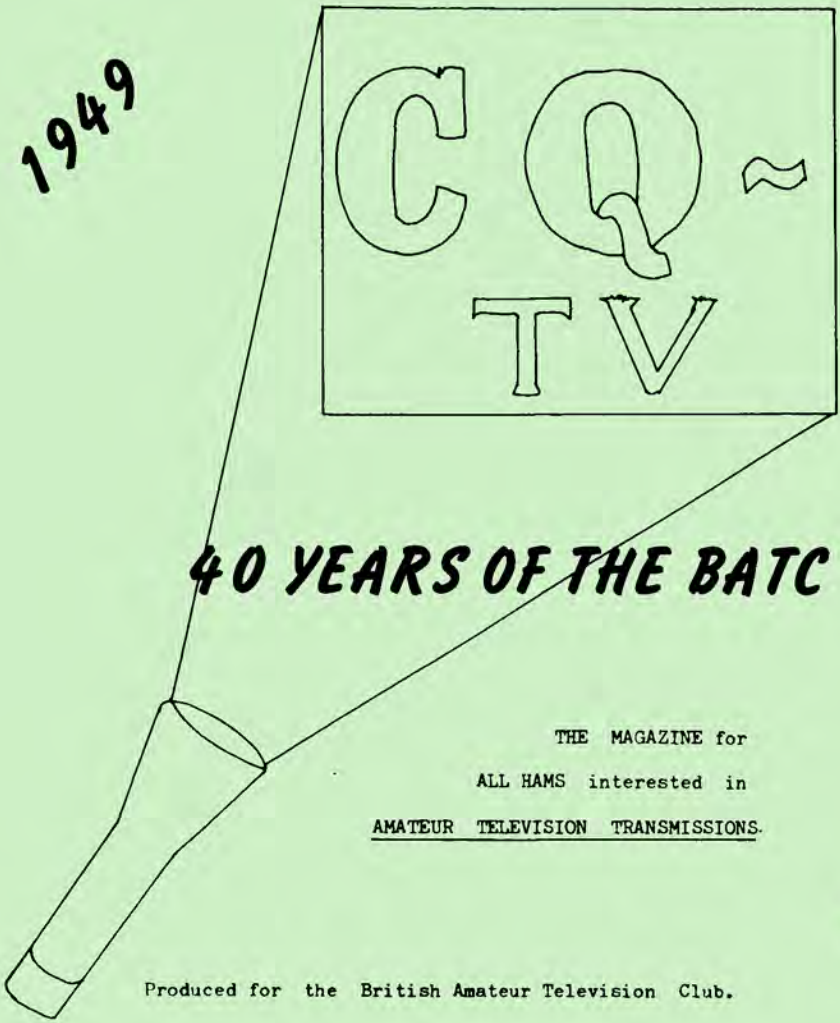
CQ-TV MAGAZINE No.146

BRITISH AMATEUR TELEVISION CLUB

MAY 1989

1949



40 YEARS OF THE BATC

THE MAGAZINE for
ALL HAMS interested in
AMATEUR TELEVISION TRANSMISSIONS.

1989

Produced for the British Amateur Television Club.

COMMITTEE

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TREVOR BROWN G8CJS - Chairman

PAUL MARSHALL G8MJW - Secretary

BRIAN SUMMERS G8GQS - Treasurer

DAVE LAWTON GØANO - Membership

IAN PAWSON G8IQU - Publications

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BOB PLATTS G8OZP - Contests

PETER DELANEY G8KZG - Member's Services

JOHN WOOD G3YQC - CQ-TV Assistant Editor

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MEMBERSHIP

FULL YEAR: Subscription to the club is £6 per year. All subscriptions fall due on the first of January. Membership application forms are available by sending a stamped addressed envelope to Dave Lawton, whose address may be found on page-2 of this issue.

OVERSEAS MEMBERS are asked to send cheques bearing the name of the banker's London agent. Postage stamps are not acceptable as payment. Overseas airmail is extra - please enquire from Dave Lawton or see the rates list with your last subscription reminder form.

The British Amateur Television Club is affiliated to the Radio Society of Great Britain and has representatives on the committee of the European Amateur Television Working Group.

The BATC is registered under the DATA PROTECTION ACT - all queries to Dave Lawton, and VAT registered - number 468 3863 01.

CQ-TV is produced by the British Amateur Television Club as its official journal and is sent free to all members. It is not for general sale.

Articles contained in CQ-TV magazine may be quoted by non profit-making organisations without prior permission of the Editors, provided both the source and author are credited. Other organisations may obtain permission in writing from the Editor

The BATC maintains many pages of news and information associated with amateur television on the Prestel Information Service. Club pages may be found within the ClubSpot section and full details were last published in CQ-TV 134. Copies of the article (two pages) may be obtained from the Publications department.

CONTENTS

CLOSE FOR PRESS DATE FOR THE NEXT ISSUE ..... 20th JUNE 1989

WHO TO WRITE TO

Members of the BATC committee are available to help and advise club members on any ATV related subject. Remember that all such work is done in spare time so please try to keep such queries to a minimum.

CLUB AFFAIRS; video tape library; technical queries, especially related to handbook projects: TREVOR BROWN G8CJS, 14 Stairfoot Close, Adel, Leeds LS16 8JR. Tel: (0532) 670115

MEMBERS SERVICES - PCB's; components; camera tubes; accessories etc. (other than publications); queries related to such supplies: PETER DELANEY G8KZG, 6 East View Close, Wargrave, Berkshire RG10 8BJ. Tel: (07352) 23121

MEMBERSHIP - Anything to do with membership including new applications; queries and information about new and existing membership; change of address; non-receipt of CQ-TV; subscriptions; membership records; data protection; Prestel: DAVE LAWTON GØANO, 'Grenehurst', Pinewood Road, High Wycombe, Bucks HP12 4DD: Tel: (0494) 28899

GENERAL CLUB CORESPONDENCE & LIBRARY - Any general club business. Queries relating to the borrowing or donation of written material. PAUL MARSHALL G8MJW, Fern House, Church Road, Harby, Nottinghamshire NG23 7ED: Tel: (0522) 703348

PUBLICATIONS - Anything related to the supply of BATC publications. IAN PAWSON G8IQU, 14 Lilac Avenue, Leicester LE5 1FN. Tel: (0533) 769425

EXHIBITIONS AND RALLIES - also arrangements and information about lectures and talks to clubs; demonstrations etc: SITUATIONS VACANT - any volunteers are asked to contact Paul Marshall.

CLUB LIAISON - and anything of a 'political' nature; co-ordination of ATV repeater licences: GRAHAM SHIRVILLE G3VZV, The Hill Farm, Potsgrove, Milton Keynes, Bucks MK17 9HF. Tel: (0525) 290 343

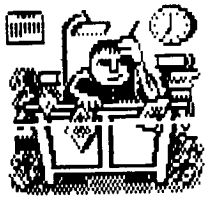
TVI & RADIO INTERFERENCE - problems of this nature to: Les Robotham G8KLH, 38 Ennerdale Avenue, Stanmore, Middx. HA7 2LD. Tel:(01 907) 4219 (not committee).

CQ-TV MAGAZINE - Anything destined for publication in CQ-TV magazine or forthcoming BATC publications. Articles; review items; advertisements; other material. EDITOR: Mike Wooding G6IQM, 5 Ware Orchard, Barby, Nr. Rugby CV23 8UF Tel: (0788) 890365.

CQ-TV ASSISTANT EDITOR - Alternative destination for CQ-TV material and queries on the content of past issues. JOHN WOOD G3YQC, 47 Crick Road, Hillmorton, Rugby CV21 4DU. Tel: (0788) 69447

CONTESTS - Bob Platts G8OZP, 8 Station Road, Rolleston-on-Dove, Burton-on-Trent. Tel: 0283 813181.

Where possible it is better to telephone your query rather than write. Please do not call at unsocial hours. As a guide, try to call between 6.30 and 9.30pm evenings and not before 11am at weekends.



POSTBAG

'A LITTLE BIT OF NONSENSE'

Dear Ed,

greetings and all the usual sycophantic comments regarding CQ-TV.

Having considered the article 'A Little Bit Of Nonsense' in CQ-TV 145 I offer the following solution: the circuit is in fact a face-saving caption and music inserter for use by contest stations.

Imagine the scenario, you are in the middle of working the best Dx you have ever heard of, surely the contact to win you the contest. Anyway, you are desperate to answer a call of nature, and the distant station is bemoaning the fact that he has only read the first two numbers so far. What do you do? Simple, switch in the PSG unit which relays a message from your micro saying 'normal service will be resumed as soon as possible'!

Yours, Carey Windeatt G1JVQ.

No apologies for applying the editorial red pen Carey, don't ring us we'll ring you!

'SCOPE TUBE?

Dear Ed,

I have recently come across an oscilloscope tube and wonder if anyone has any information on it. It is a CV2301, also known as a 902A, and made by GEC/M-O Valve Co.

I am also curious to know what it might have been used for, as the electrode structure appears to be of a reinforced nature.

M.McDermott G6NAD, 91 Hargwyne Street, Stockwell, London, SW9 9RH.

AWARDS NEWS

Dear Ed,

no awards news this time as none have been issued. However, I will be at Coventry for the convention and will have with me certificates etc. So, anyone can claim an award on the day if they bring along their claim.

73 Bob G8VBA.

NEWS ROUNDUP

ATV TO BE SEEN AROUND THE WORLD

The following is an extract from a news report which appeared in the January 1989 issue of 'Amateur television Quarterly'.

'ATV coverage of the Pasedena Tournament of Roses Parade will be available to hams, TVRO owners and cable subscribers throughout the western hemisphere. The behind-the-scenes video coverage will be provided by the Southern California ATV'ers, and is likely to be simultaneously uplinked over the Galaxy-2 satellite at 74 deg's west on transponder 5.

Anyone with a working TVRO receiver should be capable of receiving good quality colour pictures from this satellite, from anywhere in the western hemisphere.

Some 35 ATV'ers will be operating a dozen fixed, mobile and portable ATV stations along the five-mile parade route. they will be transmitting through a portable ATV repeater and several microwave links to four monitoring sites, each with numerous monitors. It is hoped that this experiment will inspire others to extend their public service capabilities into the exciting world of amateur television.'

MEMBERS' SERVICES

Delivery of stocks of the G3WCY Scan Converter boards have been delayed to an unspecified date. Members who have these PCB's on order are assured that they will be despatched as soon as they are available. Members wishing to order these boards are advised to contact Member's Services to check on availability before ordering.

The supply of other items is from a different source and is not affected.

BATC Members' Services does not hold stocks of BATC publications and vice versa. Please note that only the items listed in the CURRENT 'Services for Members' leaflet are available. A description of most of the various PCB's and components can be found in CQ-TV 140 onwards.

To avoid delay and inconvenience please be careful to include the correct amount of VAT with your order, i.e: 15% of the total goods AND postage (unless an overseas member). Payment should be by cheque or crossed postal order in favour of the BATC. Please DO NOT send cash or postage stamps.

Batches of callsign badges are sent to the engravers once per magazine cycle. Please ensure that your order reaches BATC Members' Services by the CQ-TV close-for-press date given in each issue at the foot of the contents page. Badges are distributed as soon as they have been engraved.

24CM PRE-AMPLIFIER

The Severnside Television Group are offering for sale at £48 a high sensitivity, low noise pre-amp for 24CM. Further details can be obtained by contacting Shaun Sullivan G8VPG 15 Witney Close, Saltford, Bristol, BS18 3DX.

EUROCHEQUES

Dave Lawton, our Membership Secretary, wishes to remind members who pay their subscriptions etc. using Eurocheques that there is a new format for the cheque. The new cheque is recognisable by the change to the pattern at the left hand side adjacent to the EC logo. The pattern has changed from the straight edged version to a half flower petal design.

Please note that the old style cheques are no longer legal tender.

More requests from our Dave. Firstly, would overseas members please ensure that their membership renewals are received by Dave before december 1st each year. This will help to alleviate delays in the receipt of the first issue of CQ-TV of the year.

Secondly, for overseas air-mail members, if sending in subscriptions for two years at a time, please remember to include two years air-mail postage.

Lastly, and Dave offers no apologies for repeating himself, but hopes to quell some of the letters and phone calls. Your membership number is found on every postage label on every magazine you receive. This label is attached to the rear cover of the supplement, so should (in theory) remain in your possession. In the right hand top corner of the label is your membership number. The first two figures of this number are important, they are the last two figures of the year for which your subscription is valid, i.e: if you have paid up to the end of 1989, your number will be 89xxxx.

So, please don't keep ringing Dave asking when your membership is due, take a look at the label on the supplement that you have just filed in the bin!

ATV FROM EIRE

News reaches us from Paul EI7GM that the first Eire - UK ATV QSO has taken place since the authorities re-allowed ATV. The contact was a one-way between a Liverpool station and EI6AS. As Paul says '...so it can be done'.

Paul also answers an idea mooted from the editorial office about holding a Work-Eire day. He has asked most of the presently licensed stations and the concensus of opinion is definitely in favour. See the contest calendar in this issue for more news.

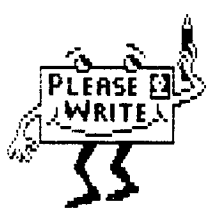
Late news hot of my packet TNC: more Eire stations licensed, most in the area of Dublin, Co.Meath and Co.Louth.

ARTICLES FOR CQ-TV

Another reminder asking for articles for the magazine. I have received very little so far this year and as a consequence the coffers are empty. If you want the magazine to retain its present size you must supply articles!

I am now using a new wordprocessor package called 'Protext' on the clubs new editorial Atari Mega 4 computer. An advantage of this package is that I can read text from any wordprocessor, from any computor, providing that it is supplied as a pure ASCII text dump on 3.5" discs.

So, come on then, out of 2400 of you there must be some of you with ideas! Let me see a flood of articles come in!.....Mike.



LATE NEWS FROM EIRE

A telephone call as I was finishing the magazine off ready for the printers brought me the latest news from Dublin.

Paul EI7GM (he who does strange things with Guiness on Saturday nights!) informed me of a successful 10GHz contact between himself and EI3CZ, a first for Eire. An attempt is being arranged for a contact between EI and GI from the Dublin mountains, more news in the next issue.

Paul also informed me of regular SSTV nets on 40M and 80M. Stations participating include EI3CZ, EI7CL, GD4HOX, GW0LAL, GI4TVV, G4GOZ and GM0DWH. A regular 144.500 net also takes place on Tuesday nights, regular attenders include EI6AS, EI3CZ, EI7CL, EI7CZ, GW4VNO, GW1SXN and EI7GM.

SKY TV ON CABLE?

Reports are being received from all over Westerm Europe complaining about the Sky cable TV network. Apparently, since Sky has been operating via the TV satellite Astra, the terrestial cable network has been suffering. The reports indicate that the cable subscribers have had many of their favourite Sky channel programs withdrawn for use via Astra, leaving them instead with sport, sport, and yet more sport!

Obviously this is a direct result of only so much material being available to the Sky program planners, this having been warned by the pundits in advance. Where the cable subscribers stand is interesting. They pay for their viewing, how many Astra viewers do I wonder! Also, is this an early warning of things to come when the IBA start their DSB transmission later this year?

EDITORIAL

As is announced on the front cover of this issue, the BATC is forty years old this year. The picture on the front cover is the actual cover of the first ever CQ-TV, and a short resume of the formation of the club and the contents of the first 'magazine' is presented by John Wood elsewhere in this issue. A very late and extremely welcome arrival to the editorial office was a letter from Arthur Critchley, who now lives in Canada. Arthur was involved with the club at the very beginning and I have included his letter after the pages dealing with the convention.

The club has certainly come a long way since 1949, with its membership now around 2400. During the forty years the BATC has represented and campaigned on behalf of ATV'ers everywhere, and not without a little success. I would like to toast the past and present representatives of the club for their efforts, and I hope to see the club grow from strength to strength over the next forty years (I should be so lucky!).

A letter received by Dave Lawton, our membership secretary, is reproduced below. Although the letter is not from a club member, its subject is sufficiently important for the committee to advise me to publish it in its entirety, a sentiment which I uphold.

'Dear Sir,

As yours is the only address listed in the 'Callbook' for the BATC I am sending this to you. Please could its contents be raised, as a matter of urgency, at your next committee meeting. If this is not possible, then please pass it on to the contest manager or chairman.

I, along with many others, make frequent use of the 2m beacons to monitor propogation conditions. I know of several stations who use automatic monitoring of several beacons in serious research projects.

On 5th Jan I was tuning part of the beacon band (around 144.870) trying to hear some of the beacons in the further reaches of Europe, when my front-end was flattened by FM signals on 144.875. One callsign belong to a friend of mine so I reached for the 'twisted pair' and was informed that he was taking part in a television contest, organised by the BATC, and that frequency was being used as a QSY frequency from 144.700 (I think) for talkback. I do not know whether this is standard procedure, but feel that this should be stopped now, before the rot sets in. It is bad enough that RAYNET use frequencies above 144.800, but they usually use low-powered, vertically polarised rigs. The offending stations on this occasion were horizontally polarised and running apparently reasonable powers.

Please, could you publicise this mis-use of the band to your members, with a strong request that those concerned should NOT do this again. Please note that I am neither anti-television nor anti-contest. Indeed I am often to be found operating during 2m SSB contests, however were I to do so in flagrant disregard of the band plan then I would be disqualified from the contest. perhaps this ultimate sanction should be applied to your members.

73, Peter Hirons, G1CEI'

Firstly, in response to Peter's letter the committee wishes to offer its apologies on behalf of the club for any inconvenience caused. However, we are not an authoritarian body and as such can only ask our members to uphold the bandplans, which in themselves are not mandatory, but only advisory.

We certainly request that members appreciate other band users and services when QSY'ing from the calling channel (144.750), and generally this practise is adopted, although within the constraints of the FM section of the band that we are allocated, there are not many frequencies to choose from without stepping on someone's toes. This apart, it should be remembered by all users of this section of two metres that some areas are in use permanently, such as the beacon frequencies, and as such should be avoided. This is further complicated by the fact that many beacons around Europe are not on channelised frequencies but, due to their narrow-bandwidth transmissions, are to be found at spot frequencies between 144.800 and 145.000. So, once again, the committee requests that all ATV'ers respect then bandplans whether contesting or otherwise. This advise can only help further the cause of ATV and our relationship with other amateurs.

An interesting snippet of information came into the editorial office from Yorkshire Television's in house magazine. Apparently the ITN is negotiating with the Belgian radio control helicopter specialists, Moving-Cam, in order to purchase and operate two radio-controlled 'copters for 'capturing shots not possible by other means'. Quoting from the article, 'The idea of having a camera mounted on a small helicopter is not new, what is new is being able to bring it about. This is thanks to advances in electronics, lightweight composite materials and reliable radio control and gives the Moving-Cam speed and manouverability close to that of a real helicopter.' A further comment from the article states: 'It is difficult to fly and requires up to eight years to become proficient. It also takes two 'pilots' to control. One flies the helicopter. The other moves the camera'

This is all very interesting, and shows the lengths to which the broadcast television companies go to bring us the pictures that they think we want. It is perhaps a pity that on this occasion they didn't contact the BATC, and in particular Brian Parkin who, as the photograph from CQ-TV 139 circa May 1987 shows, has been involved with radio-controlled helicopters carrying cameras and television transmitters for some years in the UK!

Some disturbing news has reached me concerning our recently licensed friends in Eire. Apparently a certain amateur body approached the Irish Department in charge of amateur licensing, when they heard that that department was considering re-licensing amateur TV in Eire. The complaint from this amateur body was that severe interference and damage to equipment would be incurred if ATV was allowed on 70CM. The technical reasons given may, or may not, have some validity, I am not qualified in the areas concerned to make reasoned comment. However, a mainstay of the argument put forward was that because of this interference etc, ATV on 70CM has been all but disallowed in the U.K. NOBODY TOLD US!!!!!!! It's nice to know that the true spirit of amateur radio camaraderie persists in this country!

Brian Parkin's radio controlled helicopter carrying an ATV camera and transmitter.

BATC CONVENTION 1989

☆☆ NEW VENUE ☆☆

Please don't forget, this year's convention is at a new location:

THE COVENTRY CREST HOTEL
JUNCTION 2 M6 (COVENTRY EAST)
DOORS OPEN AT 10AM. (8AM FOR TRADERS ONLY)

The other major change is that this year, as noted in CQ-TV 145, we shall be charging a 50 pence entrance fee. This decision was not taken lightly by your committee, however, to comply with the Sunday trading laws and the consequent pressure being put on the committee, we concluded that it would be in the best interests of all. Anyway, you get a smart stick-on lapel badge for your money!

For those of you wishing to stay overnight at the hotel during the weekend a special tariff has been arranged: Single rooms at £20 per night and Double rooms at £40 per night. Two children may occupy a room adjacent to their parents' double room free of charge. Both tariffs include European Breakfast.

There will be no marquee this year as the size of the FOUNDERS SUITE is large enough to hold all the stalls etc. A plan of the hall and list of traders is shown overleaf.

We must ask you to abide by the hotel car park markings and please do not park on the grass. The club may be liable for damage to the verges. It is hoped that an area of car park will be set aside for car boot sales and we ask you to honour this arrangement. Those who wish to utilise this area should report to Brian Summers G8GQS on the day for further details. Again there may be a small fee to cover the legalities.

A lecture program will be running during the day, including talks by:

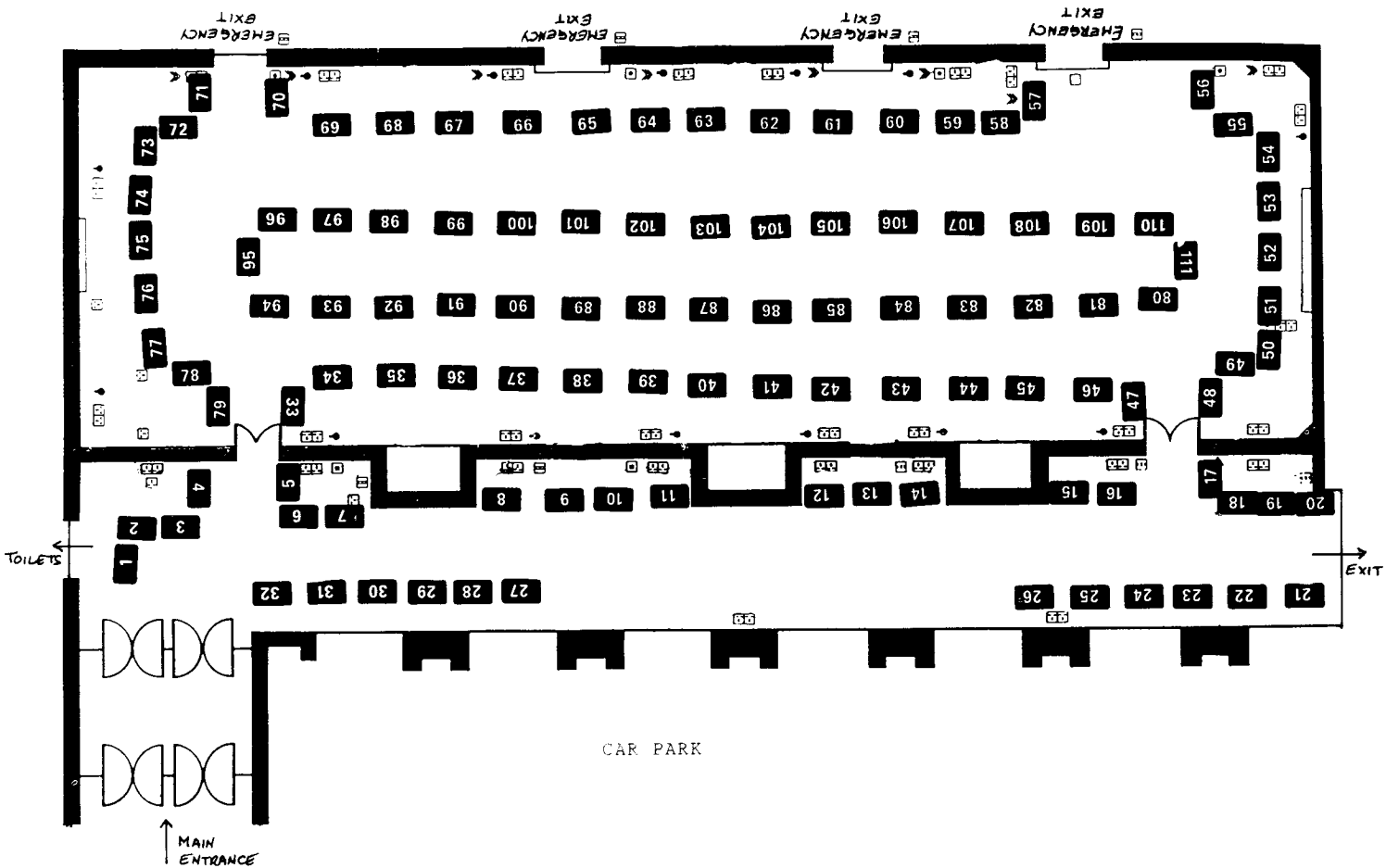
THE HOME COUNTIES GROUP on 24CM ATV
BOB PLATTS G8OZP on 3cm ATV
HENRY RUH on ATV in the USA

Note: Henry Ruh is flying over from the USA especially to be with us this year. He is attending the Dayton HamVention in the States and is flying over Saturday night the 29th, how about that for dedication!

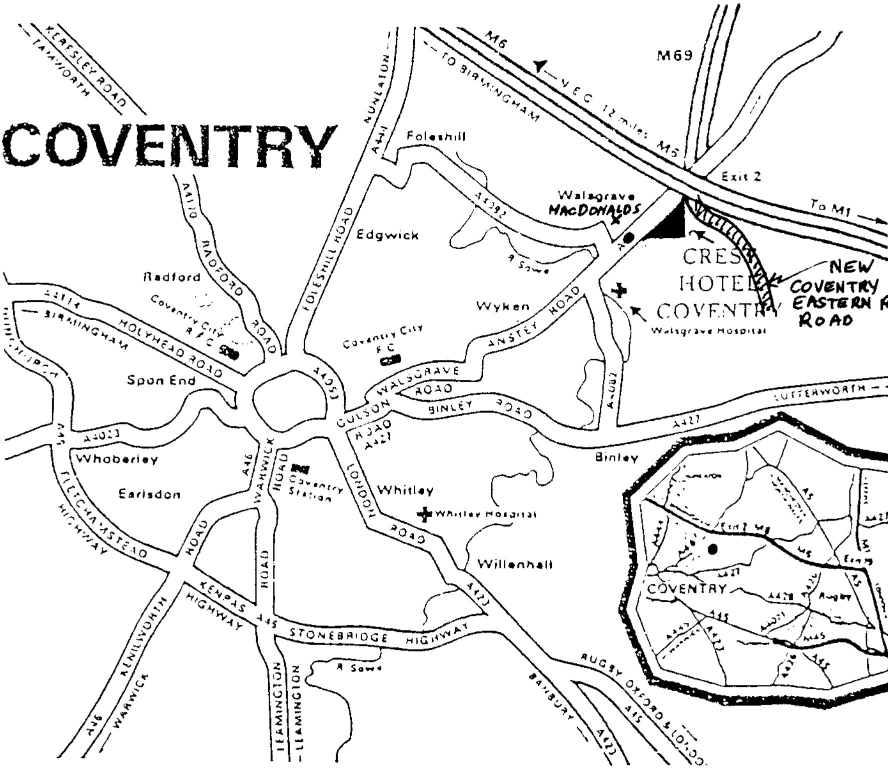
We still need volunteers to help man the various doors during the day. We don't expect anyone to dedicate the whole day, but please offer a couple of hours in order to let the committee members see the rally as well, or at least grab a pint and a sandwich!

Finally, as ever, the Rugby TV Repeater Group will again be running the 'Bring-and-Buy stall. This year there will be a registration fee of £1 per item, refundable upon sale (in the case of many inexpensive items this registration fee may be waived at the discretion of the Group). The Group hopes that this will deter those who use the B&B as a dump!. The commission rate remains unchanged at 5% or 50 pence, whichever is the greater.

TRADERS	TABLE NUMBERS
CLUB SALES	1, 2, 3, 4
POOLE LOGIC	5, 6, 7
BRING AND BUY	8, 9, 10, 11
LMW	12, 13
ELECTROCRAFT	14
WORTHING REPEATER GROUP	15, 16
HOME COUNTIES GROUP	17, 18
ANG HWA ELECTRONICS	19, 20
HAMSHACK	21, 22, 23, 24, 25
SEVERSIDE TV GROUP	26
NARROW BAND TV GROUP	27
GB3ET	28
HS PUBLICATIONS	29
GB3UD GROUP	30
405 GROUP	31
3CM SURGERY	32
BARENCO	33, 34, 35, 36, 37
NIPCO	38, 39, 40
ASTLEY VIDEO	41, 42
MFM	43
A.KELLY	44, 45, 46
SATELLITE SYSTEMS	47
WIERMEAD	48, 49, 50, 51, 52
CAMTECH	53
RADIOTRONICS	54, 55, 56
D&J SUPPLIES	57, 58
MICROMAX	59, 60, 61
TELFORD	62, 63, 64, 65, 66, 67
P.ANVILLE	68, 69, 70
PLM	71, 72
CHASE SURPLUS	73, 74, 75, 76, 77
NORTHAMPTON COMMUNICATIONS	78, 79
A.S.GRIFFITHS	80
DEECOMME	81, 82, 83, 84
A1 ELECTRICAL	85, 86, 87
COMPUTER JUNK SHOP	88, 89, 90, 91
P.HEYWARD	92, 93
CARE ELECTRONICS	94, 95, 96
P.OWEN	97, 98
KENZEN	99, 100
MK ENTERPRISE	101, 102
JANDEK	103
CPL ELECTRONICS	104, 105, 106
BONEX	107, 108, 109, 111



COVENTRY CREST HOTEL - THE FOUNDERS SUITE



When leaving the M6 motorway take the A46 into Coventry. Please Note that a new Eastern Relief road now exists at the junction as shown on the map. Approximately 200 yards from the motorway junction the hotel entrance appears on the left, starting as a slip road off the dual-carriageway. When leaving the hotel it is necessary to turn left onto the dual-carriageway for 100 yards to a roundabout, and then proceed back to the M6.

If travelling to the convention by rail, journey to Coventry station, from there a regular bus service to the central terminus operates (Pool Meadow). Then take a bus to the Walsgrave area.

If travelling by boat, the Oxford Canal (Northern section) passes through Ansty village, three miles from the Hotel on the A46.

If arriving by air, Birmingham International Airport is 12 miles away to the north on the M6.

A talk in station will again be operating, provided this year by the Coventry Amateur Radio Society, to whom we offer our grateful thanks. The station will be operating on 144.550 (S22) and possibly on 433.200 (SU8). The station will be using the callsign GB0TV.

Mike Wooding, G6IQM, Editor 'CQ–TV'
5 Ware Orchard,
Barby, Nr. Rugby,
Nr. Rugby,
ENGLAND CV21 8UF

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Tel. (416)-294-6797
FAX (416)-298-7789 (Torpey)

Dear Mr Wooding,

March 10th., 1989

FORTY YEARS AGO IN CQ–TV

Yes! The British Amateur Television Club is almost forty years old. How does that strike you?

CQ–TV magazine was first published in October 1949 by the founder of the BATC, Mike Barlow, G3CVO. It was produced to replace a circular letter which took too long to get round a few enthusiastic amateurs. It cost all of 5d to produce on a Roneo stencil and had eight quarto pages. Circulation was 25 copies to people such as Ivan Howard, G2DUS, Ralph Royle, G2WJ, Tony Sale, Bill North and Ian MacWhirter, G3ETI.

At the time Mike was doing 18 months National Service in the Army at Catterick Camp way up in the north of England. The first few CQ–TVs were banged out on Army–issue typewriters while in the guard room (on duty, that is).

Issue–2 followed in December 1949 but by Issue–4 in January 1950 the circulation had risen to 55 so that a subscription had to be introduced to help out Mike's personal coffers — 4/6d for four issues a year.

Some other well–known BATC personalities joined about this time; Ivan James, G5IJ, and C. Grant Dixon, our much respected and enthusiastic librarian for most of the forty years. Mike Barlow went on to Marconi's Wireless Telegraph Co. Ltd., in Chelmsford and eventually to Montreal, Canada, to work for the Canadian Broadcasting Corporation where he still is.

What was Amateur Television like in those days? Well, it was pretty well a black art. There were no decent camera tubes, no integrated circuits, not even transistors. Only valves, surplus cathode–ray tubes and a few mysterious devices such as Photo–Electric Multipliers. If you wanted something, you made it yourself out of anything you could scrounge.

Those who built television cameras had to create almost everything. It was no mean feat to make your own scan coils and the focus coil with several thousand turns of extremely thin wire. What a struggle it was to achieve anything more than 1 MHz resolution on a dim, ex–surplus, green screen.

The equipment was large and heavy with high–voltage power supplies and usually unreliable with fat electrolytic capacitors. Typical voltages were 250 volts for H.T. and 6.3V A.C. for heaters. Most amateurs thought nothing of playing with a few kV on cathode–ray tubes such as the VCR97. This was the era of the 955, EF50, 6V6, 807, 2C21 and the 6SN7. All of these took more power to just warm up the heater than a modern radio produces as output! Indeed, you could burn yourself on most of the valves (and on many of the resistors, too). You could see what was happening, though. The blue glow inside was an important clue and a red hot grid was disaster. Literally, you tuned for maximum smoke!

Some other numbers bring back memories too — 931A, 5527, APQ9, 6J6, MW6–2, QQV06–40A, G45 Gun Camera, 62 Indicator Unit. And what about some of the expressions — wireless, condenser, grid leak, bias, Transitron, kcs, RFC, Miller feedback, cat's whisker, Eccles–Jordan, blocking oscillators (ugh), discriminators, cathode follower, Photicon, etc.

Those were the days! How things have changed in 40 years.

Well, what brought this on? I was surprised and flattered to read in CQ–TV 145 that you intend to resurrect, by popular request, my series of articles about integrated circuits (in CQ–TV 71–86) and suitably update them as another series. You said "many years ago" and indeed it was — 19 years. Anyway, seeing my name there again sent me looking through my back numbers of the magazine where I discovered the awful secret — *forty years!* It only seems like yesterday that I was battling with a typewriter and a drafting pen to produce some copy in reply to a simple but perpetual request "Why don't you write something for the magazine?" from CQ–TV Editor Andy Hughes and others.

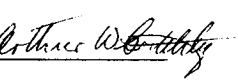
So I had a go and quite enjoyed it. Mind you, it was not easy, not easy at all. To create a presentable article often involves many rewrites. If you are going to publish something technical, it has to be accurate in every respect. However, despite considerable checking, errors creep in somehow! How I wish I had had a word–processor then! Nevertheless, the circuit examples were all thoroughly checked out beforehand. Before I started the series I had written a few articles for other magazines and one in particular for a learned journal. That one was first passed around among my expert colleagues at EMI and literally torn to shreds over its use of grammar and words. After ten rewrites it was finally deemed suitable. Consequently, I have a healthy respect for anybody who can constantly write accurate technical articles. One such person is John Lawrence who deserves much credit for the Circuit Notebooks he turned out for many years. I thought my articles were accurate at the time but no matter how many times you proofread them, something turns up when they are printed. However, don't let that deter anybody from having a go.

I kept it up for 15 issues and would have gone on for many more but for the fact that I was unceremoniously fired in 1974 from my job at EMIs (along with some 600 others) and again in 1975. Being made redundant twice in a few months did not agree with me and jobs were hard to find so I decided to emigrate to Canada and that put a stop to any amateur TV activities (and a lot of others, too). I know — I promised a booklet about the TTL devices.... It never materialized with all the problems and neither did Part–16 which CQ–TV 87 said would follow in a future issue. However, I did find time to contribute another three articles on CMOS ICs for the 100th issue on, but again I lost my job. Such is life. Maybe I could pick up again where I ..... I can only apologise for any disappointment. The CQ–TV SPG, which I wrote a series of articles about in Issues 75 on, was brought about by the IC articles. I thought it would be a suitable subject to show what could be done with the new digital ICs. It proved to be very popular and I sold at least 125 printed–circuit boards to members (some 10% of the membership) and about 20% went overseas.

I joined the BATC in 1954 as a result of running into Mike Barlow and Don Reid at Marconi's where I was doing some summer employment (for a pittance) to gain experience while at college. CQ–TV 21 was my first copy and I read it avidly from cover to cover and was hooked. That was 35 years ago. So what do I do now? For over ten years I have had my own company (if you can't join them, beat them) and design and manufacture TV Routing Switchers in Toronto, Canada. I get to the NAB in Las Vegas on my own stand and sometimes to the IBC in Brighton. I learned a great deal from the BATC and CQ–TV in particular. It was a mine of information that simply was not available elsewhere and with its help I have relearned electronics four times from valves through transistors, ICs, and LSI devices to micro–processors and computers.

Thought you might like to hear a ghost from the past. I would like to hear about some of the others. How about a series on some of them (by some of them). Keep up the good work.

Regards,



Arthur W. Critchley
(former part–owner of Matilda — remember the first amateur OB van and Panorama in 1958?)

P.S. This letter is originated on an Apple MacIntosh with MacWrite. Do you have facilities for reading Mac or AppleWorks (ASCII) 3.5–inch disks? If so, I can provide data that way in future. I may be able to convert things to an IBM MS–DOS (ASCII) format eventually. Is there a FAX number for BATC or the Editor? P.P.S. Is there a 525 VHS copy of the Panorama film available?

THE BIRTH OF THE BATC

John Wood G3YQC,

This year sees the 40th anniversary of the British Amateur Television Club, and it is therefore fitting that we should mark the occasion by taking a brief look into the past. Of course the person who should be writing this piece is the founder of the BATC Mike Barlow, however, although still a member and active correspondent, Mike has been for many years resident in Canada, so we don`t trouble him more than we have to!

IN THE BEGINNING....

When amateur radio started up again after the war, and during some regular activity on the 80-metre band, Mike discovered that there were, apart from himself, several amateurs who remembered the early pre-war TV experiments, and were interested in current developments. Being experienced in construction, a number of them started experimenting with home-brew equipment and discussing their findings on the air. It wasn`t long therefore before Mike found himself heading a regular TV net on 80. Such was the interest, and as the net got ever larger, it was thought a good idea to write the occasional `newsletter` and have the `members` circulate it amongst themselves. At first only one copy was made but this often got mislaid before it reached the last man on the list. Then several copies were made and sent on different circuits. This too had its difficulties with several people complaining that they never saw the newsletters. Poor old Mike caught the flak and so, reluctantly at first, he decided to write a regular newsletter and distribute one to every interested person.

ENTER CQ-TV

The first thing to do of course was to become organised in order to make administration easier. The name 'British Amateur Television Club' was decided upon in February, 1949 and the group became familiarly known as the BATC. There were no committee or subscriptions to start with and in fact it wasn`t until October of 1949 that the first issue of CQ-TV was published. The issue comprised eight typewritten pages with no front cover as such. The `cover` artwork consisted of a simple drawing on the first page (see reproduction). The magazine was typed on the guardroom typewriter in Catterick Camp (yes, Mike was still in the army then), drawn on stencils and duplicated on a rotary hand-duplicator. These were then hand addressed and mailed to each member (by now some twenty strong). There were still no subscriptions so Mike paid for this himself, although in the first issue he did ask for a few stamped, addressed labels (3d old money) from each member.

The first issue started with a hand-drawn TV activity map detailing some 13 stations, although of course amateur TV transmissions were not permitted at that time. Then came the Editors note (see below) followed by a couple of small ad`s. Pages 3 and 4 were devoted to TV at Radiolympia. The show that year was advertised as placing the accent on TV so it was interesting to read an amateur`s view of it. The first technical article described a wide-band modulation system for ham TV work. All valves of course, the article covered series,

parallel and absorption modulation. What was to become a regular column followed entitled `WHAT THE OTHER BLOKE IS DOING.....` And on the last page, another technical article described a Transitron time base.

This is how the first part of the first CQ-TV page appeared:-

OCTOBER 1949 NO. 1

" CQ TV " NO 1.

Published at Cheyne Cottage, Dukes wood Drive, Gerrards Cross, Bucks.

Editors Note:

Hi there, oms,

Here is no. one of what I hope will be a series of issues of your mag. Note that I say your mag, - well, so it is. Honestly chaps, I`m just about browned off with writing and re-writing the same things over and over again, hence the circular letters. These take so long to get around though, that we all tend to get out of touch.

I`m sorry this has taken so long to be produced, but I`ve had some trouble in obtaining spares for the duplicator. However, in the future you should get a copy every few weeks or months - depending on how much material you blokes send in, and also of course on my own will (or otherwise) to work.....

MOVING ON

The BATC first attracted attention by demonstrations of closed-circuit television at the 1950 RSGB amateur exhibition. A little later the first convention was held at which an interesting selection of members` equipment was on view. One notable exhibit was of an iconoscope camera, built by G.G.Short, for working on 250 lines, 50 frames per second non-interlaced. The Club went on to demonstrate TV to an enthusiastic public (after all there were not that many who had even seen TV before) right throughout the fifties.

Let`s look then at some of the Club`s earlier achievements:-

May 1952 - the first two-way amateur TV contact in the world between G3BLV/T and G5ZT/T.
August 1953 - G3GDR received G2WJ/T at 34 miles range with only two Watts peak input.
December 1953 - first amateur colour pictures produced.
Spring 1956 - colour pictures transmitted two ways over a 12 mile path

The above is documented in the author`s library of historic material on amateur television. It is intended that a book be written on the subject in the future, therefore any material, particularly early stuff, is badly needed in order to compile an accurate picture of amateur TV. Anyone having such material available (particularly any of the pre-CQTV newsletters), is invited to contact me with a view to adding it to the archive. After the book is written all material will be kept and preserved in the Club`s library (address on page-2 of this issue).

A MICROWAVE OVEN FM ATV TRANSMITTER

Bill Parker W8DMR

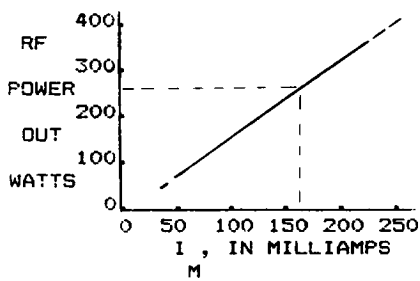
A 450-Watt microwave oven delivers about 250-Watts of RF at a frequency of some 2400 MHz. This seems a very useful power to have easily available. Such a device therefore cries out for a way to utilise its power for amateur TV. A video modulator must be added and some power supply changes made in order to make it suitable for TV, but it has been done. This article discusses how this may be achieved and shows a typical circuit diagram with construction notes, which it is hoped will assist the would-be experimenter.

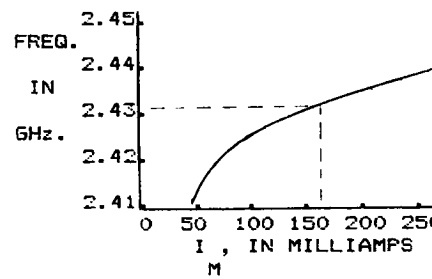
Anyone experienced enough to have a go at such a project hardly needs reminding of the danger of the high-level radiation produced by such an appliance. So DO BE VERY CAREFUL what you are doing and put safety above all other considerations. If in doubt DON'T even try it.

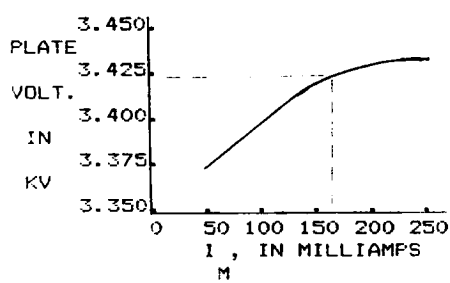
GENERAL DESCRIPTION

A microwave oven magnetron is a self-contained cross-field power oscillator. Built-in cavities largely determine the oscillator frequency, however the actual plate voltage and strength of magnetic field around the magnetron also effects the frequency to some degree. Experimental tests indicate that a maximum usable frequency swing (for modulation purposes) of around 20MHz is obtainable.

MAGNETRON PARAMETER GRAPHS



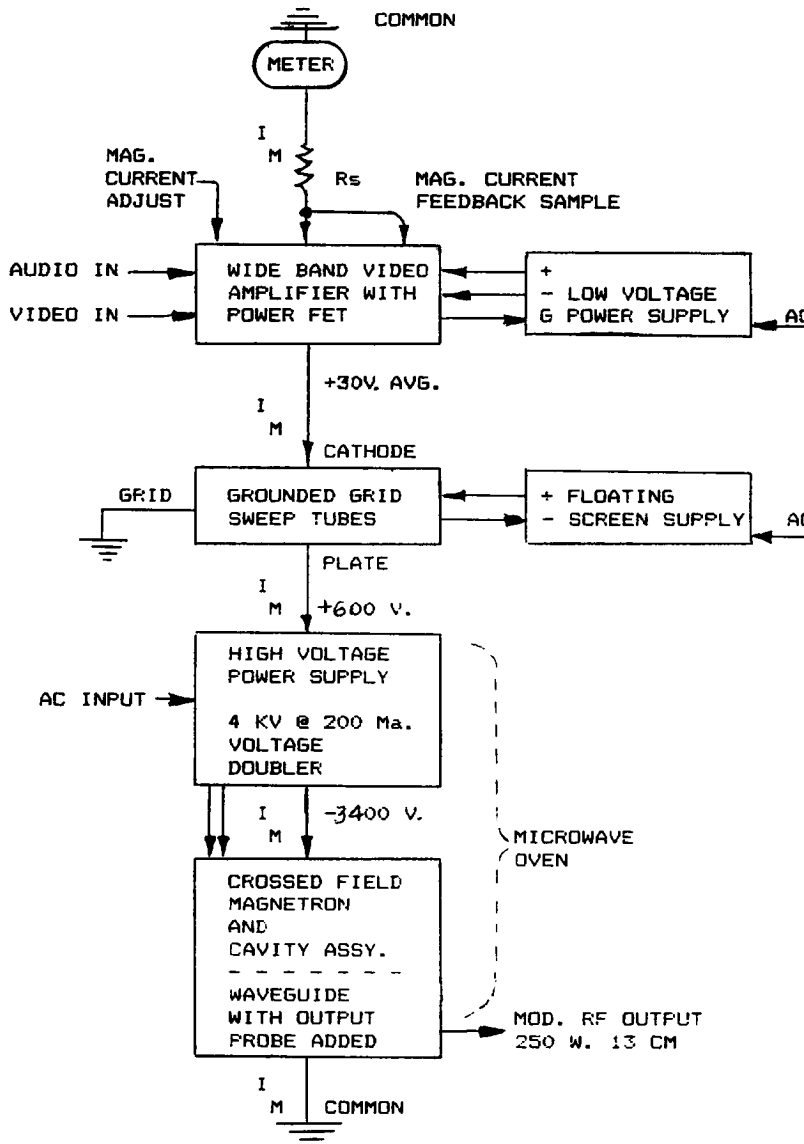


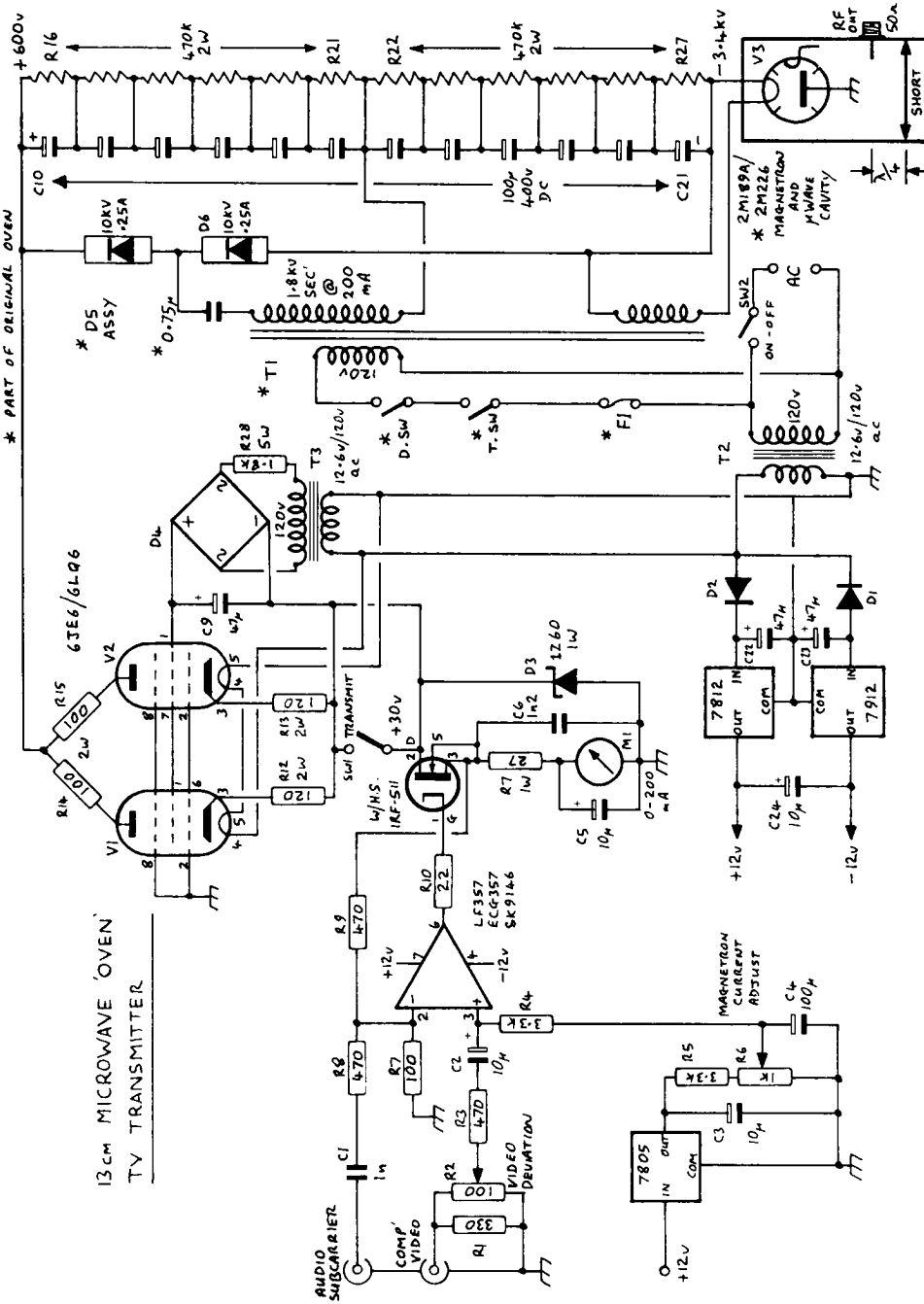


NOTES:

1. FOR 2M189A MAGNETRON.
2. CAVITY MODIFIED W/SHORT.
3. $Z_{LOAD} = 50 + J0$
4. SEE TEXT FOR SHORT INFO.

BLOCK DIAG. — MICROWAVE ATV XMTR




13 cm MICROWAVE 'OVEN' TV TRANSMITTER
* PART OF ORIGINAL OVEN
+600v
R16
470K 2W
R21
R22
470K 2W
R27
-3.4kv
C10
C21
100n 400v DC
10KV .25A
D5
D6
10KV .25A
* DS ASSY
* 0.75µ
1.8kv SEC' @ 200 mA
* T1
120v
SW2
ON-OFF
AC
V3
RF OUT
50Ω
SHORT
2M189A/ 2M226 MAGNETRON AND KWAVE CAVITY
* D.SW
* T.SW
* F1
120v
12.6v/120v ac
T2
12.6v/120v ac
R28 5W
T3
12.6v/120v ac
120v
D4
6JE6/6LQ6
C9 47µ
V2
V1
R15 100 2W
R14 100 2W
R13 120 2W
R12 120 2W
SW1 TRANSMIT
+30v
D
S
G
w/H.S. IRF-511
D3 1260 1W
C6 1n2
R7 27 1W
M1 0-200 mA
C5 10µ
D2
D1
C12 47µ
C13 47µ
7812 IN OUT COM
7912 COM OUT IN
C24 10µ
+12v
-12v
R9 470
R10 2.2
LF357 ECG357 SK9146
+12v
-12v
R4 3.3K
MAGNETRON CURRENT ADJUST
C4 100µ
R8 470
R7 100
C2 10µ
R3 470
VIDEO DEVIATION
R2 100
R1 330
C1 1n
AUDIO SUBCARRIER
COMP' VIDEO
R5 3.3K
R6 1K
C3 10µ
7805 IN OUT COM
+12v

The coefficient of frequency change is about 0.1 MHz/mA of magnetron current. Because of linearity considerations FM TV is probably the only way of modulating a magnetron effectively.

The video modulator is a bit unusual and is shown in the block diagram. It functions as a high-voltage CURRENT source of high open-loop gain that can set the magnetron current to a known value. This establishes both the operating frequency and power output.

The unit of transconductance is the SIEMEN (formerly MHOS). Transconductance is the reciprocal of resistance; for volts in, the modulator provides current out. It is essentially Ohm's Law inverted: MHOS = CURRENT/VOLTAGE. The video modulator has a transconductance of 0.2 Siemens.

The transconductance amplifier must provide enough bandwidth to amplify all of the video modulation components, and if an audio subcarrier is used the bandwidth required is 6 MHz. A capacitor and resistor (C6 & R27) is used to extend the high frequency response from approximately 4.5 to 6.0 MHz. A video pre-emphasis circuit is still required for FM use.

The screen supply for the two sweep tubes must float above ground. Only the magnetron plate current must be allowed to enter the current source control loop as the controlled variable. The screen current should not be included.

The waveguide circuit must be modified by adding a shorting partition or plate. This is analogous to a 1/2-wave coaxial stub or a 1/4-wave when a reflected path provides twice the distance. Wave fronts, in either case, are phase shifted by 180 degrees. The shorting plate causes the reflected wave to be in phase with incident wave from the magnetron. The E-field probe is inserted where the RF voltage maximum occurs. Normally, the length of the output probe is a 1/4-wave for maximum power output. Shortening the output probe introduces a reactive component to the output port of the magnetron. After an undetermined number of degrees of rotation within the magnetron feed structure, the magnetron cavities cause the operating frequency to be lowered by about 25MHz. This helps ensure operation within the amateur 13cm band.

CIRCUIT DESCRIPTION

The +5v regulator U2 provides a voltage reference. It's divided by R5 and 6 and connected to the non-inverting input of wide-band op-amp U1, establishing a current reference. The output of U1 feeds the gate of Q1. The output of source follower Q1 is sent to R9 and, through R7 provides negative feedback to the inverting input of U1. The feedback ratio is calculated as follows:-

$$\text{FEEDBACK RATIO} = \frac{R9 + R7}{R7} = \frac{470 + 100}{100} = \frac{570}{100} = 5.7$$

At equilibrium Q1's drain-to-source current produces a drop across R11 that is 5.7 times U1's non-inverting input voltage. Control R6 sets the drain current in Q1 that is proportional to the non-inverting input of U1. The plate and cathode current of V1 and V2 in parallel

are one and the same, if screen current is not considered at this time.

The voltage on the drain of Q1 increases or decreases until the control grid of V1 and V2 changes the cathode bias to Ik = Id = Is. V1 and V2 form a grounded grid voltage amplifier with unity current gain. V1 and V2 have sufficient current capacity to serve as a current source for the magnetron. Actually a transconductance amplifier is formed with the high value of 220,000 Microsiemens (0.2 Siemens). The value can be calculated by solving:-

$$S = I/V = \left(\frac{R9 + R7}{R7}\right) \times \left(\frac{1}{R11} + \frac{1}{R9 + R7}\right) = 0.22 \text{ Siemen}$$

Transformer T3 provides a non-grounded +100v screen supply for V1 and V2. R28 limits the screen dissipation. The screen floats above ground because only the plate current (Ik = Im) should enter the control loop by way of V1 and V2 cathode, and is the control parameter (less the screen current).

Components R14 and 15 help provide current sharing in V1 and V2. Zener diode D3 protects power FET Q1. Resistors R16 - R27 serve as voltage equalising as well as bleeder resistors. Regulators U3 and U4 provide +/- 15v for the op-amp. Magnetron current is metered by M1.

CONSTRUCTIONAL DETAILS

Actual construction will depend upon the exact brand and model of microwave oven, however, certain general information applies: First, inside the oven, cut off the waveguide which connects to the cooking cavity flange. A waveguide shortening cover needs to be made to cover the feed port to the oven chamber. The size of this port is typically about 1.5 x 3 inches. A piece of 18 to 22 swg copper around 3 x 5 inches will do nicely. Drill 16 to 20 holes around the outer edge for mounting holes and, of course, an equal number of matching holes will need to be drilled around the open waveguide port in the oven. Sheet metal screws or machine screws with nuts will provide a good shorting partition for the open end of the waveguide.

Next, an E-field probe for the output needs to be constructed. Using an N-connector, solder a piece of about 0.175 dia 5/8 inch long brass tubing to the connector. Solder a brass nut to the other end of the tubing. Insert a 1/2 inch brass screw into the nut, this forms a tuning adjustment for the probe. Make sure the screw is fully inserted and is a snug fit. Now a hole must be made in the waveguide to accept the probe. The hole is drilled in the top of the waveguide from outside the oven. It mounts 1 5/16 inch from where the waveguide cavity shorting partition was added. It should also be centered in the waveguide.

The filament leads to the magnetron are bypassed by 2000pF feedthrough capacitors, the ground side of each must be opened and care should be taken not to damage the insulation of the filament wiring. The capacitors are usually white oval shaped ceramic. by drilling out the four rivets the ground is removed. Simply push the capacitors back into the tube housing 1/8 inch or so.

SAFETY CONSIDERATIONS: Radiant energy above a certain level can be harmful. Use an inexpensive microwave leakage detector (available from TANDY stores etc) to verify the safety of the finished ATV transmitter. Readings from any surface in the unsafe or red zone indicate a leak which MUST be corrected. DO NOT point a microwave aerial emitting RF power levels in the class of this transmitter at people, buildings or use in residential areas. Use common sense and DON'T test it on your pets. Currently a level more than 5 mW per square centimetre at 2400 MHz is considered hazardous.

REFERENCES: 1) RF Design magazine, design award, Dave Pachlok - p24-25, July 1988
2) Microwave oven ATV transmitter by D. Pachlok at Indiana UHF & ATV meeting, 14th Jan. 1989.

Acknowledgement is made to ATCO NEWSLETTER vol.6 number 1.

PARTS LIST — M.O. ATV XMTR

ITEM	QTY.	DESCRIPTION
1.	1 EA.	MICROWAVE OVEN, 400-500 WATT WITH 2M189A OR 2M226A MAGNETRON
2.	2 EA.	TV SWEEP TUBE, 6JE6C/6LQ6C
3.	12 EA.	CAPACITOR, ELECTROLYTIC, 100 MFD/400V
4.	1 EA.	DIODE, HI. V. RECTIFIER, 10 KV, 250 MA.
5.	12 EA.	RESISTORS, 470 K OHMS, 1 OR 2 WATT
6.	1 EA.	TRANSFORMER, 12.6 VAC, 3.0 AMPS.
7.	1 EA.	TRANSFORMER, 12.6 VAC, 450 MA.
8.	1 EA.	METER, 0-200 MA. USED OR SURPLUS
9.	1 EA.	CONNECTOR, N-TYPE, FEMALE, CHASSIS MNT.
10.	2 EA.	CONNECTOR, F-TYPE, FEMALE, CHASSIS MNT.
11.	1 EA.	IC, LF357, WIDE BAND OP-AMP
12.	1 EA.	IC, REGULATOR, 7812
13.	1 EA.	IC, REGULATOR, 7912
14.	1 EA.	IC, REGULATOR, 7805
15.	1 EA.	TRANSISTOR, POWER FET, IRF-511
16.	2 EA.	DOIDE, LOW V. RECTIFIER, 200 V., 1 AMP.
17.	1 EA.	DIODE, BRIDGE ASSY., 400 V., 1 AMP.
18.	1 EA.	DIODE, ZENER, 68 VOLT, 1 WATT
19.	1 EA.	CAPACITOR, CERAMIC, 0.001 MFD.
20.	1 EA.	CAPACITOR, ELECTRO., 10 MFD., 25 VOLT
21.	2 EA.	CAPACITOR, ELECTRO., 100 MFD., 10 VOLT
22.	1 EA.	CAPACITOR, ELECTRO., 330 MFD., 10 VOLT
23.	1 EA.	CAPACITOR, POLY., 1200 PFD., 100 VOLT
24.	1 EA.	CAPACITOR, CERAMIC, 0.1 MFD., 50 VOLT
25.	2 EA.	CAPACITOR, ELECTRO., 47 MFD., 160 VOLT
26.	2 EA.	CAPACITOR, ELECTRO., 470 MFD., 25 VOLTS
27.	1 EA.	RESISTOR, 390 OHM, 1/4 WATT
28.	1 EA.	RESISTOR, 100 OHM, VARIABLE, PANEL MOUNT
29.	3 EA.	RESISTOR, 470 OHM, 1/4 WATT
30.	2 EA.	RESISTOR, 3.3 K OHM, 1/4 WATT
31.	1 EA.	RESISTOR, 1.0 K OHM, VARIABLE, PC BRD.
32.	1 EA.	RESISTOR, 100 OHM, 1/4 WATT
33.	1 EA.	RESISTOR, 22 OHM, 1/4 WATT, 5 %
34.	1 EA.	RESISTOR, 27 OHM, 1.0 WATT, 5 %
35.	2 EA.	RESISTOR, 120 OHM, 1.0 WATT, 5 %
36.	2 EA.	RESISTOR, 100 OHM, 1.0 WATT, 5 %
37.	2 EA.	RESISTOR, 470 OHM, 1.0 WATT, 5 %
38.	1 EA.	SWITCH, POWER, 125 VAC, 0.5 AMP.

OLD CAMERA REGISTER

Brian Summers G8GQS

For some time I have been increasingly concerned over the eventual fate of traditional television broadcast cameras, and of other interesting related items of equipment. The object of this proposal is to ensure the long term survival of cameras with interesting historic aspects.

I have discussed this problem with a number of BATC members and other interested parties it is felt that the best way might be to keep a register of old cameras and other equipment and their owners. In this way it is hoped to prevent the progression that many cameras have already made; shack - back of garage - spare parts - skip - lost forever.

FUNDING

The register will operate under the auspices of the BATC and receive funding from the BATC and donations from other sources. Bulk communications will be through the pages of CQTV.

REGISTER OBJECTIVES

The objectives of the register of cameras and equipment are :-

1) To record who owns what equipment, it's condition and status

2) To help with locating spare parts and circuit information.

3) To help owners find good new homes for unwanted cameras. (possibly arranging donation to recognised museum)

4) The register would operate as a "non profit making" honest broker (donations welcome - surplus to BATC funds)

REGISTER OPERATION

a) An index card will be sent to an owner to fill in and return to the register.

b) A post card sent out with the index card would be kept by the owner and returned to the register if the status of the camera changed, eg:- sold/for sale, change of address

c) The register would act as a clearing house for information to and from interested parties.

d) Sticky labels will be available for attaching to equipment to indicate it's preservation status.

e) Persons or museums will be able to register their needs to filled as items become available.

The information given is to be recorded on a paper card index and is therefore outside the scope of the data protection act. It may be computerised at a later date. Names and telephone No's. would not be given out unless authorised.

CONCLUSION

Taking a long view of things It is interesting to note that certain cameras can not now be bought at any price, eg:- Marconi MK. II's, MK. III's are harrd to find and MK. IV's are like hens teeth! How long before Pye MK. IV's & MK. V's are unobtainable? Has anyone got a EMI 204? or an Ampex 1000 quad VTR??

Can anyone offer long (very) term storage?

If you are interested in registering your equipment or can offer help/information please contact:-

Brian Summers G8GQS 29, Perivale Grange, Perivale Lane, Greenford, Middlesex, UB6 8TN. Tel: 01 998 4739 (answerphone).

CONTEST NEWS

Bob Platts G8OZP,

Firstly, a big thanks to Mike G6IQM for all the sterling work he's done as contest manager over the past years. I wish him a happy retirement in the post as new editor of the magazine.

Right down to business, the bit you've all been waiting for----

RESULTS

Autumn Vision 88: 70CM

Callsign	Pts	QSO's	Best DX	Km
GW7ATG/P	7375	13	G8MNY	241
G4SHC	3103	10	G4CRJ	287
G8MNY	3080	20	G4SHC	287
G8OZP	2610	17	G8MNY	221
G6IQM	1632	14	G4SHC	154
G7AVU	894	10	G8MNY	233
G4WGZ	627	9	G8LES	80
G2BMI	270	5	G4WGZ	39

Autumn Vision 88: 24CM

G6IQM	376	6	G1GST	66
G6XDY/P	156	5	G8LES	32
G4WGZ	25	3	G4VTD	5

Slow Scan 88

G6BHB	2	1	G8VOI	2

Winter ATV 88: 70CM

GW7ATG/P	14003	37	PE1HXD	642
G1COI	2814	11	ON4YZ	398
G7AVU	894	11	G8MNY	233
G8MNY	608	3	GW8ATG/P	241
G6IQM	582	6	GW7ATG/P	136
G6WLM	38	2	G6IQM	24

Winter ATV 88: 24CM

G6IQM	192	4	G4EUF	42
G1COI	108	1	G4VTD	52

Winter Cumulative 89: 70CM

Callsign	Pts	QSO,s	Best DX	Km
G7ATG	8342	65	G4WGZ	224
G8MNY	3562	31	G4SHC	287
G6IQM	2750	26	G4SHC	154
G4WGZ	2053	21	G7ATG	224
G2BMI	656	10	G4WGZ	40
G6WLM	585	16	G7ATG	70

Winter Cumulative 89: 23CM

G6IQM	704	11	G4DVN	100
G4WGZ	122	7	G4CRJ	62

NEWS

A quiet start to this years contesting could be one way to describe activity so far. However, with the good weather that has been booked for this year I look forward to an active twelve months.

Congratulations to the G7ATG group for three in a row, and no serious contenders in sight. All very good. John G8MNY is now able to run 400W PEP at the aerial so John, Dave and Peter cannot rest yet. John MNY comments that activity is rather low in the SE. It was not all that many years ago when that area was the centre of ATV activity. Where are you all?

I received an interesting letter from Ron G4SHC, Manchester. Ron normally operates with the 'LIR group, but decided to go it alone for the Autumn Vision. Well done Ron, and all other comments noted.

James G2BMI commented, where are all the slow scanners? Well James, it appears they are in IO90LU/MU. First place in the SSTV contest goes to G6BHB (John or Jim?). Where was G8VOI's log to claim second place? I know there are more than two slow scan stations in the UK. A couple of VK' just think of the points!

G6WLM wrote in to say how much he enjoyed his first two contests. A very commendable result for 125mW TX and a U321 tuner for RX. In the past I've used a similar device for RX, and found the first two stages of the F3XY 70Cms RX made a good pre-amp. Discard the mixer and oscillator by sawing off that part of the PCB. Details can be found in the old ATV Handbook. (This is unfortunately now out of print, but the PCB may still be in stock).

CONTEST ENTRIES

For those who are going to enter for maybe the first time this year, let me just explain how to go about it: There are no restrictions on power, aerials, etc, but operation must of course be within the terms of the licence. /P operation is becoming very popular. Most modern equipment will operate from 12v, and if a character generator is used in place of a camera, a whole station could be set up on the front seat of a car. For talkback 144.750 is used for calling before QSY'ing to a clear (if one can be found) frequency. Please avoid Packet frequencies and the beacon band on

144.800 and above. Please keep all transmissions short, especially on 70CM, where there is a chance you may be causing problems to other users.

The vision exchange should include station callsign and a four digit number. Four identical digits must not be used. The receiving station totals up the digits and via talkback sends the total together with a contact serial number and strength report. Log sheets should be filled as explained below:

The REPORT and SERIAL NUMBER SENT is your report of the received vision together with contact serial number starting at 001. No vision received, no serial number given. The REPORT and SERIAL RECEIVED is the report and serial number given for your video transmission. Vision reporting is based on the P0-P5 system, P0 being no picture just noise, P5 perfect noise free picture.

The CODE RECEIVED is the four digit number transmitted to you. It is used for checking purposes.

The POINTS CLAIMED are calculated on the simple basis of one point per kilometre. If the contact is a two way, then double points. This applies to all bands.

Contest logs should be sent to myself at the address shown below, together with a contest entry form, no later than four weeks after the event. All entries are eligible for a certificate, so PLEASE include with your entry an A4 (8.5"-12") SAE with a 34p stamp. If you have any comments or stories about the event, jot them down on the reverse of the entry form. They are useful for this column and for planning future events.

Phew, thats the first one over with. 73s and I look forward to meeting some of you at the convention. Log sheets, contest entry forms can be obtained from, and should be returned to: Bob Platts G8OZP, 8 Station Road, Rolleston-on-Dove, Burton-on-Trent, DE13 9AA.

CONTEST CALENDER

MAYDAY MICROWAVE	Mon May 1st	0001 to 2359 local	24cm and above
SUMMER FUN (JOINT EUROPEAN)	Sat June 10th Sun June 11th	1800 Sat to 1200 Sun GMT	FSTV All bands
IARU ATV (INTERNATIONAL)	Sat Sept 9th Sun Sept 10th	1800 Sat to 1200 Sun GMT	FSTV All bands
SLOW SCAN TV AUTUMN VISION COMBINED	Sun Nov 12th	0001 to 2359 local	Slow Scan FSTV All bands
WINTER ATV (JOINT EUROPEAN)	Sat Dec 9th Sun Dec 10th	1800 Sat to 1200 Sun GMT	FSTV All bands

A CAMERA MICROPHONE AMPLIFIER

Brian Summers G8GQS,

FOUR WATT GENERAL PURPOSE AMPLIFIER

This circuit (Fig.1) uses a TDA 2030 IC, it was chosen for the small number of external components needed and it's inverting & non inverting inputs. The amplifier was built to be used as a PFL amplifier with an existing sound desk and this dictated the -16 volt supply. This circuit has balanced line level input, 4 watts output and a gain of ten. The gain of the amplifier is set by R6 (Rfeedback) and R1 (Rin)

Gain = Rf/Rin

also: R2 = Rin and R3 = Rf

Resistors R2 & R3 form an attenuator which keeps the non inverting gain the same as the inverting gain. Rv1, the volume control, is a traditional balanced attenuator, and could be omitted if not required. Diodes D1,D2 and D3 are protection components. C7 should be mounted close to the TDA 2030.

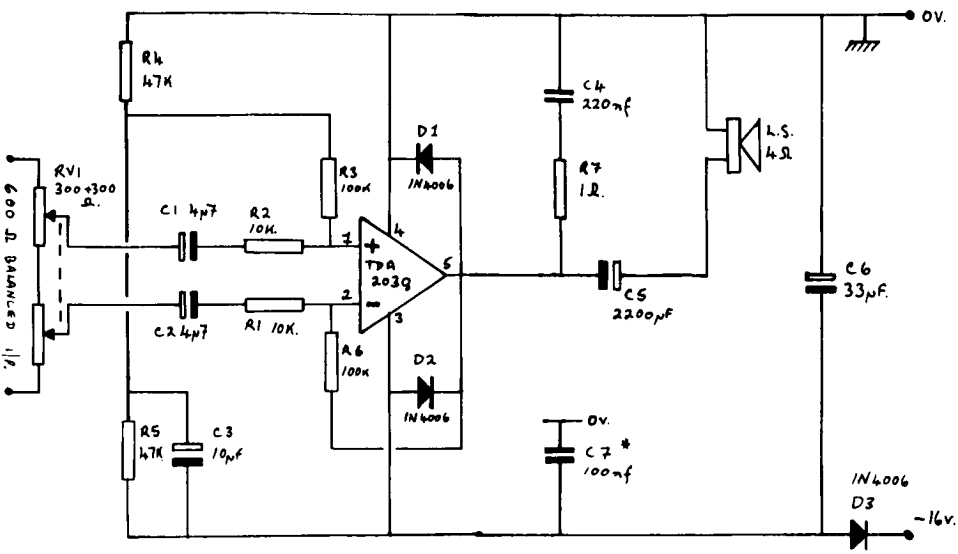


Fig.1 Four Watt Amplifier - 600-ohm balanced input.

The amplifier was built on a 3 x 2" piece of Veroboard with a small aluminium heat sink for the TDA 2030. About two or three square inches of 18 gauge aluminium should be enough for low powers, but it's size will need increasing for higher outputs. All the capacitors should be 25 volt working, and C7 should be mounted as close to the TDA2030 as possible.

The TDA 2030 is versatile and can be used with up to 36 volts of supply, split or single rail, bridge or single ended output, balanced or unbalanced input. Other features are; built in short circuit protection, thermal shut down and safe operating area protection. A pin-out diagram of the device is shown in Fig.2.

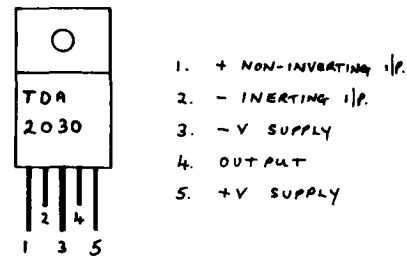


Fig.2 TDA2030 pin-outs.

Figure 3 shows the TDA 2030 in a more conventional configuration. The gain of this circuit is set by:-

Gain = (R1+R6)/R1 (10+91)/10 = 10.1

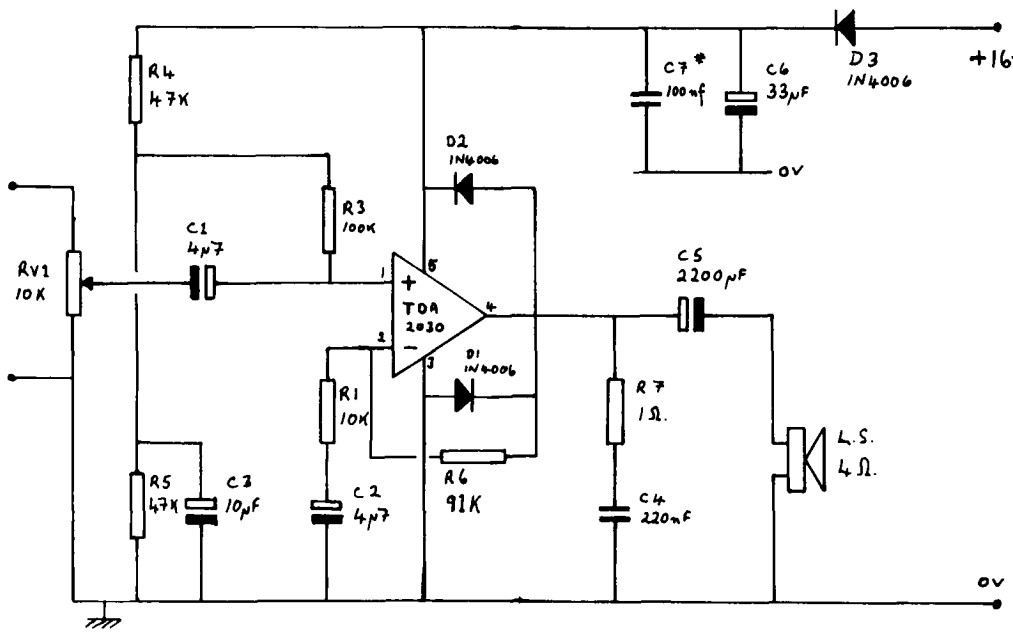


Fig.3 Four Watt Amplifier - conventional arrangement.

CARBON TO MOVING COIL MICROPHONE CONVERTER

This circuit (Fig. 4) was designed for use with ex broadcast cameras so that moving coil microphones could be used in place of the original carbon ones,. with the minimum of changes to the

cameras. Only three connections are needed and the circuit can be built on a small piece of veroboard, which can be attached to the camera with some double sided sellotape strip, or it could be incorporated into the headset.

The amplifier is suitable for use where the carbon microphone's polarising voltage is supplied through a resistor, RX. I found that a gain of 17.5 suited my system, but other systems may need a different gain. The gain is determined by the ratio of R2 & RX

$$\text{Gain} = RX/R2$$

this can be adjusted by varying R2, which could be replaced by a variable potentiometer of around 250-ohms.

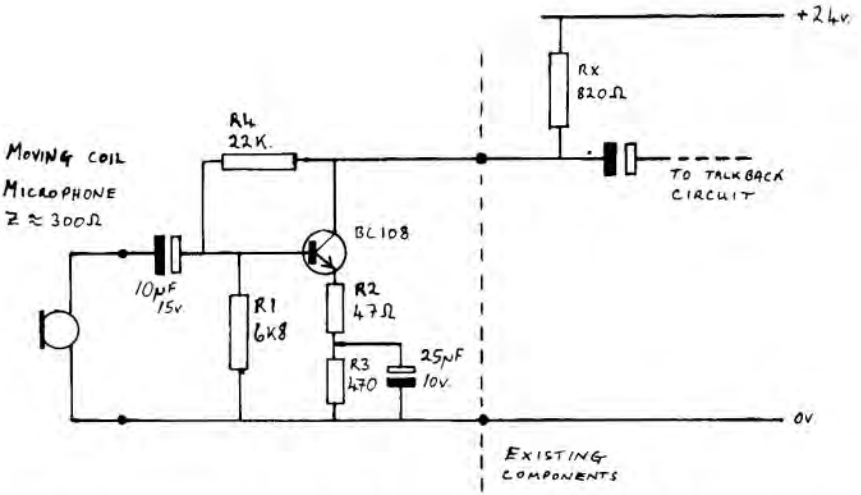


Fig.4 Carbon to Moving Coil Microphone Converter Amplifier.

AMATEUR TELEVISION QUARTERLY

REVIEW

John Wood G3YQC

January this year saw the launch of a new magazine from the USA 'devoted entirely to amateur television'. Amateur Television Quarterly is edited and produced by Henry Ruh KB9FO, whom some of you may remember as the previous editor of 'A5 Magazine' (now SpecCom International). The magazine is in direct response to the strenuous lobbying of serious ATV hams, not only for a dedicated ATV magazine, but also for one which contains practical, up-to-date and useful information on all aspects of the hobby, but with the emphasis on hardware projects.

This first issue is printed in A4 format and contains some 58 pages. It sports a colour cover but, unfortunately uses re-cycled paper inside which discolours in sunlight and is not particularly easy to photocopy.

A quick glance through reveals many pages containing just text and not relieved by any artwork, photo's or even the odd title. This does make for a rather 'heavy' magazine which sometimes takes a bit of effort to read through. Nevertheless it does contain some useful articles.

The first five pages are devoted to announcements and newsy bits of ATV interest (rather like our 'News Roundup'). Then comes an un-illustrated article suggesting what you can do with a new video camera. This tells you how to make tapes and gives some suggestions on subjects; the family, baby on the lawn, holidays, that sort of thing. There is an interesting article suggesting how one may use a microwave oven as a TV transmitter. Unfortunately there again appears no artwork or circuitry whatsoever so, although interesting, the article could hardly be called 'practical'. (see elsewhere in this issue though).

As with many new magazines there are articles taking you 'Back to Basics' and providing 'Questions and Answers' on TV topics. A nice little piece on mobile ATV breaks the monotony as it has a couple of drawings of suggested aerials(!). A series of projects which involve the flying of ATV transmitters and transponders aboard helium baloons is quite interesting. This one has a little artwork and a couple of test cards as well as a number of photographs. The trouble is all the photo's have been put on one page instead of being littered throughout the text to relieve the tedium.

On the constructional side they have re-produced the Elektor Electronics GaAsFET ATV converter from CQ-TV 144. The text has been re-typed into the magazine style, and all the artwork has been shrunk and put on one page(!!). A commercial video ident unit is described and this includes not only the circuit diagram but also a printed circuit layout. The description is quite good and it seems as though it should be buildable by the reader. Following that is a rather heavy article entitled 'Analysis of Audio/Video Tests Using Statistics'. The title alone should give you some idea, but suffice to say that there are several graphs, plots, charts and lots of long calculations included - not one for the faint-hearted I'm afraid.

JANUARY 1989 $3.95

AMATEUR TELEVISION QUARTERLY

Devoted Entirely to Amateur Television

Vol. 2 #1 **60 Pages**

The magazine has a number of useful advertisements in it, including one for the BATC, and also a nice looking ad' which we couldn't resist reproducing here. Anyone getting hold of one of these is invited to comment on its performance in these pages.

All in all a good effort for a first issue. I hope that the passage of time will ensure that the layout and presentation is honed to a sharper edge and that readers will contribute more original and practical 'build-it-yourself' articles. Well worth a years subscription (see advertisement elsewhere in this issue).

405-LINE INTEREST GROUP

Andy Emmerson, G8PTH

Recently I have sensed a growing interest in broadcast history, following mentions in 'Television' magazine and elsewhere. Plenty of people (not all BATC or British Vintage Wireless Society members) now collect and maintain old TV equipment, while others are interested in the history of the technology. A 405 line circle has been proposed in the past, but for a number of reasons it never really got off the ground. However, I think now the time is ripe!

Having floated the idea among a number of 'serious' enthusiasts, I am now confident there is sufficient interest to support a very modest circle or interest group. Bill Journeaux tells me he had fifty subscribers to his original newsletter and I have a dozen more keen names. Anyone else interested is invited to send me a large (A4 size) envelope and the stamp.

In return, within two months, you will receive the first edition of a newsletter, which will cost you nothing. Although a modest affair, it will include articles, circuits, notes, advertisement and photocopies of what ever is received from YOU: If you like what you see you will be invited to send £5, which will pay for more newsletters (until the money runs out). Hopefully, we can also act as a forum for people with 405 line recordings to swap. At this stage there will be no subscriptions, no formal society, no red tape, no elected officers, no committee meetings.

THE POTENTIAL

Swallowing modesty, I must admit that I speak with some experience of this kind of thing, having started a study group for telephone and telegraph collectors and historians two years ago. I have seen it grow from nothing to a full-blown society of nearly 500 members. So I can also envisage a 405 line group turning into something quite ambitious, if people want it - and are prepared to support it.

I must point out that this group would not encroach in any way upon the British Vintage Wireless Society's or BATC's activities; instead it would act purely as a forum for hard-core 405 line and TV history material.

If you are interested, please send your SAE and letter to me, at 71 Falcutt Way, Northampton, NN2 8PH. Because of my other commitments I shall not be able to reply to your letters, except in the newsletter, nor can I supply parts or circuit diagrams.

ATV CALLING..144.750

A "KAGA" MONITOR INTERFACE

Andy Emmerson

The problem pages of the computer magazines are full of queries along the lines of 'How do I connect my XXX computer to a YYY monitor?', largely because there are so many variables.

For instance:

- the computer may not have a built-in loudspeaker but expects the monitor to possess an audio amplifier and speaker;

- the monitor may need external syncs but the computer does not output these;

- the computer outputs separate RGB signals but the monitor requires a composite signal;

- the computer provides linear RGB signals but the monitor is adapted for digital TTL (4V on/off) signals;

- the computer provides an Intensity signal as well as RGB but the monitor is not adapted to RGBI signals;

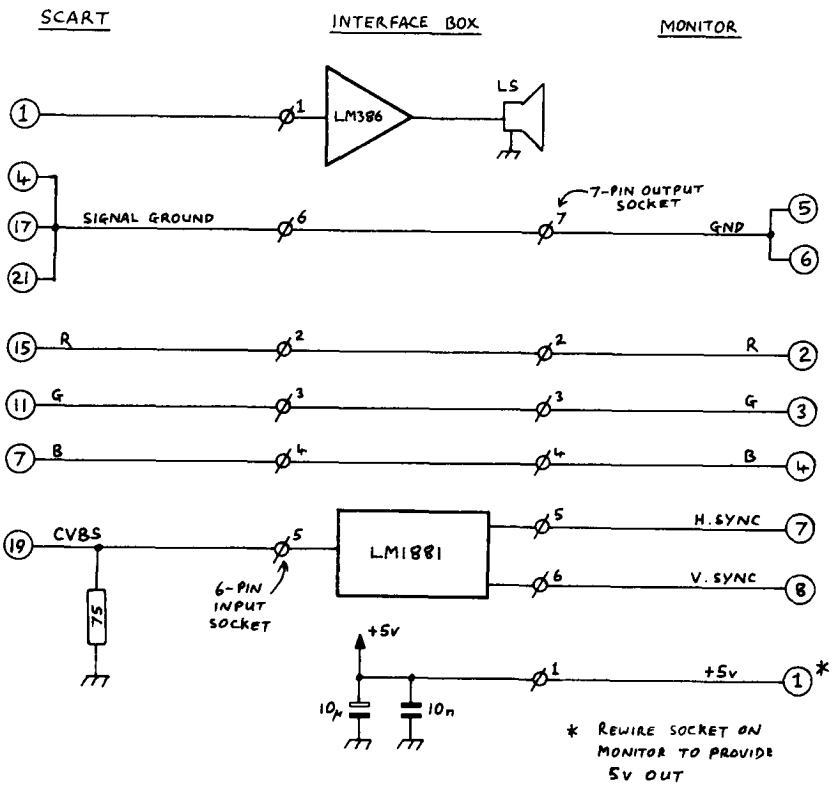
- either the computer or the monitor (or both) are equipped with a SCART/EUROCONNECTOR or some other weird multipin connector;

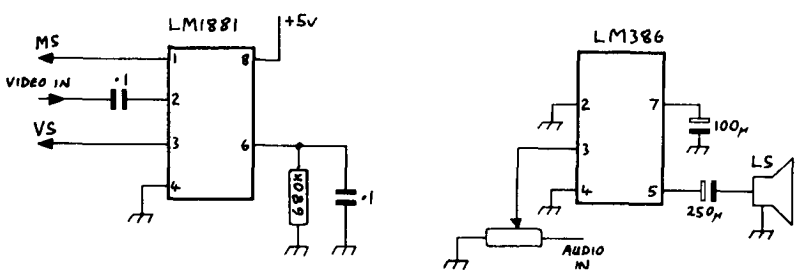
- or vice versa, or all of these!

I think all of these problems have been solved in one or other of the micro magazines; all, that is, except the conundrum which faced me. I acquired a Philips MSX2 computer and already had a Kaga RGB Vision-III (soundless) monitor. On the face of it these were not compatible, but I had neither the room, nor the money to buy another colour monitor (and at £80 the second-hand Vision-III had been such a bargain!).

Now, the Vision-III has three video modes, one for IBM and two for Apple computers. Luckily, one of the latter accepts linear RGB, so the MSX's RGB outputs were compatible. On the other hand, the Vision-III also needs separate vertical and hoorizontal sync signals which are not provided by the MSX. Genuine SCART-compatible monitors extract the syncs from the composite video signal provided on the Euroconnector, but the Vision-III does not have this capability. Finally, as I said, the monitor is sound less, so an outboard audio stage had to be provided.

The solution turned out to be extremely simple and used only two ICs (see circuit diagram). The ICs and passive components were built onto a piece of matrix board about 1" x 2" and with a 2" diameter loudspeaker the whole unit fitted easily inside a plastic box 3" x 4" x 2". The LM386 audio amplifier costs less than £1, and you can even get it at Tandy shops! At maximum volume it provides a satisfactory level of sound, and there is no need to vary this volume once set. The LM1881 sync separator is more expensive, but was a dream to use - no fiddling about and far simpler than conventional sync separators, with their 'adjust-on-test' components.





RGBA MONITOR INTERFACE

The whole circuit runs on flea-power at 5 volts and I decided to cheat and take this from the monitor. The interface PCB inside the monitor runs off 5V and there was a spare pin unused on the input connector, so this became a power take-off. The 5V line is decoupled with 0.1 and 10 uF capacitors on the main PCB inside the new interface box. Normal screened audio cable is used for the connecting leads and I used screw-on Japanese microphone connectors for the connections to the 'black box'. Total cost is under £20, much cheaper than buying another monitor. Best of all, there are no adjustments and everything worked first time round!

NOTE: The LM1881 is somewhat hard to find and was unavailable at most of the component distributors I tried. You can get it from Thame Components Ltd for £9.21 all inclusive; their address is Thame Park Road, Thame, Oxon., OX9 3UQ. The actual price of the IC is £3.50, but you come up against minimum order charges, postage, VAT and so on, bringing the total price to £9.21!

SOFTWARE NOTEBOOK

A couple of programs in the software notebook this time. The first routine comes from Bill Parker W8DMR and first apopeared in 'ATV Quarterly in Jaunuary 1989. The program is written in basic, so it can easily be adapted for various computers, and prompts for various parameters and then works out you Effective Radiated Power.

PROGRAM 1: CALCULATE YOUR ATV ERP

```
10 REM Program by Bill Parker W8DMR, in ATV Quarterly Jan 1989
20  PRINT "** CALCULATE YOUR ATV ERP **"
30 PRINT " (Effective Radiated Power) "
40 CLS:PRINT
50 INPUT "WATT METER READING (with video modulation): ",WA
60 PRINT
70 INPUT "ESTIMATED FEED LINE LOSS (dB): ",FL
80 PRINT
90 INPUT "ESTIMATED ANTENNA GAIN (dBd): ",AG
100 PRINT:PRINT:PRINT
110 VP=WA*1.6805
120 EXPO=10^(FL/10)
130 FLL=1/EXPO
140 PA=VP* FLL
150 GAIN=10^(AG/10)
160 ERP=GAIN*PA
170 ERP=INT(ERP*10+.5)/10
180 PRINT "ERP in watts (sync tip): ";ERP
190 PRINT:PRINT:PRINT
200 REM
210 INPUT "ANOTHER CALCULATION  (Y/N)",A$
220 IF A$="y" OR A$="Y" THEN GOTO 20
230 IF A$="n" OR A$="N" THEN STOP
290 REM to check use WA=10, FL=3, AG=10
300 REM answer = 84.2W ERP
310 END
```

This second program was first published in 'Radio & Electronics World' in January 1987. Again written in basic, the program works out the frequency range, subcarrier frequencies and various other bits of information, after prompting for the channel number.

PROGRAM 2: TV CHANNEL FREQUENCY DIRECTORY.

```
5 ' from Computer Digest page 12 (in Radio Electronics, Jan. 87)
10 PRINT "TV CHANNEL FREQUENCY DIRECTORY"
20 PRINT "******************************"
30 PRINT "ENTER TV CHANNEL: ";
35 INPUT A$
40 A=ASC(A$):IF A>64 THEN 300
50 C=VAL(A$)
100 IF C<2 THEN 600
110 IF C<5 THEN 200
120 IF C<7 THEN 190
130 IF C<14 THEN 180
140 PRINT "UHF OR CABLE";
145 INPUT B$
150 IF LEFT$(B$,1)="C" THEN 320
160 IF C>83 THEN 600
170 BC=14:BF=470:GOTO 400
180 BC=7:BF=174:GOTO 400
190 BC=5:BF=76:GOTO 400
200 BC=2:BF=54:GOTO 400
210 IF A>90 THEN 600
300 IF A>90 THEN 600
310 C=A-51:PRINT A$;" =CABLE CH# ";C
320 IF C>40 THEN 600
330 IF C<23 THEN PRINT "MID BAND CHANNEL":GOTO 360
340 PRINT "SUPER BAND CHANNEL"
350 BC=23:BF=216:GOTO 400
360 BC=14:BF=120
370 LB=BF+(C-BC)*6
400 LB=BF+(C-BC)*6
410 UB=LB+6
420 FV=LB+1.25:FC=FV+3.58:FA=FV+4.5
430 FL=LB+47
440 IL=UB+41*2:IU=LB+47*2
450 PRINT "FREQUENCY RANGE = ";LB;" TO ";UB;" MHZ."
460 PRINT "PIX CARRIER = ";FV;" MHZ."
470 PRINT "COLOR CARRIER = ";FC;" MHZ."
480 PRINT "SOUND CARRIER = ";FA;" MHZ."
490 PRINT "NOTE: THE FOLLOWING"
500 PRINT "ASSUMES A RECEIVER"
510 PRINT "WITH A 41 - 47 MHZ I.F."
515 PRINT "(41.25 MHZ SOUND, 45.75 MHZ PIX.)"
520 PRINT "LOCAL OSCILLATOR = ";FL;" MHZ."
540 PRINT "IMAGE RANGE = ";IL;" TO ";IU;" MHZ."
550 INPUT "MORE";C$
560 IF C$="" THEN 550
570 IF C$="Y" OR C$="y" THEN 20
580 END
600 PRINT "NON-EXISTENT CHANNEL":GOTO 20
```

Don't forget, if you have any programs for any computer, especially ATV based routines, let us know about them. If my mail bag is anything to go by, how about something for Atari's and Amiga's.

SOLENT TX - THE LAST WORD

Dear Mike,

following the article by Barry Trigger, G6IKQ, in CQ-TV 146, the Worthing Video Group thought you might like to publish the following review of a magazine article.

A SERVICE PROVIDERS LAMENT

Firstly, let us start by apologising to all those customers who have bought our kits and found one or two resistors missing. it is not our usual custom to miss out this type of part, we normally try to leave out the expensive bits, such as the BLV91 output transistor, on the grounds that they cost £15.00, and if they are not missed they make our kits cheaper to produce! We are very proud of our service, which is a guaranteed Sinclair 28 days, Post Office permitting.

We are also sorry that we are not available every evening, or Saturdays, or Sundays, to answer your queries. However, owing to the success of our kit supply policy we have been able to afford to but a Telephone Answering machine. Unfortunately, due to problems with our supplier this will not be delivered for art least 12 months.

We realise some components are a bit difficult to identify, after all, some of the have two legs and some have three (we can supply an abacus on request). However, for all those who don't know, transistors and BB204 diodes have three, whilst mostly everything else has two, except our dog which has four very short ones.

We are currently designing a new kit: it doesn't do very much, particularly as all the components are missing, excerpt for two capacitors with very short leads. In addition, we are supplying this kit without instructions, as we don't want you to, actually manage to get it to work, do we? This is compensated for by the fact that we sometimes receive kits that look as though they have been assembled with a blow-torch. This leads us nicely into a plug for our next product. In order to assist customers with their assembly we have arranged for a new kit to be made available:

Kit number NBG123 contains a Propane cylinder, a wide-angle blow-torch, a large reel of plumbing solder and a very large can of Plumbers Mate. this is THE kit for all your flow-soldering jobs. Priced at a very competitive £92.00 plus carriage (N.B: gas not supplied). We also have various other goodies on offer for the home micro user. We can supply Spectrum programmes in an empty box and discs minus the programme.

All this mayhem is carried out in the best tradition of amateur radio, i.e: a group of individuals trying to help each other amateurs in their spare time, in order to fund specialist repeater projects (plus trips to the Bahamas!).

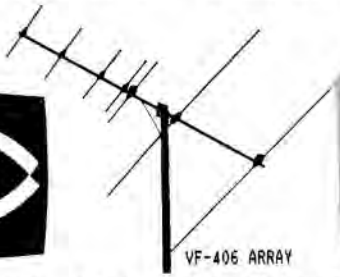
Seriously though folks ..... Sorry.

Roy Humphreys G4WTV and Ron Bray G8VEH.

Worthing and District Video Repeater Group.

HS PUBLICATIONS

7 EPPING CLOSE DERBY DE3 4HR ENGLAND



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Suitable PSU: £13.45 inc P&P...Twin output type (feeds 2 TV sets) £15.45 inc P&P

AN INTRODUCTION TO SATELLITE TELEVISION by F.A. Wilson
Highly recommended for anyone interested in satellite TV. (104 pages 260 x 195)
Price £6.55 UK.....Surface £7.45.....Air (Europe) £8.45.....Air £8.90

TV-BILDKATALOG -2ND EDITION by Norbert Kaiser
Identify DX signals with this detailed guide to European test cards and captions. Lots of useful information with maps, etc.
Price £6.55 UK.....Air (Europe) £7.30.....Air (Rest of the World) £8.50

TELERADIO NEWS DATA FILE -BAND I/II
Our very own publication revised July/August 1988. It includes a European picture guide with test cards, clocks, etc. There's also a handy Band I/II transmitter map with list of TV stations you're likely to encounter via SpE.
Price only £5.99 (UK).....Surface Mail £7.75.....Airmail £8.75

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* WE CAN SUPPLY A WIDE RANGE OF VHF & UHF DX AERIAL SYSTEMS AND ACCESSORIES *
Send 19p stamp (or 2 IRC's) for our full product range.

LOGIC CIRCUITS

Part-2

John Wood G3YQC

THE BASIC GATE

The basic TTL gate consists of several transistors and is shown in fig.1. VT3 and 4 form a compound emitter follower (or totem-pole) stage. The diode is used only to correctly bias VT3 by employing the forward-voltage drop of a p-n junction. VT2 is a push-pull driver stage providing signal inversion. So from VT2 base to the output, the IC is an inverter with low output impedance whether 'high' or 'low'.

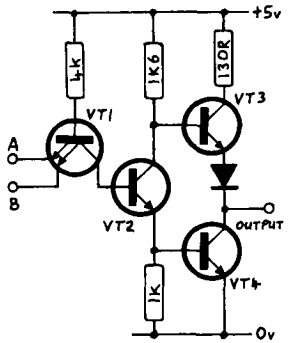


Fig.1 2-input NAND gate

The multi-emitter transistor VT1 is the particular feature of TTL as such a device can be made easily by modern methods of transistor construction by gaseous diffusion. The effect of multiple emitters is that of paralleling several transistors by their bases and collectors. It is evident that if ANY ONE of these emitters is earthed then VT1 will be 'on', but the method of driving the rest of the IC is not immediately obvious. One would normally assume that turning VT1 on would join VT2 base to +5 volts but there is no collector load resistor for VT1 and in fact what happens is that the collector voltage of VT1 ends up at about the base voltage, which is some 0.6v above ground due to the forward voltage drop of the base-emitter p-n junction of VT1, so that the phase is unchanged through VT1. Hence the output of the IC is 'high' for ANY input which is 'low'.

If ALL inputs are high, then VT1 is off and the base-collector junction is now biased in the wrong direction and so is a low impedance (it is FORWARD-biased). So VT2 base is joined to some +4.4 volts. Hence, the output of the IC is 'low' for ALL inputs which are 'high'. This is the NAND (Not AND) function for positive logic (where the input signals go TOWARDS the supply).

The fan-out, or output loading factor, of basic TTL, per gate, means that it is able to drive 10/1 other gates = 10 gates. It should be noted that the fan-out of the more modern 'LS' circuits is much less - only a couple of gates.

TTL VOLTAGE LEVELS ETC.

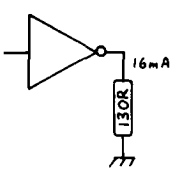


Fig.2 TTL input

A TTL gate will give out almost exactly 4 volts p-p of pulse starting at +0.05v. Fully loaded the output drops to 3.75 volts p-p. DC output impedance of a TTL gate is 130-ohms - this can be measured by resistive loading until the output is half the unloaded output. Then source impedance equals load impedance. However, under these conditions the gate is overloaded at 16mA whereas 3.75mA is the normal maximum. So the basic gate will not drive 75-ohm TERMINATED lines but since the

dynamic output impedance is 100-ohms when high, and 12-ohms when low, it will drive unterminated lines satisfactorily up to 2 metres long. Longer lines give worse reflections causing false operation of the gate. To drive 75-ohm terminated lines, parallel driving by four gates will give 4mA load current which is satisfactory. This is excessive for amateur use, so two is a good compromise. The output signal level can be made 2v p-p across 75-ohms by the use of a series resistor in each gate of 33-ohms. The gate then delivers 2.8v p-p at 7mA which is reasonable. For better results there is a higher power gate which can drive 30 loads and which will give 2v into 75-ohms with only 27-ohms series resistor. These come as two-to-a-package and are basically 4 input NAND gates.

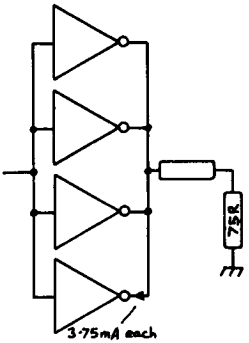


Fig.3 TTL 75 output

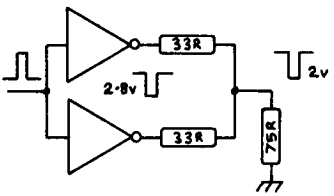


Fig.4 TTL 75 output

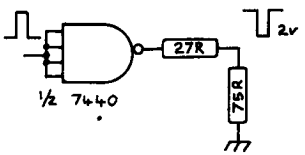


Fig.5 TTL high power output

DRIVING TTL FROM EXTERNAL SOURCES

There is no guarantee that external driving sources will stay at all times between earth potential and the supply voltage. This could be disastrous in a TTL circuit and so a simple method is required to keep the signals between these two limits.

Firstly a capacitor is used to isolate the DC, if any. The voltage on the IC side of the capacitor is then determined by a resistor to either earth or supply (or any other desired potential). Which potential is used depends on the polarity of the input pulses. If negative-going inputs are used then the resistor should go to the supply voltage so that the negative pulses come down towards earth and can drive the IC input low.

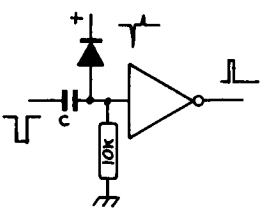


Fig.6 TTL input

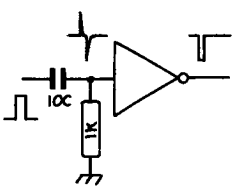


Fig.7 TTL input

The TTL arrangement is not obvious but the resistor value is high so that it JUST turns VT1 (in the IC) on - the input potential is thus +4.4v or so. A value of 4.7k to 33k is suitable. The value of 'C' is chosen to minimise 'sag' and 100uF is usual for TV mixed blanking,

whereas 100n is sufficient for line drive. If only edges are required then some 270pF will suffice, the positive going edge pulses merely reverse bias VT1 and D1 shunts them. D1 is a safety precaution and can be omitted, but the IC MAY be damaged.

For positive going pulses, the TTL input resistance is returned to earth, as in fig.7, and the pulses drive the gates up to the supply voltage. The resistor value is now about 1k and so C has to be 10 times the value necessary for negative-going pulses. There are no problems with differentiated pulses so this method is preferred.

The final protection is for excess voltage where the input pulses are greater in amplitude than the supply or if they are obtained from a source which may vary up or down outside the range. For instance; from a coupling time-constant in a TV receiver when a switch-off the DC potential may drop rapidly 100v or more.

Figs.8 and 9 show how diodes can be used to overcome this problem.

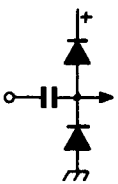


Fig.8 Diode input

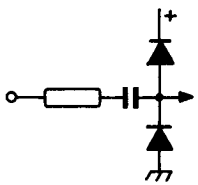


Fig.9 current limit'g

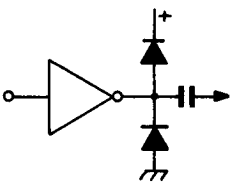


Fig.10 Output protection

Normally the diodes are reverse-biased and therefore have no effect. If the input is above the supply voltage then D1 is turned on and clamps the input to the supply voltage so that the input equals supply voltage plus 0.6v. Similarly D2 clamps the input to minus 0.6v. The input range is thereby limited to -0.6v to +5.6v. If the source is a low impedance then a series resistor will be required in the input if the diodes cannot handle the forward current. Normally any old diode will do for this job - Silicon or Germanium. Incidently, any unused inputs should be returned to OTHER used inputs, or to supply, rather than be left open circuit - if possible. They must not be earthed.

The same diode system should be employed for output stages when unknown apparatus is involved. A zener diode of 5 volts could be used instead of diodes but is more expensive and of less power rating.

TTL BISTABLES

The TTL bistables come in basically three forms, known as, J-K, J-K master slave and the D-type which can be put into two classes - the J-K bistable and the D-type of bistable. For J-K bistables, all inputs have to be taken LOW to have effect.

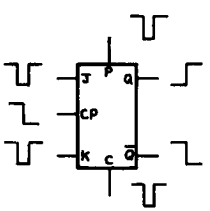


Fig.11 TTL bistable

The T-input is known as the Clock Pulse (CP) input and the Clear simply 'C'. The converse of this is Preset (P) which also overides all other conditions to make the Q-output high.

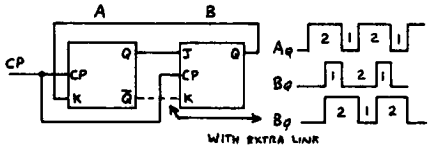


Fig.12 -3 (synchronous)

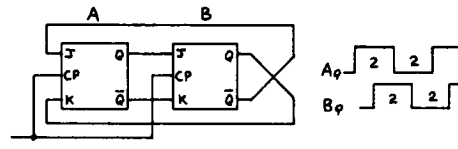


Fig.13 -4 twisted ring

THE D-BISTABLE

This can be considered as a shift register of one stage and it is a most useful device. If the CP-input (which runs on POSITIVE-GOING edges) is clocked, the Q-output takes up the polarity that the D-input had JUST PRIOR to being clocked and remains there until the next clock pulse. If the D-input is again the same then the Q-output remains as it was before. See fig.18.

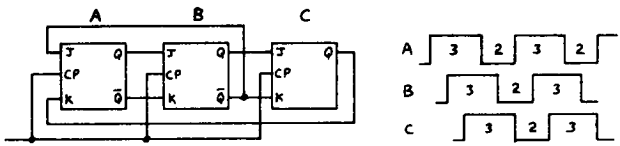


Fig.14 -5 synchronous

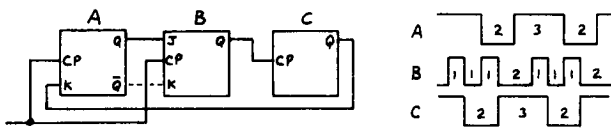


Fig.15 -5 ripple counter

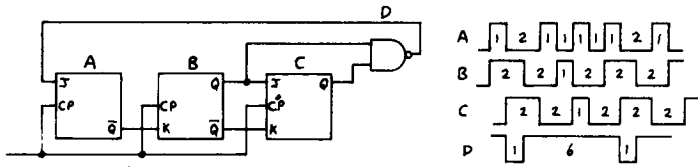


Fig.16 -7 synchronous

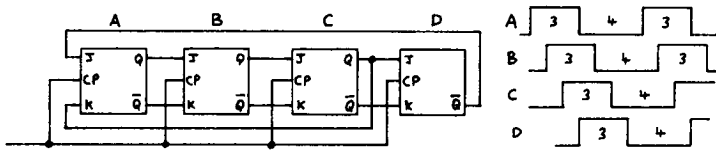


Fig.17 -7 synchronous (twisted ring)

If the D-input is fed from the $\overline{Q}$-output then it will always be of opposite polarity to the Q-output and so the result is a binary counter.

The D-bistable provides a simpler way of generating, for example, line drive than by using a J-K bistable with an inverter since the inverter is not required.

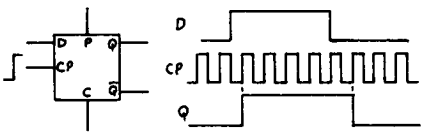


Fig.18 D-type bistable

D-bistables can be connected in a chain, as shown in fig.19 to form a shift register. If the output Q is joined to the input D then we have a Ring-Counter, but if the $\overline{Q}$ is used then we have a Twisted-ring Counter or Johnson Counter. The twisted-ring count is twice that of the ring counter and the output is a square wave, (the single stage binary counter is a twisted-ring counter). There are half the number of interconnections that J-K bistables require. Unfortunately though, there is no second D-type input with which to change the count, but this is possible by other means such as fig.21 shows. This method reduces the count by one and can be extended to a count of 2n - 1 by adding more bistables.

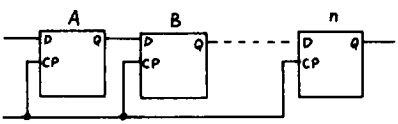
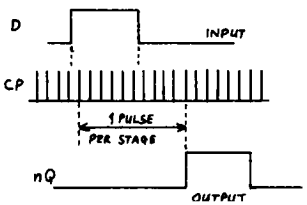


Fig.19 Shift register



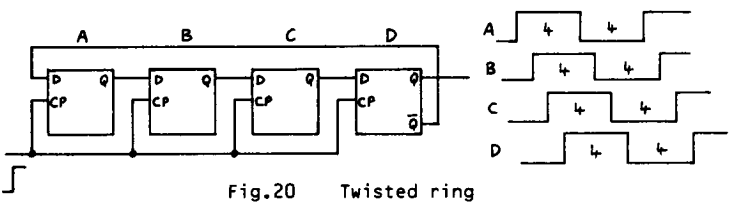


Fig.20 Twisted ring

By a similar arrangement the count can have one added to it as fig.22 shows. Here the C-input holds the first counter at the count of 2n until the (n+1)th bistable is triggered by CP and Qn output. This circuit has no advantages over the former version except that the output is more regular.

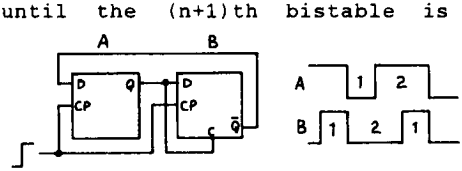


Fig.21 Reduction of count by one

If the D-bistable is used as in fig.23, then a pulse of one unit wide can be produced, for example, to make horizontal lines in a

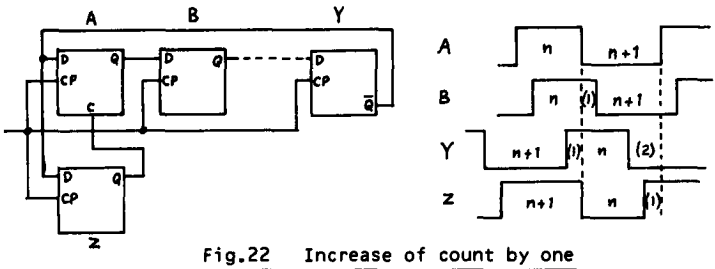


Fig.22 Increase of count by one

grille generator where the C-input is the counter, or h.f. feed and the CP-input is the slightly delayed counter output or l.f. feed. Note that although the CP-input remains high for several C pulses, the output is only one unit wide.

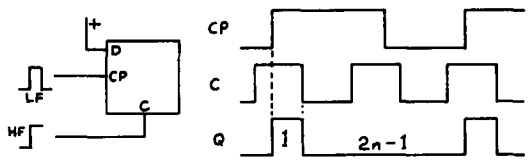


Fig.23 Producing a single unit pulse

A useful counter which is easy to make with D-bistables is a clock-counter, as shown in fig.24.

This is basically a counter of the pulses (4-bit Binary), but on the 8th pulse the output prevents the input counter from doing any more counting so the counter counts 8 pulses and stops until ALL bistables are cleared.

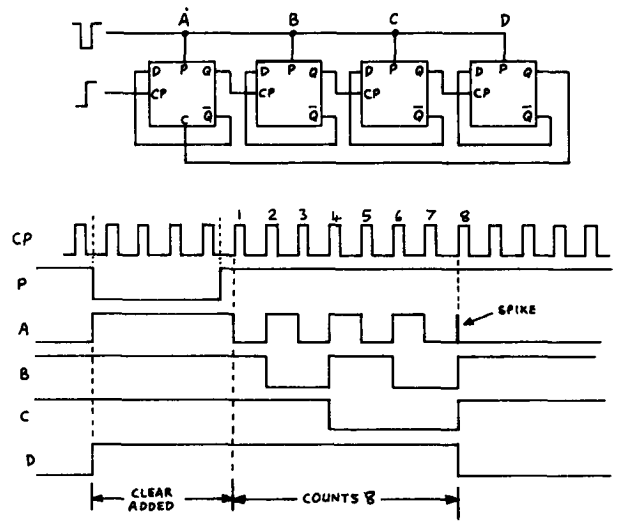


Fig.24 Clock counter

This type of counter can be arranged to count any number by changing the clearing inputs. P-inputs have a loading factor of 1 whereas C-inputs have a factor of 2, which is why the P-inputs are used if possible. If the clearing pulse is several clock-pulses wide, then this is added to the output since the counter cannot start counting until the clearing pulse is removed.

GENERAL

Well, now you should be able to rush away and play with these things, but don't despair if they don't work first time. There are lots of pins to get mixed up and good decoupling is vital to counter circuits. The best way to find out about digital IC's is to buy a few and have a go - try various arrangements. Make yourself a small board with some IC sockets on and wander-plugs, or similar, to enable changes to be easily made whilst the circuits are working. Don't keep soldering them in and out.

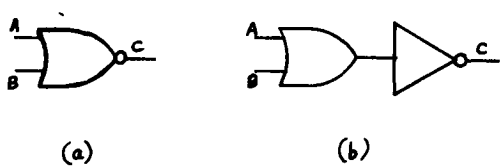
Start with a multivibrator, or a source of external pulses and string up a few bistables and gates. It really is very simple - there are no other components unless differentiators are required. But, you MUST have a well regulated power supply which preferably has overload protection. If it doesn't work, remember it isn't magic - IT'S LOGIC!

Some of the more useful TTL IC's are:-

7400	which is a quad 2-input NAND gate
7404	which is a hex inverter
7410	which is a triple 3-input NAND gate
7420	which is a dual 4-input NAND gate
7430	which is a single 8-input NAND gate
7472	Single J-K master-slave bistable with triple J-K inputs
7473	Dual J-K master-slave bistable with single J-K inputs
7474	Dual D-bistable
7490	Decade counter (2 x 5)
7492	Divide-by-12 counter (2 x 6)
7493	4-bit Binary counter (÷ 16)

ERRATA IN PART-1.

As many people noticed there was a mistake in the truth table for the NOR gate shown in part-1 of this series, on page-34 of CQ-TV 145. The corrected table is shown below:



(a) (b)

Fig.5 The NOR gate.

A	B	C
0	0	1
0	1	0
1	0	0
1	1	0

(c)

TV ON THE AIR

Andy Emmerson G8PTH

Spring is sprung and with it a new season of ATV activity. Before that though, here's a round-up of what's been going on during the past three months. The mildness of the weather did not favour many dramatic tropo openings (at least only one was reported to us) so operating success was down to people's skill (and not the weather).

Incidentally, those of you who follow my monthly column in Radio and Electronics World will have found it missing! Have no fear, it has merely QSY'd to Practical Wireless where it will doubtless see a wider readership.

MERCURY NOT GUILTY

In the last activity roundup I mentioned interference on 10GHz from Mercury Communications Ltd's telephony transmissions: I was wrong! Whoever the culprit is, it's not Mercury. They assure me they do not use the shared amateur frequencies at all, so I wonder who it is.

Ted Gilbert G8TMM (Harpole, near Northampton) is having an interesting time combining his two hobbies of television and astronomy. He has coupled up a TV camera to a remote controlled telescope, and is now experimenting with overlaying a sky map onto 'live' pictures from the telescope. He also wants to try digitising these pictures and processing them with his Atari ST computer, and would be pleased to hear from anyone who has a design for a video digitiser for the ST (and from anyone who has a monochrome video mixer for disposal). Ted is in the callbook or I can pass on letters.

NBTV AND 405 RULE OK

It is time we gave another plug for the Narrow Band Television Association. It was founded in 1975 and exists to promote the development, study and use of low definition and mechanical television techniques. Membership is open worldwide to anyone interested, and the current subscription is £3 (reductions for the unwaged). There is an annual exhibition and conference held in April or May, and members receive a quarterly newsletter containing twelve pages of technical articles, constructional projects and news. The association also offers a number of special services to members. Activities include the building of experimental cameras, monitors and so on, closed circuit demonstrations, tape correspondence on cassette as well as transmission on the amateur radio bands mainly 28 MHz and two metres). Membership enquiries should be addressed to N. Reynolds G8YXL, 6A Collingbourne Road, London W12 0JQ. For information on amateur band NBTV write to D.J.Sumner G3PVH, 20 Woodlands Way, Southwater, Horsham, Sussex, RH13 7HZ.

For those whose interests are a little higher in definition, the newly reformed 405 Line Group exists. Members include people interested in collecting and restoring receivers, monitors and cameras, also students of broadcasting history and one member even designs and builds standards converters. A quarterly newsletter keeps members in touch for £5 plus four A4-size SAE's, sent to Andrew Emmerson, 71 Falcutt Way, Northampton, NN2 8PH.

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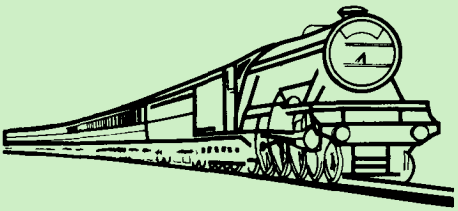

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PUBLICATIONS should NOT be ordered on this form. A separate form is provided for that purpose elsewhere in this supplement.
We reserve the right to change prices without notice.

QTY	CAMERA TUBES, SCAN COILS, BASES & LENS MOUNTS	EACH	P&P	TOTAL
.....	1" Vidicon scan-coils (low Z focus)	£6.00	£1.20	.....
.....	1" Vidicon scan-coils (high Z focus)	£6.00	£1.20	.....
.....	2/3" Vidicon scan-coils	£6.00	0.80	.....
.....	Vidicon bases - 1"	£1.00	0.19	.....
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.....	C Mount for lenses	£4.00	0.19	.....
.....	Vidicon camera tubes - see below	-	-	
.....	Image Orthicon camera tubes type 9565 **	£10.00	+	.....

(+ Buyer to arrange transport).

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1" vidicon tubes are available in different heater ratings (95 and 300mA) - 6" long, and also a 95mA 5" long version; (EMI types 9677, 9728 and EEV types P849 and P8031). 2/3" tubes have 95mA heaters (EEV type P8037). All tubes are of separate mesh construction, with magnetic focus and cost £25 each, including postage. Electrostatic vidicons, Leddicon and Ebitron tubes are available, to special order. Members requesting information on different types of tube or equivalents for other manufacturers are asked to send a stamped, addressed envelope for their reply.

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.....	Sync processor (CQ-TV129)	£3.00	0.30	.....
.....	2.5625MHz SPG crystal for ZNA134 (HB2)	£2.75	0.19	.....
.....	SPG, greyscale, char gen (MTP)	£4.set	0.60	.....
.....	Keyboard add-on(for this char. gen) (MTP)	£2.25	0.25	.....
.....	Colour test card (set of 3-double-sided)	£15.00	0.60	.....
.....	TBP28L22 PROM for test card circle	£10.00	0.25	.....
.....	PAL colour coder (CQTV 134)	£6.00	0.30	.....
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.....	Vision switcher logic (HB2)	£4.00	0.30	.....
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.....	Wipe effect generator (HB2 rev)	£3.00	0.30	.....
.....	4 Way vision switch (MTP)	£3.00	0.25	.....
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.....	Teletron VDU (MTP)	£4.00	0.30	.....
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.....	2764 E-PROM - Teletron Monitor program	£5.00	0.19	.....
.....	Power supplies - 2 +ve and 2 -ve rails	£3.00	0.30	.....
	TOTAL GOODS THIS PAGE			£.....

QTY	RX, TX AND SSTV PCBS & COMPONENTS	EACH	P&P	TOTAL
.....	70cm VSB transmitter-7 boards (HB2)	£15.00	0.40	.....
.....	13.14MHz TV TX crystal (HB2)	£5.00	0.19	.....
.....	70cm TV transmitter (TVA and CQ-TV122)	£3.00	0.30	.....
.....	108.875MHz TV TX crystal (TVA)	£7.00	0.19	.....
.....	ATV up-converter (TVA and CQ-TV112)	£2.25	0.30	.....
.....	Amateur television receiver (HB1)	£1.50	0.30	.....
.....	GaAs FET 24cm converter (CQ-TV144)	£3.50	0.19	.....
.....	FM-TV demodulator (CQ-TV122)	£3.00	0.30	.....
.....	Gunn diode modulator (CQ-TV141)	£2.50	0.19	.....
.....	6MHz audio generator (CQ-TV139)	£1.50	0.20	.....
.***.	G3WCY SSTV to FSTV RX & reprint (COM)	£10.set	0.60	.***.
.....	G4ENA mods for above (CQ'127,COM) set of 4	£5.set	0.30	.....
.....	G4ENA SSTV transmit board (CQ-TV129,COM) Add on to G3WCY - uses same memory	£6.00	0.30	.....
.....	G4ENA SSTV aux board (CQ-TV130,COM)	£2.00	0.20	.....
.....	G8CGK SSTV pattern gen. + notes (COM)	£3.00	0.35	.....
.....	SSTV pattern/sync generator (HB2)	£3.00	0.30	.....
.....	2732 E-PROM. SSTV program (HB2)	£12.00	0.19	.....
.....	MC1445N Gated video amplifier i.c.	£3.50	0.19	.....
.....	TEA2014A video switch i.c.	£1.10	0.19	.....
.....	TEA5114A video switch i.c.	£1.50	0.19	.....
.....	2716 E-PROM - programed as a substitute for 74S262 (see mod in CQ-TV132)	£5.00	0.19	.....
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.....	5MHz SPG crystal	£2.75	0.19	.....
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All Club crystals are HC18/U (wire ended).
HB1 = ATV Handbook (blue); HB2 = ATV Handbook vol.2, or revised; TVA = TV for Amateurs; MTP = Micro & Television Projects; COM = SSTV Companion. *** Temporarily unavailable.

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SALES NOTES

MEMBERS SERVICES

BATC Members Services does not hold stocks of BATC publications, and vice versa. Please send your order to the appropriate address, as otherwise extra delay and expense is caused in fulfilling the order. Please note that only the items listed in the CURRENT "Services for Members" leaflet are available - a description of the various pcbs and components can be found, in CQ-TV 140 onwards. To avoid delay and inconvenience, please be careful to include the correct amount of VAT with your order, (U.K. residents) ie 15% of total goods and postage. Payment should be by cheque or crossed postal order in favour of BATC - do not send cash or stamps please.

Batches of callsign badges are sent to the engravers once per magazine cycle. Please ensure that your order reaches BATC Members Services by the CQ-TV close for press date, given at the foot of the 'Contents' page in each issue. Badges are distributed to members as soon as they have been engraved.

Some new boards are in preparation, including the PAL coder from CQTV134 and the Spectrum Freezer from Micro and Television Projects (which is usable with other types of computer). Details will be announced on the BATC Prestel pages, or you may send a suitably stamped and addressed postcard to Members Services, if you can't wait for the next CQ-TV.

VIDICONS

We have now arranged for an additional source of vidicons to be made available through Members Services. Tubes available include electrostatic focus or deflection, and low light types not previously available to club members. Prices vary depending on the size, type and grade of tube. Please contact Members Services for information on equivalents and price and delivery times. The stripe filter tubes used in domestic type colour cameras are not available through BATC, and normally must be ordered direct from an equipment supplier.

NORTH AMERICAN MEMBERS

The BATC has an agency in North America where orders for Subscriptions, Publications and Members Services sales items may be placed and paid for. This should considerably ease the old problem of sending money overseas. A special Members Services sales form, priced in US Dollars, is available on request from our agent, as is a 7-page handout briefly describing the items and PC boards available. A large, stamped, self addressed envelope should be enclosed for these items.

Orders please to WYMAN RESEARCH Inc., Box 95, Waldron, IN.46182 and checks made payable to Wyman Research. All goods will normally be despatched from the UK so please allow sufficient time for delivery.

Your membership number is printed on the address label below.

The first two digits indicate the year that your subscription has been paid up to, and the rest is the club's database number.

Please keep your current membership number as it is possible that it may be needed in the future to obtain club discounts as well as club sales items at rallies and shows.

You will also note that we are again able to print your callsign on the address label.

KEEP YOUR MEMBERSHIP NUMBER SAFE

NEWS FROM NEW ZEALAND

Our main man in NZ, Michael Sheffield ZL1ABS, says that he and Wayne ZL1TVW have been hard at it promoting ATV. As interest in kits for exciters (CQ-TV 122 design) is low, Michael has been building them up and selling them tested and ready-to-run. As a result sales have shot up. He says he knows the circuit by heart now! Wayne constructs 5.5MHz subcarrier sound generators to go with them, and also supplies a PCB for the M57716 linear amplifier module. For those not inclined to construct, he supplies all three units in an aluminium case ready to run. Wayne produces a list of these and other amateur television projects and anyone interested should get in touch with him QTHR.

The Wellington repeater is back on the air after a year's absence, so we can expect a revival of ATV activity in that neck of the woods. Things are looking up in Auckland also. While it is still two years for the long-awaited QSY of 602 MHz radar to 1300MHz, a good temporary site should be available soon. Plans were in hand to operate the repeater with 443.25MHz in and 615.25MHz out from the AK Group's beacon site. But just as aerials and equipment were being prepared the club was informed that the site owner was going to lay new cable ducts and do general renovations.

The 6 metre beacon has been off the air because of waterlogged coax and there was no point in replacing it if the new ducts weren't ready. Happily the club has now heard that the works have been completed and the way is clear for the ham gear to be overhauled. New aerials are to be built for all the beacons and new coax has been purchased and donated. The ATV repeater is to be installed in conjunction with these improvements. Previous tests from the site have shown no QRM to the radar (unlike the club's Klondyke Tower site, which is unfortunately line of sight to the airport). Klondyke is still the eventual goal however, as it has superior coverage and good potential for ATV linking between Auckland city, Hamilton city and other locations in the Waikato region.

UK ACTIVITY

Dave G8JET in Misterton, in the Lincoln/Gainsborough/Doncaster district, is looking for new stations to work now that he has got back on the air again. G3OSF in Lincoln is a regular contact. Earlier Dave had a rather disastrous encounter with a collapsing wind-up tower - the wire cable snapped and quite a bit of damage done (though no personal injury fortunately). Dave warns that appearances can be deceptive, and just because something used to be safe, that doesn't mean that it always will be. If there's the slightest trace of rust visible on the cable GET IT CHANGED NOW!!! Unlike cats, ATVers have only one life.

Still on the eastern side of the country, Clive G8EQZ has taken time off from his professional activities evaluating TVRO terminals to try out his 24cm station. First tests have been in conjunction with Richard G4YTV in Skirlaugh, 8 miles north-east of Clive's QTH in Hull. So far they have achieved a one-way with P4 results, which is not bad considering no preamp is used. They are now looking forward to making it a two-way contact. G4YTV works for YTV incidentally and helped out on the video 'shoot' of HRH Prince Philip at last year's RSGB annual general meeting.

Moving south to Kent, Roy G6OKB sends us a report from the Isle of Thanet. He announces that the Maidstone rally will have a demonstration ATV station operating under the callsign G8TRF. The event is on 28th May, so mark that in your diary. Another ATV special event station will be GB2WVW at Waldershare Park (near Dover) at the vintage vehicle rally on 24/25th June. As well as ATV, there will be HF and VHF voice stations as well.

NEW VIDEO NET

Roy tells us a video net is now well established on 70CM and takes place Monday evenings at 19.30. Regular participants are Roy G6OKB (of course!), Brian G8ZYZ (St. Margaret's Bay), Les G3LCW (Mongeham) and David G0DQI (Kingsdown). Calling in from time to time are John G8UWS (Hougham), Norman G8GCL (Broadstairs) and Ron G6GHP (Margate). David seems to have a vast store of tapes and entertains the net with these; he is also into DX-TV and satellite reception. The net is more entertaining than technical, concentrating on general interest matters, holiday movies and demonstrations of other radio modes. It sounds like a good deal of fun - it must be, since it even attracts some un-ham-licensed viewers and listeners!

Tuesday 26th January saw more ATV activity than normal: there was a good lift on. Roy saw the 70CM output of the German DB0CD repeater at P2 strength, and also managed to work a German station on ATV.

MORE ON 70

From Oxford Jeff G8PX (must get him a middle letter for his callsign!) notes that he is looking forward to the BATC's convention (in Coventry!). He hopes to develop a little more activity in his area and keeps up a regular 70CM TV sked on Tuesdays, Thursdays and Sundays. These days G3CU and G6YTW call in, plus G6ZHC when he cannot get contacts on 23CM (hills tend to get in the way).

Jeff's latest project is packet radio: he is working on 144.650MHz and learning the AX25 protocol. It's fun, he says, but a bit on the slow side. "You should get ATV news on the BBS" he says. "It may get more people interested in ATV. We get the Six Metre, RSGB and DX news on it".

SSTV PROGRAMS

"You didn't get the news item on my programs quite right - but never mind", writes Grant G8CGK. "I have two programs for the Sinclair Spectrum which use the same input/output PCB.

"WXPR uses an input port to load digital video from the YU3UMV framestore board and store it in memory. It can then print out a picture using an Epson compatible printer. It does not put a picture on the Spectrum computer screen.

"SCRLTV uses both input and output ports and also requires a small interface board to link up the SSTV scan converter to the computer. This also stores a picture in memory and prints it as above. It can also send the picture back to the scan converter where it replaces the usual camera picture - hence disc-based

pictures can be called up and transmitted as required. It also has the facility to display the picture on the Spectrum screen with scrolling as described.

"Note that the weather pictures can be called up from disk (or tape) and displayed like a SSTV picture as they both use 128 x 128 pixels and they both occupy the same area of memory." You can get more details by writing to Grant Dixon, Kyrle's Cross, Peterstow, Ross-on-Wye, Herefordshire, HR9 6LD. Don't forget to enclose a SAE.

MORE FOREIGN NEWS

The editor of America's newest ham mag, ATV Quarterly, is visiting the BATC's convention and will be bringing samples of his new magazine. The April issue looks like surpassing all previous efforts, with 92 pages including some in colour. Technical articles deal with understanding FM sidebands, a proc amp, using the Amiga for ATV and much more. The top constructional project is a 13CM PA using a microwave oven magnetron and no, it's not an April Fool special! Annual subscription by air mail is $25: write to ATVQ, 1545 Lee Street, Suite 73, Des Plaines, Illinois 60018, USA.

The latest edition of ON-SCREEN, the Belgian ATV magazine, has just arrived. Helpfully written in Flemish and French the articles cover a mini ATV upconverter, a data table of schottky diodes and a callsign generator (originally published in CQ-TV). If anyone desires a photocopy of this I can oblige for a SAE.

SIGNOFF

And that's all for this time. Please let me have all your reports in good time for the next article and send them to 71 Falcutt Way, Northampton, NN2 8PH. Thanks.

THE NEW CQ-TV EDITORIAL SUITE (!) FEATURING AN ATARI MEGA ST4

A VHF/UHF WIDEBAND AMPLIFIER

This article first appeared in 'Elektor Electronics' in March 1989 and we thank the editor for permission to reproduce it here.

The new devices in Philips Components' series of integrated wideband amplifiers include a single-stage type, the OM2045 with a gain of 12dB, a two-stage type, the OM2050 with a gain of 18dB; and two three-stage types, the OM2060 and OM2061, with gains of 23dB and 28dB respectively. all of these can be used as RF gain blocks with an input and output impedance of 75-ohm, in the frequency range 40 to 860MHz. Since virtually all that is necessary for building a reliable wideband RF amplifier with good specifications is contained in a single chip, many applications are feasible. The amplifiers are, for instance, ideal for use in the domestic cable network for radio and TV, in which additional gain is often required to overcome cable losses. Radio amateurs, too, will find the amplifiers useful for general coverage reception experiments, as the 6m, 2m and 70cm bands are covered in one go. One further application is the use in 480MHz or 612MHz intermediate frequency amplifiers of indoor units for satellite television reception (TVRO), which incorporate surface-acoustic-wave (SAW) filters, which exhibit high insertion losses.

A PRACTICAL DESIGN

The circuit diagram in Fig.1 demonstrates the simplicity of a VHF/UHF wideband amplifier set up around one of the new OM20xx devices. Apart from a supply and, of course, the hybrid chip, all that is needed to obtain a complete RF amplifier are two capacitors and a small choke if a two or three-stage amplifier chip is used. Thanks to the simplicity of the circuit, it can be housed in a compact enclosure.

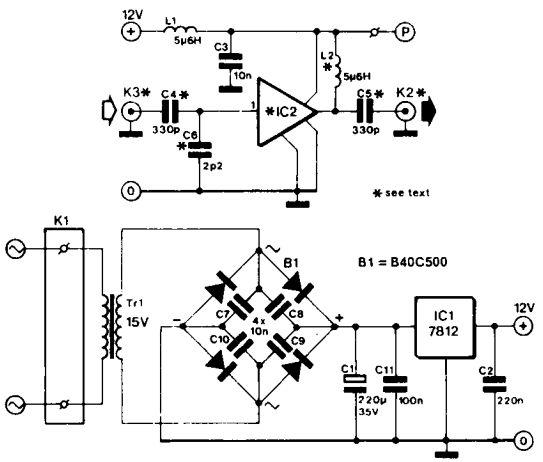


Fig.1 VHF/UHF Wideband Amplifier

The supply voltage for all the amplifier chips is 12 volts +/- 10%, at a maximum current drain of 110mA (OM2070). This allows the use of a simple power supply composed of a small 15 volt mains transformer, a 500mA bridge rectifier, a 220uF smoothing capacitor and a 7812 integrated voltage regulator with the two usual decoupling capacitors.

CONSTRUCTION OF THE RF AMPLIFIER

The printed circuit board layout and component overlay shown in Fig.2 was designed to make construction of the wideband amplifier as simple as possible, with no requirement for specialised test

equipment, but still allowing the constructor to choose and use any of the five new amplifier chips. The PCB should be constructed from good quality double-sided copper-clad material. Since the pin-outs of these is, unfortunately, not consistent (see Fig.3) short wires are used instead of PCB tracks to connect input, output and supply terminals. In view of the relatively high frequencies involved it is imperative that these wires, notably the earth connections, are not longer than 1 to 2mm. In all cases reference should be made to Fig.3 to ascertain the pin-out of the selected chip.

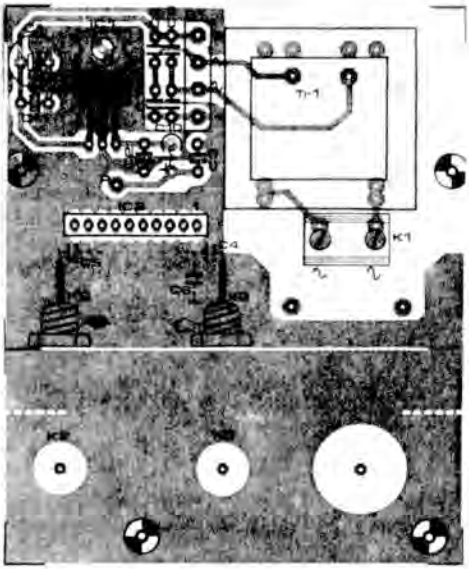


Fig.2 PCB layout (actual size).

The power rating of the 15 volt transformer on the PCB should be in accordance with the RF amplifier chip used - see Table 1 for the main specifications of these. When the OM2045 is used a 1.2VA transformer should do. The use of the OM2070, however, calls for a type rated at not less that 3.3VA. It should be noted that some transformers require two short pieces of wire between the secondary terminals and the tracks leading to the AC connections of the bridge rectifier.

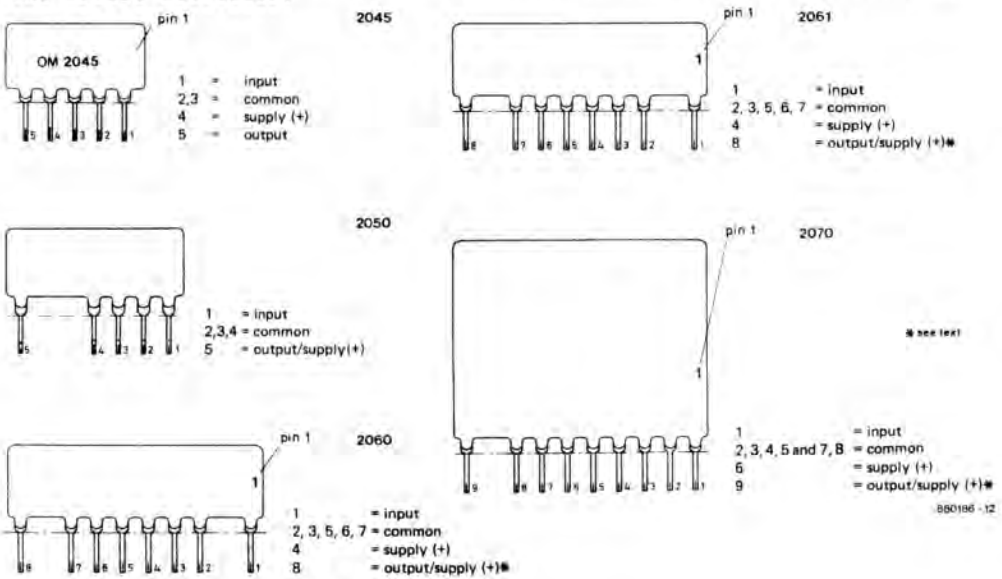


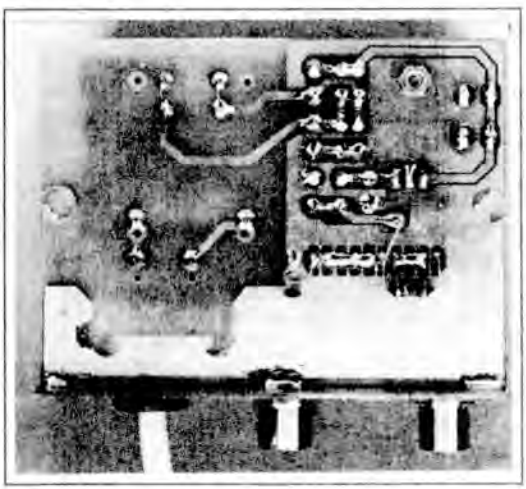
Fig.3 Pin-out Diagrams.

The PCB is cut in two along the dashed lines. The section with the round, etched, holes is drilled to accept the input and output sockets, and the grommet for the mains cable. After drilling this section of the board is soldered vertically on to the main amplifier board as shown in the photographs. Small pieces of tin-plate are bent to shape and soldered round the input and output sockets for additional screening.

	OM2045	OM2050	OM2060	OM2061	OM2070
U_b	12 V	12 V	12 V	12 V	12 V
$Z_i = Z_o$	75 Ω	75 Ω	75 Ω	75 Ω	75 Ω
I_c (typ.)	11.5 mA	18 mA	55 mA	50 mA	105 mA
Gain	12 dB	18 dB	23 dB	28 dB	28 dB
VSWR in	2.0	1.5	1.3	1.5	2.3
VSWR out	1.4	1.9	1.5	1.7	1.9
F(dB)	3.6 dB	5.2 dB	5.4 dB	4.4 dB	4.8 dB
U_o	99 dBμV	100 dBμV	107 dBμV	107 dBμV	113 dBμV

operating temperature: −20 to +70 °C

Table-1 Main Specifications.

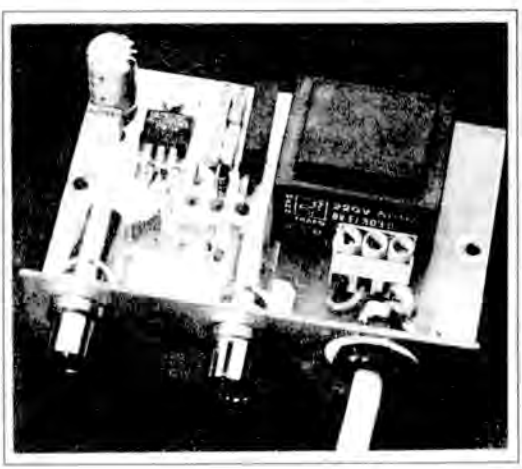


The main circuit board can now be The PCB can now be loaded with components, with the exception of the amplifier chip, C4, C5 and C6. The centre pin of voltage regulator IC1 is soldered at both side of the board. Ten non-connected solder pads are reserved for IC2, whose pins are connected with the aid of wires as outlined above. It is recommended to fit these connections on the reverse side of the board. The input marked 'supply (+)' is connected to point P. Three IC's, the OM2060, OM2061 and OM2070 require an additional connection between the supply and the chip output.

This connection is made in the form of a 5.6uH choke between the output and point P, as shown in Fig.4.

Coupling capacitor C4 takes the RF input signal direct from socket K3 to the input of IC2. the amplified RF output is coupled out to socket K2 via C5. To prevent stray inductance and possible oscillation, the leads of C4 and C5 should be kept as short as possible. capacitor C6 (2.2pF) may be added for extra suppression of interference.

For further information on these devices please contact Philips Components (formerly Mullard), the UK distributors.



CAMERA TUBES EXPLAINED

Peter Delaney G8KZG

No, this is not a guide to the Bakerloo, Piccadilly, or central line interchange stations! - although there is an electronic connection to that!! (Fig.1).

In the recent series 'In Place of the Tube' we looked at various types of CCD devices. However, many cameras in amateur use still use a camera tube of one type or another. In this series of articles I shall explore some of the different types; to help when the tube needs replacing, as it will, sooner or later.

The type of tube most likely to be found in amateur cameras is the Vidicon, and its variants the Image Orthicon and the Plumbicon. The names 'Vidicon' and 'Plumbicon' are in fact trade names of RCA and Philips respectively, but they have become generic terms in the same way as a vacumn cleaner is called a 'Hoover', or a personal stereo a 'Walkman'.

THE VIDICON

The basic design of the vidicon is shown in Fig.2. An electron beam is generated by the heater and cathode and directed towards a light sensitive layer called the target. The beam is made to scan across the target by appropriate fields applied to it, and is also focussed onto the target by another field. The light from the picture is focussed by the lens system onto the other side of the target. The effect of this is to create a tiny current that corresponds to the light and dark in the picture as it is scanned.

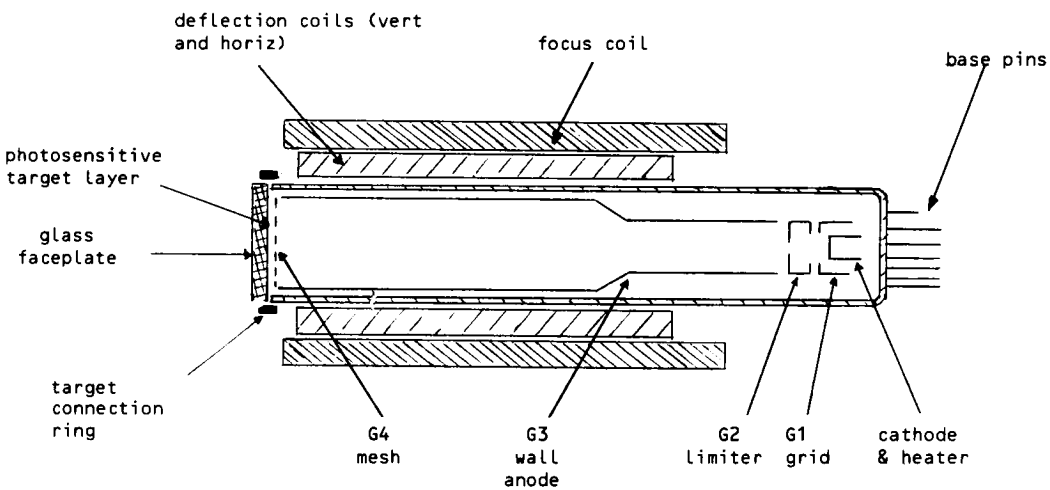


Fig.2 Vidicon basic design.

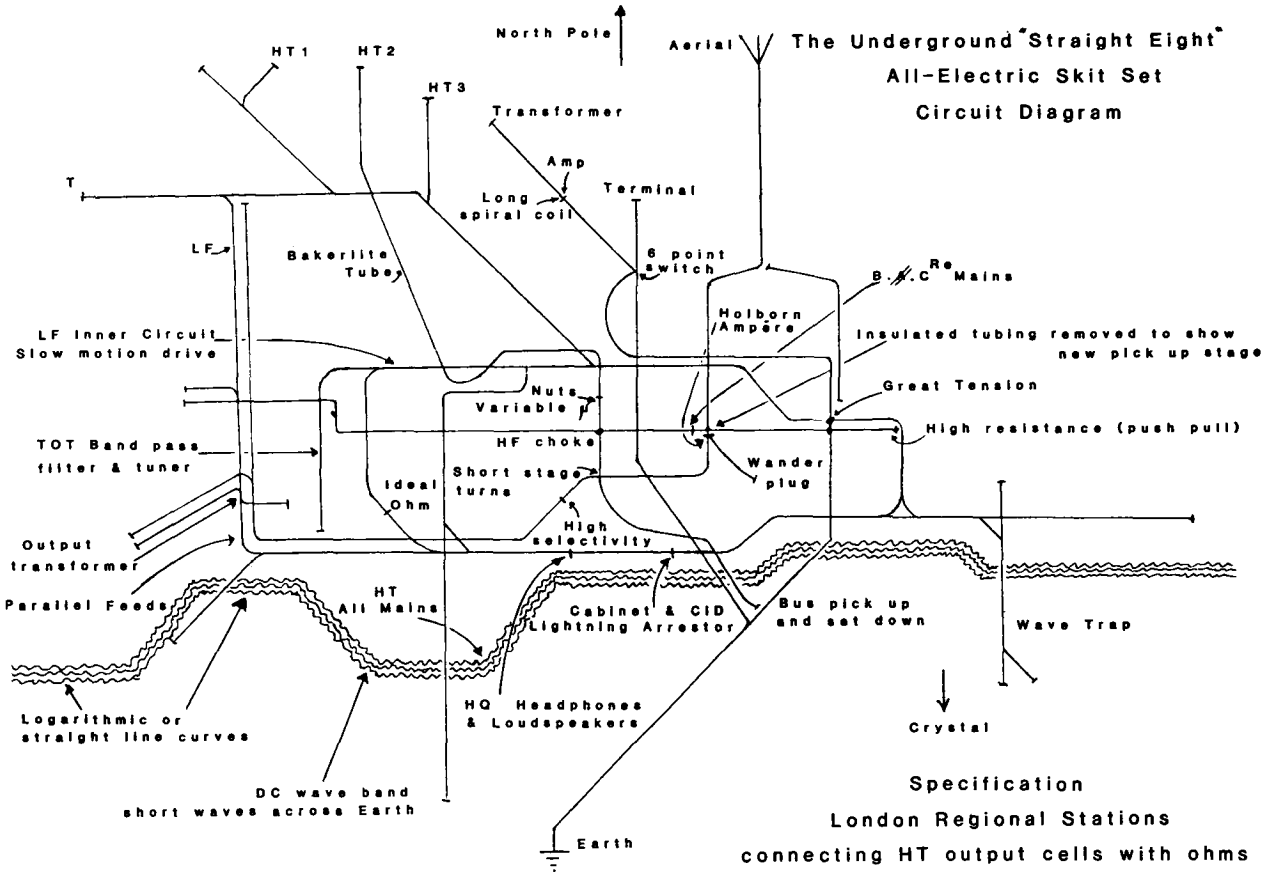


Fig.1 The original London Underground map was accurate in scale and layout. The modern (1930's) version was designed by Harry Beck, an engineer, to show connections, like a circuit diagram. A contemporary magazine produced a circuit diagram based on the map, with electrical puns on station names!!

The main variations in vidicon tube type are its size, heater rating, method of scanning and focussing. Also there are differences in the interconnections to the mesh which will be described later. All of these differences need to be considered when choosing a replacement tube.

Firstly, Size: The most common sized vidicons are 1 inch (26mm) and 2/3 inch (17mm) diameter, although there are other sizes from 1/2 inch (13mm) to 1.5 inch (38mm) diameter. It is not possible to fit a tube of different diameter into the scan coils of course, but the tolerances are such that different types or makes of tube of nominally the same diameter will interchange. Tubes of 2/3 inch diameter are normally 4.2 inches (108mm) long, but 1 inch diameter tubes come in 6.25 inch (159mm) length as standard, or 5.2 inch (130mm) short length. There is often insufficient clearance at the rear end of the tube to allow the standard version to replace a short one, but they are otherwise interchangeable.

Secondly, Heater Rating: Vidicons heaters are virtually all 6.3 volt, but there are several different wattage types. The most usual are 600mA, 300mA, and 90 or 95mA. Most of the tube variations can be obtained in a 95mA version, but it is necessary, sometimes, to replace an old tube with one drawing a different heater current. If the heaters are fed by a 6.3 volt transformer winding, then it will be necessary to ensure that the voltage surge across the heaters at switch-on is limited to an absolute level of 9.5 volts, and stays within 0.2 volts of the nominal 6.3 volts when running. This can be achieved by adding a resistor in parallel with the heater, of such a value that the current drawn from the transformer will be that current it was designed to supply with the original tube in circuit (Fig.3a). For heaters fed from a series chain, or from the transistor circuitry DC supply, an extra (or changed) series resistor is required (Fig.3b).

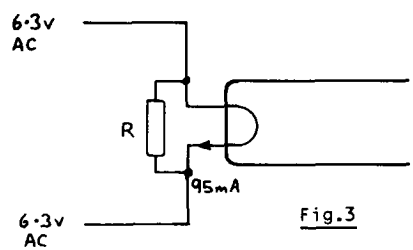


Fig.3

Parallel resistor R ro replace:-

300mA heater	30-0hms
600mA heater	12.5-0hms

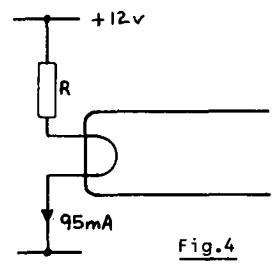


Fig.4

Total resistance R = 60-0hms

Fig.3 Vidicon heater connections

Thirdly, the Scanning and Focussing method: The standard vidicons have magnetic focussing and magnetic deflection, needing scan and focus coils in much the same way as a television cathode ray tube.

Some vidicons have electrostatic deflection (as in an oscilloscope tube) whilst others have electrostatic focus. It is not possible to use a magnetic/magnetic tube in place of an electrostatic/magnetic, or a magnetic/electrostatic tube - unless the camera is very extensively modified.

Lastly, the Connection to the Mesh Electrode: In a separate mesh tube, G4, the mesh, is brought out to a separate pin (pin-3 in standard 1 inch tubes, pin-2 in standard 2/3 inch tubes). In a integral mesh tube the mesh is connected to G3 internally (pin-6 in 1 inch and pin-7 in 2/3 inch tubes). The simplest way to replace an old integrally connected mesh tube with a separately connected type is to wire G3 and G4 together on the tube base socket. An improvement in picture resolution can be made, however, if the mesh is operated a a higher voltage than that present on G3. This helps the beam to fall at right angles to the target, rather than obliquely. Typically, a voltage of 1.5 times the G3 potential is needed on G4, with a maximum of 750 volts being permitted. If such a voltage can be made available in the camera, then the improvement is worthwhile - provided that the amplifier chain has sufficient bandwidth.

In part-2 of this series I will consider the various special forms of vidicon type of tube, and the alignment procedure for a replacement tube.

BROADCAST BAND DX-TV RECEPTION

Gary Smith and Keith Hamer

Winter can be quite a dreary time for DX-ing with lots of time and patience wasted. No wonder some DX-ers send their equipment packing into winter hibernation once the last drop of Sporadic-E reception has rained from the sky! Fortunately, this winter has been different. In fact in some ways it's been more exciting than the summer Sporadic-E season thanks to the F2 reception which has been with us for some months now.

DECEMBER

Sporadic-E reception occurred on several days. The most distant (and unusual for winter) signal was Rumania (TVR) on ChR2 on the 22nd. Switzerland was noted in the UK in Band III and UHF on the 11th and 31st by tropospheric propagation.

JANUARY

An exceptional month with plenty of tropospheric reception -almost everyday so it seemed! Swiss UHF signals were present on the 1st followed the next day by Spain with Basque TV on Ch E35 (north coast transmitter) and TVE-1 on E5. The Austrian "ORF FS1" PM5544 came through weakly on the 16th in Band III on channels E5 and E8 just after 0730. On channel E5/R6 during the lunch hour a rather odd-looking test card hovered above the noise for a few minutes before finally disappearing -a video recording was made but even time lapse photography couldn't enhance the weak signal. It has since been discovered that this was the new Czechoslovakian test card which has replaced the familar EZO "RS-KH" pattern used since the early seventies.

Other tropospheric goodies encountered during the month included many of the new Danish TV-2 test cards which incorporate the transmitter name on a white band and the American Forces Network station at Soesterberg in the Netherlands. The latter uses the 525-line system and a channel which is equivalent to E71/72!

F2 reception peaked towards mid-January with Arabic text seen on channel E2 on the 13th. Steady F2 signals occurred between 0835-0920 on the 15th with an item about aircraft. Pictures became clear for many minutes and a YL presenter was reading from small cards at times. During the afternoon weak USA/Canadian signals were resolved from the west.

FEBRUARY

After the first week in February, F2 activity occurred virtually daily with strong signals in many cases. Iran was the star performer with early morning appearances on four occasions. The signal hovered just above noise level but the tell-tale signs of an additional shaded band on the Iranian version of the FuBK test card provided definite identification. One mystery is its very early appearance. Theoretically, F2 propagation conditions are optimum when noon occurs at roughly halfway between the transmitter and receiving site. Experience gained during the last sunspot peak (1979/80) indicated that countries +7 hours GMT could be expected between 0800 and 0900 with transmissions from the Middle East appearing from mid-morning until noon. The low signal level is also a mystery! Most other reception on Ch E2 and R1 has been encountered at high-levels and has not been easily missed.

Other enthusiasts who have received F2 signals have suspected that some have originated in Malaysia. There are three networks operating there: RTM-1, RTM-2 and an independent network TV3. According to the World Radio and TV Handbook, only RTM-1 have transmitters on channel E2 in East and West Malaysia while there are none listed for RTM-2 or TV3. However, a DX-er in northern India has seen the TV3 logo a number of times on E2!

MYSTERY DRAMA

A drama series or soap opera has been noted on channel E2 on two consecutive Fridays (17th and 24th) with no real clues as to its origin except that the end credits have resembled Arabic script. At other times programmes on this channel have used captions in the Roman alphabet, although it has been impossible to read them because of the distorted images.

The old EBU bar test pattern is still being used by at least one country. It has been received via F2 in the UK and and the Netherlands several times recently but its origin remains a mystery.

STAR PERFORMER

The 26th was, perhaps, the best day for F2 reception. Starting with Iran on test card at 0830 GMT the day progressed with unidentified R2 and R1 signals at high levels during the morning with Dubai on teletext pages just before the station opened at noon. At times this station was co-channeling with a stronger signal which included a Japanese-looking presenter bowing. The Dubai reception continued as late at 1350 followed by a rapid fade out. The big surprise came later for one DX-er located close to the Welsh border -he successfully resolved 525-line signals from the west shortly after 1500.

VITS

A few DX-ers have been examining the frame blanking pulse for the presence of a VITS (Vertical Interval Test Signal). A VITS shows as a series of dots or lines within the frame bar and its sequence or style usually varies between broadcasters and sometimes between regions of a particular country. Once a country or region has been identified in the normal way, its VITS can be examined and made note of for future reference. Unfortunately, broadcasters can and do change the style of the VITS from time to time so it is only a rough guide. Sometimes signals without a VITS are received which usually implies that the service or country is rather primitive in its technical side of broadcasting! It goes without saying that DX-ers regard such signals as exotics and are ones to watch out for. Some of the recent E2 signals have not had VITS present in the frame bar.

RECEPTION SOURCES

Early morning F2 reception will come from roughly the east. Unless the m.u.f. becomes really high, most TV signals will be encountered on channels E2 and R1. There are only a handful of E2 transmitters compared with R1 and despite this fact, identification can still be extremely difficult to achieve due to the smeary and distorted nature of pictures received via F2 propagation. New Zealand and Australia operate transmitters on frequencies below channel E2. Channel NZ1 is 45.25 MHz while ChA0 is 46.25MHz. Australian signals were observed many times in the UK during the last sunspot peak, so hopefully they will be migrating again soon!

CHANNEL E2

Dubai: One high-power ChE2 transmitter. A "square" PM5544 may still be used at times although sample teletext pages currently shown during test transmissions. Yes, the BBC disease has spread its wings!
Iran: At least one ChE2 transmitter. Its ERP is not known.
Lebanon: Three 1kW ERP ChE2 transmitters. Not yet identified in the UK.
Malaysia: Three RTM-1 transmitters (plus one reported TV3) on channel E2. The +8 hours time difference means that we would receive transmissions at roughly 1700-1800 their time. Hence it would be unlikely we would see the test card.

CHANNEL R1

Channel R1 signals usually originate from one of the many dozens of Russian or even Chinese transmitters. It is difficult to pinpoint their exact origin apart from take note of any clocks to check the time difference. Although the Russian test card may carry some form of identification near the top, it is extremely

difficult to read even on a steady Sporadic-E signal, let alone a smeary one via F2 propagation with severe multiple images!

11.02.89: 0830 ChE2 -Programme (short duration F2 reception) also at 0910
12.02.89: 0845 ChE2 -Programme (weak) via F2
13.02.89: 0845 ChE2 -Iranian FuBK test card (very weak) via F2
14.02.89: 0920 ChE2 -Iranian FuBK test card (weak) via F2
1000 ChE2, E3 and E4 TVE-1 (Spain) programmes via Sporadic-E
ChE3 -RTP (Portugal) with programmes via SpE
15.02.89: 1200 ChE2 -African programme as co-channel to pulse and bar test pattern from the south via F2
17.02.89: 0930 ChE2 -Soap opera/drama with Arabic-style credits at 0955 via F2
18.02.89: 0755 ChR1 -Programmes via F2
0805 ChE2 -EBU bar test pattern via F2 (very weak)
22.02.89: ChE2 -Iranian FuBK test pattern via F2 (weak)
24.02.89: 0920 ChE2 -Programme (very strong) with fade out at 0937
0937 ChR1 -Programme (weak) via F2
0948 ChE2 -Drama programme ending with Arabic-style credits followed by female singer via F2
25.02.89: 0840 ChR1 -Programme (very strong)
1020 ChE2 -Programme or adverts (Roman alphabet) via F2
26.02.89: 0830 ChE2 -Iranian FuBK test pattern until 0920 (very weak)
ChR1 -Programme (very strong) via F2
1135 ChE2 -Japanese-looking presenter bowing with Arabic teletext pages as co-channel
1159 ChE2 -Arabic opening caption (Dubai) then Arabic programmes
1500 ChA2 -USA/Canadian 525-line signals from west via F2
27.02.89: 1115 ChE2 -Programme until 1125 via F2

MARCH

F2 reception was still present during the first few days with morning signals from the east. As a way of change, African signals were observed from time to time. Some of these were due to F2 TEP (Trans-Equatorial Skip) and occurred during the mid to late afternoon period. On the 4th a colour bar or greyscale pattern kept fluttering up above the noise from a southerly direction at 1620. At 1645 this changed to a square-looking test card which can loosly be described as a modified FuBK pattern. We have it on good authority that Ghana use such a test card. On the 6th a PM5544 was seen from the SSE at 1300 but the identification could not be read. There was no clock display to the right of the test pattern centre which implies that this was Kenya -Zimbabwe use the PM5534 (PM5544 with clock).

AFRICAN BAND I STATIONS
Ghana: Chs E2, E3 and E4 -all 5kW
Nigeria: Chs E3 and E4 -test card not known.
Sierra Leone: 1kW ChE2 transmitter
Equatorial Guinea: ChE2 but not confirmed.
Kenya: ChE2 -the PM5544 is used with "VOK-TV" (Voice of Kenya) identification.
Zimbabwe: Gwelo ChE2. ZTV uses the PM5534 test pattern.

03.03.89: 1235 ChE2 -Programme (very strong) via F2 -suspect Middle East
04.03.89: 1335 ChE2 -Programe from SSE (weak) via F2
1620 ChE2 -Colour bars with white motif top right hand corner from the south (weak) via TEP
1645 ChE2 -Square test card (Ghana) followed by programme via TEP
05.03.89: 0835 ChE2 -Iranian FuBK test card (very weak) until 0900 via F2
0930 ChR1 -Programmes until 1017 approx. via F2 (suspect USSR/China)
1005 ChE2 -Programme with white logo in lower right-hand corner with adverts at 1038 (Roman alphabet)
1405 ChE2 -Programme from south (African origin) with abrupt transmitter switch off at 1429

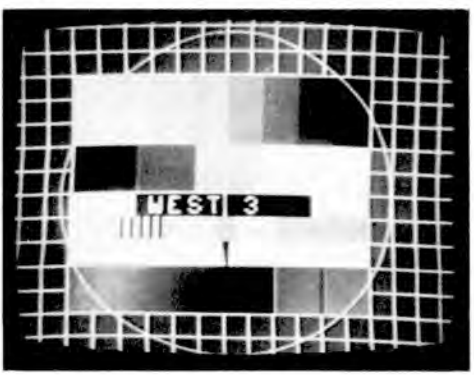
1530 ChE2 -Programme noticed with humbars via TEP
1618 ChE2 -Square test card (Ghana) (weak and short-lived) via TEP
06.03.89: 1300 ChE2 -PM5544 test card from SSE (Africa) -suspect Kenya via F2
10.03.89: 0830 ChE2 -Teletext pages in Arabic (Dubai).

DON'T FORGET!

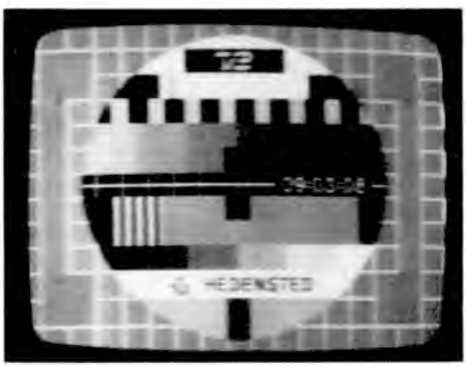
By the time this issue of CQ-TV plops on to your doormat the 1989 Sporadic-E season should be ready for the off. Will the season be as good (or bad if you missed all the exotics!) as last year? It is too early to say but many UK TV DX-ers will be watching out for Trans-Atlantic signals and also for Band III Sporadic-E. If any of CQ-TV's overseas readers would care to drop us a line regarding DX reception in their country then we'd be pleased to hear from you. Similarly, if anyone can volunteer information about test cards used and TV stations operating in Band I in African, Middle East and S.E. Asian countries to supplement our listings earlier in this article, we'd also like to hear from you via the the Editor.

STOP PRESS!

A new 3rd Edition of "Guide To World-Wide Television Test Cards" should be available in early May. At present we do not have any details about the price. This completely updated publication will be available from: HS Publications, 7 Epping Close, Derby DE3 4HR.



West German pattern from Westdeutsches Farsehen



Danish TV-2 on Channel E30

West German test card from Brotjacklriegel

Schools TV clock, Netherlands

ODDS & SODS FROM ANDY!

Andy Emmerson G8PTH

MCL EXONERATED

A few months back I mentioned interference on 10GHz, the suspected source being Mercury Communications Ltd (MCL). I am not sure why MCL was suspected as the culprit (perhaps because the RSGB warned us some years back that MCL was sharing the 10GHz band and we should avoid causing QRM). I decided to ask MCL about their operations on this band, but they said they did not use the band at all. So who else does use 10.0 - 10.5GHz? I wonder if we amateurs cause them interference. I suppose not, else there would have been complaints ...

COSMETIC MATTERS

No, not what you thought. But when you have finished a homebrew project, how do you finish it off? And how can you spruce up those battered second-hand bargains? A little work and loving care can turn all of these into something quite smart.

Unpainted diecast boxes and aluminium project cases tend to look rather scruffy to me, especially if they are finished off with non-matching knobs and switches plus Dymo tape lettering. It's amazing how much money people spend on a project, only to leave it looking unfinished. All these instrument cases will look better for a coat of paint and applying a coat of cellulose paint from an aerosol can doesn't take long. It is best to degrease and prime the surface first: a good scrub in the sink with Vim or similar cleaning powder does both. Paint doesn't stick very well to fresh, shiny aluminium, as you may have found, though a coat a spray varnish helps. Also, the smooth finish paints from Hammerite (known as Smoothrite) stick superbly to all kinds of awkward surfaces. For my part I am rather fond of the hammer finish, and you can get Hammerite in spray cans now and these are much easier to use than the brushing stuff which tends to drip and run).

Before spraying, of course, you should either remove switches and knobs or cover them up with masking tape. Lettering is best done with Letraset or similar rub-down transfers (you can get a big pack of ready made 'electronicky' words as well as meter scales and A-Z and 0-9 characters at your local Tandy shop, far cheaper than a single sheet of Letraset).

For final badging of your projects you can get plastic 'Traffo-lyte' labels engraved by the people who visit the rallies - prices start at under £2 and you should state that you don't want the callsign badge-type pin on the back. You can also have them by post from Newton Engraving, Newton Street, Petrock, Torrington, Devon, EX38 8LU; they will send you an order form and they can do larger sizes than the badges you see at rallies. Although these engraved labels are a little old-fashioned, I still think they give a well-built project the 'professional' look. They are also good for covering potentiometer holes drilled in the wrong place, as are the self-adhesive BATC badges you can buy for 20 pence!

Smartening up equipment acquired second-hand is a matter of judgement: often a repaint would not be justified. But you can clean accumulated grubbiness from instrument panels very effectively with lighter fuel and a paper towel. A dab of paint can cover up scratches - the felt pens filled with enamel paint which you can buy in model shops are particularly handy for this. Textured finishes on plastic and the crackle finish on old radio equipment should be cleaned with a toothbrush and lighter fuel, then rubbed with baby oil (yes!) and given a final wipe with a paper towel. You'd be amazed how a scruffy old case can be re-stored and made to look like new again!

BLOOMING VIDEO

No, that's not an undeleted expletive but an interesting topic brought up by Lyn Cyr W1NRE, in the new American technical magazine ATV Quarterly. He notes that some of the video transmitters in use display a 'blooming' effect and the audio is distorted for the initial 1 or 2 seconds after first keying up the transmitter. Have no fear, the solution is near.

The solution, says Lyn, lies in the keying method and its effect on the video modulator circuit. A popular keying method, in low power transmitters, is to key the entire power supply voltage to the transmitter since the current drain isn't too much. This is the culprit! Upon examining the video modulator, you will probably find a large coupling capacitor (about 100 uF or so) from the video gain control to the base of the first video amplifier. The value of capacitance at the input stage establishes the low frequency and is determined by the input impedance of the amplifier. The higher the input impedance of the stage, the lower the input capacitance can be to maintain good low frequency response. Since the capacitor can, and will, charge up through the biasing network, how soon the base voltage will stabilize will depend on the RC time constant of the network. When the transmitter has been off for some time the capacitor will have been discharged, but upon application of power the cap will momentarily look like a short circuit and charge up to the bias voltage value provided by the resistive divider network. As the base voltage is increasing, because of the coupling capacitor, the correct bias voltage will be upset as well as the blanking level. The result will be an incorrect video setup for that period of time.

The solution is simple. Key only the transmitter oscillator and multipliers and so on, not the video modulator. With minor surgery find the line that feeds +VCC only to your modulator and connect it to an unkeyed source. In this way, when you key the transmitter the modulator, and hence the input coupling capacitor, will have already been charged up, putting the bias of the first stage at a stabilized operating point. After this you should have no 'blooming' key-ups.

FIRST ATV REPEATER IN FRANCE

Our old friend F3YX (also known as the Pope of ATV) reports in Radio-REF (December 1988) that France's first amateur television repeater has received authorisation to go on the air. To begin it will have a provisional licence, reviewable after six months.

The location is Montagne de Cormeilles (in Department 95) and its technical details are as follows.

Input frequency: 1255MHz FM.
Video deviation: 3.5MHz.
Modulation sense: positive.
Receiver passband: 10MHz to 6dB.
Audio subcarrier: 5.5MHz.
Subcarrier level: 12 per cent.
Video pre-emphasis: 8dB at 4.4MHz.
Audio pre-emphasis: CCIR 50 microseconds.
Trigger: video with syncs, plus 1750Hz on audio.
Output frequency: 438.5MHz.
Modulation: AM positive.
Audio subcarrier: 5.5MHz FM, CCIR norm
Audio subcarrier re-insertion rate 12% video level.
Output power: 30 watts peak video.
RX aerials: 4 panels of 10 dB gain, orientated N-S-E-W.
TX aerials: 4 dihedrals of 6 dB gain, same orientation.

The aerials give virtually omnidirectional coverage (within 6 dB), using horizontal polarisation. The repeater was constructed by F1HKT, assisted by members of the Argenteuil radio club (FF6KAL), and it is confidently expected that ATV activity in the Cormeilles district will now increase.

ATV BULLETIN BOARD TOO

F3YX has established at his QTH in Limours, near Paris, a bulletin board system specialising in ATV matters. The contents list sounds fascinating: names of active ATVers, DX distance records, details of ATV get-togethers, contest news, hints and tips, etc, etc. Operating under the callsign F3YX-1, the mini BBS has a memory of 15K, and can be reached either direct or via the packet radio network. It is powered by batteries charged by solar cells and puts out 100 Watts on 144.675MHz into tow 9 element beams. The BBS runs on a KAM controller and a PC-XT computer equipped with a 20 megabyte hard disk. Marc F3YX says he hopes in this way to rekindle the flame of French amateur television, which seems to have lost its vigour lately despite 650 to 700 ATVers known to exist.

OPTICS NEWS

How do you get 35 mm slides onto video? It ought to be a straightforward task - but is it? Projecting them onto a screen and then pointing a video camera at the screen seldom works out. Usually the image is wider at the top than at the bottom (the so-called keystone effect) and the centre of the picture is brighter than the rest (the 'hotspot'). Much better is a proper slide scanner or at least a diascope, an internally-illuminated optical device which replaces the camera lens and gets the slide image straight into the video camera. Unfortunately both of these gizmos cost loads of money and seldom if ever appear on the surplus market. But there is another way.

The solution is a slide copier, an attachment which fits onto the lens of your camera. Illumination is provided by natural light, then using the macro setting on your existing zoom lens and the optics in the slide copier you can frame up the slide image. In this way

slides can be televised very satisfactorily, the only limiting factor being the resolution of your camera tube (or chip). Subjectively the results are very good.

So where do you get hold of a slide copier? Not a camera shop: they sell them but they seldom fit video cameras. A specialist dealer should have them, and a very good value offering (at 29.95) is that from SRB Film Service (286 Leagrave Road, Luton, Beds., LU3 1RB. Tel. 0582-572471). Adaptors are supplied to fit filter rings from 49mm to 58 mm. SRB also have warming and cooling colour filters and a macro-zoom kit to enable you to enlarge specific areas of the slide image.

Another very useful service of SRB is making stepping rings to order: I had an ancient zoom lens with a filter thread which did not match any modern lens attachments. But at a modest cost SRB made an adapter ring so I can use a slide copier with this old lens on my 405 line cameras. Well recommended, and SRB sell many other video and normal camera accessories at discount prices - ask for their catalogue.

IT NEVER RAINS IN CALIFORNIA

Southern California now has three repeaters, with their outputs on 923.25MHz. These repeaters are 100 miles apart, so they cannot 'see' each other but they are all in sight of one central repeater. This looks at each of the 900MHz outputs on a voting basis and relays the chosen input on 1253MHz. Fascinating! Repeater input is always on 434.0MHz, incidentally. Thanks Tom W6ORG for this interesting snippet.

VIDEO LINE INPUT

Final word this month is extracted from P5, the excellent newsletter of the Severnside Television Group. Pat Janes GW1SXL reports that the American model train firm Lionel is now advertising an on-board video camera to give you a 'driver's eye' view of the track ahead. This should certainly make people see railway modelling in a new light.

The camera is monochrome only (not surprising) but that means CCD cameras must be available in the USA at an affordable price. As I have mentioned before, they give a superb picture, even in low-light conditions, and as soon as the price comes down I shall procure one to put on the shack wall. With a wide-angle lens it should provide excellent pictures.

SSTV FREQUENCY - 144.5MHZ

IN RETROSPECT

PLESSEY SP4742 PRE-SCALER IC

News has reached us from BCD Electronic Services of a replacement for the difficult to obtain SP4742 1.3GHz pre-scaler IC. A direct replacement is now available from Plessey called the SP4740, Although this device features a few small internal changes, to all intents and purposes it can be used directly in lieu of the SP4742 device. The data sheet for the replacement IC is shown below courtesy of Plessey Semiconductors. The SP4740 may be obtained from BCD at a cost of £2.80 + postage + VAT, please phone for further details: 0482 225437.

The SP4740 ÷ 256 prescaler is one of Plessey Semiconductors' latest range of high speed dividers for consumer frequency synthesis and measurement systems. It has a lower supply current giving reduced dissipation and operating temperatures in an 8-pin plastic DIL package. Spurious radiation has been reduced from all stages.

The SP4740 incorporates an on-chip preamplifier with differential inputs, and has a single TTL output.

Electrostatic protection is provided on all pins.

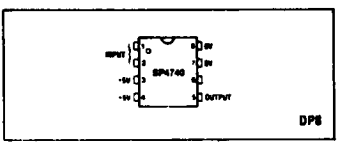


Fig.1 Pin connections - top view

FEATURES

- Low Supply Current
- Low Radiation
- Input Wideband Amplifier
- High Input Sensitivity
- TTL Output
- Electrostatic Protection On Chip

ABSOLUTE MAXIMUM RATINGS

Supply voltage	Vcc +7V
Input voltage	2.5V p-p
Storage temperature	-55°C to +125°C
Operating temperature range	0°C to +80°C

Characteristic	Pin	Value			Units	Conditions
		Min.	Typ.	Max.		
Supply current	8		35	50	mA	Vcc = 5V
Input sensitivity	2,3					RMS sinewave
50MHz			3	5	mV	
150MHz to 1000MHz			1	5	mV	
1.1GHz			1.5	10	mV	
1.2GHz			2	15	mV	
1.3GHz			4	20	mV	
Input overload	2,3	400			mV	50MHz to 500MHz
		800			mV	500MHz to 1.3GHz
Input impedance	2,3		50		ohms	See Fig.6
			2		pF	
Output voltage						
High	5	3.3			V	Sourcing 0.2mA
Low	5			0.4	V	Sinking 2mA

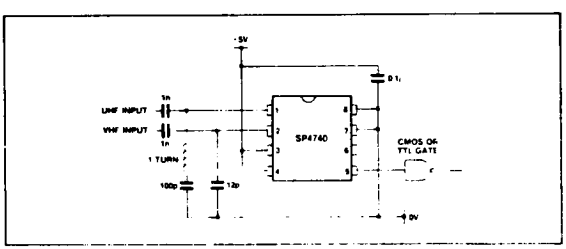
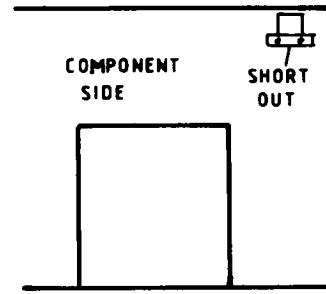


Fig.4 Application circuit

PHILIPS U321 TUNERS

Several projects in the past have suggested using the Philips U321 tuner in 24CM receive systems. One point that seems to have been overlooked is that the final stage of the tuner is a bandpass filter. As this tuner has been designed to work in broadcast TV receivers, this output filter is of necessity fairly narrow band. Thus, when the tuner is used in a wideband FM ATV receive system it is advantageous to remove this filter from the circuit. This can be achieved as shown in the adjacent diagram, by shorting out the filter inductor.



24CM ATV CONVERTER, CQ-TV 144

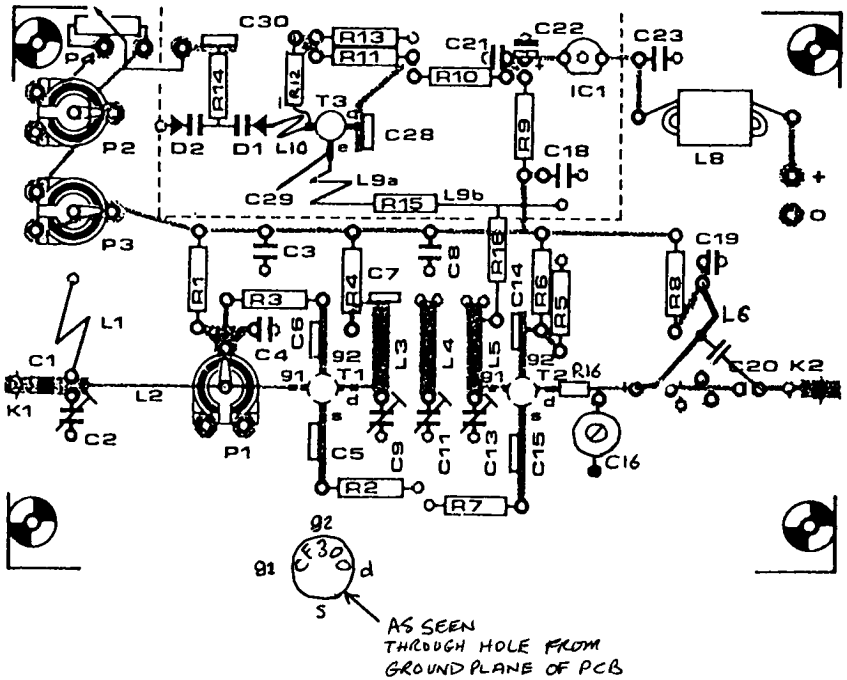
Peter Johnson, G4LXC, writes to us with details of modifications to the 24CM ATV converter board (originally published in Elektor Electronics). These modifications will cause the converter to output within the broadcast UHF TV band (470 to 530MHz), instead of at an IF of around 50MHz. The advantage of this being that 24CM ATV can be received using just this converter and a standard television set. Unfortunately, this will not allow the full quality of the wideband FM pictures to be seen, as a conventional television is AM in operation, and consequently the signal is actually slope-detected within the TV set. However, unless you are regularly receiving P4 plus pictures the difference will not be noticed.

The basic changes are extremely easy to carry out, please refer to the component layout shown below. Capacitor C29 is used to establish just enough capacity to ground to sustain a stable oscillation, consistent with maximum oscillator output. A value of approximately .5 to 1p maximum is required, a low-loss trimmer may be used instead if desired. Inductor L10 is an additional component constructed from the cathode lead of D1 by forming a 3.5mm 1-turn loop. This inductor is all that is required to bring the local oscillator down from its original minimum of around 1000MHz, to 750 to 850MHz. Resistor R16 must be very small (1/5 Watt) to allow it to fit along the track between T2's drain and C16's solder pad, a small cut in the PCB track (1/32" gap is sufficient) is easily made with a blade.

New components L6 and C16 tune the output of the converter from 430 to 570MHz, the tuning is quite wideband so no difficulty will be experienced in finding the signal on the TV set. L6 is formed from a piece of 18 - 20SWG tinned copper wire 16mm long and 3mm above the PCB. Adjust C16 for maximum signal commensurate with minimum noise whilst receiving a weak signal. The replacement capacitor C20 is tapped off approximately a quarter of the way along L6 from its end connecting to C16, and its other end connected to the original C20 circuit pad.

When constructing the converter do not fir the GaAsFET's until last of all. Make absolutely sure that all of the circuit is completed and that all the ground-plane solder joints are correctly made, examining them with a magnifying glass. Apply 12 volts DC and confirm that the

oscillator is running, by tuning in the television at the top end of the UHF band (around channels 60 to 68) and looking for an increase in the noise level.



COMPONENT CHANGES

New components: L6 ... 16mm long 3mm above ground plane, 18 to 20 SWG.
C16 .. 1 to 10pF plastic trimmer (yellow).
R16 .. 10 to 22-ohm 1/5th Watt sub miniature.
C20 .. 20pF
L10 .. Formed from 1-turn of D1's lead, 3.5mm dia.

Components not
required : C20, C16, C17, L6, L7 and L10

Once you have established that the oscillator is running OK check the voltages at all points around the circuits of T1 and T2. Components which are earthed must be soldered to both sides of the PCB. Finally switch off the DC and place the GaAsFET's into position ensuring that they are configured correctly. Looking from the ground-plane side you should be able to read the device type number (i.e: CF300) through the hole in the PCB. Having confirmed that all is correct re-apply the 12 volts and tune in a 24CM signal, readjust the trimmers as necessary to achieve the best picture/noise ratio.

NOTE: The quality of the PCB for this project does not stand up to removing the components without causing damage to the track. The core of L6 is easily broken if the wrong type of trimming tool is use.

900MHZ TV TAKES OFF

Andy Emmerson G8PTH (with a little help from Tom O'Hara W6ORG!)

"900 MHz ATV is the next way to go!" says Tom O'Hara W6ORG of PC Electronics. Unfortunately for us Europeans this opportunity is open only to hams in north America, but there's no harm in taking a look at this fascinating band and what it offers. It will also serve as a prelude to our review of one of the commercial goodies available to American ATVers. It is also instructive to look at ATV from a different viewpoint.

Up to now the main band exploited for ATV in America has been 70 cm, the three-quarter meter band as they sometimes call it. There is a little activity on 23 cm, mainly for local repeater working, but it has not taken off to the same extent as in parts of Europe. A few years ago the 33 cm band (902-928 MHz) was opened to American hams and this was rapidly claimed by some pioneering ATV amateurs ...

All pros and no cons

So why the attraction of 900 MHz? Mainly because it's an ideal band for ATV - low occupancy, no QRM and quite workable for sending a bit of power.

Cost is another of the answers. Thanks to cellular radio, price and availability of semiconductors, antennas and other parts for this band are excellent. Comparing the cost of 33 cm modules to 70 cm ones and shows that 900 MHz components cost only 10 to 20 per cent more on average. By comparison, 1200 MHz parts are hard to get and much more expensive. An equivalent 1 watt 23 cm final is three times the price of a 33 cm one.

Ease is another reason. Anyone who has put together a 70 cm system should be able to assemble a 33 cm system for just a few dollars more the same way. PC Electronics has all the modules now for a basic 1 watt AM system, with three other companies developing linear amplifiers. Communications Concepts has a neat 900 to 70 MHz downconverter usable for AM or FM, and an exciting new FM transmitter was previewed at this year's Dayton Hamvention.

Performance

All factors being equal, there is 6 dB more path loss than on 70 cm, but almost 3 dB less than on 23 cm. Co-ax loss is of course less than on 23 cm, and in most areas there is little interference from other services and radar. To give you the same picture as experienced on 70 cm, the 6 dB is easily made up in the higher gain of smaller antennas and/or by mounting the downconverter at the antenna. Compare the cost of a 16.3 dBd

Tonna yagi to a 14 dBd gain 70 cm one: you can almost put up dual 33 cm yagis for the price of a single 70 cm one. Snow-free line-of-sight DX with 1 watt and single Tonna yagis at each end is 10 miles, and 20 miles with a 7 dB omni and 18 watt amplifier in the repeater case. These figures assume 4 dB feeder loss: you would get greater DX of course with lower loss co-ax and antenna-mounted downconverter.

Full duplex ATV is now a possibility: this is the best part! Now you can both talk and see each other by transmitting on one band (70 cm) and receiving on the other (33 cm). If you are using one of PC's 70 cm transmitters, there are no harmonics of the 108 MHz crystals that fall into the 33 cm band. So you will probably not need any special filtering to transmit at the same time as receiving the other band. You can avoid front-end overload usually with just 8 feet vertical antenna separation. Be a repeater yourself!

Crossband repeater or link

With the loss of 420-430 MHz near the Canadian border, interference from FM repeaters, radar and the fact that an in-band repeater doesn't allow simplex without interference, crosband repeat to 900 MHz is an answer. You not only free up one of the 70 cm frequencies for simplex, but you can also see your own video coming back to you for adjustment without someone else's opinion.

Up to now most activity has been short-range, using the same AM techniques as on 70 cm. This has enabled the use of simple downconverters and normal domestic TVs for receiving. Because of the difficulty of generating power linearly, most transmitters have been relatively low power affairs. Obviously, changing to FM would solve the power production problem but would mean that people would have to invest more in a proper FM receiver. The availability of Communications Concepts' downconverter and a glut of satellite TV demodulators means that making an FM demodulator is no longer the problem it was thought. There is a lively debate over the relative merits of AM and FM - it will be interesting to see which mode wins.

Frequencies used for simplex ATV are 910.25 and 911.25 MHz, while repeater output is on 923.25 MHz. In Britain, of course, these frequencies fall within the cellular radio allocation, but in America this is not the case. Because the UHF band is not used so much for broadcast TV (VHF covers the larger distances better), cellular radio is accommodated in the 800 MHz band rather than on 900 MHz. This leaves room for a healthy amateur band from 902 - 928 MHz.

The bottom line

In case you are wondering what all the equipment costs, here is a quick rundown. The 1 watt (peak sync) vision transmitter from PC Electronics costs $139: audio subcarrier costs an extra $29. A GaAs-FET receive converter (to VHF channels 2, 3 or 4) is $69 bare or $109 cased, and the Tonna 23 element yagi costs $59. The downconverter from CC costs $60 (kit) or $80 assembled. With nearly two dollars to the pound these prices look by no means dear.

A 33CM ATV RECEIVER REVIEW

Reviewed by Andy Emmerson, G8PTH.

In many ways building your own equipment is more satisfying than buying 'plug-in and play' boxes off the shelf, it also tends to be cheaper. When it comes to UHF though, a fair amount of skill and 'green' fingers are required - particularly in laying out components to operate at UHF frequencies - and if you are not initiated in this art a kit is a welcome solution. For someone like myself, with no professional skill in this field, or experience in making wireless work, a kit makes the difference between a sporting chance of success and a disaster!

This particular kit is a little unusual - it is for the American 33 CM amateur band (902-928 MHz) - but as it has not been reviewed elsewhere our American readers may like to learn about it here. The specification is good: the noise figure is quoted as less than 1.2dB, the preamplifier stage is a GaAsFET and the RF stage two MMIC chips. The downconverter's output can be tuned to American TV channels 2, 3 or 4, which means a standard 70 MHz IF strip can also be used if you don't fancy trying to watch the output signal at VHF.

The full circuit includes a Motorola MRF966 GaAsFET in a low noise preamplifier circuit, two microstrip-tuned MAR1 amplifier stages for gain, a double-balanced mixer, a varicap-tuned VCO (for remote tuning if desired) and a pre-IF amplifier stage for better matching into the TV set. The VCO circuit includes a temperature compensation diode to minimise drift. The completed device can be mounted next to the receive antenna and tuned by a remote potentiometer in order to minimise losses in the coax downlead.

SEVERAL OPTIONS

The ATV4 can be had assembled and tested ($79.95), in kit form ($59.95) or as a PCB only ($12.00). We were given the kit to review. First impressions are important as they are usually correct - ours were good! The PCB is a sturdy glassfibre affair, heavily plated and with plated-through holes. All components are of good quality and packed in separate plastic bags. The manual is a model for other firms to copy and I suspect it was inspired by those supplied with Heathkits. It starts with a description of the product and specifications. General assembly notes follow and then step-by-step notes for assembling each group of components. Diagrams show the orientation of each device and how to solder chip capacitors, how to bend the inductors and so on. Boxes are provided for ticking each stage completed and really you cannot go wrong. If only other kits had an instructional guide as good as this.

BUT HOW WELL DOES IT WORK?

That I cannot say until it has been checked out professionally, and there wasn't time before this magazine went to press. In the next issue we hope to give a full test report. I very much doubt if there will be any major problems, though.

Supplier: Communication Concepts Inc., 121 Brown Street, Dayton, Ohio 45402. Tel: (513) 220 9677. Visa & Mastercharge/Access cards taken.

A NEW HAM TV MAGAZINE

FROM THE HAM THAT BROUGHT YOU ATV DX VIA BALLOON: WB8ELK

AND

FROM THE HAM THAT GOT ATV IN THE AUG. 27 ISSUE OF **TV GUIDE**: KB9FO

Amateur Television Quarterly. A high quality technically oriented ham TV magazine.

PROFESSIONAL STAFF FOR EDITING

In the tradition of the BATC, CQ-TV, Ham TV in the US needs a technically oriented ATV magazine. Amateur Television Quarterly is being started to fill this need. Each issue will cover technical subjects, build-it projects, equipment reviews, theory articles and operating news. Each issue will have virtually **no** editorial content except for FCC and operating news. Each edition will be edited by a professional staff of technical and journalistic experts. Not every item submitted will get published unless it passes our editorial and technical staff.

VALUABLE CONTENT

The first issue is expected to be out in January of 1989. Each issue should be at least 48 easy to read pages. That's 48 pages of useful information not 12 pages of ads for in house products and promotions.I Areas covered will be FSTV, SSTV, video and related subjects. Our internal text paste up is done on daisy wheel and laserjet printers . . . no hard to read dot matrix fonts!

YOUR INPUT NEEDED

In order to succeed we encourage your input. This can be in the form of articles, operating news, subscription or comments. Amateur TV Quarterly will PAY for your technical articles. You won't get rich but it will keep you in typewriter ribbons. Our initial distribution of 4,000 copies will make you famous! This may mean even more issues per year if response is large enough! Well known ATV'ers have already submitted prime material for the debut issue.

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- ☐ Technical article or regular column about _____

☐ No, thanks but I may be interested later.

Other comments:

Reply to: **ATVQ**
1545 Lee St., Suite 73
Des Plaines, IL 60018

One last advantage, a business phone you can call: 312 298-2269

COMPONENT SUPPLIERS

This list of suppliers first appeared in the Microwave Newsletter in their January 1989 issue. This was as a response to a questionnaire sent out by the Microwave Committee requesting the need for more information on component suppliers etc. This response to their questionnaire backs up some comments received in letters here at the CQ-TV office over the past few months, so I have included the list here in order that you can have a handy reference in the shack.

* .. denotes list or catalogue available.
# .. denotes old information which may be out of date - enquire first.

METALWORK AND ANTENNA SOURCES

SEVERNSIDE TV GROUP 15 Witney Close Saltford Bristol, BS18 3DX	1.3GHz Broadband 18-element Yagi. Suitable for ATV or portable use.
J.EDMONDSON, G6KKA Wigg Farm Blackshaw Road Hebden Bridge West Yorks, HX7 7JA	# Spun dishes to about 36 inches.
B.J.GORDON, G4GHP 113 Pound Lane Oakdale Poole Dorset, BH15 3RS Tel: 0202 745013	# Finger stock, semi-rigid coax, connectors, PTFE sheet/rod. Brasswork to your specification.
C.C.JAMES, G3VVB 15 Perhaver Park Gorran Haven St. Austell Cornwall, PL26 6NZ	# Metalwork for valve linears and items to 3.4GHz. Other items - enquire.
JVL ELECTRONICS (G3JVL) 26 Fernhurst Close Hayling Island Hants, PO11 0DT Tel: 0705 464482	# Loop Quad aerials to 3.4GHz. Alford Slot omni aerials to 10GHz. Microwave Connectors. Interdigital Filters. Semi-rigid coax and connectors.
METSPIN LTD 94b New Brighton Road Emsworth Hants, PO11 7QS Tel: 0243 373712	# Spun dishes to 84 inches. (ask for Mr.Cousins)
MICROMAX RF SYSTEMS 5 Pinfold Crescent Penn Wolverhampton Staffs Tel: 0902 343746	* Metalwork for linear amps to 2.3GHz 1.3GHz Interdigital Filters. 1.3 and 2.3GHz loop yagi aerials. Power dividers for aerial stacking Second-hand test equipment etc. RF power indicators - 2m to 2.3GHz.

RANDAM ELECTRONICS 12 Conduit Road Abingdon Oxon, OX14 1DB Tel: 0235 23080		F9FT 1.3 and 2.3GHz aerials Phasing harnesses to suit.
SANDPIPER COMMUNICATIONS Pentwyn House Llwydcoed Aberdare Mid Glamorgan Tel: 0443 685515 0685 870725	*	Various aerials for 1.3GHZ. Other frequencies to order. Aerial 'bits', spares, etc. Aluminium and fibreglass tube.
P.G.SERGENT, G4ONF 6 Gurney Close Costessey Norwich Norfolk, NR5 0nb Tel: 0603 7477782	#	Cavity wavemeters for 2m to 13cm. Self calibrating wavemeters for 10 and 24GHz.
WAVEBAND ELECTRONICS (GW4HBZ) 3 Lon Howell Denbigh Clwyd, LL16 4AN Tel: 074571 2777 (evenings)		Low loss coax. Possibly TRW, Motorola & Avantek semiconductors, trimmers, filters and RF relays.

COMPONENTS AND MODULES

ASPEN ELECTRONICS LTD 1-3 Kildare Close Eastcote Ruislip Middlesex, HA4 9UR Tel: 01 868 1311		GaAs FET's. DRO modules. Many components from US suppliers. Enquire for manufacturers data. Minimum order 50.
J.BIRKETT 25 The Straight Lincoln, LN2 1JF Tel: 0522 20767	*	Various 'surplus' transistors. Gunn diodes, including 300mW types. Mixer diodes, PIN diodes. Wood & Douglas kits. WG components at rallies.
BCD ELECTRONIC SERVICES Somerset House Somerset Street Hull, HU3 3PH Tel: 0482 225437	*	Some lower GHz transistors. BFR/BFQ series transistors.
CIRKIT DISTRIBUTION LTD Park Lane Broxbourne Herts, EN10 7NQ Tel: 0992 444111/440779	*	Mail order, no minimum charge. General components. Converter/transverter crystals. 'Coffin' capacitors. Coax relays to 2.5GHz. Some kits to 1.3GHz.
ELECTROMAIL PO Box 33 Corby Northants, NN17 9EL Tel: 0536 204555	*	Mail order, catalogue as RS. Components. General components. Chip C's and R's.

FARNELL ELECTRONIC COMP'S LTD Canal Road Leeds, LS12 2TU Tel: 0532 636311	*	Note: credit card orders for non-account holders. Full range of semi-rigid coax. SMA, SMB and SMC connectors. Chip components, Gunn diodes. Minimum order 5 + post & VAT.
BONEX LTD 12 Elder Way Langley Business Park Slough Berks, SL3 6EP Tel: 0753 49502	*	Mail order, no minimum charge. Specialist RF components. TOKO inductors. GP transistors & fets. Some chip components. Logic/linear IC's. Avantek GaAsFET's and MMIC's. Avantek products to order.
LMW ELECTRONICS LTD 12 Bidford Road Braunstone Leicester, LE3 3AE Tel: 0533 630038	*	Transistors and GaAsFET's Microwave trimmers and comps. Kits to 2.3GHz. SR coaxial RG402. Components to order (enquire).
MICROWAVE SOCIETY c/o Glenn Ross, G8MWR 81 Ringwood Highway Coventry Tel: 0203 616941	#	Gunn diodes. WG16 flanges. 10GHz WB Tx/Rx PCB's. Dishes up to 23". 24GHz modules.
NORE MICROWAVES 4 Vanguard Way Shoeburyness Southend-on-Sea Essex, SS23 9SH Tel: 0702 294255		WG isolators. WG circulators. (Made to order).
OAKBURY COMPONENTS LTD 12 Oxford Road Newbury Berks, RG13 1PA Tel: 0635 521077		Siemens dielectric resonators. Siemens ceramic cavity resonators.
PIPER COMMUNICATIONS 4 Severn Road Chilton Didcot Oxon, OX11 0PW Tel: 0235 834328		Parts for DUBUS designs. SSB Products transverters. Kits to 2.3GHz. Bipolar transistors and GaAsFET's. Agent for SSB Electronics products.
QUARTSLAB MARKETING LTD PO Box 19 Erith Kent, DA8 1LH Tel: 0322 330830		Converter/transverter crystals. 5th, 7th, 9th O/T, 60 to 175MHz.
RAEDEK ELECTRONICS Bannerley Road Garrets Green Birmingham, B33 0SL Tel: 021 784 8655		RF power transistors (VHF/UHF). BFR/BFQ series. Enquire for transistor types.

M.TWYMAN, G8KOA 65 Griffins Brook Lane Bourneville Birmingham, B30 1QB	#	Surplus 5.7GHz equipment. Surplus elliptical WG Surplus TWT's. Enquire availability please.
WOOD & DOUGLAS Unit 12/13 Youngs Industrial Estate Aldermaston Reading Berks, RG7 4PQ Tel: 07356 71444	*	Kits and modules to 1.3GHz. Some useful general components.
TECHNOMATIC 468 Church Lane Kingsbury London, NW9 8TQ Tel: 01 205 9558		Semiconductors, all types.
UNIVERSAL SEMICONDUCTOR SUPPLIES Unit 4 Springfield Road Chesham Bucks, HP5 1PW Tel: 0494 791289		Semiconductors, all types.
RAPID ELECTRONICS Hill Farm Industrial Estate Boxted Colchester Essex, CO4 5RD Tel: 0206 272730		Semiconductors, all types. (Including special devices for the G4ENA SSTV transmit board).
THAME SYSTEMS LTD Thame Park Road Thame Oxon, OX9 3XD Tel: 0844 217676		Astec AT1020 and AT 3010 modules.
WORTHING & DISTRICT VIDEO REPEATER GROUP c/o Robin Stevens, G8XEU Toftwood Mill Lane High Salvington Worthing West Sussex, EN6 3JE		1.3GHZ TV orientated kits. 1W Solent 24cm FM ATV Tx. 1.3GHz to VHF converter for ATV. PLL for Solent Tx. Repairs and spares for above.
RSGB MICROWAVE COMMITTEE Components Service Lambda House Cranbourne Road Potters Bar Herts, EN6 3JE		Mixer/multiplier diodes. Selected GaAsFET's. PTFE PCB material, suitable to above 10GHz. 24GHz modules and waveguide.

ASTRA INFO

Peter Vince G8ZZR,

Unless you have been in Outer Mongolia for the last few weeks you can't have failed to notice that satellite television has truly arrived in the U.K. Of course I am referring to the Arianne launched Astra 'bird', now beaming an assortment of television channels twenty four hours a day to Great Britain and Europe. Although at the time of writing very few people are able to receive these transmission, mainly due of course to the non-availability of the appropriate equipment, I have given below a list of the available channels, details of frequencies, modulations details etc.

I have also included a simple BBC basic program for calculating the azimuth and elevation for any geostationary satellite from any latitude. This program is based around the formula given by Space Communications (Sat-Tel) Ltd. in their PRK3 receiver manual, and I thank them for permission to reproduce it.

TECHNICAL INFORMATION FOR THE ASTRA SATELLITE

Astra is positioned in a geostationary orbit over longitude 19.2 degrees east. From London, point your dish 24.2 degrees east, with 28.3 degrees elevation. Subtract 6 degrees from the azimuth value if using a magnetic compass.

FREQUENCIES

HORIZONTAL POLARISATION		VERTICAL POLARISATION	
Ch. 1	11214.25 MHz	Ch. 2	11229.00 MHz
Ch. 3	11243.75 MHz	Ch. 4	11258.50 MHz
Ch. 5	11273.25 MHz	Ch. 6	11288.00 MHz
Ch. 7	11302.75 MHz	Ch. 8	11317..50 MHz
Ch. 9	11332.25 MHz	Ch.10	11347.00 MHz
Ch.11	11361.75 MHz	Ch.12	11376.50 MHz
Ch.13	11391.25 MHz	Ch.14	11406.00 MHz
Ch.15	11420.25 MHz	Ch.16	11435.50 MHz

Video deviation	16MHz p-p
Pre-emphasis	CCIR 405-1
Energy Dispersal	2MHz p-p
Channel bandwidth	26MHz
Primary audio	6.5MHz
Audio pre-emphasis	50uS
Audio subcarrier bandwidth	180kHz

Additional sound channels using the PANDA-1 discrete subcarrier system

Stereo 1	7.02MHz (Left channel)	7.20MHz (Right channel)
Stereo 2	7.38MHz (Left channel)	7.56MHz (Right channel)

(some channels use four separate mono sound signals)

NETWORKS

Ch. 1	Screensport	T.B.A.		
Ch. 2	---			
Ch. 3	Scansat TV3	On Air	Stereo	MAC
Ch. 4	Disney	T.B.A.		
Ch. 5	Lifestyle	T.B.A.		
Ch. 6	---			
Ch. 7	Scansat TV4	T.B.A.		
Ch. 8	Sky Channel	On Air	Stereo	Text/Data
Ch. 9	Eurosport	On Air	Mono	Teletext
Ch.10	---			
Ch.11	Filmnet 24	On Air	Mono	Teletext
Ch.12	Sky News	On Air	Stereo	Teletext
Ch.13	Sky Arts	T.B.A.		
Ch.14	---			
Ch.15	MTV Europe	T.B.A.		
Ch.16	Sky Movies	ON Air	Stereo	Teletext

Stereo 1 on Sky Channel (Ch.8) carries main program sound.
Stereo 2 on Sky carries 'Sky Radio'. (Wegner Comms. 1800 demod reqd).

The channels shown T.B.A. have yet to have their start dates announced, although by the time you read this they may in fact have started transmissions.

BBC 'SATELLITE FINDER' COMPUTER PROGRAM

```
 10 REM > Findsat.  Find direction of geostationary satellite.
 30 REM (Figures below are for receiving Astra in London).
 40 rel_long = -19.3 : REM Longitude of sat wrt receiver, East = -ve.
 50 abs_lat = 51.5  : REM Absolute latitude of receiver, South = -ve.
 60 PRINT "Astra from London:"
 80 x = ACS(COS(RAD(abs_lat))*COS(RAD(rel_long)))
 90 azim = DEG(ATN(TAN(RAD(rel_long))/SIN(RAD(abs_lat))))
100 elev = DEG(ATN((COS(x)-0.1513)/SIN(x)))
120 @% = &2020A : REM Print formatting for two decimal places.
130 PRINT TAB(10)"Azimuth + ";ABS(azim);" degrees ";
140 IF SGN(azim)= -1 THEN PRINT "East" ELSE PRINT "West"
150 PRINT TAB(10)"Elevation = ";elev;" degrees"
160 @% = £A0A  : REM Restore print formatting to normal.
180 PRINT"Don't forget to allow for Magnetic North being approximately
190 PRINT"6 degrees West of true North (in London) so the dish should
200 PRINT"be pointed 6 degs  West  of  the indicated figure if using a
210 PRINT"magnetic compass."
```

Typical display after a program run:

```
Astra from London

          Azimuth = 24.11 degrees East
          Elevation = 28.33 degrees

Don't forget to allow for Magnetic North being approximately
6 degrees West of true North (in London) so the dish should
be pointed 6 degrees West of the indicated figure if using a
magnetic compass.
```

BETA VIDEOS FOR 70CM

Eric Edwards GW8LJJ,

Beta video machines give good results and many are found to give improved results over many VHS machines. Despite this the popularity of Beta machines has dropped, mainly due to the fact that the general public require their, machines mainly for replaying tapes obtained from video libraries. Another example of market forces in operation and the success of the VHS marketting strategy. All of this is good news for the ATV'er, as Beta machines can be purchased on the second-hand market much cheaper than their counterparts. I am assuming that this is the case nationally, it certainly is here in my part of the world (Glamorgan and Gwent).

Consequently , due to this decline in popularity, Beta machines can be obtained for around £70 complete with new video heads. This compares with VHS machines going for around £150 each. Beta machines can also be purchased for less in not such good condition, and new video heads can be purchased for as little as £25. So, even if you buy a machine with worn heads, it would not be too expensive to replace them.

With these thoughts in mind I decided to raid my store-room of used video machines and check the tuning range of various models with a view to the suitability as 70cm receivers. My findings are listed below:

SONY SLC5

A large machine, but the tuner goes down as far as 434MHz, thus just about usable as a 70cm receiver.

TOSHIBA 9600

A front loading machine. If the video heads have to be replaced make sure that the upper cylinder is replaced at the same time. This model tunes down to 420MHz, thus giving good gain at 435MHz.

SANYO 9300

This is a 'battleship' of a machine, and although it will not tune directly to 435MHz it has a three-band tuner fitted as standard - OK for DXTV?. It is an old machine but very reliable. It should be very cheap to buy.

SANYO 5400

This a slim top-loading machine and tunes to 434MHz.

SANYO 5000

The earlier version of the 5400, this machine tunes to around 436MHz on average.

All the machines were tested at random and three of each type listed were checked for minimum tuning range. None of the tested

machines have been checked for ease of 'pulling' down to the required frequency or for means of increasing their sensitivity.

Other Beta models were checked but they did not immediately tune down to 435MHz. There are some very good machines available such as the Sony C9 series, which has Dynamic Picture Noise Reduction (DNR) a system that really works. Many machines have such features as instant record, slow or fast playback, x2 playback, slow or fast search, etc. It is certainly worth looking round for a second-hand Beta machine for ATV if you want to record received pictures etc.

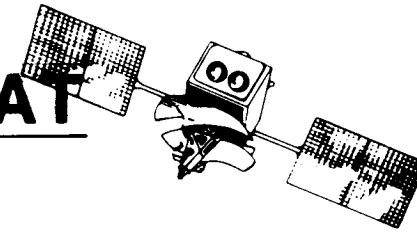
How about a Beta video correspondence network within the club? Send a Beta tape to other members and show what you are doing in ATV. Show others your received off-air pictures, your latest project. How about showing others who want to learn more about a particular aspect of ATV. The list is endless, but with cheap Beta videos on the market it could be worthwhile project. There ios nothing more exciting about receiving a video tape in the post especially if it is from another ATV'er.

Think about it chaps (and gals) I don't mind starting the ball rolling.

For anyone interested in Eric's idea his address is listed below, please refer all letters, tapes etc. to him and not the editor.....Ta.

Eric Edwards, 11 Old Village Road, Barry, South Glamorgan, Wales.

SATELLITE CHAT



Paul van Rossum,

As you might have noticed the last issue of 'Satellite Chat' was rather dated, it had been written in August, but due to the postal strike it wasn't published until February. As you might have seen on page 68, the Eutelsat organisation revised its plans due to a malfunction in the ECS-5 satellite, now ECS-4 is at 13 degrees East instead.

First, a couple of news items to update the February list:

ECS-5 (10 deg. East) please add:

Transponder 7 (vertical polarisation) 10.968GHz West Beam 3-SAT (German lang.) Audio 6.50MHz.

Transponder 10 (vertical polarisation) 11.472GHz West Beam Service Information aux Parieurs (bookmakers service in good English) B-MAC scrambled.

Frequency changes: RAI UNO = 11.009, RAI DUE = 11.640, TVE = 11.149GHz

ECS-4 (13 deg. East) please add:

Transponder 5 (horizontal polarisation) 11.565GHz Atlantic Beam Galavision (Mexican - American 24 hours - News service and Evening entertainment for Spain/Canary Islands. Audio 6.65 and 7.20MHz, 625 lines colour.

The original programme can be seen via PanAmSat at 45 degrees West, at approximately 11.570GHz in the USA/Puerto Rico/Virgin Islands version, using a 525 line NTSC format.

Transponder 3 (11.057GHz) has been abandoned for this.

Transponder 8 (11.091GHz, vertical polarisation) 3-SAT East Beam moved to this transponder, audio subcarrier remains at 6.65MHz

ECS-1 (16 degrees East)

After a long period of non-activity finally a first user appeared on the scene:

Transponder 10 (vertical polarisation) West Beam 11.473667GHz ITC - Stockholm, audio 6.60MHz.

Of course, there's more to report upon: Astra has been launched last year and started distribution of programmes on february 2nd. On April 1st the Scandinavian Tele- X DBS satellite is to be launched. However, considering the extensive coverage given to Astra (and its still unfinished user list) I would like to postpone reporting on these developments until next time.

This time I would like to make a start on the subject of C-band transmissions. On the next pages you will find a complete list of video activity as per March 10th. without going into detail on each station at this point a few notes are in order:

1) Reception of SCPC signals in its simplest form requires the use of an East European FM receiver, or other receiver tunable to 70MHz. This should be connected to the 70MHz IF stage present in most satellite receivers. Naturally, tuning in such a way requires the use of two satellite receivers in order to receive audio and video simultaneously. One good tip from Marios Colocassides (Cyprus); he mentions that a regular FM receiver tuned to around 87MHz would bring in NTA Lagos Channel 10's audio (on 27.5 degrees East) while still seeing some of the picture. try it you'll like it.

2) Reception of Soviet television isn't hard at all, particularly the First programme via Gorizont 14 at 14 degrees East which is of DBS like signal strength. Even a 90cm dish brings in the signal! Considering the wavelength this would be the same as a 30cm 12Ghz dish! However, two things should be kept in mind:

- the signal is transmitted over two frequencies about 8MHz apart, in order to avoid interference with terrestial services. So, the receiver should be either very broadbanded, or have an extremely fast AFC to cope with this. When using a larger dish the over-saturation tends to compensate, causing a fairly quiet picture after all.

- in order to improve the dynamic range of the audio of both TV and radio, a rather unique companding system is used. Along with both audio channels a control signal is broadcast, containing the necessary information for a decoder to restore the original audio quality. Without such a decoder the sound, though understandable, is very scratchy, and during quiet periods the noise level is raised dramatically through unwarrented AGC action. As Soviet TV offers a lot of high-quality cultural entertainment, I was glad to find a solution to the problem at last year's 'Cable and Satellite Exhibition' in London. An Israeli based firm, K.K.Lavianim Electronics Ltd, produces a module for this purpose. Though normally used in cable TV systems worldwide, the module is also made suitable for private viewers. It only requires a 12 volt supply and connection to the audio-out of any satellite receiver. After processing the regular audio can then be connected to an amplifier, or audio-in of a video recorder as required. The address of Lavianim is: 13 Hasharon Street, Tel-Aviv 66185, Israel.

3) Moroccan TV (RTM) used to be an SCPC affair. Good news and bad! SCPC has been abandoned and regular audio is now present. However, Morocco now also decided there is money to be made. The RTM programming now made way for a new service called 'M-2 International' which, in the afternoon and night, uses a similar coding system as France's 'Canal +' on VHF. Continuous demonstrations are given about 'how-to-connect-your-decoder'. One shouldn't discount the possibility that eventually all programming will be coded as is the case with 'Canal +' in France.

4) Sudan and Zaire used to be active on an older Intelsat bird at 21.5 degrees West. However, I was told last year by Intelsat's The Hague representative, that due to end-of-life instability all use of this satellite had ceased. However, in recent publications both

services are still listed. I havn't seen a trace of them, but as the signal levels were rather low to begin with, this does not mean that nothing is there. Frequencies reported are 3966MHz for Sudan (SCPC audio on 3992MHz) and 4046MHz for Zaire (using 4072MHz for SCPC audio). As neither station has been sighted on any other satellite they might indeed still be using Intelsat IV f4.

5) Non-video reception is something I'd like to devote attention to in a future article. As mentioned, SCPC reception generally requires a 70MHz receiver (or, of course, one covering the entire 950 - 1750MHz range, such as the Icom R-7000). telephony can be received while attaching a shortwave receiver with SSB facility to the baseband video output of the satellite receiver. Data should be available with the use of a modem and appropriate program for your computer. With some limited experiences in the first two modes and none in the latter, I'd rather gather more information first before writing on the subject though!

Slot 1-2 3704 - 3781 MHz. Hemi Beam RHCP	transponder 11/21	transponder 41/51 Zone Beam LHCP
66° E		non-video 52/58
63° E	3720 SABC (B-MAC) 58	non-video 58
60° E	/7,0 Radio Orbita IV\	non-video 52/59
53 °E	3675 Wostok Orbita IV 64	
26° E	3756 SCPC reported 55	
1° W	3718 RTG Gabon 59	
5° W		
8° W		3709,6 Antenne 2/Caraibe 60
11° W	/7,5 Sojuz Radio 1\	\3730,6 CFO (nx, report) 57
14° W	3675 I Programma, Moscow 64	
18½°W	\3725 Vremija relais/ tel. 58	non-video 57/58
24½°W	non-video 54/58	non-video 52/58
27½°W	3743 USIA, Washington 56	
34½°W	non-video 57/58	non-video 53
50° W	/3735 RTP-Madeira 57	
53° W	3755 RTP-Lisboa 55	

Slot 3-4 3789 - 3861 MHz. Hemi Beam RHCP	transponder 12/22	transponder 42/52 Zone Beam LHCP
66° E	unknown tv-station 49	
63° E		
60° E	non-video 51	non-video 44
53° E		
26° E	3830 occ. video reported 45	
1° W		
5° W		
8° W	/7,5 Sojuz Radio 1\	
11° W	3825 CT-1 Moscow N.Hemi b. 46	
14° W	3825 Intersputnik feed 46	
18½°W	(Cuba, GDR, OIRT feeds)	non-video 48
24½°W		
27½°W		
34½°W		non-video 47
50° W		
53° W		

Slot 5-6 transponder 13/23 3869 - 3941 MHz. Hemi Beam RHCP		transponder 43/53 Zone Beam LHCP	
66° E	3890 EET Ethiopia		38
63° E	3875 RTA Algeria (SCPC)	non-video	39
60° E	\3896 audio & radio/	non-video	36
53° E	3875 II Progr Double IV		40
26° E	\audio Mayak Orbita 4/		
1° W	3915 Tele-Sahel,Niger.SCPC	3900 AFRTS - Navy, Italy	35
5° W	(3933 audio & 2 radio st)	\ & sev. AFRTS radio/	37
8° W			
11° W			
14° W	3875 II Programma, Moskou		40
18½°W	\audio 7,0 Mayak/	non-video	37
24½°W			
27½°W	3915 France (testpattern)	/3932 TVE 2, Spain	35
34½°W		3908 TVE 1, Spain	33
50° W			36
53° W			

Slot 7-8 transp. 14/24 / 34 3959 - 4031 MHz. Hemi/Global Beam RHCP		transponder 44/54 Zone Beam LHCP	
66° E		non-video	29
63° E	non-video		32/34
60° E			
53° E			
26° E	3977/4015 SCPC reported	4008 unknown tv-station	21/28
1° W			24
5° W			
8° W			
11° W			
14° W			
18½°W	non-video	non-video	22/28
24½°W	non-video		24/32/33
27½°W	4022,5 Libya TV, Tripoli		25
34½°W	3980 irregular tests		22
50° W			27
53° W	3990 M2-Int. RTM, Morocco		25

Slot 9 transp. 15/25 / 35 4037 - 4073 MHz. Hemi/Global=Spot B RHCP		transponder 45/55 / 85 Zone/Global=Spot Beam LHCP	
66° E			
63° E			
60° E	non-video		18
53° E			
26° E	4052 Saudi Arab TV Ch.1	4071 Oman (SCPC 4078,45)	19
1° W			16
5° W			
8° W			
11° W			
14° W			
18½°W			
24½°W			
27½°W	4064,5 NTA -Nigeria (SCPC)	4048 Antenne-2 US-report.	17
34½°W	\4037 audio/		19
50° W			
53° W			

Slot 10 4077 - 4113 MHz.	transponder 36 Global=Spot Beam RHCP	transponder 86 Global=Spot Beam LHCP
66° E	non-video	
63° E		
60° E		
53° E		
26° E	4089 SCPC reported 14	
1° W		
5° W		
8° W		
11° W		
14° W		
18½°W		
24½°W		
27½°W	4095 TV Nac. de Chile 12	
34½°W		
50° W		
53° W		

Slot 11 4117 - 4153 MHz.	transponder 37 Global=Spot Beam RHCP	transponder 87 Global=Spot Beam LHCP
66° E		
63° E	4135 occ.video reported 08	
60° E		
53° E		
26° E	4126 Video exch. (Tunis) 10	
1° W		
5° W		
8° W		
11° W		
14° W		
18½°W		
24½°W	non-video 07	
27½°W	4140 Bright Star Wash/Lond 08	4125 FBIS (CIA) B-MAC-cod 09
34½°W		
50° W		
53° W		

Slot 12 4157 - 4198 MHz.	transponder 38 Global=Spot Beam RHCP	transponder 88 Global=Spot Beam LHCP
66° E	4177 USIA, Wash. D.C. 03	
63° E	4166/4188 video exch. 02/04	
60° E	4166/4188 video exch. 02/04	
53° E		
26° E	4163 Saudi Arab TV Ch.2 05	4181 occ. video reported 03
1° W	4175 AFRTS, Frankfurt 04	
5° W	\ & div. AFN-radio/	
8° W		
11° W		
14° W		
18½°W	4166/4188 video exch. 02/04	
24½°W	4177 o.a. ABC-Tel Aviv 03	
27½°W		
34½°W	4166/4188 video exch. 02/04	
50° W		
53° W		

Please note:

- the transponder/beam indications are only valid for Intelsat. Arab and Soviet TV use a different channel system.
- In Eastern Europe additional Soviet satellites might be seen; In Ireland some activity from US/Brazilian satellites is reported.
- The figures at the end of each listing refer to Drake's frequency indication (system 4240); users of other receivers please disregard.
- The non-video indications are just a sampling of some of the stronger signals. Indication is made to find some of the non-video transmitting satellites. Arabsat and Soviet satellites also radiate strong level non-video signals.
- About the Intelsat VA f15 satellite, launched succesfully on 1-27-'89 there is some confusion: I had been informed that it would be located at 50° West, but the French commentator at Arianespace reported that it would be positioned above the Indian Ocean...
- The strongest channels (giving fair to good pictures with a 10-ft dish) are: Moscow 1 & 2 from 53E/11W/14W, Ethiopia, SABC, Saudi Arab 2nd px, AFRTS-Frankfurt, AFRTS-Navy (SEB), USIA, Libya, France from 27W, and Morocco. The other stations listed will at times vary in quality, but never reach near-perfect quality. Intersputnik, Nigeria, Chile and Tele Sahel signals have been seen at higher levels irregularly.
- "reported" stations have never been witnessed by the author.

BARGAIN EQUIPMENT OFFER

The BATC has received the following equipment as a donation from the Hertfordshire Education Authority through John Goode. The equipment is listed below and will be offered on a first come first served basis on the Club stand at the convention. All the equipment is supplied with manuals and each item will cost the sum of £5.00, which is to cover club expenses.

SONY 1" reel-to-reel video recorder type EV320CE (monochrome but colour capable with colour adaptor, which is not available at this sale). Plus an amount of 1" tape on metal spools.....2 off.

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SONY AV3670CE 1/2" reel-to-reel video recorder.....1 off.

SONY AV3420CE 1/2" reel-to-reel video recorder, for spares only.2 off

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PHILIPS N1500 video cassette recorder.....1 off.

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SONY AVC-3450CE 12v vidicon camera (has electronic viewfinder)..1 off.

IKEGAMI 14" monitor, valve but working OK.....2 off.

ITC PM-96T 9" monitor.....1 off.

Remember, all at £5 each, on the Club stand, first come first served.

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BF480	£ 0:85	MPF102	£ 0:40	UPC1365	£ 4:65
BF981	£ 0:85	MPS918	£ 0:30	VN10LM	£ 0:70
BFQ23	£ 2:25	NE565	£ 1:25	VN66AF	£ 1:60
BFQ51	£ 2:10	NE564	£ 3:10	ZTX327	£ 1:50
BFR34A	£ 1:65	NE570	£ 3:50	ZN414Z	£ 1:10
BFR90	£ 1:30	NE592	£ 1:20	ZN416E	£ 1:65
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BFW30	£ 1:75	SL6601	£ 2:95	2N4427	£ 1:75
BFW92A	£ 1:35	SL6700	£ 4:45	2N4921	£ 0:70
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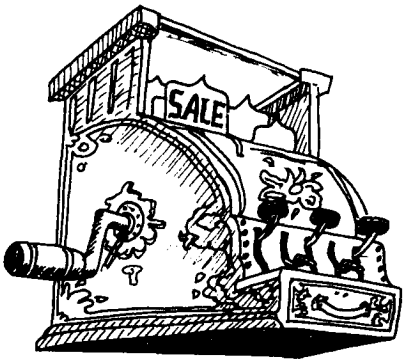

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FOR SALE

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I have the following for disposal and would welcome enquiries from anyone interested. Prices are negotiable. Brand new 1" VIDICON YOKES. Brand new 90 degree MONITOR DRIVE BOARDS, complete with coils. 1" Vidicon TUBE BASES. C-MOUNT lens BOSSES. Many used EX-COMPUTER POWER SUPPLIES, 12v, +5v and -5v, all with ML723 regulators on board, so voltage outputs may easily be changed. Many used 4.5" 240v AC COOLING FANS. Many 12 and 2/3" CAMERA CARCASSES which are almost complete and could be got going, in most cases circuit diagrams are available. Many MONITOR TUBES, 9", 11" and 12". Audio MONITOR scope with 9" tube. GBC TIME/DATE GENERATORS, complete but not working, standard 19" rack width and about 2" high, manuals available. A number of new 40-TRACK SHUGART FLOPPY DISC DRIVES, as well as a few 8" Shugart drives. Various COMPUTER MONITORS. A number of RS232-ASCII CONVERTERS; these were designed to allow an Olivetti electronic typewriter to produce a video monitor output, full data available. CAMERA CASE METALWORK. Lots of USED VIDICONS. 1GigOHM RESISTORS for auto target use. Lots and lots more goodies at reasonable prices, so if you are looking for something why not give me a ring, I may be able to help. Derek Pattinson, Kingshill, Nextend, Lyonshall, Herefordshire, HR5 3HZ. Tel: 05448 426.

MICROWAVE MODULES 24CM downconverter, 25 to 30MHz IF output...£25 Mike Wooding G6IQM, 5 Ware Orchard, Barby, Nr.Rugby, Warks, CV23 8UF Tel: (days) 0788 76125 ext 35 or (evenings) 0788 890365 (answerphone).

22-80mm TAMRON C-mount Zoom lens...£30. IVC IMAGE ENHANCER...£30. COXBOX...£20. BBC white unit DISTRIBUTION AMPLIFIERS, various...£2 each. PAL CODERS...£10 each. PAL DECODER...£15. RANK NIVICO 1./2" B&W reel-to-reel VTR...£10. BBC COLOUR SYNTH unit, incomplete...£8. Technicolour CVC VE30 CASSETTES, new and unused...£4 each. Marconi dual AUDIO COMPRESSOR c/w two PPM's...£30. VINTEN friction pan-and-tilt head, 3/8" screw mount...£12. Sony PVM6000 4x4" MONITORS in 19" width unit...£140. Tektronix 529 WAVEFORM MONITOR...£20. BBC pre-set law TEST STEP GENERATOR...£6. 40-track single sided DISC DRIVE...£15. Pye 25W AUDIO AMPLIFIER, three in 19" rack...£25. G101 CAMERA CABLE, long and short lengths...£8 each. SIX foot 19" RACK...£10. JVC KY2700 three-tube CAMERA, c/w 14:1 lens, batteries and charger...£1000. Many COX VISION MIXER modules including processing amplifiers, matrix modules, mixer amplifiers, +/- 9V PSU's etc. Plus many more items, ring for details. Simon Gough 0234 852789

PIONEER PX-7 MSX (Z80) A/V COMPUTER (directly genlocks to an incoming composite colour TV picture). C/W instruction book, service manual (copy), PTXB-7 graphics tablet with 'Video Art' graphics software cartridge and documentation, Joystick, some software, a number of books and magazines...£150. TOSHIBA HX-F101 3.5" MSX disc drive and interface. C/W documentation, PX-RA32 32k RAM expansion cartridge, some disc software including Anglosoft 'Video Titler and Display' system (superb for video titling), also VTR clock etc...£160. All above in superb condition, boxed and little used. Also available a range of 'Elektor' MSX add-on cards, including an E-Prom programming system - all working OK - please enquire. All postage/carriage extra. John Wood G3YQC, 47 Crick Road, Hillmorton, Rugby, CV21 4DU. Tel: (days) 0788 76125 ext 31 or (evenings) 0788 69447.

PANASONIC VHS EDIT SYSTEM; NV-8200 recorder with NV-8170 player and NV-A960 edit controller. Controller will also work with U-Matic machines and will also give insert edits with NV-8500 VHS. Well serviced, in very good condition. New equivalent price probably £6000+... very near offers in the region of £2000 please. David Wilson, 7 Massie Close, Willen Park, Milton Keynes, Bucks, MK15 9HG. Tel: 0908 665106.

PANASONIC TRIPLE 6" Black & White monitor unit type WV-763, free standing or can be 19" rack mounted...£80. SONY TUNER TIMER type TT-F1 in as new condition...£30. SONY BETAMAX VTR type C9...£150. SONY REMOTE CONTROL unit for C7, brand new...£25. Tamron C-mount ZOOM LENS, 15 - 150mm/f2.5...£50. KOWA C-mount ZOOM LENS 11.5 - 90mm f2...£25. Sony CH-1400CE Black & White CAMERA HEAD and PU-1401CE POWER UNIT. Power unit supplies 18 volts down the single video lead. Complete with 8mm, 16mm and 25mm C-mount lenses...£75. ATV 70CM TRANCEIVER home built to high standards. Receiver consists of Microwave Modules converter MMC435/600 into Manor Supplies tuner giving video output. Transmitter has 10 Watt PA (Motorola MHW710-3), modulator, output monitor circuit to feed scope, aerial changeover relay and two power supplies all housed in a neat metal cabinet, 350 x 280 x 100mm...£75. New poorly located QTH forces sale of above! Buyer to collect or pay carriage, monitor unit should be collected. Tel: Peter G3UDV (not QTHR) 01 998 6225 before 9.30pm.

NEW 17" CRT's plus some other sizes...phone for details. HITACHI VTU70E tuner/timer (thought new)...£15 inc carriage. D.Higginson G8JET, 28 High Street, Misterton, Doncaster, South Yorks, DN10 4BU. Tel: 0427 890768.

COLOUR CRT's for sale: 3 off A51-110X Re-guns. 1 off A51-510X second hand. HITACHI 370ECB22-TC05 14" colour CRT second hand. A56-140X second hand. All £5 each, prefer buyer arranges collection. Chris Kentch G0FJY, 2 Coleridge Close, Worthing, Sussex. Tel: 0903 40072 evenings only please.

WOOD & DOUGLAS 1250DC/50 24CM downconverter, as new and in perfect working order...£60. LMW 6 WATT 24CM PA, built, boxed and tested...£30. Trevor Brown G8CJS, 14 Stairfoot Close, Adel, Leeds, LS16 8JR. Tel: 0532 670115.

19" DX TELEVISION, only needs a simple dipole to perform well...£15. D.Higginson G8JET, 28 High Street, Misterton, Doncaster, DN10 4BU. Tel: 0427 890768.

G4ENB Spectrum SSTV system as in the Slow Scan Companion.. Working OK, built on a small chassis with power supplies and Spectrum interface. Complete with data sheets, software for SSTV and RTTY (needs a terminal unit). Prefer exchange for computer bits or W.H.Y. Also for disposal a set of boards, data sheets, software and programmable sound generator. J.Brown, 45 Marlborough Ave, Falmouth, Cornwall, TR11 4HS.

STC PRESTEL TERMINAL c/w 5" green screen monitor, complete and working with circuits...£50. BBC PULSE DISTRIBUTION AMPLIFIERS, four outputs...£2 each. PC BASIC language HANDBOOK...£3. PIONEER PX7 genlockable colour computer (PAL) c/w graphics tablet, ROM pack, Keyboard and handbooks...£225. PROWEST 19" monochrome MONITOR...£1. PROWEST 14" MONITOR, no tube...£1. TEKTRONIX 528 HANDBOOK...£2. Tel: B.Summers G8GQS 01 992 4739 (answerphone).

EXCHANGE & WANTED

OLD CAMERA TUBES and similar imaging devices, of various types and age for historic (!) collection. Particularly welcome would be an Orthicon, an Image Isocon, or a 1.5" Vidicon. Tubes that are not operable are suitable, so if you replace tubes in cameras don't throw the old ones away, but please contact Peter Delaney G8KZG, 6 East View Close, Wargrave, berks. Tel: 073522 3121.

SERVICE MANUAL for SONY DXC1610P CAMERA, purchase or copy, all expenses met. Bob Platts G8OZP, 8 Station Road, Rolleston-on-Dove, Burton-on-Trent, DE13 9aa. Tel: 0283 813181.

New SONY 2000 VTR belts for preservation of 405 line recordings. 405 line T.V.S., Test Gear, Signal sources, etc. W.H.Y. D.Higginson, 28 High Street, Misterton, Doncaster, South Yorkshire, DN10 4BU. Tel: 0427 890768.

BACK ISSUES OF CQ-TV. I am trying to build a reference library of material dealing with ATV. Any member who has a collection of back issues of CQ-TV and who would be willing to part with them, I am interested. I need all issues up to and incvluding 140. I also need copies of the ATV handbooks. Please send details in a letter to Howard Cochran W4PPN, 5600 Birchill Road, Charlotte, N.C. 28212, USA.

The following odds and ends would be most useful for a display of 405-line television I intend to present at this year's convention. PYE LYNX CAMERA in first class condition. Any C-MOUNT lenses made by Dallymeyer. Any 405-line GREYSCALE GENERATORS. 405-line ELECTRONIC CAPTION/CALLSIGN GENERATOR. Some BROWN 13amp MAINS PLUGS (yes, you remember them!). I also have a small number of 405-line TV recordings (VHS format) which I will be happy to exchange with others. Does anyone have a decent recording of the CAT-70 proceedings? mine is about 4th generation. CAMERA SERVICE MANUALS for PYE LYNX tyo buy. Also service manuals for PYE SENTINEL to but or copy. Andy Emmerson G8PTH, 71 Falcutt Way, Northampton, NN2 8PH. Tel: 0604 844130.

Does anyone know of any disc based software for a TANDY TRS80/2 to run MULTIPLAN or VISICALC? Also wanted 8" DISCS for the TANDY computer. J.Brown, 45 Marlborough Avenue, Falmouth, TR11 4HS.

MARCONI DUAL SLIDE PROJECTOR for telecine. VOL-2 HANDBOOK, spares and accessories for MARCONI Mk.8 CAMERA. PYE 11" MONOCHROME MONITORS, black and silver style. COX EXTENDER BOARDS, single and double width. Small STORAGE RADIATOR. 17" PIL CRT 17VAZTC02, fits Electronic Visuals colour monitor...good price paid. Set of RESPONSE SHAPING AMPLIFIERS (RSA's) for incorporation into sound mixer. Tel: Brian Summers G8GQS 01 998 4739 (answerphone).

Good prices paid for recordings of early BBC TRADE TEST CARD MUSIC and early Test Card 'C' 50/60's music. Tel: Paul Sawtell 038482 6679.

Good prices paid for BAIRD autographed letters etc. TELEVISOR or parts etc for a permanent exhibit. MOTOROLA walkie-talkies. Piers Bedford, 77 Barrowgate Road, London, W4 4QS. Tel: 01 747 0069.

WANTED ALL YOUR SURPLUS EQUIPMENT FOR THE RUGBY TELEVISION REPEATER GROUP'S BRING-AND-BUY STALL AT THE CONVENTION. The ideal place to sell your gear and raise enough money to buy all those other goodies you want! You can of course donate it all to the group! thus helping us raise the necessary funds to maintain the GB3RT 24CM FM ATV repeater. For information on the Bring-and-Buy please contact Mike Wooding G6IQM (manager GB3RT) on 0788 890365 (evenings).

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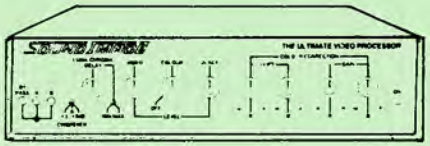

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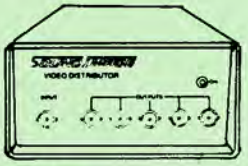

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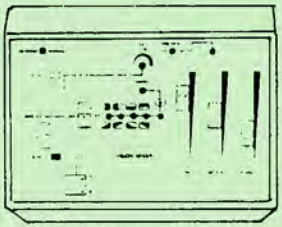

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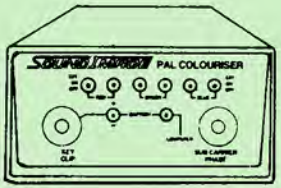

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