logo generator, Nice if you can figure out how to change the prom to say something useful! £20.00

Books for Sale

Tektronix handbook for 528-waveform monitor

Tektronix handbook for 1421 PAL vectorscope

Pye handbook for LDM 1911 picture monitor

Ikegami handbook for TM10-16 colour picture monitor

Ikegami handbook for TM10-19 colour picture monitor

Barco handbook for CM33 colour monitor

BBC handbook for AM7/512

BBC handbook for CD3L/531

Decca handbook for RU 4011 TV check receiver

** Items are only available to BATC members. Apart from the books items are collect only. Contact Brian Summers G8GQS QTHR Phone 01276 677879 0797 0417875

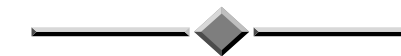
Wanted

Wanted: Philips N1460, N1500, N1501, N1502, N1512, N1520, N1700, N1702, Grundig SVR and Toshiba/Sanyo VCORD video machines. Any condition considered. Also wanted: Literature, tapes and spares for any Philips "VCR", "VCR-LP" or "SVR" format machines. Phone Mike G7TRF on 01395 274227, or email to mdb@permanent.co.uk.



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A viewfinder-magnifying lens for a Marconi Mk3.

Details (or drive) of external disk drive for Del Latitude Xpi portable computer.

Contact Brian Summers G8GQS QTHR Phone 01276 677879 0797 0417875

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Contact Derek GW6MLF. Tel: 029 2089 1508. (New Cardiff code). E-mail: gw6mlf@talk21.com

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Please note that the office will be closed from 11th Feb 2000 and will open again on 28th Feb.

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