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CQ-TV

225

Caption Contest

Here are the entries for last issues picture (shown below):

"What have I to smile about – it still works doesn't it" - Richard (VK4XRL)

"What do you mean its big? it's the smallest they had when I purchased it 40 years ago" - Mark (VK3EME)

"Watch the birdie smile please"
- David (G8TNE)

"With this shirt and my hair I hope the camera has AWB switched on!"
- Eddie (G0EHV)

"What do you mean we have to run on battery power for the entire exercise?"
- Don (KE6BXT)

'What the Butler saw' - without the handle - John (GW3JGA)

and the winner is..... Don (KE6BXT), congratulations - a caption generator will be on its way shortly. Please send in your suggestions for the image below, by email to editor@cq-tv.com or by post (see committee contacts for address)

CQ-TV 225

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Deadlines

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

February	-	please submit by	December	31st
May	-	please submit by	March	31st
August	-	please submit by	June	30th
November	-	please submit by	September	30th

Please send your contributions in as soon as you can prior to this date. Don't wait for the deadline if you have something to publish as the longer we have your article, the easier it is for us to prepare the page layouts. If you have pictures that you want including in your article, please send them, in the highest possible quality, as separate files. Pictures already embedded in a page are difficult to extract at high quality but if you want to demonstrate your preferred layout, a sample of your finished work with pictures in place is welcomed. Please note the implications of submitting an article which are detailed on the contents page.

Editors Preamble

Happy Birthday BATC !

The club celebrates 60 years in 2009, I wonder if Mike Barlow thought the club would still be around today, back in 1949, and I wonder if he even dreamed of the advances in technology we've seen over the past 60 years!

I hope to see a you all at our birthday "bash" on June 13th/14th - see page 12 for the details.

We've also reached another milestone: the 100th "Circuit Notebook" and John revisits a few of his favourites for you.

I have had a couple of people ask why there are so few NBTV articles in the magazine, in answer I have to say that I would be more than happy to publish NBTV articles if anyone would like to send them to me! I personally know very little about NBTV so I'm not in a position to create any myself, but if anyone has anything interesting that other NBTV enthusiasts might be interested in, please send it along.

Talking of articles, I am still short of them! Membership is around the 800 mark last time I looked, I'm sure there must be somebody constructing/designing/operating/producing ATV related projects out there, if you have the time to send a photo or two and write a few words, the other members would be interested to read about it I'm sure.

This editors job has changed a lot since I had a stint at it fourteen years ago, back then I could pick and choose the articles I published as there were so many of them, today I publish everything I receive and hope I can fill the pages! The membership is a bit smaller than it was back then, but not that much compared to the lack of input from the membership.

I know there are people out there "doing" ATV, it doesn't take much to let me know what you're doing and get it published.

One area that you are not shy at coming forward is the caption contest and I have had to limit the entries to one per person or they wouldn't all fit, still I guess it's worth the effort to win £70's worth of caption generator - maybe the Hon. Treasurer could offer to pay for articles... Hhhmm now there's an idea!

Someone commented recently that they had visited www.batc.tv but could only find a few repeaters and only one member streaming, so I checked the logs and found to my surprise that in fact the majority of the members streams were being used but all at different times. Might I suggest that if you have a members stream, you use the "description" area to advertise when you next plan to operate your stream, or if you have a regular timetable, let everyone know, so we can join in.

The same goes for the repeater streams - not all repeaters stream 24/7 and a timetable of when you do would help folk make the most of the service.

That's my rant over with, now enjoy the magazine!

73, Chris - G1FEF

PS: The BATC DVD is still available, but we decided to replace the usual advert below with some info on forthcoming streaming events.

Chairman's Column

Let me start with an amusing story from one of the many sound engineers who had input to the sound article elsewhere in this magazine.

He was booked for what we call rat pack interviews, the sort of thing we have all seen, an announcement to several camera crews and a desk full of microphones. This was a sports event and the sound engineer concerned got held up in traffic and was late. The interview had not started but it did mean a rig in double quick time.

First problem the desk mike was in the car and there was no time to go back for it, improvisation time: clip a lapel mic onto someone else's and go.

The club chairman was second on the list to speak, all that was required for the item. He sat there looking bored and then spotted the little lapel mic and picked it up and started playing with it.

Our sound engineer then had to remove his head phones to stop the distressing noise and he knew he was in trouble. So did all the other sound engineers in the pack and it was evident who had the problem. The ITN engineer came to the rescue and passed a cable with a feed of his sound on it. Gives you a warm feeling, but as our engineer said afterwards he was thankful we all use the same plugs i.e. XLR's.

I took this as an idea for an article on TV sound and went through some of the cabling and level problems I have experienced, and expanded it with a lot of help from numerous sound engineers into the article on streaming sound.

A lot of the kit I know is professional and not the sort of equipment found in the average shack, but prices are falling and if you don't go with the expensive brands and like me you shop on eBay everything is possible.

Now we have the streamer we all need to learn a little more about TV production and production based engineering, we may not have the broadcasters budgets yet, but we do collectively own a vision mixer and monitors and I hope we can find some more sponsors to expand this kit. We have already been asked by the RSGB to stream their AGM.

So we need a crew in fact several if we are going to stream events as often as we would all like to see...

60th Anniversary

I hope you all have seen the publicity for this event being held this summer organised by Jill and Paul Marshall again see elsewhere in this magazine for the full details. You have been given as much notice as we can, please keep the date free and come along.

If you know of a good speaker and or demonstration that would add to the event please let Jill and Paul know so they can get them booked.

ATV news letter

I assume by now that you are all seeing Bryons ATV news letter, if not then you can subscribe free by emailing:

atv-newsletter@hotmail.com

The news letter arrives on your PC every Saturday, written in the USA by Bryon, it has a lot of useful info on what's happening. I like to think the ATV streamer is responsible for narrowing the gap between us and the USA, now we can watch ATV across the Atlantic and stream programmes to each other. Bryon is planning to stream the ATV Forum from Dayton, the AMSAT Convention, and the ARRL Convention.

"Winston Churchill said give us the Tools and we will finish the Job" well we now have the tools its called:

www.batc.tv

let's see if we can indeed use it to get ATV the attention it deserves.

Trevor Brown - G8CJS

ATV Newsletter

The ATV Newsletter is a weekly publication covering World ATV News that I find interesting as well as events, projects and activities sent to me by my readers. You also get the latest Local ATV News from the repeater networks here in Southern California. And it's free. Plus information on Digital-ATV/ATV GUIDE, for weekly scheduled ATV events via Streaming Video/ ATV Website Links/and more. To subscribe send me an email with your first name and call to *atv-newsletter@hotmail.com* and I will add you to the mailing list. You can also include any info about your ATV activities in your email, if you wish. I just might put it in the newsletter!

Bryon Foster - N6IFU
Editor & Publisher of the ATV Newsletter

Circuit Notebook 100

by John Lawrence GW3JGA

I am absolutely delighted to have been made an Honorary Member of the Club in recognition of producing 'Circuit Notebook'. I would like to express my sincere thanks to the Committee and to the many Editors of CQ-TV for their friendly help and encouragement over the years.

And now, having at last reached No. 100, Circuit Notebook looks back over the half century of Amateur TV circuits choosing a few which have interesting and/or useful features.

But first, a bit of background. My interest in Television began 1950 when I built a TV receiver for my parents, ready for the opening of the Northern BBC Winter Hill TV station in 1951. I used a home-built test pattern generator and oscilloscope to set it up. The receiver had a 12" diameter round Mazda CRT and of course, used valves throughout.
I then began experimenting with TV transmission and built a flying-spot scanner. In 1957 I started transmitting 405 line pictures using a valve transmitter on 436 MHz. These activities with GW3FDZ/T from 50 years ago are described in 'Turning back the Pages' in CQ-TV 224, page 37.

At that time, all my circuits used valves, but in the 1960s I, and many others, gradually moved over to transistors. CQ-TV 48 contained details of a Transistorised Pulse & Waveform Generator by Mike Cox. Inspired by this design I began rebuilding my station using transistors and eventually ICs. I kept a Hard-backed Notebook in the shack and recorded details of everything I built. I constructed a wide range of electronic equipment and a fair proportion of these designs were related to ATV.

From my Shack Notebooks came the Circuit Notebook series published in CQ-TV. I also included (with acknowledgement) circuits from other sources including those from fellow Television Amateurs, in fact anything that seemed interesting and appropriate. I will pick out just a few, starting with No.1 in CQ-TV 68 Nov. 1969

Circuit Notebook No.1. A pulse narrower circuit (Fig.1.)

This simple circuit will produce a short positive-going output pulse when driven by a longer negative-going pulse. The circuit is a practical experimenters dream. With a base resistor of 150kohms the duration of the positive output pulse is approximately equal to1 microsecond per 10pF or for 15kohms the pulse is 1 microsecond per 100pF.

The circuit shown accepts a line blanking pulse and generates a front porch and line sync pulse signal. The component values shown are for 405 lines (it was 1969!).

The output can drive a further stage to provide a delay. A negative-going pulse can be generated by inverting the circuit and using a PNP transistor. This circuit was used extensively (10 times in all) in 'A Simple Sync Pulse Generator' described in CQ-TV 68 Page 5. An associated 'Simple Video Processing Unit' is also shown.

Circuit Notebook No.3. Vidicon blanking generator (Fig.2.)

This simple circuit generates a 20V p-p pulse from a 10V supply. This type of voltage-doubling circuit appears elsewhere, for example, in Circuit Notebook No.78 'Using Coax Relays with High Voltage Coils' where a 24V relay is pulsed from a 12V supply.

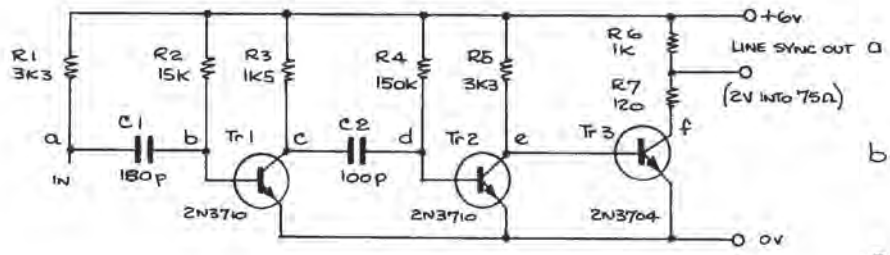


Figure 1
Pulse narrower circuit

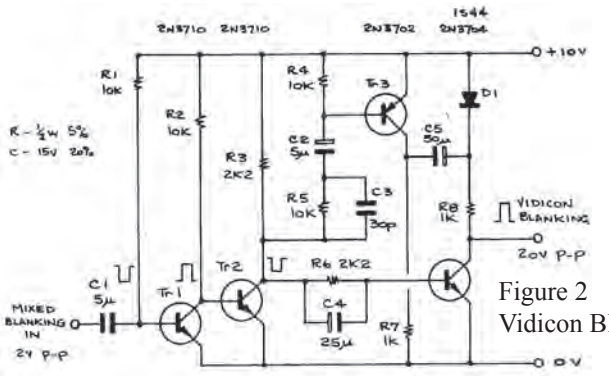
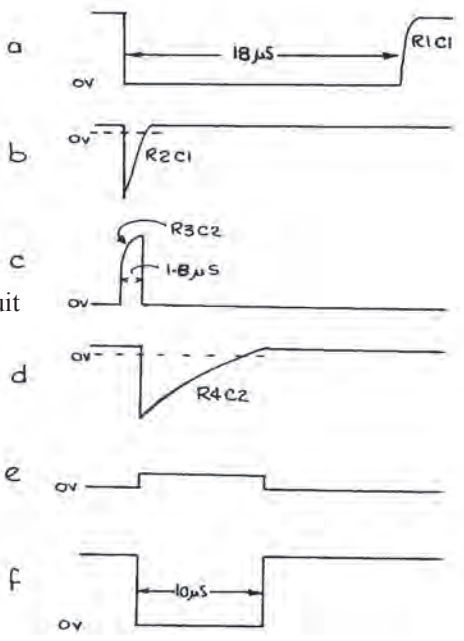


Figure 2
Vidicon Blanking Generator



Circuit Notebook No.11. DIY quadrant fader mixer (Figs. 3, 4 & 5)

This was a mechanical design for a dual quadrant fader using standard 100 ohm rotary pots and Meccano gears. Normal slider pots were not readily available at this time. Two parallel aluminium plates each carried a gear-pot system and the fader levers came out through the front panel, side by side. A buffer video amplifier fed each pot and the output from each slider was fed to a summing/ inverting amplifier. The incoming video signals were from sychronised sources but without syncs, which were added later.

DIY quadrant fader/mixer, mechanical

Figure 3

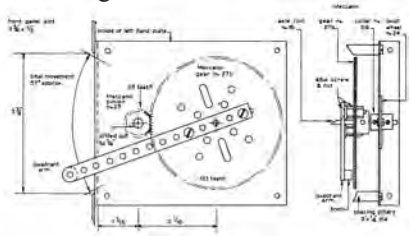
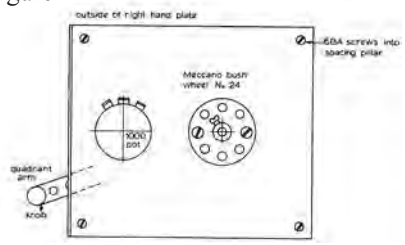


Figure 4



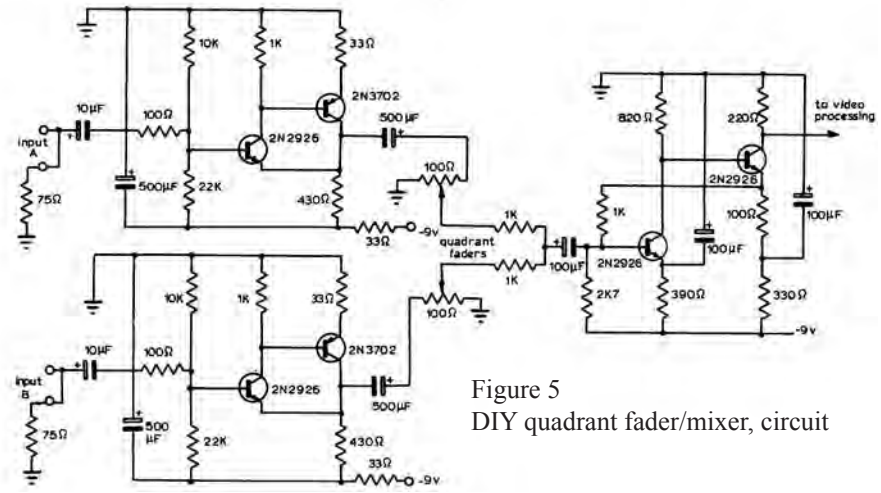


Figure 5
DIY quadrant fader/mixer, circuit

Circuit Notebook No.53. Video switching unit (Fig.6.)

Where a mechanical contact is used e.g. keyboard, press-switch, relay etc. the contacts are apt to bounce on closure causing a number of contact connections before eventually remaining closed. The contact usually settles closed after about 1-3 ms but during that time several 'makes' occur which can affect the following circuits. In this circuit the 'Latch Pulse Gen' (lower left) uses a low-cost 4011 CMOS IC, to provide a delayed 1ms latch pulse. This is used in the 4 Input Video Switching Unit described in Circuit Notebook No. 53 and also appears in other similar circuits.

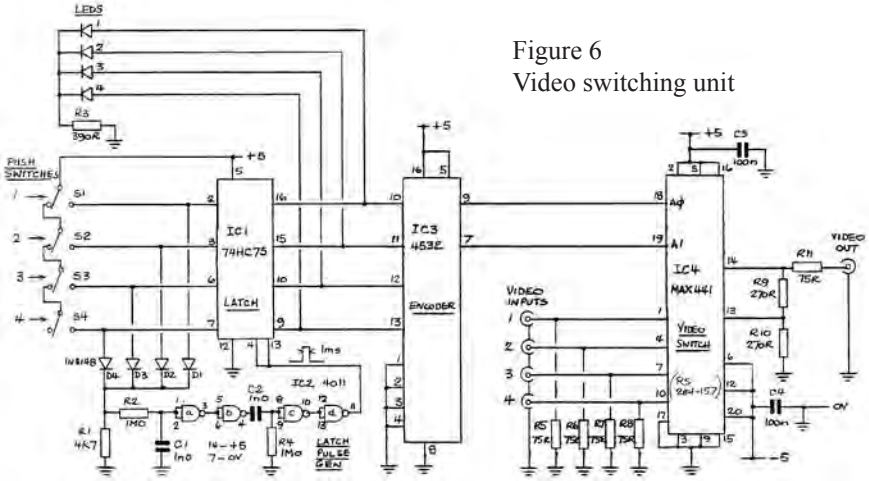


Figure 6
Video switching unit

Circuit Notebook No.60. Stepped frequency burst generator for video testing (Figs. 7 & 8)

This uses the Maxim MAX038 High frequency Waveform Generator I.C.(a free sample from Maxim) This device will generate square, triangle and sine-waves from low frequencies up to 20MHz. The circuit shown generates sine-wave bursts of 1, 2, 3, 4, 5 and 6MHz each having a duration of 4us with 4us spacing, which is repeated on each line. The p-p amplitude of each sine-wave burst is equal and extends from black level to peak white. The space between each burst is mid-grey. The line sync pulse is 4us, a little shorter than the specified value of 4.7us. The circuit does not provide field blanking and sync signals.

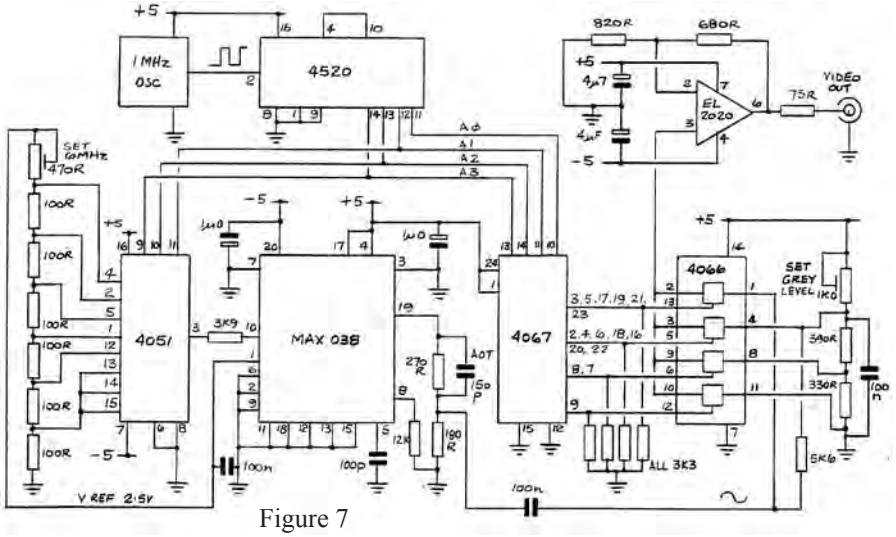
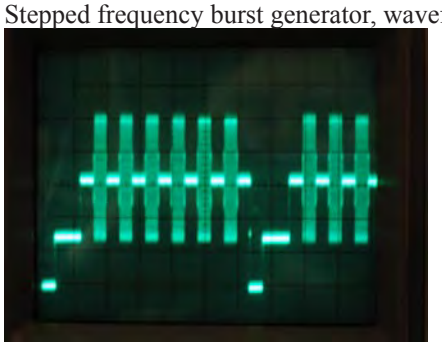


Figure 7
Stepped frequency burst generator, circuit

Figure 8
Stepped frequency burst generator, waveforms



Circuit Notebook No.61. Not another fade to black circuit (Fig.9.)

Then there is the ubiquitous sync separator, the National LM1881. This IC accepts a conventional video signal and produces, composite sync, vertical sync, burst output and an odd/even field signal. It has been used in many Video Clamp and Fade-to-Black circuits. Its popularity resulted in the above title.

Circuit Notebook No.90. Veroboard video distribution amplifier (Fig.10.)

This is a 'bog-standard' video amplifier circuit which could find its way into almost any piece of ATV equipment. The circuit has a gain of x2 and provides overall unity voltage gain when the output(s) are terminated in 75 ohms. The circuit uses the Analog Devices AD817AN. The older Elantic EL2020 would also be suitable.

The above circuit descriptions are necessarily brief, but a Circuit Notebook Index is attached which gives the CQ-TV No. and date and page number of each Circuit Notebook from No.1 to No.100, so that further details can be obtained on line from the BATC Archives.

Circuit Notebook No. 100. An unusual earth-lift box (Figs.11 & 12)

This is a circuit that I have used for many years in spite of it being likely to breach Health & Safety regulations. Its purpose is to temporarily overcome a mains hum problem where this is caused by a low impedance inductively-coupled earth loop.

For example, all my video/TV equipment is supplied from the same mains socket and all equipment is bonded together through coax cables and other earthing

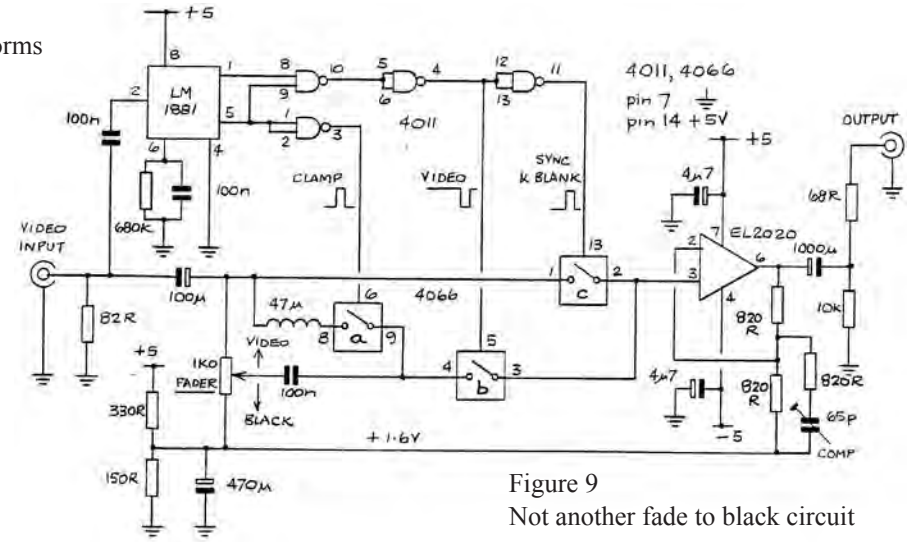


Figure 9
Not another fade to black circuit

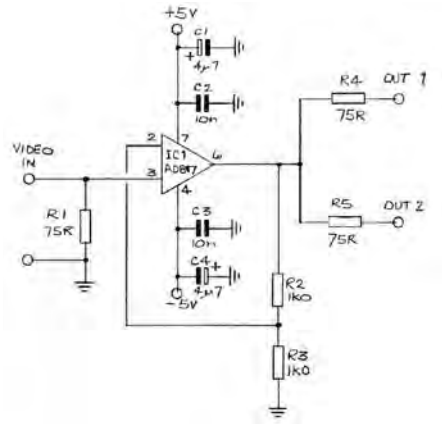
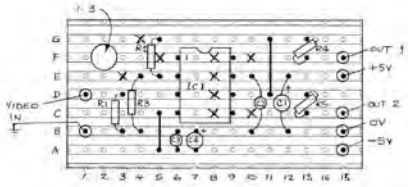


Figure 10
Veroboard video distribution amplifier



connections. But, when I connect an oscilloscope (which is fed from a different mains socket) to measure a signal, a low impedance earth loop is formed which causes a 50Hz circulating current to flow. This produces a small signal voltage across any poor coax connectors. These problems were discussed in Circuit Notebook No. 97.

Even after taking all precautions hum loop problems may persist, particularly when making tests on an experimental setup. One way of overcoming this is to temporarily disconnect the earth wire in the plug-top of one of the pieces of equipment. This is to be discouraged as its reconnection may be forgotten and the equipment left in a potentially

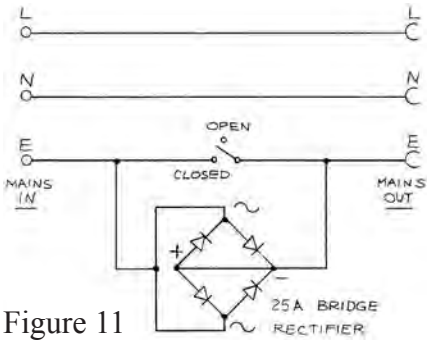


Figure 11
An unusual earth lift box, circuit

dangerous condition. My solution is to use an 'Earth-lift Box'. Here, the mains live and neutral wires pass directly through the box but the earth wire passes through a switch. This allows the earth connection to be broken without having to disconnect the earth wire in the plug-top. Lifting the earth connection stops the circulating current and overcomes the problem.

However, in the event of an earth fault in the equipment it could possibly become 'live'. To prevent this, the switch has several crossed diodes, in the form of a bridge rectifier, connected across it. This allows a +/- 0.6 volt window in the earth wire, to overcome the hum loop problem, but still maintains a safety earth path capable of passing a fault current of 20 amps or so.

Figure 12
An unusual Earth Lift Box

The Earth-lift Box may be less effective if the equipment has large mains filter capacitors between live, neutral and earth.

Earth loop problems can also occur at TV line frequency. Fig.13 shows a disturbance (with the Earth-lift closed) due to inductive coupling from the scanning coils of an old CRT monitor. Fig.14 shows the effect of opening the Earth-lift.

Warning

Whilst this unit may provide a temporary solution for experimental test purposes, it should not under any circumstances be made part of a permanent installation. Users should be fully aware of the safety hazards of operating un-earthed equipment.

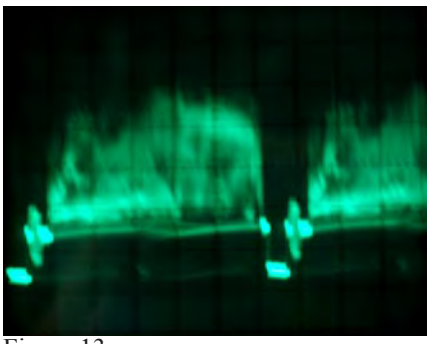


Figure 13
Line waveform, earth lift 'closed'

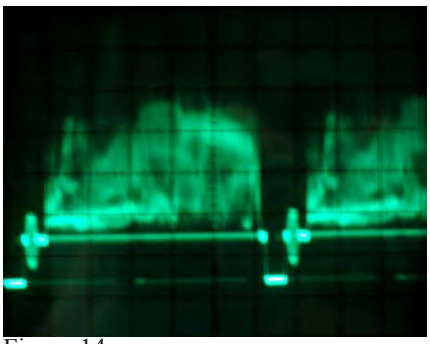


Figure 14
Line waveform, earth lift 'open'

Also see:
http://www.epanorama.net/documents/groundloop/groundlift.html

A Circuit Notebook Index has been prepared so that a copy of any original full article can be obtained by searching the BATC DVD or the CQ-TV Archives, both of which cover all issues of CQ-TV.

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43	131	Aug-85	38	VIDEO COMBINER
44	137	Feb-87	68	BLACK AND BURST GENERATOR
45	157	Feb-92	68	AN 'S' METER FOR THE WOOD & DOUGLAS VIDIF BOARD
46	158	May-92	58	COLOUR PATTERN FROM THE ZNA234 IC
47	159	Aug-92	59	BNC COAXIAL ATTENUATORS
48	162	May-93	51	VIDEO OP-AMPS
49	163	Aug-93	36	AUTO MORSE AUDIO KEYER
50	164	Nov-93	49	LATCHING RELAYS
51	165	Feb-94	72	AN A-B MIXER
52	166	May-94	56	COLOUR VIDEO TRAVELS ON TWISTED-PAIR CABLE
53	169	Feb-95	12	A 4-INPUT, LATCHED KEY, VIDEO SWITCHING UNIT
54	170	May-95	13	AUTOMATIC VIDEO FADER-SWITCHER
55	171	Aug-95	10	CONTROL BY DTMF
56	172	Nov-95	29	A DTMF CONTROLLED VIDEO SWITCHER-FADER
57	173	Feb-96	31	VIDEO SYNC STRIPPER. AUDIO LEVEL METER
58	175	Aug-96	47	REMOTE UP-DATING OF THE NEWS PAGE AT GB3TM
59	176	Nov-96	12	ENGINEERING TALKBACK INTERCOMM
60	178	May-97	57	STEPPED FREQUENCY BURST GENERATOR FOR TV TESTING
61	179	Aug-97	10	NOT ANOTHER FADE TO BLACK CIRCUIT
62	180	Nov-97	73	OFF AIR FREQUENCY STANDARD
63	182	May-98	34	CRYSTAL OSCILLATORS, SELECTION
64	183	Aug-98	75	MODIFYING THE MASPRO SRE-90R FOR ATV PORTABLE USE
65	184	Nov-98	57	VIDEO OPTOCOUPLERS
66	185	Feb-99	48	AUTO SWITCH-ON CIRCUIT FOR MASPRO SRE-90R
67	186	May-99	34	DTMF CONTROLLED EIGHT INPUT VIDEO SWITCHER
68	188	Nov-99	36	INDICATORS, METERS AND MONITORING
69	189	Feb-00	8	AN ALTERNATIVE MOTORISED PANNING HEAD
70	190	May-00	29	SSD AND SMD (SURFACE MOUNT DEVICES AND STATIC)
71	191	Aug-00	5	ADDING AN AUDIO SUB-CARRIER INPUT
72	192	Nov-00	7	OSCILLOSCOPE CALIBRATOR
73	193	Feb-01	38	CURRENT LIMITER FOR LNBs
74	194	May-01	37	VISION'S FINE, SHAME ABOUT THE SOUND - MICROPHONES
75	196	Nov-01	16	RF BANDPASS FILTERS FOR 1.3 GHz
76	197	Feb-02	23	VARIABLE GAIN VIDEO AMPLIFIER
77	198	May-02	17	BLACK LEVEL CLAMPS
78	199	Aug-02	43	USING COAX RELAYS WITH HIGH VOLTAGE COILS
79	200	Nov-02	8	USING THE I2C BUS EXTENDER PHILIPS 82B715
80	201	Feb-03	15	SATELLITE RECEIVER CONTROL
81	202	May-03	47	A SIMPLE TRANSMIT-RECEIVE SEQUENCER FOR ATV
82	203	Aug-03	30	OSCILLOSCOPE CONVERTER FOR NARROW BAND TELEVISION
83	204	Nov-03	39	VALID VIDEO DETECTOR
84	206	May-04	21	A FIELD PULSE FOR 'THE SIMPLEST PATTERN GENERATOR'
85	208	Nov-04	35	USING STRIPBOARD (VEROBOARD) FOR VIDEO PROJECTS
86	210	May-05	42	3CMS INPUT SWITCHING FOR GB3TM (BATC I2C)
87	212	Nov-05	24	A FLASHING CURSOR FOR ATV
88	213	Feb-06	27	A BAR DISPLAY AUDIO LEVEL METER
89	214	May-06	27	EXPERIMENTAL AUDIO LEVEL ON-SCREEN DISPLAY
90	215	Aug-06	13	VEROBOARD VIDEO DISTRIBUTION AMPLIFIER
91	216	Nov-06	11	VIDEO SWITCH FOR PORTABLE OR SIMPLE SHACK USE
92	217	Feb-07	11	SIMPLE PEAK VIDEO DETECTOR
93	218	May-07	6	THE TEP IQ2 MICROCONTROLLER BOARD
94	219	Aug-07	5	AUDIO TEST BURST GENERATOR
95	220	Nov-07	7	AREA MEASUREMENT OF IRREGULAR SHAPES USING CCTV
96	221	Feb-08	7	A BATISM OF FIRE INTO THE DIGITAL AGE OF ATV
97	222	May-08	7	EARTH LOOPS
98	223	Aug-08	7	FREQUENCY MEASUREMENT IN THE 10GHz BAND
99	224	Nov-08	7	DATV PROGRESS ON 1280 MHz
100	225	Feb-09	7	CIRCUIT NOTEBOOK LOOKS BACK & EARTH LIFT BOX

We have now merged the old cq-tv.com website with the clubs primary website: **http://www.batc.org.uk**

Please update your bookmarks!

Celebrate 60 years of the BATC...

...on June 13th/14th in the beautiful surroundings of the Hellidon Lakes Hotel near Daventry in Northamptonshire.

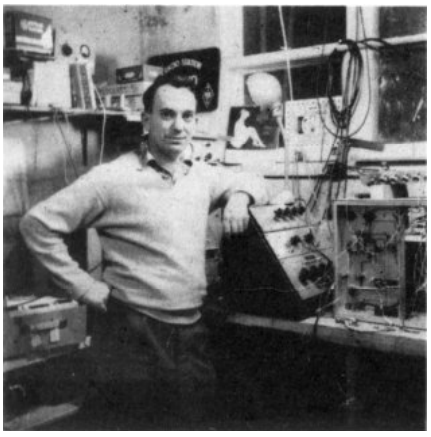
It's sixty years ago now since Michael Barlow, G3 CVO, and a collection of like-minded enthusiasts got together to form the British Amateur Television Club, with Mike typing copy for CQ-TV on the Guardroom typewriter whilst carrying out his National Service duties.

The Club has come a long way since then, as Radio Amateurs broadened their horizons to encompass this relatively new means of communication which began in Great Britain in 1936 but paused for the duration of World WarII.

Many exceptionally talented characters have come and gone over the years, each sharing their expertise and special qualities with other members, both in the form of articles written for CQ-TV and other specialist BATC publications. They have shared their enthusiasm and encouraged others to delve into the mysteries of the technology with their attendance at radio rallies all over the British Isles, including, of course, the BATC's own regular conventions.

Technical developments in the mainstream commercial world of television and broadcast equipment have been followed in parallel by many club members and in some instances amateur developments were ahead of the curve! They have also restored and preserved a multitude of examples of broadcast 'kit' in their back yards, shacks and anywhere they could find the space to house and work on such things – and demonstrated their achievements at shows and events. Now, with the launch of the Streamer project last year it means that the BATC is once again in the vanguard of television technology!

The BATC has staged many events and conventions during the last 60 years, organised and run by lots of people who have invested their time, energies and talents in enhancing them



with informative lecture programmes, interesting guest speakers gathered from industry and, of course, the Club's own rich resource of experts, some even from abroad. Special features were the presence of major projects, like equipment demonstrations, test equipment 'surgeries' and TV Outside Broadcast Units, satellite trucks and so on.

Other features of the BATC Convention have been, most importantly, trade stands, which have helped members to purchase all sorts of kit and components which have enabled them to produce a huge diversity of equipment and projects. Mention must, of course, be made of the official club 'Bring and Buy' Sale which has been a regular feature in the past, together with the car boot sale.

Unfortunately, venues have not always taken kindly to this particular activity.

And so, to the arrangements for our 60th Anniversary Celebratory Event:

It has been difficult to find suitable places to hold Conventions of late, but the club feels that, in holding our event at this prestigious venue, we may have found the perfect place.

Located fairly centrally within England at Daventry, it is close to the M1 and should make it quite an easy place to get to for most of our members.

We are currently negotiating accommodation rates for those who would like to stay over on the Saturday night and we are planning a celebratory 3-course anniversary dinner, priced at £29.95 per person – for more details of costs, booking, etc. go to the BATC website at http://www.batc.org.uk in the next few weeks. These details are not published here as we are still negotiating the best deal. In the mean time, please do register your interest, stating that you would like to attend, if you would be interested in the dinner and overnight accommodation; give us some idea of what, if anything, you propose to display and/or suggestions/ offers for the programme.

Contact Jill or Paul Marshall:
Tel. (01522) 703348
E-mail: publications@batc.org.uk.

The range and style of the facilities at the Hellidon Lakes Hotel will mean that there is plenty of space for displays, and ideal accommodation for lectures, talks and outside exhibits – all that we would need for a successful event.

We would like from you …

Let's make this anniversary event special … to do this we need help from you. We need:

- Enthusiasm from members… to make it special we need lots of people to attend.
- Ideas – themes, subject matter for lectures/talks, offers from people to give lectures/talks.
- To contact past members and encourage them to attend.
- Most importantly, we want people to display projects, etc.

This should be a really good, happy, social event, with the dinner on the saturday to set it all off for a great day on the sunday. Let's pull out all the stops!

We plan to put on a display of BATC memorabilia – many members have examples that would be good to show, so if you have anything please let us know, and please bring it on the day (we will need to know how much space you need and your power requirements – power and tables will be provided).

There will be space for outside exhibits, such as OB Trucks and other larger displays.

Jill Marshall
Event Co-organiser

Colour test pattern generator

By Angelo La Spina

For development and repair, the TVs and VCRs need a test signal that respects the CCIR 625 standard. The generator presented in this article produces signals for the three basic colours (red, green and blue) and the colourbars.

This equipment should preferably be constructed by those who already have some experience of digital circuits and can handle the oscilloscope and digital frequency meter, because the circuit is quite complicated.

The repair and development of video equipment requires a standardized test signal composed of eight graduations of luminance and six coloured bars. The brightness of the bars is equal to 75% and the colour is saturated at 100%. To regulate the purity of colour TV monitors and television receivers, and for regulating the relationship phase/amplitude in the delay line, we must create basic colours like red, green and blue. The device is able to provide a composite video signal with amplitude of 1Vpp. For specific measurements you can switch off the colour subcarrier and PAL switching. Although today there is the possibility of designing TV sync generators with a single PIC microcontroller and the integrated circuits, which are all-in-one TV sync pulse generator, are expensive and they are difficult to find on the market, this unit has been built using standard CMOS ICs, so, thanks to their exclusive use, the power required by the instrument will be small and therefore highly suitable for other video applications for which low consumption instruments are required: the video signal so obtained matches with the standard CCIR 625.

Unlike most simple solutions, this circuit also generates back and front equalization pulses and interlaced fields. The instrument should be completed with a digital frequency meter and an oscilloscope with a bandwidth of 10 MHz with a probe 1:10 plus a capacitance of 10 pF.

All syncs are derived from a single oscillator. Figure 1 shows the TV sync pulse generator. Its task is to generate vertical VSYNC and horizontal HSYNC sync pulses, the back and front equalization pulses (EQ) and the blanking signal CBLK. It also produces the signals for the generation of mono bars, RGB colours and the switching pulse PAL SW.

U1 (74HC4060) works as oscillator/divider from a crystal of 10 MHz. All waveforms are obtained by a sequence of pulses of 1.6µs which is derived by dividing 16 through U1, the frequency of the 10 MHz oscillator. The 1.6µs pulses are therefore taken out by Q4 of U1 and applied to the inputs of clock U2a (4518), U5 (4017) and U11 (4040) through the logic gate U8a (4001) used as level translator from TTL to CMOS, "flybacking" it with R3, since U1 is powered, unlike all other ICs, by +5 VDC.

U2 is a dual divide-by-10 counter, connected in such a way that once it reached the number "40", both the counters are cleared. R4 and C4, inserted into a reset line, ensure, through their retarding effect, a secure reset of both the counters. The diodes D1 and D2 form with R5 an OR function that lets free to operate the counter U5 only when the counting of U2 will be between 0 and 10, that is when the outputs of Q0 and Q1 of U2b are at "0". Since a complete cycle counting of U2 is 40x1.6µs=64 µs, you can obtain, according to the outputs of U5, the horizontal sync signals.
When U2 has achieved a status of "40", it will be back to zero. The next pulse puts at logic state "1" the output Y1 of U5; another pulse brings Y2 to the same level, and the cycle continues until U2b reaches the number "10" and Y0 reverts to "1" and remains in this state. The diodes D4 to D12 establish a logical OR between Y1 to Y8, so you can get the signal of horizontal blank HBLK while D20 provides the signal of vertical blank VBLK. The combination of signals of horizontal and vertical blanks will be obtained from the diodes D19 and D20 (CBLK). The length of HBLK is 8x1.6µs=12.8 µs, while VBLK is 8x160µs = 1.28 ms.

The diodes D13 to D15 form a logical OR from the output Y2 to Y4 of U5. In this way the signal of horizontal sync is created, which is 3x1.6µs=4.8µs. Through the combined OR with D16 and D18 from the outputs Y1 to Y3 of U6 (4017), and inverted by U10a (4001), it will create a signal which excludes U5 through D3, but leaves free the flip-flop U9a (4013), used in this case as a monostable. This last one, driven by pulses from Q0 of U2b and integrated with an RC network, produces a pulse duration of 2.5µs every 32µs. These EQ pulses (called "equalizing pulses") appear in place of horizontal sync during the vertical interval of 3x160µs. The EQ pulses from U9a, present during the vertical sync pulse, are included in the composite sync signal through D21.

The mixed signal reaches the NOR gate U8b, so that during pulses of vertical VSYNC timing, its duration is 160µs, remains guaranteed the horizontal synchronization. At the output of this

logic gate will be available the SYNC signal with negative polarity.

The reset pulse applied to U2, which appears at the end of a line, is drawn and used for switching the flip-flop U9b, which activates the PAL switch.

From Q3 of U2a are taken the pulses at intervals of 16µs, which are then applied to U3a (4518). Since U3a is a decimal divider, the pulses that appear on Q3 of U3a have an interval of 160µs and are sent as pulses of clock, to U6 and U3b. The decimal counters U3b and U4 (4518) are linked together through the AND gate U7 (4012): in this way, once the counter reaches the number "125", the counters U3b, U4a and U4b are cleared. The counting cycle therefore will be 125x160µs=20ms: this interval matches the length of a field. The reset pulse prepares the flip flop, formed by two NOR U8a (4001) and U8b, so that the counter U6 is left free to work after the disappearance of the clear signal.

After 8x160µs=1.28ms, the counter U6 reaches the state where Y9 is "1". Therefore the flip-flop formed by U8a and U8b will be reset. Only a new reset of the counters U3b, U4a and U4b will switch again the flip-flop. The signal from 1.28ms, taken from the flip-flop, will then be used as vertical blank, as we have seen.

The colourbars

The binary counter U11, driven by the clock signal from U8a, is normally hold by the signal CBLK: when this signal is not present, U11 produces three binary signals from the outputs Q3 to Q5, with the polarity inverted by U10b, U10c and U10d, representing the three RGB signals for colourbars. The RGB signals passes through the multiplexer U12 (4053), with the effect of being excluded from a logic signal "1" at the inputs ABC of U12 (connector "j4"). In this way, connecting three sources of independent variable voltages from 0 to 12V into the inputs AY, BY and CY of U12, you can get the basic RGB colour with individually adjustable saturation and optionally, changing the logical state at the connector "j4", the colourbars. The signal CBLK connected to INH of U12 ensures that during the blanking signal, no other signal is present to drive the inputs R, G and B of the encoder U13 (MC1377P), otherwise this last would not work properly.

The PAL modulator

U13 (MC1377P) is a RGB Encoder NTSC/PAL produced by Motorola that will generate a composite video from baseband red, green, blue, and sync inputs. Its features include: a colour subcarrier oscillator, a voltage controlled 90 ° phase shifter, two double

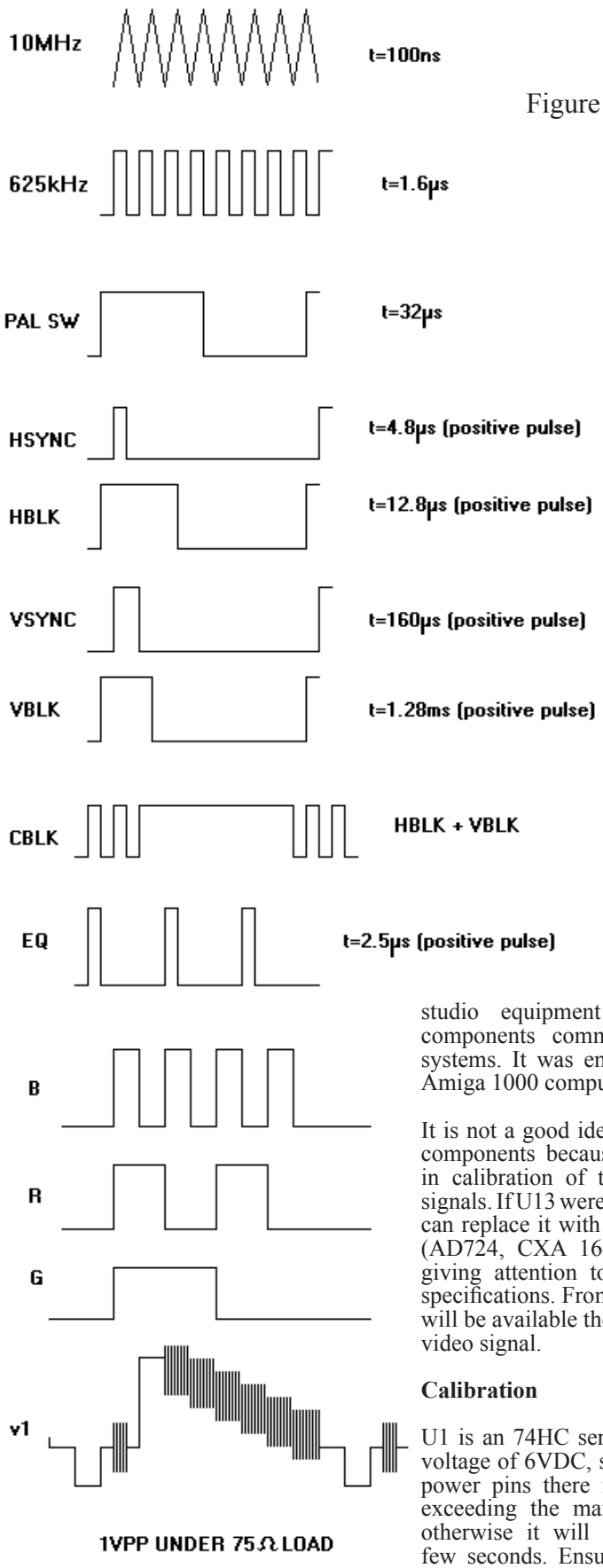


Figure 2

sideband suppressed carrier chroma modulators and RGB input matrices with blanking level clamps. Such features permit system design with few external components and accordingly, system performance comparable to studio equipment with external components common in receiver systems. It was employed in early Amiga 1000 computers.

It is not a good idea to use discrete components because of difficulties in calibration of the various PAL signals. If U13 were untraceable, you can replace it with other equivalent (AD724, CXA 1645, and so on), giving attention to their technical specifications. From connector "v1" will be available the PAL composite video signal.

Calibration

U1 is an 74HC series IC with max voltage of 6VDC, so check if on its power pins there is a voltage not exceeding the maximum allowed, otherwise it will be destroyed in few seconds. Ensuring that all the tensions have the right voltage and a video monitor is connected to the connector "v1", we can turn on the device. If the bars appear, even if in greyscale, it is a good sign. Check with a frequency meter if at the pin

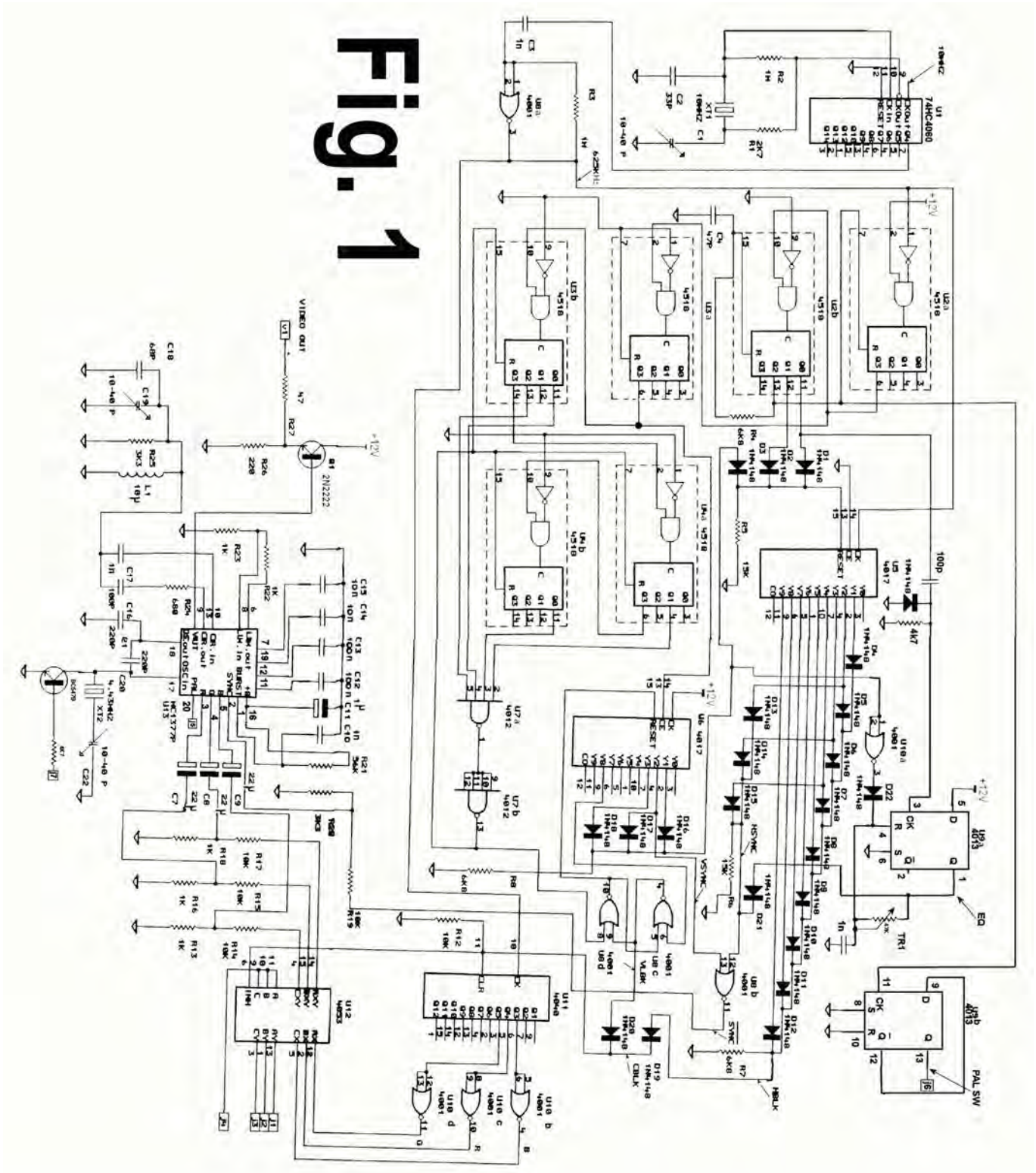


Fig. 1

9 (CKOUT) of U1 the 10 Mhz signal is accurate and adjust C1 accordingly if it is not. At pin 3 of U8a must therefore be a signal of frequency equal to 625.00000kHz, with the amplitude of 12Vpp. TR1 will be adjusted with an oscilloscope to get from the pin Q of U9a a series of positive pulses of 2.5 µs and to facilitate this calibration, unsolder momentarily a terminal of the diode D22. C22 controls the colour subcarrier frequency of 4.43619 Mhz, with the probe of the frequency meter placed to pin 18 of U13. Instead C18 controls the amplitude of the chroma: adjust to the fullest extent possible using the oscilloscope its probe will simply be inserted into the connector "v1".

In figure 2 there are described the various signals on the circuit. In the event of anomalies and strange behaviours, check the stadium adjacent to the signal that does not match to those ones indicated into the figure.

In figure 3 are represented the various controls of the unit. The three linear potentiometers govern the width of each level of red, green and blue. To get a "pure" colour simply turn up the cursor towards 12 VDC of that colour and to a minimum the other two ones. To obtain the white raster rotate all three sliders to 12 VDC, vice versa for black raster put everything to GND. Turning as you like the cursors you can get all the shades of possible colours. This is very useful if you want a particular background colour for your videographic work (i.e. a background for video titling, chroma-key, etc.). The three basic colours are driven analogically, so applying a modulated signal instead of the three potentiometers, you can get interesting

colour effects. SW1 allows the switching between colourbars and basic colours. SW2 and SW3 respectively turn off the colour subcarrier and the PAL switching.

In figure 4 is described the power supply. Note the separate power supply for U1. Although it has not been mentioned, all the ICs must be coupled with a capacitor of 10 to 100nF between its supply terminals. The pin 7 of U12 must be connected to pin 8 (GND), otherwise it will not work.

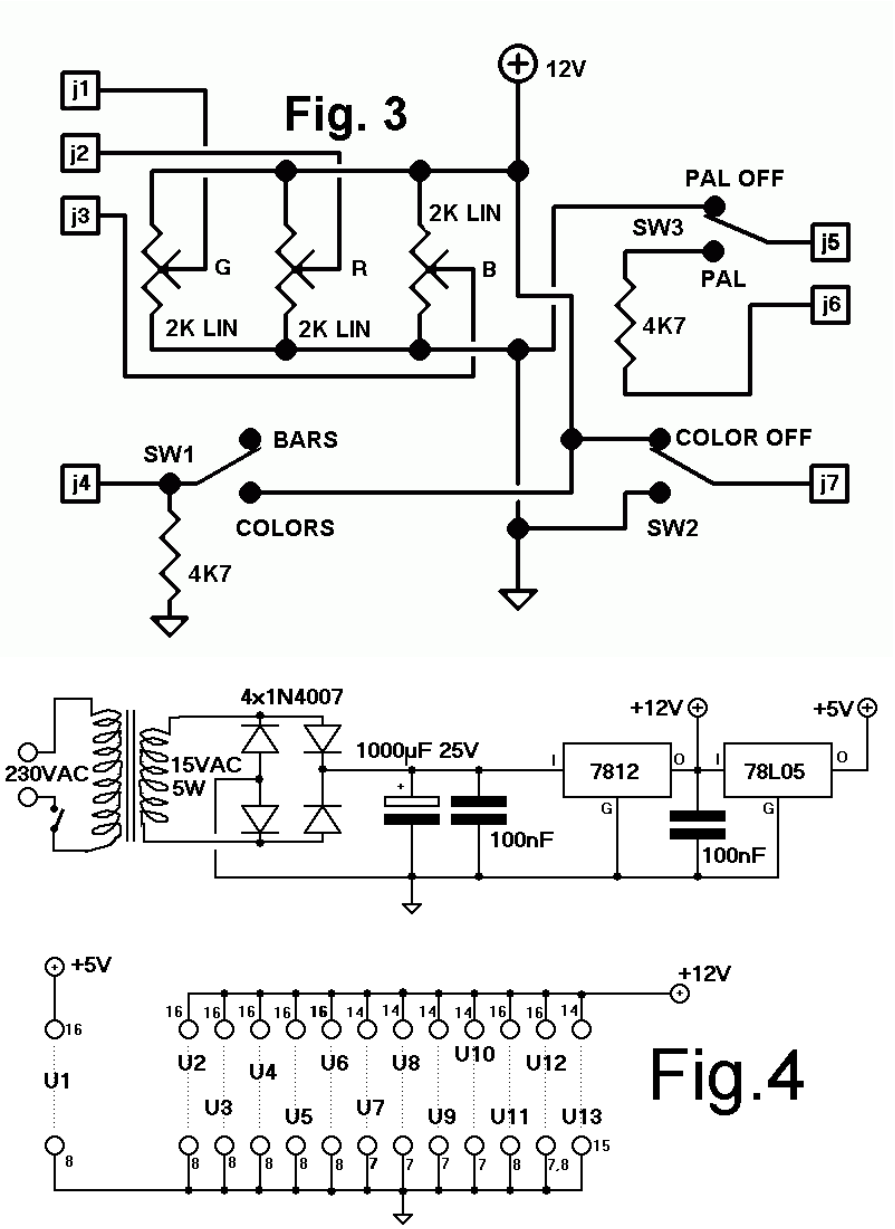
Other suggestions are not except the fact to do not build a tiny PCB if you wish to use SMD ICs and the other passive components.

If you own a vectorscope, you can make the necessary changes for fine calibration of the PAL signals (90 ° phase shift, carrier chroma modulators, etc.), following the instructions on the datasheets of the chip, which can be obtained from Motorola.

It is possible to make further improvements, such as locking in phase the colour subcarrier and the horizontal sync using a VCO and PLL, or completing the generation of video signal with patterns as horizontal and vertical rows, grid, points, chessboard, a multiburst signal, etc.

The entire circuit, including power supply, can be inserted in a metal cabinet of sufficient size.

Any queries regarding this article, please email: **tecchese@libero.it**



Bits and pieces...

Nick - G4IMO wrote in to answer Euginio Muratore's request for help in the last issue:

"I think Eugenio is seeking the information published in CQTV 125 on Page 14 (Dividing by N with 4040)".

Brian Summers - G8GQS will be giving a lecture on TV cameras at the Maidenhead and District Amateur Radio Club (http://www.madarc.org/) on the 5 March. Starting time about 7.45 to 8pm. The lecture will be an improved version of the one given at the BGM last year.

Dayton Hamvention 2009

Will be held on May 15th - 17th at the Hara Arena, Conference & Exhibition Center.

Details can be found on their website:
http://www.hamvention.org/

If you don't plan on being in the States anytime soon, not to worry, they are planning on streaming the event via the BATC.

So browse to: **http://www.batc.tv** and check the "Live Events" link for details nearer the time.

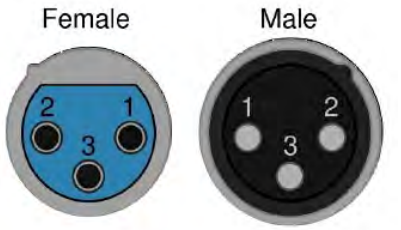
Use the club Forum - Post a msg today!
http://www.batc.org.uk/forum

Streaming: Engineering the sound

by Trevor Brown G8CJS

In the last issue, I covered some of the do's and don'ts of videoing an event for the streamer, pictures are priceless but sound is also essential and often more complex than video. So I thought, in this issue, I would run through interconnecting audio kit in general, sound levels, both analogue and digital, and some of the do's and don'ts of using microphones. I have touched on stereo, although the streamer is mono.

Broadcast Audio always uses XLR connectors and twin screened cable, the connections are Screen to pin 1, Red to pin two and Black to pin 3 (assuming you were lucky enough to have Red and Black wires). It can be best remembered by the name of the connectors, XLR, i.e. screen, live, return.



Using two wires for the signal as a balanced line helps stop any induced hum, as it should be induced into both signal wires equally and cancel out, as the required signal is the difference between the two wires. XLRs come in male and female variants, and a cable should have a connector of different sex on each end, so the cables can easily be cascaded. There is also a protocol, sound comes out of pins (male) and goes into sockets (female) (useful if you are putting cables in place waiting for the equipment to turn up). There are exceptions to the rule, so a couple of crossover male and female leads in your toolbox are always useful, and these gender-changers, as they are called, are available commercially.

Unfortunately not all equipment uses these connectors and you will come across the dreaded phono plug. The first problem is, it's only a two-wire connector, i.e. inner and outer. The simplest way to interconnect XLRs and phonos, is to connect pins one and three of the XLR (black and screen) to the phono outer and the red (pin 2) to the phono inner, this will work, but YOU will lose the induced hum rejection of the balanced line. Transformers are available to do this conversion without the loss of this common mode rejection, but are not often found. The second problem is one of levels, XLR sound levels are higher than phono, so you may need attenuation or gain, depending which way you are going. The standard for XLR is 1mw in 600ohms, i.e. 0.775 of a volt (0dBm) for standard level tone, i.e. 4 on a PPM, peak programme meter, depending on content, sound can go to 6 i.e. +12dbm. Each division of a PPM is 4dbs

Although Programme sound on a PPM

should never pass 6 some material was restricted to lower PPM levels, depending on content and compression. Well you wouldn't want the ads to sound louder than the programmes, (oh, sorry that happens now!).

The PPM (Peak Programme Meter) originated at the BBC and has been the standard for UK broadcast sound levels. To appreciate it, all you have to do is compare a VU meter, with a PPM and you will never go back.

You can download an electronic version of the PPM free from the Darkwood site; see the link at the end.

The BBC's motto, 'Nation shall speak peace unto nation', has been adapted by engineers to reflect correct level as indicated on a PPM: 'Nation shall peak six unto nation'.

The PPM also made it into the stereo age with separate needles for left and right channels. While there is some value in this for stereo work, more complex monitoring equipment is required so that the phase relationship between left and right channels can be monitored. Some dual PPM's are switchable so that instead of left and right, it will monitor S (difference) and M (sum) signals (A+B =M and A-B =S). The S signal is quite low and +20db of gain is often built into the PPM in this mode, If the S is higher than the M, then you are in trouble. Silly as it sounds, this is at its most important when working in stereo, feeding a mono listener. If there is very little stereo content, and due to some engineering mishap one of the channels has suffered a phase reversal, the two signals can cancel out, leaving the mono listener with no sound and yet it looks fine on a stereo PPM in A/B mode.

My favourite piece of kit for monitoring stereo phase is the stereo vectorscope, which compares the mono signal and the stereo part (S and M signals) as an X-Y display. If your budget wont stretch this far and you are worried about mono compatibility, then try to find some monitoring equipment with a mono

select button, if the sound disappears when mono is selected, i.e. A+B=0, you have a problem.

Armed with this information you can almost get by in an analogue world, but then digital storage came along and the world changed.

The digital file is made up of ones and zeros and as you increase the level of the signal you are feeding to the digital storage device, you will reach a point when all the bits turn to 1 and no more level increase will be registered. Pass this point at your peril and you are into distortion. This point is 0dBFS, i.e. full scale, and to ensure we never get there, we work to -12dbFS for a zero level tone, i.e. 4 on the PPM, which should give us 12dbs of head room before we clip, i.e. 7 on the PPM. In Europe 0dBu has been standardised by the EBU to be -18dBFS, and some broadcasters work to -20dBFS. Avoiding level problems was never easy and some experimentation is inevitable, always err on the low side, levels can be increased after any storage, but overload and distortion is fatal.

Let's leave sound recording and levels and have a look the microphone end and, in particular, what not to do with a microphone:

1. Some microphones have very characteristic 'sounds' – presence boosts, very full bass or whatever. These characteristics can be helpful in specific applications, but generally restrict what you can do with the microphone. Better to choose a very neutral-sounding mic, and use positioning (or equalization if you must) to create the necessary sound character.

2. Capacitor and electret mics don't like dust, smoke or humidity, all of which will affect the sound quality whilst in that environment and, in the case of dust, smoke and moisture, progressively and permanently degrade the microphone diaphragm.

3. Always handle mics with care -- not style! Put them away when not in use, don't drop them, and never slam the lid on their boxes or you could split the diaphragm. Ideally, keep your microphones in a closed foam lined box unless in use. The one it came in is usually best!

4. Dynamic mics tend to have less dynamic ability than capacitor or electret mics, but are far more capable of taking abuse from loud instruments or rough handling. So in applications where a high sound level is likely, a dynamic mic may be the answer.

5.Capacitor and electret mics tend to be more sensitive than Dynamics.

6. Electret mics can often be powered either by an internal battery or phantom power. Given the choice, phantom is the preferred way to power the mic, firstly because it avoids the problem of a battery running flat part way through the best take and, secondly, because the head-amp inside the microphone will have more headroom and less noise. If your mic must be powered by a battery remove it when not in use, so that the battery contacts are wiped clean by the action of inserting and removing the battery.
The mic draws such a small current that any corrosion on the terminals will degrade the quality and may cause strange popping and scraping noises. Allow electrets and capacitor mics to stabilise for a few minutes before any critical recordings.

7.Talking of head amplifiers inside capacitor and electret microphones, these are generally designed to cope with a 'normal' range of sound pressure levels. If you place the microphone very close to a loud sound source, the head amplifier can easily be overloaded, producing distorted sound.

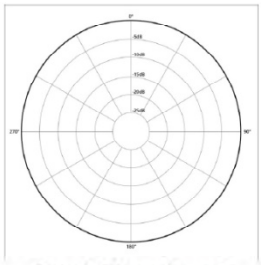
8. Don't forget to mute the speakers or remove headphones when you reposition microphones, re-plug, or switch on phantom or battery power to them. Anyone listening will be very unimpressed (not to mention deafened) by the thumps, pops and bangs!

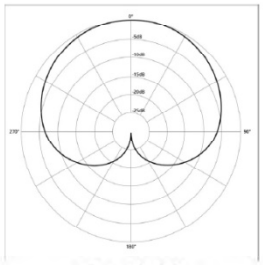
9. When adjusting the position of a microphone on a boom stand, never force the clamps, because they will quickly lose their ability to hold position. Better to loosen all the clamps, allowing complete freedom of movement to position the mic exactly where you want it, then tighten everything up again.

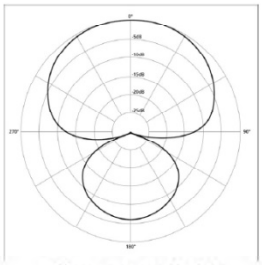
10.Possibly the most important thing to remember about using a boom, is to ensure that it's not in shot. During rehearsal, communicate with the camera operator to see where it comes into shot.

11. It is important to isolate microphones from physical shock (especially omnidirectional mics) as subsonic and low frequency noise will reduce headroom significantly. If you see peaks on your meters, which don't seem to correspond to the sound, suspect LF rumbles – often from the boom operator inadvertently tapping the fish pole. Ideally, isolate the mics with purpose-designed shockmounts.

12. The usual reason for using any kind of directional mic (such as a Gun mic) is to gain separation from an unwanted sound source. Remember this when placing the mic, because what you


Omni Directional


Cardioid


Hypercardioid

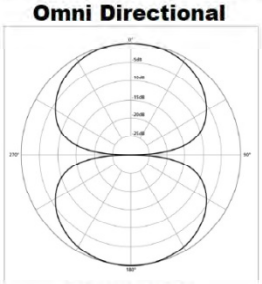
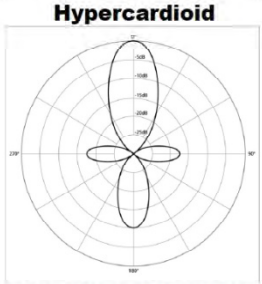


Figure of 8


"Gun Mic or Rifle Mic"

aim the thing away from is sometimes more important than at what you point it. Think about the polar response in three dimensions and position the mic so that the unwanted sound approaches its least sensitive angles. These are directly behind a cardioid, to the sides of a figure-of-eight, and on the edges of a rear-facing cone for a hypercardioid. (Gun mic)

13. At a given price, an omnidirectional microphone often has a more neutral sound and a more extended bass response than a directional one. However, because it has no ability to discriminate against unwanted sound sources, it must be positioned at less than around half the distance of any directional mic for the same amount of spill or room sound. So if you are happy to close-mike a source, don't discount using an omni, which will often sound less coloured than a cardioid, for the spill penalty will probably be negligible.

14. All directional mics exhibit some degree of proximity effect, bass boosting, which becomes stronger the closer the mic is to the source. This can be used to advantage if you want to warm-up a sound in a more natural way than with EQ.

15. The ultimate quality of your recording is partly dependent on the quality of your microphones; however, even the best quality microphone poorly placed will result in inferior results.

16. Where you place the mic is the single most important and creative aspect of recording. Take the time to experiment and the care to get it right.

17. Reduce spill by thinking about the positioning of the mic and the appropriate selection of polar patterns.

18. If you really are stumped about where to put a mic, a handy rule of thumb is to place it as far away from an acoustic source as the longest dimension of that source. Most acoustic instruments need space for all elements of their sound to gel and take on their correct proportions. Miking too close will tend to emphasise the mechanical noises of fingering, bowing or valve click.

19. Never check a microphone by blowing into it - you could quite literally destroy it, particularly ribbon mikes!

So now you know what not to do, what about what to do, well this is experience and experimentation.

Rifle Microphones

Every situation is different. The rifle mic is ideal for parting wanted and unwanted sound, see the polar diagram, it can also be fitted with a Rycote wind screen often called a Zeppelin to which can be added a fury cover known as a Squirrel. If you align the axis with the wanted and unwanted sound you will get a poor separation. If its dialog and something is unwanted behind the subject mic from above, don't put both sound sources on the same axis. If this is not possible mic from below pointing up, but beware of aeroplanes. The smaller version of this mic the Gun mic fitted with the push on American style windscreen is not quite as effective at parting wanted from unwanted sound, but is ideal for interviews of two or more people where the rifle mic might not be able to be panned quickly enough, off mic sound on both of these mics is very thin. If you are using either of these on a fish pole, if you don't get complaints from camera about being in shot perhaps you are not close enough. Video cameras only show what the viewer sees, film cameras with their optical viewfinders show more and this does help sound and camera to work together

Mini Discs

The late Steve Irwin made his name chasing snakes and other dangerous animals. The sound fix for him was a small lapel mic and a mini disc recorder in his back pocket. Although you had to synch up the sound and pictures in post, the mini disc was sufficiently stable speed wise that it would remain in lock for long periods of time. So it only needed the sound and picture takes identifying, pairing up and syncing up once. This is fairly simple in the edit suite and is preferable to chasing him on location even with the longest of fish poles, in situations where retakes were something everyone wanted to avoid.

recorded material and won't help you live with the streamer.

Omni Directional Cardiod Microphones

I would normally reserve the use of one of these for instances of loud sound where a powered mic such as a rifle or gun mic could be overloaded, i.e. orchestras but I had colleague who worked on Whickers World as a sound recordist, and used an Omni directional mic for Alan's interviews on several occasions. Place it midway between Alan and the person being interviewed and Alan being the pro he was, would always match his voice level to that of the interviewee. This does not work for everyone.

Radio Microphones

If anything will give you a problem it's radio mics, avoid VHF ones and go for a UHF and dual diversity receivers. There are two frequency allocations licensed and unlicensed. It goes without saying that the licensed channel will carry a lot lower risk of interference. Most of this kit will have a choice of several frequencies, but it's not always convenient to change channels if problems occur with the transmitter in your presenter's pocket.

There is a funny side to these and that's the person wearing it always seems to think it stops when they leave the studio, or go for a loo break and conversation of a personal nature has often been overheard, usually referring to the performance or looks of the crew.

Monitoring sound

There is no substitute for listening to your sound, I have a pair of Beyer DT 100 headphones, they are expensive, but you can buy replacement parts for them, and extend their life indefinitely. They are frequently to be found on ebay. What is so good about them, well in order to listen to your microphones you need to exclude the sound that is coming to your ears directly. The next trick is to not look at the person talking, if there are unwanted noises you will be in a better position to judge if the wanted dialog is being drowned out by background

sound if you deprive yourself of any advantage provided by lip reading, and just go on what you hear.
This has been a very brief look at a complex subject I hope some of it is useful for streaming and any other times that you might be involved in sound recording. The following links may also help, the internet is full of useful information on sound recording.

http://www.darkwood.demon.co.uk/PC/meter.html#PPM1

http://www.soundonsound.com/sos/jun00/articles/metring.htm

http://home.pacific.net.sg/~firehzrd/audio/mics.html

http://plugin.org.uk/meterbridge/

http://www.equipmentemporium.com/selectshotgun.htm

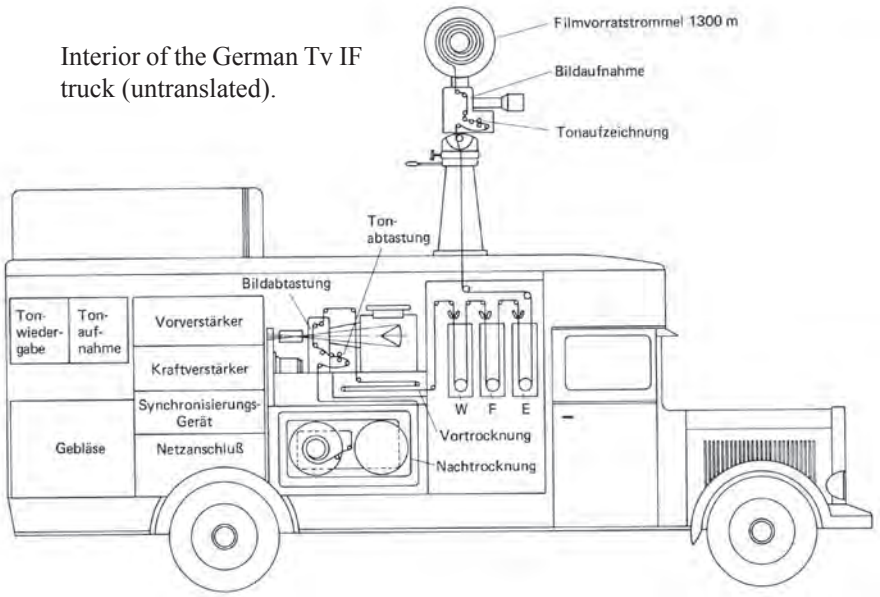
Fatherland TV

By Dicky Howett

"The following snippet, written by Wilhelm E. Schrage, is from a pre-war US magazine called 'Radio News', and is a contemporary report on German Television in the mid 1930s'. Of particular note; the cost of tv receivers is quite high, but according to most subsequent accounts, they were never actually offered on sale to the general German public (RADAR/War preparations a priority?). Generally, much was made of the quality and ease of operation, with many demonstrations, however, initially, a tv receiver in Germany (and indeed the UK & the US), cost as much as a small car and thus was beyond the reach of the masses"

While America is still of the belief that television has not advanced sufficiently for general use, England and Germany are now endeavoring, through the aid of their respective governments, to make television as popular as sound broadcasting. Other European countries are following in their footsteps, and it can be truthfully said that Europe is now in the throes of 'television fever'.

Four hundred and fifty-three feet in the air, rising slightly above the top of the well known Berlin radio tower, with its famous restaurant, two copper rings appear to be growing in the sky. Each has a diameter of about ten feet, and their surfaces shine in the early spring sun like spun gold. They are symbolic of a new era--television is no longer a mere technical problem, but is being made available for the use of the general public. The golden rings are the antennas of the Berlin Television Station. From these high points, far above the surrounding buildings, radio waves of a special kind--ultra-short waves, as the technicians term them, are radiated into the air by a force of 15 kilowatts, covering an area of about 50 miles in diameter. Each of these television stations has two ultra-short-wave transmitters. One radiates the



Interior of the German Tv IF truck (untranslated).

sound impulses, as usual, while the other one delivers the picture impulses to be shown in the home transmitter. The radio listener, or should we say the "television looker," uses a special television receiver to receive these transmissions. Pictures of home-movie size are reproduced. These receivers are of two sizes, one having a screen of about 4 inches by 6 inches and the other about 10 inches by 12 inches

It is simple to tune in on television programs, because there is plenty of space in the present wave range, which is about 7 meters. In other words, there are far less stations in this wave range than in the normal broadcast band, and the selectivity of the television receiver does not have to be as great as for plain broadcasting. Also, the "monkey chatter" does not occur, because of the stations being situated so close to one another. There is also no danger of two stations showing their pictures at the same time to the surprised listener. A great number of these new receivers have to be tuned only once. Later on it is brought into operation by turning only the small switch of the power line

For the past 9 months, the Berlin Television Station has been radiating interesting programs, daily, on 7 meters. The picture appears, as stated before, behind the surface of a glass plate. Sometimes it is in black and white, but very often, has a slightly bluish or greenish caste. If the transmitter radiates the picture in the so-called "180 lines manner," as is done in Berlin, not only heads, but the entire body may be seen. Entire scenes with all movements are easily recognized

The average price range of the receivers is from $250.00 to $500.00 per set. A television receiver contains two complete receivers, one for sound reception, and the other for the reception and reproduction of the image. While the sound receiver is only connected with the loudspeaker, the picture receiver works with a cathode-ray tube which is the heart of the visual system. Another type of picture receiver uses a "mirror-screw" for reproducing the picture.

Recently, in Germany, there has been developed a television pick-up car. This car carries on its roof a standard motion-picture camera mounted on a cast-iron roof, allowing the camera to be moved in any desired direction. The hollow pillar of the camera support is used to convey the exposed film ribbon to the dark room which is in the interior of the car. By use of special apparatus and extremely fast-working chemicals, the film is developed in 1-1/2 minutes. The still-wet film ribbon is then sent at once through a so-called "Abtastgerat", which cuts the single-film pictures in 180 lines and transforms each line in a succession of strong and weak electrical impulses. The impulses are radiated from a transmitter into the air and the radio listener, receiving these impulses through the televisor, may see the broadcast scenes

Wilhelm E. Schrage,
Radio News, July 1935

German Tv's 'Intermediate Film' OB Truck. Two of these 'delayed action' systems (could be at little as 15 seconds) used quick-processed film to cover selected events of the 1936 Berlin Olympic Games. Alas, no footage survives.

A Farnsworth type Image Dissector camera (plus a couple of Iconoscopes) was used at the 1936 Berlin Olympic Games. The picture shows the actual ID camera. Range finding was achieved by using a side-mounted optical scope. Video quality was reported as 'good'.

Members Ads

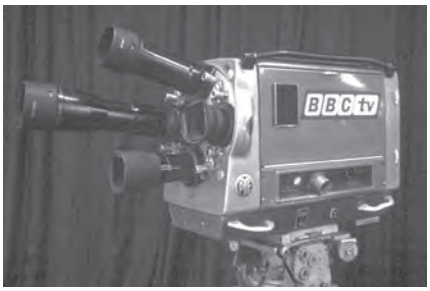
Wanted

Pye Mk6 Image Orthicon Camera, ex BBC. There were only about 50 of these made for the BBC's new fleet of MCRs in 1963. If you know of one in any condition please contact me. In the past I had a few of them and I passed them on to others, they were big heavy, unreliable and unwanted, how times change!

I have a long list of difficult wants, view it in full at:
http://www.tvcameramuseum.org/master%20wanted%20list.pdf

Thanks.

Brian Summers G8GQS
Tel: 01276677879 / 07740291191
Email: Brian@summershome.co.uk



A frequency reference you can have at home

By Steve Anderson
(steveand@truemail.co.th)

Some time ago I bought a new frequency counter which although it had a good accuracy and stability specification I wanted better. It has an external 10MHz reference input for greater precision. I found a source of reasonably priced GPSDOs from James Miller in the UK, http://www.jrmiller.demon.co.uk.

This is really a sub-assembly comprising of a Rockwell Jupiter GPS receiver, an ovenised 10MHz oscillator, interface board and a regulator all in a diecast box. The version I purchased is below; it has been updated since but is basically the same. GPS receivers branded Conexant and Navman can also be used.

All one needs to do is plug in a GPS antenna, and apply 12V at about 1A. After a few minutes the oscillator is up to temperature and the PLL locks it to the 10kHz output of the receiver and the current consumption drops to less than 400mA.

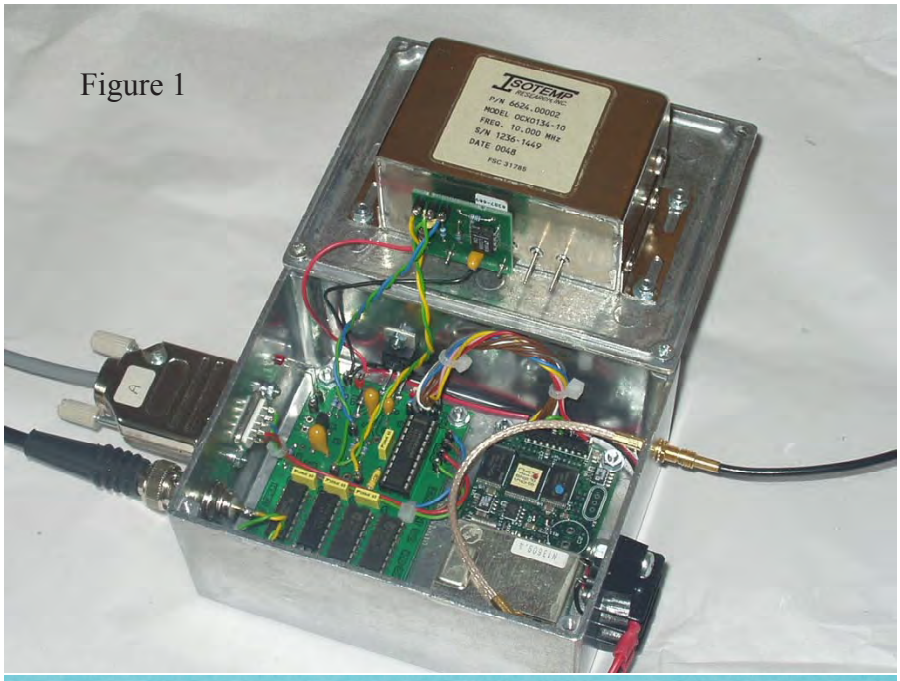


Figure 1

Figure 2

It outputs a 10MHz sine wave at +13dbm on a BNC connector at 50Ω; this can be changed to 75Ω or (HC)TTL upon order, there is also a one-pulse-per-second signal and NMEA data both at RS232 standard. The unit can also be programmed via the same port. In my case I didn't need to do that and used it as supplied. Binary output can be selected as well.

Ultimate stability and accuracy is reached after 24 hours, but it's usable after one hour, I leave it on 24 hours, the figures that follow are for the current version not the Isotemp version shown in figure 1

1s < 1x10-12	1000s < 2x10-12
10s < 3x10-12	10000s < 3x10-13
100s < 5x10-12	1 day < 5x10-14

Once it has settled down the unit is dissipating around five watts which means that this small die-cast box in my normal ambient temperature of 30°C runs warm. I wanted to place it in the roof void of the house where it regularly gets up to over 55°C. This I felt would exceed the receiver's temperature limit.

So I split the unit in two and relocated the oscillator into its own thermally insulated enclosure and the +5V regulator was moved to an old Pentium II heatsink which resulted in a dissipation in the die-cast box of just over 1W. The temperature rise was now hardly noticeable. In European climates this should not be necessary. This was fitted into a case with a conventional power supply to provide the +12V and +5V voltages. The current version uses less power largely negating the requirement for this modification. The current version is shown inf figure 2 with my implementation of the Isotemp version shown in figure 4.

I added three other refinements, a meter just to keep an eye on the OCXO control voltage and a power outage indicator. Once the PLL is locked the reading on the meter never moves: never. I also added a one hour outage indicator as we have many outages here, generally short

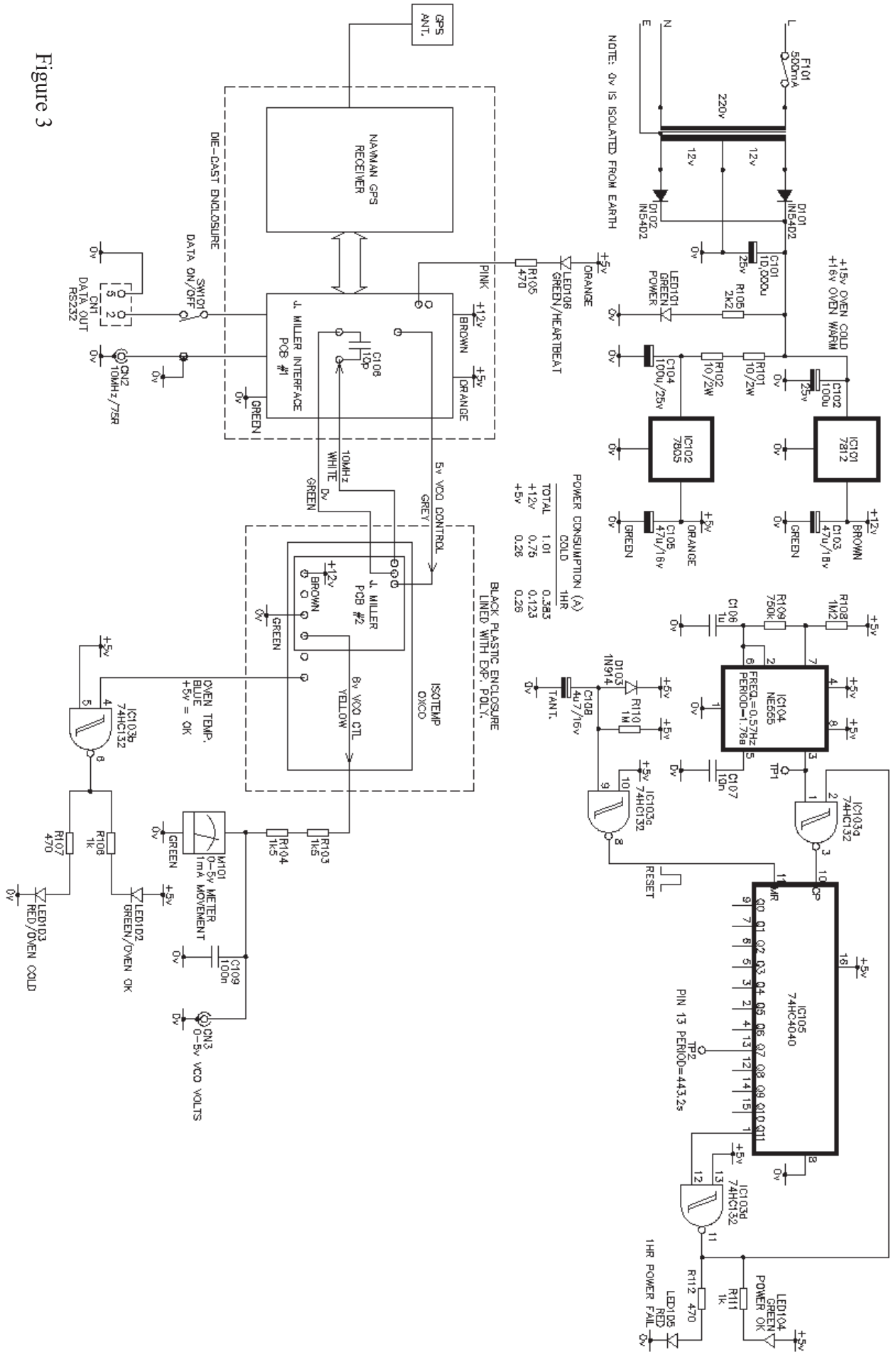

GPS ANT.
NAVMAN GPS RECEIVER
DIE-CAST ENCLOSURE
DATA ON/OFF
SW101
CN1 DATA OUT RS232
CN2 10MHz/75R
J. MILLER INTERFACE PCB #1
C108 10p
PINK
BROWN
ORANGE
GREEN
R105 470
LED106 GREEN/HEARTBEAT
10MHz WHITE
5v VCO CONTROL GREY
J. MILLER PCB #2
8v VCO CTL YELLOW
ISOTEMP OXCO
BLACK PLASTIC ENCLOSURE LINED WITH EXP. POLY.
OVEN TEMP. BLUE +5v = OK
IC103b 74HC132
R107 470
R108 1k
LED103 RED/OVEN COLD
LED102 GREEN/OVEN OK
M101 0-5v METER 1mA MOVEMENT
R104 1k5
R103 1k5
C109 100n
CN3 0-5v VCO VOLTS
F101 500mA
220v
12v
12v
D101 IN5402
D102 IN5402
C101 10,000u 25v
R106 2k2
LED101 GREEN POWER
+15v OVEN COLD +16v OVEN WARM
R102 10/2W
R101 10/2W
C104 100u/25v
C102 100u 25v
IC102 7805
IC101 7812
C105 47u/16v
C103 47u/16v
NOTE: 0v IS ISOLATED FROM EARTH
POWER CONSUMPTION (A)
COLD 1HR
TOTAL 1.01 0.383
+12v 0.75 0.123
+5v 0.26 0.26
C106 1u
R109 750k
R108 1M2
IC104 NE555
FREQ=0.57HZ PERIOD=1.76s
D103 1N914
C110 4u7/16v TANT.
R110 1M
C107 10n
TP1
IC103a 74HC132
IC103c 74HC132
RESET
IC105 74HC4040
PIN 13 PERIOD=443.2s
TP2
IC103d 74HC132
1HR POWER FAIL
R112 470
LED105 RED
R111 1k
LED104 GREEN POWER OK

Figure 3

but worth waiting that hour for things to settle down again. As I didn't plan to use the programming input I didn't wire that up, likewise the 1 PPS output. The completed unit is shown in figure 4, my wiring standards are not as good as others so please excuse me.

The unit had only just been turned on so both the red Oven Temperature and the One Hour Outage indicators are on. The top one is power, the bottom one the 'Heartbeat'.

The unit has been in use for well over a year now with no problems at all. Since the picture was taken the front panel indicators and meter have been duplicated so they're visible in the workshop whilst the unit itself lives in the roof void.

The NMEA data output in its raw format looks like this:

```
$GPGGA,235955,1340.8244,N,10036.9264,E,1,08,1.18,5.7,M,-27.3,M,,*57
$GPGGA,235956,1340.8244,N,10036.9264,E,1,08,1.18,5.7,M,-27.3,M,,*54
$GPGGA,235957,1340.8244,N,10036.9264,E,1,08,1.18,5.7,M,-27.3,M,,*55
$GPGGA,235958,1340.8244,N,10036.9264,E,1,08,1.18,5.7,M,-27.3,M,,*5A
$GPGGA,235959,1340.8244,N,10036.9264,E,1,08,1.18,5.7,M,-27.3,M,,*5B
$GPGGA,235959,1340.8244,N,10036.9264,E,1,07,1.18,5.7,M,-27.3,M,,*54
$GPGGA,000000,1340.8244,N,10036.9264,E,1,08,1.18,5.7,M,-27.3,M,,*5A
$GPGGA,000001,1340.8244,N,10036.9264,E,1,08,1.18,5.7,M,-27.3,M,,*5B
$GPGGA,000002,1340.8244,N,10036.9264,E,1,08,1.18,5.7,M,-27.3,M,,*58
$GPGGA,000003,1340.8244,N,10036.9264,E,1,08,1.18,5.7,M,-27.3,M,,*59
$GPGGA,000004,1340.8244,N,10036.9264,E,1,07,1.18,5.7,M,-27.3,M,,*51
$GPGGA,000005,1340.8244,N,10036.9264,E,1,08,1.18,5.7,M,-27.3,M,,*5F
```

The data above shows the rollover of 2008 to 2009. The leap-second isn't shown but a hold command is issued in lieu and 23:59:59 is simply repeated (in red). The time is in blue; my latitude and longitude are in green, 13° 40.8244' N, 100° 36.9264' E. I have omitted a lot of other data for clarity's sake.

This was captured using the simple Hyper Terminal program in Windows, more elegant and useful programs like VisualGPSXP provide a very good user interface where one can get all the data you need and generate a plot of the coverage where you are.

ATV Contests - Hints and Tips

By Dave Crump G8GKQ

Ever wondered how those mainland Europeans get their enormous scores in ATV Contests? Well read-on; this is the first article in an occasional series of hints and tips for ATV Contesting.

Introduction

There are 5 basic steps to a Contest Exchange:

1) Establish talkback; 2) Align aerials; 3) Tune receiver to transmitter's frequency; 4) Record numbers, send report and locator; 5) Switch transmit/ receive ends and repeat.

Sounds easy? Well let's consider each step in detail.

Establish Talkback

Talkback has traditionally used 144 MHz or 432 MHz FM or SSB, although there is no reason why mobile phone or Internet should not be used – it would be within the rules. With the higher antenna gains giving increased range on 432 and 1255 MHz ATV, it is not unusual to struggle with talkback if a typical 144 MHz setup is used. Contests are a lot easier if you have legal limit power and a high gain aerial for talkback; also, don't hesitate to use SSB rather than FM.

The calling frequency is 144.75 MHz for FM. Please move off this as soon as you have established contact. For SSB, 144.525 is the calling frequency.

Once you have found a potential contact, exchange locators, transmit frequencies and names. Even though we are contesting, there is no reason not to enjoy it and make it personal!

Align Aerials

Coarse aerial alignment can be achieved through guesswork, or peaking on the talkback signal - an S-meter is essential for this method. Fine alignment can be achieved through calculation, or by peaking on the Vision Carrier.
To align your aerial by calculation, you first need to have a calibrated means of indicating which way your aerial is pointing. You should be able to set the heading repeatably within half of the aerial beam width. You can use a repeater or beacon for practice and calibration before the contest. I always use true bearings to avoid magnetic/true confusion.

To calculate the bearing, use a computer program to work out the bearing from your and the distant stations' locators. The ATV Contest log in Excel spreadsheet form (download from the BATC website) will helpfully display this if you fill in the log as you go – always good practice! I have found that some stations do not know their locator, so I keep a list of postcodes with corresponding Lat/Longs on my laptop so that I can calculate their bearings.

For 70cm AM ATV, you can easily peak on the Vision carrier using a normal SSB receiver with an S-Meter. Ask the distant station for his exact carrier frequency - I have peaked on the wrong one in the past! For FM ATV, things are a little more difficult. I use a (homebuilt) spectrum analyzer connected to the 35 MHz IF of my receiver. Using this, I can see a modulated FM ATV signal at least 5 dB weaker than anything that can lock syncs. Asking the other station to transmit an unmodulated carrier can make peaking even easier.

Tune Receiver to Transmitter's Frequency

There are 2 parts to this – knowing the exact transmitted frequency, and having a calibrated receiver. If you are able to

remove these 2 variables your chances of a successful contact are much greater.

If possible, before entering a contest make sure that you know your exact transmitting frequency. You should aim for 1 KHz accuracy for AM, and 1 MHz for FM.

Receivers should be properly calibrated. For 70cm consider the use of an expanded tuning scale if you use a modified broadcast receiver (use a lower varicap tuning voltage). I use a scanning receiver with an IF output that goes to a TV IF strip. I can then just dial in the frequency I want. For 23 cm and above you can use a synthesized receiver, or use the prescaler output from a converted satellite tuner to drive a frequency counter. Presetting the counter with your IF Frequency will allow you to have a direct readout.

Record Numbers, Send Report and Locator

If your aerials are aligned, and your receiver tuned to exactly the right frequency, you may have to sit and wait for fading and/or aircraft flutter to bring up the signal level. It is not unusual to wait 15 minutes during an ATV Contest to get those elusive numbers. Remember that this is thinking man's contesting, not like the frantic events you hear on HF!

Visibility of the numbers is important. I am not a fan of digital caption generators for this; I use a camera to view printed numbers. Using this setup, it is easy to send one number at a time should the path be very bad. I fix 2 (or 3) sheets to the wall, one for each band, as shown in figure 1. Printing the band and locator at the bottom of the sheet serves as a useful reminder. Make sure that your numbers are within the rules (not consecutive or repetitive). I use PowerPoint and a Laser printer to get clear black numbers in Arial font.

Write down the numbers as soon as you see them – I have lost points in the past through forgetting what I had seen! Then add the 4 digits together and check the total with the transmitting station over the talkback.

Write down your report as you send it, and double check that you have the other station's locator in the log. The report is from 5 (BBC Quality) to 1 (just visible in the noise) followed by a sequential 3 digit serial number.

Switch Transmit/Receive Ends and Repeat

Although not essential, switching from receive to transmit is clearly easier if you have relay switching. It can also save you blowing up a preamp during the excitement of the contest (yes, I've done that as well!).

Checklist

You may find this preparation checklist useful:

Figure 1

- Have you printed Number sheets for each band?
- Do you know your locator?
- What is your transmit frequency?
- Have you thought about how you are going to align your aerials?
- Are you going to use an electronic or paper log?

After the contest, you should submit your entry to the BATC Contest Manager. Entries are currently accepted by normal mail or e-mail.

I hope that this might encourage you to enter the next contest (the Summer Fun contest in June). In the next article, I will focus on some of the technical aspects of a well-developed contest station.

Contest News

By Dave Crump G8GKQ

IARU International Contest

The full results for the IARU Region 1 ATV Contest are published opposite. In total, the Contest attracted 40 entrants from UK, The Netherlands, France and Germany: 31 on 70cm, 37 on 23cm, 31 on 13cm and 16 on 3cm. The overall winner was PA1DYK with a total of 58 contacts across all 4 bands. The best DX was in two 426km one-way contacts between F6ANO and F1AHH on both 70 cm and 23 cm. The best DX on 13 cm was 131km from PA1DYK to ON4DPP/P, and on 3cm 77km from PA1DYK to PE1ACB. There were only 2 entries from the UK, and none from Belgium (although ON4DPP/P was clearly active). Thanks to the teams at G0ATW/P and M0DTS/P for flying the UK flag.

What struck me was the high level of 70cm AM activity on the Continent. This mode is ideal for contest use, especially when the bandwidth is limited to 2 MHz by video filtering.

December Repeater Contest

I have not received any entries for the December Repeater Contest, which is a pity after there was so much activity in the March Contest. Please mark the weekend of 21/22 March down in your diaries to try some easy ATV Contesting using your favourite (and perhaps not-so-favourite) repeaters.

News from the IARU Region 1 Conference in Cavtat, Croatia

There were 2 recommendations passed at the recent IARU Region 1 Conference which affect ATV Contests. The first recommends a central repository of electronic contest logs to allow International cross-checking:

Recommendation CT08_C5_Rec34 (Paper CT08_C5_30 Exchanging ATV contest logs):

Each society participating in an IARU Region 1 ATV contest, as well as each society organising sub-regional ATV contests, should be invited to deposit all log entries on the central repository within the timescales stated in the VHF Managers Handbook. The repository should be available to all participating contest managers from that date on for cross-checking purposes.

Proposed UBA, Seconded RAAG, agreed unanimously

The second proposes a standard format for ATV Contest electronic logs:

Recommendation CT08_C5_Rec35:

That paper CT08_C5_32 Electronic logsheet for ATV contests be adopted.

Proposed UBA, Seconded ZRS, agreed unanimously

Lastly, it was agreed that the UBA (Belgium) should host the 2009 International ATV Contest and that REF (France) would host it in 2010.

Conclusion

I can be contacted through e-mail (contests@batc.org.uk), or through my BFPO address: Wg Cdr D G Crump, Mailbox Number ACT, BFPO 63, London.

Contest Calendar 2009

1800 UTC 21 March 2009	1200 UTC 22 March 2009	BATC Repeater Contest
1200 UTC 6 June 2009	1200 UTC 7 June 2009	BATC Summer Fun Contest
1800 UTC 12 September 2009	1200 UTC 13 September 2009	International ATV Contest
1800 UTC 12 December 2009	1200 UTC 13 December 2009	BATC Repeater Contest

Section 1

70 cm

Pos	Call	Locator	QSOs	Points	Best DX	QTH	QRB
1	F9ZG/P	IN98JW	17	7021	F1AHH	IN95QQ	364
2	F1AHH	IN95QQ	10	4271	F3YX	JN18AP	386
3	F3YX	JN18AP	14	4221	F1AHH	IN95QQ	386
4	F6ANO	JN18JR	13	4202	F1AHH	IN95QQ	426
5	F6GNJ/P	JN08WV	15	3953	F5AGO	JN06DP	277
6	F6IQG	JN08BM	11	3217	F1AHH	IN95QQ	320
7	F1CIA	IN97XW	12	3077	F6ESU	JN19OO	302
8	F1DUJ	IN97XT	9	2322	F1AHH	IN95QQ	241
9	F6ESU	JN19OO	7	2318	F9ZG/P	IN98JW	329
10	F6CIU	JN08GE	7	1478	F6ANO	JN18JR	177
11	PA1DYK	JO22VA	15	1270	PE1JMZ	JO21du	104
12	F1SGO	JN18OU	4	1088	F9ZG/P	IN98JW	323
13	F1PDX	JN08XS	4	843	F9ZG/P	IN98JW	232
14	PA2RIK	JO32HB	9	535	DH8YAL/P	JO31mo	58
15	PE1RLF	JO32CG	7	385	PE1RXK	JO21wt	56
16	PA0ZR	JO22GF	6	384	PA1DYK	JO22va	88
17	PE1JMZ	JO21DU	5	374	PA1DYK	JO22va	104
18	PE2TV	JO32GH	7	357	PA1DYK	JO22va	61
19	PE1RXK	JO21WT	6	251	DH8YAL/P	JO31mo	84
20	PE1IWT	JO32KF	5	197	PA1DYK	JO22va	77
21	PE9KKM	JO32DD	4	186	PA1DYK	JO22va	37
22	PE1ORG	JO32HJ	4	185	PA2RIK	JO32hb	37
23	PA1RHQ	JO22MD	4	183	PA1DYK	JO22va	53
24	PE1EBX	JO32BC	6	164	PE1RXK	JO21wt	37
25	PA3DZA	JO31BK	2	126	PA1DYK	JO22va	69
26	PA3DLJ	JO20VW	3	105	PA0AVN	JO21nj	69
27	PA1AS	JO20XW	5	101	PA3DZA	JO31bk	57
28	PE1AXM	JO11VM	1	51	PE1JMZ	JO21du	51
29	PE1RKM	JO32AA	2	43	PE1RXK	JO21wt	26
30	PA1EBM	JO20XW	3	22	PA3DLJ	JO20vw	12

23cm

Pos	Call	Locator	QSOs	Points	Best DX	QTH	QRB
1	F6GNJ/P	JN08WV	15	7728	F5AGO	JN06DP	277
2	F6ANO	JN18JR	13	7700	F1AHH	IN95QQ	426
3	F9ZG/P	IN98JW	10	6632	F6ANO	JN18JR	294
4	F3YX	JN18AP	15	6212	F5AGO	JN06DP	258
5	F1CIA	IN97XW	8	4284	F1AHH	IN95QQ	254
6	G0ATW/P	IO93WH	5	3870	G7AVU	IO93OJ	265
7	PA1DYK	JO22VA	20	3810	ON4DPP/P	JO20mw	131
8	F6IQG	JN08BM	7	2934	F5AGO	JN06DP	209
9	PA2RIK	JO32HB	19	2632	PE1OMB	JO21un	84
10	PE1RXK	JO21WT	6	2554	ON4DPP/P	JO20mw	113
11	F1DUJ	IN97XT	6	2394	F6ANO	JN18JR	233
12	PE1EBX	JO32BC	17	2072	DH8YAL/P	JO31mo	84
13	PE1OMB	JO21UN	10	1954	DH8YAL/P	JO31mo	92
14	PA3DZA	JO31BK	9	1900	PA2RIK	JO32hb	77
15	PA3DLJ	JO20VW	10	1768	DH8YAL/P	JO31mo	114
16	PE1OFO	JO32DJ	13	1734	PE1IWT	JO21wt	71
17	F6CIU	JN08GE	4	1648	F6ANO	JN18JR	177
18	PE1RKM	JO32AA	11	1550	DH8YAL-P	JO31mo	83
19	PE2TV	JO32GH	12	1420	PA1DYK	JO22va	61
20	PA1AS	JO32XW	10	1352	PE1RXK	JO21wt	97
21	PE1OLR	JO21UN	8	1146	ON4DPP/P	JO20mw	83
22	PE1IWT	JO32KF	7	1070	PA1DYK	JO22va	77
23	PE1RLF	JO32CG	9	970	PE1RXK	JO21wt	56
24	M0DTS/P	IO94LI	3	944	G0ATW/P	IO93WH	130
25	F1SGO	JN18OU	3	884	F6GNJ/P	JN08WV	98
26	F1PDX	JN08XS	4	828	F9ZG/P	IN98JW	232
27	F6ESU	JN19OO	2	772	F3YX	JN18AP	136
28	PE1JMZ	JO21DU	5	690	ON4DPP/P	JO20mw	114
29	PE1AXM	JO11VM	4	650	ON4DPP/P	JO20mw	108
30	PA1EBM	JO20XW	6	498	ON4DPP/P	JO20mw	64
31	DK7UP	JO30NI	2	412	DD4PQ	JN39TT	70
32	PE9KKM	JO32DD	5	346	PA1DYK	JO22va	37
33	PA1RHQ	JO22MD	2	226	PA1DYK	JO22va	53
34	PE1ORG	JO32HJ	5	184	PE1IWT	JO32kf	25
35	PA1PAS	JO21WX	2	104	PE1RXK	JO21wt	19

13 cm

Pos	Call	Locator	QSOs	Points	Best DX	QTH	QRB
1	PA1DYK	JO22VA	19	8990	ON4DPPP/P	JO20mw	131
2	PA2RIK	JO32HB	16	6215	PA3DZA	JO31bk	77
3	PE1RXK	JO21WT	11	4265	PA1AS	JO20xw	97
4	PE1EBX	JO32BC	13	4055	DH8YAL/P	JO31mo	84
5	PA3DZA	JO31BK	7	3780	PA2RIK	JO32hb	77
6	PE1RKM	JO32AA	9	3485	DH8YAL-P	JO31mo	83
7	PE1OMB	JO21UN	7	3300	DH8YAL/P	JO31mo	92
8	PE1OFO	JO32DJ	10	2980	PA1DYK	JO22va	54
9	PE2TV	JO32GH	11	2720	PA1DYK	JO22va	61
10	PA1AS	JO20XW	9	2560	PE1RXK	JO21wt	97
11	PE1RLF	JO32CG	8	2290	PE1RXK	JO21wt	56
12	F6ANO	JN18JR	4	1735	F6GNJ/P	JN08WV	70
13	F6GNJ/P	JN08WV	4	1640	F1SGO	JN18OU	98
14	PE1GQE	JO21JN	4	1630	PA1DYK	JO22va	86
15	PA3DLJ	JO20VW	5	1535	PE1OMB	JO21un	70
16	M0DTS/P	IO94LI	1	1080	G7AVU	IO93OJ	108
17	F3YX	JN18AP	3	1010	F6ANO	JN18JR	56
18	PE1OLR	JO21UN	4	985	PA1AS	JO20xw	72
19	PE1JMZ	JO21DU	2	855	PA0AVN	JO21nj	77
20	PE9KKM	JO32DD	4	745	PA1DYK	JO22va	37
21	DK7UP	JO30NI	2	680	DD4PQ	JN39TT	70
22	F1PDX	JN08XS	3	605	F6ANO	JN18JR	61
23	PA1RHQ	JO22MD	1	530	PA1DYK	JO22va	53
24	PA1PAS	JO21WX	2	260	PE1RXK	JO21wt	19
25	PE1IWT	JO32KF	2	245	PA2RIK	JO32hb	25
26	PA1EBM	JO20XW	4	245	PA3DLJ	JO20vw	12
27=	F1CIA	IN97XW	1	140	F1DUJ	IN97XT	14
27=	F1DUJ	IN97XT	1	140	F1CIA	IN97XW	14
29	PE1ORG	JO32HJ	1	25	PA1MB	JO32hk	5

3 cm

Pos	Call	Locator	QSOs	Points	Best DX	QTH	QRB
1	PA2RIK	JO32HB	7	1955	PA1DYK	JO22va	57
2	PE1OFO	JO32DJ	6	1395	PE1RKM	JO32aa	45
3	PA1DYK	JO22VA	4	1280	PE1ACB	JO32kf	77
4	PE1EBX	JO32BC	5	1260	PE1ACB	JO32kf	53
5	F6ANO	JN18JR	3	1250	F6GNJ/P	JN08WV	70
6	F3YX	JN18AP	2	860	F6ANO	JN18JR	56
7	PE1RXK	JO21WT	4	655	PA3DZA	JO31bk	45
8	F6GNJ/P	JN08WV	2	650	F6ANO	JN18JR	70
9	PA3DZA	JO31BK	2	510	PA1AS	JO20xw	57
10	PE1RKM	JO32AA	2	495	PE1OFO	JO32dj	45
11	PA1AS	JO20XW	3	360	PA3DZA	JO31bk	57
12	F1SGO	JN18OU	1	340	F6ANO	JN18JR	34
13	PE2TV	JO32GH	2	235	PA2RIK	JO32hb	28
14	PE1IWT	JO32KF	1	125	PA2RIK	JO32hb	25
15	PA1EBM	JO20XW	2	75	PA1AS	JO20xw	5

Section 2

70 cm

Pos	Call	Locator	QSOs	Points	Best DX	QTH	QRB
1	PE2HHN	JO32KK	6	238	PA1DYK	JO22va	77

23cm

Pos	Call	Locator	QSOs	Points	Best DX	QTH	QRB
1	F1AHH	IN95QQ	3	1612	F6ANO	JN18JR	426
2	PE2HHN	JO32KK	10	634	PA1DYK	JO22va	77

13 cm

Pos	Call	Locator	QSOs	Points	Best DX	QTH	QRB
1	F1SGO	JN18OU	2	660	F6GNJ/P	JN08WV	98
1	PE2HHN	JO32KK	4	280	PA2RIK	JO32hb	25

3 cm

Pos	Call	Locator	QSOs	Points	Best DX	QTH	QRB
1	PE2HHN	JO32KK	3	185	PA2RIK	JO32hb	25

IARU Contest - Section 1

Pos	Call	Locator	70 cm	23 cm	13 cm	3 cm	Total
1	PA1DYK	JO22VA	1270	3810	8990	1280	15350
2	F6ANO	JN18JR	4202	7700	1735	1250	14887
3	F6GNJ/P	JN08WV	3953	7728	1640	650	13971
4	F9ZG/P	IN98JW	7021	6632			13653
5	F3YX	JM18AP	4221	6212	1010	860	12303
6	PA2RIK	JO32HB	535	2632	6215	1955	11337
7	PE1RXK	JO21WT	251	2554	4265	655	7725
8	PE1EBX	JO32BC	164	2072	4055	1260	7551
9	F1CIA	IN97XW	3077	4284	140		7501
10	PA3DZA	JO31BK	126	1900	3780	510	6316
11	F6IQG	JN08BM	3217	2934			6151
12	PE1OFO	JO32DJ		1734	2980	1395	6109
13	PE1RKM	JO32AA	43	1550	3485	495	5573
14	PE1OMB	JO21UN		1954	3300		5254
15	F1DUJ	IN97XT	2322	2394	140		4856
16	PE2TV	JO32GH	357	1420	2720	235	4732
17	PA1AS	JO20XW	101	1352	2560	360	4373
18	F1AHH	IN95QQ	4271				4271
19	G0ATW/P	IO93WH		3870			3870
20	PE1RLF	JO32CG	385	970	2290		3645
21	PA3DLJ	JO20VW	105	1768	1535		3408
22	F6CIU	JN08GE	1478	1648			3126
23	F6ESU	JN19OO	2318	772			3090
24	F1SGO	JN18OU	1088	884		340	2312
25	F1PDX	JNO8XS	843	828	605		2276
26	PE1OLR	JO21UN		1146	985		2131
27	M0DTS/P	IO94LI		944	1080		2024
28	PE1JMZ	JO21DU	374	690	855		1919
29	PE1IWT	JO32KF	197	1070	245	125	1637
30	PE1GQE	JO21JN			1630		1630
31	PE9KKM	JO32DD	186	346	745		1277
32	DK7UP	JO30NI		412	680		1092
33	PA1RHQ	JO22MD	183	226	530		939
34	PA1EBM	JO20XW	22	498	245	75	840
35	PE1AXM	JO11VM	51	650			701
36	PE1ORG	JO32HJ	185	184	25		394
37	PA0ZR	JO22GF	384				384
38	PA1PAS	JO21WX		104	260		364

IARU Contest - Section 2

Pos	Call	Locator	70 cm	23 cm	13 cm	3 cm	Total
1	F1AHH	IN95QQ		1612			1612
2	PE2HNN	JO32KK	238	634	280	185	1337
3	F1SGO	JN18OU			660		660

New Handheld FMTV Scanners

AOR USA have announced a new hand-held scanning FMTV receiver covering 900MHz to 2.8GHz. The AR-SV has a built-in rubber duck antenna with SMA connector and includes a 2.5" LCD screen, and has a SD card slot to which images can be captured. It has USB connectivity too, and a whole host of other features. The AOR-USA web stite is curiously silent on the new device, despite a full-page advert in the February CQ magazine. However, Unversal Radio has details on their site at:

http://www.universal-radio.com/catalog/scanners/5131.html

With a list price of $950 this may be a little rich for some people, so for 2.4GHz only there's always the Maplin "Mobile Viewer" 4-channel 2.4GHz receiver L73BJ. This may be the ticket at a little under £90. This palm-size receiver has a built-in rechargeable battery, integral antenna and a 2.5" LCD.

A bit more expensive, at £299.99, is the Maplin wireless CCTV scaner N96FN which covers 900MHz-2.7GHz and operates with both PAL and NTSC sources. Separate antennas are used for low band and high band reception, and it apears possible to attach external antennas. I have seen these in operation here and there, notably at Friedrichshaven, and I was quite impressed by the performance if not by the battery life.

Sensitivity of all these receivers seems to leave the Icom R-3 in the shade - as many people know these venerable video receivers can struggle to receive a 10mW 2.4GHz transmitter at just a few meters range.

It's nice to see that there is actually quite a lot of choice out there for video scanning enthusiasts, and it looks as though the gear may also be suitable for amateur TV reception. Has anyone got one of these beasties and would like to write a review for CQ-TV?

73, Giles Read - G1MFG

BATC Publications and Members Services

Publications	Each	Qty	Total
An Introduction To Amateur Television (225gm) 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 BATC handbook featuring construction articles on video units, 24cm and 3cm ATV, a Digital Frame Store, and much more.	£2.50	.....	.....
The Best of CQ-TV (150gm) A compilation of the best construction articles from CQ-TV's 133 to 146	£3.50	.....	.....
CQ-TV Back Issues: The following issues are still available. Please circle those required: 185, 186, 187, 188,189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210,211,212,213,214,215,216,217,218,219,220	£1.50	.....	.....
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All items appearing in Members Services from previous editions, can still be ordered (subject to availability). Please see page four for contact details. Several items are still on sale, so please check for the latest pricing before sending a cheque.

Letters to the Editor

Dear Sir,

I would like to reply to Eugenio Muratore's email asking about a 15625Hz generator.

I don't know where he saw it but as an exercise it was straight forward:

To simplify the problem he has a 74HC4060A, a 10MHz crystal, and wants to know how to obtain 15625Hz.

Quick answer is a 2 input AND gate 74HC08. The two inputs of one gate are connected to pins 14 and 15 of the 74HC4060A, and the output connected to pin 12. The gate output is a spike repeated 15625 times a second.

The working out: It is best to convert the two frequencies into their time equivalent so 10MHz becomes 0.1µS, and 15625Hz becomes 64µS. This means an output is needed every 640 clock pulses. 74HC4060 is a 14 stage binary counter with outputs labelled Q0 to Q13. Not all outputs are available. Converting 640 into binary gives us 10 1000 0000 (or 280 in hex). The binary number shows we need to detect the 8th and 10th stage outputs corresponding to Q7 and Q9. A two input AND gate connected to these outputs will give an output at 640 pulses which will reset the counter. This AND gate output can then be used to clock other counters to give 50Hz for vertical sync.

Hope this is of help.
Mick G6NAD

Hi Chris,

I was pleasantly surprised to see my picture in the magazine from fifty years ago! I had somewhat more hair in those days.

You may like to know a few details about this epic on 'Panorama'.

It all came about after the Cambridge Group attended a BATC Convention in Red Lion Square, London, and some BBC types invited us to appear on the program.

There were three of us on the show, David Neech (driver), Mike Soames (inside twiddling the knobs) and myself up on the roof with the camera. The camera was largely built by another Pye Apprentice, John Jull, who now lives in Tasmania. But several other fellow Apprentices had a hand in it. Mike and myself worked in the Industrial TV Lab under Ian Waters, G3KKD.

The camera cost us all of 1/3d to make and that was to buy a ball catch from Woolworths to hold the lens turret mechanism in place for each lens. The rest of the gear was built from scrap and surplus parts liberated from the Pye factory. The pick-up tube was a 'Spoticon' - a reject Staticon from Cathodeon but the blemishes on it were negligible.

In the picture I am shown adjusting the lens turret. It may seem strange to be doing so inside the camera but actually there was a long rod from front to back with a coupling in the middle and I was tightening that. You can just make out a three-pronged handle at the rear which rotated the three-lens turret. There is a tale as to how we acquired this unusual handle. It was off a sink tap we saw one day while at the Dagenham Town Town the year before. Just the thing we thought and it was rapidly unscrewed leaving a jet of water spouting in the air!

In 1958, we took Matilda II to the Dagenham Town Show, complete with camera gear and petrol-electric generator on the running board, and participated with the Chelmsford BATC Group in a TV play put on by the Valence Theatre Group. I was the cameraman and it went quite well. The pictures were sent to a bank of monitors for all to view ‹ there were no video recorders in those days.

In 1957, Matilda I took part in the BATC event at the Dagenham Town Show. There were five amateur TV cameras (Jeremy Royle had one and Ivan Howard, G2DUS, I believe) and the Outside Broadcast Unit (Matilda I) all hooked together on twelve receivers for the public to see in a large marquee. It was the largest such event that had been done by amateurs to that time. Mike Barlow was there and Ian Waters had his Photicon camera too. David Neech was stuck up the aerial mast tracking Matilda as it ran around the district.

The weekend was marred slightly by Mike Soames who drove Matilda into a Morris Minor. The driver, a Vicar, got out, examined what remained of the flattened boot and then looked at Matilda in disbelief for there was not a mark on it due to the springy front bumper. The brakes were almost totally useless and it frequently took two people to stop Matilda, the driver standing on the brake pedal while the passenger heaved on the handbrake. Mind you, it had four separate horns, including a very raucous klaxon (modified to get two types of noise) so that liberal doses of these usually obviated the necessity for hard braking. No doubt the sight of Matilda bearing down on one was rather daunting, for most cars seemed to magically get out of the way.

The Dagenham Town Show became an annual event for the BATC and Matilda was taken again in 1959. Alas, in 1960, Matilda was no more and I was in the RAF doing National Service.

Matilda II ended its days as scrap at the end of 1959 when it was vandalised on the car park at Pye¹s. The lads had just got round to boring out the engine and fixing the head gasket problems by shaving the head. It had just been put back together prior to taking it out on the road again when somebody slashed all the tyres, stole the battery and smashed all the windows and instruments. It was simply not worth trying to repair it all so we had it towed away for scrap.

Panorama

Matilda II was taken to the Fourth BATC Convention in the Conway hall, Red Lion Square, London, on September 6 1958, and roamed up and down

the streets sending mobile television pictures back to the show. The BBC saw it and invited the Cambridge group to take it to their TV studios a week or two later to appear on ŒPanorama¹, in the first of a new series of that magazine/ current affairs program.

It was decided that David Neech would be the driver, Mike Soames the inside controller and I would be the camera man up on top. So we set out from Cambridge early on Monday, September 22 1958 for London. We got as far as Trumpington Street near the Backs when smoke came from under the dashboard the wiring had set alight. We switched off the battery, loosened the wires and carried on without the battery.

Arriving at Lime Grove Studios in Shepherds Bush about lunchtime, we were told to completely empty the petrol tank for safety reasons and the taxicab was pushed into the freight elevator, taken up to the top floor and into Studio-D. There, the BBC staff provided colour-coded coaxial cables with Syncs, etc., and connected the camera output back to their system. Later on, we were taken on a short tour of the new TV Centre under construction at White City, just up the road and alongside the ex-Olympic Stadium. This was where I was to later spend several years working for the BBC as an Engineer.

We went to meet Richard Dimbleby in his dressing room for lunch and rehearsals were held for the performance that evening. He was not a bit like his widely-held image of pomposity and was very friendly and interesting. He asked some intelligent questions until he found out what he wanted and then wrote out a little reminder note (of names and things) which he attached to Matilda¹s window frame out of camera shot.
On the show, he interviewed David and Mike while I, being out of the way up on the roof operating the camera, was largely ignored. I was wearing BBC headphones so that they could direct the aim for camera angles. The pictures from the Staticon camera were better than the BBC had expected so the lighting was deliberately reduced so that they would not seem to be as good as those from the BBC¹s old CPS Emitron cameras. Altogether, we had a six-minute live spot (no video recording in those days) of which 2 1/2 minutes was film from the recent BATC Convention. During the film, the camera was brought down from the roof to floor level and used to finish off the program with Richard Dimbleby in close up. We were each paid 15 guineas (£15/15/d) - wealth indeed to us impoverished apprentices.

A 16mm teleciné film of the Panorama episode was made by the BATC group at Marconi¹s in Chelmsford and is in the archives of the BATC somewhere. I would dearly like a copy on DVD if it can be found. Bob Moore at Pye¹s made an audio tape recording (I have a copy) and several people took photographs off their receivers. The episode was reported in the papers as being the brightest spot in an otherwise dull program.

The Post Office later contacted Mike Soames to explain to them how it was we managed to transmit under the G8PY/T call sign when not licensed to do so!

He managed to explain it all away as artistic licence for the purposes of the program. John Jull, as the builder of the camera, should have been on the trip but had not long since been called up into the army for National Service. He apparently saw the show in his local NAAFI.

After the BBC event, Matilda II sported a new sign ‹ ŒAs Shown on BBC Panorama¹.

Incidentally, I later became a BBC Engineer in the Planning & Installation Department and it turned out that my boss, Jack Wacey, had been a studio engineer on that very program! Many years later, after working for EMI on colour cameras and special effects, I emigrated to Canada. Who should I meet there but Mike Barlow, the founder of the BATC, who worked for the CBC in Montreal. At that time I ran my own company making audio-video routing switchers and would also see Ian Waters and friends from Marconi's from time to time at the NAB shows in Las Vegas. Nowadays, in 'retirement', I have nothing to do with television gear but design electronic control systems for church organs.

Keep up the good work with the magazine, Mike Barlow would be proud to see how his society and the magazine has developed over the years. I joined the BATC in 1954 when I went to work at Marconi's during summer holidays from college and met Mike Barlow, Don Reid, and other BATC types in the Transmitter Department there. I was fascinated by what they were doing and joined up on the spot. I later built my own TV camera.

Arthur Critchley
organawc@sympatico.ca

Dear Sir,

I am not sure if this is a letter to the editor or a more general plea for help. Here goes:

When I was a student I was set on a path into BBC engineering. Along the way I spent several months at Southern Television. This must have been late fifties, early sixties. I remember talking with a staff designer called Gregg Dyke and I remember missing the Beatles visit. Now for the technical stuff.

I got used to composite waveforms in camera control and master control. What is the equivalent in digital steams? Is it all kept analogue till transmission? It seems to make sense to go digital as soon as possible as with camcorders.

Do people still measure and possibly adjust sync pulses, front porch etc.?

I seem to remember that film had a 10 second run up presumably for genlock. The old ampex VT machines had 40 seconds although they would do it in less. Am I right in thinking that most programmes come from hard disc now? How much run up do they need for a synced input?

How do you assess colour bars in digital streams?

You will have realised that I was a black and white man. Colour was unknown until I saw a test transmission at the GEC Research Centre in the early sixties.

Stephen Harris,
recently returned member and once G3OAI/T

The Amateur Television Network EchoLink Talkback

by Don Hill KE6BXT
(ATN-CA President)

The Amateur Television Network (ATN) in California is using EchoLink to allow Internet viewers a way to "talk back" to the friendly faces that they see on the Amateur Television Network's linked ATV repeaters.

The ATN has been streaming video from one or more of its Amateur Television repeaters for several years now. This allowed its members to view the repeater activity when out of the local area (such as when members went to the Dayton Hamfest). They could then "check into" the net by using a cell phone and calling one of the members in Southern California and then having them relay their message over the ATV repeater system. Now with the ATN-EchoLink interface they have a talk back channel without having to use the phone.

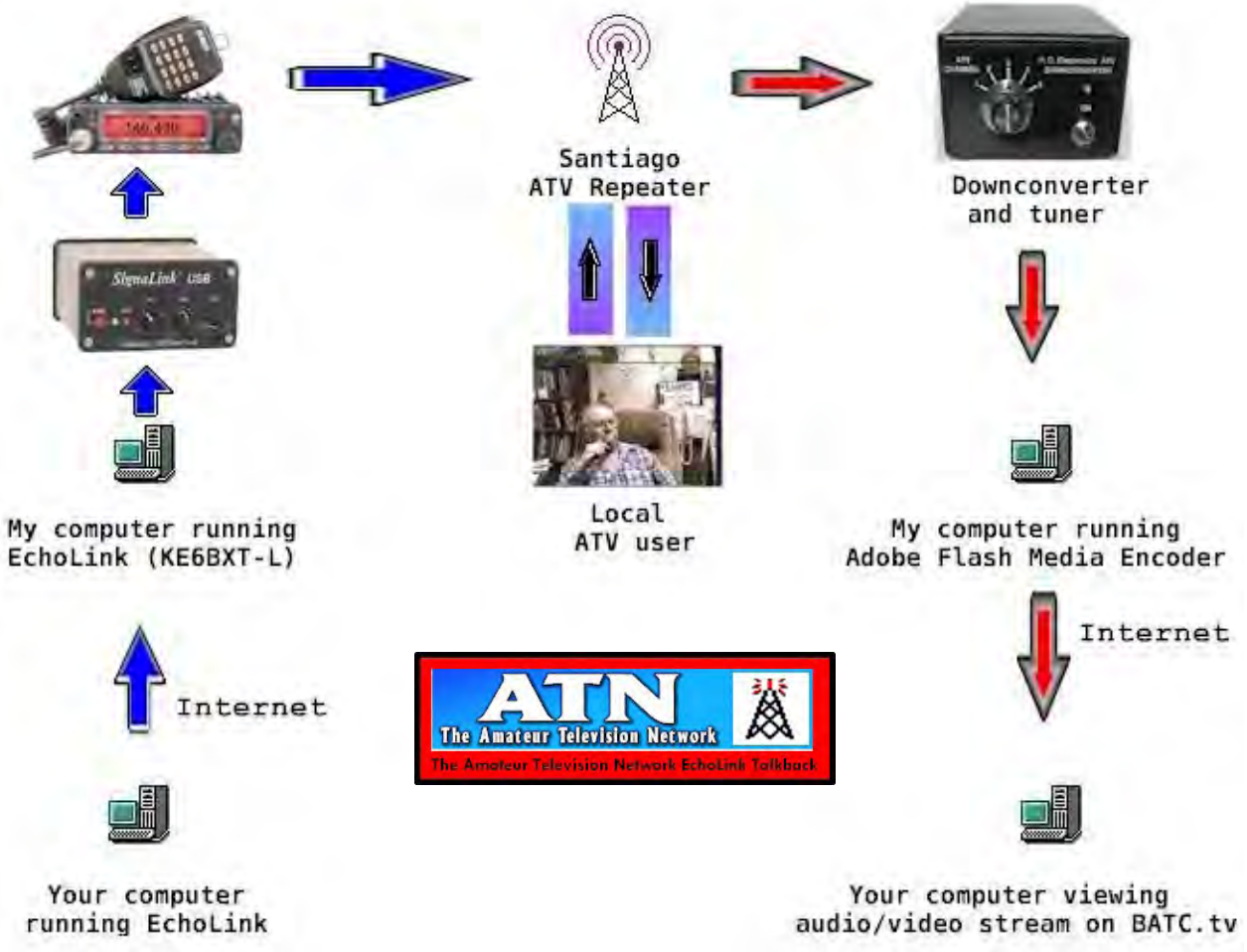
The ATN-EchoLink interface is used in conjunction with the ATN-BATC streaming video from the Santiago Pk. repeater in Southern California. You can access the streaming video by going to:
http://www.batc.tv/ch_live.php?ch=5&id=78

If you are new to EchoLink you will need to visit the EchoLink website at http://echolink.org and sign up for an EchoLink account before you can use the system. You will need to download the FREE software to run on your computer and VALIDATE your callsign by one of several ways explained on their web site.

Without going into how the Amateur Televisions Network's ATV repeaters are linked, let me briefly explain how the streaming video and EchoLink interface expand the capabilities and reach of the W6ATN ATV repeater located on Santiago Peak

The Santiago Peak repeater is the hub of several linked repeaters. This means that in addition to the ATV input and ATV output links it also has ATV inputs and outputs that are used for linking to the other ATV repeaters within line of sight. It also has a simplex audio receive on 146.430 MHz that is repeated out onto the ATV audio carrier. This is the link used by the EchoLink interface to get audio from the EchoLink system onto the ATV audio coming from the ATV repeater.

Here is a simplified block diagram of how the EchoLink and Streaming video interfaces works.



ATN-EchoLink block diagram. Note: There is a 15-25 sec delay in the red arrow loop.

Because any good HAM always listens (and in the case of Amateur Television watches) the output of a repeater before transmitting, I'll explain the video streaming side of the interface first.

The output from the ATV repeater is received and downconverted. The downconverted signal is then passed to a TV tuner and the resulting audio and video signals are sent to a computer running Adobe Flash Media Encoder software. The computer then streams the audio and video to the British Amateur Television Club's server where it is available for viewing by anyone with a computer and Internet browser. The British Amateur Television Club's streaming video website is at:

http://www.batc.tv

Click on "Members Streams", find KE6BXT in the list and click on "View Stream". At this point you should be able to see and hear the ATVers using the repeater or check for activity before connecting to the EchoLink interface.

One of the characteristics of Internet streaming of video is that there can be (sometimes substantial) delays as a result of analog to digital encoding of the packets, transmission time over the Internet, and subsequent digital to analog conversion on the receive end. Because of this you need to keep in mind that what you see is not what is happening on the repeater NOW but what was on the repeater some seconds ago. This can be confusing for both the local ATVers that have to wait for an Internet viewer to respond and to the internet viewer that does not want to start talking too soon. With this system the EchoLink user may actually hear two audio streams. The first audio stream will have very little delay from real time but will be out of phase (early) from the video being received. This audio stream is coming over the EchoLink interface. The second audio steam will be delayed up to 15-20 seconds from real time but will be in sync with the video. This audio stream is coming over the BATC video stream. If it is possible to mute the delayed audio on your computer and listen to the EchoLink audio you will have a much more enjoyable QSO. Another way would be to run two computers, one to monitor the BATC video/audio/chat and the other to talk and listen over EchoLink.

Assuming you have your EchoLink software loaded and running on your computer you are ready to connect and enter the QSO. This is how you would do that.

Within the EchoLink software program you would connect to the KE6BXT-L (subject to change) node. Upon connecting, the EchoLink program will send a signal to the SignalLink USB interface box. The SignalLink acts as an additional sound card for the computer and is the interface between the computer and the radio for mic and push-to-talk functions on the radio. When the EchoLink user goes into TX mode, the SignalLink keys up the 2m radio and puts the EchoLink audio on-the-air.

Lessons learned:

When we first set up the EchoLink interface we made two assumptions that later proved to be incorrect. We originally thought that 1) only people that were watching one of our streams would try and talk back using EchoLink, and 2) all of our members and guest that use our ATV repeaters on a daily basis would welcome hearing from and talking to other HAMS that were watching them over one of the internet streams. Oops!!! Wrong on both assumptions. We had hams that would go down the list of available stations or links in the EchoLink directory and make calls in the blind without knowing if the repeater was in use and this led to complaints by those who were talked over. All very understandable. (Nobody enjoys having their QSO interrupted by the "K6xxx CONNECTED beep!", 'HELLO, IS ANYBODY THERE? HELLO, HELLO", and then "K6xxx DISCONNECTED beep!" messages)

Fortunately, EchoLink provides the means to either block specific callsign from connecting or only allowing approved callsigns to connect. The ATN opted to go for only allowing callsigns that have been approved to connect. It is fairly easy to get your callsign added to the approved list and even easier to have it removed.

You can request that your callisgn be added to the list of callsigns that can use the ATN-EchoLink interface by visiting the ATN Echolink page at:

http://atn-tv.org/echolink

Once approved you will be able to conduct two way QSOs with the ATVers on the repeater. To be removed from the Approved List you can simply visit the same site and request that you callsign be removed. Another way to have your callsign removed is to have an ATN member raise a legitimate complaint about your conduct or language when using the EchoLink interface.

I would like to thank W7TED, KD6ILO, K8JWT, WB9KMO, and others that helped with testing the system and helped work out some of the initial bugs.

We look forward to hearing from you over Amateur Television Network EchoLink Talkback interface.

73s,
Don Hill (KE6BXT)
ATN-CA President

Disclaimer:

We would like to make it clear that the Amateur Television Network is first and foremost an Amateur Television organization and the video/audio streaming (and now EchoLink VoIP) that we provide is intended to enhance the enjoyment of Amateur Television for both those new to Amateur Television and those that have been doing Amateur Television for many years. We are NOT an EchoLink node repeater that just happens to have an Amateur Television repeater attached to it.

Thanks for the memorabilia

Dicky Howett looks at a few of his tv toys.

These days, my weighty tv equipment collection is complimented by a somewhat smaller assembly of tv toys, knick-knacks and various items of broadcast memorabilia. This assemblage is snugly housed at the corner of my dining room (see back cover, photo one) in an illuminated and adapted display case (Edwardian actually). Although I have several items of steam radio provenance, generally, my collection reflects aspects of past television programming and promotion. As is apparent, this small scale 'television' collecting is by far the easiest to accomplish and indeed store.

Currently, the better available old 'collectable' television memorabilia can be found, typically at boot fairs, on ebay or at charity shops. These items usually are commemorative mugs or boxed series issued by toy makers, Lledo and Matchbox. Themes covered consist of '40 years of ITV' , '35 years of Coronation Street' or 'Heartbeat Memories' with classic vehicles- cars, buses or vans - emblazoned with the appropriate logos.

Of better quality and probably now not found at boot sales or Oxfam shops is the famous Dinky range of green 'tv vans' (see back cover, photo three). I have three of these BBC ob vehicles; the Eagle Tower, an MCR and the famous Roving Eye, complete in all instances but without the all-important (to a collector) boxes. Boxes will double the price (although reproductions are available) and double that price again if you happen to find a reasonable condition boxed blue 'ABC Television' control van complete with camera, cable, cameraman and Debrie pedestal. (Current ebay 'Buy It Now' price £195).

Other 'scanners' can be found, some from Japanese toy maker Gragstan Asahtoy, who in the 1950s produced a friction-drive NBC 'Remote' tin truck, (ebay price £60) with two orthicon-looking cameras ('WNBT WRCA'- these cameras are sometimes missing) and a charming misspelling of the word 'Television' (see back cover, photo four). This toy van was sold also in red livery but with a correction to the erroneous 'Televition' spelling. Ah so. Later, Corgi cheapened the entire BBC fleet with a tatty 'BBC' Escort van.

Smokers of the world unite, especially during the 1950s when US TV Station, KXLY-TV (CBS Spokane) commissioned a novelty ashtray with the company ident. The camera depicted on the tray (see photo below) is a freelance example of an RCA TK 30A image orthicon camera with only two lenses. Lately, I've noticed that these ashtrays continued to appear with several different station call signs,

proving that the template was capable of slight variations on a theme. Same old goggle-eyed camera though.
Much rarer, although not impossible to find, are the 'one off' souvenirs, produced 'in house' for a specific tv or radio occasion. To find these items, one has either to await patiently for ebay to list, or scour 'junk' shops or be in at the actual event commemorated.

During 1994, BBC Television celebrated 40 years of its tv news service. At the time, I was a member of the Alexandra Television Trust (also ex-BBC staff) and as the original television news studio was at AP (studio B) I, along with the other Trustees, was invited to attend a buffet at AP. Gathered were many staff members past and present including several famous news 'faces', Richard Baker, Robert Dougall, Angela Rippon and the ill-fated Jill Dando. At the conclusion, we were all dished with

commemoration paperweights in nice blue boxes. (I found a spare lying about but this has since been 'collected'.)
Another 'one off' in my collection is a small tea plate, with, printed on the back the words 'designed by Wedgwood for the BBC on the occasion of the opening of Broadcasting Centre by Her Royal Highness The Princess Anne November 10,1971'. Although of doubtful syntax, this inscription refers to the erstwhile BBC radio and television studios (no longer with us), at Pebble Mill, near Birmingham. Perhaps in the not too distant future, some enterprising manufacturer should consider 'studio demolition' commemoration plates? The old Southern TV Studios in Southampton would be a good trial run, with possibly the BBC Television Centre not far behind?

One of the very rarest items in my collection is a beautiful 'scale' model in brushed brass. This model depicts a Vinten HP419 (Mk1) pedestal. The

'BBC tv' camera on top is an amalgam of mostly a CPS Emitron Mk3 with a little bit slapped on the front , possibly of a Marconi Mk III. This exquisite model is attached to a circular polished wooden base, with space for a 'commemoration' plaque of some kind. As an indication to the quality of this model, all the lenses unscrew, as do the pedestal 'domes', the 'tiller' and even the pan handle! A totally unnecessary refinement, but wonderful quality all the same. Hours of fun twiddling (see back cover, photo two).

Barney Colehan with the Top Town Trophy,

Incidentally, over the years, other tv companies made their own presentation model cameras. I've seen a Link 125 (made of wood!), a Marconi Mk VIII, and, of course, ATV had the 'Seeing Sport' trophy with its racy Pye Mk3. The BBC programme 'Top Town' had a Marconi Mk III on a Debrie pedestal. Who was the final 'Top Town' winning team and did they get to keep the trophy? Further investigations might uncover the whereabouts of all these model awards, but as yet, I've had no success.

Although not definitive, I've traced something of the 'history' of my model CPS Emitron and Vinten pedestal. I gather it was found originally in an antiques shop in Kent (possibly Ramsgate) and bought for £75. I acquired it later (from the original purchaser) but for considerably more money! My information to date suggests it was 'made' for presentation purposes during the 1960s in the workshops of BBC Television Centre by a Polish-born employee. Three of these models were constructed. One was given to a retiring BBC executive, one to an Australian jockey, George Moore, who was voted BBC Sportsview 'International Sports Personality 1967'

and the third model, I own. There are no identifying marks on my model camera or the wooden base. However, there is a very small shallow scratch on one side of the camera which probably explains why it was never used as a presentation object, but held back perhaps as a template, used as an exhibition spare or 'taken home for safe keeping'. Eventually, the award found its way to Kent. More than that, details are not known and likely never will be. Perhaps a future edition of the Antiques Road Show might prove enlightening. Until then, if anyone knows better…?

Turning back the pages

A dip into the archives of CQ-TV, looking at the issue of 50 years ago.

CQ-TV 39 - “Spring 1959”

The magazine carried details of a new service available to members - a feature of the time - whereby cathode ray tubes could be supplied rebuilt with new a electron guns for a charge of £4/15/0d to £6/15/0d, depending on the size. A discount was given if a corresponding old tube glass was handed in. For the same price as a rebuilt tube less the discount, new heaters and cathodes could be fitted to a member’s existing tube.

There was an article on ‘Fundamentals’ by Don Reid, covering the gain and bandwidth properties for video and pulse amplifiers, and a discussion on the advantages of interlacing the scanning for sequential colour work, by Arthur Critchley. The major technical article, however (occupying half of the inside pages of the magazine) was Mike Barlow’s article on Microvave Links.

At that time, amateur TV transmitters were normally thought of in terms in of 430 MHz equipment, being the lowest assigned frequency band for TV and at that frequency more or less conventional valves and techniques could give useful results. However there were occasions when the use of 430MHz was not easy to achieve - maybe the frequency was already occupied, or only a short line of sight path was needed if there were only 2 amateurs in the town, or even “where authority frowns on TV activity the possibilities of microwave operation for undercover activity should not be overlooked!”
The amateur bands available in the UK were the 13, 6 and 3 cm bands roughly (readers were advised to check with their local authorities for precise limits). Microwave components were expensive to buy new, so Government surplus equipment could be modified to suit. It was suggested that surplus klystrons such as the CV67 or the 723A/B (for 10cm or 3cm work, respectively) would be easier to use than disc seal triodes like the DET22. Both were reflex klystrons in which the electron beam is passed through a cavity, reflected back through it again and finally collected by the anode. The power output is only a few milliwatts, but was adequate for amateur purposes. Modulation could be applied to the reflector very easily, giving AM or FM or (usually) both.

Mike then went on to consider the design of a 13cm link using CV67 klystrons. It was suggested that a two way link could be made simply - as a klystron would be needed at each end anyway - by offsetting the two carriers by the desired IF frequency. As a very wideband IF was required for FM, it was suggested that the amateurs use AM at that time. The specification was to have a 2.5 MHz video bandwidth (for 405 line tv), using the klystrons, and reasonably sized aerials to get a range of 2 miles in the open, and having an RF head capable of being tied to a mast etc. The RF head should be showerproof for use in the open air at exhibitions etc.

As explained above, the operating frequencies of the klystrons were separated by the IF frequency so that only the one klystron was needed at each end for a two-way link (Figure 1). For convenience, a double aerial system was used. It was thought that the finite leak of RF from the transmitting aerial to the receiving aerial might be enough to give the right amount of “local oscillator” injection to the crystal mixer.

A Band 1 IF could be used as it enabled a reasonable separation of frequencies to

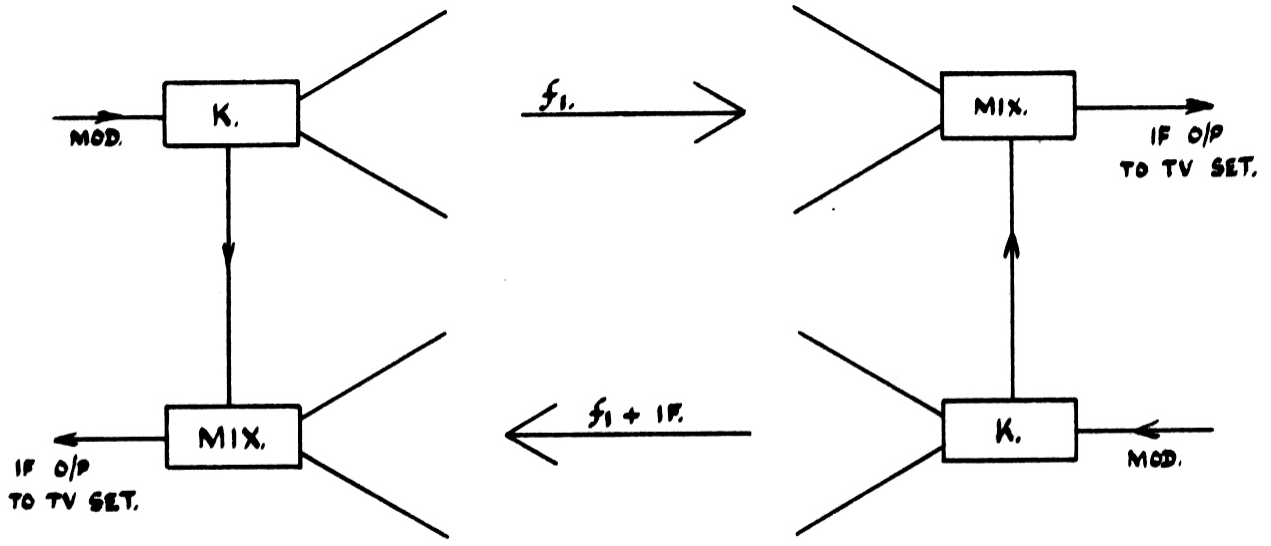


Fig. 1: Frequency separation of terminals

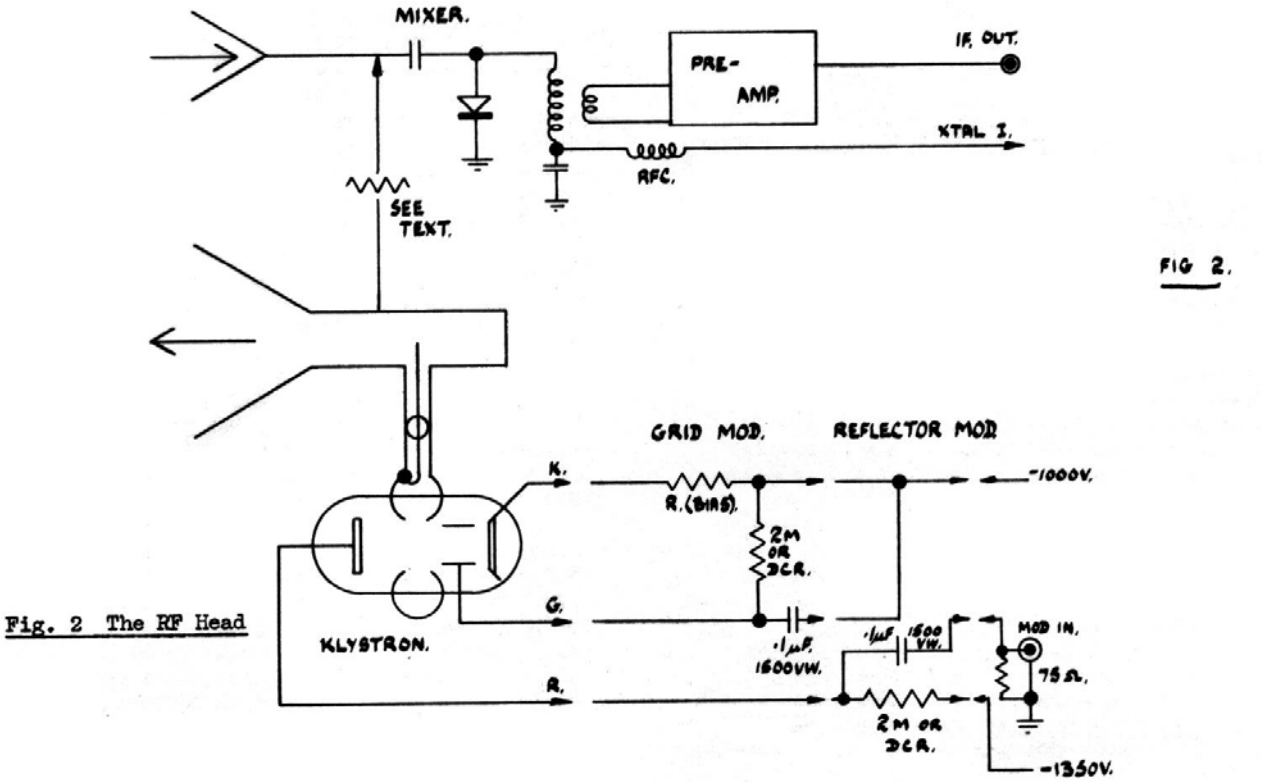


FIG 2.

Fig. 2 The RF Head

be obtained without an excessive noise level, or a (then) standard tv IF of 35MHz could be used, by-passing the tuner in a tv set. Automatic frequency control (AFC) was advised for at least one end of the link for reliable, unattended operation. The RF head (Figure 2) would consist of the two aerials, mixer, oscillator, IF pre-amplifier and possibly the modulator. For weight reasons, the power supply was kept separate. The mixer used a standard crystal diode such as the CS2A designed for microwave mixers, mounted in a simple cavity. The cable joining the RF head to psu had to contain: two 75 ohm co-ax for modulation input and IF output; ii earth (possibly utilising the screens of the co-ax); iii. klystron cathode supply (-l000V at 50mA max); iv. klystron reflector supply (-1350V at lmA); v 230V ac for a heater transformer - or 6.3 and 4V; vi. HT+ for the cascode pre-amp; vii. supplies needed by modulator.

The control section contained the fine tuning (reflector volts) and video input gain controls. A meter was provided to measure crystal mixer current, to monitor correct operation of the klystron. The power supply was straightforward, with simple regulation. As most of the electronics in the RF head was highly negative to ground, coupling capacitors of l500 volt rating were necessary.

The aerial consisted of two horns made of expanded aluminium fed from a short length of 4" x 2" home-made waveguide shorted at an odd number of quarter wavelengths from the aerial. The klystron output probe was through one of the broad sides, whilst a crystal diode was fitted in the receiver part, with a matching screw either a quarter wavelength behind or in front of the crystal. Details were given in several diagrams, some of which are included here - which are still of help with modern devices at these frequencies.

The remaining pages also included the usual 'What the other chap is doing' page - including reports from Jim Bramhill in Uxbridge building a 16/9.5mm telecine unit, Mike Bues near Epsom building a flying spot scanner, and John Ware in Chelsea a colour set using a tri-gun tube (relatively rare at the time) and Puff Plowman, working on slow scan facsimile. Other reports came from Indiana, Belgrade and France.

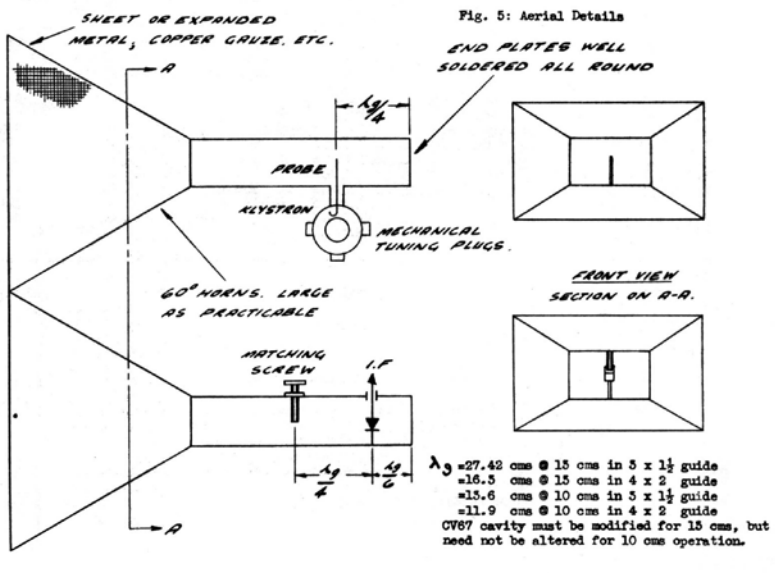
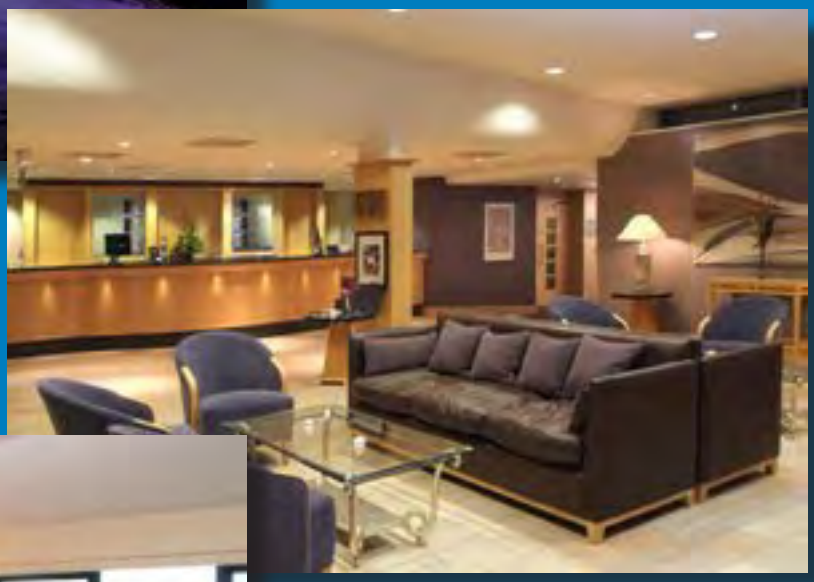
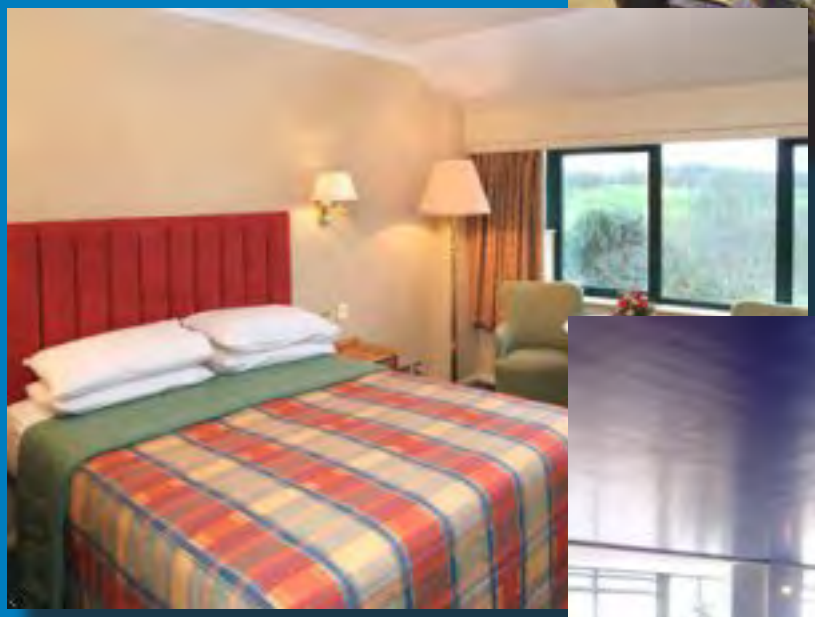


Fig. 5: Aerial Details

Hellidon Lakes Hotel





See page 35 for article relating to these photo's

Left: Photo one

Below: Photo two

Above: Photo four

Left: Photo three