CQ-TV 194

Contents

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Chairman's Column

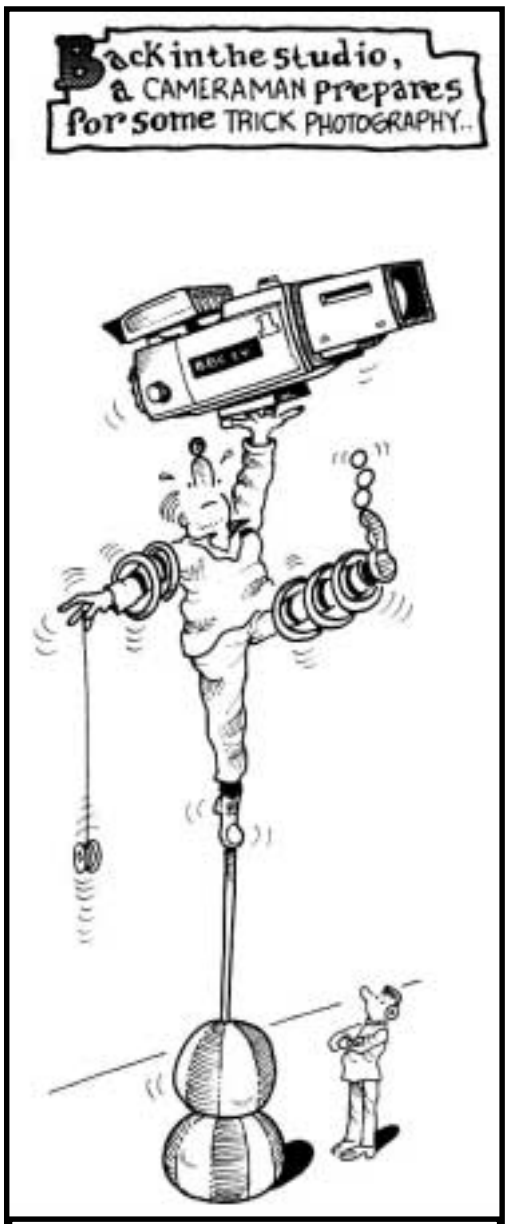
A lot has happened since CQ-TV 193, and not all of it is good. On the 16th of February Roger Jones G3YMK died of a heart attack. Roger was a keen ATV supporter and author of the ATV column in Radcom. I first met Roger when I was asked to attend a meeting at the RSGB to sort out 70 cms problems. Roger turned up under some guise or other to add his support to ATV. Only a few weeks later Alan Watson died. Alan was another keen supporter of BATC and served for several years on the BATC committee, but was probably best known for his efforts at providing P.A for all of our rallies. His engineering skills were brought to my attention at one of the hotel based rallies where attempts to connect one of the outside broadcast vehicles to the hotel mains had come to grief, as the heavy current supply provided terminated in a different socket to the vehicle plug. Alan looked into the problem and soon the OB vehicle sprang to life. It wasn't until some time later I visited the switch room, to find some dubious rewiring of the switch room bus bars which - I presume - he must have done with live bus bars. Alan died of an aneurysm - nothing at all to do with electricity. Both these two will be sadly missed by BATC.

The RA also sent me an email to draw attention the Radio Mic on page 30 of CQ-TV 193 (I had no idea CQ-TV was read in such high circles of power). They would like me to draw your attention to the fact that it can not be licensed for use in the UK.

I promised in the Editorial of CQ-TV 193 that in this issue we would start looking at the advantages of digital television, starting with PC editing of video material. I have never had so much email on the subject, from producing DVD's on CDR through to the merits of various PC video cards and software packages. This has helped no end in filling what is the most difficult magazine of the year. The idea of using a PC to edit television material together is not new, but is very demanding on PC hardware. As PCs get faster, the idea becomes more attractive. It removes all the need for vision mixers and digital effects machines, most of which are beyond amateur budgets, getting all the sources locked to an SPG and timed and - in the case of VT machines - time base corrected. I did some preliminary tests on my humble 500MHz machine and found the results very encouraging. With the Pentium 4 now on the market, with its faster memory access, things will only improve. I hope most of the articles speak for themselves and, with demonstration software freely available on several sites, this should find an opportunity for getting you feet wet in digital editing and CD creation.

Last, but not least, can I remind you all that our Rally will be again at Bletchley on Sunday May 6. I hope this magazine is on your door step before then, but its going to be a close thing. I hope to see you all there. At the time of going to press we are hoping to include a lecture programme, but as yet this has not been fixed, whilst if the local elections do not tie up satellite time we may again manage to link up with some of our overseas readers.

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



An image from 'The Dr Who Fun Book' by Tim Quinn & Dicky Howett. Target Books 1987. Cartoon by Dicky Howett.

Sue Miller, W9YL, SK

Sue Miller, W9YL, wife of Don Miller, W9NTP, passwed away on November 10, 2000 from a heart attack. Everyone in the ATV/SSTV Amateur Radio Community will feel the loss. Sue worked with Don to provide outstanding service to all of us.

Don says "She has always been suportive to my experiments on SSTV. She had been a ham since 1947. We were married in 1946 and she took the tests from Class B licence through the Extra class. Her picture was in several magazines when the Russians sent up Sputnik. I built a special antenna that had to be turned with a pip wrench. She was pictured turnung the antenna with the wrench. She was named the 'armstrong rotator'".

All of us at ATVQ send our sympathy. We will miss seeing her smiling face at hamfeste. God be with you.

From ATVQ, Volume 14, No. 1, Winter 2001.

A Few Thoughts on Video Editing – Both PC and Linear

By Mike Cox (el presidenté)

In June 1996, I was offered the chance of buying one of the first DV camcorders, a JVC GR-DV1 at a price substantially below that charged by Dixon's, and it came with 3 batteries and a grip to carry 2 batteries – which greatly increased usable shooting time.

At this time, the only editing I could do was to copy to the household S-VHS machine.

At IBC that year, my colleague in the Message Service had a Sony DHR1000 full size DV VTR so the potential of the DV tape format was amply demonstrated.

PC Based Editing

I also acquired, originally on loan but subsequently purchased, a DPS Perception system. This is a PC based system, consisting of a card that plugs into the PCI bus slots, and some driving software. The system relies on a separate SCSI hard drive to store picture files on. (Figs. 1 and 2)

At the rear of the card are two 15-way D-Sub connectors to which break out leads are connected, and a SCSI 50 pin connector.

The system can take in either composite, Y/C (4 pin MINDIN) or analogue component (Y, Pb, Pr), and it can output the same. A reference input is provided so that the playback can be synchronous with the system.

The card also has a SCSI port on its edge so an internal drive could be connected.

I had commissioned a PC to be built for this card, running Windows NT and in a tall tower case with plenty of space for extra drives, CD-ROM readers and writers. For the first IBC, the system was used with an external SCSI drive that was loaned by Aston. After the show, I got a 9.1 GB SCSI drive and fitted it in the tower case immediately under the system SCSI drive (4.7GB).

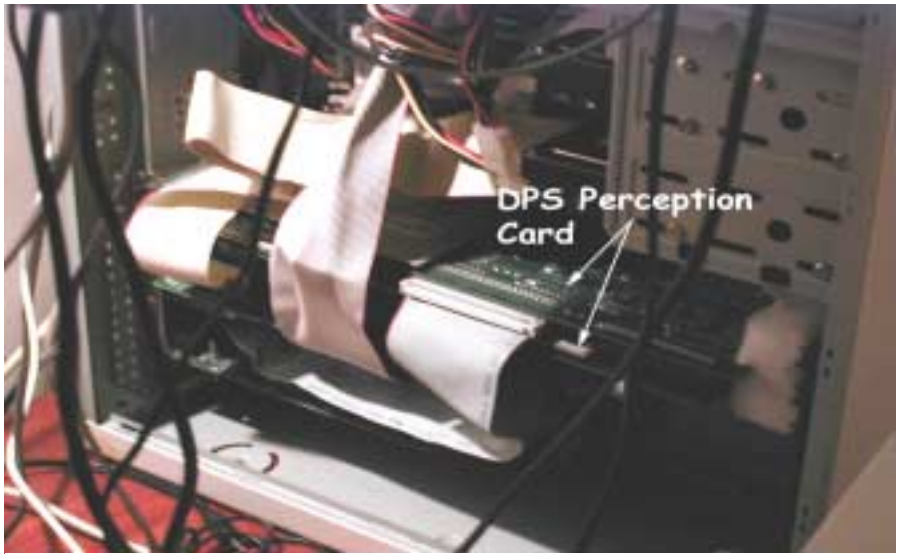


Figure 1

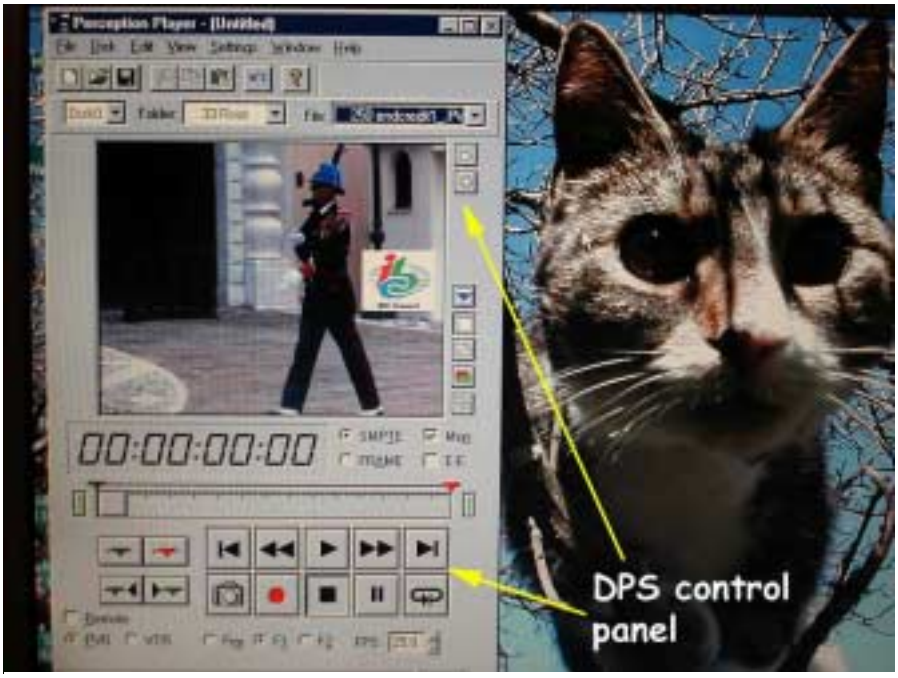


Figure 2

BIG MISTAKE!

I discovered that SCSI drives run hot, and the A/V drives that are specified for the DPS system run very HOT!

On the second day of IBC99, the picture output got jerky. Now the DPS system has a nice feature, which is a disk test facility (Fig. 3) that displays the Megabytes per second transfer rate from the disk over the disk surface. If this falls below about 6MB/s, jerky pictures result, as the system cannot get files from disk quickly enough. On invoking this test, the trace showed severe dips in the transfer rate. Attempts at increasing the cooling proved fruitless, and the next day no pictures could be accessed. The hard drive was no more! The DPS Dutch agent got me a replacement 4.7GB drive which got the system going again, but with only 15 minutes of broadcast quality recording time.

After the show, the DPS office in Farnham kindly gave me an external SCSI case, which would take two drives. Acquisition of another 9.1GB drive was a useful boost to the system, with a total recording time of 45 minutes.

However, fate - or whatever looks after computers - had not finished with me yet.

Some weeks ago, on turning on the computer, an error message appeared with one of those "can't find file xxxx.dll" or similar, and NT would not boot up. Back to the repair disk and the NT CD-ROM, without much joy. Luckily the man who built the original machine for me is still in business and he was able to recover all the system files from the hard drive and install them on a new 9.1 GB drive.

This seems to have to been a relic of the overheating problem that caused the A/V SCSI drive to fail, particularly as this failed drive was on top of the A/V drive.

The DPS system has some limited assemble editing facilities built in, and these can be very useful. A series of short clips can be put into a playlist (*.PLY files), and played out.

Sound in the DPS system that I have is handled using the PC's sound card. So the corresponding audio is saved as a *.WAV file on the system drive and marked in the *.PLY file. It seems that on my version of the DPS system, there can be a time shift when the playlist goes from one clip to another, and so a progressive loss of lip sync occurs.

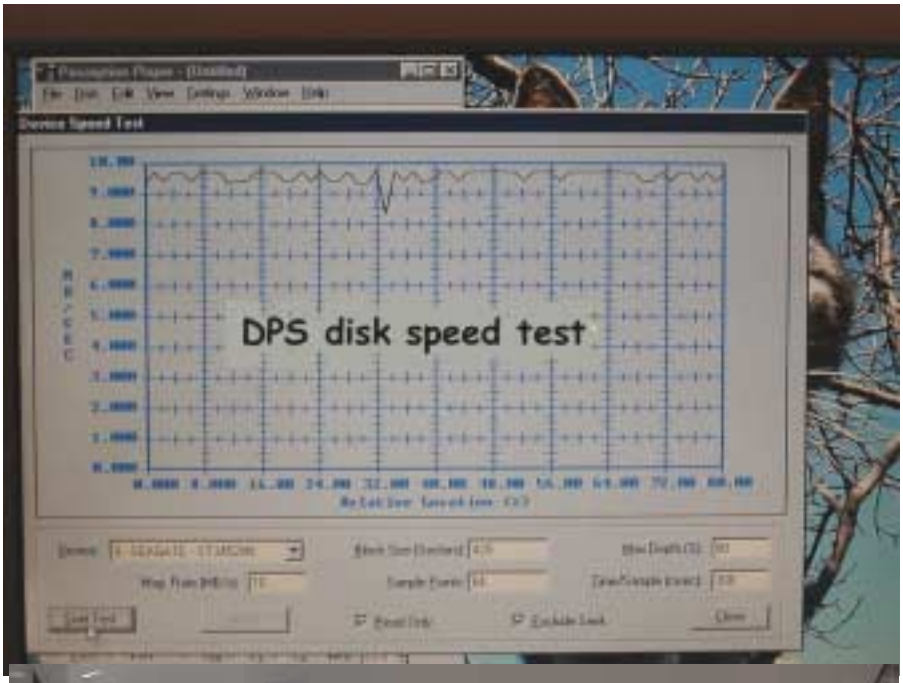
So far I have not got to the bottom of this.

Top - Figure 3
Centre – Figure 4
Bottom - Figure 5

Linear Editing

In parallel with the PC editing activity, I bought a Sony DHR1000 full size DV VTR, and a little Sony machine, GR-D300 (that is the one without the LCD display). (Fig. 5)

Connecting the machines together via the IEEE1394 (FireWire or I-link) cable and the LANC cable makes for an excellent edit pair for simple cuts-only editing. Because transfer is digital, copies should be perfect. However, if there is any thing else to be done such as adding titles, or voice over or music, then a trip back to the analogue domain is necessary. It is then that the snags start to appear.



The audio output level on the DHR1000 is around +10dB for a recording level of 0dB.

The GR-D300 has an output level of +4dB.

How can I be so sure, you ask? I have found that found that to do decent editing, you need continuous time code on the tape. This applies even if you transfer clips to the PC.

Accordingly, every tape I use is striped, that is has 20 seconds colour bars, 10 seconds multiburst, 10 seconds of ramp followed by a 10second countdown. The first section has continuous 1 KHz tone on one channel, and switched 1 KHz tone on the other, with tone pips every second during the countdown section. After this, the rest of the tape is filled with colour black and silence, ensuring continuous time code when the tape is put into a camcorder.

This whole sequence comes from a modified COX 2085 Test Generator (left from a previous existence!) at a single button push. (Fig. 6)

Hence at the beginning of most tapes, there is a video and audio level reference that can be used for checking the system levels.

To solve the Sony problems, resistive pads have been made up to correct the level.

Titling

Three methods are available; Adobe Premiere is installed which can work with the DPS system (when I have mastered it!) and has a titling capability, Adobe After Effects is also installed and is used with Adobe Photoshop, and there is a Vine Micros VineGen Pro that is a scan converter and keyer. Each of these has its place in the scheme.

Adobe After Effects, to those not familiar with it, is an amazing program for creating animated title sequences for use at the beginning and end of programmes. The start point is a Photoshop picture, created with a 720 x 576 pixel image size. This can be pictures, or text or a mixture, with each element on a different layer. The image is saved as a Photoshop .PSD file and imported into After Effects. After the

Top - Figure 6, Centre – Figure 7, Bottom - Figure 8

Figure 9

total time for the sequence is set, each layer is then brought down into a time line and can be manipulated independently. Rotation, opacity, and position can all be changed on a frame by frame basis, and when completed, the sequence is rendered and stored on the DPS hard drive as a Targa sequence (.TGA). It then has to be played back from DPS as Y/C for recording on one of the DV machines, or used as a clip in Premiere.

The VineGen system uses the SVGA output of a separate PC (my laptop) as the title source. (Fig. 6 again) Powerpoint (tmMicroSoft) is used as a complete caption sequence, and can be prepared (on another PC if necessary) and stored ready for conversion to video in the VineGen. As this unit is a keyer, Y/C from one of the VCRs, or from the DPS is used as the input.

The use of Powerpoint is very flexible, as a variety of fonts and sizes are available to you, pictures can be imported as background, and operating is as easy as pressing the space bar to change caption. There is also a fader panel, which allows fading in and out of the keyed title. If black slides are inserted in the Powerpoint sequence, then a succession of titles can be keyed in down the complete programme, with appropriate gaps. It has been useful to have a monitor with safe title area graticule to check that titles are not going over the edges. It pays to use as large a font as possible so that your titles can be read. We have all seen lists of credits in tiny writing rushing up the screen – totally illegible!

Again, there are some snags: - the VineGen has a small gain increase and a small luminance-chrominance delay error, and the video response falls a little. So it might be wise to do all the titling jobs in one pass.

Audio

The audio system has a home-brewed stereo audio mixer with 3 stereo high level inputs, a mono mike channel input, master fader and twin PPMs. An Auxiliary input takes the tone output from the 2085 TSG for line-up. One of the input channels has a foot operated dim facility, useful for voice over work when the main audio level has to be dropped a few dBs.

Recently a new problem showed up after a cuts-only edit on a tape of around 15 minutes. The material was shot on my Canon MV200 camcorder, and on a friend's Sony PC100. All seemed alright, but the audio level was uniformly low, chiefly because we were using the camcorder's microphones and were shooting where we were, some way from the sound source. On close listening to the tape, I

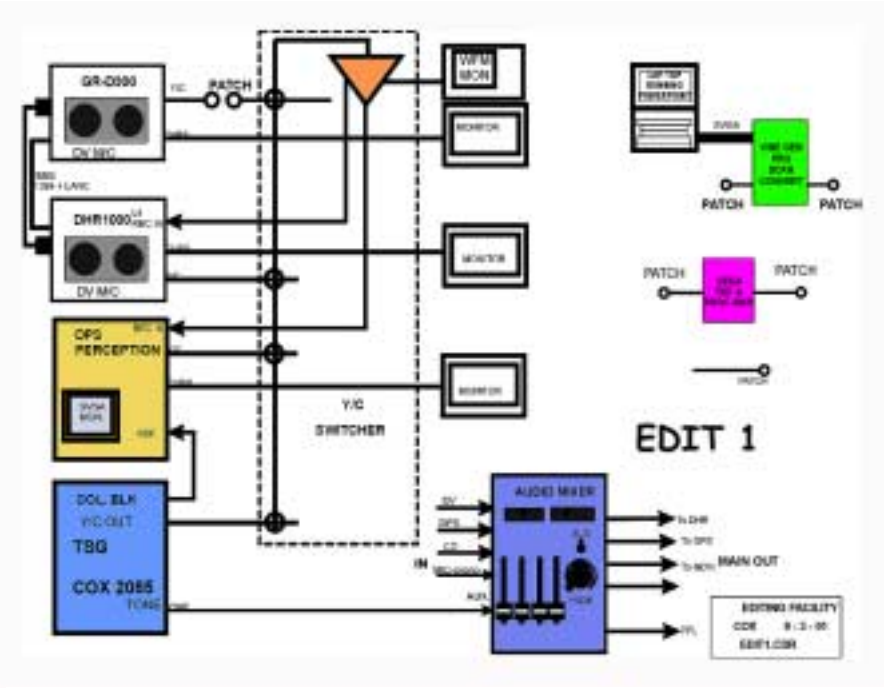


Figure 10

became aware of clicks at some edit points, but not all. All edits were done using the two-machine set-up in the FireWire mode. I took the tape over to John Holton who has a more sophisticated DPS set-up, including a SonicWave audio editing program. When we examined these clicks, they were enormous – in digital terms probably from 0000 to FFFF. Fortunately, the package managed to remove them, and to bring the audio level up to acceptable levels.

Compatibility Issues

This may be part of the audio problem mentioned above, but there are some major issues of machine compatibility with DV. It is not only at the domestic camcorder level according to reports I have had. My Canon MV200 developed a problem during IBC when its tapes became unplayable on the Sony GR-D300, and not too good on the DHR1000. The effect is jerky pictures and wildly broken audio.

I should take the machine back for a warranty repair, but how to explain the fault to the average sales assistant in Dixons where it came from. The fix is to play the tape back in the camera connected to the DHR1000 via the FireWire link. There is then a usable dub of good quality for editing. The camera tape can then be re-cycled.

This is making the assumption that my DHR1000 is OK. But when a friend came over with a recording made on the Panasonic large DV machine to put some titles over, the titled dub we made on the DHR1000 would not play properly on his Panasonic or his Sony GR-D900 or his Sony TRV900 camcorder. Any clues will be gratefully received.

A further worry was when my friend's Sony Camera failed to recognise the DV out from the DHR1000, but it recognised the output from the GR-D300! I then connected the FireWire lead into the Sony Vaio PC, which has FireWire in and a simple edit package. The DHR1000 output was recognised and the Vaio screen controlled the transport.

Editing Discipline

Tape logging is essential if you are to make life easy for yourself. Once you have listed your material, you can begin to tell the story. It is usually then that you realise you need more of a particular scene, and you have to use all your ingenuity.

All my tapes are numbered, striped (as described earlier) and logged in a small notebook.

The Mini-DV tapes (up to 60 of them) fit into a standard box file and take up little space. (Fig. 9)

Conclusions

Editing is great fun. But it can be very time consuming; and not a little cash consuming as well. Be prepared to tear your hair out, keep a wax effigy of Bill Gates and some pins handy (for when the 'blue screen of death' appears), and have a go.

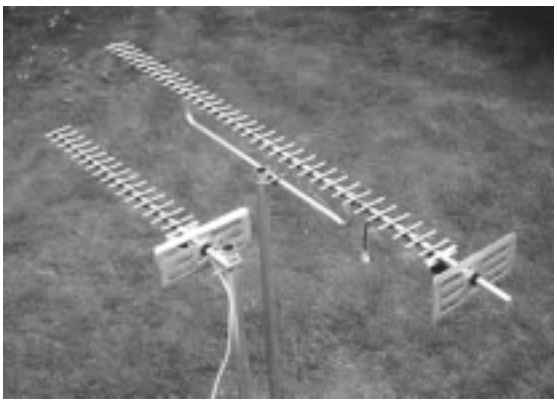
Despite the hair and temper loss, you will eventually get a result you can be proud of.

I have moved over the years from building the camera, to using one and attempting to put together a simple programme. It is good fun.

Good editing.

The 'Parrot Farm' – picture from Brian Summers

Severnside Television Group



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In Retrospect

CQ-TV 193, FM Radio Mic.

Dear Mr Smith

The Agency's attention has been drawn to your article in the February 2001 edition (pages 30/31) of CQ-TV 193 in relation to the stated frequency of operation: 88 - 108 MHZ.

The frequency band 88 - 108 MHZ is exclusively allocated to the FM radio broadcasting service and is therefore not available for radio microphones. The available frequency bands are set out in the Agency's Information Sheet RA114 and the technical requirements are contained in UK Interface Requirement IR 2030. Copies of both of these documents can be found on the Agency website www.radio.gov.uk.

I note that according to your article the radio microphone you constructed had a range of 88 - 100 metres. Consequentially there is the possibility that when used it could interfere with radio reception in the immediate vicinity and the Agency might receive a complaint. You may therefore wish to note that any use of the 88 - 108 MHz frequency band other than by authorised broadcasters constitutes an offence contrary to section 1 of the Wireless Telegraphy Act 1949. Agency staff are empowered to seize any equipment used contrary to the Act.

In view of the above you may wish to take the opportunity to issue a correction advising readers of the correct technical requirements for radio microphones.

Please let me know if you require any further information.

Yours sincerely

Derek German
Enforcement Policy Manager
Radiocommunications Agency.

YOUR HELP NEEDED!

In many parts of the UK the 2-meter band appears heavily populated and few free frequencies or channels seem to be available. On the other hand there must be many areas where it is quite easy to find spare space.

With the advent of PC based SSTV systems and the introduction of SSTV relay units such as MB7TV (see article on pagexx) we need to find some frequencies to use in addition to the 144.500 existing recognised SSTV calling frequency.

So my questions are:

1: which 2 metre frequencies are used in your area for FSTV talkback?

2: do you ever hear any ATV activity on 144.525 that is listed as ATV talkback (SSB)?

3: where is the SSTV activity taking place in your area?

4: is there any/much activity on 144.700 or 144.725 in your area? If so what?

A quick email response to g3vzv@amsat.org would be mush appreciated so that the BATC can give some much needed guidance! Thanks for your help. 73s, Graham G3VZV

From the Internet

Ian just got your reply! Thank you for responding. My repeater is on split bands here in west Texas - Its in put is 439.125 and the output is 911 MHz fm. Its been getting some interference from the 900 MHz Cell phones but I'm getting a amplifier with 30 watts out put .now this Will be able to duplex by going in on either of the bands just unable to Transmit on same bands the 70 cm is 100 watts out put and the 911 is Going to have 30 watts! It's a p.c.i. produce and I've used just the Transmitter of 1 watt and it does really well with a good antenna system Right now I'm still trying to find a location to place it but have gotten One offer but its crammed with other commercial gear ,but i do have a Place I've been talking to for a building here about 500 ft or so but have Not gotten a reply yet from the committee yet as they ha vent meat for This month Would love to get it on "cq-tv" magazine but i need to get the bugs worked Out so that i will be able to send you guys pictures or a good write up On this thank you for your interest and best of 73 to you guys in Britain

Marcus, Pacheco, n5omv

Capturing and Encoding for VideoCDs

By John Schlichther

Okay, you've decided you want to make a VideoCD. Maybe you've taped a family get-together, and want to make copies for the participants, or maybe you want to distribute a presentation for your business. Here's how to get started. (Be sure to also read the first two articles in this series: "Introduction to VideoCDs," and "Hardware for Making VideoCDs," published earlier in the newsletter, and available on Roxio.com at: http://www.roxio.com/en/interest/video/index.html

The first step in producing a VideoCD is getting your video into your computer. There are many possible sources of video: videotapes, television broadcasts, computer generated animations, etc. In the case of television broadcasts, you may be tempted to first record the broadcast onto videotape, then later, when it is more convenient, capture from the videotape into your PC. However, it's best if you can use a higher quality tape format like DV (digital video), SVHS, or Hi-8 VCR to preserve image quality. Standard VHS (and 8mm) VCRs and camcorders generally have poor resolution and can introduce random video "noise" into the picture, which will adversely affect the quality of the resulting VideoCD after compression. If possible, you should try to directly capture broadcast television to your PC without taping first.

Capturing from DV

If you are lucky enough to own a DV camcorder, you potentially have the simplest, high quality means for importing video into your PC. In order to directly read the DV video into your PC, you'll need a 1394 port (also referred to as FireWire or iLink) in your PC. If your PC did not come with a 1394 port, there are relatively inexpensive 1394 port cards that can be added. These 1394 ports do not perform any conversion on the video coming from your PC; they simply allow you to transfer the digital video data already stored on your videotape to a file on your PC. Beware; DV is approximately 3.9MB per second, so a 2GB hard drive will only hold about 9 minutes of video! If you don't yet have a 1394 port on your PC, but you have an analogue capture card, you can still use that with your DV camcorder by connecting to its analogue S-video or composite video jacks.

Capturing through an analogue capture card: If you're using anything other than a DV camcorder, you'll need an analogue capture card. These cards connect to your camcorder, VCR, or other video source using the same kinds of cables you use to connect to your TV for playback. These have three RCA-style connectors at each end, one for video, and two for stereo audio. You may also be able to use S-video cables for better quality if both your camcorder and capture board have S-video connectors. Follow your card's directions to capture video. You will typically have to make several settings before beginning:

Capture size: You will be asked to set the resolution at which you wish to capture the video. VideoCD requires video dimensions of 352-by-240 pixels for NTSC (North America, Japan, etc) and 352-by-288 for PAL (Europe). Set your capture card for this resolution if you can. If not, most video editors and MPEG encoders can adjust the size after capture, though it is best to get it right at the start if your card can do it. If not, then try settings of 320-by-240 NTSC, or 384-by-288 PAL. You can also try 640-by-480, 704-by-480 or 720-by-480 for NTSC, and 704-by-576 or 720-by-576 for PAL. These larger resolutions will be harder to capture because of all the extra data and your PC may be incapable of capturing them at the full frame rate (see below). In general, try to capture as close as possible to 352-by-240 (NTSC) or 352-by-288 (PAL). Experiment with your settings to get the best results.

Capture frame rate (in fps - frames per second): The capture rate needs to match the video: 29.97fps for NTSC or 25fps for PAL. (Note: Some older analogue capture cards may not very good at capturing at the exact rate. For example, you might set it for 29.97 and actually get 29.85. If this happens it may be fine, but you'll want to check your captured video for "lip sync" drift, where the audio gets out of sync with the video).

Capture bit depth: The bit depth refers to the number of colours possible for each pixel. The more colours, the better. Use 24- or 32-bit colour depth (millions of colours).

Compression codec: For hardware compression boards, you should generally select the board's native codec (compression method) for best results. For capture boards without compression hardware (that use the CPU to do the actual compression), you may have a large selection of codecs. Refer to your board's directions here. We will convert to MPEG-1 (VideoCDs codec) later.

Compression quality level: Use as little compression (highest quality mode) as possible for best results. Of course, the less compression you use, the more disk space required for each minute of video. Try to set the compression level so that the resultant data rate is approximately 2MBps or higher for 320-by-240 to 384-by-288 video, or 4MBps or higher for full-resolution (640-by-480 or larger) captures. As a general rule, a compression ratio of 4:1 or less should not introduce significant visual artefacts (jaggies or distortion) into the video.

It's important when judging the quality of the resulting VideoCDs that you do so on the equipment you intend to view them on. If you're making VideoCDs for playback in consumer DVD players, then you should judge the quality on your TV, not a PC. PCs have much sharper, higher-resolution screens than any TV (other than HDTV) and will show even minor imperfections that would be very hard to pick out on a TV.

Audio bit depth: You should have a selection of 8- or 16-bit sampling. Use 16-bit, which is higher quality, and matches the MPEG audio depth.

Audio sample rate: For VideoCD, you should select 44.1KHz. If you don't, you'll have to resample the video file either in a video editor, or in the MPEG encoder (if it is capable of it). Bear in

mind that if you resample audio later, some software has difficulty re-sampling audio and maintaining audio/video synchronisation.

Audio channels: VideoCD requires stereo. If you capture in mono, your editing software or MPEG encoder may or may not be able to convert it to stereo.

Capturing DV through a 1394 (aka FireWire or iLink) card: One of the great things about DV is that there aren't very many settings to worry about when capturing to disk. The capture resolution, frame rate, colour depth, audio settings, are all fixed by the DV tape format. You just want to copy the digital data on your camera tape to your disk drive.

Should you use one big capture file or many small ones? If you are trying to edit a one-hour videotape and hoping to come up with 15 to 20 minutes of finished video, you have a decision to make. Do you capture the entire hour of video to one big capture file, or do you create many small capture files, each with a separate scenes? Unless your capture card supports AVI files that exceed the VFW (Video For Windows) limit of 2GB, your decision is probably already made for you. If you are capturing with a data rate of approximately 2 MBps, 2GB will hold approximately 16-17 minutes of video. Higher data rates will result in even shorter times. Either way will work, since you will still have to use a video editor to cut and paste together the portions of video you wish to be in the final production. The advantage of a single capture file is that it is significantly less work to just capture the entire hour at one time. There are also capture utilities that can be set to capture to multiple files automatically, switching to the next capture file as the last one reaches a set size limit.

Creating the Final Video

Using a video editing application, such as MGI's VideoWave, Ulead's VideoStudio, Adobe Premiere, ArcSoft's Video Impression, or Pinnacle's DV Studio, you can either generate an output file (in AVI or QuickTime format), which can then be encoded by a standalone MPEG encoder. Some video editors can utilize plug-in MPEG-1 encoders. Using these plug-ins, you can directly generate a final MPEG-1 file ready for recording to VideoCD. This can be helpful if you wish to generate a single MPEG-1 file which will constitute the entire video, since using an intermediate video file may restrict you to the 2GB file size limitation. Alternately, you can create several separate video tracks, each consisting of a single scene. Each scene could then be separately encoded to MPEG. Each MPEG scene would then be recorded as a separate video track. The disadvantage of separate tracks is that they do not play back smoothly one after another. Most DVD players will pause briefly between tracks, for one to three seconds. Some players simply freeze the last frame of the last track, while others display black during the pause.

MPEG encoding: One of the easiest places to make a mistake while attempting to produce a VideoCD is in the MPEG encoding stage. MPEG-1 is not a rigidly defined standard. There is a wide variation in the parameters that can be used to encode MPEG. The total data rate, the size of the video in pixels, the audio parameters and so on, can all take on a wide range of values and still be legitimate MPEG. VideoCD however, is a rigidly defined subset of the MPEG-1 standard. This rigidity was intended to make it simpler for VideoCD playback hardware to be designed and manufactured. Somewhat simplified, the "White Book" standard for VideoCD 2.0 MPEG-1 files is as follows:

Video Size, one of:

- NTSC - 352-by-240 pixels at 29.97fps
- PAL - 352-by-288 pixels at 25fps
- FILM - 352-by-240 pixels at 23.976fps

Audio:

- Layer - 2
- Sampling frequency - 44.1KHz
- Bit depth: 16 bits
- Bit rate - 224Kbps
- Mode - stereo, dual-channel, or joint stereo)

Multiplexing:

- Data rate - 176,400Bps
- Sector size - 2,324 bytes

Most MPEG-1 encoders have a preset for VideoCD, which automatically sets all the parameters correctly. Be careful, not all MPEG encoders that claim to be VideoCD-compliant generate true VideoCD-compliant files. Symptoms of non-compliance range from major (the VideoCD authoring package you use refuses to accept the MPEGs at all) to subtle (audio/video sync drifts, an incorrect time indication on your DVD player, inability to fast forward or rewind the video properly, etc).

Many commercial MPEG encoding tools are available. Some freeware encoders can also be found on my Web site, at http://www.mnsi.net/~jschlic1/

Depending on your PC, and the MPEG encoder you use, you can expect it to take anywhere from two to 60 minutes to encode each minute of video. This part of the process normally takes a great deal of time using a software-based encoder. Some hardware compression cards can encode faster than real time, but these are very expensive-too expensive for casual users.

This article was originally printed in Roxio's CD-R newsletters, delivered free to subscribers' e-mailboxes weekly. For more information and to subscribe, please see https://www.roxio.com/en/jhtml/subscription/newslettersubs.jhtml.

Update

Roxio have just released a new version of EasyCD Creator. The 'Platinum' version has muh improved VideoCD creation abilities. It also has updated video editing software. An article titled 'Video Made Easy with Creator 5 Platinum' can be downloaded from their web site at https://www.roxio.com/en/jhtml/subscription/newslettersubs.jhtml

The MATRIX – A versatile switching solution

By Geoff Mather G8DHE

Introduction

Over the years since the introduction of video repeaters, the complexity of both repeaters themselves and the average station has increased dramatically. Originally we often only had a couple of video sources, perhaps a couple of monitors and a single transmitter to worry about and the linking between these devices could be handled with no more than half a dozen cables. In contrast a recent count of sources and sinks in my own shack totalled 15 sources and 18 sinks for video alone: several of these had matching stereo sound sources as well.

Our repeater site (Worthing Video Group - GB3VR-GB3RV) has a planned 20 video sources, 11 video sinks, 13 audio sources, 11 audio sinks, 17 data sources and 11 data sinks. Which has lead us to the inevitable conclusion that we have a SWITCHING PROBLEM!

What do we need?

In asking around the local area, I have decided that we all need something slightly different. Also that no matter what we think is large enough now, in a couple of years time we will come to the conclusion that it wasn't quite right either in size or shape. So the first requirement is a flexible size of switching array, and more than a single array is required in order to meet all requirements.

The next question is how should it be controlled? A simple keypad is nice, but it doesn't lend itself to the more complex re-arrangements that are sometimes required.

Obviously some form of memory capacity would allow rapid switching between defined states, but there is a limit to the number of memories that can be stored or documented so that we can choose between them. So a more complex driving device will be needed in some situations, but that shouldn't be at the cost of a simple interface.

For use on repeaters then remote computer control is a definite requirement, so some form of serial or parallel interface is needed to allow interface to the existing controlling computers.

Switching Structure

In looking around the possible devices that would allow switching of both video and other types of signal sources it became clear that there were two main choices. First the common form of multiplexer or crosspoint switches, typified by the Maxim range of devices, which give great flexibility but some rather significant challenges when it comes to controlling more than a few devices. The second are the dedicated switches from the likes of Mitel who have a great range of sizes but a price range suited to the professionals! Also the number of current devices that work in analogue mode rather than using digital streams is now beginning to become a problem. The devices most suitable that I have discovered are those intended for domestic TV source switching such as TEA5116, TEA6145 etc; however, they have a limited number of sources and again a difficult mode of control if you need to use several devices in an array. My final choice came down to the Philips TDA8540 device which is an I^2C controlled device with 4x4 crosspoint and buffering; however, even this has an apparent limit of seven devices, which would not be sufficient to handle the envisaged size without some extra help, which is now – fortunately - available.

Implementation

The design has finalised on a PIC 16F873 processor, a two-line LCD display, Hex keypad, serial interface and an 8-bit I/O port. The processor board also has 2Kbytes of CMOS EEPROM for memory storage. The interface to the switching matrix is via an I^2C bus and to enable the use of more than 7 TDA8540 devices, the I^2C bus is multiplexed via a number of PCA9544 devices that allow one bus to be expanded to 4 buses. The overall block diagram is shown in Fig. 1.

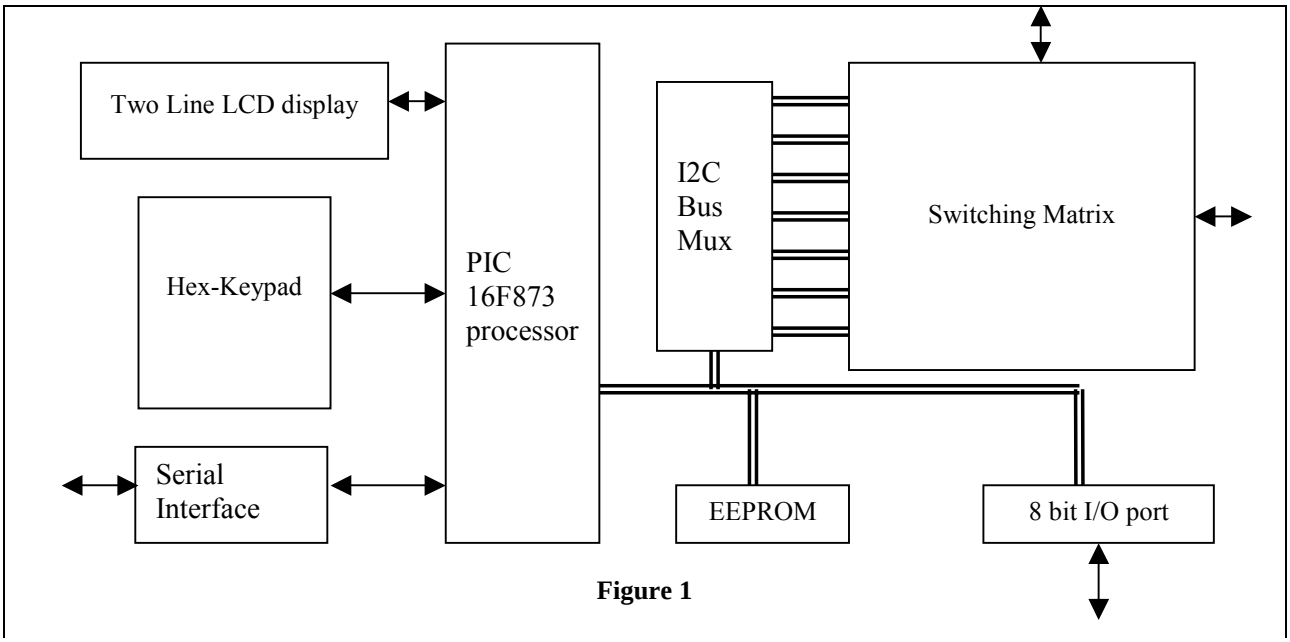

Figure 1

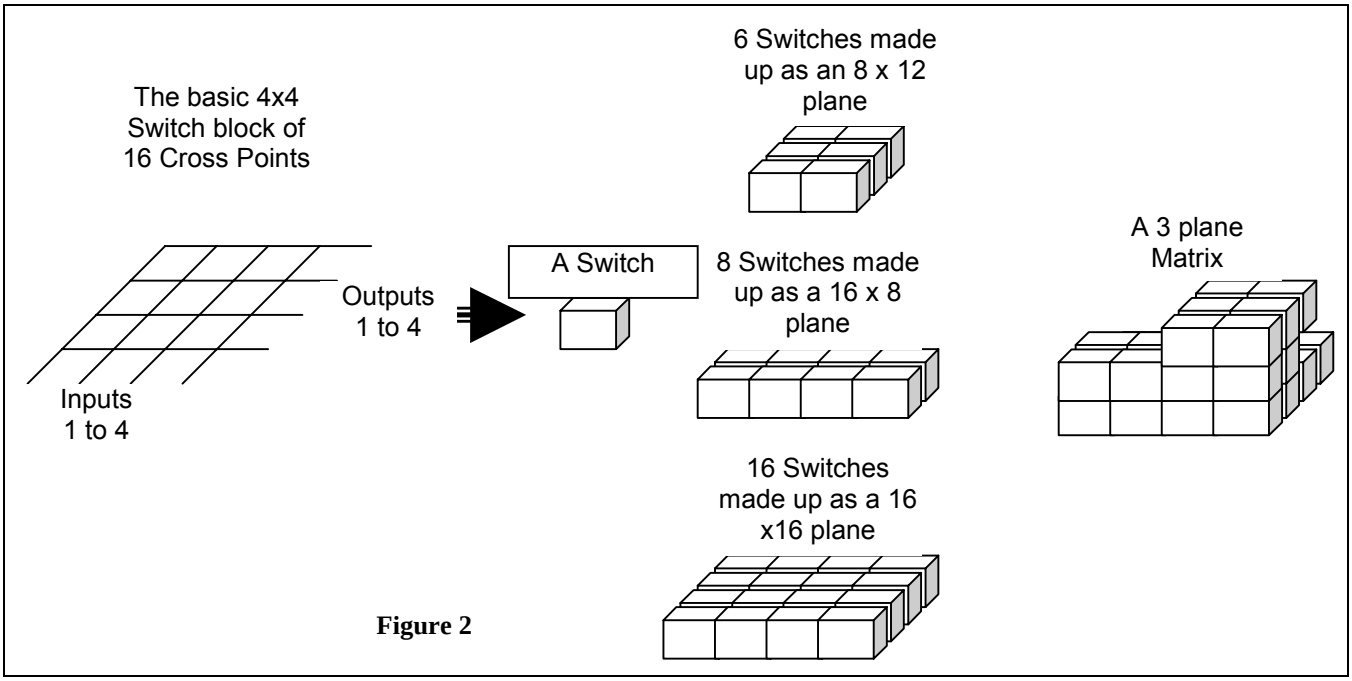

Figure 2

The switching matrix itself has been designed to be very flexible, with the software taking the strain in terms of the shape and number of independent switching planes, Figure 2. Shows the way that the switching is implemented.

In the current design the overall limits to the size and shape of the matrix are;

- There cannot be more than 224 (4*4) Switches in the entire matrix.
- No single plane can have more than 100 inputs or 100 outputs.
- That there cannot be more than 186 outputs across all the planes if the full complement of 10 memories is required.
- A maximum of 10 planes.

Progress

To date a prototype of both the controller and switching matrix has been constructed and the software is being developed at the present time, Feb. 2001, see Figure 3. The controller board will be identical for any size of switching matrix, and possibly the basis for a number of other projects as well.

The actual switching matrix has been designed around a basic board size of 16x16 I/O's but the board need not be fully populated and can be cut down if necessary. Multiple boards can be used either to extend the size of a single plane or to add additional planes to the matrix.

A kit?

If there is sufficient demand then it is possible that a kit will be produced. However as the boards use surface mount devices, I am not sure at this stage if sufficient people would be interested, as many builders seem to be put off rapidly when it comes to using SMD's. This has been my own first experience of using SMD's in any quantity and I have not found it to be a massive problem (despite using varifocal glasses!).

Given the flexibility of the design it is not practical at this stage to give any firm cost figures, other than to say that the target price is between £100-£200 for a 3 plane 16x16 matrix.

Another factor is the availability of the Phillips PCA9455 I^2C Bus multiplexer devices; these are a fairly new device that seems impossible to source via any of the UK or European distributors. American sources are available, but seem unwilling to ship to the UK; time to find a W* colleague (or anyone else!) to assist I think?

Demo at the BATC rally

It is hoped that the prototype will be on display on the Worthing Video Group stand in May, where you can register any interests in a kit.

Geoff Mather G8DHE
Email:geoff@g8dhe.cix.co.uk

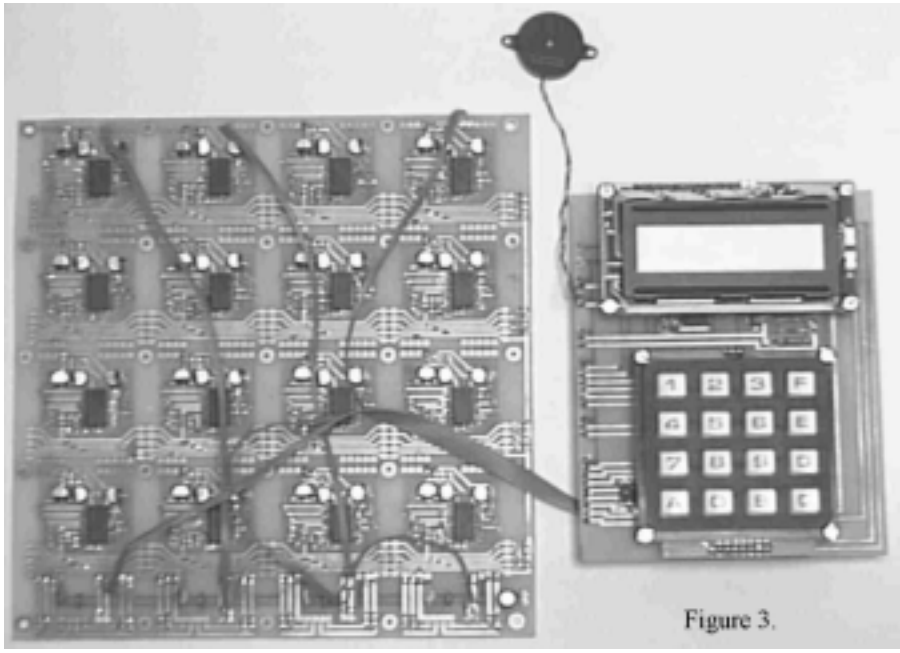

Figure 3.

Subscription rates

By the Membership Secretary

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

Please note that the '**Surface'** rate covers postage within the EEC, airmail rate is **not** required.

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. Also, we have a web site devoted to the CQ-TV magazine at www.cq-tv.com

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 either by post or via our web store.

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- *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.

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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@cq-tv.com

PC Video Editing

By Trevor Brown

For some considerable time I have been thinking about expanding my home VT editing suite. I have at the moment two VPR2's and an Aston caption generator along with a small Marconi vision mixer. This enables me to perform cut edits and create and superimpose captions. To expand this to a third VPR and add digital effects was my ultimate aim, but then I started wondering about importing video into my PC and using VT editing software.

Video is very demanding on a PC and so, if you are still in the 486 era, you will need to seriously update your PC. A 500MHz-processor speed is a must and a 1 GHz would be even better. Ram sizes of around 125 MB to 256 MB are also a must, along with a second hard disc to keep the video clips on. This disc will need to be able to capture video at speeds of around 4MB per second or more, depending on the amount of video compression the capture card applies. This will take you into Ultra 66 or even Ultra 100, so make sure your mother board supports this technology before installing Ultra hard drives. I have a 450MHz AMD processor and 125 MB of ram and, as yet, no second hard disc, but it was enough to venture forth and evaluate a possible system.

I visited the Adobe site and down loaded a demo version of Premier (http://www.adobe.com). This is a 16MB download, so with a 56 k modem you will be on the phone for about an hour. Choose your time, off peak, weekends, or from work, I think the saying goes.

This demo package will not let you capture or save video, so you are down to cutting demo files that are included. It is enough to get a feel for the software, and see if your PC is creaking.

The opening screen (fig 1) will provide two picture monitors and a time line display, Once a file has been loaded it can be 'drag and dropped' into the timeline editing part of the screen. The razor blade can be used to cut up files and remove sections. The time line can be viewed by scrubbing (moving the pointer provided across a file). If you want a transition then you have to create an A B roll that consists of an overlap of clips. Transitions can be viewed by double clicking on one of 76 options in the window /option. When you have made a choice, it can be 'drag and dropped' into the transition time line and should fill the overlap between the clips.

Figure 1 shows a caption set to fade in and out, two video clips with a transition and a sound track with fade out. The mauve bar sets the preview and the scrub pointer can be seen along with Transitions menu PV and TX monitors.

Captions can be created using the file/new/title option; you will be presented with a simple to use caption generator that will let you select fonts, colours and backgrounds. You can also 'drag and drop' a picture from the PV monitor to use as a background to help position the caption. This picture is not part of the stored caption. The caption can then be added to the time line, and can be keyed in if necessary. The keys can be found in clip/ video/ transparency/ and include the popular chroma key.

Scrubbing will not preview transitions or keyed in captions. To achieve this you need to select the preview section with the purple bar at the very top of the display and select project/preview. This will take time - called rendering - while the PC constructs the necessary frames needed for the effects and superimpositions.

There is more to this versatile software than can be covered in the space available here. It includes tools for dealing with pictures with sync sound, locking tools for sound that has been put in sync, sound and picture fades and creating an EDL to guide an on-line edit. Most of the keys support help legends, so if you are prepared to spend a little time fumbling around, you will get to grips with it. If you are not, then Anthony Bolante's book 'Premier' is recommended reading and can be found at PC World for £15.99.

Fig 1 shows a caption set to fade in and out, two video clips with a transition and a sound track with fade out. The mauve bar sets the preview and the scrub pointer can be seen along with the transitions menu, PV and TX monitors.

It took me some time to adapt to time line editing; (I spend my working life operating professional on line edit suites). I liked the graphical display and found it particularly good for rippling the edit list, which is a function required in an on line edit suite to add additional material in a place other than at the end of a programme. The film leader which replaces the traditional egg timer in Windows was novel at the start, but did wear me down with its frequent appearance on my 600 MHz AMD. I found this most annoying in the title maker. I have not yet mastered flying captions in or changing the size of a picture and superimposing it in the background. This may be me wanting too much from the software, or it could be that I need more time playing with this software package. The biggest downside you will not experience from the demo software, but the files you have been making and would like to save (if the demo software would let you), are just cutting lists. To export the finished item you have to compile a single file that can be played in real time. The time required for this compilation can be considerable depending on your PC, the length of the cut item and the number of effect that require rendering. If you still have time on your hands, you might like to look at another software package - again a demo version that works for 30 days is available, but this time it is 35 MB, so I hope you have the net on your 'Family and Friends' list. http://www.ulead.com is the site; let me know which you prefer.

The next step involves spending money in the form of a video card and importing some video to work with. A look at http://dvguide.sharbor.com/head-to-head/ is the best place to compare prices and weigh up the demand each card puts on your hardware. The more expensive cards have hardware codecs, which are a big help in speeding things up, as they do tasks that would normally tie up the CPU

You need 720-pixel resolution across the TV line; some cards work with less to the detriment of the picture. If you have a camcorder with an IEEE 1394 interface, then chose a card that has this - but this should be as well as, not instead of, composite as you may find it a little limited when exporting your finished work.

I have, as yet, not purchased a video capture card, but you don't have to look far to find a BATC member who has, and is willing to talk about it.

Dicky Howett writes "I'm currently preserving a 1950s TTH VAROTAL One zoom lense used originally by Associated-Rediffusion but require the front and base mounting plate rig. (see illustration). Any condition sought. Also a PYE Mk3 camera lense base plate (see illustration) with or without lense. Cash offered. Will collect"
Contact Dicky Howett on 01371 820155 or email: dicky.howett@btinternet.com

Video Toaster

By Mark Bloor

About 3 months ago - in the heady days of what we euphemistically call summer - I was browsing around the Internet, when I happened upon a site that was telling me about the Newtek Video toaster for Windows NT. At last, I thought, they have ported the Toaster to the Windows platform.

For those of you old enough to remember, Newtek made a phenomenal card for the now defunct and lamented Amiga platform. This amazing piece of hardware allowed video to be recorded to disk and manipulated, and all sorts of effects to be applied to the video; furthermore, through some very sophisticated software, 3D animations and modeling could be spliced into, or indeed added to, live video - and all of this 12 years ago!!! (well it has taken Bill Gates and co that long to catch up, and that's being generous). The Toaster in its Amiga and NTSC only variant has been used in the States for many Sci Fi programs, the most notable being Babylon 5. Enough of the history lesson. I found that the Video Toaster NT was now available in a dual standard model and that this could be run on a Windows NT platform. From a list of the UK agents I decided to use One Video, who I telephoned and spoke to a very helpful gentleman called Stewart. Having discussed supply and price (One Video are extremely competitive and I am sure that all those phone calls to the Chairman in Leeds are having an effect …yes it is in Yorkshire) I decided to buy, making quite a large hole in my bank balance (though for professional users, as it is computer equipment, it should be possible to offset the capital cost in just one year). I was intending to build my own machine to support the card. However, having discussed the matter with Stewart, he asked to quote for the system and came in with a very good price, so I decided to let them do the work.

My final system specification was as follows dual 600MHz Pentium 3 processors, 256MB ram (P133), Tyan Tiger motherboard; UDMA 33 Fujitsu hard-drive (for system and audio), Adaptec Ultra 160 SCSI card and dual IBM ultra 160 18.2GB hard drives striped as a 35GB pair. The graphics card is the Matrox G400 32MB dual head and the sound card is a Soundblaster Live.

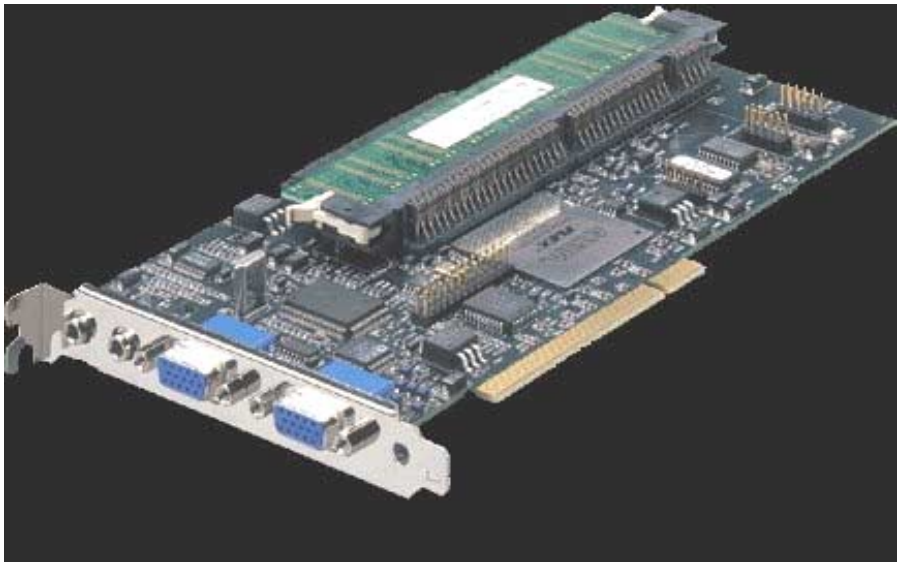
On receipt of the unit and booting up, I was greeted with Windows telling me that my display needed changing. Altering the settings and rebooting, I was fairly soon greeted with the dreaded Windows blue screen; this did not augur well for my first foray into what is supposed to be the most stable of the Windows platforms i.e. NT4. To cut a long story short, and thanks to the excellent support from One Video and a replacement motherboard later, things settled down; now all I had to do was to get my head around the bundled software! I think it is worth mentioning at this point that the Toaster card has only one function in life - to convert video to data and vice versa as quickly as possible - everything else is done in software. This is why they abhor the use of the word streams! Newtek's reason for this is that as processor speeds are following an almost cubic law, then all the manipulation of images can be done in the digital domain; in fact it has been suggested that around 1.5GHz processor speeds should result in real-time rendering of digital effects. Newtek's software has always been written with this in mind; in fact, in the manual they proudly state that it has been written for computers that have yet to be made! You may also gather from this that the card is intended for high level use and therefore there is no compression. The data is recorded basically as D1 (i.e uncompressed YUV 4:2:2), which is the current gold standard. With this in mind, you should be aware that each minute of recorded material will use around 1.2GB of file storage!!

What of the bundled software? Well, it includes the Toaster software, Aura - which is a paint package, and Lightwave VT - the 3D animation and modeling software (note this is a cut down version of the full Lightwave 5.6, though, if you want to, there are upgrades available at a price!) Finally, the editing software package is a special edition of the well respected Speed Razor 4.5. In the box are included breakout leads, composite, S VHS (Y-C) and YUV both in and out, 4 very thick operating manuals and 4 CD roms. The first has all the software for the Toaster, Aura, Lightwave and Speed Razor, the rest include images and tutorials. There is finally what can only be described as a pamphlet regarding the Toaster itself.

The Toaster needs to have various parameters set up in its .ini file in order to record and play PAL signals properly and this was supplied by One Video in addition to the other information. It does not take long to adjust the values in WordPad, and once saved can be forgotten about.

Also included is a software vector and waveform monitor that displays the results - in the case of the vectorscope in NTSC only. The waveform monitor can display normal, LPF, and RGB orYUV parades. The display was, I felt, superior to the Hamlets that I have seen but I have not checked the accuracy of these tools.

The Speed Razor interface allows recording of material and must be used



if sound is required, for if the Toaster alone is used there is no sound facility. Material may also be captured from tape through the Speed Razor interface, which once set up allows batch capture from VTRs through the computers serial interface via an RS 232 to RS422 converter (which is not supplied). The software supports a large number of VTRs that use the Sony 9 pin protocol including Panasonic MIIs. Once the material is edited, it can be "printed" to tape again through the serial interface, though machine ballistics must be tested to allow accurate editing to existing tape material.

The editing interface follows the usual time lines for both audio and video, and multiple video layers may be built up to a maximum of 25. Included in the software are a selection of 2D and 3D dve filters which can allow very sophisticated effects as well as tints and colour corrections to be applied to the video images. Additionally there are a number of plug-ins - for example, film grain, scratches and the well known Boris Fx or Red and Ultimatte - which can purchased separately and a list can be found on the Speed Razor (in-sync) website. With the system I have, effects can be rendered to the graphics screen in real time (just about). Utilising the Matrox dual head allows one screen to show the editing interface and the playback window can then be dragged to the other monitor screen and maximised to allow previewing of the "video". This is the screen in which the editing process takes place. Basic titling is included, using any Windows TTF. The G400 also allows a normal composite monitor to be connected, if you don't have a second VGA monitor.

When you are happy with the finished edit, the 'editing mode' is changed to 'output to Toaster' and the machine will then render the completed project, which can then be printed to tape. This takes some time, so it is a good opportunity to go down to the pub! The Newtek website will give you preliminary information on the NT Toaster 2, and there is currently an offer which allows all NT Toaster users to get a free upgrade to the Toaster 2 software when it becomes available.

Aura is a paint and rotoscoping package which allows the import of graphics or sequences which, once in the program, may be manipulated to produce mattes, garbage mattes, post production CSO or Chroma key and a derived key signal (alpha channel); from the images these can then be shipped back into the programme as required. They may also be exported to Lightwave for further effects such as 3D backgrounds (in fact One Video's technicians left some very nifty spacecraft travelling through space on my hard-drive). Aura also allows the production of normal graphics using its own paint program or various graphic files can be imported and the nice touch is that if they are if not the correct size (768x576), you are prompted and they are then automatically resized. The various filters and effects allow, for example, animation (such as a page curl of a logo), which can then be recorded as a Toaster file. Support for Twain devices is also included.

Finally in the bundled software is Lightwave VT. This allows the production and animation of 3D object. The sequence can then be rendered and recorded to disk via the Toaster remote. I think you will gather from the little that I have said of Lightwave that as yet I have not really played with it; it does look mighty complicated with positions for cameras, lights and so on, but any of you who have seen Titanic will have seen what it can do (all those little people scurrying across the bridge and various other areas of the ship (in long-shot) were produced using Lightwave).

Well you can see what you get for your money from the above. The subjective results are superb, especially if used in the component domain, and for those who want it there is an SDI interface for around £600 (or less if purchased with the Toaster). It can do just about anything an Editbox can do, but it is not as fast and you may have to buy additional plug-ins - but then again with the PC the total cost is around £5-6000 pounds and just how much is an Editbox? (For those who do have huge budgets, One Video are Quantel agents as well!). There are cheaper capture cards, but all use compression. As the full effects of concatenation have yet to be discovered, if you want the best

possible images then uncompressed is best. Finally a quick word about the sound. The quality will be limited by the sound card used (suggestions are available on the Newtek website, as are all hardware options) - however, as the audio effectively "free runs", absolute sync is dependent on the audio cards crystal oscillator. Any drift leads to loss of sync. There is a re-sync option in Speed Razor - the best way, however, is to have the audio card crystal locked to the 27 MHz oscillator on the video card. There are a couple of cards which do this, in addition to providing balanced audio channels and additional card locking i.e. multiple audio channels. These are the Lynx Studio one card and the Antex 2000, but both carry a £600 price tag. They are, however, 24 bit!!

Newtek have undoubtedly an extremely good product. The included software really does make it a "production centre". Yes, for us amateurs, it is not a cheap option. If you compare it with the price of a couple of dv recorders required for editing, which would allows cuts, fades and inserts, then I think providing you don't mind computer based editing, you should seriously consider the Toaster - after all most of the TV stations in America have one, but we have just had to wait an extra 12 years for the privilege.

Finally I would like to thank Stewart, Mark and Symeon at One Video. For those people who want to compare various capture cards, an American site Safe Harbour (www.sharbor.com) have a head to head where various types can be directly compared.

Post script:- I have at last some details regarding the Videotoaster NT2:-

The current hard drive requirement for the Toaster1 is a sustained transfer rate of 22 MB/sec, this can be easily achieved using a UDMA 100 controller card and, for example, the IBM Telesto drives. In fact for a striped set of 4, read rates of 100 MB/sec and write of around 84 MB/sec have been demonstrated. This is more than adequate for the Toaster1and it is relatively cheap. However there will be available around April of this year the Toaster2. Newtek have stated categorically that no upgrade to the Toaster card is needed at all, as all the improvements are in software. This may be one of the few cases where you throw away the computer and keep the peripheral to improve performance. There is of course a rub (there always is) - system requirements; more of these later.

Toaster 2 will allow the use of a 24-channel composite or 8-channel component add-on box that makes the unit become a vision mixer. It also has 12 audio inputs (RCA) and 4 balanced inputs. This is around $2000. The onboard audio will be enabled and interleaved with the video, so the synchronisation problems mentioned above would no longer be an issue, and more to the point I don't have to go and buy a very expensive sound card! The video effects will be in real-time, providing you have a minimum of a dual 600MHz board. In the software package will be a utility that will allow the conversion of multiple picture formats - tiff, bmp and so on - to almost any other. It will also allow the conversion of the Toaster files to MPEG1, 2 and so on which will be very useful for DVD authoring, but as quality is paramount the conversion time will be around 25x!! Windows 2000 will be the preferred operating system (I have already put this on my machine. It is much, much nicer than NT). There are also improvements in the versions of Aura and Lightwave, and Newteks own storyboard editor will be included, I believe.

System requirements are quite daunting for Toaster2. Briefly, these are 1.5GHz PentiumIV processor with 500meg of 400fsb (front side bus) ram. If dual stream effects are envisaged, then the hard drive array must support a staggering 70MB/sec. This is why Newteks` Dr. Andrew Cross suggests that a striped Ultra 160 SCSI array is used, as the transfer rates are more predictable. An IDE drive is suitable for the audio however!

I would suggest that any one interested in this product, which really is a television station in a box, goes to www.videotoaster.com or www.videotoaster.co.uk to see what it can do, remembering that if you get Toaster1 you should be eligible for the Toaster2 upgrade. Also there will be an HDTV version of the Toaster card in the future. The current one is not suitable but needless to say the software is. Stewart can be contacted at 07000 ONEVIDEO (07000 663843 or at www.onevideo.net .

Satellite TV News – Due to a combination of illness and pressure of work, Paul Holland has been unable to provide his usual column for this issue. I am assured that normal service will be resumed in time for CQ-TV 196. – *Editor*.

Hardware for making VideoCDs

By John Schlichther

In a previous article we talked about what VideoCDs are, and what you can do with them. Basically, they're VHS-quality discs recorded on CD-R/RW media that can be played back in most computers CD/DVD drives, as well as many consumer DVD players. They're great for sharing home movies, and creating business presentations.

So after reading all the great things you can do with VideoCDs, you've decided you want to make one. Wondering what hardware you're going to need to do it? Let's go over the various components required for PC VideoCD creation.

PCI Slots

It goes almost without saying that your PC is going to require PCI slots. If your PC is old enough not to have PCI slots, and you want to edit video, it's time to start shopping for a new PC. How many slots? I'd recommend a minimum of four, though you might be able to get away with less if the motherboard has enough built-in features (like sound and networking) to require fewer add-in cards.

CPU

There are two things to look for in CPUs for VideoCD recording: type and speed. Most current video software makes some use of Intel's MMX instruction set; for some, MMX is non-optional. All new Pentiums have these instructions, early ones do not. In terms of CPU speed, video capture is generally not dependent on it (beyond some reasonable minimum), but editing and MPEG encoding is greatly affected by it. The general rule is how much CPU can you afford? My minimum recommendation would be a 233MHz MMX-capable CPU, although this will be slow, it will be usable. If you're buying a new PC, get at least a 533MHz CPU, more if you can afford it. You might even consider a dual-CPU system, but you should realize that few software packages can make use of dual CPUs, and you will have to run Windows NT or 2000 in order to use both CPUs.

Memory

Although you can get by with 64MB, 128MB allows more memory to be dedicated to disk cache, minimizing the risk of dropped frames during capture. Advanced editing benefits from 256MB.

Video Card

Almost any video card will do. You don't have to go out and buy the latest and greatest. If the card you have is not particularly fast, then the video may skip frames during playback, but that doesn't mean your VideoCD is affected. It will play back fine elsewhere. If you are buying a new card anyway, get an AGP card if your motherboard has an AGP slot. AGP is the latest and fastest technology, and will preserve precious PCI slots for other things. Then let whatever else you use your PC for be your guide for video card features. Recent improvements in video cards have concentrated on 3D acceleration, which is great for games, but of no particular use in basic video editing.

Sound Card

Almost any sound card should do. You'll want a card with line level inputs, stereo, and a 44.1KHz-sampling rate. This pretty much describes every sound card manufactured in the last 5 years! If you're truly an audiophile, and your source video sound quality justifies it, you may want to get a pro-level audio card with an exceptional signal-to-noise ratio. If you're working with a DV camcorder, however, it really doesn't matter since the sound is digitally encoded in the video signal, and your sound card is only used when you play back the video on your PC.

Disk Drives

A good disk drive is critical to your ability to capture video without dropping excessive frames (which results in jittery or jumpy video). If you have a fairly new PC with a large disk drive, you're probably thinking that you're all set. Well, sorry to break the bad news, but even if you have a 20GB hard disk on that brand-new computer, it's probably not going to be good enough for video editing. Why not? Your "C" drive contains all your system files, probably contains your swap file, and likely your data files. At any given time, it's full of fragmented files that your multitasking operating system is accessing at apparently random intervals. This plays havoc with video capture, which depends on recording an uninterrupted stream of video data at a rate typically in the range of 2 to 4 MB per second. The only reliable way to capture video without dropping frames is to use a separate disk just for capturing video. In fact, it's good practice to format this capture drive before each recording session to ensure that it is empty and completely defragmented. Please note that this means a separate physical disk, not just a separate partition. The size of this disk is important as well. If you use an analogue capture card, you will probably be using a data rate of 2 to 4 MB per second. DV format video is fixed at 3.6MB per second. A little math, and you can see that a one-hour DV tape will require approximately 13GB of disk space.

If you're going to be editing, you'll need even more space. Fortunately big disks are becoming quite reasonably priced. You can get 30 and even 60 GB for a few hundred bucks. Going all out, the best editing set-up has two dedicated video disk drives: One for capture, and one for editing.

You may be tempted to add these two disks to your existing IDE controller. If you don't have enough space on your IDE controller, you can add another. But you need to be careful here. For video editing purposes, your disks should all be ATA Ultra-66 (or even 100). Don't mix videodisks on the same cable with CD or DVD-ROMs (or any other non-hard disk device), as these can slow down access to your disks. If you're buying new drives, make sure they are at least 5,400rpm, 7,200rpm is even better. You could also add a SCSI controller and use SCSI disks.

The newest, and perhaps easiest solution if you're running Windows 98SE/Me/2000, is IEEE 1394 (also called FireWire or iLink). You can buy quite reasonably priced external 1394

disks that can be plugged into a 1394 port installed in your PC. If you're going to be working with DV, this is an ideal solution, as you will already be adding a 1394 card to your PC to connect your DV camcorder. Bear in mind that to use a 1394 disk drive, you'll need to be running Windows 98SE, 2000 or later.

One other thing to be note is that some higher performance disk drives generate a significant amount of heat. If you mount one of these in your PC, make sure you have sufficient cooling. High-performance SCSI drives generally require a fan blowing directly on them in order to keep them sufficiently cool. Otherwise they won't last long.

Video Capture Card

Your capture card is either going to be analogue or digital (DV).

Analogue Capture Cards

Analogue capture cards come in a wide variety of prices and features:

Inexpensive frame grabbers: These cards (typically based on the Brooktree BT848 or similar capture chip) are basic capture devices. They do not perform any compression on the video they capture, which means that your CPU has to do any compression required in real time, and typically at lower quality than a hardware compression board. The advantage is these boards are inexpensive, and sometimes built into the video display card, which can save you a slot. The disadvantage is that they require a more powerful CPU to perform the real-time compression. They are typically priced from $20-$100.

Hardware compression capture cards: These cards include built-in hardware that compresses incoming video in real time, relieving the CPU of the burden so it can concentrate on getting the video to disk. These boards generally use Motion-JPEG compression. Some boards can even capture directly to VideoCD-compatible MPEG, eliminating the need for subsequent encoding. However, if you are going to be performing any degree of editing or special effects, you will get better quality results with an M-JPEG board. These boards usually also have analogue video out connections for sending edited video back to tape, turning your PC into a true video editing station. Both types of cards provide a much more reliable solution for video capture and editing than basic frame grabbers. Their disadvantage is cost. Hardware compression capture boards will cost in the range of $100 to $1,000, depending on features. Pro-quality boards can cost even more.

External Video Capture Devices

For those who don't like the prospect of installing cards, there are also completely external devices that connect to parallel or USB ports. These devices generally compress directly to low-quality MPEG and have limited flexibility, although they are without a doubt the easiest to install.

DV (Digital Video) cards: If you have a DV camcorder, you don't need to "capture" video at all. It's already digitised, and you just need to transfer it to the PC via an IEEE 1394 (FireWire) port adapter. IEEE 1394 can support numerous types of devices, such as disk drives, scanners and DVD-ROM drives, as well as camcorders. A 1394 card doesn't change the data coming from your DV camera; it simply allows your computer to download it. IEEE 1394 cards range from less than $40 to over $1,000. The basic $40 card will get just as good quality video into your PC as the $1,000 card. The difference is in additional features (such as real-time DV encoding for analogue inputs) and included software. It is important to realize that the low-end 1394 cards use the built-in FireWire support of Windows 98 and 2000. You will not be able to use them with NT 4.0 or Windows 95.

CD Recorder

You'll also need a CD recorder. Since many DVD players cannot play CD-Rs, but can play CD-RWs, you'll want to make sure you buy a CD-RW drive. It's especially helpful while you experiment with different settings while making your VideoCDs, so you don't end up with a huge pile of coasters. I highly recommend that you also buy a DVD-ROM drive for playback. Save your CD recorder for recording. Please note that you can now buy external 1394-based CD recorders. This is the easiest way to add a new recorder to your system if you're going to be using DV anyway.

Try Before You Buy

If your system just barely meets these requirements, then don't run out and upgrade it right away. Try making a few VideoCDs to see how the process works. It might take a little longer, but once you've made a few discs, you'll have a better idea of what you need to upgrade. The biggest problems are usually the video capture card and hard disk drive. Either your equipment is good enough to capture video without dropping frames or it isn't. Once you've got the video on your hard disk, a slow computer will merely take longer to produce the VideoCD, but it should still work fine.

DV Considerations

Although I highly recommend DV camcorders and FireWire-based video, there are a few gotchas to look out for. First off, not all DV camcorders have 1394 connections. Many first-generation models don't, so be sure to check that bargain camera. Also be aware that there are two variations of DV video (or .avi) files. They are referred to as Type 1 and Type 2 DV. Type 1 DV is Microsoft's preferred way to support DV. If you use an inexpensive 1394 card and Windows 98 or 2000, then Type 1 DV is likely what you've got. Not all video software can handle Type 1 DV, and some that do (including Microsoft's own DirectShow subsystem) are somewhat buggy.

Since DV predates Microsoft's built-in support, various suppliers of DV capture cards, such as Pinnacle, had to create special drivers to provide Video For Windows-based support for DV. This is called Type 2 DV. Type 2 DV is readable by most all video software, if the proper codec is installed. The best advice I can give is that if you are going to go DV, buy a 1394 card/editing software package guaranteed to work together. One more thing to consider is the maximum size of video file you can capture with Type 1 or Type 2 DV. For Type 2, the largest you can capture is 2GB. This is a limitation of Video For Windows, and amounts to approximately 9 minutes of video. For Type 1, the maximum size is

dependent on the file system in use on the disk drive you capture to. For FAT32, the maximum size for a Type 1 DV file is 4GB, or approximately 18 minutes. For NTFS, the limit is on the order of terabytes, bigger than any disk you can buy today. The problem is that to benefit from NTFS, you'll have to use Windows 2000, which will break a lot of other software. Windows NT 4.0 has a limit of 2GB, not because of file size limitations, but because of Video For Windows limitations.

This article was originally printed in Roxio's CD-R newsletters, delivered free to subscribers' e-mailboxes weekly. For more information and to subscribe, please see https://www.roxio.com/en/jhtml/subscription/newslettersubs.jhtml. Copyright 2000/2001 Roxio, Inc. All rights reserved. This publication or any portion herein may not be reproduced in any form without the express written consent of Roxio, Inc.

Super VCD the choice for amateurs?

By Mark Bloor

I wonder how many of you have heard of SuperVCDs? Until very recently, I certainly hadn`t. What I had been looking for was a sensible way of putting video that I had shot onto a disc - preferably that could be played back on stand-alone DVD players. For those who have been burning CD, many of the burning software available allows for the production of VCDs. These were the precursors, if you like, of DVD. The image size was 352x288 and used MPEG1 encoding techniques to produce a CD that contained pictures and some degree of interactivity. Having found the option to produce VCD on my ce-Quadrat burning software, I decided to have a go. I sourced the material with my Matrox Rainbow Runner at the required resolution, made three three-minute tracks and let the software convert from MJPEG to MPEG1 suitable for burning the VCD. This does take a long time - about 10x is average for a reasonable current PC. I then took my results and put them successfully into my Pioneer DVD. The track listings came up correctly. I then played the track and was, to say the least, disappointed. There was lots of blocking in the background and results that I felt were inferior to VHS. This was about 18 months ago now, but I thought, "DVD burners will soon be available". Well they are, but with a severe price premium and, worse still, DVD blanks are around £20-£25. It appears that the motion picture industry has managed to get a levy on the blanks, hence the high cost.

This is where SVCD comes in. It appears that (like amateurs) the Chinese government was unwilling to have to pay for all the patents and licences tied up with DVD and, moreover, they wanted something which would play on much cheaper CD transports, so they came up with SVCD. A sort of halfway house between DVD and VCD.

SVCD discs will play on any modern CD ROM and offer in PAL a resolution of 480x576 or 2/3rds D1; they also allow for the inclusion of Dolby 5:1 sound, still picture resolutions of 720x576, graphic overlay in a separate video plane, 4 selectable subtitles and dual audio streams (multi-language), as well as extended interactivity. I think it is fair to point out that all these options will only be available if you are prepared to purchase some form of authoring software; if, however, all you want is video on a disc then, assuming you have a capture card and a CD burner, the only software you will need to purchase is Aheads Nero burning CD ROM. This can be downloaded and a software key can be purchased on line at, www.ahead.de; the site is in

Comparisons of SVCD and VCD

Item	SVCD 1.0	VCD 2.0
Sector rate	**Variable**	**Fixed**
CDDA tracks	Not used	Optional
File locations for data	Fixed locations	Fixed locations
CDI sub directory	Not used	Mandatory
Video encoding Max bite rate Mbps Resolution NTSC Resolution PAL	MPEG 2 Variable to 2.6(2.8?) 480x480 480x576	MPEG 1 Fixed 1.15 352x240 352x288
Still Picture resolution NTSC PAL	MPEG2 480x480,704x480 480x576,704x576	MPEG1 352x240,704x480 352x288,704x576
Audio	MPEG1 layer 2 variable bit rate from 32 to 384 kbps. 2 stereo or 4 mono MPEG 2 5:1 Dolby digital	MPEG 1 layer 2 fixed at 224kbps 1 stereo or 2 mono i.e.dual audio Stereo with Dolby pro-logic
Graphics and Text	Overlay video plane up to 4 4 colour CLUT (2 bit per pixel)	N/a

*The apparent discrepancies of horizontal resolution are tied up with the variation that exists with regard to active line period and that which includes blanking. i.e. 704 and 720 horizontal lines respectively.

English.

The rest of the software is available from the web. I think the best place to start is the Doom site at http://doom9.excelland.com/software. This has two folders, SVCD 1 and 2, which contain all the remaining software codecs required to allow the production of SVCD that, of course, are only going to contain your own material! I used the Tsunami TMPEG encoder that worked fine. Just a word of warning - don't start converting files and expect to be burning CDs within minutes. It takes about an hour for 10 minutes on a 633 Celeron machine.

What of the quality? Viewing it on a Sony 28in wide screen set at about 1 foot away you can see artefacts. There is the usual softening on whip pans and in severe cases noticeable blocking. However, for normal material it really is very good; there is, of course, the usual mosquito noise around edges but I would put the results up with Super VHS, though minus the dropout and chroma noise. Results I would say are comparable with Sky Digital. At normal viewing distances the picture quality is very good - so much so that I intend wherever possible to duplicate on this format in the future. I have a friend who is an ex television director and he has seen the results and is also impressed - so much so that he has a short movie, which we are going to master onto the format for distribution to interested parties.

I think it is expedient for me to mention the downside. Because of the limited size of a CD, video will be limited to around 35-40 minutes, so anything over this will have to span multiple discs and most importantly not all standalone DVD players will support the format. Most recent (i.e. from now) machines probably will, though it would be wise to check first. Logix manufacture a player for £180 that does, as do Scan computers. The player needs to be able to play SVCD 1.0 compliant discs. SVCD discs can be played on a PC with a suitable software DVD player and a standard CD ROM.

MB7TV – An SSTV relay unit on 2 metres

By Graham G3VZV

Although it has been operating for some time, MB7TV has recently been moved to its new, permanent, location at a very good VHF site at Colchester General Hospital!

MB7TV is an SSTV relay unit that operates on 144.700MHz with 10watts output to a co-linear at 150 feet above ground.

After receiving a 1750Hz tone burst, the unit transmits a 'K' and will listen for up to ten seconds of SSTV signal. When the signal has been received it is relayed with a digital overlay of the MB7TV call sign at the bottom of the frame.

Almost all formats of SSTV can be relayed but the Mscan software is limited to a set screen size and the M1 (Martin 1) mode is the default.

When not in active use MB7TV radiates a set of seven beacon identification frames every 15 minutes.

As MB7TV does not act as a store and forward device but simply relays signals as received the Datacomms Committee of the RSGB was able to provide the simplified frequency clearance procedure that apply to digital nodes on this band.

The increased coverage from Colchester has lead to a welcome increase in SSTV activity in the area.

Signal reports are welcomed by the keeper g0mba@bigfoot.com

Roger Jones, G3YMK

It is with deep sadness that we have been informed that Roger has become a silent key following a recent illness.

Roger held a number of positions on the RMC and his energy and enthusiasm will be sadly missed. Our immediate thoughts and sympathy go to his XYL and family

Members' Services

	All prices in UK pounds (£)	Each	P&P	Qty	Total
Camera Tubes, Scan Coils, Bases & Lens Mounts					
3	One inch Vidicon base	**£1.20**	**£0.30**	.....	.....
4	2/3 inch Vidicon base	**£0.80**	**£0.30**	.....	.....
Video and I²C Circuit Boards/Components					
7	Sync pulse generator PCB	**£14.00**	**£0.43**	.....	.....
89	NBTV Scan Converter PCB	**£21.00**	**£0.43**	.....	.....
40	I²C CPU PCB	**£10.00**	**£0.43**	.....	.....
41	I²C VDU PCB	**£10.00**	**£0.43**	.....	.....
43	SAA5231 Genlock IC	**£8.80**	**£0.30**	.....	.....
44	SAA5243PE Teletext IC	**£14.70**	**£0.30**	.....	.....
45	PCF8583 Clock IC	**£7.00**	**£0.30**	.....	.....
39	LM1881N Sync separator IC	**£3.50**	**£0.30**	.....	.....
81	I²C 27256 EPROM	**£9.70**	**£0.30**	.....	.....
38	PCF8574P Input expander IC	**£4.70**	**£0.30**	.....	.....
10	I²C Relay PCB	**£6.50**	**£0.43**	.....	.....
9	PCF8574A Input expander IC	**£4.70**	**£0.43**	.....	.....
RX, TX and SSTV PCB's and General Components					
47	70cm up converter PCB	**£13.50**	**£0.43**	.....	.....
50	108.875 MHz crystal	**£8.20**	**£0.30**	.....	.....
68	4.433618MHz crystal	**£3.25**	**£0.30**	.....	.....
69	5.0MHz crystal	**£3.25**	**£0.30**	.....	.....
86	24cm solid-state amplifier PCB	**£10.50**	**£0.43**	.....	.....
88	XR215 phase locked loop IC **	**£5.00**	**£0.30**	.....	.....
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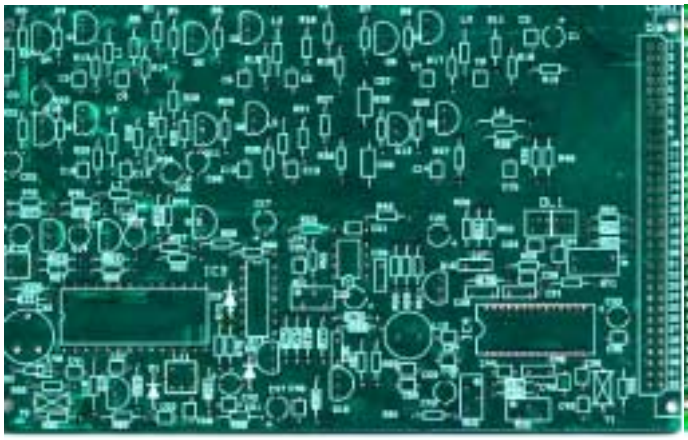
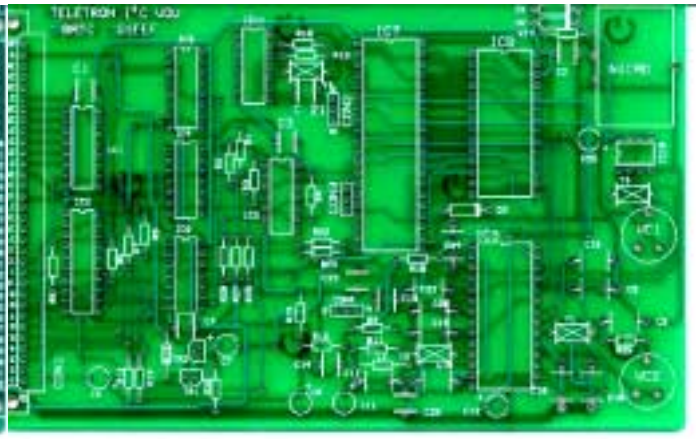


The Sync Pulse Generator PCB (item 7)



The I²C VDU PCB (item 41)

The indicated **P&P** prices for Members Services are for postage within the UK only. Will members outside the UK please either try to estimate the extra postage required, or write for a quotation. All cheques **MUST** be drawn on a UK bank. (Eurocheques, in £ sterling, are acceptable). ***Items marked thus: ** are available only until present stocks are exhausted.***

Members Services orders ***ONLY*** to: **Mr. P. Delaney, 6 East View Close, Wargrave, Berkshire, RG10 8BJ, England.** Tel: 0118 940 3121 (Evenings, Weekends only please). Email: services@batc.org.uk Items from these lists can **ONLY** be supplied to **CURRENT** members of the BATC. These lists supersede all previous ones.

A description of the various PCB's and components can be found in the 'What's What' guide, or on the CQ-TV Internet pages at www.cq-tv.com (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:

An Introduction to ATV: PCB's 10, 40, 41, 47, 86**. CQ-TV 174:** PCB 7

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.

The BATC cloth badge (item 74)

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, 186, 187, 188,189, 190			
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Please note that the above books (except 'The best of') and CQ-TV issues 171 onwards are available in Adobe Acrobat format for download from our web site, www.cq-tv.com. They are also included on the BATC CD. (The CD also contains a full keyword search index) Please note that the versions on the web site do NOT include the colour covers or any colour inserts. This is to improve download times.

The indicated prices for **Publications** include postage within the EEC. Will members outside the EEC please either try to estimate the extra postage required, or write for a quotation.

Publications orders ***ONLY*** to: **BATC Publications, Fern House, Church Road, Harby, Notts., NG23 7ED, England.** Tel: 0152 270 3348 (Evenings/Weekends only). Email: publications@batc.org.uk. Publications can also be ordered via our web site at www.batc.org.uk

PLEASE MAKE CHEQUES PAYABLE TO 'BATC'.

A Deviation checker

By Harold R Skelhorn, G8BPU

Having recently returned to amateur television after been absent for more than 25 years, the first task I set myself was to drastically modify the SRX 200 satellite receiver. Having done that I then built a 50mW transmitter to enable me to test the receiver. The tests soon revealed the need for the transmitter deviation to be accurately set.

Over 30 years ago I purchased from Shibaden a deviation checker for my company to allow us to set up the deviation of a Shibaden SV700 video recorder.

With that in my mind, I searched through my CQ-TV magazines from 40 to CQ-TV 192 for any further ideas. I found in CQ-TV 128 that John Allsop G3OGX had all ready designed an instrument using the same principles as the Shibaden deviation checker, operating at an IF of 70MHz.

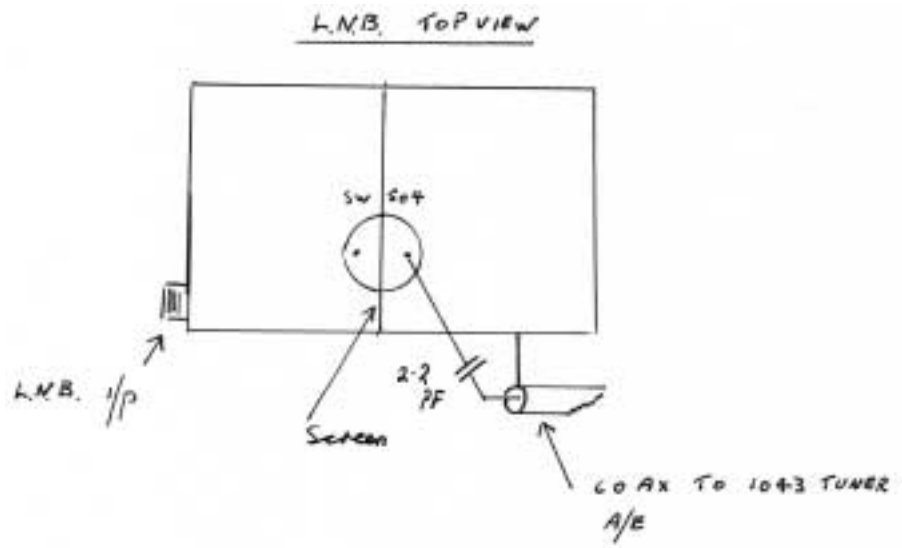
The first part of this project was to build the36MHz IF amplifier in the revised ATV handbook, this was followed with the building of Johns Allsops crystal marker circuit, both seriously modified as can be seen in my circuits.

I had two crystals in my junk box one at 10.166 the second at 16.50 the 10.166 is tuned to its third harmonic ie 30.5 and the 16.5 is tuned to its second harmonic of 33.00MHz a difference in frequency of 2.500MHz. The SRX200 satellite receiver has an IF of 480MHz.

I found a very simple way to extract this signal that had no affect on the receiver's performance.

The modification is as follows:- solder a 2.2pF capacitor to the junction of co51 ro31 and the output of the saw filter sw504, there is a convenient pin at this point.

This is accomplished by removing the top cover of the tuner. There is a screen in the centre of the PCB, with LNB socket on the left: co51 with its convenient pin is about 1.5cm up the right hand side of the screen. Connect a short length coax from this pin to the aerial socket of the ELC1043 tuner.



To receive the 480 MHz on the 1043 tuner the tuning voltage has to be between 1.5 and 2.5 volts. The resistor chain used in my circuit was selected to restrict the tuning range to about a 10 MHz shift.

There are two outputs on the IF amplifier. One is a feed to a monitor; the second is a feed to a scope via a filter having a cut-off at 1.25MHz to clean up the LF waveform.

Marker set up

Ensure the crystal marker oscillators are on frequency; the crystals I used came from my junk box. If you need to purchase two 11.5MHz x 3 = 34.5 would be ideal for the sync bottom marker, and 18.5MHz x 2 = 37MHz for the peak white marker.

Connect the scope to the output; adjust the VCO trimmer to obtain a good clean square wave with a p-p of about 200mV. Using a frequency counter on the VCO test point, the frequency should be close to the centre of the two markers, in my case 31.8MHz.

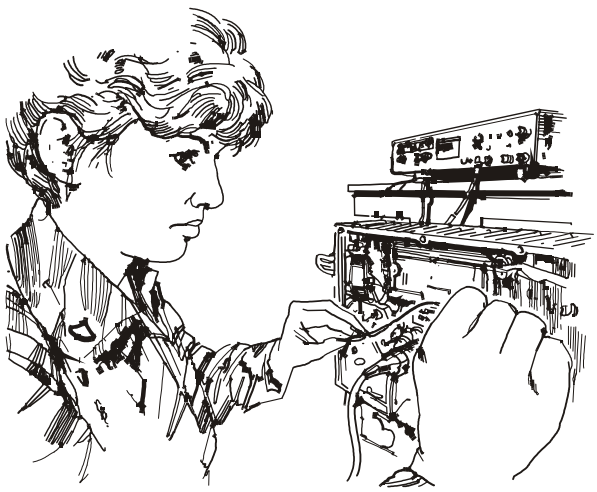
Operation

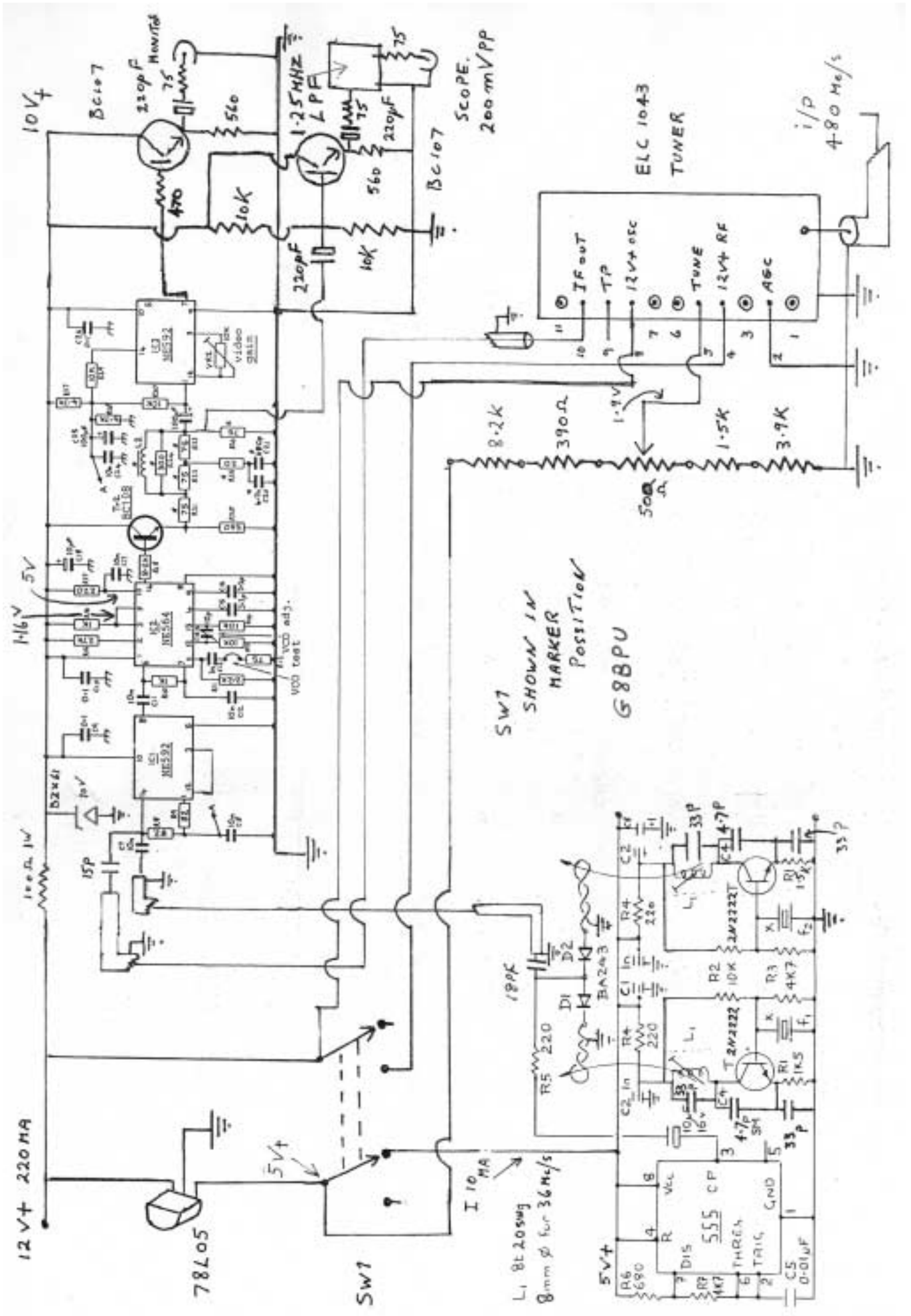
Feed a peak white video signal to the transmitter having an output of 50mW. Receive the signal on the SRX200. Switch the deviation checker to calibrate, adjust the IF core on the 1043 tuner for the best waveform and picture. Adjust the scope gain so that the square wave occupies 5 divisions on the graticule, each square now represents 0.5MHz so 5 squares = 2.5 MHz. Switch the deviation checker to receive and display the peak white wave form on the scope. Now set the deviation control of the transmitter so that the video waveform occupies 5 squares.

The transmitter deviation is now 2.5MHz.

References.

- CQ-TV 142 Page 70
- CQ-TV 128 Page 25
- CQ-TV 122 Page 6
- CQ-TV 131 Page 74
- CQ-TV 127 Page 52





TV or not TV? That is the question

By Dave Barford G8KBC

I have been working 3cms almost since I started Amateur Radio about 28 years ago (at that time there were no DROs , GaAs Fets or LNBs and hardly any stations to work on those frequencies!)

Anyway, I digress. About a year or so back I decided to improve my 3cms TV TX/RX in an attempt to work a few more stations. To this end I decided to increase the TX power from a 200 mW Gunn diode to a 1.5 W DRO controlled GaAs Fet PA TX. At the same time I increased the gain of the antennas from 2*22dB horns to 2*25dB dishes (one for TX the other for the RX LNB.)

The main objective was to try to work through the new GB3XY 3cms TV repeater that was about to come on line and also to get better signals to and from Richard G1AUQ near Lincoln, Peter G4RNA in Sheffield, Brian G7AJP at Stenigot Lincs and all the lads in Yorkshire, Richard G4YTV, Richard G7MFO, Bill G4RMX and others.

The biggest problem for me as far as microwave working goes is that basically I live in a bit of a hole even though the QTH at Brookenby, Lincs IO 93 VK is on top of the East Lincolnshire Wolds at about 100 metres ASL! The surrounding hills are slightly higher by about 50-60 metres in most directions! This means of course that the only line of sight paths I have are to the next hilltop, in my case this means about 6 km in any direction! So as you have already figured out, 3 cms does not look very promising (or any other microwave band for that matter!)

However, as I had already worked most of the stations previously on lower microwave bands, I decided to continue to try on 3 cms anyway. Up to that point in time I had only worked G1AUQ, G4RNA, G0FVF and G7AJP very sporadically on 3 cms TV over a period of several years. During the summer of 1999 I did see PI6ATV at P5 for several hours on 10.425 GHz at 393 Kms and another I could not identify on 10.4 GHz. Unfortunately these are rare events!

So, eventually the big day came when all the new equipment had been installed and was ready to test. I tried to work Peter G4RNA first and although he did manage to see some sync, the conditions did not seem to favour us that particular evening. Later on that week I tried again with Richard G1AUQ and as we rather expected that seemed to be a failure too, but you always try again don't you?

Well, to cut a long story short, later on that week I had another try with Peter to no avail and after chewing it over between us for a while Peter said "Well why don't we try audio WBFM that is much narrower bandwidth than TV and should get through a bit better?" At first I thought this would be a retrograde step, but after some consideration I decided to give it a try.

I had of course already used 50 kHz WBFM audio on 3cms years ago before experimenting with TV. So, after thinking about Pete's idea a bit more, I decided to convert my equipment to give me the option to transmit WBFM audio 50KHz or WBFM TV 8 MHz deviation at the flick of a switch, which turned out to be very simple. At least then if TV was not possible a contact on audio may be, so making use of otherwise ineffective equipment. (This later proved to be very effective indeed).

Modification of the unit consisted of inserting a switch at the output of the microphone audio amplifier where it entered the TV sound sub-carrier oscillator. This was so that audio only could be re-routed directly to the DRO/ Gunn FM modulator via a 22k pot (for deviation adjustment) to give audio modulation only on the transmitter. At the same time the other half of the 2 pole 2 way switch disconnects the combined video and sound sub-carrier (baseband) from the input to the DRO FM modulator in the TX, as that would not be required for audio only modulation. In fact I have now decided to modify all my TV only transmitters in the same way!

Results from this very simple modification have been nothing short of astounding! Since the modifications were carried out I have mainly been working Richard G1AUQ and Brian G7AJP. Richard has been mainly looking for my signals on 3cms as I have the most ERP on transmit. The path between us is not good at all, and consists of two major obstructions (hills) and a total path length of about 30 km. At first sight this would seem an almost impossible contact but TV signals had been received very occasionally on 3cms under certain conditions so we persevered. During the first four or five months very brief TV contacts had occurred, but, as soon as the audio modification was installed at my end and Richard modified his receive set up to include a scanner receiver set to wide band FM, audio signals were there!

The receive modification was very simple and basically consisted of a 'T' connection inserted into the satellite LNB feed cable at the shack end. A DC blocking capacitor of .1uf feeding the scanner with the IF frequency (about 1275 MHz in this case) but still allowing the DC feed to the LNB from the satellite receiver, and TV IF from the LNB back to the satellite receiver as normal. Richard can now get TV and/ or audio at the same time, independently tuneable!

Since these simple modifications Richard has been able to get audio FM signals from me over this path almost every night. The most interesting thing is that now we can monitor conditions with this signal, we have been able to judge when conditions are up. If the audio signals are better than normal we can then look for TV by flicking the appropriate switches and have had TV signals on several occasions since, where previously we would probably have given up and missed them! Over the last few months Richard and myself have accumulated quite a bit of interesting information by using this system on 3cms, but it could apply to other microwave bands so I have tried to sort it into various categories as follows: -

Equipment

G1AUQ has a 60-cm dish for TX & RX. 200 mW Gunn Diode TX. RX is Sat RX & scanner.

G8KBC I have 2* 25cm dishes TX & RX. The TX has 5 DRO oscillators on different channels with a 1.5 watt GaAs Fet PA. For RX Sat RX & scanner, and of course we both have RX LNB's with 9 GHz local oscillators.

Propagation

In general, protracted periods of calm, settled weather with high pressure and little or no wind seem to help. Signals heard using WBFM audio often seem to contain a lot of flutter although the level of the audio seems to stay more or less the same, as you would expect with FM. Another as yet unexplained anomaly of 3cms WBFM audio is that the background noise seems to increase as the dish goes down towards the ground even if signal levels stay about the same.

Day/ Night

There seems to be little difference in signal levels between day and night, although usually they seem to dip slightly around dusk (we have dubbed this 'The twilight zone') and sometimes peak slightly around dawn before returning to normal.

Winter/ Summer

If anything signals seem to have been generally slightly better in the summer, although sometimes as good or better under certain conditions during the winter.

Precipitation

Richard has been monitoring GB3XY and G7AJP as well as my own signals, which has given us the opportunity to gauge the effects of various weather conditions concurrently over several different types of path. We have found that because GB3XY and G7AJP are almost line of sight to Richard any precipitation such as fog, rain or snow (because of the water content) physically obstructs those paths, and the signals nearly always show degradation. However the opposite appears to be true on the path from Richard to me, which is severely obstructed by hills, because instead of relying solely on refraction the otherwise weak signals also reflect off the water particles and enhance the received signals! The best TV signals from me to Richard so far occurred

during a snowstorm at both ends of the path. Good TV signals have also been received from me during heavy rainfall at both ends. The same conditions at the same time both resulted in poor signals from G7AJP and non-existent from GB3XY! During the same evening I got signals from Richard's 200 mW TX for the first time! Another interesting aspect of this rain/ snow scatter mode is that the signals can be found over a very wide beamwidth of about 90 degrees at both ends of the path, whereas under normal conditions it would only be about 5 at each end.

Obstructed & Line of Sight Paths

Different types of path can show markedly different effects for apparently similar weather conditions as previously mentioned, one usually improves, as the other gets worse to a similar degree and visa-versa as conditions change again. Certainly on 3cms, if trying to get signals over a partly or fully obstructed path, you would probably have more success during heavy rain or snow preferably without fog or mist. (I have had several really good lifts on 3cms TV during heavy snow over the last few years). If however an almost line of sight path exists then best results would be more likely under clear, still, dry conditions possibly with high pressure in evidence.

Humidity

In general, very high humidity (fog and mist) on its own does seem to be detrimental to all paths on 3cms to a similar degree.

Pointing Accuracy

Richard and myself have found that not only do you require horizontal

movement on the antenna but also a small amount of vertical adjustment can be very productive. Not all signals come exactly from the horizon but can sometimes be found bouncing off clouds, rain or snow and refracted down from hills. I would suggest that a good all round antenna would have a beamwidth of about 10 to 15 degrees for ease of finding signals and a low wind resistance. A pair of 22dB horns mounted side by side for TX & RX would be a good start. If a bit more gain is wanted for DX then a 60 cm dish with vertical adjustment, steady mount and sturdy rotator with a gain in excess of 30 dB may be required, but wind loading and pointing ability become more critical. (Not to mention some possible planning violations!)

Bouncing

As has been mentioned in several other articles, it is quite possible to use large objects to bounce signals off. If no direct path is available it can work quite well if the object is about mid path, large, curved to some degree, preferably metallic and most importantly visible at both ends of the otherwise obstructed path. Obviously, the position and orientation relative to both stations plays a part in the final result. I have done some experiments with G7AJP on this system and can confirm it does work quite well if most of the above parameters apply. However, signals are considerably weaker than a line of sight path of equal length, but if available better than none at all!

Polarity

Please remember most microwave TV (and audio FM/SSB) is horizontally polarised that is with the shortest dimensions of the waveguide at the top and bottom, and the longest dimensions either side. If you get this wrong you could be looking forever and not find any signals at all! If using circular waveguide then the monopole RX antenna inside the guide or LNB should be horizontally oriented pointing to the left or right - either will do.

Frequency Stability

Gunn transmitters are not noted for their frequency stability, they can drift several MHz during a QSO. The lower powers ones are usually not too bad. If a Gunn TX is used for WBFM audio you will probably have to retune the RX every few minutes to maintain contact. Although high power Gunns do drift a bit, on TV this is not such a problem due to the wider bandwidth of the TV signal. A really efficient heatsink on the cavity can help to slow down this drift if it gets a problem.

DRO transmitters however we have found to be very stable, usually drifting only a few kHz at switch on, and then perhaps a few more kHz over the contact. In fact Richard can usually tune to my frequency from a previous QSO, switch on, point the dish and find my signal straight away. He may need to tune slightly to optimise it, but then it more or less stays there all night even on WBFM audio.

50 KHz WBFM Audio

As previously mentioned, this mode will often get signals through when the wider bandwidth TV (8MHz or more) will not. Signals can be monitored on audio, only trying TV when they get to a reasonable strength. It is possible that with DRO TX capability it may be possible to use NBFM audio on about 8khz deviation with added sensitivity, albeit with a little extra tuning now and again. Richard and myself have also noticed that with WBFM audio received through the scanner, IF noise is very much in evidence. We think that this could probably be improved by feeding the scanner or other RX from some point before the MIMIC IF preamplifiers in the RX LNB. This should then not over power the scanner front-end circuitry thereby improving the signal to noise ratio. Possibly this could be effected by an extra DC isolated IF output socket, perhaps from around the mixer circuitry (the rest of the LNB functioning as normal for the Sat RX). It may also be possible to receive NBFM, AM and SSB using that output with a suitable scanner or receiver that covers the IF from that particular LNB. This system is of course not just limited to satellite receivers or LNBs; I have also used the 50MHz IF from my 23cms Wood & Douglas TV RX to get audio NBFM and SSB as well as German AM FSTV signals on a BAND 1(50 MHz) TV set!

Audio Tone Generator

During our months of looking for signals on 3cms (and elsewhere) Richard and I have found that if an audio tone of about 800 Hz is transmitted in WBFM audio the signals are much easier to find and peak up on than a person talking or calling CQ etc. We have often resorted to this system for finding very weak otherwise unreadable signals; these can then be peaked for maximum effect after which speech can usually be resolved. This is also a modification that will greatly aid anybody using microwaves; both Richard and myself recommend you do this to increase your chances of signals on these bands. Occasionally, even if signals are so weak as to prohibit speech on WBFM audio, amazingly, tones and Morse still seem to be readable even down into the noise.

Audio Receivers

In order to receive audio WBFM/ NBFM/ SSB or AM on these bands, usually through an LNB powered up by a Sat RX or perhaps the IF of another receiver, you will need a set that covers the band or IF required. Some of the lower bands may of course be received directly from the RX antenna.

Summary

I hope you have enjoyed reading this article about our experiments on 3cms and may glean some useful information from it. The basic message is that until we did these little modifications to our gear we hardly, if ever, got signals on 3cms over the doubly obstructed path that lies between us. But since these modifications we now work 3cms nearly every night on audio FM and we have worked TV about 4 or 5 times in the last few weeks compared with TWICE over the previous 6 months! How many contacts have we missed because we just gave up? My advice is DO IT NOW.

I hope to see or hear you soon on 3cms (or any other band). If you wish to contact Richard G1AUQ or myself G8KBC we are normally on or around the TV calling channel of 144.750 MHz most evenings.

TUNER I.F./PSU add-on unit

By Len Smith G7GNA

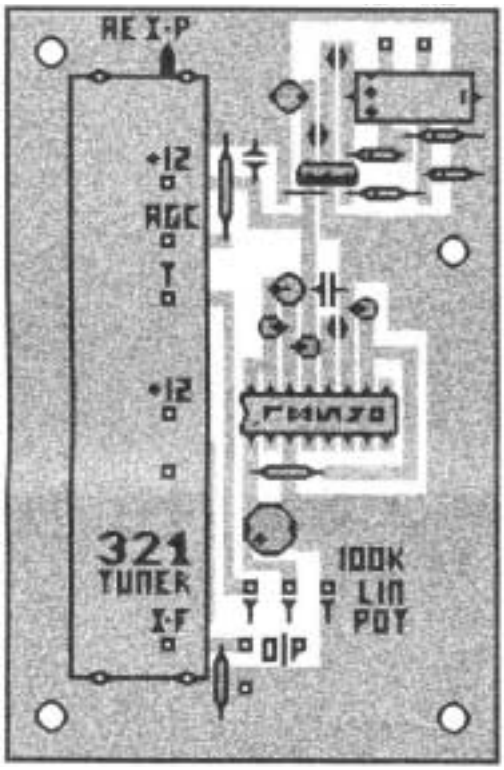
This unit was intended for the BATC FM-TV receiver, however it has found itself in several other projects that I have used in the past. The compete circuit is shown, and as you can see using what was found in the junk box, and from the wife's purse. (HI, HI)

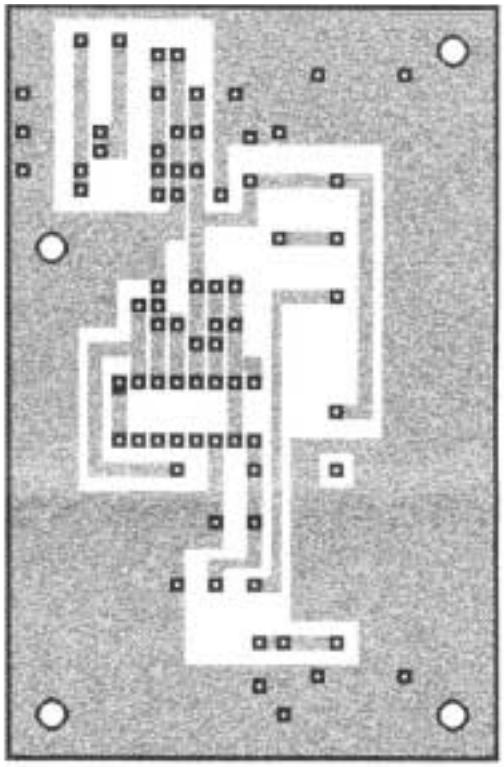
A Mullard U321 tuner unit is used since it's available quite cheaply from a number of sources. M.C.E.S. can supply new. It is operated at maximum gain by connecting the A.G.C. pin 3 to 0V via a 100R resistor (this passes a current of around 10mA corresponding to minimum attenuation).
Operating the tuner in this way is quite acceptable for our needs. The component count has been kept to a minimum including the cost, making construction very simple

The Heart

The heart of the unit has been concentrated around the IC 78S40, for a regulated 30V supply to provide the tuning voltage to the tuner via a tuning control. This approach uses a switching regulator in a step-up arrangement, providing a stabilised 30V from 12V.

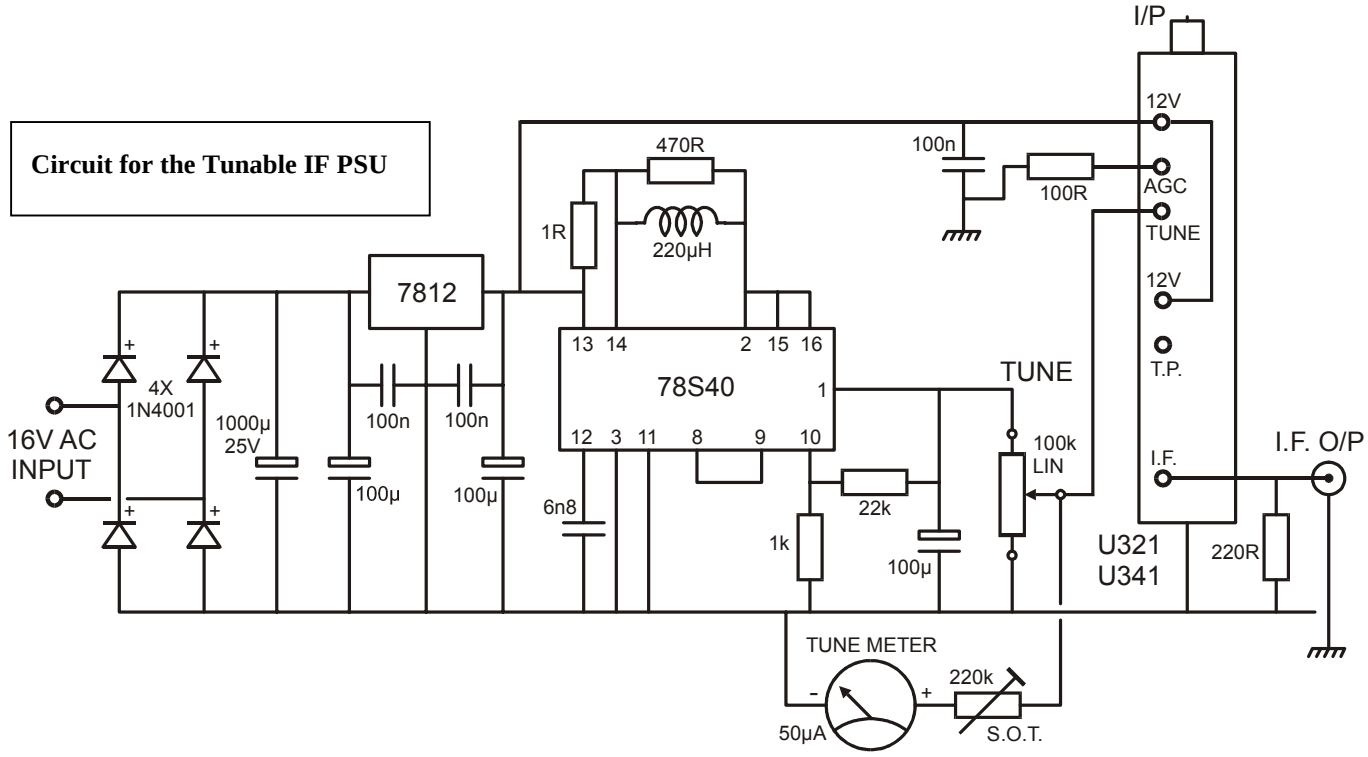
The 78S40 IC consists of a current-controlled oscillator; a temperature-compensated voltage reference; a high-gain differential comparator; a power

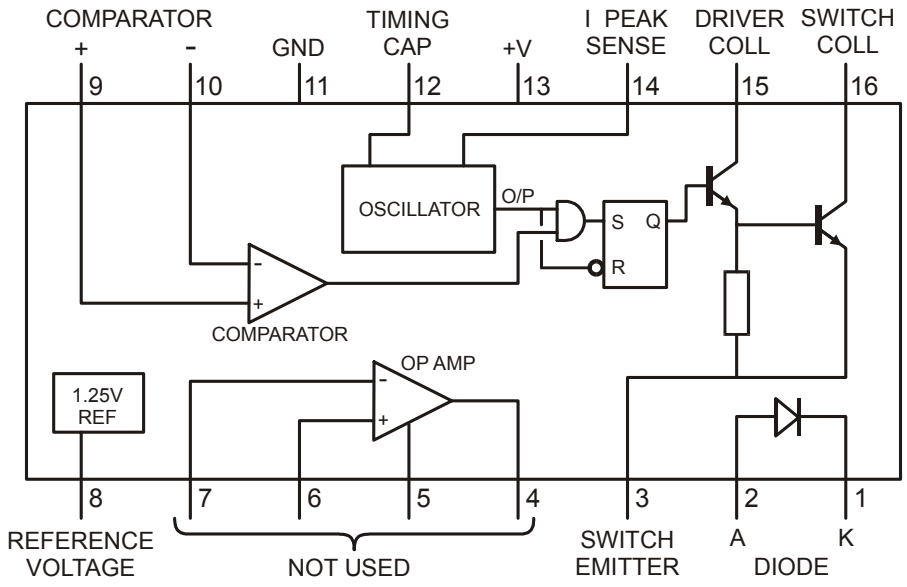




Top side **PCB shown actual size** **Underside**

Circuit for the Tunable IF PSU





Block diagram of the 78S40

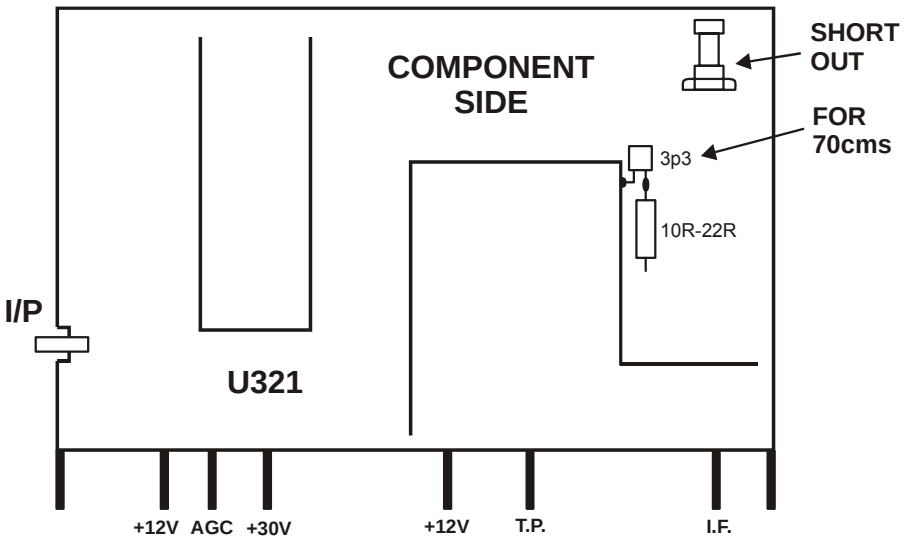
switching circuit; a high gain amplifier (that is not used in this application). The 1.3V reference voltage at pin 8 is fed to the non-inverting input of the comparator (pin 9). The 1K and the 22K resistors sample the output, applying 1.3V to pin 10. When the output voltage at pin 1 is at 30V, any rise or fall in the output voltage alters the duty-cycle of the switching waveform, via the action of the comparator, thus maintaining the output at 30V. The 6n8 capacitor connected to pin 12 determines the oscillator's "OFF" time: the ratio of the OFF and ON times is determined by the step-up requirements. This enables the oscillator frequency to be determined (in this case, frequency is around 26KHz). The resistor (1R) between pin 14 and the +12V rail determines the maximum peak switching current. The value of 1R limits this to around 330mA. The energy stored in the inductor (220µH) is switched by the two output transistors, which are connected in a Darlington configuration - the resultant peak voltage excursion being added to the 12V pedestal. The damping resistor (470R) is included to prevent instability; the output is then rectified by the diode (pins 1-2) inside the IC, charging the 100µF reservoir capacitor to 30V.

Tuner

The U321 tuners (believe it or not) comes in four different types to suit the I.F. module of a TV set, in this case Philips KT3/4 or KT30/40 and other models of that time. If a U321 tuner was used in a KT3 then if you were going to use it for 70cms RX, it is advisable to use the I.F. module that goes with it. You may ask why; the simple reason for it is that some sets were fitted with alternative versions and will not work with other tuners or if they do, the gain is somewhat less than it could be. Some TV Engineers will not agree with me, however, building 70cms RX using these tuners and I.F. modules I have come across this many times before. A tuner from one set and an I.F. module from another, do not always work. (Trust me). The U341 Tuner (which is a high-gain version of the U321) as a stand-alone unit (for this project) may need some mods made to it in the A.G.C. department. For this reason it is always best to use a preset pot first to obtain the correct nearest resistance value, and then fit a fixed one in its place.

To use the tuner for 70cms (remembering that there are four versions of the tuner - some do not have a 10R resistor or look totally different inside, or the AGC could be different, but are still U321 tuners), short the mixer coil and fit a 3p3 capacitor to the top end of the 10R resistor and the other end to the metal screening close to the resistor.

TUNER UNIT U321/341



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: mayday

Proposal to the RMC for an advanced ATV repeater in North Hampshire - Version 1 July 2000

By N. Matthews – G8GTZ and R. Powers – G8CKN

Introduction

This paper outlines the proposed development of an advanced ATV repeater to be sited near Basingstoke in North Hampshire for which the call sign GB3FT (Future Television) is requested. It is being presented to the RMC at this stage for comment and it is hoped that a formal proposal will be available within the next 2 months.

Phase 1 – 13cms in-band repeater

Phase 1 of the project would be an in-band 13cm ATV repeater. As well as encouraging use and experimentation on 2.3GHz there are 2 specific reasons for planning a 13cms in-band TV repeater in North Hampshire.

Firstly, there is currently no useable ATV repeater service to amateurs in the North Hampshire/Wiltshire area and in particular in the Basingstoke and Andover urban areas. Neither GB3HV at High Wycombe or GB3AT at Winchester provide this service. The GB3PT proposal based on the Isle of Wight will increase coverage in the Southampton basin, however it will not improve coverage North of Winchester. The use of 2.3GHz for GB3FT avoids frequency-planning difficulties in an area where it is likely that GB3HV, GB3PT and GB3AT would be seen from most potential repeater sites.

The second is to encourage use of the more readily available video low power devices becoming available for the 2.4GHz band. Whilst these units as sold operate in the legal but unlicensed band at the top end of the amateur allocation of 13cms, it has been proven that they can be easily modified or re-programmed to work at any frequency in the 13cm band. The performance of the units is surprisingly good, with the transmitter running 10mWatts, good sensitivity from the receiver and both are conveniently terminated in 50 ohms.

It is believed that with a correctly sited and efficient repeater, a number of amateurs would be encouraged to experiment with these modules on 2.4GHz ATV.

Repeater equipment

The proposed repeater equipment would be a commercial 2.4GHz Tx and Rx unit. These would be mounted at the top of the mast, along with pre amp and a 5-10 watt power amplifier and filters to reduce feeder loss.

Aerials

It is envisaged that phased antennas will be used to provide 360-degree coverage.

Logic

The basic logic will allow simple test pattern / video ID generation and repeater capability.

Repeat audio and Morse code ID will be carried on the main 6 MHz audio subcarrier.

A 144.750MHz receiver will provide audio to modulate a 5.5MHz sound subcarrier. Switchable CTCSS operation may be implemented to allow filtering due to the increasing use of 144.750MHz.

Power output – analogue FM

The RMC is requested to consider the proposal to license a 100-watt ERP output for GB3FT. The group believes this is a reasonable request given the low occupancy of the band and the relative difficulty in construction of low noise, high gain wide bandwidth ATV receivers at this frequency.

Phase 2 – 10 GHz input

A secondary function of GB3FT will be to encourage experimentation on 10 GHz ATV by initially providing a receive facility for that band. This may be upgraded to include a transmit facility in the future.

To achieve this, a 10GHz down converter will be fed into a second FM TV receiver. This input will be fed into the GB3FT logic as the primary input with identical operation as the main 23cms receiver except that it will have priority over the 2.3GHz input.

Phase 3 – digital output

It is intended that GB3FT should break new ground and provide the world's first ATV OFDM digital output on a second transmit carrier modulated with DVB-T digital modulation (OFDM). This will be used to transmit an MPEG-2 coded version of the main analogue audio and video output.

The DVB-T OFDM modulation scheme has already been proven for use at 2GHz on broadcaster video and ENG links. G8GTZ has been responsible for the implementation of many of the initial test systems in use around the world. Regulatory bodies around the world, including the JFMG in the UK, accept OFDM as the preferred

Frequency	Use	Comments
2310 – 2450 MHz	Military links	Primary user
2320 – 2380	Home office	Emergency links
2310 – 2450	Amateur band	Secondary user
2400 - 2450	Amateur satellite	
2320 - 2322	Amateur narrow band	
2390 - 2600	PMSE video links	ENG + heli-teli FM video links
2400 – 2500	ISM band	General use
2400 – 2483	Low power devices	
2325 – 2335	ATV repeater input	Germany and Holland
2350 – 2390	ATV repeater output	Germany and Holland

modulation scheme for digital microwave video links.

The digital output will be to broadcast standards and fully DVB and MPEG compliant. It will be compatible with the current range of Digital set top boxes being supplied for the On – Digital services and it is intended to encourage users to experiment with 2.3 GHz down converters as a first stage to enable reception. Note that it is not intended that the repeater will have a digital input and the intention is to encourage amateurs to experiment with digital receivers as these become more readily available.

Equipment

The digital transmission will be generated by a professional broadcast MPEG-2 encoder with video and audio inputs. The output will be feed through an MPEG multiplexer, which in turn is fed to a DVB-T compliant OFDM modulator. This will produce an 8MHz bandwidth signal capable of carrying up to 32Mbits of data, depending upon configuration, although it is intended to configure the modulator to run at approx 10Mbit/s initially.

The IF output from the modulator at 36 MHz would be mixed with a high stability, low phase noise oscillator source, filtered and amplified to the final carrier frequency. A power level of approximately 5 - 10 watts from a linear transmitter is envisaged and will be feed via low loss co-ax to plate antennas at the top of the mast.

Frequency of operation

There is currently no provision for ATV repeaters in the UK 13cms-band plan. After much research it is clear there is no real order in mainland Europe either, but the occupancy of the band seems to be as follows:

Analogue frequency

For ATV operation on 13cms using 16MHz bandwidth, a minimum repeater input and output split of 30 MHz is needed and for 27MHz bandwidth a minimum split of 60 MHz is required.

Therefore an input frequency of 2330MHz and an output frequency of 2370 MHz is requested for the in-band analogue FM repeater operation with a bandwidth of 16 MHz.

Digital frequency

In order for ON-Digital type receivers to be used to receive the digital transmission, the final down converted frequency must be placed in the centre of a UK UHF channel. In order to avoid IF breakthrough problems ideally this channel would not use by a local terrestrial transmitter site. A commercial receive down converter from Cal Amp is readily available with a local oscillator of 1664MHz and so a frequency of 2386 MHz is requested for an 8 MHz transmission.

Tx freq 2386MHz – LO freq1664MHz = 722MHz = channel 52

As the actual OFDM bandwidth is 7.56 MHz and the 8MHz already includes a guard band, this choice of frequency will also ensure no overlap with the current PMSE broadcaster video links analogue allocation, managed by the JFMG, starting at 2390 MHz. It is also compatible with the proposed JFMG digital band plan, which will also start at 2390 MHz.

Power output - digital

The RMC is requested to consider the proposal to license a 100-watt ERP at 2386 MHz.

Whilst this may be harder to achieve, due to the typical 6dB back-off required with OFDM transmitters, the group believes this is a reasonable request given the low occupancy of the band and the experimental nature of this transmission.

The group will readily accept a 25 watt ERP licence if the request for higher power levels for analogue or digital is likely to cause any substantial delay in the licensing procedure.

Group organisation

It is intended that the project would be run by a small group of dedicated individuals living in the area. This group already has a very close working relationship with the groups running GB3HV, GB3PT and GB3AT and the support of the Basingstoke Amateur Radio Club.

GB3FT location

The experimental nature of GB3FT means that a good RF site offering maximum coverage of the Southampton and Thames Valley area is required. The group is currently exploring a number of sites within a 10-mile radius of Basingstoke and will be in a position to submit a formal proposal to RMC as soon as negotiations with site owners are concluded.

Conclusion

We believe that the proposed GB3FT takes Amateur Television in the UK into the 21st century. It will benefit not only the existing ATV'ers in the south of England, but other amateurs who are not involved at present by putting ATV within their reach and will raise the profile of UK amateur radio world-wide.

It is a forward looking but realistic proposal that we believe is achievable and we would welcome any comments the RMC members may make to help ensure a quick and smooth licensing process.

2332 MHz	FM input - lower end
2340 MHz	FM input – centre frequency
2348 MHz	FM input - upper end
2364 MHz	FM output – lower end
2370 MHz	FM output – centre frequency
2378 MHz	FM output – upper end
2382 MHz	OFDM output – lower end
2386 MHz	OFDM output – center frequency
2390 MHz	OFDM output – upper end
2390 MHz	Start of PMSE band

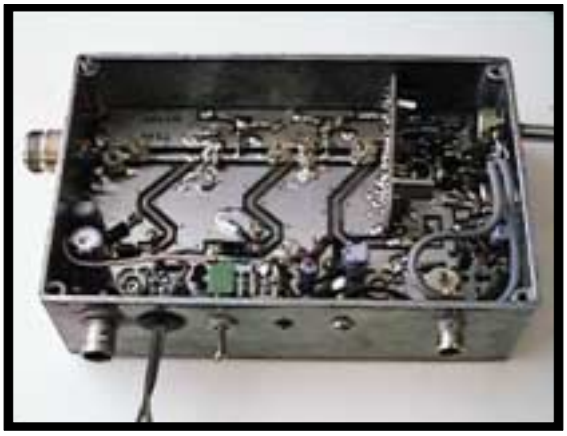
Proposed GB3FT 2.3GHz frequencies layout

Worthing Video Repeater Group

GB3VR GB3RV GB3SR & GB3BR

Web Site: - www.videorepeater.co.uk

1Watt FM-TV 24cms Transmitter

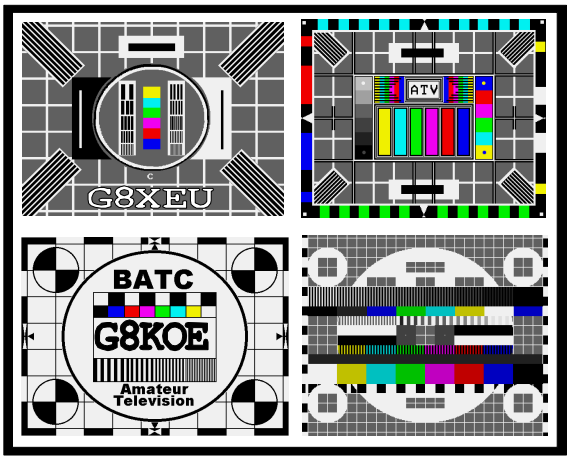


The 1 watt transmitter generates its signal at the wanted frequency which can be set anywhere in the band, colour or B/W. On board inter-carrier sound and fixed pre-emphasis are standard features. The kit includes the PCB all the on board components, pre-drilled heat sink, an Eddystone Di-cast box and full and comprehensive instructions. Building time is three evenings work. The new price for this kit is **£85.00, P&P £2.50**. Available to licensed radio amateurs only.

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 test cards, 20 wipes, superb text control, 30 screens of text messages, QRA calc, Test card music, selectable displays, and this version has a DTMF tone pad to control your repeater. All test cards are over-scan i.e. the whole screen is used, Load in your own customised test cards, 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**

For help with ATV kits, contact:-

Mr G Mather G8DHE. Email atvkits@g8dhe.cix.co.uk Tel: 01903 237726

PC-ATV now available, see web site for details.

Orders should be sent to: -

Worthing Video Repeater Group, 2 North Farm Road, Lancing, West Sussex, BN15 9BS

Cheques payable to "WVRG"

Circuit Notebook 74

By John Lawrence GW3JGA

Vision's fine, shame about the sound.

From one point of view, video inter-connections are easy. The camera, camcorder or other video source provides a video signal having a peak-to-peak amplitude of 1V when fed into a resistance of 75 ohms. The video mixer, recorder or transmitter has an input impedance of 75 ohms and works properly when fed with a video signal of 1V peak-to-peak. You connect everything together with 75-ohm coax and basically, it works.

Audio is more difficult, because (a) the signal level (amplitude) can vary widely, (b) it must be held within certain limits, too low and noise may be present, too high and distortion may occur and (c) it may come from and go to equipment having different output and input impedance.

Historically, audio signal measurements originate from the design of the telephone system. A signal power of 1milliwatt into an impedance of 600 ohms (the impedance of overhead telephone lines) is defined as 0 dBm and this is equivalent to an r.m.s. signal voltage of 0.775 V. Most audio milli-voltmeters are calibrated to read in both a.c. volts and decibels relative to 0 dBm, more strictly '0 dB (mW)', also known as dBu [1]. Some signal and microphone measurements are based on 0dBV where 0 dB is referred to a signal of 1 volt r.m.s. but no account is taken of the impedance of the circuit. R.F. signal generators come with a different range of terminology that is not covered here.

Does all this matter you may ask? You plug your camcorder into the ATV TX and ask Joe, who is receiving your signal, if it sounds ok. He may say that it is weak, or sounds a bit distorted, or there is a lot of hum or buzzing. Also, when passing the transmission over, he gets audio feedback and howling until the controls are readjusted - so perhaps it does matter. We use 6 MHz FM inter-carrier sound, there is no reason why we shouldn't have excellent audio to go with our pictures.

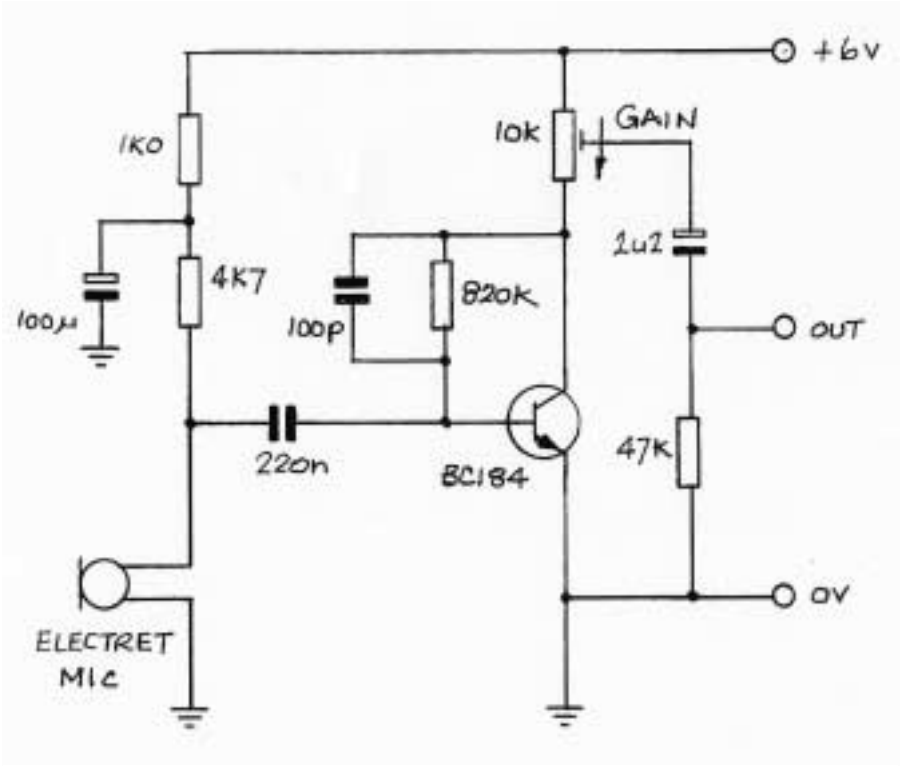


Figure 1 - Pre-amp for electret microphone

Microphones

A microphone converts pressure waves in the air into an electrical signal. The sensitivity of a microphone is usually quoted for a 1kHz signal and can be expressed in several ways.

Usually the sound level is quoted in microbars (one millionth of the static atmospheric pressure) which may be visualised as 0.0001 % modulation of the static pressure - not very much. As a 'rule of thumb' a person speaking at a distance of about 2 ft (60cm) from a microphone produces a pressure signal of 1 microbar.[2]

Looking at a data sheet for a low cost electret microphone [3], I note that it gives the output as -60dB +/- 3dB where 0 dB = 1Volt/microbar at 1kHz. That means, when speaking at 2 ft distance from the microphone its output will be 1mV (-60dB referred to 1Volt) +/- 3dB (the manufacturing tolerance). The data sheet also gives the typical frequency response over the range 50Hz to 8kHz and this is reasonably flat.

As the acoustic sound pressure is inversely proportional to the square of the distance, halving the distance from the microphone to 1 ft, will increase the voltage output by four times (12dB). This is why the clip-on lapel microphone is so successful, it gives a high output from the wearer and minimises more distant sounds from, for example, your talkback receiver on 144.750.

In comparison, a camcorder microphone is likely to be several feet away from you and a similar distance from your talk-back receiver, possibly resulting in acoustic feedback or howl round. In addition, during any silence the camcorder automatic level control will wind up the gain making the situation even worse. Plugging a lapel microphone into the camcorder and thus muting the camcorder internal microphone can make some improvement.

If the wearing of a lapel microphone is inconvenient then a directional cardioid, or preferably, a super-cardioid microphone, placed at about 2 ft, is a useful alternative, but of course you must remain 'on beam'.

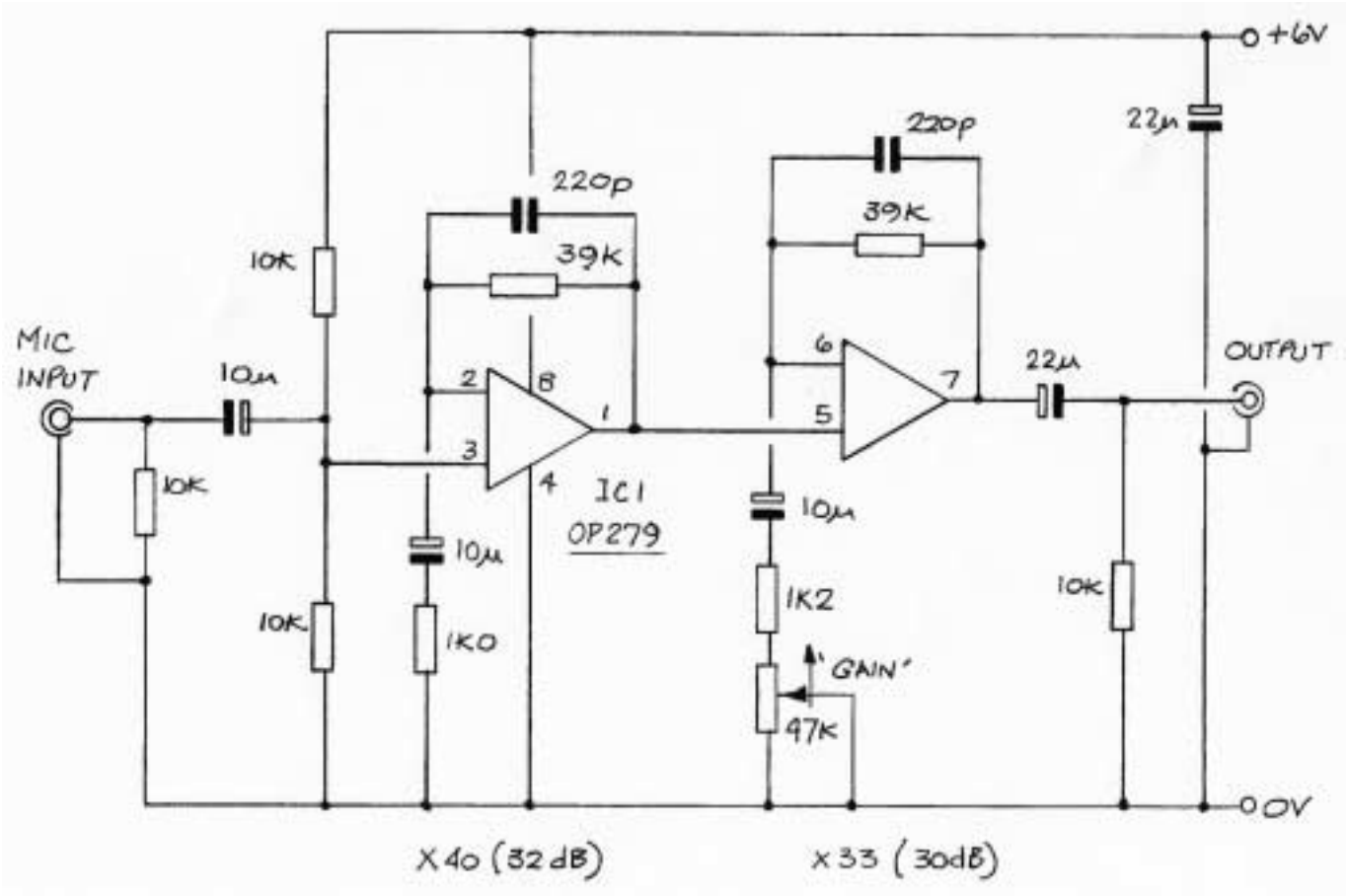


Figure 2 - Amplifier for moving coil microphone

The electret microphone mentioned previously, has a relatively high signal output because it already has an in-built amplifier. In comparison, a moving coil microphone has a much lower output. For example, a cassette recorder microphone has an output of -78 dB (16 micro volts) for 1 microbar. So you would need to speak into it very closely or provide more amplification to equal the electret microphone. The problem of speaking closely is that the output level varies enormously with slight changes of distance.

When using a moving coil microphone it is good practice to connect it to an amplifier having an input impedance of about 10 times greater than the microphone. A 200-ohm microphone should be connected to an amplifier with an input impedance of 2k ohms or more. Some moving coil microphones have a built-in step-up transformer that raises the voltage level by a factor of 10 (20 dB) but they must be connected to an even higher impedance amplifier, of at least 100k ohms, for best results.

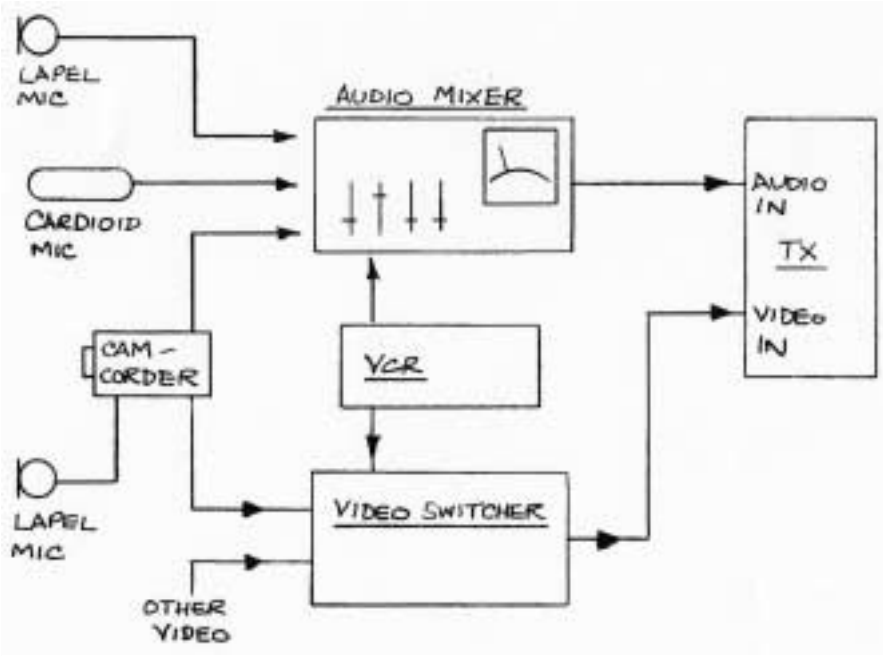


Figure 3 - Typical ATV station layout

Microphone Amplifiers

In essence the microphone amplifier should contribute as little noise as possible to the microphone signal. For our communication purposes this is not a problem. A simple single transistor amplifier is quite adequate. The circuit, shown in Fig.1 is suitable for use with an electret microphone and will provide a gain of about 40 (32 dB). Speaking at about 30 cm from the microphone produces an average output signal of about 300 mV (approximately -10 dBm).

For a moving coil microphone the amplifier shown in Fig. 2 is more suitable, having sufficient amplification (62 dB) to bring a microphone signal of -72 dBm up to -10 dBm

When amplifying the signal to a higher level you need to consider the peak-to-peak amplitude of the signal waveform and the possibilities of distortion. For example, a 1 V r.m.s. sine wave signal will have a peak-to-peak amplitude of 2.8 V. But, as speech is essentially a widely varying signal, the amplitude of the peak sounds can be 2.5 times (8dB) greater than the average value resulting in a maximum possible peak-to-peak value of 2.8 V x 2.5 = 7 volts peak-to-peak. This is too high for camcorders operating from batteries and most domestic audio equipment too, so the maximum signal levels are usually restricted to -10 dBm, that is 316 mV, with an absolute maximum excursion on speech peaks of about 2.2 volts p-p. This is borne out by referring to the specification of my Sony camcorder [3] that defines the audio output level as 327 mV, which is just slightly over -10 dBm. This level of signal is convenient for interconnecting equipment in that it is high enough to avoid noise pick-up and low enough not to require higher voltage supply rails for the circuits.

Audio Mixers

An audio mixer will help solve many audio problems in the ATV shack. The mixer does not have to be elaborate or expensive. A range of simple mixers was marketed under the names of Eagle and Realistic and can often be picked up second hand for under £ 10. The mixers usually have two or more inputs (some are stereo), with slider faders providing an output of 775 mV (0 dBm). A built-in VU meter monitored the output signal level, on some models. The units provided the mixing of say microphone and camcorder or VCR sound and, at the same time, monitoring the audio level being fed to the transmitter. The microphone input on the mixer had just sufficient gain for an electret, but not quite sufficient for a moving coil type. If you are seriously considering building your own mixer, then it is worth reading the excellent series of articles 'Sound in the Studio' by John Goode, which first appeared in CQ-TV 139 (August 1987).

Typical Station Layout

A suitable arrangement is shown in Fig. 3. A clip-on lapel electret microphone, either direct or through the camcorder, provides good pick-up and minimum feedback and the mixer allows control and monitoring of audio signals from alternative sources.

References

[1] The Sound Engineer's Pocket Book Michael Talbot-Smith

(Ex BBC Training Dept.)

[2] Video HandbookRu van Wezel, Chapter 7, Audio, p. 315. ISBN 0 434 92189 0

[3] Data SheetRapid Electronics Ltd. (01206) 751166 Electret Microphone 35-0192

[4] Operating InstructionsSony Camera Recorder CCD-TR3200E, p. 115.

[5] Sound in the Studio John Goode, CQ-TV 139 onwards

TV on the Air

By Graham Hankins G8EMX.

Dave Murray, Keeper of 1.3GHz ATV repeater Gb3RT in Coventry, Emails: "GB3RT went back on air today (Thursday 15 Feb). It has had a new power amplifier, some replacement cabling, new EPROM for idents and info, new aerials and feeder. GB3RT now runs full power and is very stable due to the fitting of a heat sink and fan. We are now running tests to see what coverage we gte, so would be glad of any reports.

Anyone seeing GB3RT (last known location Tile Hill, Coventry - GJH) please drop me an Email dave_murray@gb3rt.fsnet.co.uk

A full report of the test in the Isle Of Man can be found at http://www.qsl.net/g1hia/gd1hia.html

Birmingham ATV repeater.

The Beacons Repeater Group is desperate for some close-down volunteers for its 24cm ATV repeater application.

The 1.3GHz repeater will be sited in a private house in Erdington. All hardware is available yes transmitter, receiver, logic, antenna etc. but we need four names who are within half an hour of Erdington! Can ANYONE help?

Remember anyone can switch off! We just need names, address and telephone numbers where they can usually be reached if needed. Obviously one of the close down names will be the person who lives in the house (who is a licenced operator and a BRG member) but we are looking for three more volunteers.

Email me or phone 706 7384 if you can help put an ATV repeater into Birmingham!

CHATHAM Navy Days 2001

Members of several local radio clubs are uniting to “Put on” an Exhibition Station at this years Navy Days. Navy Days 2001 are being held at the Old Naval Dockyard, Chatham, Kent during the May Bank Holiday weekend (26/27/28). Members of the following clubs who will assist in running the station are, BAe Systems ARC, Rochester Bredhurst Receiving & Transmitting Soc. (Brats) Medway Amateur Receiving & Transmitting Soc. (Marts)

North Kent ATV Group.

We have applied and hope to use the Call Sign, GB0CHD (Chatham Historic Dockyard) and will be operating on all bands and modes where ever possible. P. Carey. G3UXH

Contest News

By Richard Parkes G7MFO

I would like to thank John G4ZJY for not making me redundant this issue! John managed to work fifteen stations over the winter cumulative contest and as can be seen, from the results below, came in first place, on both bands due to no other station sending in logs. A list of all the stations John worked can be found on the BATC web site under the 'Contest' link.

The only problem I have seen up to now, with the contest logs sent in, is that one station changed his contest numbers for every station he worked throughout the International contest. Please keep the same numbers throughout the contest, even if you don't send in your logs, as it makes it very hard to cross-reference the results.

I am writing this article just before the deadline so I could include any information from the Spring Vision contest (or that's what I tell Ian). Due to the foot and mouth I abandoned my plans of going portable for the contest and I also received a couple of emails from other stations saying they were doing the same. I only managed to raise the head of Dave G8KBC; I don't know where all the rest of the local ATV'ers had disappeared too. They must have organised some trip without me!

On a good note, I received the logs from John G7JTT within five hours of the contest finishing. Can anybody beat that? I have also had a couple of enquires about the contest log sheet software.

Contest Rules Changes 2001

I have changed the following to the contest scoring: -

For one-way contacts 70cm 1 point per km, 24cm 2 points per km and on higher bands 5 points per km. With these points doubled for two way contacts

I look forward to working many of you over the next year and hope to see you at the BATC rally at Bletchley in May.

Richard Parkes G7MFO
7 MAIN STREET,
PRESTON,
HULL. HU12 8UB,
ENGLAND.
Tel: - 01482 898559

E-mail: - contest@batc.org.uk

Winter Cumulative 2001 Results

Place	Callsign	Locator	QSO 24cm	Score 24cm	QSO 3cm	Score 13cm	Total Score
1	G4ZJY	IO82SQ	21	4952	9	1885	6837

Contest Calendar

Summer Fun 2001 (Joint European)

Saturday June 9th – Sunday June 10th

From 1800 GMT Saturday to 1200 GMT Sunday

Fast Scan ATV all Bands.

UK ATV Repeater List

Using the contest software, I have produced a worksheet with all the UK ATV repeaters and proposed ATV Repeaters. The 'UK ATV Repeater list' can be found on the BATC web site (www.batc.org.uk) through the 'UK Repeaters' link. As with the contest software make sure you input your location in uppercase and the worksheet will work out all the bearings and distance from the locator to all the repeaters on the list. All the information was obtained from the RMC web site and past copies of CQ-TV. Please get in touch with me if you can fill out any of the blank cells or if any of the information is incorrect.

E-mail: - richard@g7mfo.karoo.co.uk

‘Repeater’ is the premier ATV magazine in Holland.

Repeater is an 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.cchmedia.nl email: rulrich@cchmedia.nl

Snail mail: - Gibbon 14, 1704 WH Heerhugowaard, Netherlands.

Repeater is now a bilingual magazine (Dutch/English) as you can see from the cover picture.

Juke Box Jury

Dicky Howett **dings his bell and honks his hooter.**

Juke Box Jury wasn't the most original BBC television programme of the 1960s, but it was certainly one of the most popular. And it had a secret ingredient: The General Public.

Juke Box Jury, chaired by genial David Jacobs, was aired first in 1959. It occupied an early evening weekday slot but soon, the show was shifted to Saturday peak time in order to compete with ITVs frantic pop show 'Boy Meets Girl'. Like most British popular TV programmes of the time, Juke Box Jury was based on an American original format. The Hollywood-based CBS TV company KNXT (Channel 2 'California's Most Popular Station') first transmitted the show- devised and hosted by a strange non-telegenic individual called Peter Potter- in 1953. The US show, sponsored each week by a variety of products, concentrated on the (usually 6) star guests and even had a live music spot. The raison d'être of the show was that the celebrity panel displayed their ignorance/intelligence/wit/judgement of various newly released popular recorded ditties. Also, the US version had a glamorous 'hostess' who, during the playing of the discs, wandered amongst the jurists dispensing 'refreshments'.

No BBC Glamour Girl

The BBC's Juke Box Jury had fewer jurists (4), and no glamour girl dishing out BBC plonk. The main BBC departure from the US version was that during the disc play, the cameras concentrated on the studio audience. Therein laid the success and popular appeal of the programme. People clamoured for tickets just for a chance to be "on the telly", albeit for five seconds. But that was enough to promote wild enthusiasm and score a ratings success. Also, it did me no harm because I appeared on the programme twice!

David Jacobs off air in 1962

Peter Potter, the US M.C. of the original Juke Box Jury.

Juke Box Jury was staged at several of the BBC's studio sites, including the Television Theatre at Shepherds Bush, Lime Grove Studio G and Television Centre Studio 3. However, elderly BBC studio commissionaires always had to stand well clear when the audience was admitted, as there was an almighty stampede for the front row. Grabbing a ringside pew was pointless as the cameras always found faces to shoot wherever they were seated. No amount of admonishing, "Don't rush, don't rush!" made the slightest difference. Thus, one evening I found myself unexpectedly and precisely in the middle of the front row. This had an unfortunate effect on me because when a camera loomed to take my picture, almost within inches of my nose, I developed suddenly an uncontrollable twitch and a shifty eye. Tv cameras in those days were still unfamiliar and thus looked extremely daunting!

Juke Box Jury was broadcast live each Saturday, but what viewers didn't realise was that after the live show was aired, another was recorded. To facilitate this, the audience was judiciously shuffled. Then the 'celebrity' panel was changed, the prop Juke Box re-stuffed and off it all went again. This meant of course, that when a lucky member of the audience got 'caught' on camera they could catch up with the 2" quad recording of their star performance the following week.

Suspicious Audience

At the Television Theatre on one occasion, at the end of a live broadcast, the cameras were unexpectedly kept trained on the audience. We were told to remain in our seats. The cameras then panned around focussing on individuals, this caused a frisson throughout the theatre. It subsequently transpired that a policeman had seen the live broadcast and thought he had spotted a 'wanted' face amongst the audience. This turned out not to be the case. However, the hiatus even silenced one of the guests, Jimmy Savile who fortunately, on this occasion, didn't attempt to keep the audience amused. Thus was the power of live television, back in the days of two channels, 405 lines, black and white and no VCRs.

Juke Box Jury (even the sig tune was a hit) ended its original BBC run in 1967. The programme resurfaced in 1979 with Noel Edmonds and again in 1989 with Jools Holland honking the hooter, but the original excitement had vanished. It was impossible to recapture those special magic TV moments. A few spring to mind such as when all four Beatles and later all five Rolling Stones were 'jurists'. And then there was the time when singer Johnny Mathis stuck a peg on his nose in a witty attempt to characterise the quality of a Cliff Richard song. Soon after, Mathis' career in this country went into a bit of a decline.

OBITUARY - Alan Ross Watson, died March 4th 2001

Prepared by Paul Marshall

Sadly, we must report the sudden death on March 4th 2001, at his home in Bigby, Lincolnshire, of former BATC Committee Member, Alan Watson.

Alan lived all his life in this quiet part of the country, except for a period doing National Service in the Royal Air Force. He was a partner in the successful local Public Address hire and manufacturing company, W and T Ultrasonics, and this expertise often spilled over into BATC activities.

He joined the BATC in 1960 and became one of the pioneers of the club in using ex-broadcast television equipment. He was often to be found helping the late Joe Rose with his outside broadcast van, Monoculus. Working with all this surplus equipment, and often struggling for missing parts and equipment, he decided to join the BATC Committee and set up the Equipment Registry. The idea behind this was that a central list of equipment wanted by individual members could be cross-referenced to surplus available, be it from other members or donations from other organisations. He ran this for many years until the need for the service petered out. Alan remained a stalwart member of committee and one of the most regular attendees at committee meetings through the late 70's and all through the 80's. He turned his attention to helping with the BATC Rally, in particular providing memorable public address equipment at no charge. His PA's were so well known that he gained the title in the club of 'MegaWatt Watson' in deference to the power and clarity of these systems.

He will undoubtedly be remembered by his friends as someone that you could always go to with a problem, whether it was technical or otherwise. You knew that he would give it his full attention, and that once he had grasped the problem the task would not be put down until it was completed, and completed well. His well known humour and endless supply of jokes would help along the way.

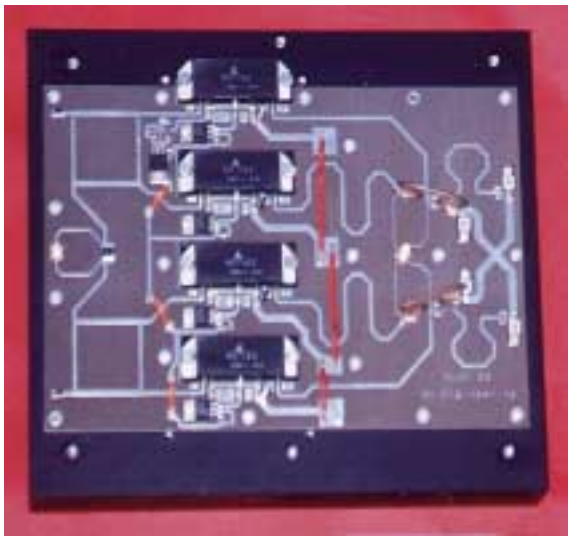
Alan was a very capable engineer and not one to shrink from daunting practical difficulties - a number of us remember how he once 'saved the day' for one OB truck by 'hot wiring' into a large mains power distribution unit!

He will be missed greatly, and rally time will never be quite the same again. It is a measure of the regard in which he was held that a number of BATC members were at his extremely well attended funeral, which appropriately enough was relayed by PA to the overspill congregation in the Church Hall.

Alan leaves a widow, Maureen, son John, and daughters Angela, Claire and Christine, to whom we extend our deepest sympathy. Maureen and John regularly accompanied Alan to BATC events to help with the PA and anything else that needed to be done.

On a personal note, I first met Alan in the early 1970's when I was in my early teens. Seeing him with a Pye Mk3 3" image orthicon camera undoubtedly helped set me on course to be an engineer and later on to start collecting and preserving these large lumps of television hardware!

GH Engineering



GH *Quad* solid-state amplifier

1.24 - 1.3 GHz 2 - 4W input, up to 72W output

Mini kit £360 Full kit £450 Fully built and tested £595

Mini kit includes PCB, PCB mounted components, mounting/drilling template, 2 x PCB mounted SMA sockets and undrilled heatsink. Full instructions and assembly drawings are provided, or can be viewed and downloaded on the GH Engineering web site (www.ghengineering.co.uk). Heatsink can be supplied pre-drilled and tapped at an extra cost of £38.

Fan kit – optional, but recommended for ATV use. Consists of 2 x 93mm 12VDC axial fans, finger guards and fixings. £12

(Requires extra holes to be drilled and tapped in heatsink – details supplied)

Requires DC PSU 12.5 – 13.8V@25A (not supplied).

PA1.3-2 2 Watt amplifier and PA1.3-18 18 Watt amplifier

◄PA1.3-2

Mini-kit £74.00

Diecast box £3.50

N connectors with flying leads £3.00

PA1.3-18 ►

Mini-kit £88.00

Full kit £124.00

Full kit with deluxe case £132.00

Built & tested £215.00

Operating from an external 12-13.8V DC PSU (1.5A for PA.13-18, 5A for PA1.3-18) – not supplied.
Features: - Both amplifiers have reverse polarity protection, solid state DC switching, selectable PTT polarity (either 0V on Tx or +12V on Tx) and optional input attenuator. Heatsinks can be supplied drilled & tapped for an extra £8. Mini-kit consists of PCB, PCB mounted components and PA module. Full kit (PA1.3-18 only) also consists of front panel labels, switches and LEDs, aluminium case and DC & RF connectors.

PA2.3-1 – 1W 2.3GHz amplifier – available soon

Mitsubishi Semiconductors

M57762 - £50 M67715 - £56 M68719 £87

MGF1302 £6

Miscellaneous

BFQ34 - £10.50 BLV93 – £20

Mini-Circuits

MAR-1, MAR-2	£2.00
MAR-3, MAR-4, MAR-6	£2.50
MAR-8	£2.80
MAV-11	£3.50

All other Mitsubishi and Mini-Circuits products available, many in stock – ask for details

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On Screen Display programming with the PIC 16F84 & STV5730A

By Simon Blake,

The BlackBoxCamera Company Ltd
Simon.Blake@BlackBoxCamera.net

This article describes programming the popular 16F84 microcontroller to control the STV5730A On Screen Display chip reviewed by Trevor Brown in CQ-TV 192. As an example it uses the demonstration code freely available from www.STV5730A.co.uk and designed to run on the PIC 16F84 On Screen Display project board. This code is available in both MPASM assembler and PIC BASIC.

The learning curve from a simple introductory 16F84 program to a useful application program can be steep. This is particularly true when your aim is to develop an on screen display. Until recently there was no simple, inexpensive, way for the hobbyist to develop versatile microcontroller driven on screen displays. Hardware solutions for writing text over video required the use of a serial interface, had a very limited command set and virtually no software support. The PIC 16F84 On Screen Display (OSD) project board has been specifically designed to provide the hobbyist developer with the hardware *and* software to create both simple and complex OSD applications.

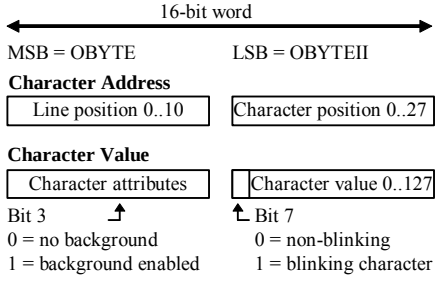
The low cost, versatility and ease of use of the PIC 16F84 have made it a microcontroller widely used by both hobbyists and industry. As a result an enormous amount of support for it exists in the form of tutorials and example application code on the Internet and elsewhere. The STV5730A is an OSD chip widely used in VCRs and television set top boxes for displaying on screen programming menus. Because this device is designed to be controlled by a simple microcontroller it is ideal for providing any 16F84 program with the ability to create an on screen interface.

By combining a 16F84 with an STV5730A the OSD project board creates a unique environment for application program development. The interface required to control the STV5730A uses a minimum of 127 words of the 16F84's 1024 word program memory, 3 i/o lines and only 6 bytes of RAM. For the experienced programmer the small footprint of the interface means that many existing PIC applications can be adapted to run on the OSD project board by simply replacing their existing interface code. For the novice programmer the simplicity of the interface makes it extremely easy to learn to use and then to modify as experience grows.

The output of the demonstration program. The STV5730A character set consists of 128 text and graphics characters that can be displayed on screen in a 28 column by 11 row grid.

The default STV5730A set up used by the demonstration program requires only a single routine, **SETUP_5730**. This routine takes care of setting up the 16F84 i/o connections, initialising the STV5730A and setting its 5 control registers. You should not need to change these values for most simple text over video applications. The STV5730A divides the screen into 11 rows each with 28 character positions. Each character position is individually addressable and can be thought of as simply a memory location to which the 16F84 writes a value. In this case of course the value written is then displayed as a character on the screen. The demonstration program defines and uses the **OUT_WORD** routine to write character address and value data to the STV5730A. This routine writes a 16-bit word consisting of the two bytes, **_OBYTE** and **_OBYTEII**.

Each character is written as a sequence of two words. The first word consists of the character address, composed of the line and character position values. The second word contains the 7-bit character value in its least significant byte (LSB). This value indexes the STV5730A's character ROM. Bit 7 of this byte determines whether the character blinks when displayed or not. In the demonstration program the use of a byte counter with a 0..255 value range results in the display of the entire STV5730A character set alternately unblinking and then blinking. The most significant byte (MSB) holds the character display attributes that control the character's colour and whether it is displayed with a background. Only bit



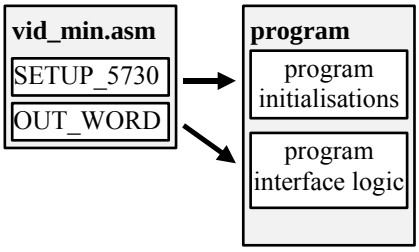
Two word character sequence

```
;-Set address pointer to line 1 see STV5730A datasheet pgs. 11 & 12
MOVF  CHAR_COUNTER, W   ; LSB for row address,STRU = 00, DEPL = character pos.
MOVWF _OBYTEII          ; ... into second byte
MOVF  LINE_COUNTER, W   ; MSB for register address, BUF = line number
MOVWF _OBYTE            ; ... into first byte
CALL  OUT_WORD          ; Write the word to the STV5730A

;-Write the character as a 16 bit word. LSB = character code, MSB = character attributes.
MOVF  _COUNTER, W
MOVWF _OBYTEII          ; Character code in LSB, bit 7 controls blinking
MOVLW b'00011111'       ; MSB sets default character attributes, background = bit3 1, white text
MOVWF _OBYTE            ; ... into first byte
CALL  OUT_WORD          ; Write the word
```

This code fragment from the 16F84 demonstration program illustrates the two-word sequence required to write a character to the screen via the STV5730A. The character position is derived from the CHAR_COUNTER and LINE_COUNTER variables that are incremented in a loop to cover the entire screen. The COUNTER variable holds a value from 0 to 255 that is displayed as the corresponding STV5730A character.

3 is of this byte, the character background control is used as character colour is fixed to white on the project board.



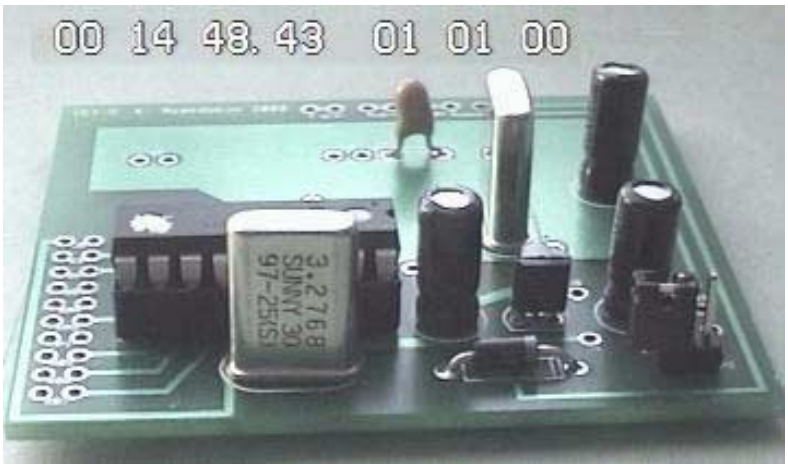
The routines in the demonstration program **SETUP_5730** and **OUT_WORD** provide the basis for developing any type of 16F84 program with an on screen display capability. Your program will first need to include 5730_min.asm. Then **SETUP_5730** should be called as part of your program's initialisation. After the interface has been initialised you can call **OUT_WORD** as described to write to the screen to display text as dictated by the requirements of your program's interface logic.

In many cases the ideal starting point for developing a new program is to adapt an old one. For example many existing 16F84 programs use a serial LCD to display information. As such they already have the logic required to position and write information to a screen. Translating from an LCD to a TV screen is straightforward as the serial routines can simply be replaced by the routines from the demonstration program. As a demonstration of this a real time clock example is given on

Using the simple code structure of the demonstration program text strings can be displayed with or without a background at any location on the screen.

www.STV5730A.co.uk which can be assembled either to display on an LCD or on a TV screen. The free third party code used in this program can also be used to interface the 16F84 to simple temperature sensors and other devices.

The STV5730A data sheet together with full details of the OSD project board and software, including advanced application examples can be found at www.STV5730A.co.uk.



Output of the real time clock program which demonstrates how to integrate the on screen display routines with existing code.

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LCD transceiver controller bug

There was a bug in the first release of the LCD transceiver controller software. This affected the 23cm and 13cm transmitter/receiver controllers and could result in a corrupted display and incorrect operating frequency. The "ENG" receive-only controller is not affected.

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Trio TS700 2M multimode. A bit deaf complete with VOX and workshop manuals £110 and a Microphone

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Contact Dicky Howett 01371 820155

email: dicky.howett@btinternet.com

Sony HVF2000P viewfinder, service manual or circuit diagram..Sony HVC3000P camera service manual or circuit diagram. Sony BC-1WA battery charger manual or circuit diagram. Sony DXC_M3AP any information, service or spec sheets/

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Does anybody have circuits for any of the following:- Manor Xhatch and colour bar generator, Link video sweeper type, Link ITS gen type 375, Link grey scale gen 112 or similar.

Contact David Long on 01274 877211, email valid@tesco.net

Can anyone help me with camera cables for Ikegami colour camera's type CTC2300 and CTC2400/ITC240, or information of the connectors used. Also manual or diagram for Vectorsope - Philips type PM5667. Contact John.R.Ranson G7NND, Tel-0161 973 4500, email: - jr.ranson@cwctv.net

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