P5

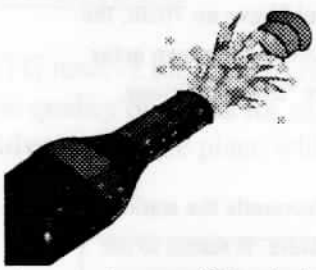
The Newsletter of The Severnside TV Group.

December 1995

A MERRY CHRISTMAS FROM SEVERNSIDE TELEVISION

May we take this opportunity to wish you and your family a merry Christmas and a happy New year

CHRISTMAS SOCIAL



The Christmas Social will take place at Elm Park Parish Pavilion, Filton, Bristol on SATURDAY 9th December, starting at 7.30pm. Please feel welcome to bring your friends and relatives, the more the merrier. A small buffet will be provided by the committee, but members are requested to bring along some refreshments to supplement this please.

As usual, we will be holding our Christmas raffle to raise funds. The First prize of £25 will not be high as the National Lottery stake, but the odds of winning are more favourable.. Further consolation prizes of drinks and confectionery will be drawn, so don't forget to buy your raffle ticket.

Once again, we will have a Christmas Auction. Therefore, please donate any unwanted items such as Magazines, Bananas!!, Electrical etc. for us to auction. This helps the funds and puts a bit of fun into the evening. "Who says Roger Worth puts the items under the hammer".

GB3XG BACK ON AIR

Yes good news, GB3XG is now up and running again thanks to a lot of hard work by the chosen few. Pictures will improve as the leaves disappears.

The International Contest (or the Wet One)

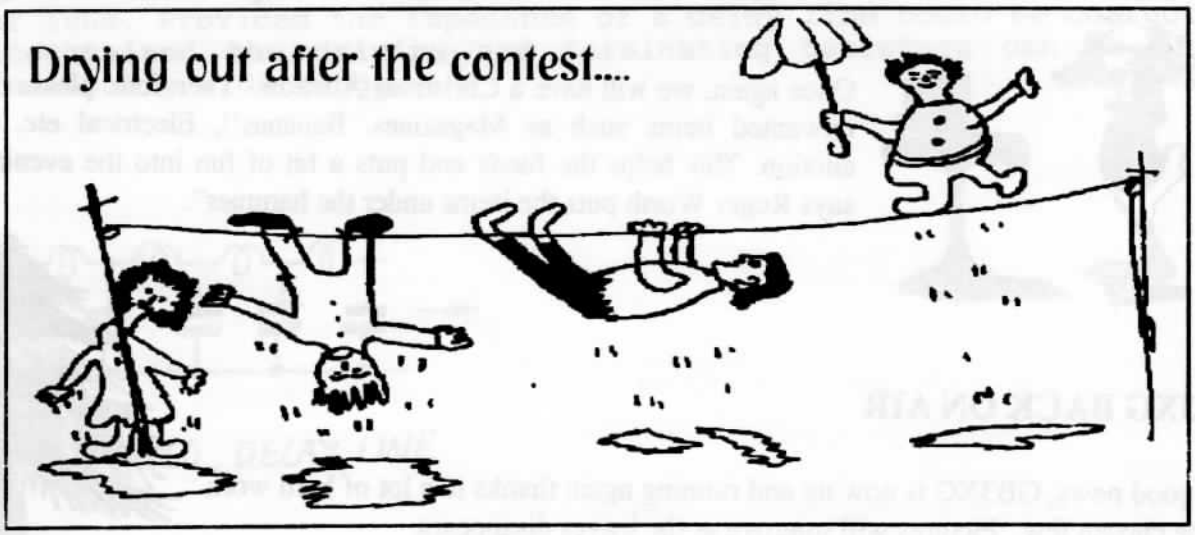
Phil G1HIA

Another contest has come and gone, this one being the "International", not that you would have noticed as there was a complete lack of continental stations to be heard, let alone seen. As you can imagine, conditions were as flat as we have ever known them to be. I also felt that the lack of notice in the CQ-TV may not have helped, as the number of stations that were there well down on years past. Even comparatively local stations were conspicuous by their absence.

I have to say a great big "thankyou" to the helpers that dismantled the station on Sunday. The weather was "wonderful" (I jest). We all, despite wet weather gear, were soaked from our heads to our toes. The rain was relentless, but it didn't diminish the team spirit, especially the ladies, who worked in the pouring rain without the whinging (like I was doing). I take my hat off to you all!

Whilst we were at the contest site, it gave us chance to "air" our views as to what may happen if we lose 70cm ATV. It would certainly make our lives easier when erecting aerials and it's my opinion that we could run the TV contest with 24cm and 3cm from some form of mobile van come caravanette. This would slim down the need for the mast, caravan etc. as we could make do with a pneumatic mast from the vehicle, it would certainly simplify the ATV contest operation. The downside to this would be that we would have no 70cm, the only DX band that we have. Therefore you might find that contest groups would look more to their own areas for the winning contacts. Thereby eliminating contacts with other groups, unless there are "lift" conditions, which is as rare as a Blue LED, or so it seems these days.

It must be said that the enthusiasm and hard work of the usual members that build and dismantle the station may flag at some stage, and I wonder how long we can continue to ask for help of this nature. It seems to me that the contest station has got large and unwieldy, and the question remains, how long can we continue to mount such an exercise without the support of the regular participants, or should the we that want to continue to run the contest station "put up" or "shut up"... Your comments please...



As I write, the message has come through from Richard Gutteridge, G4YTV, BATC Contest Manager, with the results of the 93,94,95 contests. These are as follows:

1993 Summer Fun	70cm	4285 points	2nd Place
	24cm	2269 points	2nd Place
	3cm	128 points	**1st Place**
1994 Summer Fun	70cm	2795 points	**1st Place**
	24cm	1191 points	2nd Place
	3cm	174 points	2nd Place
1995 Summer Fun	70cm	2257 points	3rd Place
	24cm	1460 points	**1st Place**
	3cm	708 points	**1st Place**
1995 International	70cm	2541 points	2nd place
(*UK section*)	24cm	1142 points	**1st place**
	3cm	406 points	**1st place**

ARTICLES FOR SALE

CONDITIONS

STG reserve the right to refuse adverts and accept no responsibility for omissions ,errors, originality or for the quality of goods for sale. Members can advertise free, but large adverts could incur a small charge. Adverts must be place with the editor 4 weeks before publication. All sales must be conducted privately.

• 23 cm Ready built Power Amp (Mitsubishi Block) 20W	£75.00
• 23 cm Worthing Group ATV Transmitter	£85.00
• Colour Test Card Generator (Mendip repeater design)	£60.00
• 23 cm GaAsFET Pre amp (Home brew ARRL design approx 10dB)	£10.00
• Qty, 4 23 cm Yagi antenna (home brew)	£30.00
• Satellite RX CX2460R, slight hum bar hence	£10.00
• Desk Mic with DTMF key pad	£05.00
• 3 pole 23 cm filter BNC I/O (G7GZP manufacture)	£20.00
• GB3UT converter 23 cm to UHF (home brew)	£05.00
• B/W mains battery portable TV (slight case damage otherwise OK)	£05.00
• Qty, 3 B/W 9" monitors (various conditions but usable)	£05.00
• 2 meter 9 element Tonna yagi antenna	£15.00
• 12" paper white computer monitor (slight screen marks)	£10.00
• B/W TV camera with wall mounting bracket	£15.00
• Akai VC80E colour camera (macro/zoom lens)	£40.00
• Phillips B/W observation monitor with B/W camera	£25.00

Contact Trevor Rumbold (G6AYY)
Tel (01225 872896) after 6.00pm

CHROMINANCE EQUALISER/BOOSTER by Ian F Bennett G6TVJ

Here is a unit which is capable of equalising or boosting the chrominance content of a PAL video signal with a minimum of disruption to the rest of the signal. It is often difficult with home built ATV equipment to maintain a flat video frequency response, particularly transmitters often exhibit losses at the colour subcarrier frequency. Attenuating the chrominance signal will result in excessive colour noise on a received ATV signal, further attenuation will eventually result in a black and white picture due to the action of the colour killer circuitry in the received picture monitor. The unit described, with care, can significantly improve the received picture quality when used at the transmitter end of an ATV microwave radio link.

How it works

The unit is based on a design used in broadcast quality active variable video equalisers. The equaliser uses a video delay line in what is called a transversal equaliser technique. GB3ZZ uses a similar but more sophisticated equaliser to flatten the frequency response of the receiver, being variable it can be readjusted for different receivers and make them almost identical in performance. Delay line equalisers can also be used to produce pre and post echos of a video signal to help correct some group delay and ringing characturistics of the equipment through which the video signal is passing, the GB3ZZ equaliser does this.

Firstly IC1 buffers the incoming video signal and then drives two different paths. The video signal is passed through a passive delay line which forms path one. The delay line is the key to how this unit works, it delays the video signal by 110 ns which is approximately equal to half a cycle of colour subcarrier at 4.43 MHz. The delayed video is then applied to the inverting input of IC2 a video opamp. The non delayed path two video is applied to the non-inverting input of IC2. Due to the action of IC2 it can be seen that at low frequencies the two signals cancel out, however as the frequency approaches 4.43 MHz the two signals add together boosting the chrominance, it is possible by adjusting the levels at IC2 to completely cancel out the luminance component of the signal and leave just the frequencies at 4.43 MHz. This unit is adjusted so at the output of IC2 the luminance is reduced but not completely cancelled thus providing a source of chrominance enhanced video. The enhanced video is then fed to one end of a potentiometer the other end is fed with normal video with the same luminance level. By advancing the potentiometer the video fed to IC3 will increase in chrominace level but remain static in luminance level thus providing a continuously variable chrominance level from unity to the max output of IC2 which is about 8dB. IC3 buffers the output video and will drive two 75R terminated loads.

DC coupling is used through out this design so a split rail supply is required. The unit is mains powered with regulators and a split transformer secondary to provide the negative and positive supplies. A portable version should be possible by using a DC-DC converter to provide the nagative supply rail. Good decoupling should be used as DC-DC converters can be noisy when used in video circuitry.

More on video delaylines

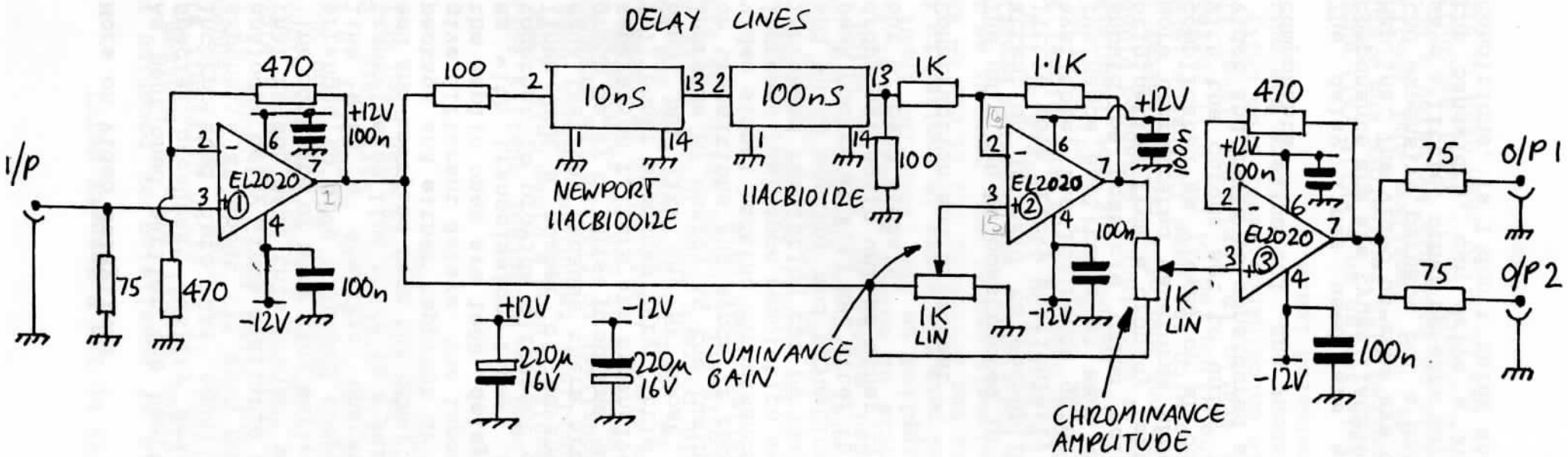
As mentioned earlier the heart of the unit is the delay line. Special broadcast quality devices are available and have been incorporated into ZZs equaliser. Broadcast units are quite expensive at about £35 each but to my surprise the much cheaper analogue delay lines available from maplins work very well and for that reason make this project possible. A video or analogue delay line consists of many tiny series inductors and parallel capacitors arranged to give a lumped component equivalent of a transmission line with a specific characteristic impedance. As with a transmission line there is a delay between a signal going in at one end and emerging from the other. The components are housed in a DIL package and either tappings or individual lines made available to give different delays. The impedance of broadcast units is 75R and the maplin ones are 100R, delay lines must be properly terminated as with transmission lines, individual units can be cascaded together to provide different delays. This technique using delay lines has a number of advantages over other types of video equalisation. Because there are no filters involved there are no group delay or phase problems, also proper luminance and chrominace separation filters are expensive themselves. The unit described at full boost produces very little distortion outside the chrominance band, but like any HF boost to a video signal the unit does increase HF energy in the luminance components causing overshoots on transitions and syncs if too much boost is applied. Normally a video signal lacking chrominance will also lack HF so the unit will increase luminance resolution as well as the reducing colour noise, increased resolution can be seen by viewing the output on a black and white monitor and adjusting the chroma pot. The equalisation peak occurs at 4.43 MHz after this frequency the frequency response drops off again unlike other types of HF boost which can increase out of band signals.

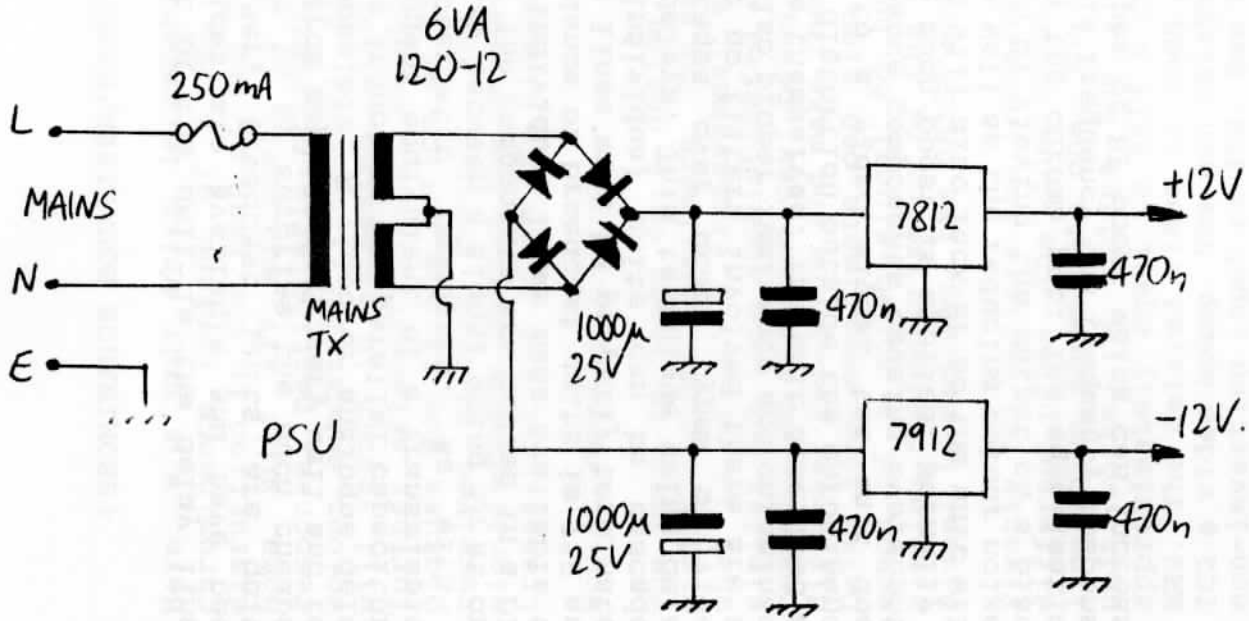
Construction and alignment

The unit can be constructed in a variety of ways aslong as proper attention is paid to decoupling and grounding. Alignment is a little more tricky particularly if a calibrated test signal is not available. The luminance gain pot is adjusted to give identical luminance amplitudes at each end of the chroma boost pot. This should be possible using colour bars with a peak white bar originating from a cropedy test card generator or similar, other more complicated waveforms should be avoided as they become too complicated as viewed on an oscilloscope. Correctly aligned and with the chroma set to unity the unit should be transparent to video and could be considered as broadcast quality.

Components

The delay lines used are actually manufactured by Newport components and are types 11ACB10012E and 11ACB10112E available from Maplins. The video op-amps are of course EL2020s at a fiver each a tad expensive perhaps but a dual version is available which will save a little, other op-amps may be usable provided they can handle the bandwidth, can drive a 200R load and don't create odd DC conditions. Ie I don,t think an NE592 will work!



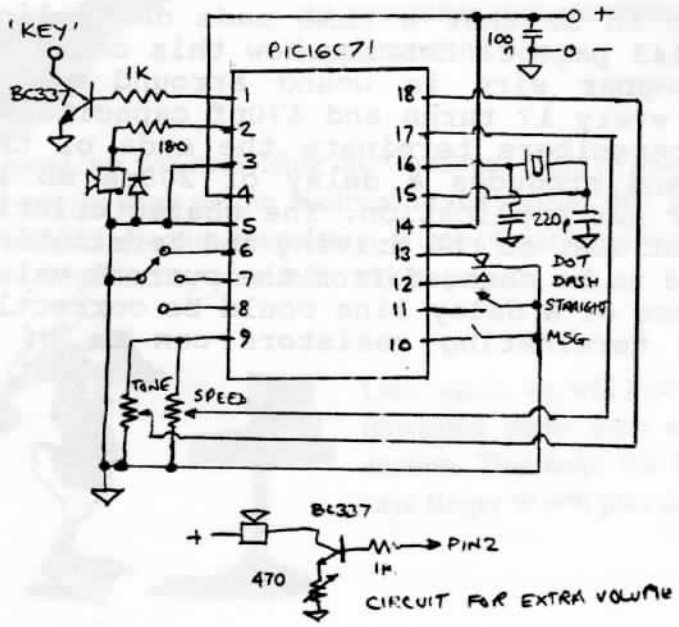


G6TVJ CHROMINANCE EQUALISER/BOOSTER

IB ELECTRICS

Mini Project - An Electronic Morse Keyer. GW6BWX

A while ago I asked what kind of projects readers would like to see in P5. Strangely, the only reply I received was a suggestion for something that has little to do with TV, a Morse callsign generator! Well here it is and it costs all of £10 to build, compare that with the cost of the equivalent Maplin unit. The circuit is so simple that it can be built on a small piece of Verboard and no PCB has been designed. No on/off switch is needed as the circuit switches itself off after about 5 seconds and then only draws about 2uA. It will work from supplies of 4.5 to 6V so a battery can be used if want to make it a self-contained unit. To keep it simple and minimise its cost, the speed and tone controls will cover a range far wider than necessary, if you want to narrow their range you can do so by adding resistors in series with each end of the potentiometer tracks. If the monitor volume is too low, add the single transistor amplifier as show in the diagram. Exactly how the "key" output is connected to a transmitter will depend on the type of equipment used. As shown it will sink about 50mA which is sufficient for most transmitters, if this isn't enough, use the output to drive a small relay. The keyer works in "straight" (conventional) key mode, in automatic dot or dash mode, in iambic mode and in memory mode. There is a slight warble on the monitor tone in "straight" mode as the chips timers reset but it shouldn't be objectionable. In automatic modes, closing one keyswitch causes a stream of dots to be sent, closing the other causes a stream of dashes. If both are closed, alternating dots and dashes are sent. When used in "straight" mode, the shortest interval and tone period is equal to one dot length, this nicely cleans up sloppy keying! To disable this function, simply set the speed faster than you would manually send.



Parts List: (Maplin order codes)
2 x 220pf capacitors (WX57M)
1 x 100nF capacitor (WW21X)
1 x 455KHz resonator (UL61R)
1 x 180R resistor (M180R)
1 x 1K resistor (M1K)
1 x BC337 transistor (QB68Y)
1 x 1N914 diode (QL71N)
1 x PIC16C71-04 IC (DC19V)
2 x 22K min potentiometer (JM72P)
1 x rotary switch (FF73Q)

The 16C71 microcontroller MUST be programmed before it can be used. If you send the chip and return postage to me I will program the keyer software into it and also add three short messages of your choice.

(3)

Use

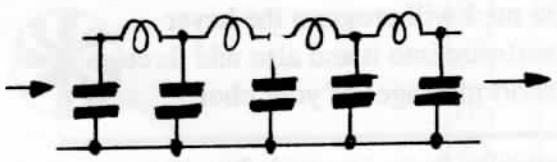
This unit should be used with care, only sufficient boost should be used to give an acceptable picture and reduced colour noise, excessive chroma will over modulate the transmitter, intermodulate with the luminance and may cause buzzing on the sound. NEVER USE THIS DEVICE ON 70 cms as it can cause alot of energy away from the carrier and cause interference to other users. Unfortunately GB3ZZ does attenuate colour when using the beam antennas, this device set to about 3dBs will correct for this. The unit will only improve colour when placed in a transmit chain of equipment, due to the automatic action of the chroma agc in colour picture monitors it will do nothing on the output of a receiver. By increasing chroma on TX it helps combat the noise added to the signal by the ATV link.
This unit has been tried at G0UMPs and G1HIAs QTHs with encouraging results. Theres' no substitute for well designed and aligned equipment but ATV is often in operation with far from ideal circumstances so this unit will help to produce colour pictures when otherwise black and white may be all that is possible.

Other Uses

In the broadcast industry equalisers are used to correct or equalise signals in transmission systems, also equalisers can correct for losses in long cable runs, the unit described can also be used to equalise long cable runs for instance from a remote cctv camera. Cables can be pre-equalised or post-equalised as is convenient.

Home Made Video Delay lines

G0UMP has kindly pointed out to me that a home made delay line might be possible. CQTV no. 143 page 81 details how this could be achieved. 26swg enamelled copper wire is wound arround a 6mm former, 10 tappings are made every 17 turns and 470pf capacitors ground the tappings. 270pf capacitors terminate the ends of the unit. This design I understand produces a delay of 200ns so it would have to be modified for our application. The characturistic impedance I beleive to be about 50R, so the driving and terminating resistors of my unit will need to be changed from the current value of 100R. Provided the impedance of a delay line could be correctly accertained the driving and terminating resistors can be of a reasonably wide range.



A VIDEO DELAY LINE