



**South East Queensland ATV Group Inc.**



446.5Mhz DVB-T

*As part of the ATV Digital Network*

*PO Box 3,  
Chermside 4032*

Box 3,  
inside 4032

# ***CQ-DATV7 Production Team***

- *Ian Pawson - G8IQU*
  - *John Hudson - G3RFL*
  - *Mike Stevens - G7GTN*
  - *Ken Konechy - W6HHC*
  - *Paul Wade - W1GHZ*
  - *John Lukey - VK2ZUH*
  - *Clive Reynolds G3GJA / G8EQZ*
  - *Richard Carden - VK4XRL*
  - *Trevor Brown - G8CJS*
  - *Mike Cox*
  - *Mike Berry - G1LWX*
  - *Klaus Kramer - DL4KCK*
-

# DATV News

*The last of the VHF and UHF analog television were switch off here on Sunday 1 of December at 2am. The digital switch over has been a major problem for DATV here in New Zealand. This has came about due to the fact that we have lost the 70cm band for ATV usage and ended up with a 50cm band at 614 to 622MHz. As you can tell it's falls in to the frequency block that is used for digital TV services. As of yet we have not been provided with replacement spectrum. All that ZL Amateurs have got out of this is access to 50 to 51MHz the lower end of 6 metres.*

*I have been involved with ATV here in Auckland for 20 years now and in that time we have lost a large amount of spectrum manly affecting ATV usage.*

*Ham bands lost:*

- 420 to 430MHz
- 440 to 450MHz
- 614 to 622MHz
- 2.3 to 2.396GHz
- 3.41 to 3.5GHz

*This why I have been pushing for common band plans and spectrum usage world wide. To try to minimise these ongoing problems, there could be other countries where there is alack of usable spectrum for ATV / DATV.*

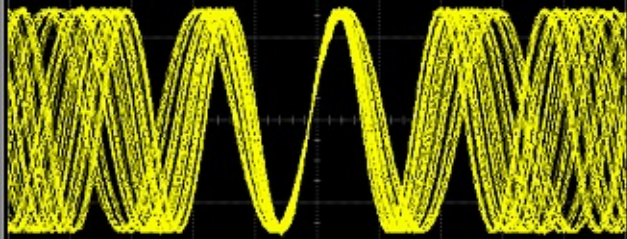
*In short digital switch over has gone badly for ATV in ZL.*

**Grant ZL1WTT**

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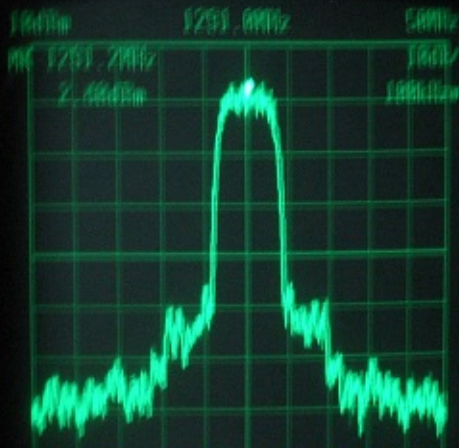
*The SEQATV Group has gone through some significant changes in the last 6-9 months.*

# *South East Queensland ATV Group Inc.*



**23cm FM ATV**

**23cm DATV**



**446.5Mhz DVB-T**

VK4RMG  
*Incorporating*  
Digital ATV Repeater

**VK4RMG**

**VK4RTW**

**VK4RGO**

*As part of the ATV Digital Network*

**PO Box 3,  
Chermside 4032**

The Club now owns a digital ATV repeater with FM 1283MHz, 2415MHz and 1287MHz DVB-ST, streaming to [www.batc.tv](http://www.batc.tv)

*Peter, VK4EA, is evaluating the DTX1, but unfortunately the symbol rate is not configurable enough to suit the VK4RMG digital receiver.*

*Trying to get the batc to revise the firmware, more on their website <http://www.seqatv.org/>*

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## **New logo**



*The BATC has designed and implemented a new logo to harmonise all its various outlets.*

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## **OFCOM**

**O***FCOM has recently issued five new NoVs for ATV UK repeaters. This is very welcome news because, due to the wide bandwidth used, amateur television relies more on repeaters than do other forms of communication.*

*The new repeaters are:-*

- GB3SQ - Bournemouth, Dorset (23cm)
- GB3BA - Basingstoke, Hants (9cm)
- GB3BH - Bushy, NW London (adds 9cm TX)
- GB3KM - Spennymoor, Co Durham (adds 9cm TX)
- GB3FY - Fleetwood, Lancs (adds 3cm TX)

*The repeaters will use digital transmission mode DVB-S. This is the same mode as commercial satellites use and therefore relatively low cost satellite receivers can be used to receive them.*

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## **Book your place at the final Centenary event**

*There is still time to book your free place (<http://rs.gb.org/main/about-us/rs.gb-centenary-2013/ietrs.gb-joint-meeting/>) at the final, national, RSGB Centenary event. A meeting will be held at Imperial College, London, in the Huxley Building, between 6.30pm and 9pm on 5 December. The meeting is open to all and attendance is free, including refreshments. The meeting will comprise two lectures on amateur radio technology. If you are unable to attend the meeting, the proceedings are being streamed live on the internet thanks to the BATC. No registration is required to watch the video, go to [www.batc.tv/streams/rs.gbiet](http://www.batc.tv/streams/rs.gbiet). Our thanks to BATC for making this possible.*

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## **More from OFCOM**

*Last month OFCOM issued their Amateur Licence Review Pre-consultation discussion. The full details can be seen at [http://licensing.ofcom.org.uk/binaries/spectrum/amateur-radio/licensing-updates/Amateur\\_Radio\\_Licence\\_Review.pdf](http://licensing.ofcom.org.uk/binaries/spectrum/amateur-radio/licensing-updates/Amateur_Radio_Licence_Review.pdf)*

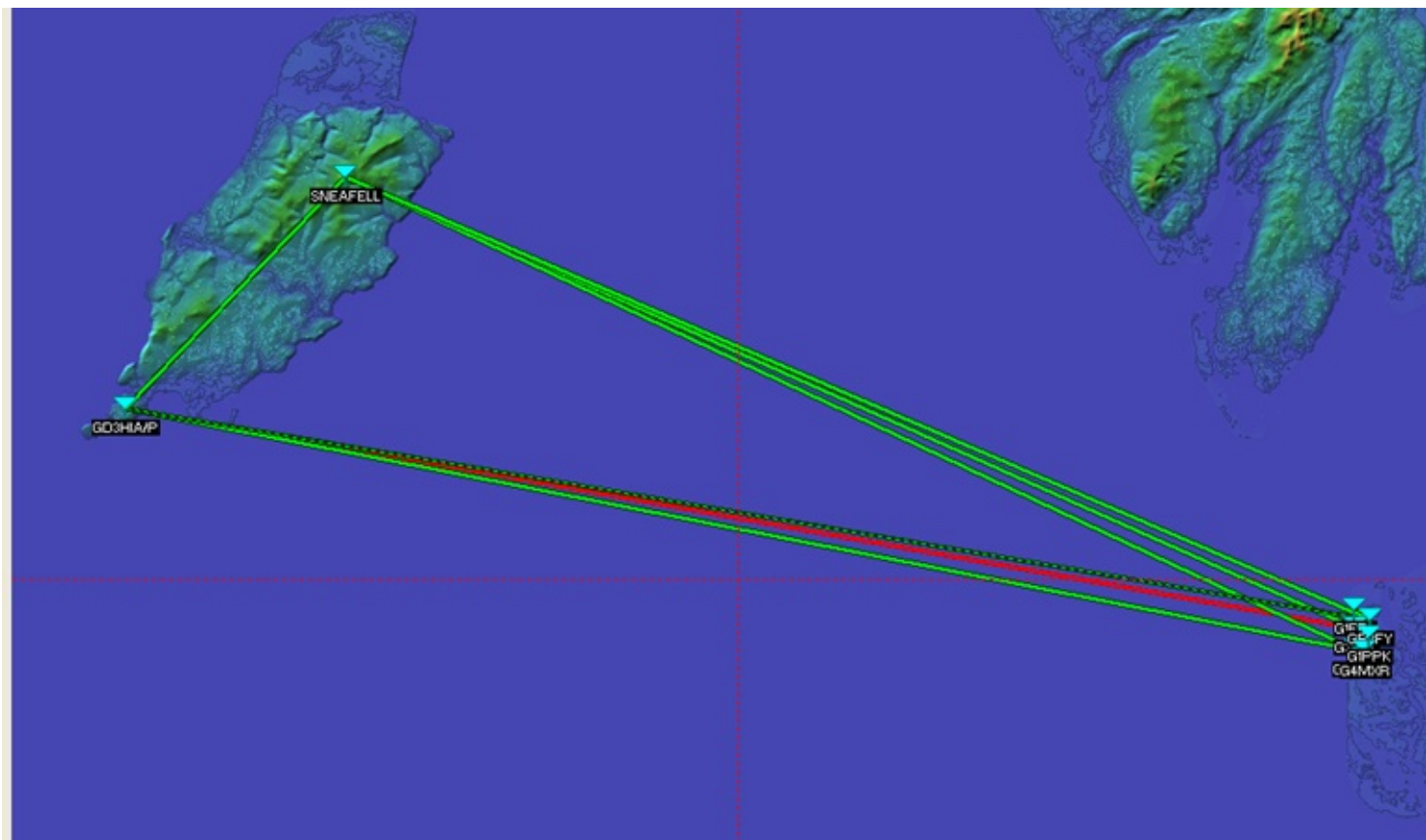
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*Well Phil GD1HIA is an old dab hand at ATV, he used to live in Horfield (North Bristol) and used to regularly work John G3RFL in Clevedon, Somerset.*



*Now John lives in Cleveleys and Phil has moved to the I.O.M, but they hope to work when Phil goes portable*

*with his newly commissioned ATV Van. And also the whole thing pumps up too, with a rotator on it.*



*Notice the Dish will it be possible to get into GB3FY when John gets it up and running ?*



***PHIL GD1HIA***



***SHACK scene is in an IRISH ATV shack receiving PHIL direct on the I.O.M a few years back (using***

## **Ofcom spend 1.8 million on Ham Radio**

**O**fcom claim to have spent £1.872 million on amateur radio in 2011/12.

*On Wednesday, following a stakeholder request, they released an addendum to the consultation on setting cost based fees for spectrum licences. It provides a breakdown of Ofcom's spectrum management costs and invoiced fees by Wireless Telegraphy Act licence class.*

*Read the addendum at*

*[http://stakeholders.ofcom.org.uk/binaries/consultations/cbfframework/summary/CBF\\_Addendum\\_to\\_Consulta](http://stakeholders.ofcom.org.uk/binaries/consultations/cbfframework/summary/CBF_Addendum_to_Consulta)*

*Spectrum Pricing: A framework for setting cost based fees consultation*

*<http://stakeholders.ofcom.org.uk/consultations/cbfframework/>*

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## **BBC TV visit FUNcube station at RSGB National Radio Centre**

**O**n Friday, November 22 a film crew from the BBC Breakfast show visited the RSGB National Radio Centre (NRC) at Bletchley Park to interview the FUNcube Project team about the new educational amateur radio satellite FUNcube-1 (AO-73)

*BBC presenter John Maguire interviewed Graham Shirville G3VZV at the GB3RS station in the NRC. Other members of the FUNcube team were filmed making a SSB contact from the Bletchley Park car park using the linear transponder on FUNcube-1.*

*[Touch here](#) to see our article on FUNcube.*

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# Happy 2014

*In late February 2013 CQ-DATV was born and with 6 issues published, it more than exceeded my hopes of a bi monthly ATV publication*

*The format was unusual and quite a few of you had to get your head around eBooks, and either buy a stand alone reader or download a free PC eBook reader.*

*The average download for each individual issue of CQ-DATV is more than 1200 and growing. We also listened to your complaints and on top of the three eBook formats, CQ-DATV is now published in PDF format.*

*I know we all have a soft spot for paper magazines, but 2013 has seen the demise of VHF communications in the UK and the AGAF adopting electronic publication for overseas readers.*

*We are just going to have to face up to it, electronic publications are the way forward and they do have advantages.*

- 1. Cost of printing and posting is almost negligent to the point where I have personally shouldered the cost of producing and delivering over 8000 magazines in 2013*
- 2. The disadvantage of only being able to read electronic magazines at the PC has been overcome by eBook readers*
- 3. The language barrier is beginning to melt as copy can be cut and pasted into free translation software.*
- 4. http links which (if you are connected to the Internet) deliver expanded information, video and files, some of these links are short lived and can only really be exploited if the magazine is published frequently hence we are striving to move from a bi-monthly to a monthly publication in 2014*

*So some of the traditional geographical barriers to ATV magazines are now being eroded by CQ-DATV, that at no cost is available throughout the world, I hope that our publication will provide the glue that is necessary to bond and unite our hobby.*

*2014 is going to be a challenging year and it will deliver its problems and success's. The top success will*

*undoubtedly be the launch of DATV Express which was engineered by TV amateurs for TV amateurs and I hope CQ- DATV has informed and kept you all up to speed on its progress.*

*2014 is also going to have a down-side for us here in the UK with spectrum cuts looming, representation has been made to the regulator OFCOM, but alas little representation has been made to our legislators. We all have MP's but I wonder how many of us has brought our personal representative up to speed on our problems. If I can explain how another organisations has tackled this communication problem and lets decide if their approach would work for us. 38 degrees flag up problems almost daily to their Internet readers too, but then they have a more effective approach. They also provide their members with a well written standard letter, and a click link that requires your post code to identify your MP's email address, so you can forward it. There is also an opportunity to edit it, if you feel it necessary. There are 80,000+ Amateur Radio Licenses in the UK, add to this your friends, who also might like to forward the letter, it will make a sizable download for any MP. Will it work ! well if we don't try it we will never find out, alas it is too late for the UK but perhaps other countries, that might in the future face the same problems, this might be worth trying.*

*Off my soap box please relax and enjoy CQ-DATV7 and remember if you like it and would like to see more issues, we need your contribution and remember CQ-DATV is ATV and all that will stop it becoming a monthly magazine is your contributions to [editor@cq-datv.mobi](mailto:editor@cq-datv.mobi)*

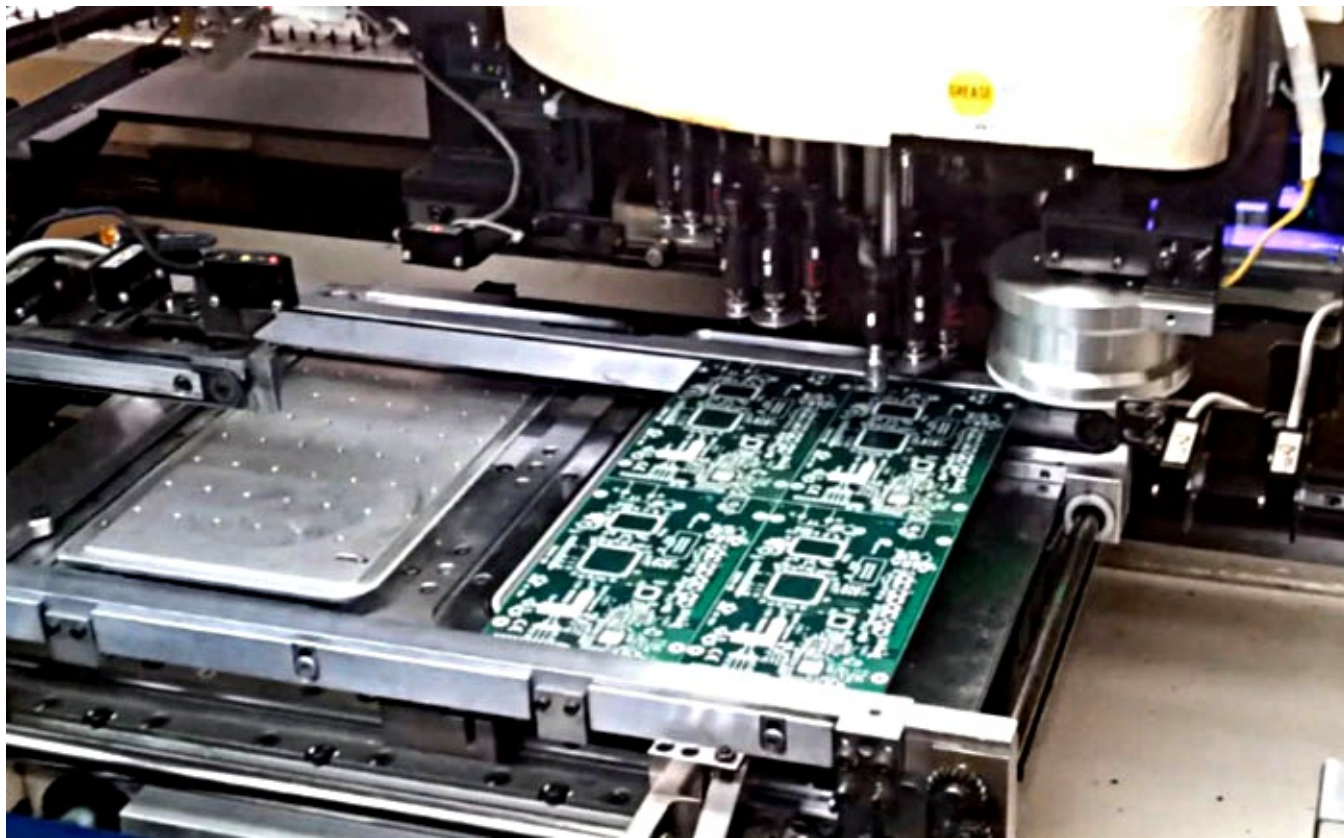
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# ***DATV-Express Project – October update report***

**By Ken W6HHC**

**A**rt WA8RMC had a very productive month. He received 100 blank PCBs in early October from Sunstone board fabricators. On the same day Art took the blank boards and the components to a local board assembly house. The "pick-and-place" robots whirled and soon four boards came out of the reflow solder oven and into Art's hands. All four boards worked!!! These four boards are now being held in reserve by G4GUO for anyone interested in helping with the software development...and will be sold at a significant discount to the purchase price. "Interested and willing" software programmers should contact Charles G4GUO.

The blank PCBs are arranged as 2x2 arrays. The photo below shows the robot arm spinning to the right location in order to lower the SMT component onto the correct footprint...and the board array underneath shifts so that the arm can reach all four boards.

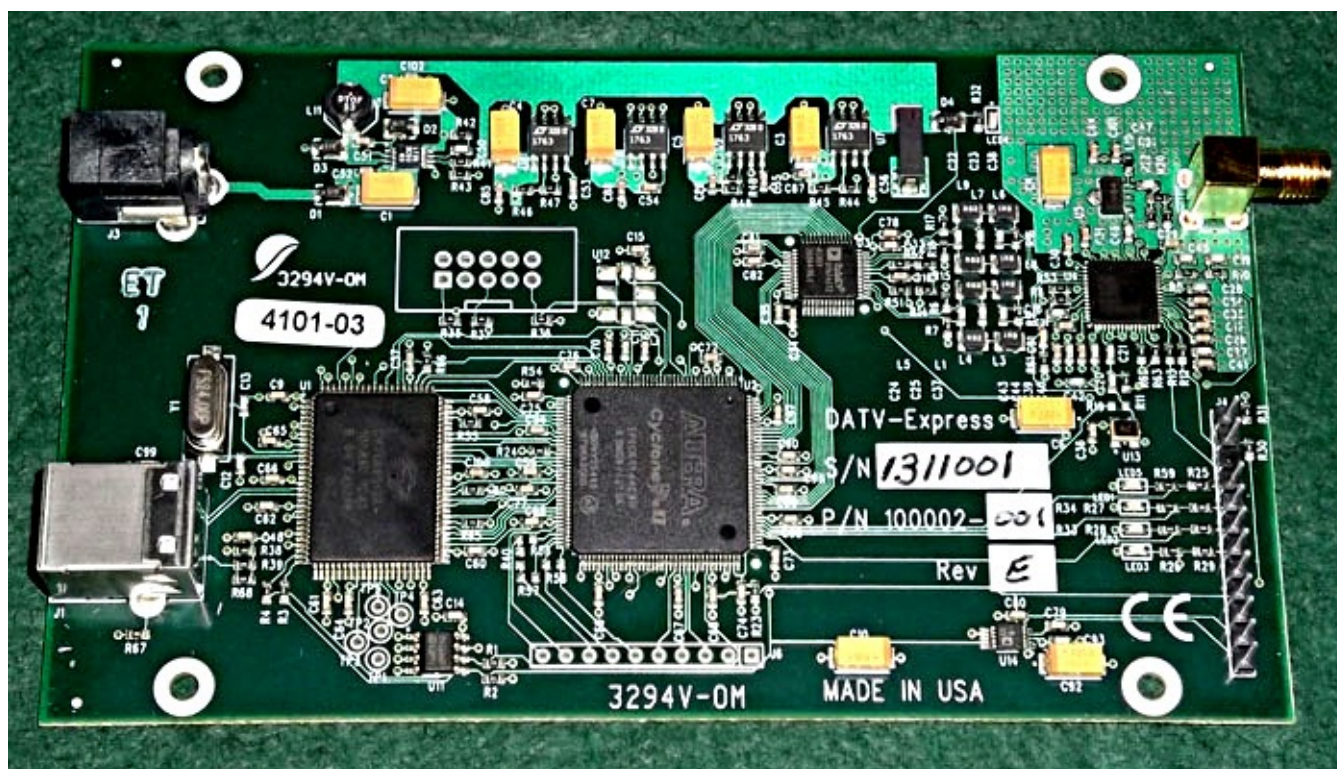


***Pick-and-place robots place components down onto a panel of four boards***

*A short MPEG4 video of the pick-and-place robot in action can be found at: <http://www.W6ZE.org/DATV/>*

*One of the changes that Tom WB6P implemented with this latest etch-update of the board was to flood the ground etch around modulator chip U4 and the SMA RF connector and the upper-right-hand mounting hole. The etch-flood exists on the top layer, ground layer, and bottom layer in order to carry heat away from the modulator. Plenty of heat-conducting-vias were added by Tom to connect all of these layers together. Art ran some temperature tests and reported the top of the modulator has a temperature-rise that is 7C degrees cooler than the earlier etch with no heatsink and no fan.*

*New Rev E etch produces a U4 temperature rise of 38.9 C (no heatsink) Older Rev D etch produces a U4 temperature rise of 46.0 C*



***The new Board Layout (Rev E) used in the Pre-production Design***

*Further testing by Charles G4GUO and analysis by Jean-Pierre F6DZP (using the Tutioune analyzer) resulted in being able to determine that problems with PCR timing fluctuations were a direct result of the poor clocking inside Hauppauge video-capture unit. A google search was able to confirm that the Conexant chip used inside the Hauppauge units resulted in a 27 MHz clock that jittered and/or skipped enough to produce a PCR that was rejected by most of Art's STB units. As explained last month, all of the other seven STBs and receivers used by the project team work OK with the Hauppauge-originated PCR timing. Charles implemented a massive software timing design change for the PCR time-stamp where the PC starts with the Hauppauge clock, but then recalculates the time stamp based on the PC timing. Charles came out with the "proof-of-concept" v1.07 software build allowing the PCR timestamps with our own calculated clock as suggested by other internet-found work-arounds. Now all of Art's STB units and his Tutioune-S2-1600 analyzer can receive DVB-S video and audio OK.*

*Ken W6HHC spent most of the month working on drafts of a User's Manual for the DATV-Express hardware*

*and software. The draft of the manual is now up to 17 pages. Tom WB6P just received his first DATV-Express board and now will be the alpha-tester for the User's Manual.*

*Charles also presented a short slide presentation (remote from home by Skype) on the DATV-Express for the BATC CAT13 convention at Finningley. Charles also explained that the project team expects to have the boards available for general sale in January, however the software is not quite ready, and hence the delay. As mentioned earlier, Charles is looking for programmers willing to help with the software. Contact G4GUO directly at [G4GUO@ARRL.net](mailto:G4GUO@ARRL.net) if you are willing to help.*

*All questions are welcome.*

**"Full speed ahead"...de Ken W6HHC [W6HHC@ARRL.net](mailto:W6HHC@ARRL.net)**

*[Touch here](#) to read the latest (November) update report - ED.*

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# Amateur Television Quarterly



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# ***A Digital World - part 1***

**By Richard VK4XRL**

***T**here has been much discussion around the table relating to be able to obtain digital transparency throughout the DATV process. Up to now somewhere we have to convert digital back to analogue not once but maybe twice.*

*Let's start at the source and then hence to our DATV transmitters. In my early days we had to build our own SPG's, colour coders, test generators and switchers and press into service the VHS etc. In other words we had to roll our own equipment. Today it's a different story, most things are black boxers you can arrange together to obtain the required result.*



*Mike Cox over the years has written many articles on digital equipment including SDI switcher, Test signals and SDI test generator. These articles can be found in past issues of CQ-TV from around issue 200. Maybe a PCB needs to be made with SDI test signal generator and SDI output DA ,including a SDI to composite output for checking?*

*With the PC software programs such as VMix and the like it's very easy to keep most things within the digital domain to a point including capture cards (although the input maybe composite or S-Video).*



*So what about the output? How do we connect to the DATV transmitter? Trevor and I talked about this and wondered would HDMI work. My laptop had HDMI output and you can get video cards with HDMI DVI outputs also. At this stage I am still converting back to composite using a small interface device from EBay.*

*That is because the SR-System Encoder is set for composite or S-Video. Stefan does make an encoder with HDMI but maybe a little costly or overkill for some.*

*Another way would be to use either a SDI output card on the Desktop or a HDMI to SDI converter on the laptop etc. Therefore the SR Systems encoders would require a SDI input card that would interface to their encoder.*



*It is possible also to use the 'Raspberry P' as a media player to do the same thing. It has two outputs being*

*HDMI and AV.*



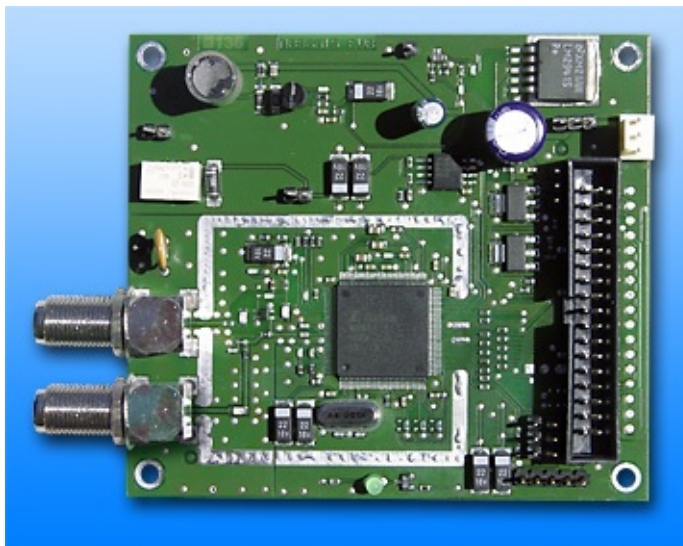
*ASI could also be used although I haven't seen many video cards with ASI outputs, again SR-System do have an ASI input board.*

*It would also be possible to use a small HDMI switcher or SDI switcher to enhance the production if required.*

*The next major drawback is the conversion from the digital DATV receiver in the repeater to composite and back again before transmission. I know of one person that has a SDI system only to find the repeater is the weak link in the chain.*

*There are some digital receivers around that have SDI outputs and again if you're using SR system boards then a SDI input board would be required.*

*Also SR-Systems have NIM's units available that also could be used either by themselves or interfaced with a 2TS MiniMux so that switching between an analogue system and digital can be made automatic depending on the settings of the MiniMux unit.*



*This is only a fleeting glance of what can be achieved and where the new players such as the DTXI from the BATC can forge ahead.*

*I have not mentioned the method proposed by Grant ZL1WTT, ( <http://www.qsl.net/zl1wtt/S-D.htm> ) however I hope to see more articles on this subject in future issues of CQ-DATV as it's an area I believe that major players are looking at.*

*If you have any different approaches that you have been doing or working on not mentioned here and you would like to contribute then please contact [editor@cq-datv.mobi](mailto:editor@cq-datv.mobi). It's our hobby for everyone to enjoy whatever your experience happens to be.*

*See you all on DATV*

**Richard VK4XRL**

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# Known DX DATV Records

**by Ken W6HHC**

**W**hile watching the Video Archives of the BATC CAT13 conference presentation on DATV Proceedings, I heard Noel G8GTZ list some recent DX DATV QSOs on 70 CM. The longest receptions involved G8GTZ and F1FY for 696 KM over the two day period of the International ATV Contest, last September



***Received 70 CM DATV at G8GTZ***

*I am still in the process of researching some of the longer 23 CM DATV QSOs that may have occurred during the same IARU ATV contest. My current updated list of known DX DATV Records is shown below. See more details (including some analog-ATV records) at [www.von-info.ch/hb9afo/records/recordse.htm](http://www.von-info.ch/hb9afo/records/recordse.htm) If anyone knows of other DX DATV QSOs please contact me directly at [W6HHC@ARRL.net](mailto:W6HHC@ARRL.net)*

Known Digital-ATV DX Records		
updated 2013-12-01		
by Ken W6HHC		
24 GHz		
124 KM	JA6DME & JA6EES	2011-11-12
Locations Mont Ten-Zan and Mont Ge-Zan		
10 GHz		
450 KM	HB9JBC & F4CXQ	2005-06-21
Locations JN40CT (Sardinia) and JN12OH (Spain)		
5.7 GHz		
341 KM	JL1BLF & JH1GED	2011-08-06
Locations Mont Chokai-san and Mont Kashimayari-gatake)		
2.4 GHz		
252 KM	JA6SPI & JA5MFY	2009-11-03
Locations ??		
1.2 GHz		
440 KM	G4KLB & G1LPS	2010-10-11
Locations IO90BR and IO94EQ (tropospheric ducting - one-way DATV)		
419 KM	G4KLB & MØDTS	2010-10-11
Locations Bournemouth, England and Yarm, England (tropospheric ducting)		
379 KM	VK3RTV(RPTR) & VK7EM	2011-02-23
Locations Mount Dandenong, Victoria and Penguin, Tasmania (operators VK3BFG, VK3DQ , VK3WWW and VK3TRX)		
252 KM	JA5GYU & JA6JNR	2009-11-03
(1 Watt)		
70 CM		
696 KM	F1FY to G8GTZ	2013-09-24
(DVB-S 2MS/sec FEC=1/2 - - one way reception)		
696 KM	G8GTZ to F1FY	2013-09-25
(DVB-S 2MS/sec FEC=1/2 - - one way reception reported by FM) Locations IO91KH (near Basingstoke) and JN16VB (near Roanne, France)		
528 KM	G3PYB & F5AGO	2013-09-24
(DVB-S 2MS/sec) Locations near W YORKSHIRE and JN06DP (near Poitiers, France)		
373 KM	G8GTZ & F3YX	2013-09-25
(DVB-S 2MS/sec FEC=1/2) Locations IO91KH (near Basingstoke) and JN18AP (near Limours, France)		
121 KM	KH6HTV & KØRZ	2011-11-21
(video resolution HDTV 1080i - protocol ITU-T/J.38 QAM-64 - one-way DATV) Locations Cheyenne, Wyoming and Boulder, Colorado		







# TV AMATEUR



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3. Quartal 2013

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SSTV-FAX-Ecke

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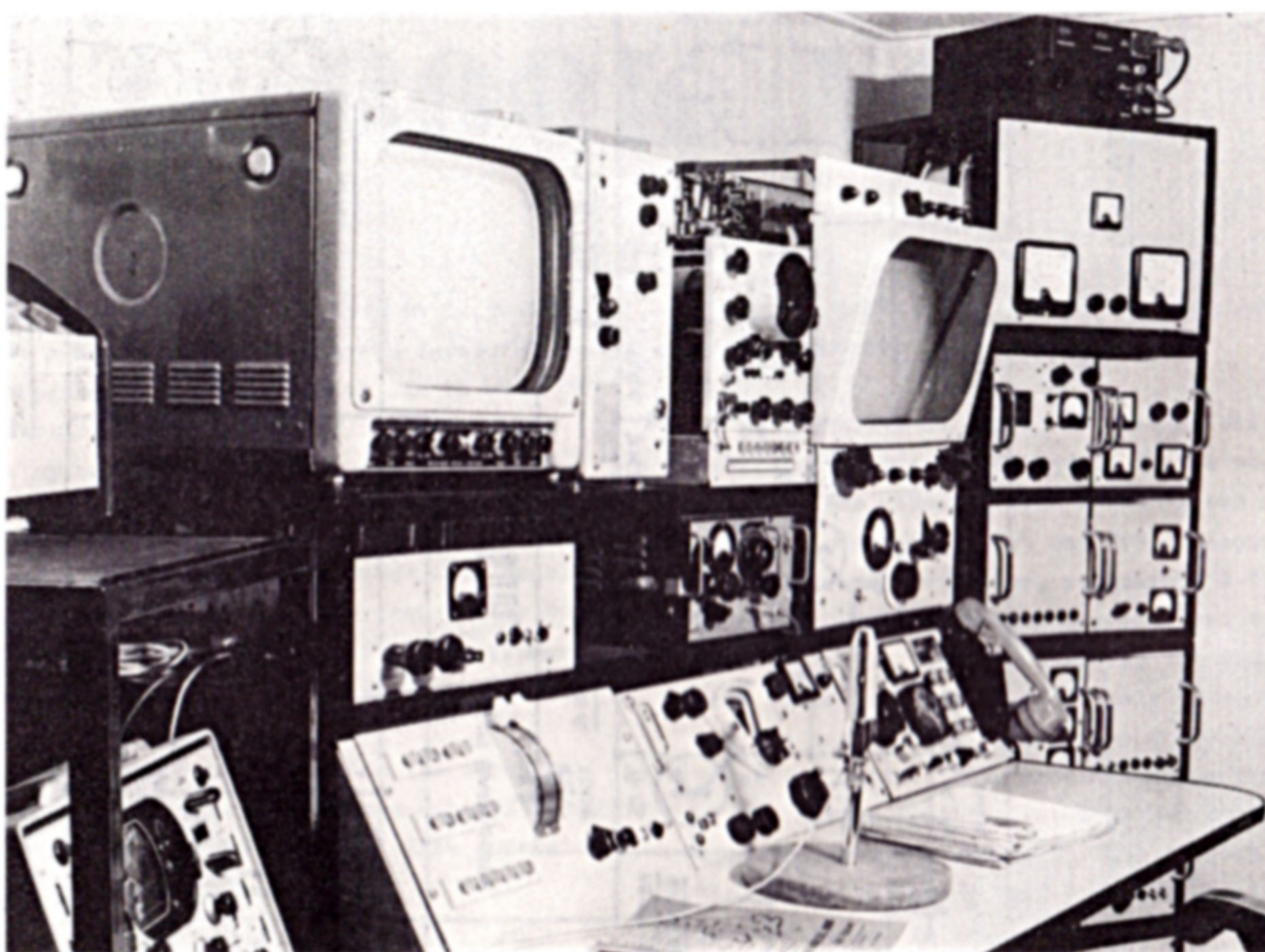
# ***Conferences on Amateur Television Ancient and Modern***

***By Trevor G8CJS***

*July 24-26 1970 was the first time I recall BATC using the word CAT (Conference on Amateur Television). The event was run at Churchill College Cambridge and was an event all of us will remember. There had been ATV meetings before and meetings since but this was the first CAT and it even had its own Logo.*



*The kit used at CAT 70 (sorry for the poor quality pictures)*



The set up at CAT 70





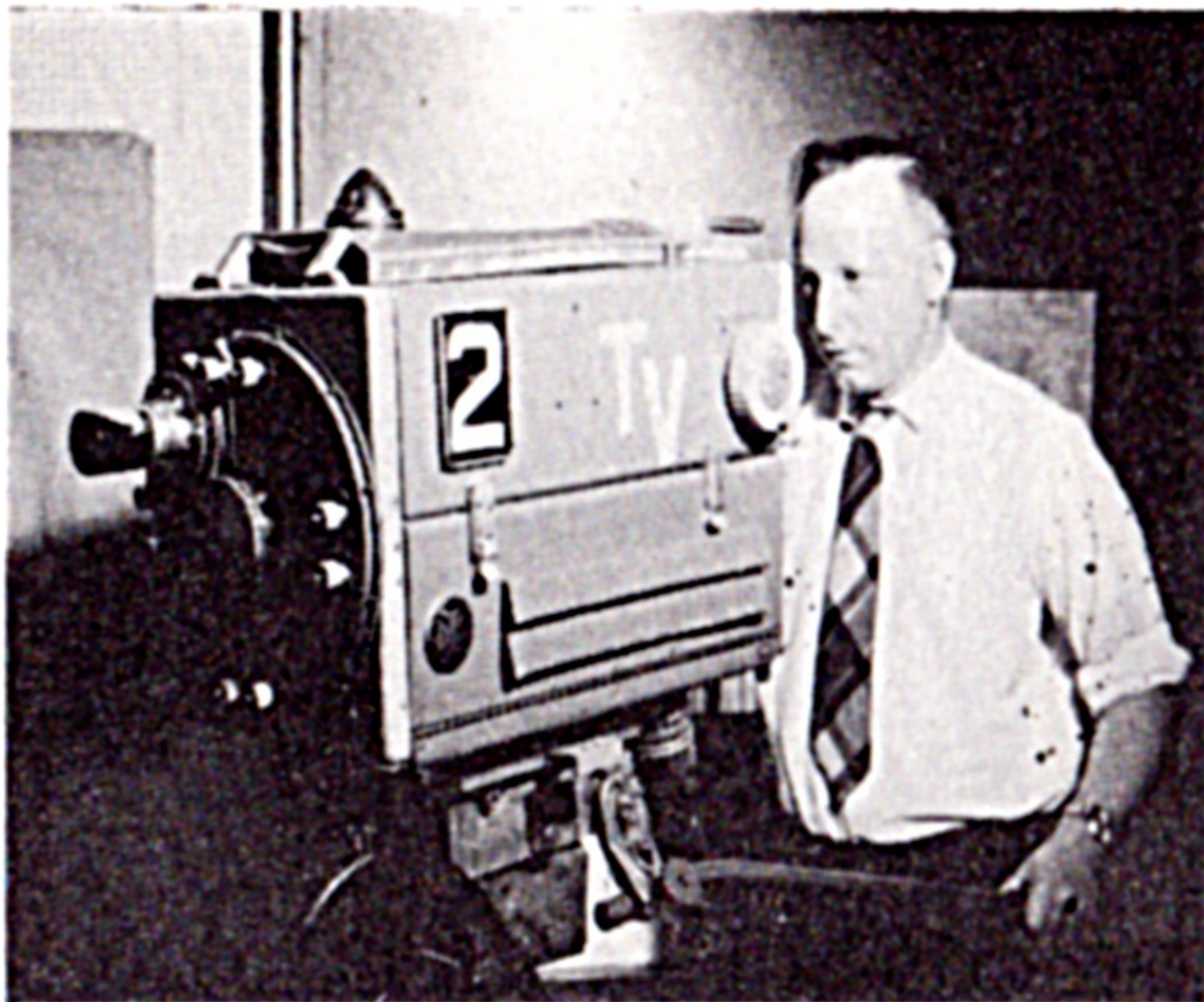
Ian Waters G3KKD/T home set up

*The event was masterminded and run by Ian Waters G3KKD. The chosen venue was Churchill College Cambridge. This was a brilliant venue, it was out of term time and the venue, offered accommodation, food and an excellent lecture theatre with full facilities. Also the East Anglia region was in those days a very active region for ATV. ( it is a pity there is virtually no activity there today!). There were two reasons for the activity. First it was a centre of the electronics industry, being among others, the home of Pye and Marconi, bringing with it a grouping of amateurs. Secondly the flat country was favourable for UHF propagation. The event was supported by Pye TVT who loaned a colour broadcast camera. For many visitors it was the first time they had seen one working. CAT 70 attracted visitors from Switzerland, France, Holland and Germany. One from Germany was Uwe Kraus, later prof Kraus, who was responsible for the AGAF MPEG 2 coder/DVB-S modulators which were used extensively in the early 2000s at the start of DATV.*

*My personal favourites were Henry Neal G3REH who presented his insert from the top of his aerial tower and Graham Shirville G3VZV who presented his live insert from a river boat along with Ian Waters studio links which included a video tape insert of his own station (cutting edge in 1970). Those were the days of 405 line AM TV transmissions on a 70m allocation that extended to 450MHz, providing enough band space for Jeremy Royle G3NOX to receive and relay G6WJ Ralph Royle's (his father) ATV transmission to the venue. After the event various local members entertained the overseas visitors at their homes.*

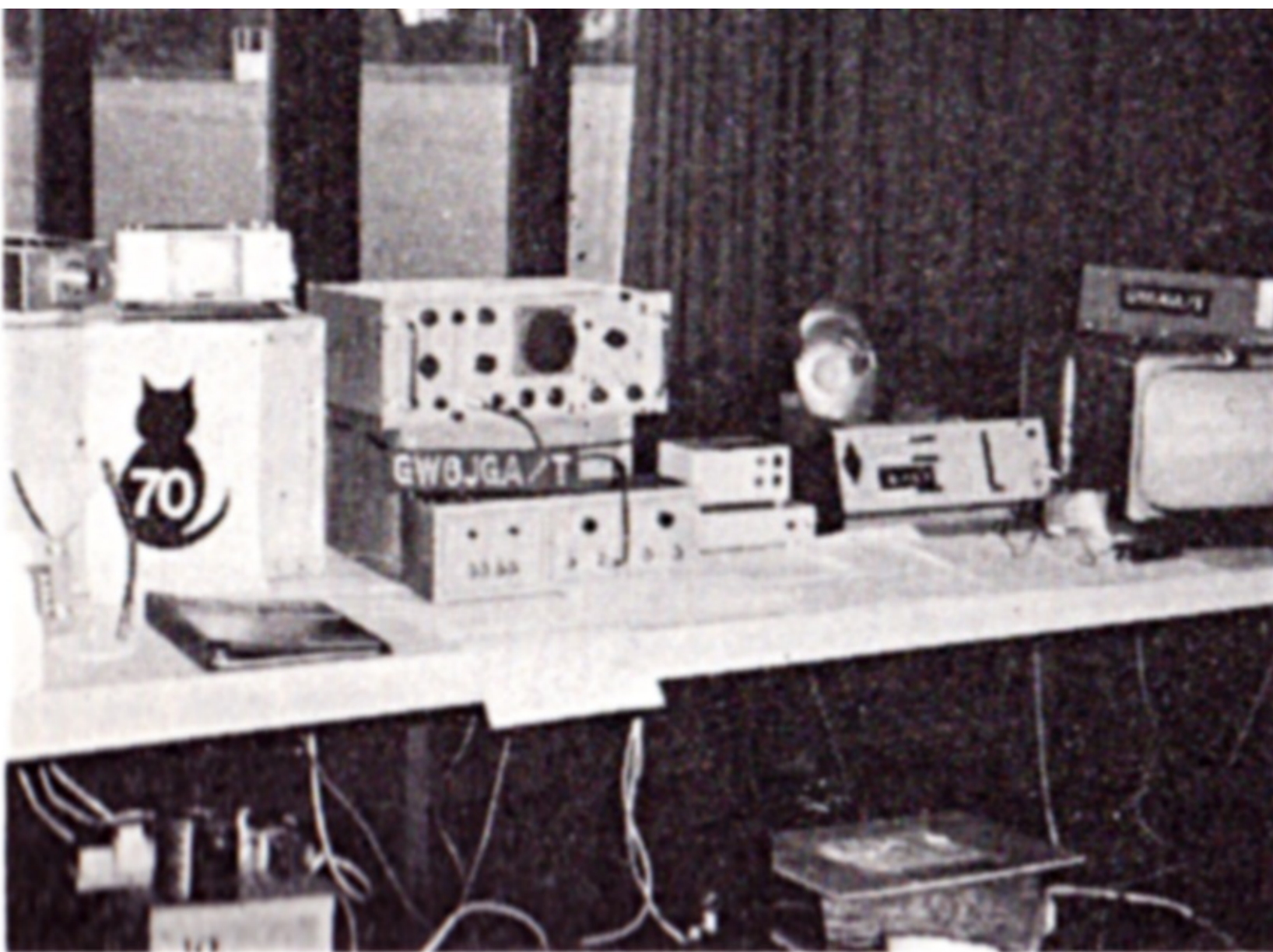


Ralph Royles G6WJ/T Relay via G6NOX/T



Alan Pratt and Camera in the CAT 70 Studio

*There was a video tape made of the event, I know I used some of it to edit together the Ian Waters biography which can be seen in the BATC streamer video tape library [www.batc.tv](http://www.batc.tv) , select film library, classics and Ian Waters. If the full CAT 70 tape ever surfaces I will put it on the streamer.*



John Lawrence's GW6JGA/T Exhibition Display

*Lets wind the clock forward to CAT 13 Held at Finningley Doncaster October the 26-27th 2013 This was the*

*venue for CAT 13. this had a series of lectures, Flea market and a fix and test area for those with kit problems that need some state of the art test equipment and expertise to solve.*



*When I arrived the first Lecture KU Band LNB developments was in progress with Bryan Harper talking to an audience of around 50 people Ian Waters G3KKD the CAT 70 organiser was in the audience.*



*There is no doubt this is one of the best equipped amateur radio clubs in the country, located at what was once part of RAF Sandtoft, and is now home to Finningley amateur radio club. It has exceptional views, communications, classrooms and workshops. I went along on the Saturday to see this venue and what was happening there.*

*The event was being streamed via the BATC streaming kit which must now be 6 years old and still working well and a big leap in technology from the CAT 70 kit.*



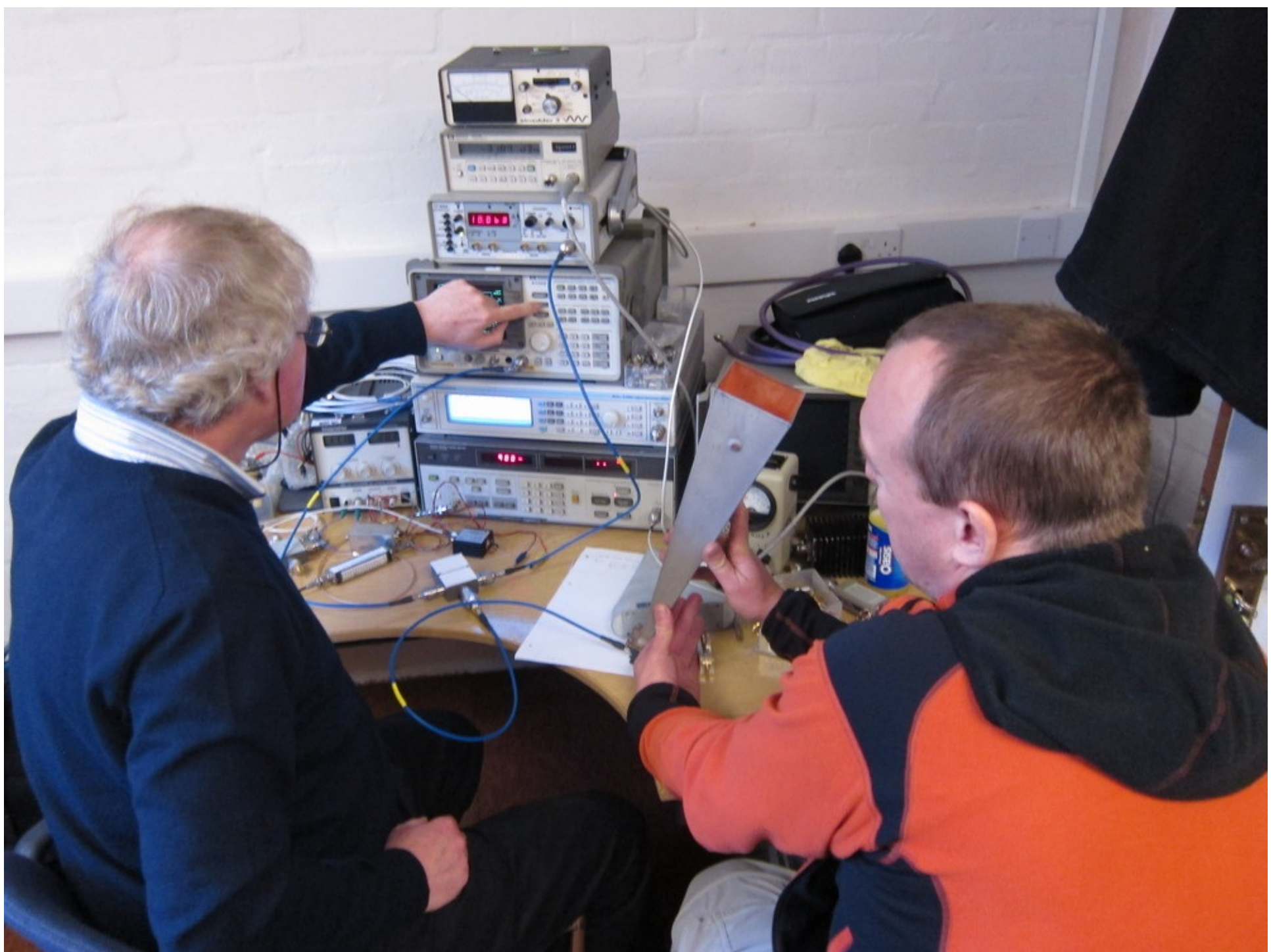
*Graham G3VZV was in the hot seat. and Henry Neal G3REH recording his own back up version (just in case),*

*both CAT 70 veterans.*



*I have to admit it was good to see some old friends and Henry is definitely up there.*

*While the Lectures were progressing the test and fix area was in full swing*



*With Martyn G8FEK (Picture Left) and Martin G7CKX ( Picture Right) checking out the performance of a 10GHz*

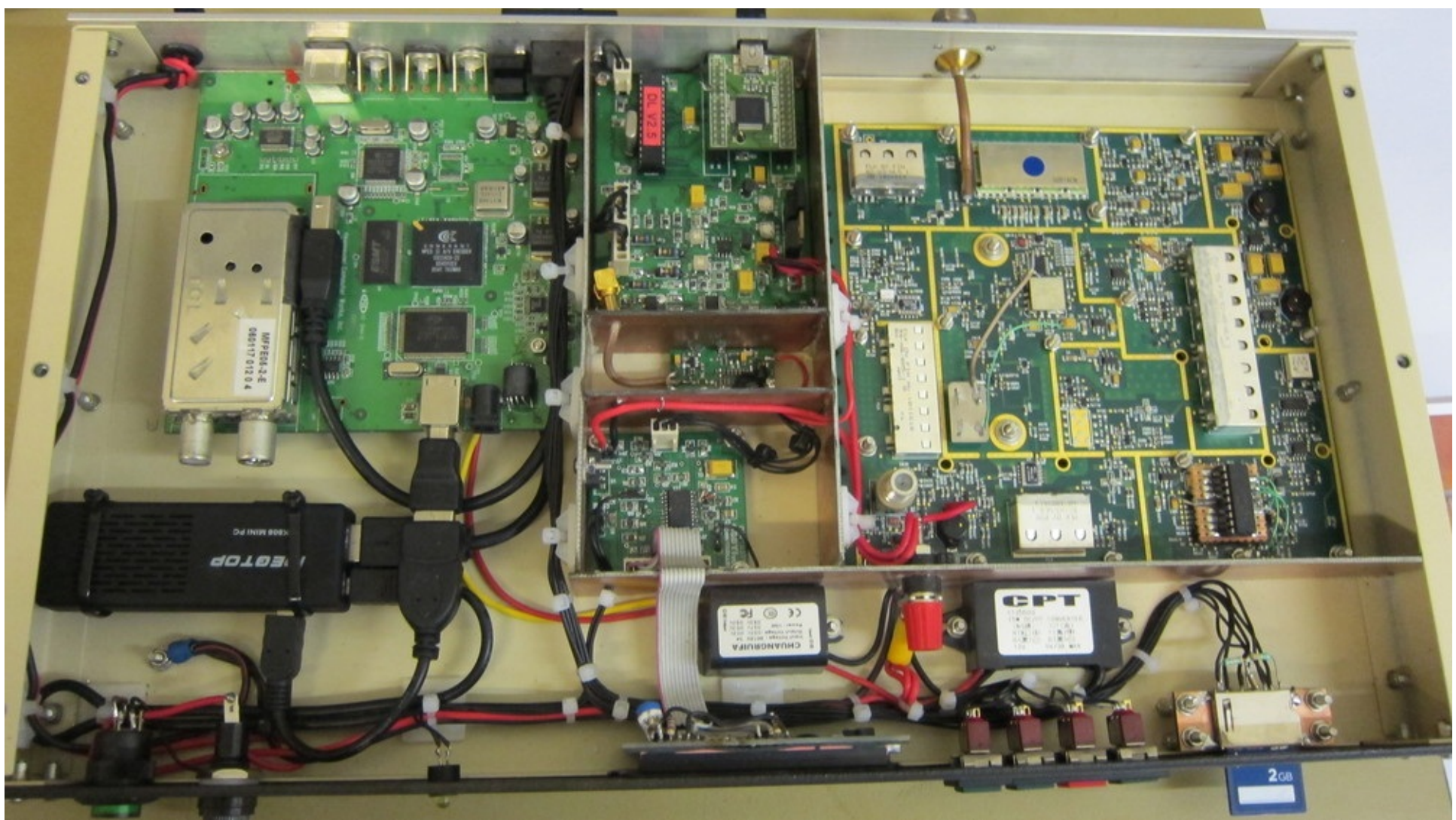
*Horn using Martyn's personal test equipment.*



*Further down the corridor was the Finningley workshop and constructional area manned by Bob G7AYU this is where the new members train in the art of construction 2013 style, by surface mounting chips onto a plentiful supply of redundant PCB's which are ideal for training purposes.*



*Also on display in the workshop was the 3.4GHz DVBS transmitter for GB3KW*



*Meanwhile the next lecture of the day had started in the other room with Phil MODNY and the intricacies of High Altitude Balloons. This was going to be an actual balloon launch but the weather intervened and it was reduced to a Power Point Presentation*



*There was also a small flea market set up outside the club, no amateur radio event should ever be without one*



*Finningley is indeed an impressive Amateur Radio Club with a very delightful venue and well worth a visit and*

they were a very gracious host for CAT 13 and are always open to new members see <http://www.g0ghk.co.uk/>

Perhaps worth remembering the history of the Venue.



For those of you that missed the live lectures from CAT 13, the first 11 lectures are now available on-line at the following links

- BATC review = <http://www.batc.tv/streams/cat1301>
- LNB developments = <http://www.batc.tv/streams/cat1302>
- HAB introduction = <http://www.batc.tv/streams/cat1303>
- Early colour cameras = <http://www.batc.tv/streams/cat1304>
- SMD techniques = <http://www.batc.tv/streams/cat1305>
- DTX1 DVB-S xmtr = <http://www.batc.tv/streams/cat1306>
- DATV in practice = <http://www.batc.tv/streams/cat1307>
- Spectrum matters = <http://www.batc.tv/streams/cat1308>

- 10 GHz Tx multipliers = <http://www.batc.tv/streams/cat1309>
- 10GHz PLL LNBS Archive = <http://www.batc.tv/streams/cat1310>
- ISS HAMTV = <http://www.batc.tv/streams/cat1311>
- ATV operation in the North West = <http://www.batc.tv/streams/cat1312>
- DATV-Express update = <http://www.batc.tv/streams/cat1313>
- Potential new Narrow Band ATV modes = <http://www.batc.tv/streams/cat1314>
- Digilite update = <http://www.batc.tv/streams/cat1315>

# **DATV talk 04**

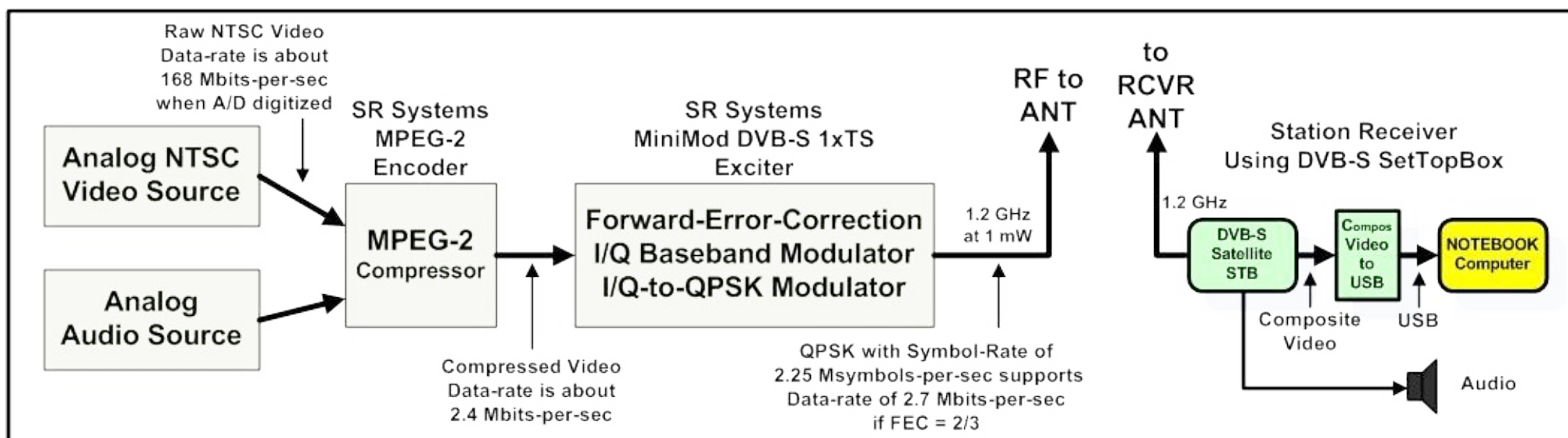
## **Bench-Testing a DVB-S Transmitter – Part 1**

**by Ken Konechy W6HHC and Robbie Robinson KB6CJZ**

Reproduced from the Orange County Amateur Radio Club newsletter. [www.W6ZE.org](http://www.W6ZE.org)

*[Please Note – This is the third article in a series of DATVtalk articles to introduce Digital-ATV to hams for this new area of ham radio. The article was originally written in 2009 for the OCARC newsletter. Since, 2009, there have been changes and improvements in technology...but there is still a basic problem (most severe in US) that too few hams are using digital-ATV. This article has been now updated to reflect new knowledge about DATV that we have learned and reflect the most significant changes since 2009.]*

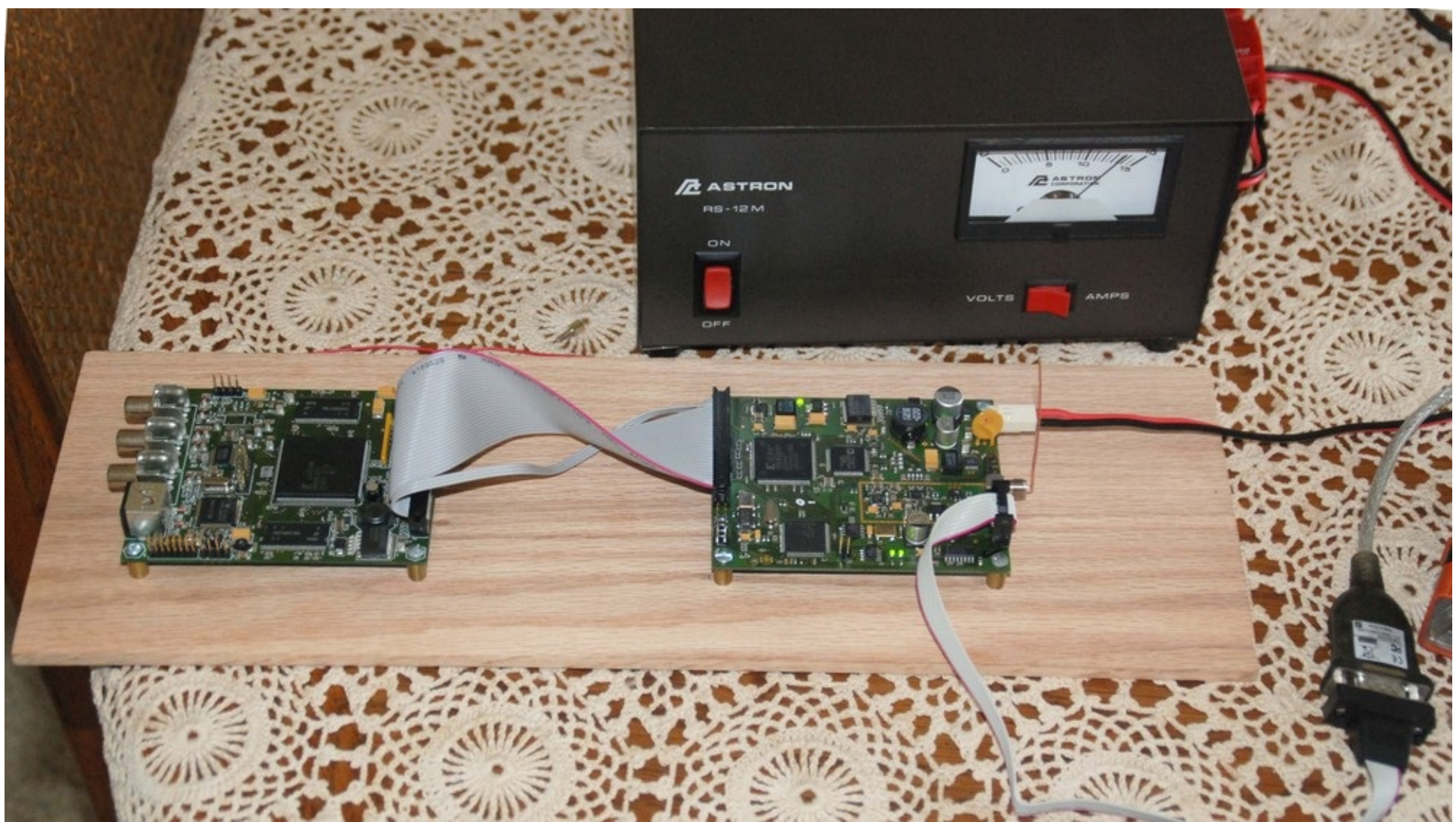
*In the CQ-DATV5 issue, the DATVtalk02 article presented an introduction to Digital-ATV. In the CQ-DATV6 issue, Robbie-KB6CJZ and I teamed-up in the DATVtalk03 article to present a top-down approach for planning a DATV Station that resulted in selecting the DVB-S protocol standard. In this DATVtalk04 article, Robbie and I team up to test and share the initial test results of the DATV station we had planned.*



**Figure 01 Test Set-up for DVB-S exciter bench tests**

## **Configuring the DATV Transmitter**

*A block diagram for the set-up for testing the DATV transmitter "exciter" for the DVB-S protocol is shown in Fig 1. The two critical boards for the DVB-S station are the MEP-2 encoder board and the MiniMod DVB-S exciter board for 1200 MHz band. These boards were purchased from SR-Systems located in Germany (...see links at the end). Fig 2 shows a "breadboard" for the two-board DATV exciter station. Note (at this point) that we have not yet added an RF power amplifier to the test set up, so we tested with only 1 mW output on 1.290 GHz. The RF power amplifiers will be discussed in detail in the next in-the-series-article called DATVtalk05.*



**Figure 02 "breadboard" set-up for the two-board DVB-S Exciter**

Choosing the transmitter frequency and all other setups and adjustments with the DVB-S exciter board and the MPEG2 encoder board are made through an RS232 interface connected on the DVB-S Exciter board. I used a RS232-to-USB adaptor to plug the RS232 cable into the notebook computer. By running a Windows XP application called "Hyper-Terminal", I can read out the settings on the boards and make changes to the settings on my computer screen. [NOTE: in Windows7 and Windows8, the "Hyper-Terminal" application is no longer supplied by Microsoft. For Windows7, I now use a terminal program called uCon terminal emulator ([www.umonFW.com/ucon/](http://www.umonFW.com/ucon/)) to communicate with the SR-Systems board.] Shown in Fig 3 is a typical display

*of the settings menu as seen on the notebook computer.*

## **DVB MiniMod Firmware V54.34 LOWDVBT**

**(c) 2009 maintech GmbH**

**OnBoard VCO: ADF4360-0**

**Real HF output range from 575000 to 1425000 kHz.**

**FPGA firmware v042.**

**Encoder firmware upload done (tvp5146,  
0x01600425).**

### **MiniMod Mainmenu**

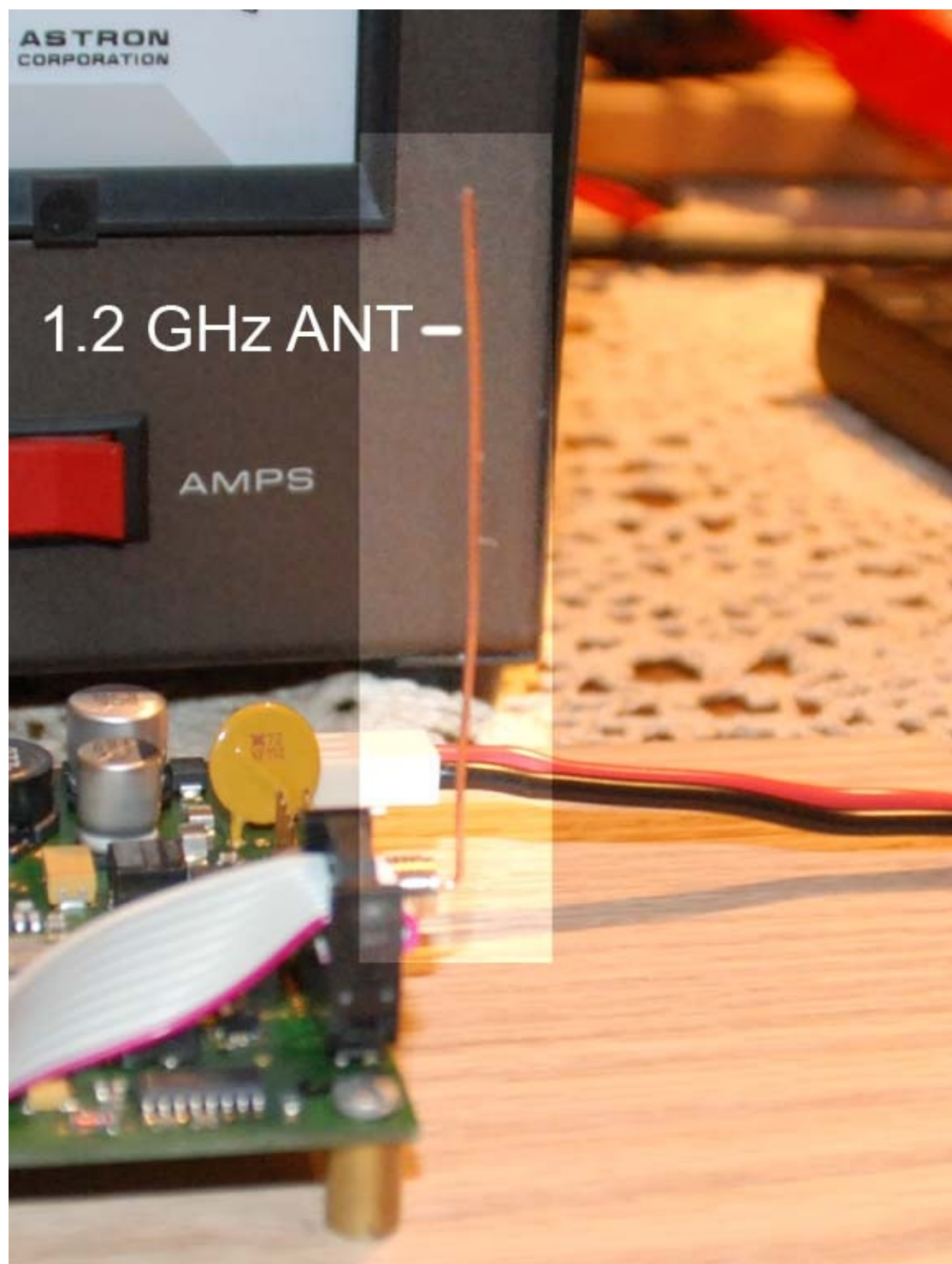
- 1) show status**
- 2) Input Settings**
- 3) Modulation Settings**
- 4) Video Settings**
- 5) Audio Settings**
- 6) PSI Settings**
- 7) PID Settings**
- > 3**

### **Modulation Settings**

- 1) TX Enable (ON AIR)**
- 2) Output Frequency (1290000 kHz)**
- 3) Spectrum (normal)**
- 4) Carrier Only (no)**
- 5) Output Gain (12)**
- 6) Symbolrate (2500 ksym/s)**
- 7) Coderate (FEC) (3/4)**
- 0) exit menu**
- >**

### ***Figure 03 – Computer display of SR-Systems menu***

*For the test set-up, a very simple  $\frac{1}{4}$  wavelength wire was inserted into the RF SMA connector and used to provide a 1.2 GHz vertical antenna on the XMTR, as shown in Fig 4.*

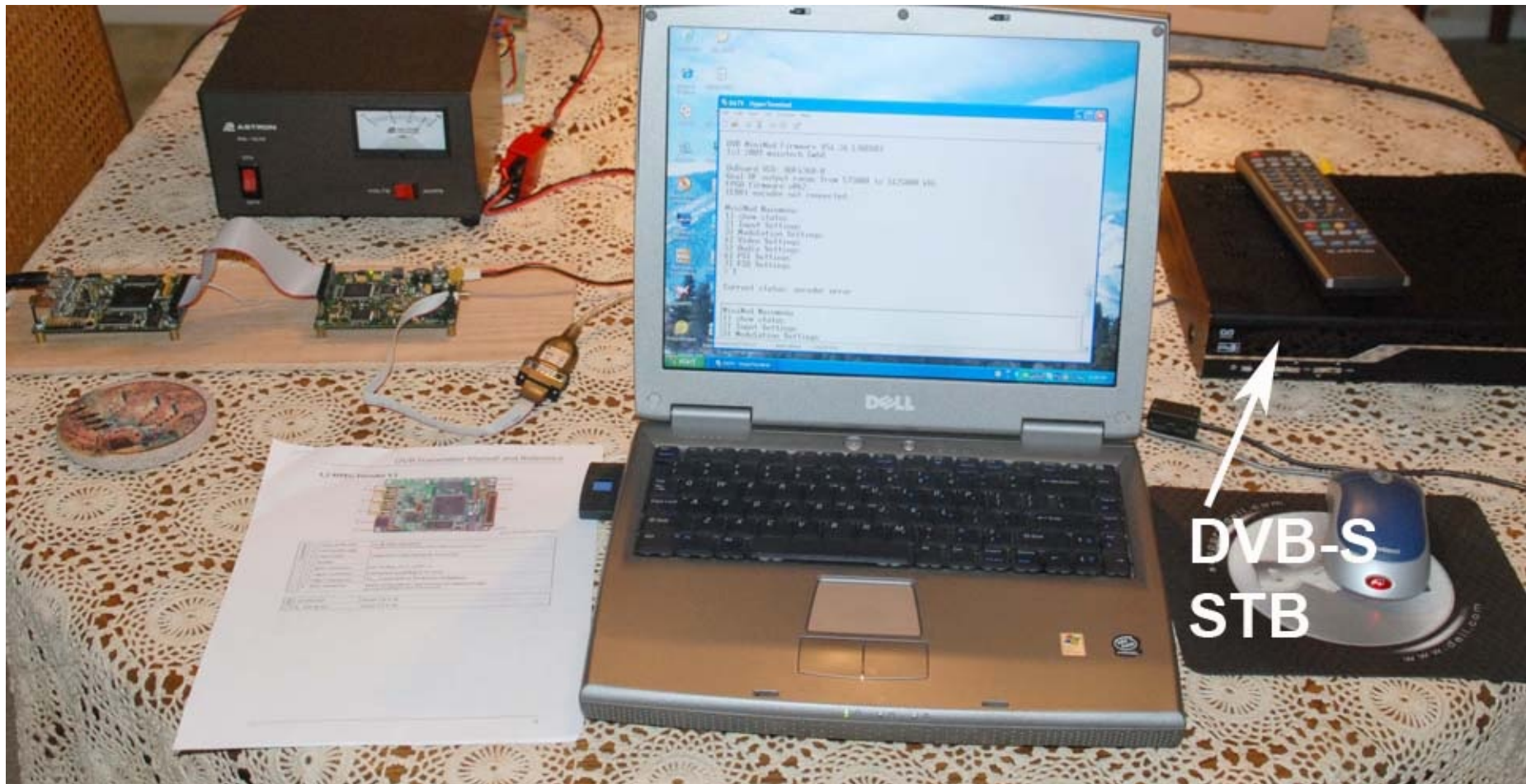


**Figure 04 - Simple  $\frac{1}{4}$ -wave vertical antenna used for testing the DVB-S exciter**

*For the first step, we used W6HHC's trusty Kenwood TM-741A FM receiver to confirm that there was a nice strong RF signal centered around 1.290 GHz when the DVB-S exciter was turned on.*

## **Configuring the DATV Receiver**

*The heart of the DATV receiving station is a ViewSat Model VS2000 Xtreme DVB-S SetTopBox (aka FTA or Free-to-Air) shown in Fig 5 (the STB unit is shown on the right-hand side). Ken and Robbie both bought this model used on e-Bay. The price was right; less than \$75, including cost of shipping.*



**Figure 05 – The DVB-S testing set-up**

*As the block diagram in Fig 1 shows, the output of the STB sends Composite Video to the USB port on the*

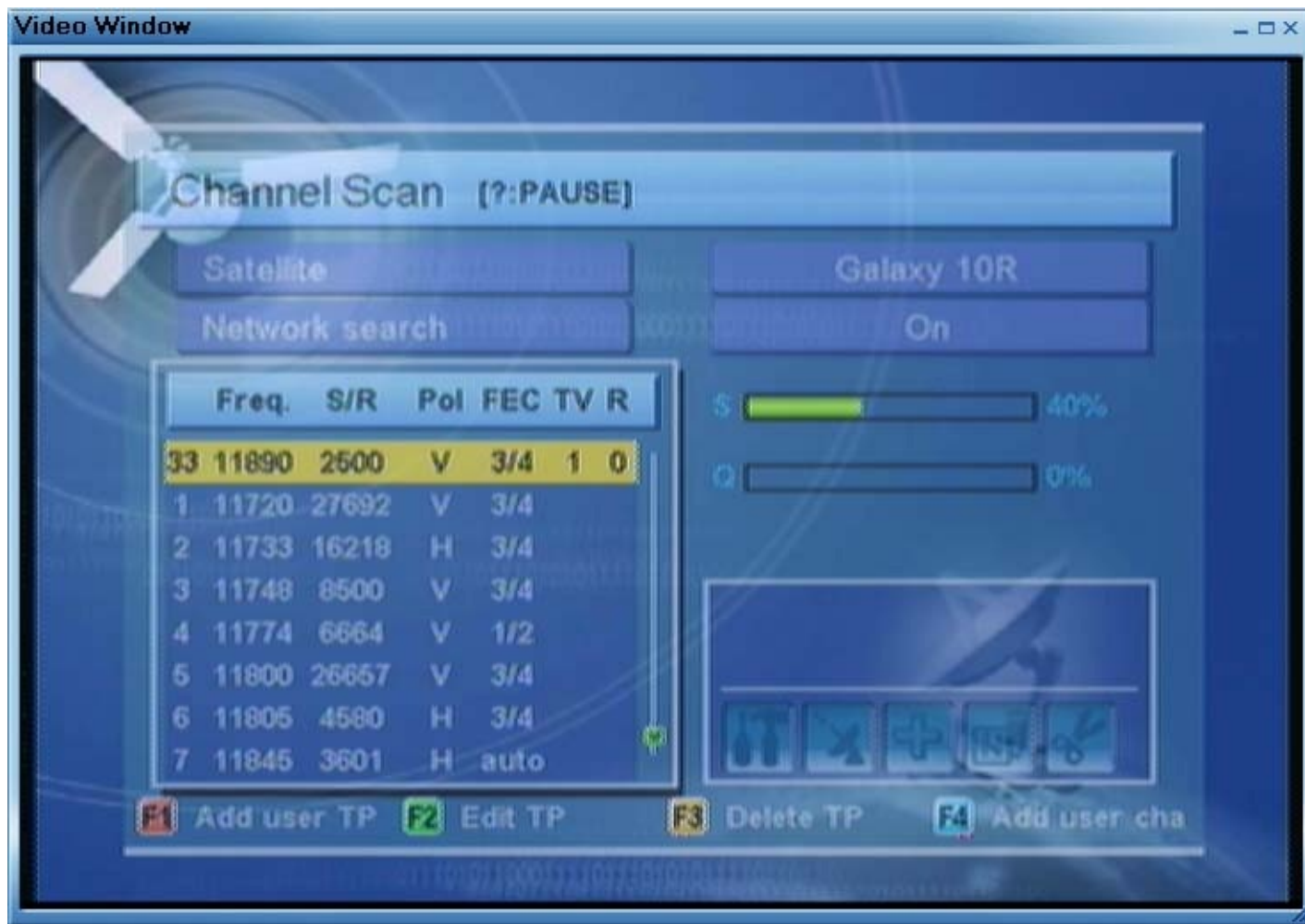
*Dell notebook computer via Composite-Video-to-USB converter that costs about US\$50 on the Internet. I bought a Startech.com USB 2.0 converter (new) via Amazon. Fig 6 shows a photo of the Startech.com USB 2.0 converter. Note that this model does not send the audio to the computer, only composite-video or S-video. The Startech.com product is primarily designed to capture video files to a disk on a computer and to take "snap shots" of video streams. It includes a software program called GrabBee that allows the USB data to be displayed on the computer screen.*



## Video-USB Converter

**Figure 06 – The Startech video-capture unit converts STB video to USB**

*The computer screens in Fig 7 and Fig 8 are being displayed by the GrabBee application software and device drivers for the video-capture dongle.*



**Figure 07 - The STB Configuration menu for editing received frequencies and other settings**

The hardest part of our first testing session was to determine how to use the SetTopBox receiver to tune in the frequency we wanted, 1.290 GHz. This was not easy. Robbie determined from inspecting the STB menus that the STB local oscillator was 10,600 MHz. So, on this particular brand of STB:

- STB Search Freq = XMIT Freq + 10,600 MHz
- STB Search Freq = 1290 MHz + 10,600 MHz
- STB Search Freq = 11890 MHz

Because each brand of STB has a different user's interface...we could never determine how to command our

STB to search-and-find our signal on a frequency of 11,890 MHz. So we tried a different approach and added a "new transponder" to the GALAXY 10R Satellite settings already on the STB. Now we could edit the frequency for the new transponder to 11890 MHz. Fig 7 shows the settings for new 'transponder 33" is configured to 11890 with a Symbol-Rate (S/R) of 2500 (Ks/sec).

Robbie explained there are two cautions hams need to take on the antenna connector of satellite STB's:

1) The centre conductor of the STB antenna F-connector has a DC voltage present that is normally intended to power a remote LNB (low noise block) converter box near the satellite dish antenna. Do not short the centre conductor to ground. The fuse is normally soldered down to the PCBA inside the STB (not an easy task to replace). Robbie installed a "DC Block" adaptor to the antenna F-connector to prevent an accidental short circuit.

2) The STB receiver RF amplifier is quite sensitive and designed to receive tiny microWatt signals (typically -20 dBm to -70 dBm). We feared we could blow out the STB amp if the received signal is too strong. For initial testing, Robbie inserted some 50 dB of attenuators on the antenna...knowing we could always remove the attenuators once we knew the signal strength

## **First DATV Test Pictures Received**

Once we determined how to correctly configure a "transponder" setting for our frequency on the STB, the picture magically appeared on the notebook screen....crystal clear!! A photo of our first test pictures is shown in Fig 8. To add a little professional touch to the received pictures, Robbie-KB6CJZ inserted his text generator in series with the video input to the MPEG2 encoder board. You can see the text "W6HHC ORANGE" show up in the upper-left corner of the DATV picture in Fig 8.



***Figure 08 - First DATV test pictures (of Ken W6HHC) are displayed on the Dell notebook computer***

*The first thing that we noticed was that the audio had very little latency (delay) from real time. Probably about 1 second. For the first test trial, we had set the Symbol-Rate on the transmitter menu to 2.5 Msymb/sec and the MPEG2 databit-rate setting to "MANUAL" and 2.5 Mbits/sec, while FEC was set to 3/4. There was noticeable latency in the picture motion and also a noticeable "jerking" to the motion. We were confused to understand what was going on?? Why were we seeing so much video motion jerking??*

*The answer appeared with a little more testing at higher Symbol-Rates. When the GrabBee software was set for default 720 pixel wide picture, the jerking was gone. When the Grab-Bee was set for a 1024 pixel wide picture (full screen), the jerking was extreme. The settings on the transmitter were NOT incorrect, but the receiving notebook computer and its display lacked the processing speed to convert the NTSC video pixels into a full display screen at 1024 pixels wide at the frame rate. The notebook computer was probably dropping five frames (or more?) to process one frame at 1024!!*

### ***Inspecting RF Bandwidth***

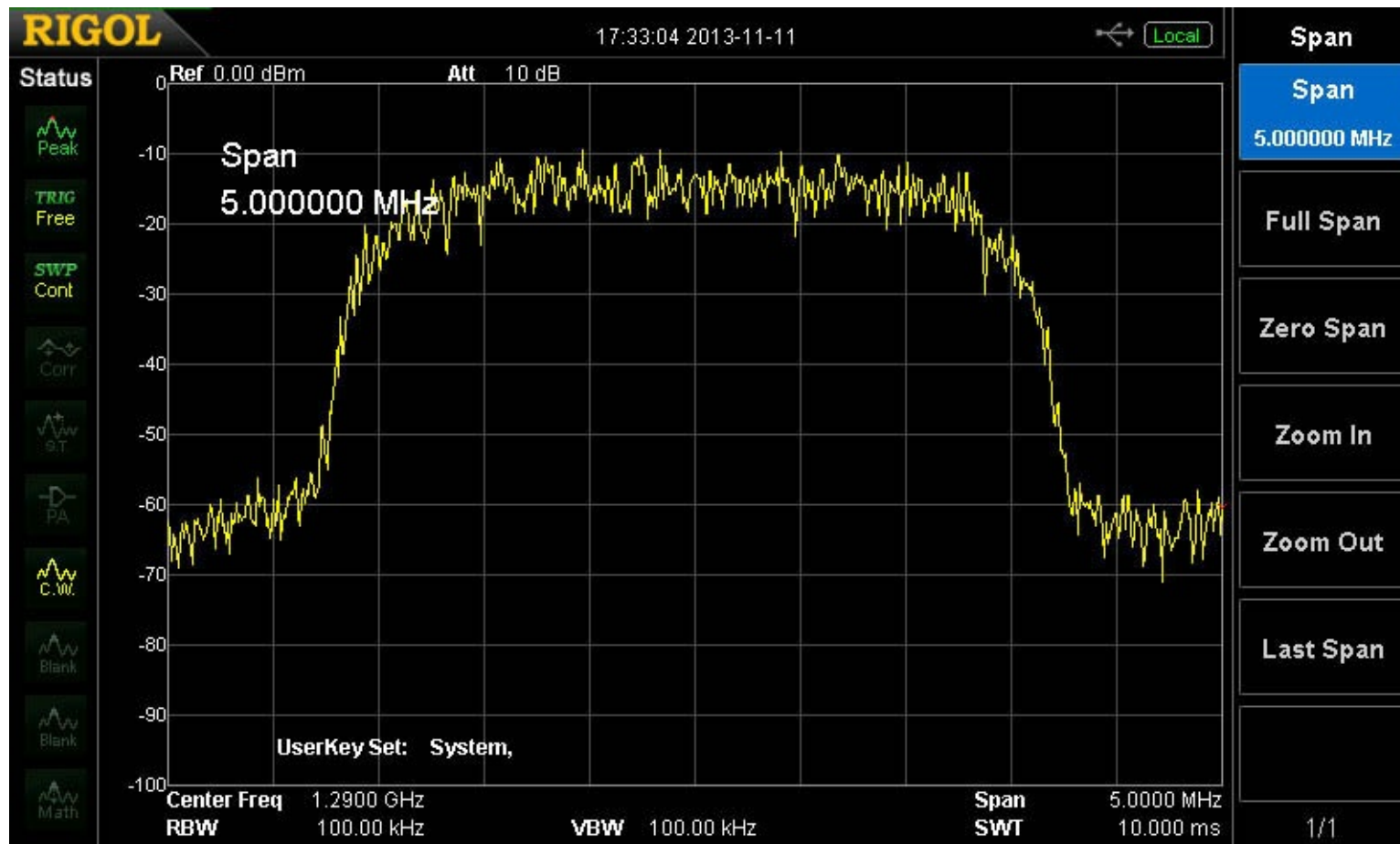
*Robbie used his HP Model 8559A Spectrum Analyser 0.01-to-21 GHz plug-in (installed in a HP 182T display) to determine the quality of the transmitted QPSK RF signals. Ken used his Rigol Model DSA815-TG Spectrum Analyser (0.01-to-1500 MHz) and compared RF signals.*



### **Figure 09 - Robbie-KB6CJZ inspects RF bandwidth with an HP spectrum analyser**

Both spectrum analysers were set to 1.290 GHz, @500 KHz per /div (horizontal) and a bandwidth at 30 KHz. RF input was set at 0 dB with a two inch sniffer on the HP and a direct input was used on the Rigol. Robbie checked the signals bandwidth which was reading about 3.5 MHz. The DVB industry literature explains that "allocated" RF bandwidth for a QPSK (DVB-S) signal is predicted as:

- $RF\ Bandwidth_{allocated} = 1.33 \times Symbol-Rate$
- $RF\ Bandwidth_{allocated} = 1.33 \times 2.5\ MSymbols/sec$
- $RF\ Bandwidth_{allocated} = 3.33\ MHz\ signal$



**Figure 10 - A close-up of the 1.290 GHz signal RF bandwidth on the Rigol spectrum analyser**

*So our measured bandwidth looked as expected. The signal looked clean and did not drop out (or even change much) when the video was removed. No out-of-band testing or other testing was performed. More test reports will come in later DATVtalk articles.*

## **Findings and Plans**

*The DATV station works like we had hoped it would work. The picture really is crystal clear. But, we need to still better understand computer display-density processing limitations when displaying DATV video. We will do more testing at various Symbol-rates and data-bit-rates. Then as a next step, we plan to amplify the RF output from 1 mW to around 10 W. Then we will do some cross-town distance testing.*

## **Contact Info**

*The authors may be contacted at [KB6CJZ@ARRL.net](mailto:KB6CJZ@ARRL.net) and [W6HHC@ARRL.net](mailto:W6HHC@ARRL.net)*

## **Useful D-ATV Links**

*AGAF D-ATV components (Boards) – see [www.datv-agaf.de](http://www.datv-agaf.de) and [www.AGAF.de](http://www.AGAF.de)*

*BATC info site for DTX1 exciter – see [www.DTX1.info](http://www.DTX1.info)*

*British ATV Club – Digital/DigiLite/DTX1 forums – see [www.BATC.org.UK/forum/](http://www.BATC.org.UK/forum/)*

*SR-Systems D-ATV components (Boards) – see [www.SR-systems.de](http://www.SR-systems.de)*

*Amateur Television of Central Ohio – see [www.ATCO.TV](http://www.ATCO.TV)*

*Orange County ARC entire series of newsletter DATV articles – see [www.W6ZE.org/DATV/](http://www.W6ZE.org/DATV/)*

*Yahoo Group for Digital ATV - see [groups.yahoo.com/group/DigitalATV/](http://groups.yahoo.com/group/DigitalATV/)*



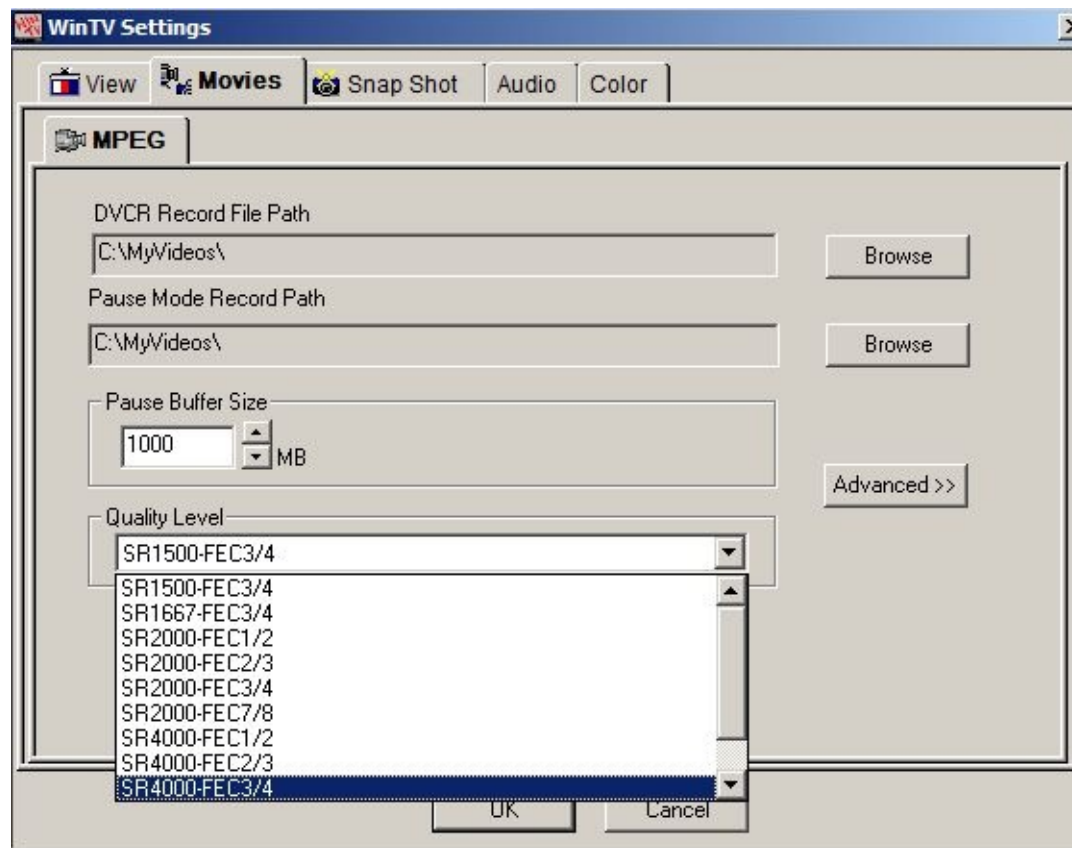
# ***Fixing WinTV v6 for DigiLite***

***Clive Reynolds G3GJA / G8EQZ***



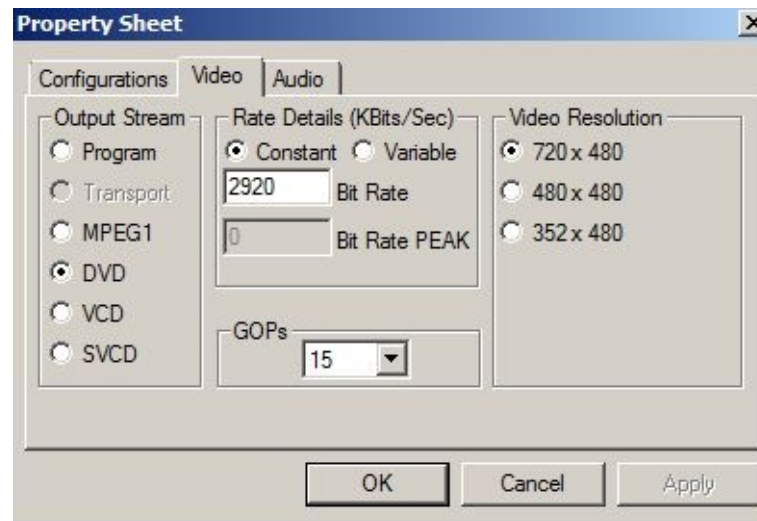
***Hauppauge!***

***H***aving got the DigiLite boards built for 23 and 70cms shortly after the launch I was soon looking for Hauppauge PVR-x50 and similar cards for the dedicated digital PC that I had available. A trawl on eBay netted a PVR-350 card complete with the WinTV v6 software on disk. While the card and software worked fine as intended I found that I was unable to use it with the DigiLite system because the WinTV v6 software would not remember the settings that controlled the symbol rate needed to match the DigiLite configuration.



***The record settings after registry modification***

*The settings area is found by clicking the preference button and then selecting the movies tab. You should be able to modify an existing setting or create a new one by clicking the advanced button and making the changes in the appropriate property sheets that are displayed but I could never get the program to save any changes.*



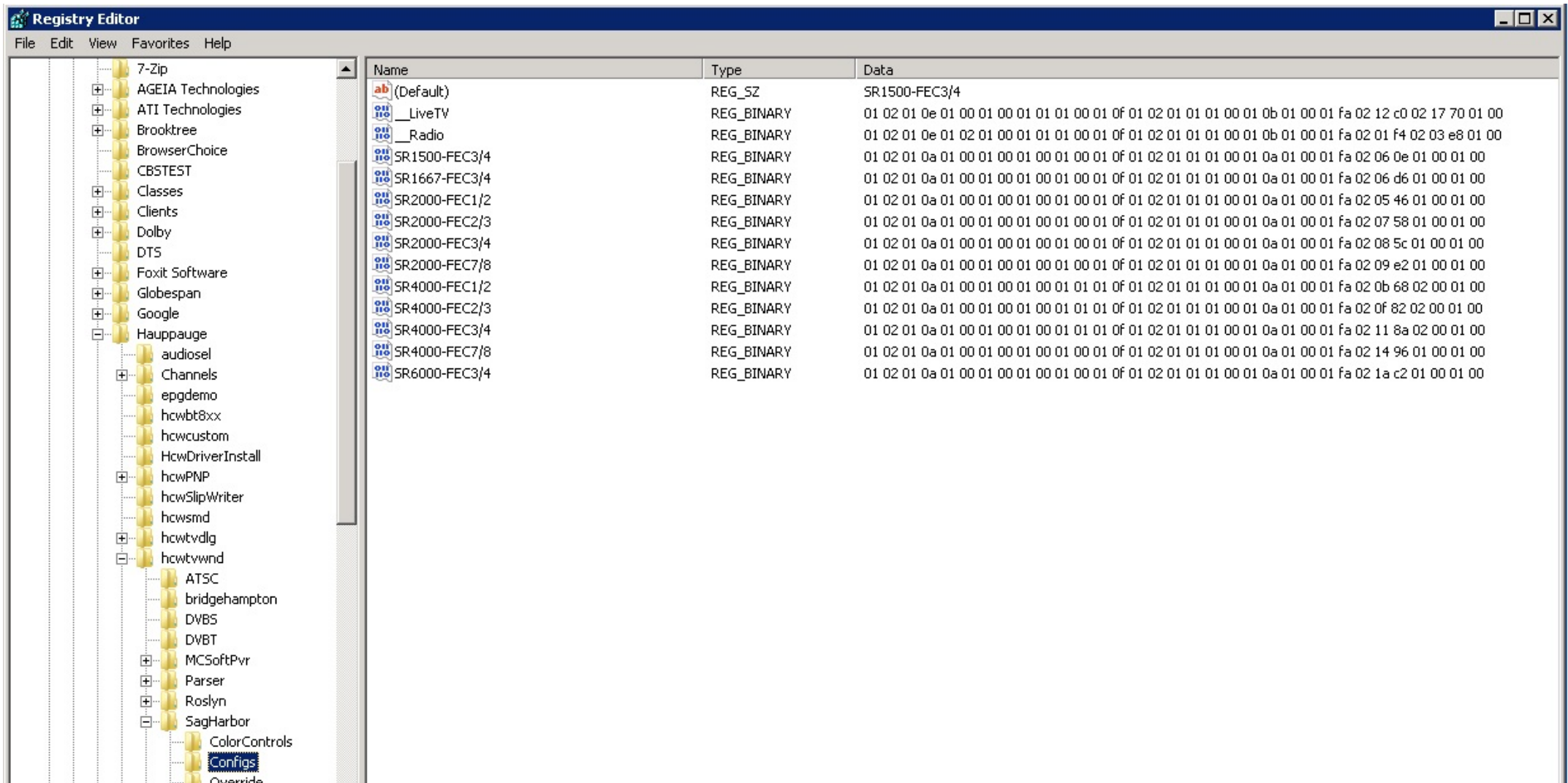
***The advanced video property sheet set up for 4MS/s with FEC ½***

*Whenever I went back to the same settings they had reverted to the default installed by the program. I also tried running the software on Windows XP and Windows 7 32bit and got the same result.*

*I also tried downloading WinTV v7 and got no further forward so I then tried the GB-PVR v1.47 software to control the card. This worked and it did allow me to get the DigiLite on the air but I found the user interface very clunky and it was real pain having to set up the record timer every time I wanted to transmit some DATV. In addition, it's not possible to set low symbol rates without manually editing an .ini file and then you have to be careful not to go into the configuration again or the program will crash.*

*I decided to have a look again at the WinTV v6 program again with a view to making it usable with DigiLite and started with looking for the registry entries that stored the recording parameters using the built in Windows registry editing program regedit.exe. The settings were found here:*

***HKEY\_LOCAL\_MACHINE\SOFTWARE\Hauppauge\hcwtvwnd\SagHarbor\Configs***

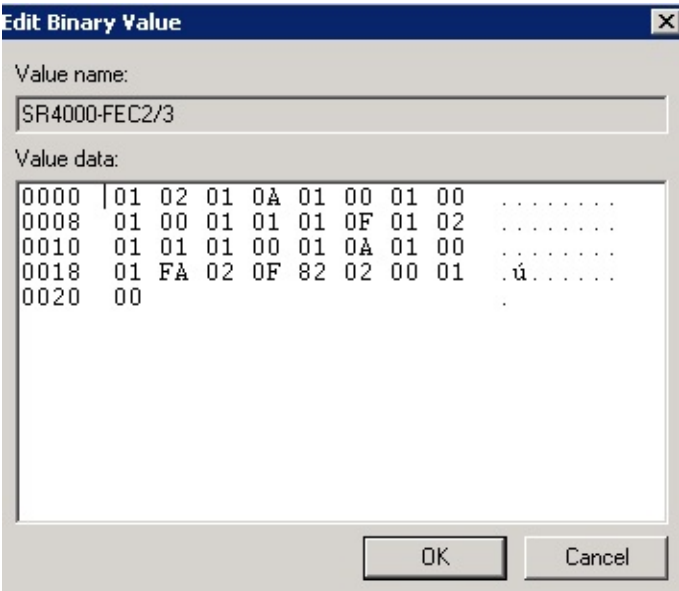


### ***A view of the modified registry entries***

*It's a good idea once you have found this key to save it before you do anything else in case you make a mess of the editing. Left mouse click the key to highlight it as above and then right mouse click it to bring up the drop-down dialogue box from which you choose export and store the key on your desktop with a meaningful name.*

*(A registry file to automate this process, WinTV6.reg is available from the downloads page on the CQ-DATV web site. <http://cq-datv.mobi/downloads.php>- ED)*

*The next stage was to find out what effect the values in the key entries had on the settings of WinTV. This was done by innumerable cut & try experiments and noting what changed. To keep it simple, I'll only detail the parts of the key that have a bearing on using the card with DigiLite. The binary keys for each setting are comprised of 33 two digit hexadecimal values in one long string.*

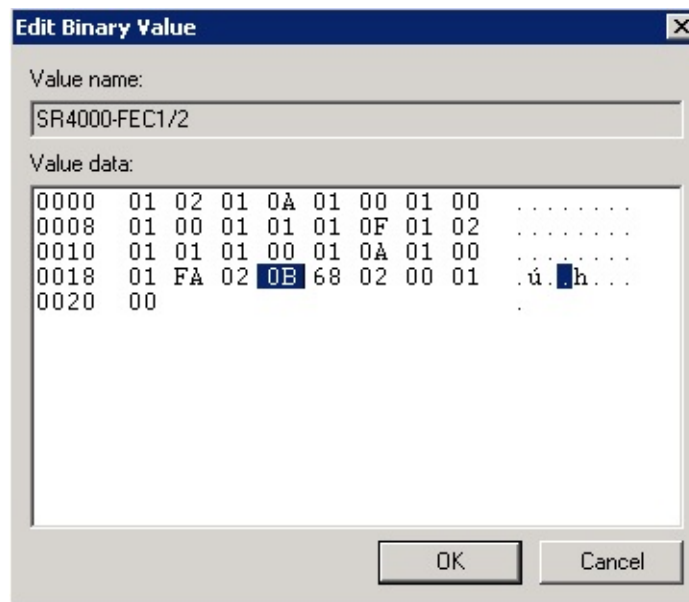


***The registry value modification window***

*In the table below I've included the hexadecimal position of the values in the key as that is the format used by the key editor that pops up when you modify the content shown above.*

Value Position¶ (Dec)¶	Value Position¶ (Hex)¶	Purpose¶	Setting for DigiLite¶	DigiLite Hex Value·¶
03¶	03¶	Sets stream¶	DVD¶	0A¶
07¶	07¶	Video Resolution¶	720·x·576¶	00¶
09¶	09¶	Variable/Constant Bit Rate¶	Constant¶	00¶
17¶	11¶	Audio Sample Rate¶	48kHz¶	01¶
21¶	15¶	Audio Bit Rate¶	192kHz¶	0A¶
27¶	1B¶	Video Bit Rate MSB¶	See below¶	See below¶
28¶	1C¶	Video Bit Rate LSB¶	See below¶	See below¶

*The hexadecimal values for the video bit rate must be worked back from the desired sample rate configured in DigiLite's configuration program. For example, the recommended video bit rate in the DigiLite configuration program for a 4000k symbol rate with FEC of 1/2 is 2920kbps. Converting 2920 to hexadecimal gives B68. You can use the calculator program in Windows to do this; just put in into programming mode using the view option and then enter the decimal value followed by clicking the hex button. The least significant bytes (LSB) are the rightmost two digits, 68. The most significant bytes (MSB) are B or 0B as it appears in the registry. When entering the value for the MSB value you must remember to add a leading zero if the value to be stored is a single digit as shown highlighted below.*



*To edit the value place the mouse cursor to the right of the value to be changed and double click. Remember you must enter two valid hexadecimal digits or you will mess up the whole string.*

*Here are some hexadecimal values for commonly used DigiLite symbol rates:*

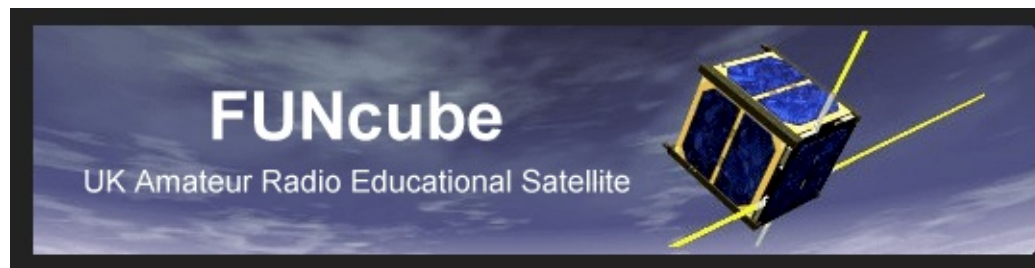
Symbol·Rate·kS/s¶	FEC¶	Video·Bit·Rate·kbps¶	Hexadecimal·value¶
2000¶	2/3¶	1870¶	074E¶
2000¶	3/4¶	2140¶	085C¶
2000¶	7/8¶	2530¶	09E2¶
4000¶	2/3¶	3970¶	0F82¶
4000¶	3/4¶	4490¶	118A¶
4000¶	7/8¶	5270¶	1496¶
1333¶	2/3¶	1180¶	049C¶

*Having made the changes to the registry, start WinTV and then check the settings in the preferences section and make sure that the video bit rates are correct by looking at the advanced property video page. If all is well you can now select the setting you want and then start WinTv v6 recording with a couple of clicks on the red buttons.*

*I have also made a registry export from my system available for download for those that don't want to run the risk of editing the registry themselves. You must have WinTV v6 installed and working as supplied before applying the download. To install it just double click it and follow the prompts to modify your WinTV v6 settings. Note that this will overwrite all recording settings in WinTV, including most of the factory defaults.*

*Please note that editing the registry or modifying keys can cause significant damage to your Windows installation and I accept no responsibility for any losses incurred as a result of your attempts to follow my instructions or using my registry export.*

---



*Thursday 21-11-2013 saw the launch of the AMSAT-UK FUNcube. The events was streamed from the National Exhibition Centre at Bletchley Park on the BATC streamer.*



*Would have loved some higher resolution pictures, from what appeared to be a single camera shoot using what I suspect is Vmix software judging from the strap lines which were very informative and kept all the viewers up to speed.*



*The sound track was at times missing and at best not informative of what was happening, but I think along with the other 200+ viewers I enjoyed the event and it was a chance to share the excitement with the AMSAT UK team from the comfort of my arm chair*



*Well done AMSAT UK and congratulations from CQ-DATV*

EPS				
ASIB				
RF				
PA				
ANTS				
SW				
Electrical Power Subsystem				
Latest update at: 2013-11-21 07:42:32 UTC				
Name	Value	Min.	Max.	
Solar Panel Voltage X	4035 mV	122	4382	
Solar Panel Voltage Y	3907 mV	134	4248	
Solar Panel Voltage Z	3633 mV	150	4142	
Total Photo Current	472 mA	1	501	
Battery Voltage	7886 mV	7389	7897	
Total System Current	123 mA	4	343	
Reboot Count	721	N/A	N/A	
EPS Software Errors	0	N/A	N/A	
Boost Converter Temp X	15 C	14	36	
Boost Converter Temp Y	14 C	13	35	
Boost Converter Temp Z	15 C	13	35	
Battery Temp	14 C	12	33	
Latch Up Count 5v1	0	N/A	N/A	
Latch Up Count 3.3v1	0	N/A	N/A	
Reset Cause	5	N/A	N/A	
Power Point Tracking Mode	1	N/A	N/A	

The FUN cube data is decoded and displayed at <https://warehouse.funcube.org.uk/>





# Internet Television

**By Trevor G8CJS**

*The Internet is virtually treasure trove for ATV, covering both ancient and modern pictures, stories and television broadcasts. let's start with some nostalgia from the 60's and what I think was the Hunstanton Bucket and spade rally, both these two pictures are from Mike G3TSO's archive, I think they sometimes make you wish we had not had all the technical advances in equipment as it all looks so much fun. There are many more at <http://www.qsl.net/g3tso/Pictures.html>*



**Amateur TV Hunstanton Rally 64 G6REH/T**

*The /T call signs also belong to a time well past. You had to have a separate license for ATV transmissions. If you were a G8 then you were allocated a G6\*\*\*/T mine was G6AGM/T. G3's were allowed to keep their call sign and just add the /T suffix.*



**G6REH/T camera - G3KPO Mic - G3MMs + XYL**

*Moving back to present day Ham Nation is a weekly broadcast, which goes out in the small hours of Thursday (2am in the UK) <http://twit.tv/hn> fortunately there are downloads of the programmes available on the site for those of us in different time zones. This is a programme that covers the latest in Ham radio and even Ham TV see <http://ke6bxt.com/TWiT.tv/episode12/index.php>*



## Don Hill (KE6BXT) Show Notes Episode 12



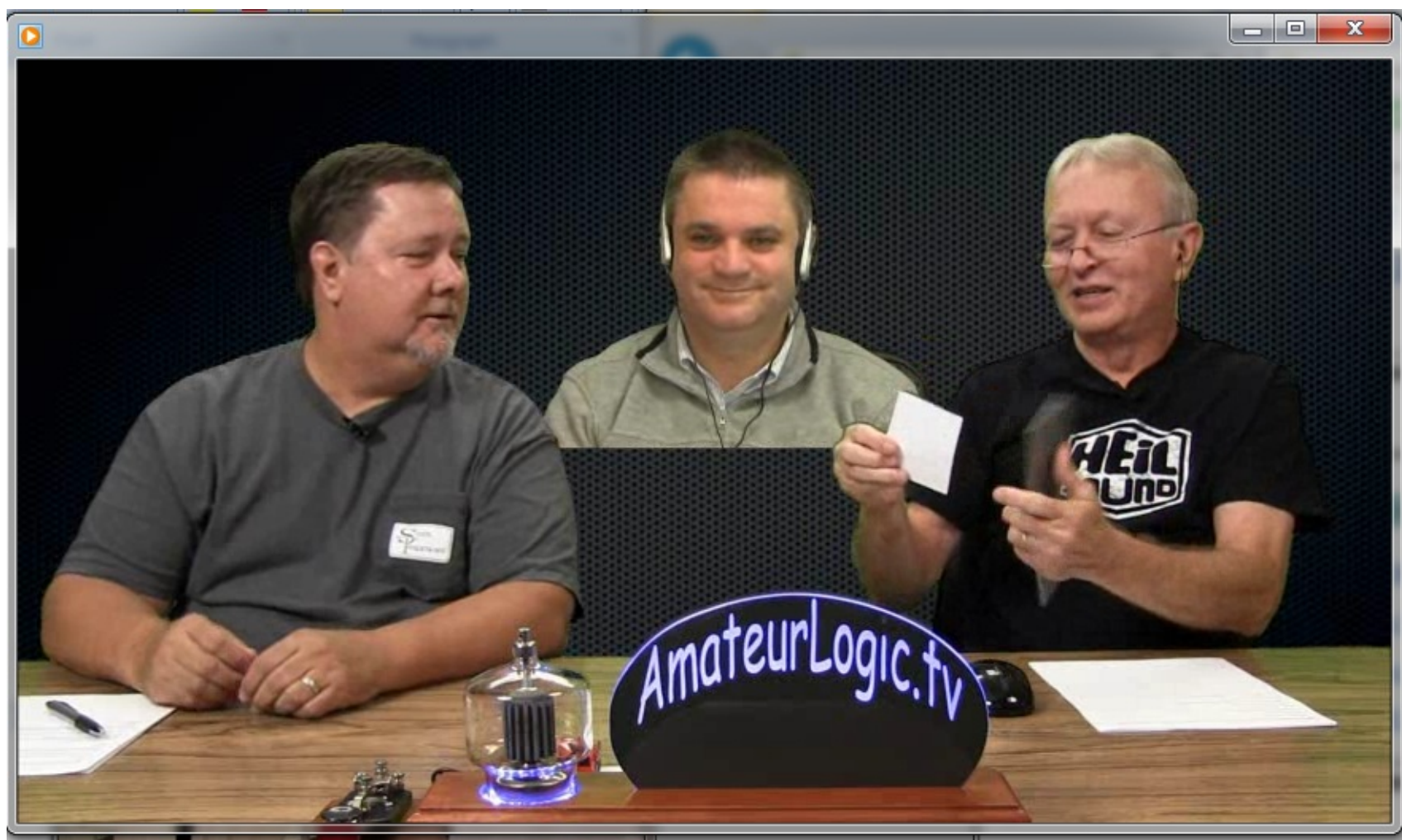
*It's a partnership between TWIT TV and Bob Heil K9EID so expect some advertising. Every episode has guests via the Internet or Skype and the whole show is very professionally packaged. His co presenter is Gordon West WB6NOA and ep12 is an interview with Don KE6BXT one of the big ATV shakers in the USA*

*Another of favourite is Amateur Logic <http://amateurlogic.tv/downloads.htm>.*



*Its presented by George Thomas W5JDX, Tommy Martin N5NZO, Peter Berrett VK3PB, the episode that stands out is EP 53 that covers how they make the programme, which is not easy with a presenter located in Australia.*

- *Episode 53 (High Def 1.42 GB)*
- *Episode 53 (Large 544 MB - H.264 - MP4 - iPod)*
- *Episode 53 (Large 359 MB -Windows Media)*
- *Episode 53 (Small 103 MB - Windows Media)*
- *Episode 53 (AUDIO Podcast 57.1 MB MP3)*



<http://arvideonews.com/hrn/> is the Site of Gary Pearce Gary used Kickstarter to raise funds to produce videos of the 2013 ARRL/ TAPR Digital Communications Conference in Seattle. TAPR is the showcase for the latest hardware and software advances in amateur radio and parts of it are now available in EP 99 on Gary's site



*No it's not an ATV set up but a great picture from IW6OCN who has a record of 438K on 23 cms ATV of 438K on 23 cms ATV.*



*Monitoring times is a new subscription eBook (what a good idea for a format) Gordon Bousman NW7D is*

*delighted about being able to read their copy on the move. I think the same goes for CQ-DATV readers  
Gordon see <http://www.monitoringtimes.com/readingMTonipad.pdf>*



*[www.batc.tv](http://www.batc.tv) is the BATC streamer, keep checking there are often live TV streams delivering interesting programs often at short notice. There are also member streams and repeater streams and you can watch 6 simultaneously. The RSGB news is also available live on Sunday morning*

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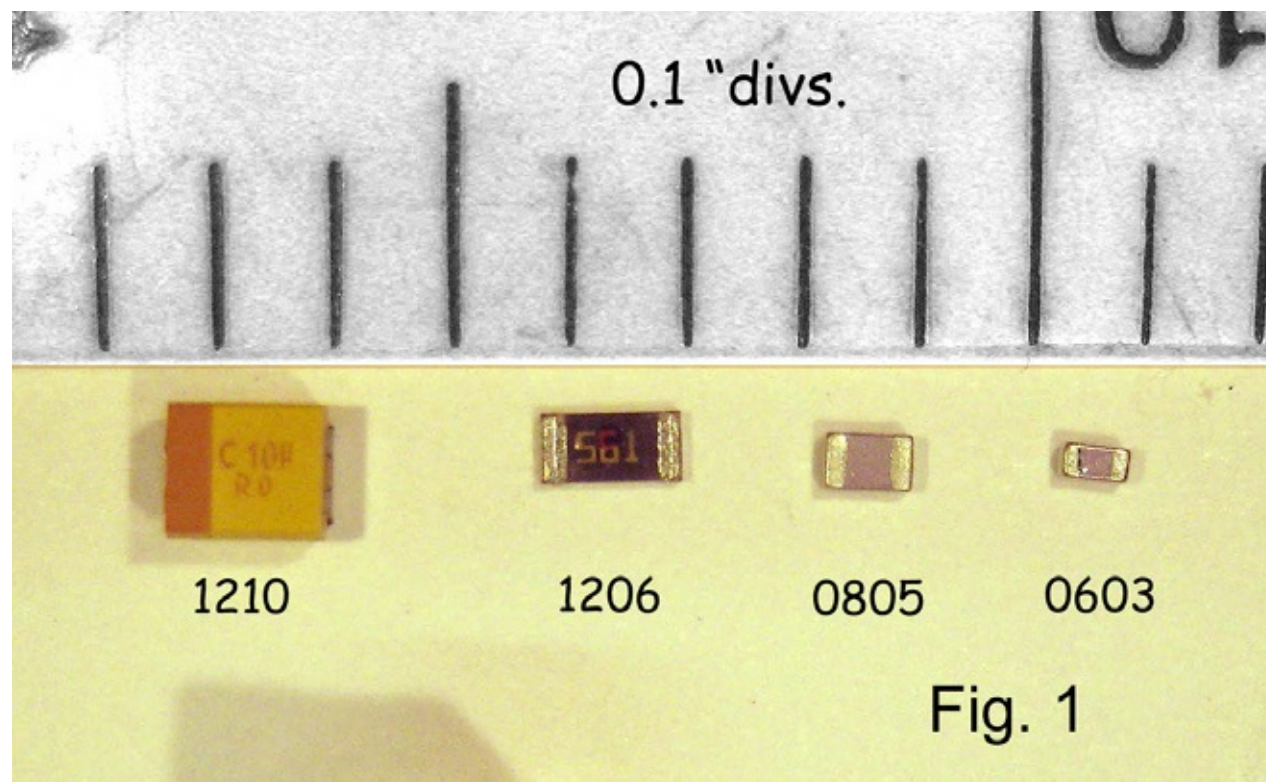
# Constructional Matters

**By Mike Cox**

*I have been asked to write a few words about construction of kit, particularly relating to the use of surface mount components. Let me take you back about 25 years when I was getting Cox Associates going. In my previous existence, we had embarked on a series of thin film modules for things like crosspoints, and dc restorers for use in switch matrices. As I no longer had access to this source of supply, the driver was to build our own. As we had to use a different circuit design, prototypes were built using conventional pcbs laid out to accommodate SM components.*

*Batches of these were made and assembled. The assembly method was crude – solder cream was laid down on the pads, the components were placed, and a Black and Decker paint stripper provided the reflow heat. One or two boards fried, but the majority worked. Our assembly sub-contractor, who was a tenant in our building, acquired an infrared reflow tunnel, and we were away. After a year or two, we got a thick film version of the crosspoint made.*

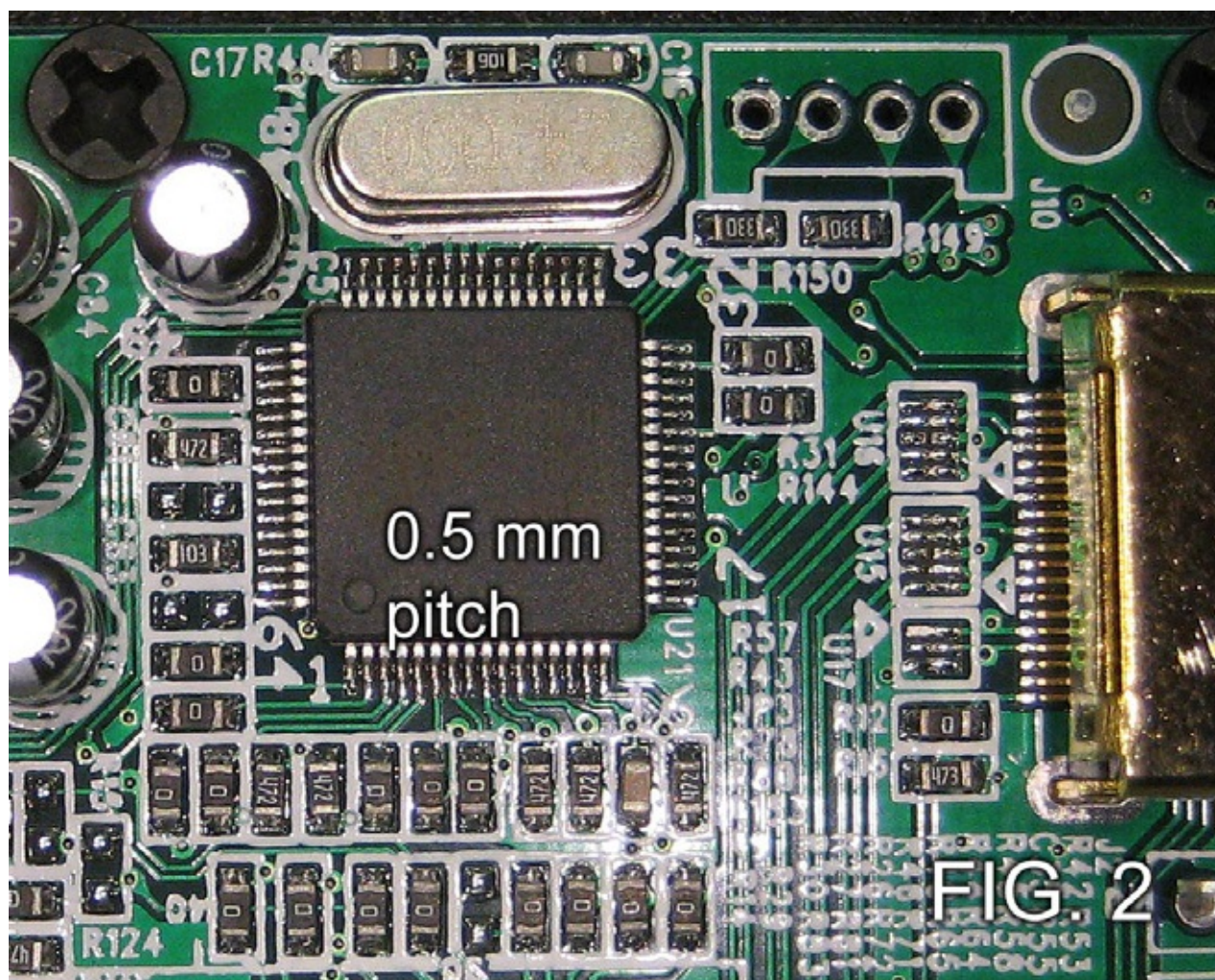
*That is all very well when one is making quantities of products using large numbers of pcbs. As a home constructor, life is more difficult. Component sizes are dropping, and whereas 20 years ago, the 1206 resistor was common, now 0805, 0603 and even 0402 sizes are common. It is becoming difficult to find stockists of 1206 resistors in all values.*



*I am grateful to Bernd Kaa, DG4RBF, who wrote an article in VHF Comms recently on this topic.*

*If you are presented with a pcb, with all components, you only have to assemble it. This can be done in several ways, depending on the soldering method you choose to use. If the board is well tinned, and your components are likewise, additional solder may not be needed. A suitable flux is that is needed for the tinning to flow and anchor the component to its pads.*

*If you use solder cream, then the cream has to be spread thinly onto the pads. The component then has to be carefully placed on the pads. The board is best kept flat and horizontal for this part. You do not have to place all components at once; it is better to place and solder a few at a time. Also leave ICs until later. For soldering, a small but hot bit is needed, [Some of the Weller Irons with appropriate bits are suitable] and a magnifying light is very useful, even a binocular microscope.*



*The object is to see what you are doing, and with 0.5 mm pad spacing, this is critical.*

*Note that the solder cream or solder you use should be lead free as most components these days are lead free. Likewise cored solder should be lead free, but if you are not selling the product, this is not essential. Melting point of lead free solder or cream is about 30 C higher than lead/tin solder, and will need a higher temperature soldering iron.*

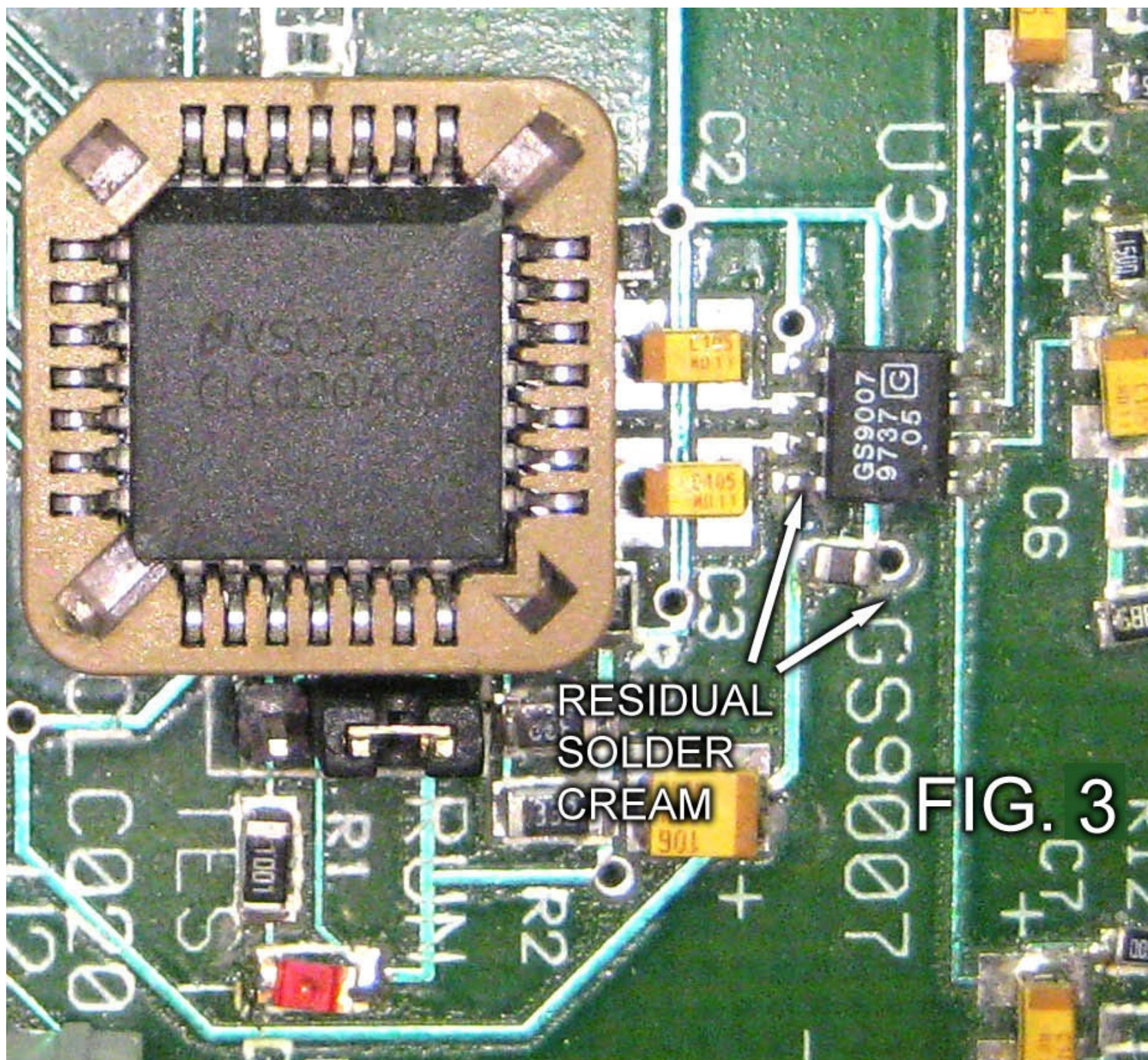
*This will deteriorate quicker than a lower temperature bit, and should not be left on when not being used.*

*It is worth experimenting with some bigger devices such as SOIC 14 or 16 pin ICs, and 1206 sized*

*components before attempting fitting a 0.5 mm multi-pin package. [Fig. 2 shows a typical 0.5 mm package in an HDMI splitter unit] You will have the better of me here because the finest [size] package I have fitted is the Gennum SDI 8 x 8 routing switcher, GX9533, which is a 100 pin package with 0.635 mm pin spacing, I also had to create the library shape for that one.*

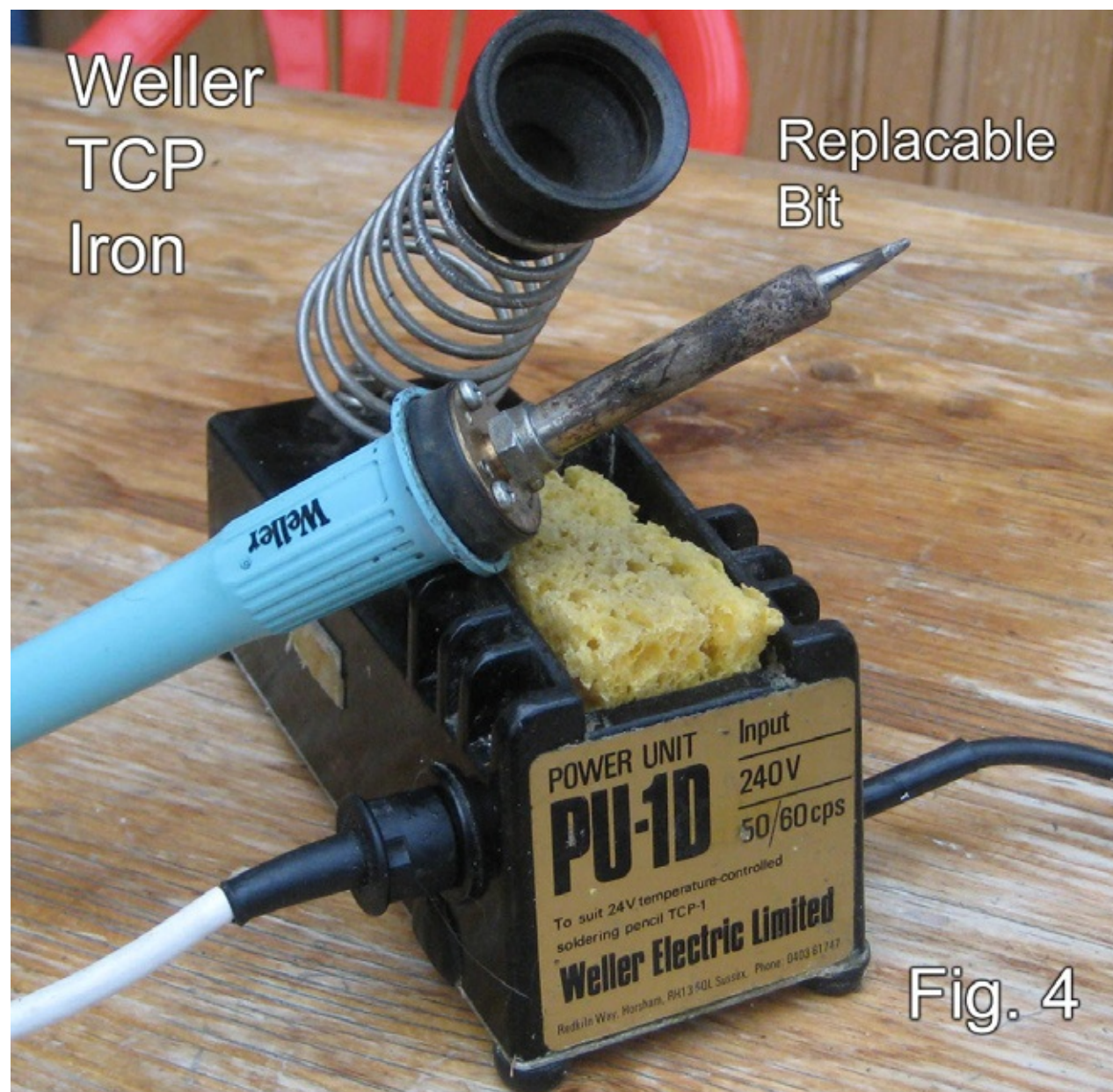
*If any one would like a bit of spare pcb with pads for larger devices to practice on, and perhaps one or two devices for fit, get in touch with me via the Editor, and I will see what I can do. Luckily a perusal of the Digilite Project parts list shows that most of the components are not the smallest. There are a pair of 0603 inductors, and some 0805 capacitors, but the rest are 1206 or larger.*

*One of the problems with solder cream is that the board frequently has a lot of very small globules of solder left on it that are difficult to completely remove. They probably won't do any harm, but they don't look very pretty.*



*Bernd gives a good tip [among many] to placing ICs. He suggests laying the IC over its pads, then soldering two pins at diagonal corners of the chip. This then anchors the chip, and you can then go on to carefully soldering the other pins.*

*He also makes some valid points about soldering irons, with advice not to use a very light iron, but one of the meatier Weller irons with a 0.8 mm bit.*

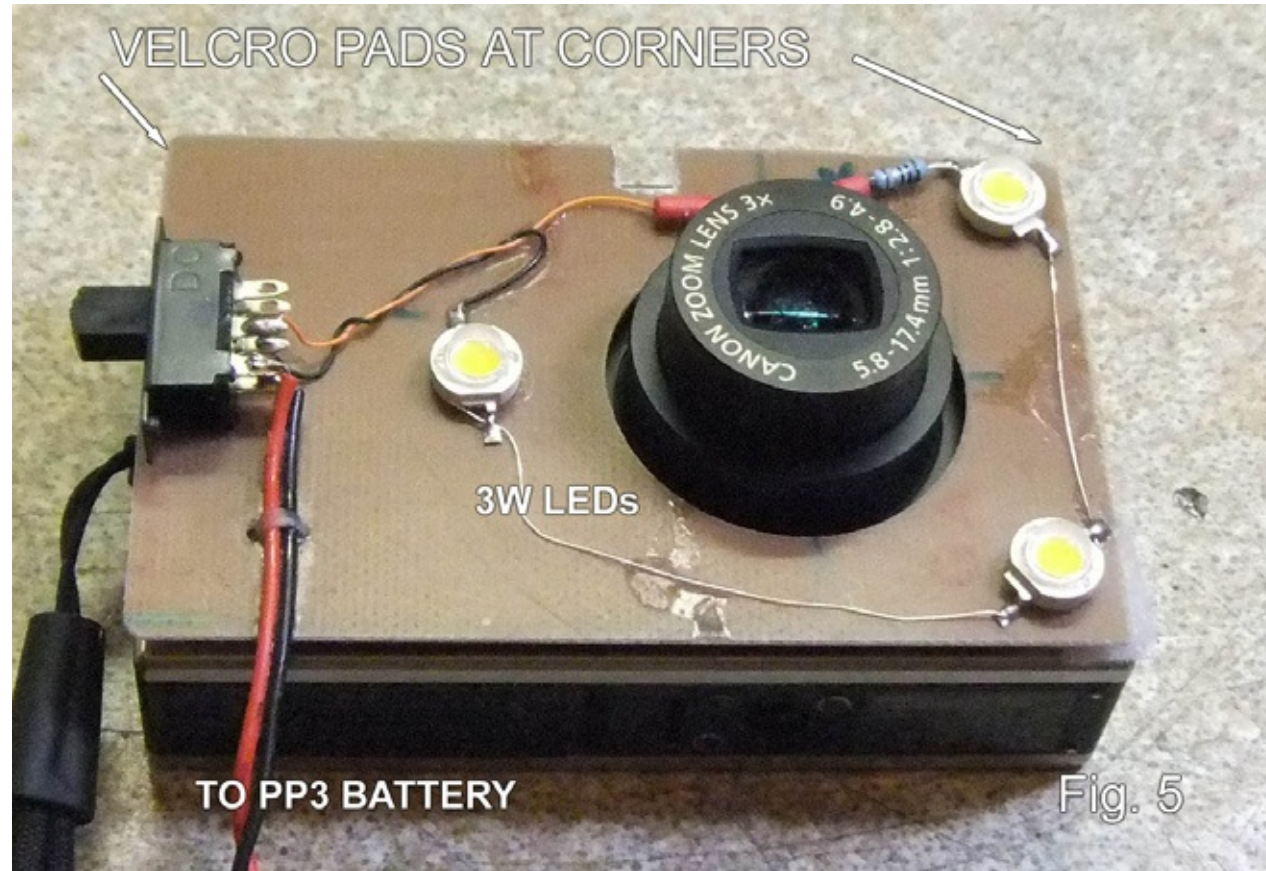


**Fig. 4 Weller TCP iron with PTF bit**

*The numbers on Weller irons indicate the temperature they work at; a -7 bit works at 3700 while a -9 bit works at 4800, a bit hot.*

*One of the things I did while preparing for this article was to make a "Poor Man's Ring Light" to use with my*

*Canon Ixus camera, which tends to be my workhorse. This has taken nearly 1900 pictures in the 4 or so years I have had it.*



*The ring light is built on a piece of 0.8 mm FR4 cu-clad laminate, with a hole for the lens. Fig. 5 shows the construction. Three 3W LEDs were used in series, with a PP3 battery for power.*

*At least two of the figures for this article were taken using it. The LEDs were "Super-Glued" to the laminate, as was the wiring and switch. "Velcro" pads at the corners anchored the panel to the camera.*

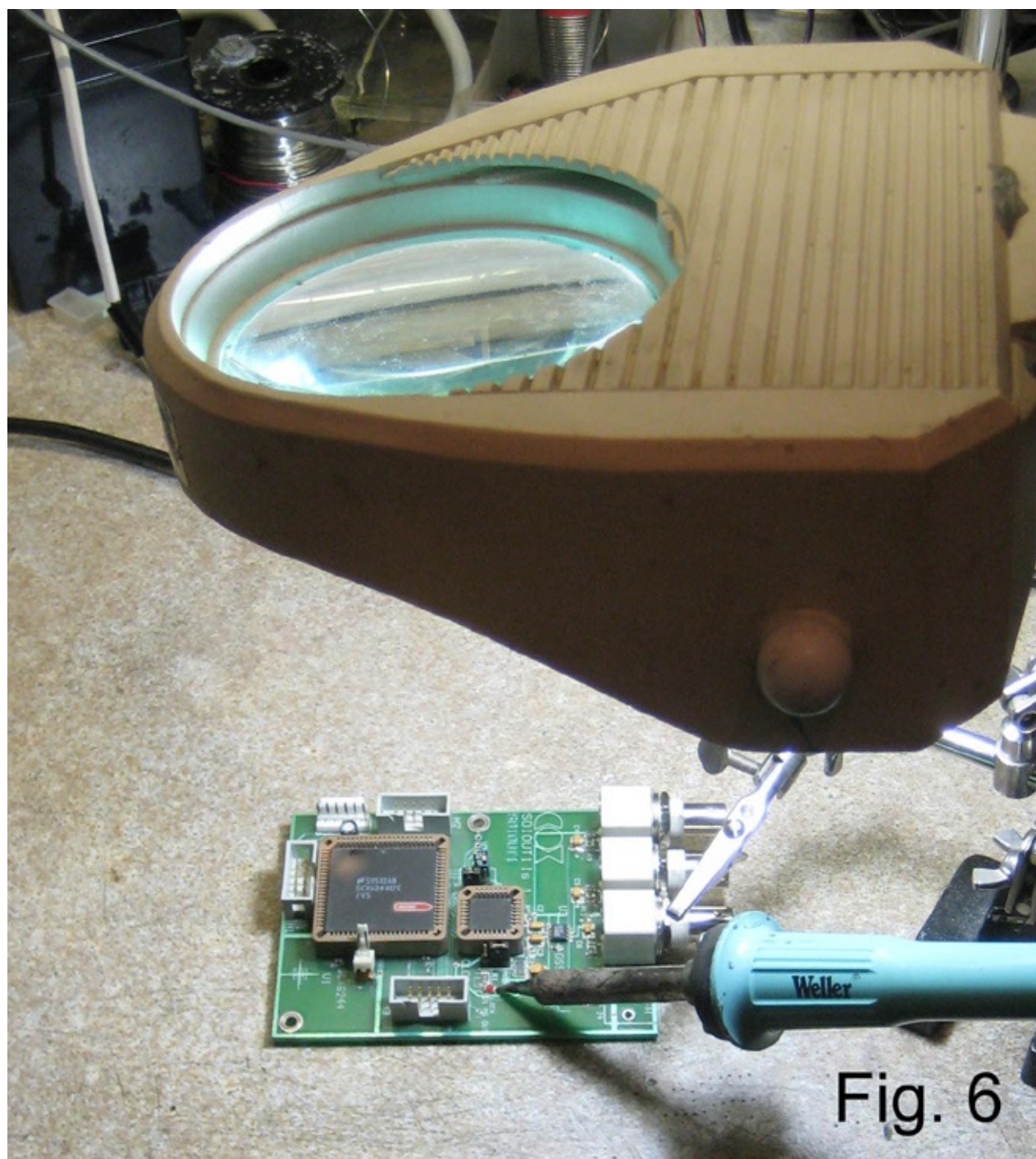
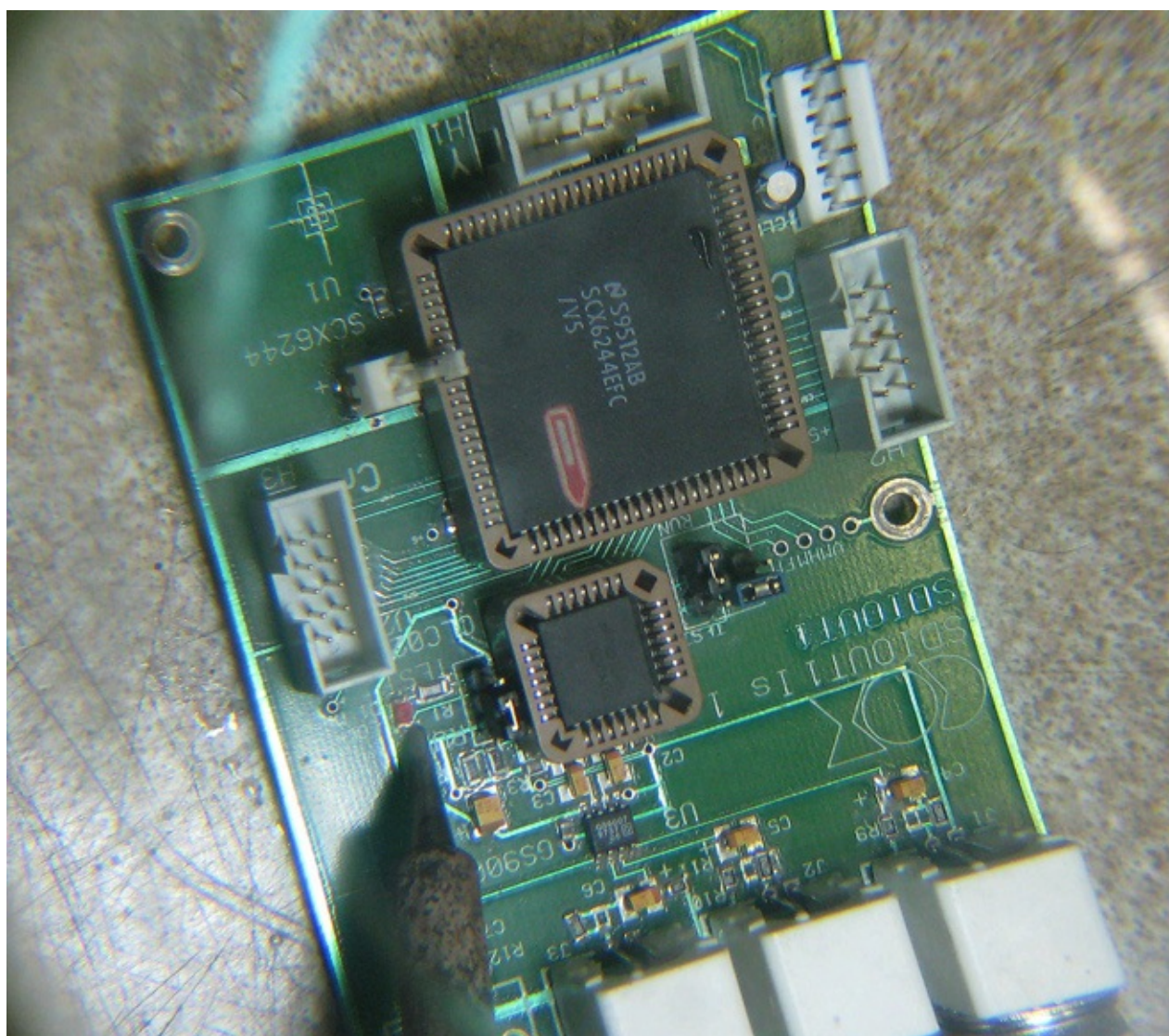
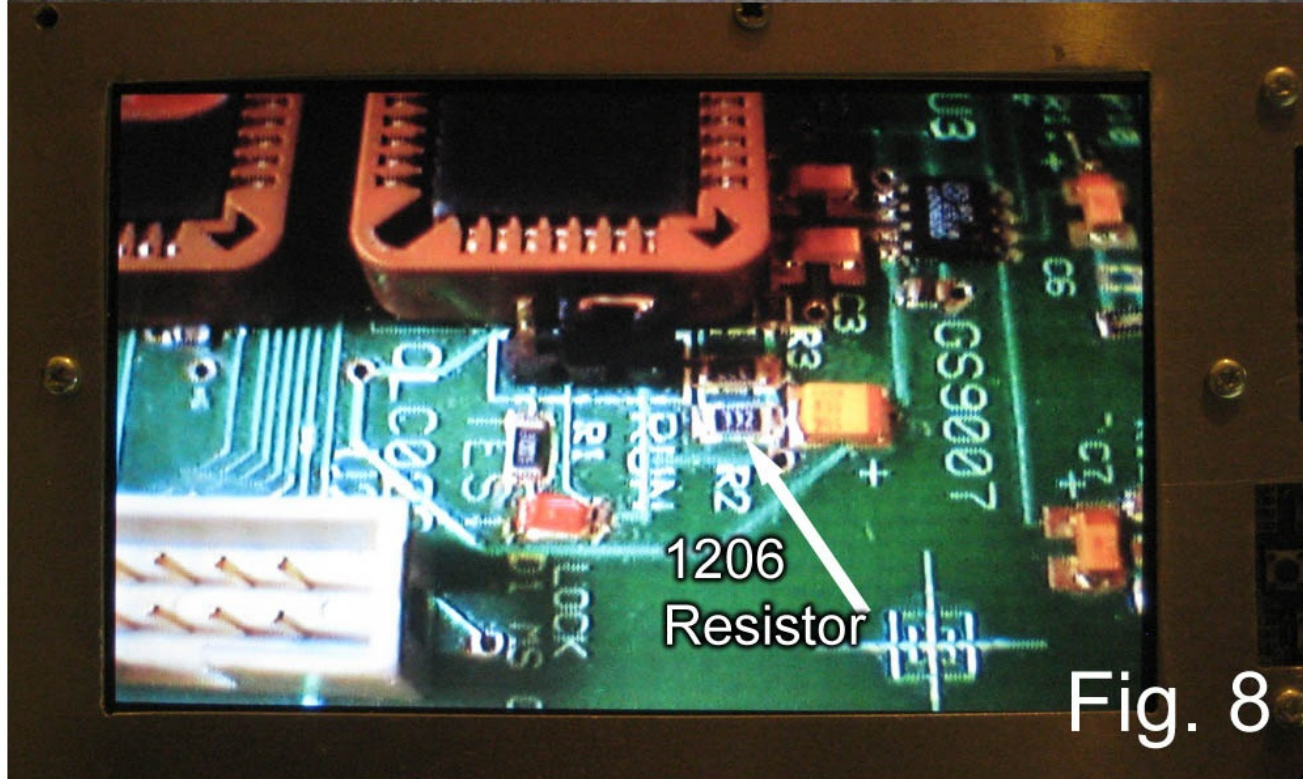
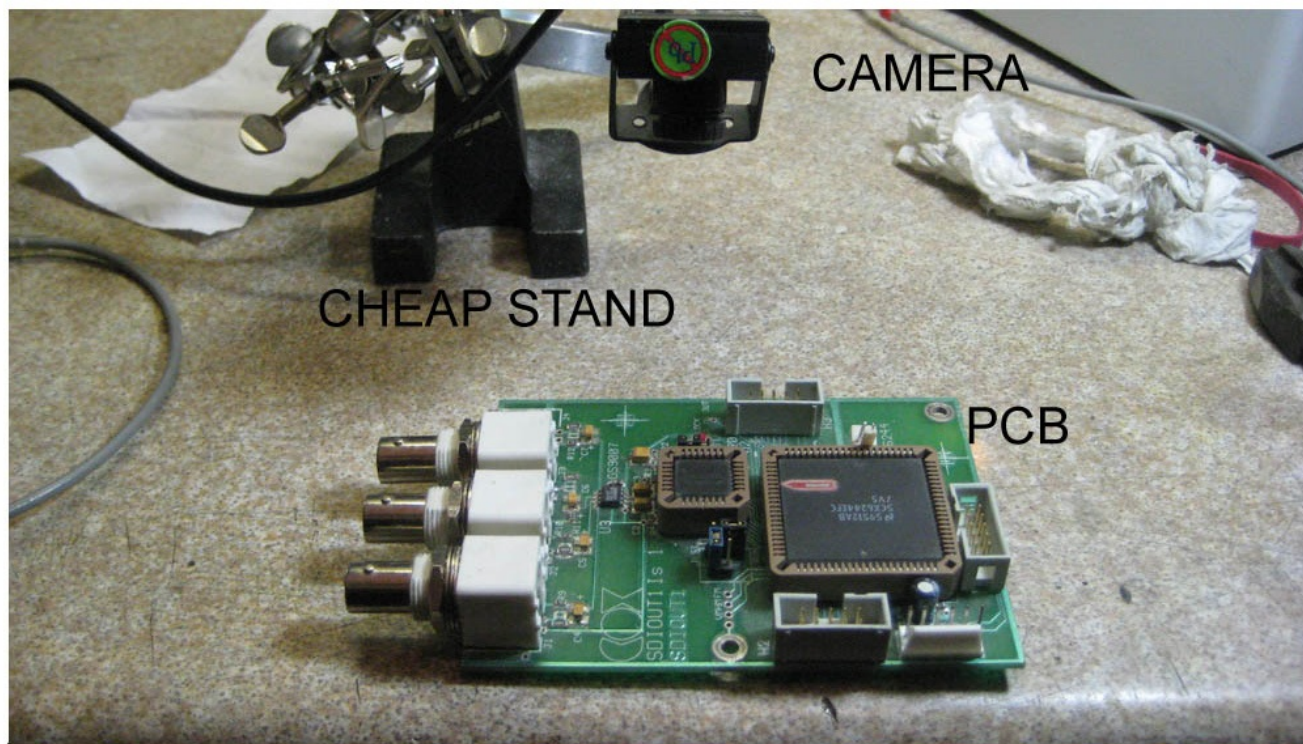


Fig. 6



***Fig. 6 & Fig.7 show a magnifier light in action.***

*I hope I have covered the salient points about placing SM components in this short piece. There are some golden rules:*



1. 1. Take your time.
2. 2. Be able to see clearly what you are doing
3. 3. Practice first on a scrap pcb.

*Good luck! I am off to get some flux from RS.*

## **List of suppliers**

### **A. FLUX**

*Farnell :- FL88 flux, 15 ml pen, order code 876732 @ £6.97 + VAT*

*RS :- RMA Solder Flux 9 g pen, order code 425-9379 @ £7.00 + VAT*

*Rapid :- SMF12P, 12 ml pen, order code 87-4426 @ £5.67 + VAT [Prices correct at time of writing, December 2011]*

*They will also stock Weller and other makes of iron, RS stock solder cream as well.*

### **B. Illuminated Magnifiers**

**RS** <http://uk.rs-online.com/web>

*A range from bench magnifier @ £29.40 [+VAT], order code 137-452, to a flexible magnifier @ £44.25 [+VAT], order code 137-480*

**Rapid** <http://www.rapidonline.com>

*Rapid's own @ £34.11 [+VAT] order code 86-3366, Long reach mag lamp*

*@ £358.24 [+VAT] order code 86-3333.*

**Machine Mart** <http://www.machinemart.co.uk/>

*I got my magnifier from here. They have many branches around the UK.*

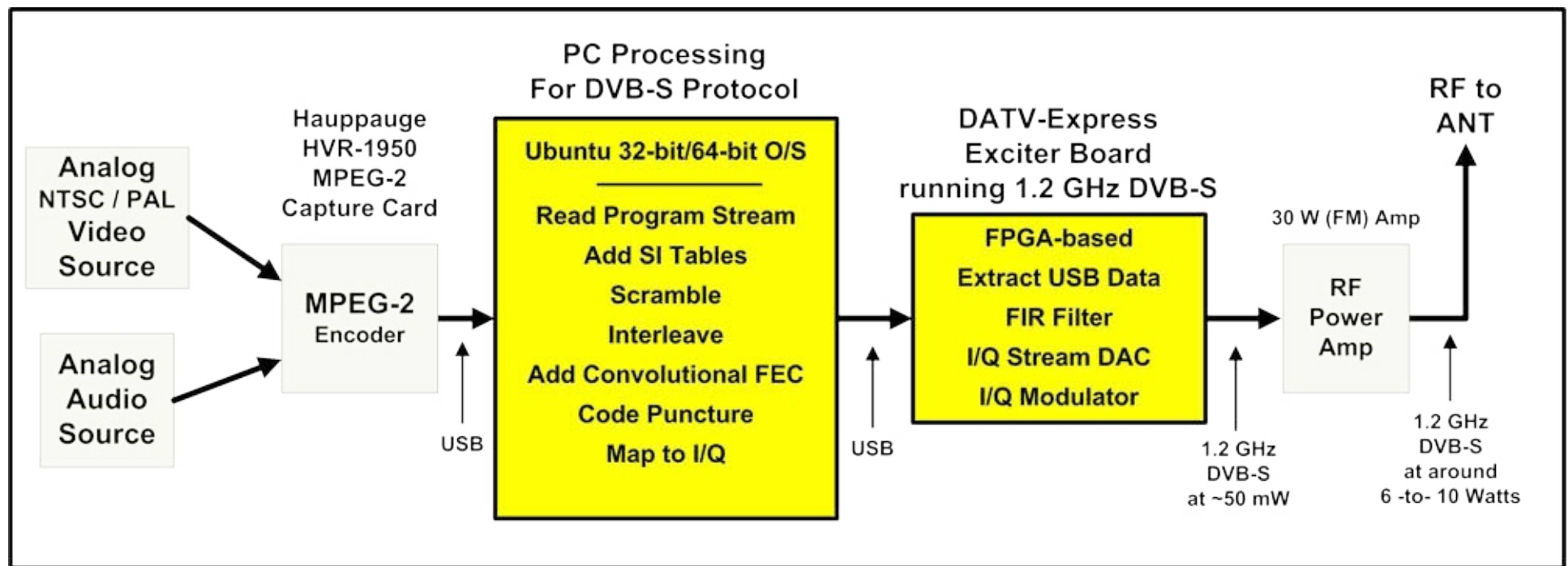
# ***DATV-Express Project – November update report***

**By Ken W6HHC**

**C**harles G4GUO released v1.08 software to the project team. The main change was to fine-tune and replace the "proof-of concept" v1.07 that had fixed the PCR clock-jitter problem that is caused by Hauppauge video-capture units (especially in linux). Also the organization of the GUI windows has been reorganized and is now more straightforward. Charles is working towards a final software clean-up effort before releasing the 32-bit and 64-bit software for production at the end of December. The production release of software will hopefully resolve a nagging I<sup>2</sup>C communications problem on initial startup. This I<sup>2</sup>C problem is being caused by the FPGA code design and will occasionally results in the need to power-cycle the board and restart the software.

Ken W6HHC continues to work on updating the USER MANUAL. The latest PDF draft (now 24 pages long) has now been uploaded to the project website. When Ken tested the new v1.08 software he discovered that his ancient (but trustworthy) P4 CPU running at 1.8 GHz was no longer fast enough to run the software with the new design that re-calculates the PCR clock. He partitioned his newer Win7 notebook (3 GHz dual-core CPU), loaded the ubuntu V12 LTS OS and now the v1.08 transmitter works perfectly.

Art WA8RMC reports that all production boards that he has ready for production sales, test with at least 17.5 dBm (around 55 mW) of RF output. This means the board can directly drive 30W RF amplifiers (30W FM rating like DownEast 2230PA for 1.2 GHz).



**Typical System Block Diagram running DVB-S on 1.2 GHz**

Art has recruited Bob N8NT (from the ATCO club) to help set-up the [www.DATV-Express.com](http://www.DATV-Express.com) website. The web site will be "under construction" for a few more weeks, so we ask you to be patient. The PayPal payment method has been tested and you can download a PDF draft of the USER MANUAL from the web site (click on "DATV-Express Progress" link on left-hand frame at HOME) today. Anyone wanting to help improve the basic product software is welcomed. Art explains that as an encouragement, we are asking for a US\$200 purchase donation (including shipping) which is our cost. Contact G4GUO directly if you are interested programmer and he will provide you with a "PromoCode" to enter...we still have two more pre-production boards reserved for early programmers that can ship today. After that we would like to market the complete board to ATVers at about US\$300 plus shipping. Our goal is to not make a profit on this project but only recoup our production/parts costs in order to provide a low cost entry into DATV for Hams. The goal for the team is to 'begin taking production orders in January and then shipping immediately'.

Questions are welcome.

**"Full speed ahead"...de Ken W6HHC** [W6HHC@ARRL.net](mailto:W6HHC@ARRL.net)



# ***Caption contest***

***Just for fun....***

***Last issues picture is shown below.***



"MMM....The instruction say fit an SMA plug ?" - John G3RFL

*"I said RG59, I want be there when you fit the BNC connectors" - Trevor*

*"Three guys set out to test worlds largest Hula Hoop on roof top" - Mike G7GTN*

*"New designer range of ladies larger hoop ear rings soon available" - Mike G7GTN*

*"The plug on the end. ? It's a BNC." - G8KZN*

*And the winner is .....*

*G8KZN - congratulations.*

***This issues picture is shown below.***



Please send your entries to [caption@cq-datv.mobi](mailto:caption@cq-datv.mobi)

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*If you have an eBook reader that has WiFi then you will be able too providing you are in a WiFi zone.*

*But if you have a Kindle 3G then yes, but only to Amazon, and there is not a lot of ATV material on their site.*

*Smart phone reading apps are ok providing that you have a 3G data connection.*

**Note: These links will fire up your devices browser and if you are using 3G/4G then you will incur data usages charges.**

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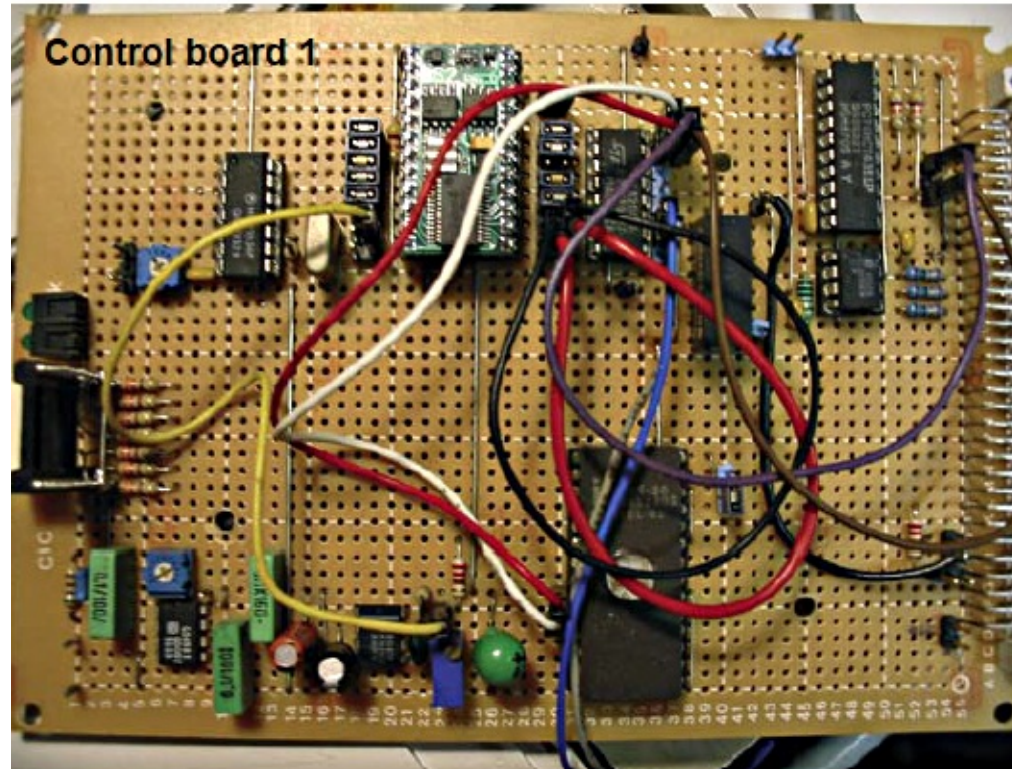
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## Coming up in CQ-DATV

**P**art 2 of Richards 'Digital World' series.



***Don't miss this issue***

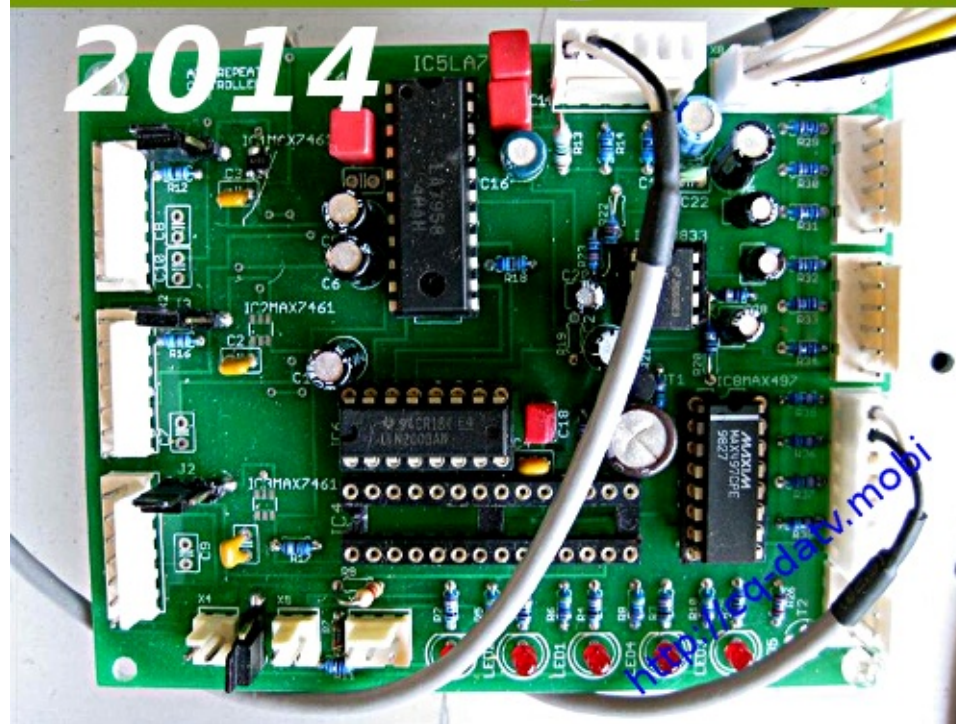
# CQ-DATV

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## Issue 8 - February

### 2014



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