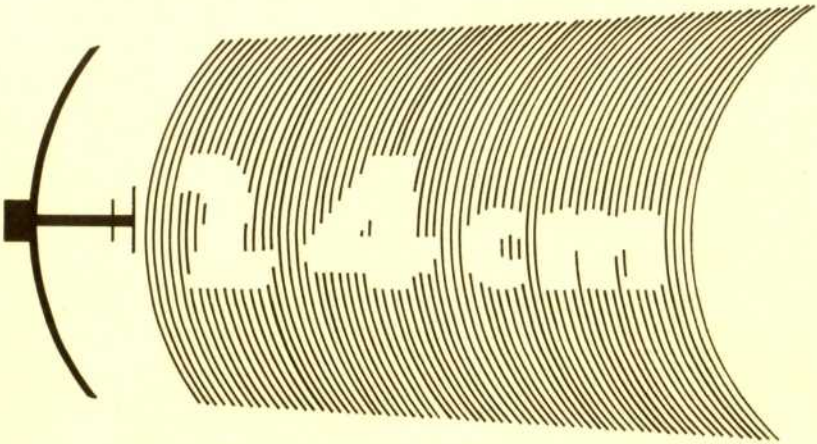
CQ-TV MAGAZINE No. 117

BRITISH AMATEUR TELEVISION CLUB

FEBRUARY 1982



AMATEUR TV

CONSTRUCTION PROJECTS INCLUDE.....

- 24cm ATV DOWN-CONVERTER
- 24cm SOLID-STATE EXCITER
- 24cm LINEAR AMPLIFIER AND VIDEO MODULATOR
- ATV MODULATOR FOR THE 2C39A

ALSO.....

- ATV ON 24cm
- THE LID OFF 24cm TV
- THE 'GOLF WHISKEY COLOUR FIDDLE BOX'
- PLUS ALL THE REGULAR FEATURES

special issue

COMMITTEE

Roger Appleton		PRESIDENT
Mike Crampton	G8DLX	CHAIRMAN
Trevor Brown	G8CJS	GENERAL SECRETARY
Arthur Rix	G3RYF	TREASURER
John L.Wood	G3YQC	EDITOR, CQ-TV
Brian Summers	G8GQS	MEMBERSHIP SECRETARY
Peter Delaney	G8KZG	MEMBERS SERVICES
Ian Pawson		PUBLICATIONS
Paul Marshal	G8MJW	LIBRARY
Alan Watson		EQUIPMENT REGISTRY
Graham Shirville	G3VZV	CONTEST MANAGER

Jeffry Borin		Lewis Elmer	G8EUP
Cyril Chivers		John Lawrence	GW3JGA
Mike Cox	G8HUA	Dave Lawton	G8ANO
Grant Dixon	G8CGK	Don Reid	
Eric Edwards	GW8LJJ	Paul Surtees	G8OVX

WHO TO WRITE TO:

CQ-TV copy and advertisements	J.L.Wood. 47 Crick Road, Hillmorton, Rugby CV21 4DU. Tel: 0788 864220
Subscriptions and change of address	BATC SUBS. 16 Percival Road, Rugby, Warwickshire.
Membership enquiries and applications	B.Summers. 13 Church Street, Gainsborough, Lincs. Tel: 0427 3940
Orders for components and printed circuit boards	P.Delaney. 6 East View Close, Wargrave, Berks. Tel: 073 522 3121
Orders for books and other publications	I.Pawson. 14 Lilac Avenue, Leicester, LE5 1FN. Tel: 0533 769425
General Correspondence	T.Brown. 25 Gainsbro Drive, Adel, Leeds, LS16 7PF. Tel: 0532 670115

PLEASE NOTE: If, when writing to a committee member, a reply is required, please enclose a stamped addressed envelope or, in the case of an overseas member, an International Reply Coupon.

MEMBERSHIP

Enrolment fee .50p. This applies also to persons re-joining the club after an elapsed subscription. Full year (1982 only) £3. April to December £2.25p. July to December £1.50p. October to December 0.75p. All subscriptions fall due on the first of January each year. Overseas applicants should not send foreign cheques please.

CONTENTS

CLOSE FOR PRESS DATE FOR THE MAY 1982 ISSUE.....20th March 1982

HAPPY NEW YEAR....MAY WE HAVE A BIG OPENING THIS TIME

EDITORS POSTBAG

Dear ED,

The fast-scan TV scene here in EI land is almost non-existant and the position regarding the licencing of amateur TV transmissions is not yet resolved. I continue to develop my ATV capabilities through experimentation (into a dummy load of course!) and have settled on the standard up-conversion from IF to UHF. I have a monochrome TV camera which modulates an Astec modulator which has 6MHz intercarrier sound capability. The UHF is fed through a colour TV receiver.

As I am constantly striving for reception of weak UHF TV signals from the UK across the Irish sea I have a number of UHF signal pre-amplifiers and, of all of them, I find that a recent Labgear - the CM7065 - is of quite low noise and improves signals even on a sensitive 12" Philips portable. The amplifier works very well on 70cm but I suppose in areas with very strong signals in the VHF/UHF bands, some prior selectivity would be required. Anyhow, for £16 or so (UK) you get low-noise, broadband and high gain characteristics.

For the time being here in EI I will have to content myself with further experimentation as I cannot forsee much ATV activity for a few years. I would like to get /portable capability as soon as possible as I shall be moving house in the near future to an area with a good take-off towards Wales and the SW of England. During good periods of UHF tropo. propagation I can often see TV signals from the 500W relay in the Scilly isles, particularly clear, ch.21 - very near to 70cm! However I will have to get going on 70cm phone prior to /ATV.

D Walsh, EI5CD

Dear ED,

As one of the lucky ones who have a SC77 Japanese converter board, and knowing there were many more, I wonder if it is possible for any data to be published There are, I know, a few modifications/ omissions that are experienced. Many operators have direct or over-the-air contact but I feel sure there are a few like me "out in the sticks" that would greatly appreciate any suggestions etc. Also for the colour memory boards.

J.Brown, G3LPB

Dear Ed,

As you know the Repeater Working Group are at present processing two television repeater applications, one for GB3TV in Luton and the other for GB3UD at Stoke-on-Trent.

The R.W.G. files, which go back many years still include an application from the Birmingham area under the call sign GB3VR.

We have been unable in the recent past to make any contact with the group responsible and therefore are uncertain whether this project is still viable.

In order to finally clarify the situation on way or another I would like anyone concerned with this project to contact me as soon as possible otherwise the application will be deleted from the files.

Graham Shirville, G3VZV
18 Church End,
Milton Bryan,
Milton Keynes
Buckinghamshire,
MK17 9HR

Dear Ed,

I have a Jap. TV camera, no name, type or serial number. I would very much like to find the identity of this unit. Clues are; PCBs are marked as follows; Nemco 91-211-07, 91-201-02, 91-201-01, 910211-06. The viewfinder tube is Matsushita 140 F B4, 120mm diag. 110 x 80mm screen area. Scan coil assy 1-451-003-09 KCB1.

The vidicon is buried in screening and movable screened deflection assy, with gears etc, so I have not disturbed it yet. Though it seems dead, I get a hum bar pattern on the viewfinder tube when touching the input of the video amp. Circuits, inst. book etc can be paid for or borrowed to copy etc. all expenses paid.

I am keen to get going on slow/fast scan TV on HF and 436MHz. Can offer copy instruction book on Pye Lynx and Ikegami VF302.

Current project is a VDU for my Video -Genie and getting the Genie to work with my HF and 2m rigs on RTTY. Genie/TRS80 users who are inclined to slow-scan are assured of attention to all correspondence, exchange of data etc.

CQ-TV is much enjoyed here, I hope to contribute more in the future.

J.Brown, G3EUR
74 Humber Avenue,
South Ockenden,
Essex RM15 5JN

Dear ED,

Some years ago I purchased a surplus unit of USA forces origin, measuring approximately 13" x 11" x 7", which contained little apart from two 5FP7 CRTs and a few potentiometers, and many sockets. I stripped it down and have not retained the type number. I would be most grateful if any reader could supply me with any information on the (potted) deflection and focus coils for the 5FP7 contained in this unit. I will of course re-imburse any costs involved.

G.H.Grayer, G3NAQ
c/o Post Room R1,
R.A.L., Chilton,
DIDCOT,
Oxon, OX11 0QX

MEMBER'S SERVICES

For administrative reasons the title 'Club Sales' has been changed to 'Member's Services'.

You will also have noticed that in an attempt to rationalise and simplify the ordering procedure, all sales items, including publications, are now in the shape of printed order forms which comprise a centre-page pullout to the magazine.

It is hoped that this will assist members in making out their orders as well as assist in the running of the departments.

Members are asked to please enclose a recent address label from CQ-TV as proof of membership, this will be returned to you with your order.

The club would like to thank Mr.P.Dunstall for bringing this subject to the fore again. Any other observations or suggestions would be gratefully received by the Editor.

9831 2/3" VIDICON TUBES

The 9831 vidicon tube is manufactured in relatively infrequent batches as EMI normally only make this size of tube to broadcast spec., when a commercial run is set-up. Supplies to the club become available at the end of these runs - so are rather erratic. Peter Delaney will accept and process orders, but it is stressed that supply dates cannot be given and long delays are very likely, (currently about eight months). All orders are fulfilled in strict order of receipt.

TEST CARD PROM

The 74S471 PROM for the test card circle (Amateur TV Handbook) is no longer made. A new device - the TBP28L22 - from Texas Instruments is available from the club, pre-programmed and is a direct plug-in replacement for the original type. All future orders for a pre-programmed PROM will be met with the new device.

MEMBERSHIP UP AGAIN

The last issue of CQ-TV magazine was sent to 1,268 members. This represents a total increase in membership, up till the end of September, of well over 50%. The upward trend continues and it is expected that over 1400 members will have joined by the end of the year.

SOUTH AUSTRALIAN AMATEUR TELEVISION GROUP GOES OFFICIAL!

After some 15 years informal association, the South Australian Amateur Television group has become a formally constituted body. The aim is to promote amateur television in South Australia by the operation of several ATV repeaters and by publishing a quarterly journal "The ATVer".

The BATC has signed an agreement with SAATG for an exchange of magazine and a reciprocal "use of copy" arrangement has been made.

The BATC would like to wish the group every success for the future.

CQ-TV SPECIAL ISSUE

As I have said in recent issues there is a growing interest in the use of 24cm for amateur TV. This is becoming increasingly so since there could soon be a couple of ATV repeaters in operation on that band.

Over the past few months I have been scouring this, and other countries, for practical information on getting started in the band. The contents of this issue are part of the result. I have tried to include in the one magazine sufficient information to enable anyone to assemble a complete (albeit low power at present) ATV station and to give such information on the band itself as well as the techniques used, as to be useful to those taking the plunge.

I have in reserve a certain amount of material which, owing to the lack of space, could not be included this time. I would like to thank all those who have helped me with the assembly of the articles, in particular I should mention Andy Emmerson who was cajoled into doing the foreign language translations.

Editor, G3YQC

CQ-TV COPY BUILD-UP

How's this for a change then? I have to report that I have accumulated a fair amount of copy for the magazine which, for various reasons, I have been unable to use so far. To those who sent articles and items which have not been in print yet rest assured that most of it will be used in the future - I have had some for several months now.

Please don't be put off from sending more copy though I can always use it, the more I have to choose from the better the magazine! Thank you to all concerned.

Editor, G3YQC

BATC SUBSCRIPTIONS

By now all subscriptions for 1982 should have been paid, if you have not yet renewed please do so soon. All members who have not renewed before the 31st of March will be deleted from the membership list and will therefore receive no further magazines. You are reminded that a 50p enrolement fee will be payable to re-join should your membership lapse.

A MESSAGE FROM THE CHAIRMAN

Recently, there have been various comments regarding the future of amateur television in the 70cm band. To clarify the matter Graham Shirville and myself have been in contact with the General Manager, VHF committee Chairman and the VHF Manager of the RSGB. We have received assurances from all of them that the RSGB are not trying to remove ATV from 70cm. To quote from one letter:-

'I have always regarded 70cm as the home of ATV as so much has been done in the past. I can assure you that it is not the intention of the RSGB to move ATV to 24cm but to encourage the use of the 24cm band as well. May I say that I would strongly oppose any move to remove ATV from 70cm. The band has been the home of ATV for a considerable time and I will do my utmost to ensure it remains so for the future'.

May I assure you that the BATC committee is constantly reviewing the situation and will keep members informed of any developments.

73
Mike Crampton
Chairman, BATC

POSTAGE RATES

The Post Office are increasing their charges once again this month therefore you will find increased postal rates for club service items. It is thought likely that the membership subscriptions will need to be raised for 1983, more on this will be published in the next issue.

MEMBERSHIP APPLICATION FORMS

A new membership application form has been produced to cover 1982 and 83. The form (light yellow) has been altered to make it easier to fill in and to assist in the form processing. Anyone with the old 'gold' forms should please destroy them. The new form may be obtained from the Chairman whose address in on the inside front cover.

CQ-TV TO GO'COMPUTERISED'

The club's editorial electric typewriter has recently been replaced. The new machine is an Olympia ES100 daiseywheel typewriter which has a standard RS232 computer interface enabling it to be used as a printer as well.

The Editor already has a Transam Tuscan Z80 based computer with twin disc drives, and therefore, after the acquisition of a suitable VDU card, a text editor/word processing programme will be written to assist in the compilation of the magazine. It is hoped that this will speed up the preparation of the magazine text and improve the overall presentation.

BBC MICROCOMPUTER

Did you know that the new BBC computer is ideally suited to the display of slow-scan pictures? It can display a high-resolution picture with a resolution of 256 vertically by 320 horizontally, with four levels of luminance (2 bits per pixel) This requires the 32k machine (model 'B'), the model 'A' will do 256 x 320 but only with one bit per pixel (black and white).

If any members are planning to program the computer for slow-scan (or other TV related uses), Richard Russell, G4BAU would like to hear from you. The address is; 59 Campbell Road, Gravesend, Kent. DA11 0JZ

CB-TV AND ALL THAT

If we owe nothing else to CB radio we do owe it one thing, when the media now do a piece on amateur radio they no longer insist on drawing parallels with Tony Hancock - at last! Of course there is a penalty, viz; it's now 'glorified CB'. Anyhow, it makes a change. How long will it be I wonder before some clown tries to send fast-scan TV on 27MHz! this I gotta see.

ATV though has been getting a fair bit of publicity lately. A 5-minute film was recently shown on the Midlands "ATV Today" (appropriate) programme. The film was made in the shack of Derek Wills, G3XKX in Leicester, with live on-air assistance - in colour - from Rod Timms, G8VBC near Burton-on-Trent. CB was mentioned only briefly and the interview was conducted very ably with not too many silly questions. A sensible film which should be an example to others.

A few days earlier the same pair featured in a good sized article in the local "Leicester Mercury" newspaper. A large photo' showed Derek sitting in front of his gear with a colour camera in the forground. The article was also well written and gave people a glimpse into our world. Two analogies were made with CB; 'the technical knowledge, skill and equipment needed to send and receive your own TV pictures makes CB radio look like a Christmas toy; and, 'the difference between CB and amateur television is like the difference between riding a bicycle and flying Concorde'. Well put Derek.

Not so well done was a short piece under the 'Ad Lib' column by John Blake which apeared in "The Standard" London paper. The title itself tells you what it's like; "Next tune in to citizens band TV", and it starts...'Now CB radio is legal at last the next dimension for "breakers" is about to become television. The chap obviously didn't listen to what was told to him and he generally got it all wrong. This sort of article - which we could well do without - only serves to confuse people and to give a false image (sic) of amateur TV. John even says that some chap from 'Video Palace' has had a lot of enquiries about this sort of thing and is checking into the legalities of it, I hope he has the sense to contact the BATC. As I write a film is being made in the South Midlands with amateurs from the Luton/ Dunstable area taking part.

My thanks to Mr P Dunstall for sending the 'Ad Lib' cutting.

ATV ON 24 CM: an overview

by Andy Emmerson, G8PTH.

1. Introduction

First of all, yes I did mean 24 cm - no connection with the 23 cm crowd up the band! Secondly, in case you think it absurd that this article is written by somebody with no practical experience of the subject, let me just say that other people seem to get away with doing this sort of thing all the time. Anyway, in this article I would like to give you a brief appreciation of subjects such as AM vs FM, established frequency generation techniques, the choice of linear amplifiers, receive converters, commercial equipment and types of aerials. To achieve this ambitious goal I have jettisoned style in the interests of brevity, while some of the material has been ripped off from a more detailed study by Hans-Ulrich Schmid, DJ6TA, in 'Der TV-Amateur' (issue 33/79). Any errors or omissions are entirely mine, however. Correspondence on any matters raised will be welcome in 'CQ-TV'.

2. Propagation and system engineering

Compared with 70 cm, ATV signals on 24 cm suffer greater attenuation while 'in the air'. Practical experience shows that on non-optical paths this attenuation is 10 dB greater than the comparable path loss on 70 cm. Other causes of loss are (a) the relative difficulty of power amplification at 24 cm, (b) greater feeder losses at 24 cm, and (c) higher noise figures in receiving equipment. The diagram which accompanies this article illustrates a comparison of various systems to demonstrate the level of system engineering required to achieve comparable results with operation on 70 cm. It goes without saying that care in construction and installation is essential to achieve good results and avoid disappointment.

3. AM vs FM

To date most ATV activity on 24 cm has employed amplitude modulation. This applies particularly to West Germany and the USA where 24 cm is widely used in connection with ATV repeaters. By contrast, 24 cm ATV in France is on FM due mainly to the leadership of F3YX who is doing a lot to popularise this system. FM has the advantage of making less demands on linearity from PA stages and need not take much more bandwidth than AM. The FM system has been carefully thought out and designed - a full description is being published in 'Radio-REF' and is attracting coverage in Germany as well (see 'Der TV-Amateur', issue 43/81).

4. Channels and frequencies

Various bandplans have been evolved in the hope of finding one acceptable everywhere. A joint BATC/RSGB bandplan for Great Britain is republished in this issue. The German ATV club AGAF proposes 1250 - 1260 as repeater input, 1283 - 1293 as repeater output and 1270 - 1280 for ATV simplex (and other wideband modes). Most German stations currently operate video on 1252.50 MHz with 5.5 MHz (system G) sound on 1258.00 MHz. French simplex TV is centred on 1255 MHz. In the USA they have settled on 1241 (simplex), 1278.75 (repeater input) and 1253 (repeater output).

5. Frequency generation

Published concepts for 24 cm transmitters include designs by DJ4LB and

DC6MR, both adapted from their 70 cm transmitters. Both generate a vestigial sideband audio-video signal at IF and mix this with a local oscillator. The former design is described in 'VHF Comms' issue 1/81 and PCBs are available. The design for the latter can be found in issue 40/80 of 'Der TV-Amateur'. For the FM system F3YX sells PCBs and a set of coils, together with full documentation. In this country Fortop Ltd. have announced their intention of selling a ready made transmitter for 24 cm.

6. Power amplification

As at 70 cm, the choice is between transistors or valves. Both techniques tend to be more expensive than at first sight - the transistor types available are generally rather pricey and require 26 volt power supplies. Teflon PCB material is essential to maintain impedance and contain losses. Valves, on the other hand, offer potentially greater power levels though their power supplies and blowers can be bulky and expensive, and some people object to the high voltages involved. Furthermore, only new valves really come into consideration since secondhand examples often turn out to have reduced gain at these higher frequencies.
Considering transistors first, a typical PA might employ a BLX 98 or a BLW 98 giving a TV output of 4.5W, with up to 4dB stage gain. By comparison a single 2C39BA valve PA with 820V on the anode will give up to 11W effective output power. These effective TV output power levels are realistic and less than the unmodulated or peak power levels achievable. At 24 cm it is quite feasible to use multiple valve PAs: a triple 2C39 arrangement will produce 50 to 60W TV power with 15W drive, while a quadruple arrangement can produce considerably more (230W peak). "This PA would be of use where licence conditions would permit its use" said the article. One or two operators have got hold of 'exotic' transmitting valves and speak of 400W on 24 cm.
Commercial productions using both val ves and transistors are available in Germany but tend to be rather expensive. The cheapest 24 cm PA design which employed just a coffee tin (and a fair amount of engineering) was described in issue 3/78 of 'VHF Comms'. Another single stage amplifier, again using a 2C39, is described in the RSGB VHF/UHF Handbook (but note the important corrections in Rad Com 4/79 and 2/81. It is also possible to modify military surplus UPX-6 amplifiers but I do not know where these are available.
Several transistor designs are being published in this and forthcoming issues of 'CQ-TV'; photocopies of specific designs are also available on request from the author.

7. Receivers

Preamplifier and receive converter circuits abound in the 'TV-Amateur' and 'VHF Comms': many of these convert down to Band I or III. Fortop are working on a converter with a UHF output and no doubt Microwave Modules will have a similar product. Experienced 24 cm operators seem to rate interdigital bandpass filters highly to eliminate image and other spurious reception.

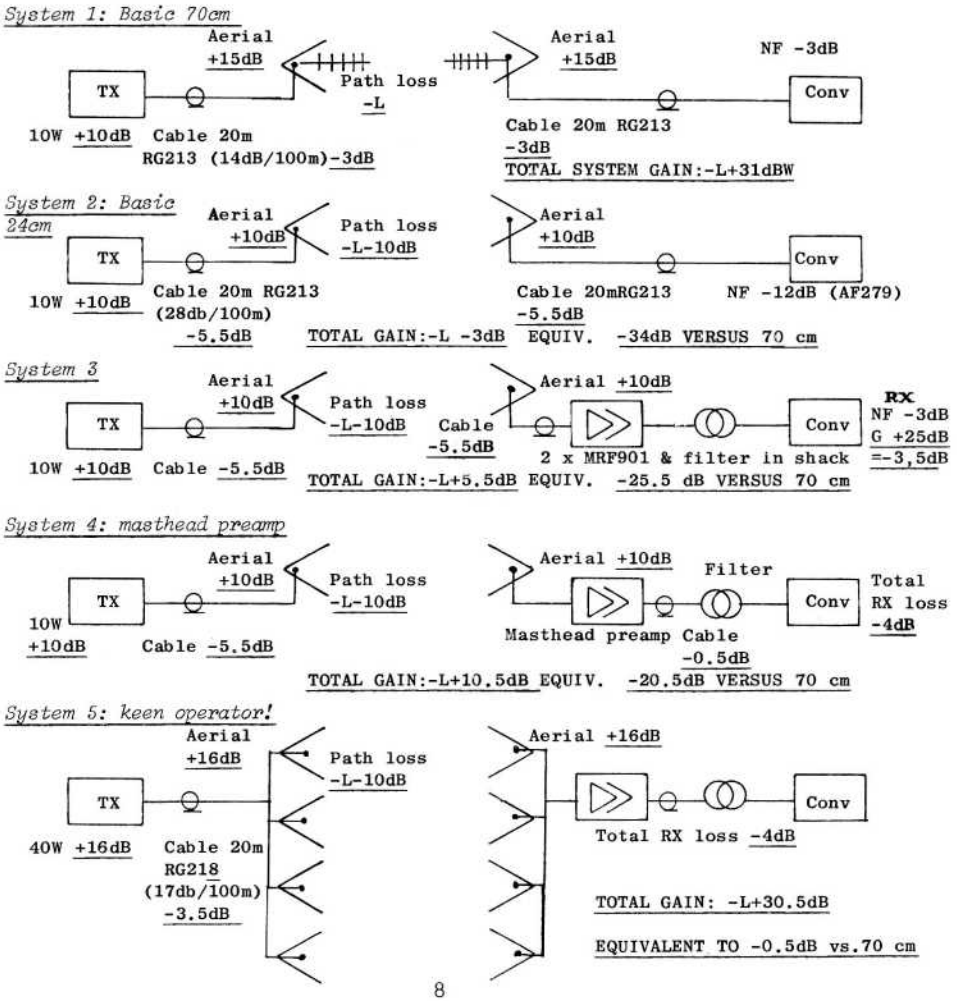
8. Aerials

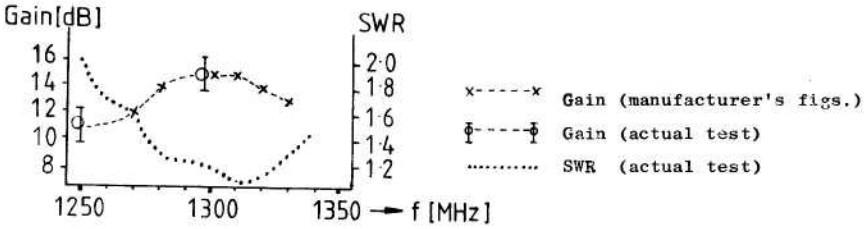
For 23 cm there is no shortage of designs for high-gain antennas as well as some commercial products. Among the latter are loop yagis with 17 - 18dB gain and a 2 x 15 element yagi with skeleton slot feed. Please note: these have no application for TV use. They are tuned sharply for the 23 cm telephony sub-band around 1296 MHz and have high SWR and much reduced gain at the TV end of the band (see diagram published elsewhere in this issue). All is not lost, though, since Jaybeam also produce a special D15/1252 version of their aerial for the German market. This one is specially tuned and designed for television operation at the bottom end of the band. The antenna

is normally manufactured in batches of 25 for VHF Comms in Germany but Jaybeam have indicated their willingness to add orders for UK customers to the next production batch (delivery 2 months or less). Alternatively, if the BATC place an order for 25 aerials Jaybeam will produce these straightaway. Price and most technical details are as for the D15/1296.
If you are prepared to accept a lower gain (10dB) a corner reflector antenna is an easy do-it-yourself execise. This is a broadband design and not affected by minor dimensional deviations. Note that maximum gain (12dB) is not coincident with best match to 50 ohms. A diagram is published elsewher in this issue. Issue 2/74 of 'VHF Communications' gives designs for a 40 element horzontal stacked colinear (16 to 18dB gain) and a stacked tubular slot with allround horizontal radiation (6dB gain). Polarisation is horzontal for ATV.

- - - - - 0 - - - - -

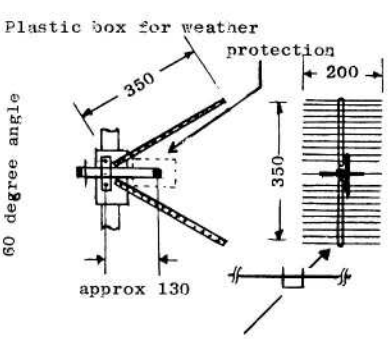
PERFORMANCE COMPARISON BETWEEN 70 cm AND 24 cm



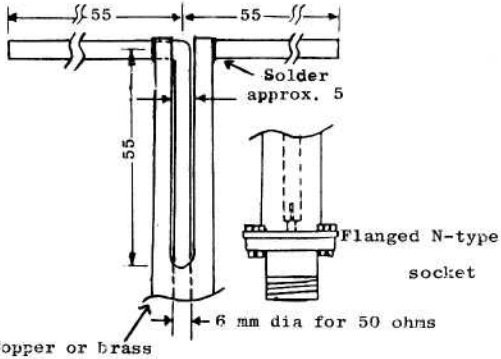


Corner Reflector antenna for 24 cm.

(all dimensions in mm)



Aluminium profile with 2mm aluminium welding rod glued (epoxy resin) at 25mm intervals



Copper or brass tubing

outer diameter 16

inner diameter 14

A limited number of the current issue of 'Amateur Television Magazine' are available by sending £1. to the British representative; Andrew Emmerson, G8PTH. 4 Mount Pleasant, Blean Common, CANTERBURY, Kent. CT2 9EU. Full details on subscriptions may be obtained by sending a SAE.

CONTEST NEWS

1981 INTERNATIONAL ATV CONTEST

We were not, unfortunately, blessed this year with good conditions, however a very large number of stations were active and, as you will see, there are almost thirty entries.

Activity seems to be fairly evenly spread around the country with an obvious concentration in the "ZL" region, but still no evidence of activity north of the border!

The full International results will be published in the next edition of CQ-TV but, in the meantime, congratulations to the Worthing and District Amateur Society who operated G8GCP/P from the top of the South Downs, who were the leading U.K. station with a clear lead over G8MNY/P who were operating from near Stoken Church, South of Oxford, who came in 2nd place just ahead of the Dunstable Downs Radio Club G4ARD/P.

G8GCP/P had what appears to be the only contact into Europe with F3YX near Le Havrẽ at just over 300 kilometres.

Most people appeared to enjoy the contest although there were the usual tales of woe, broken rotators, blind receivers etc.

Although the rules had not changed substantially from previous years it appears that there was increased confusion caused by the wording of the "one way contact" rule. They were written with the intention simply of ensuring that stations entering the receive only part of the contest were not also giving points to section A contestants so as to increase your chances. Your scribe is in discussion with the other organisers in Germany, France,Holland and Belgium and I hope that by next year the difficulties will be resolved.

Obviously one way contacts help to encourage those stations with only receive facilities to also aquire transmitters and that must be a good thing. The total number of U.K. stations active appears to have been a little over 100 and as the number of the portable stations "represented" 3 or 4 other TV operators this shows a very good level of activity.

1981 AUTUMN CUMULATIVE CONTEST

These notes are being written as the contest is proceeding and, although conditions do not appear to have matched those of some of the periods last year, activity seems to be well up, with a good number of stations in evidence. The full results will appear in the next issue.

Finally, it has been suggested that we should hold another Cumulative contest in the early summer of 1982 as the weather is more likely to be conducive to portable operation. Full details will appear in the next issue when your scribe has had a chance to look at the contest calender published by the RSGB.

73'

GRAHAM P. SHIRVILLE G3VZV

1981 INTERNATIONAL CONTEST

SECTION A - 70cm

POSITION	CALLSIGN	QRA	POWER	POINTS	QSO's
1	G8GCP/P	ZK09F	150	4820	32
2	G8MNY/P	ZL26E	80	4262	33
3	G4ARD/P	ZL18H	100	4248	40
4	G8DTQ	ZL60E	150	3679	41
5	G8ZWM/P	ZL68H	25	2930	33
6	G8GLQ/P	YL57G	150	2837	17
7	G8VBC	ZM13E	40	2784	28
8	G4AGE/P	ZN63E	4	2266	33
9	G3YQC	ZM54B	12	2149	22
10	G8EGG	ZL77H	10	2063	18
11	G4CRJ	ZL38B	150	1797	27
12	G8MLA/P	ZM76A	45	1631	11
13	G4DYP	ZM21G	10	1508	14
14	GW8GIZ/P	YN65H	50	1439	9
15	G8GHH	AL57B	100	1372	12
16	G4AKG	ZL60B	50	1160	20
17	G4HMG	ZL38E	15	1058	17
18	G3YVI	ZL39H	150	968	15
19	G8CQE	ZL50D	50	900	16
20	G8VBS/P	AM64G	50	863	9
21	G8HBR/P	YN39H	100	787	13
22	G8GKQ	ZL50C	10	715	14
23	G3UMF	ZL15F	0.1	681	8
24	G8CJS/P	ZO77B	6	589	4
25	G4IZT	ZN02D	4	525	5
26	G4UR	ZM72B	0.25	12	1
27	G8JLE	ZN53A	10	1.5	1

SECTION B - 70cm

1	BRS46324/A	ZL67H	-	252	7

SECTION A - 23cm

1	G4ARD/P	ZL18H	25	399	2

24cm TELEVISION

DOWN-CONVERTER

by John L. Wood. G3YQC

This unit will convert amateur television signals in the 1.3GHz band to a frequency within the broadcast UHF TV spectrum, thus permitting any domestic 625 line TV set to be used for amateur TV reception without modification. The converter is connected directly to the TV aerial socket.

Design and construction techniques have been purposely kept simple in order that the converter may be built and aligned without the need for a special printed circuit board and elaborate test equipment. Because of the simplicity, exceptional performance - when compared with pro fesionally engineered units- should not be expected although the performance is adequate. It is hoped that this converter will encourage people to investigate the 24cm ATV band.

SPECIFICATION

Input frequency:	1240 - 1300MHz (adjustable)
Output frequency:	Adjustable over UHF bands 4 and 5
Overall gain:	25dB, (typical)
Noise figure:	3-4dB (optimised)
Bandwidth:	+20 -40MHz from centre frequency @-3dB (typical)
Power requirements:	11 - 14v DC (12v nominal)
Overall size:	100mm x 65mm

CIRCUIT DESCRIPTION

A BFR91 was chosen for the first signal amplifier which is adjusted for best noise performance. The second amplifier employs a BFR90 which is set for maximum gain. These transistors, although rather dated by todays standards, have proved to be the easiest to use in this design, and are still readily obtainable (Modular Electronics, Ambit International etc.). All the gain for the converter is obtained from the two signal frequency amplifiers.

The mixer TR3, is, for simplicity, a single-ended transistor type which is biassed for unity gain. The IF is selected by the collector tuned circuit which will tune between 450 and 800MHz.

The local oscillator TR4, uses a FET and is tunable over a wide range enabling virtually any IF in the UHF TV band to be used. The oscillator was found to be quite clean and to be sufficiently stable. It is quite important to use the specified FET, other types may not be very satisfactory.

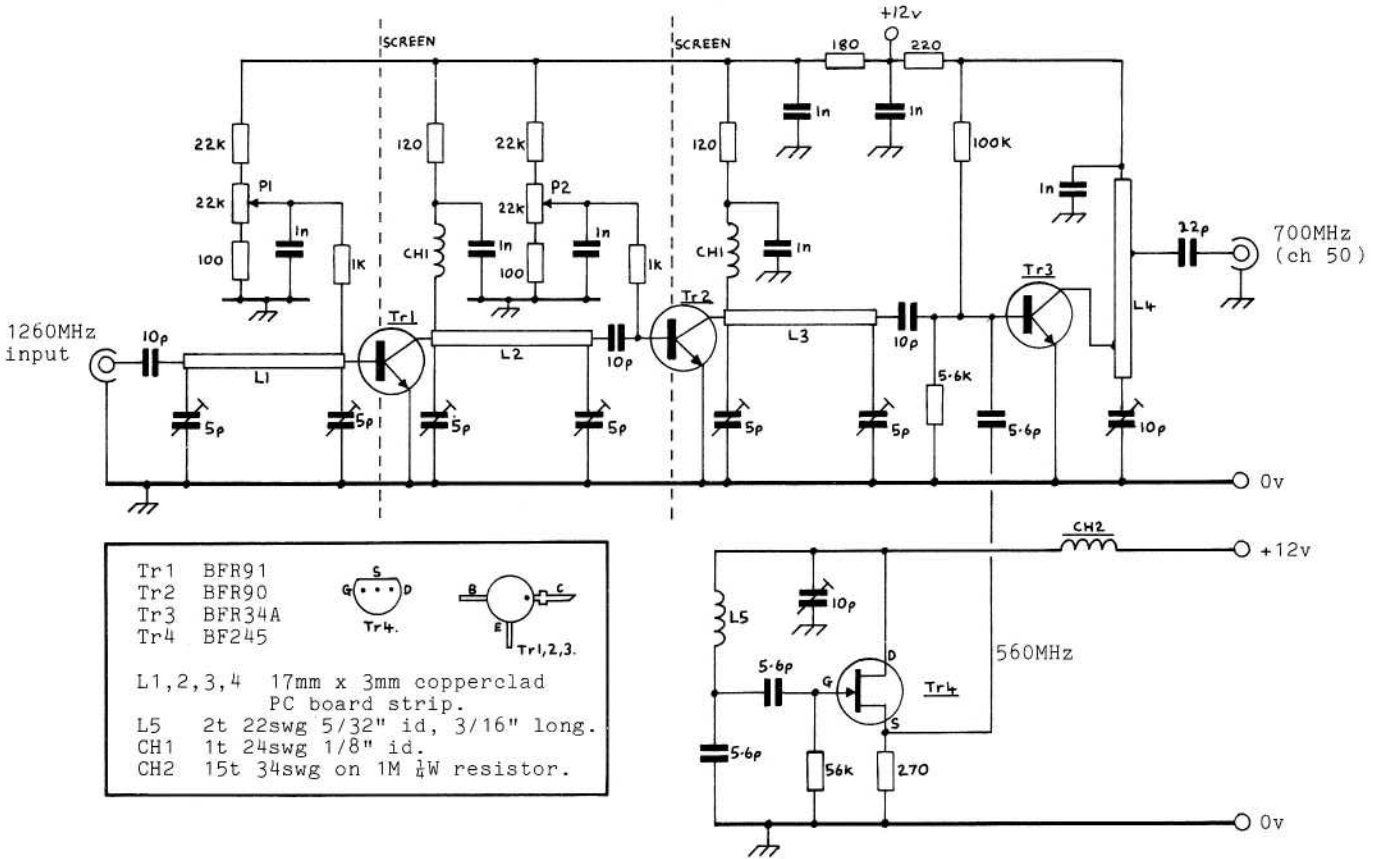


Fig.1 G3YQC 24cm ATV DOWN-CONVERTER

COMPONENTS

All components should be of good quality. Fixed capacitors are sub-miniature ceramic. Trimmer capacitors may be good quality plastic foil types. Mullard sub-min 0.5 - 3.5pF trimmers (809-05001)[1] have been used and were found to be excellent.

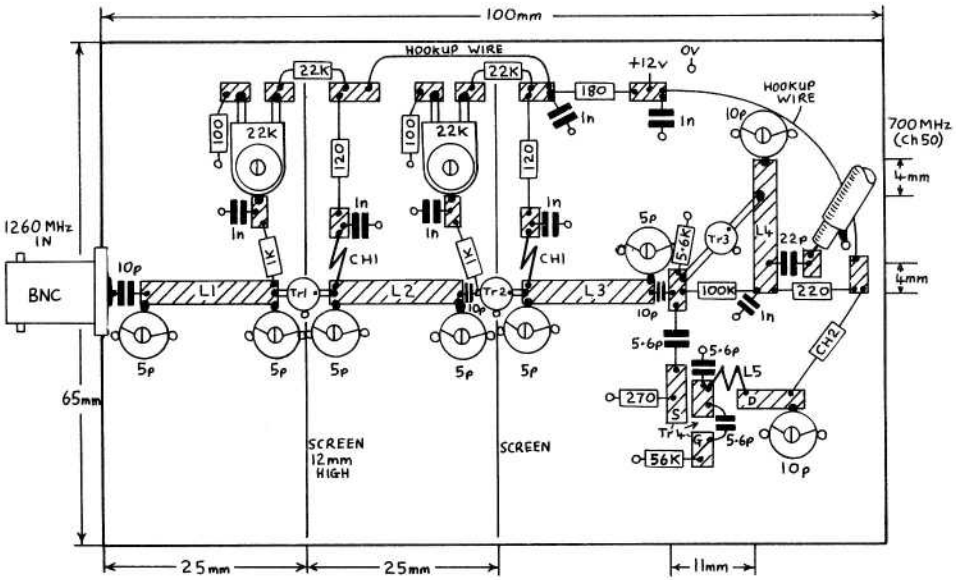


Fig.2 LAYOUT DIAGRAM, 24cm CONVERTER.

CONSTRUCTION

Although printed circuit techniques are used to ensure repeatability, it is not necessary to etch and drill conventional printed circuit boards.

Take a piece of single-sided copper laminate epoxy board 100mm x 65mm and place it copper side uppermost. Cut out the pieces indicated by the shaded areas in Fig.2 from another piece of similar board using a small saw. Glue these pieces, copper side up to the main board so that the copper is insulated from the earth plane (position as shown in Fig.2). The small pads should be about 3mm wide and no longer than that required. 12mm high screens should be soldered to the ground plane in the positions shown. Thin guage copper, brass or tin plate may be used.

It is strongly recommended that the converter be installed into a screened box before alignment. The box may be made from single sided PC board material. If possible the converter should be soldered around the edges to the box. If this is not possible the enclosure should be large enough to allow at least a quarter of an inch between the edge of the converter board and the inside walls of the box. Failure to do this may result in a variation in tuning when the box is handled. Should neither of these techniques be possible and a small gap is unavoidable, the board should be bonded to the case in several places using either solder tags or copper fingers soldered to the board and bent up to press against the inside of the case.

Fig.2 illustrates the ideal input connection where the socket is adjacent to the end of L1. It is strongly recommended that either N or BNC types are used especially at the input. It is advantageous also to mount the output connector in such a way as to eliminate the need for coaxial cable.

All capacitors (with the exception of oscillator injection) should be wired so as to keep their leads VERY short.

ALIGNMENT

Up-end the 180 Ohm resistor from the 12v input and apply power. Monitor the oscillator frequency on a TV receiver and, with the aid of a piece of wire soldered to a short length of coax connect it to the TV aerial socket, and place near the converter, tune the oscillator to the required frequency.

Re-connect the 180 Ohm resistor and up-end the 22k base resistor of TR1. Connect a milliammeter in series with this resistor and adjust P1 for around 3.5mA. Re-connect the resistor and repeat the operation with TR2, adjusting P2 for about 4.5mA.

Connect the output to a TV receiver tuned to the IF and adjust the output tuned circuit for maximum noise. Apply a 24cm signal to the input and tune it in on the TV set. Carefully peak all trimmers for best output. The first stage should be optimised for minimum noise figure and the second for maximum gain. The pairs of trimmers on the tuned lines are, to a certain degree, interdependent and the optimum position may be found by trial and error.

CONCLUSIONS

At the time of writing five converters have been constructed (two by myself and three by others using this information), all worked first time and, when checked under lab. conditions, all met the specification almost exactly. The units proved unconditionally stable when built as described. The converter has been **used** on the air with excellent results.

NOTES

Early prototypes used chip capacitors but they were found to have no significant advantage over the sub-miniature ceramics specified.

Under-board power wiring was tried but had no effect on performance.

Many different types of choke were tried for ch1 and the size given has proved to be about right for this application.

As with any single-ended mixer little attenuation of the local oscillator signal is realized therefore the fundamental and second harmonics appear at the output at fairly high levels. In practice this does not affect the converters' performance although it is wise to space the IF and oscillator frequencies as far apart as possible.

A series-tuned circuit tuned to the oscillator frequency may be connected to the output socket, this should attenuate the oscillator signal by around 40dB. Obviously a balanced mixer would be best but for simplicity it was decided to use the single-ended system.

With this type of converter there is always the danger of other signals (particularly in the UHF TV spectrum) getting into the converter and appearing at the output as unwanted signals. A great deal of work has been done to ensure that the converter will handle such signals and will not add to them by spurious mixing. Users in very high signal strength areas adjacent to a local TV transmitter could still suffer however. One user, who is line of sight to the large Sutton Coldfield transmitter, experienced this problem which was cured by installing a simple bandpass filter at the converter input.

The IF output level is fairly high and in general up to about 10dB of attenuation may be used before any noticeable degradation of the picture is noticed.

My thanks to the following for their help with this project: G8VBC, G8DIR, G4DYP, G4HJM, and especially to Roland Hall G8KER whose valuable assistance in the lab made this project possible.

[1] Modular Electronics, 95 High Street, Selsey, Nr.Chichester, Sussex.

Keeping Television Alive

The National Film Archive was established in 1935 to acquire, preserve, document and make available for study a national collection of films. It later added television to its brief. It has now published the first guide to its television holdings, KEEPING TELEVISION ALIVE. This guide is illustrated and contains articles explaining how the material is selected, preserved and made available for viewing. Jerry Kuehl, Television Producer, and Sean Day-Lewis, Television and Radio Editor of the Daily Telegraph, contribute articles on the work of the History and Current Affairs and Television Selection Committees. The guide lists all the television material held in the Archive - over 5,000 entries - both BBC and ITV, in title order and by company, including commercials, newsreels and foreign material. The transmission date of each item is given and also whether a viewing copy or a script is available. It costs £3 plus 50p p&p and is available from; Publications Department, British Film Institute, 81 Dean Street, London W1V 6AA.

KEEPING TELEVISION ALIVE is edited by Paul Madden, former Television Officer of the National Film Archive. It was funded by the Independent Television Companies Association who have given an annual grant to the NFA since 1969 which has enabled the NFA to preserve about half of the ITV programmes it has selected for preservation.

2C39A TV MODULATOR

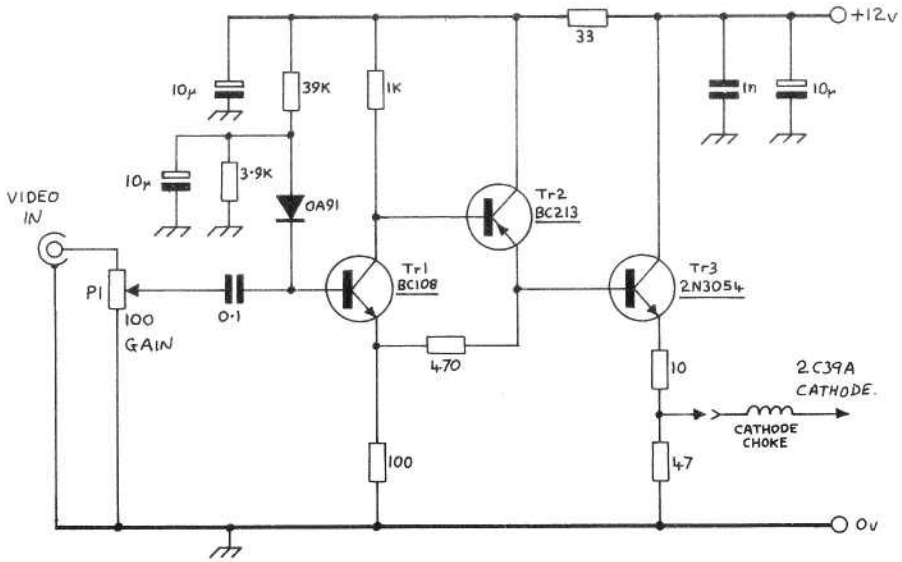
by DC6MR - from "der TV Amateur" Jan. 1976.

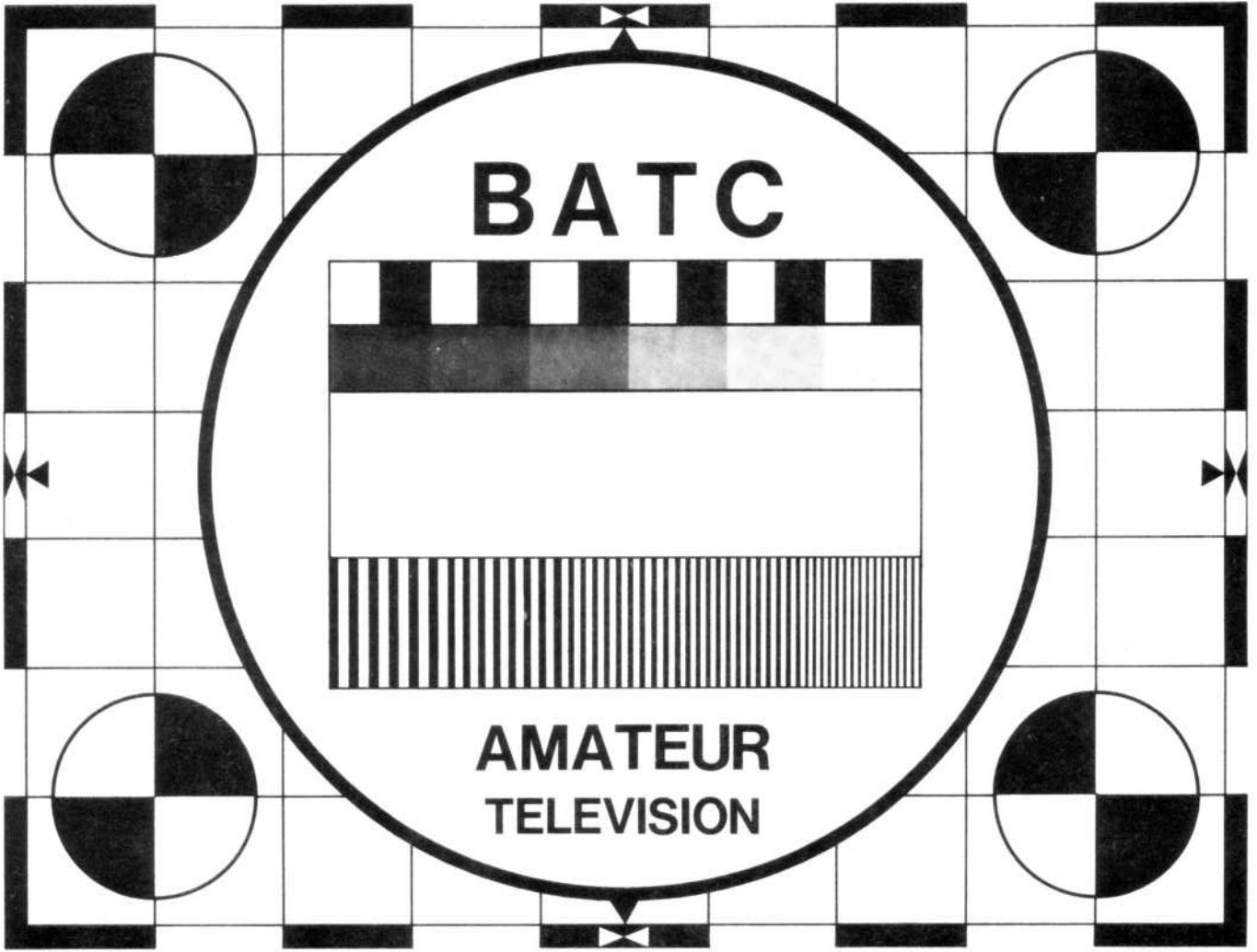
There are several ways of producing an ATV signal on 24cm. One of the easier methods is to directly modulate a 2C39A amplifier.

A suitable TV modulator is shown in the circuit. A standard 1v p-p video signal is fed to the input and is adjusted by P1. D1 acts as a DC restorer.

The unit may be built on a printed circuit or 'Vero' board and should be placed close to the valve cathode in order to keep the connecting lead as short as possible. The modulator is connected to the valves' cathode/heater flange via a suitable RF choke. Tr3 should be mounted on a small heatsink.

It is essential that the modulated stage be an amplifier and not a frequency multiplier




BATC
AMATEUR
TELEVISION

THE B.A.T.C. TEST CARD

This new style BATC test card, which has been developed by Mike Crampton, G8DLX and John Wood, G3YQC, has been especially designed to include the important patterns necessary for checking TV equipment and transmissions.

ASPECT RATIO AND PICTURE CENTERING

The aspect ratio conforms to the standard 4:3 format. The castellated border permits accurate picture centering, the inside edges of the castellations should be just visible within the picture area of the tube.

PICTURE GEOMETRY

The large centre circle together with the four corner circles permit precise settings of timebase amplitude and linearity. The coarse background grating of horizontal and vertical lines permits visual assessment of electronic scanning linearity.

RESOLUTION AND BANDWIDTH

Definition bars provide an aid to focussing and permit a check of video bandwidth. The five sets of bars correspond to approximate frequencies (left to right) of 1.2, 1.6, 2.0, 2.4 and 3.2MHz.

TONAL RANGE

A six step grey-scale is included to assist setting of the camera tonal range and to enable adjustments of brightness and contrast.

LOW-FREQUENCY RESPONSE

Alternate black and white blocks permit the observation of low and middle frequency response, smearing on the right hand edges indicate poor LF response. The vertical transitions between black and white in the corner circles may also be used for this purpose.

VISUAL IMPRESSION

To ensure that the test card is easily recognised under weak signal conditions the following features have been incorporated; corner circles exhibiting large, high contrast areas. A heavy main circle and the provision for large callsign letters within the centre rectangle. As a further aid to a visual assesment of a received picture, the lettering has been presented in four different sizes (including callsign).

33.9mm dry-print lettering is suitable for printing of the callsign.

This illustration may not represent the full quality of the test card.

This card is available from Members Services department - see advertisement in this issue.

24cm ATV EXCITER

by Jurgen Dahms, DCØDA. from "der TV Amateur" December 1979

The reasons for building this unit on a printed circuit board are (a) to ensure repeatability of performance, (b) to facilitate stable operation and (c) to enable easy construction and alignement of an output bandpass filter.

CIRCUIT DESCRIPTION

Fig.1 shows the complete circuit diagram of the exciter. Tr1 is a crystal oscillator operating on a frequency of 104.833MHz. The crystal is an overtone type and should be in either HC/18-U or HC/25-U packages, the PC board however does cater for crystals in the larger HC/6-U style. The collector tuned circuit comprising C1 and L1 should resonate at the crystal frequency. In the original design a Neosid ready-wound coil (blue/brown) was specified but this may prove difficult to obtain in the UK. The oscillator is powered from an on-board regulator (IC1) type 78L08A which produces +8v stabalised.

Tr2 is a class C tripler stage. The 314.5MHz signal is selected by L2. This tuned circuit, in conjunction with L3, form a bandpass filter and the printed inductors are so dimensioned as to ensure that only the required frequency will be selected. Tr3 is a class AB doubler and also has a bandpass filter at its' output. P1 sets the operating point of this stage. Tr4 operates in class C and is tuned to the final output frequency by an etched 3-pole filter. The output from the unit should be of the order of 8mW. Spurious outputs should be at least 40dB down.

CONSTRUCTION

The PC board is made from double sided epoxy or fibreglass board 1/16" thick. The printed circuit pattern is shown full-size in Fig.2.

Figs 3 and 4 show the component layouts for both sides of the board. Components are mounted on both sides to ensure stable operation and minimum interaction between the stages. All soldering points which are not connected to ground are on the upper side whilst all ground connections are on the underside. Where indicated, 1n chip capacitors are fitted into slots at the ends of the lines. The other lines should be grounded using strips of thin copper or brass which pass through slots and are soldered to the line and to the earth plane.

Tr3 and Tr4 lie in 5mm holes cut in the board, the emitter of Tr3 is also grounded with a chip capacitor. Tr4 emitter lug is bent down at 90° and passed through a flat filed into the side of the hole and soldered to the ground side. The base is bent 90° upwards and connected to the chip capacitor (as shown in Fig.3) which is soldered to L5. Choke ch4 is mounted on the top of the board and is soldered to the base side of the capacitor.

The output socket should be a flanged BNC type and is mounted onto the underside. The PTFE and metal protrusion on the underside of the socket should be carefully removed to enable it to sit flat on the board. The output power depends largely on the correct mounting of this socket.

MEMBERS SERVICES

Items are available to club members only and an address label from a recent CQ-TV magazine envelope should accompany the order as proof of membership. This will be returned with the goods for future use.

CHEQUES should be made payable to "THE BATC" and should be drawn on English banks only.

ORDERS please to:- Mr.P.Delaney. 6 East View Close, Wargrave, BERKS, RG10 8BJ England. Tel: 073-522-3121

QTY	TV CAMERA TUBES AND SCAN-COILS	EACH	P&P	GOODS TOTAL
.....	E.E.V. Leddicon	£82:00	nil	.....
.....	1/2" E.M.I. 9777 Ebitron	£30:00	nil	.....
.....	2/3" E.M.I. 9831 Vidicon - amateur grade	£15:50	nil	.....
.....	1" E.M.I. 9677 Vidicon - amateur grade	£15:50	nil	.....
.....	1" E.M.I. 9728 Vidicon - amateur grade	£15:50	nil	.....
.....	1" E.M.I. 9706 Vidicon - amateur grade (5"type)	£15:50	nil	.....
.....	4½" E.M.I. 9565 Image Orthicon	£10.per2	collect	.....
.....	1" Vidicon scan-coils (low Z focus coil)	£6:00	£1:20	.....
.....	1" Vidicon scan-coils (high Z focus coil)	£6:00	£1:20	.....
.....	2/3" Vidicon scan-coils	£6:00	0:80	.....
.....	Vidicon bases (1" or 2/3" delete which not reqd)	0:32	0:16	.....
.....	TV camera lens mounts, 'C' type	£1:00	0:24	.....
	STATIONERY AND ACCESSORIES			
.....	B.A.T.C. test card (latest) - with instructions	0:50	0:24	.....
.....	B.A.T.C. reporting chart (illustrated)	0:12	0:20	.....
.....	B.A.T.C. lapel badge - diamond - button hole	0:40	0:16	.....
.....	B.A.T.C. lapel badge - round - pin fastening	0:40	0:16	.....
.....	B.A.T.C. headed notepaper/envelopes (50 each)	£1:75	£1:20	.....
.....	B.A.T.C. key fob	0:50	0:16	.....
.....	B.A.T.C. equipment stickers, 1" round	0:15	0:16	.....
.....	B.A.T.C. windscreen stickers, 2½" round	0:10	0:16	.....
.....	B.A.T.C. club tie printed with latest badge, dark blue	£1:80	0:30	

TOTAL this page £ :

QTY	PRINTED CIRCUIT BOARDS	EACH	P&P	GOODS TOTAL
	'Amateur Television Handbook'			
.....	Wide-band 70cm tuner	£3:00	0:30	.....
.....	Amateur television tuner	£1:50	0:30	.....
.....	Electronic character generator	£3:00	0:30	.....
.....	Character generator memory	£3:00	0:30	.....
.....	Colour test-card (set of three double sided)	£15:00	0:60	.....
.....	Horizontal aperture corrector	£3:00	0:30	.....
.....	Video switching unit	£3:00	0:30	.....
.....	P.A.L. colour coder	£3:00	0:30	.....
.....	'Project 100' sync. pulse generator	£3:00	0:30	.....
.....	5 MHz SPG crystal	£2:75	0:25	.....
.....	4 fsc colour crystal	£2:75	0:25	.....
	COMPONENTS			
.....	TBP28L22 PROM, pre-programmed for colour test-card circle. (eqt. 74S471)	£10:00	0:25	.....
.....	TMS4036 memory IC for char. gen. memory board	£5:00	0:25	.....
.....	4.433618MHz PAL colour sub-carrier crystal*	0:40	nil	.....
.....	Colour TV delay line*	0:60	nil	.....
	*surplus - untested			

total this page £ :

total from page I £ :

postage £ :

TOTAL ENCLOSED £ :

It is cheaper to send several small items in one package. Please try to estimate the correct amount of postage. All enquiries requiring a reply should enclose an SAE or IRC.
Overseas members should ask for a quotation of postage costs before ordering large items. Thanks to all those who estimate on the high side and donate any ballance to club funds.

block letters please

NAME	CALL
ADDRESS	

receipt	goods sent

(office use only)

PUBLICATIONS

QTY		EACH	P&P	GOODS TOTAL
.....	AMATEUR TELEVISION HANDBOOK. B.A.T.C by J.L.Wood. G3YQC and T.Brown. G8CJS	£1:50	0:40	.....
.....	SLOW-SCAN TELEVISION. B.A.T.C. by B.J.Arnold. G3RHI (second edition)	0:35	0:16	.....
.....	CQ-TV BACK ISSUES. The following issues are still available although stocks of some are low.(circle)			
	68,77,82,87,88,89,90,91,92.....	0:25	*	.....
	93,94,95,96,97,99,100,101,102,103,105,106,107, 108,109,111,113,114,115,116.....	0:50	*	.....
	*please estimate appropriate postage			
.....	RE-PRINTS. Photocopies of any article from past issues of CQ-TV are available. Payment (if ordered seperately) in UK postage stamps please	0:20 per sheet	0:16	.....
.....	INDEX. All main articles in past issues of CQ-TV and both handbooks. Including page-count.	£1:00	nil	.....
		sub total		£ :
		postage		£ :
		TOTAL ENCLOSED		£ :

Publications are available to club members and an address label from a recent CQ-TV envelope should accompany this order. This will be returned with goods for future use.

ORDERS please to:- BATC publications, 14 Lilac Avenue, Leicester LE5 1FN.

AUSTRALIA

Would Australian members please note that the 'Amateur Television Handbook' is available directly from the Wireless Institute of Australia at PO box 150, Toorak, Victoria 3142.

block letters please

NAME	CALL
ADDRESS	

B.A.T.C. LIBRARY

A MESSAGE FROM THE CLUB LIBRARIAN, Paul Marshall, G8MJW

I have recently taken over the task of Club Librarian from Grant Dixon who has looked after it for many years.

The library, though not huge, may well contain that article or paper that you have been searching for.

A full list of its contents would take up too much valuable CQ-TV space, so I have prepared a duplicated list which is available to any member upon receipt of a stamped addressed envelope, or, alternatively, you may send or telephone your specific requests for information. If the information is not in the Library at present, it is quite likely that I can obtain it.

As it stands now the Library contains a large number of manuals for Marconi, Pye, E.M.I., etc. broadcast equipment - back-issues of CQ-TV - A5 - Der TV Amateur, etc., and a vast amount of Mullard application notes. There are also some historically interesting letters and photographs etc. from the very early days of BATC.

In the future I hope to extend the magazine side to include such publications as International Broadcast Engineer, SMPTE Journal, Television etc.

I would welcome any suggestions regarding what you would like to see in the Library.

My address is: Paul Marshall.
B.A.T.C. Library,
62 Rutland Road,
CHELMSFORD,
ESSEX.

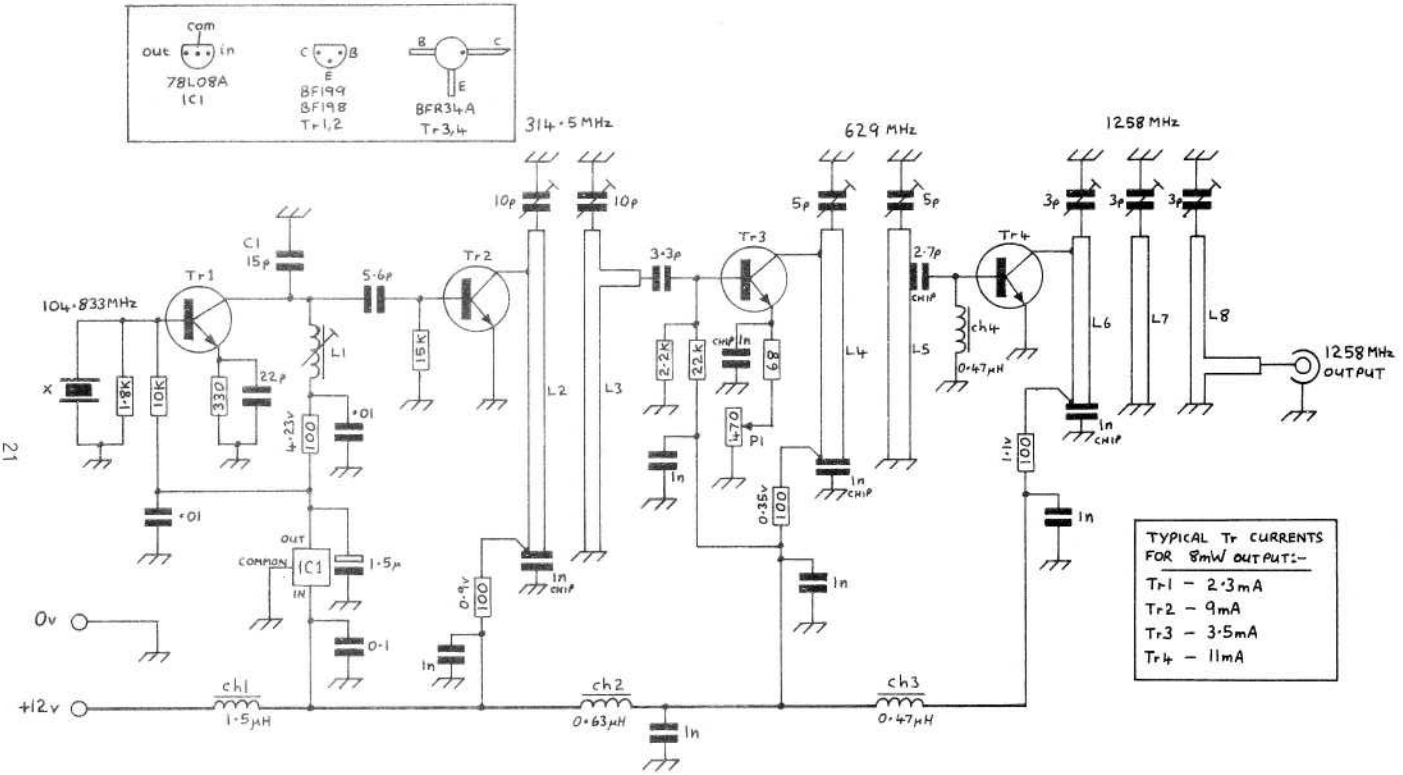
Tel: 0245 57681

PS. Do you have any manuals, circuits etc. which are of no further use to you but may well be to someone else? If so, I would be interested to hear from you.

EQUIPMENT REGISTRY

The BATC Equipment Registry exists to help members of the Club who have equipment for disposal, or who wish to purchase some specific item. Send a list of your 'wants' or 'disposals' to the address below and during the six months for which your application will be held on file the Registry will attempt to put you in contact with someone who may be able to help.

Mr. A.Watson.
BATC Equipment Registry,
"Somerby View",
Bigby, Barnetby,
LINCS.



TYPICAL Tr CURRENTS FOR 8mW OUTPUT:-

- Tr1 – 2·3mA
- Tr2 – 9mA
- Tr3 – 3·5mA
- Tr4 – 11mA

Fig.1

24cm TELEVISION EXCITER

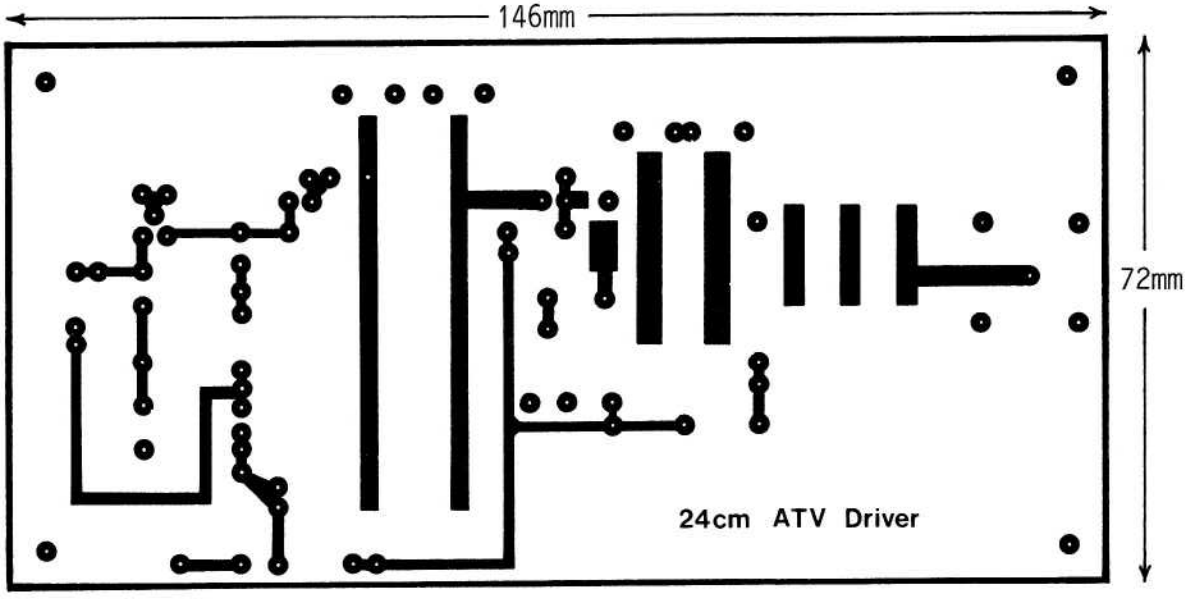


Fig.2 PRINT PATTERN

The unit should be installed in a suitable metal box or one made from PC board material. The earth plane of the board should be soldered all round the edges to the inside of the enclosure.

COMPONENTS

Capacitors should be ceramic sub-miniature where applicable. Trimmers should be good quality plastic foil types with the exception of the output filter which should be tubular trimmers, preferably for horizontal mounting although the vertical types should lay in position fairly easily.

The original design calls for chip capacitors. As an alternative it MAY be possible to use sub-min ceramics with the shortest possible leads.

IC1 mounts vertically and requires no heat sink.

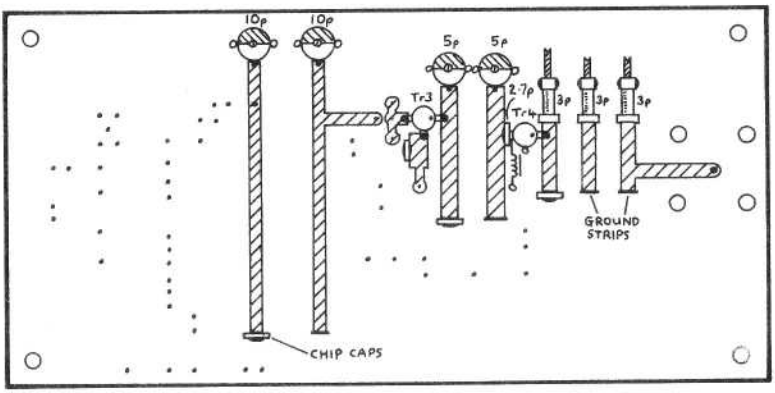


Fig.3 PRINT SIDE

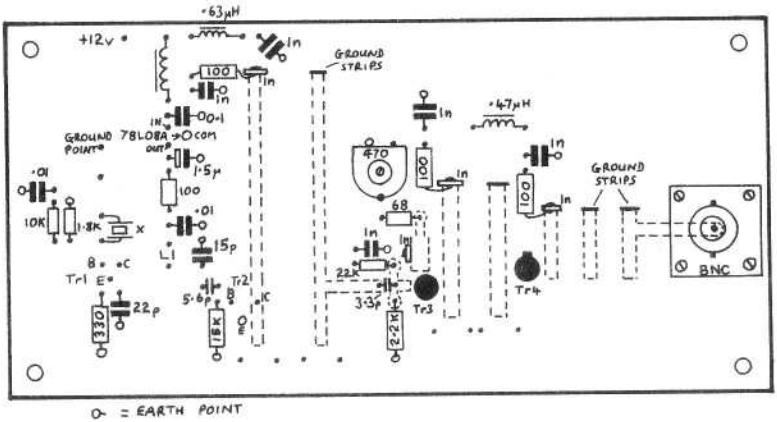


Fig.4 GROUND PLANE SIDE

Suitable ready-wound chokes are available from component suppliers.

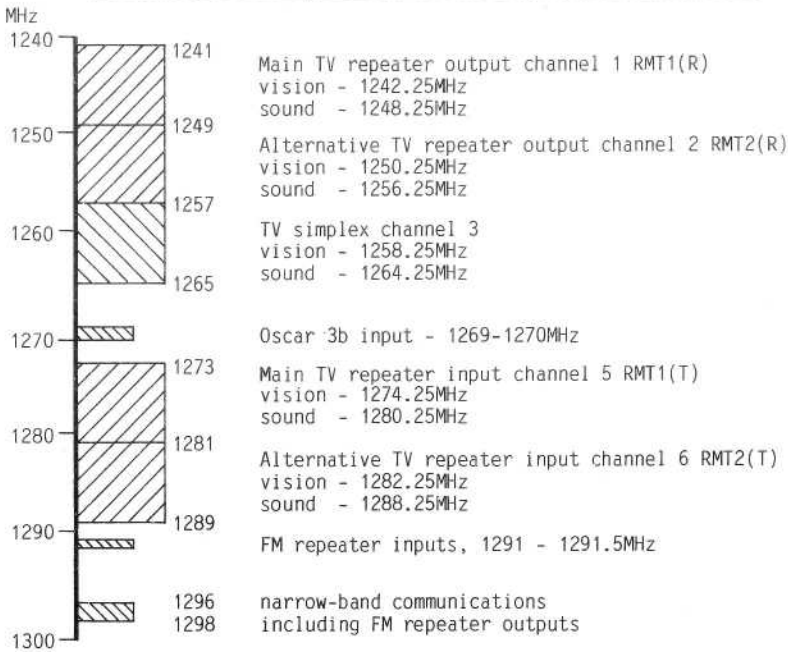
ALIGNMENT

Temporarily up-end ch2 and apply power, check that the oscillator operates correctly. Switch the oscillator on and off a few times to check for reliable starting. Connect a 50 Ohm load to the output and re-connect ch2. Tr2,3 and 4 should be adjusted for maximum current drop in the 100 Ohm collector resistors. Fig.1 gives specimen voltages measured on a prototype.

Set P1 for maximum output. Owing to different transistor characteristics, if too low an emitter resistor is used in Tr3 then Tr4 will be over-driven, the output will start to fall and the spectral purity will be impaired.

Grateful thanks to Andy Emmerson, G8PTH for the original translation from the German.

1·3 GHz BAND PLAN



This bandplan is an updated version of that published in CQ-TV115 and corrects some minor errors in that chart.
The bandplan is from the RSGB draft bandplan which is as yet only a proposal, however it seems likely that this will be accepted by those concerned in the near future.

CIRCUIT NOTEBOOK

John Lawrence, GW3JGA No.32

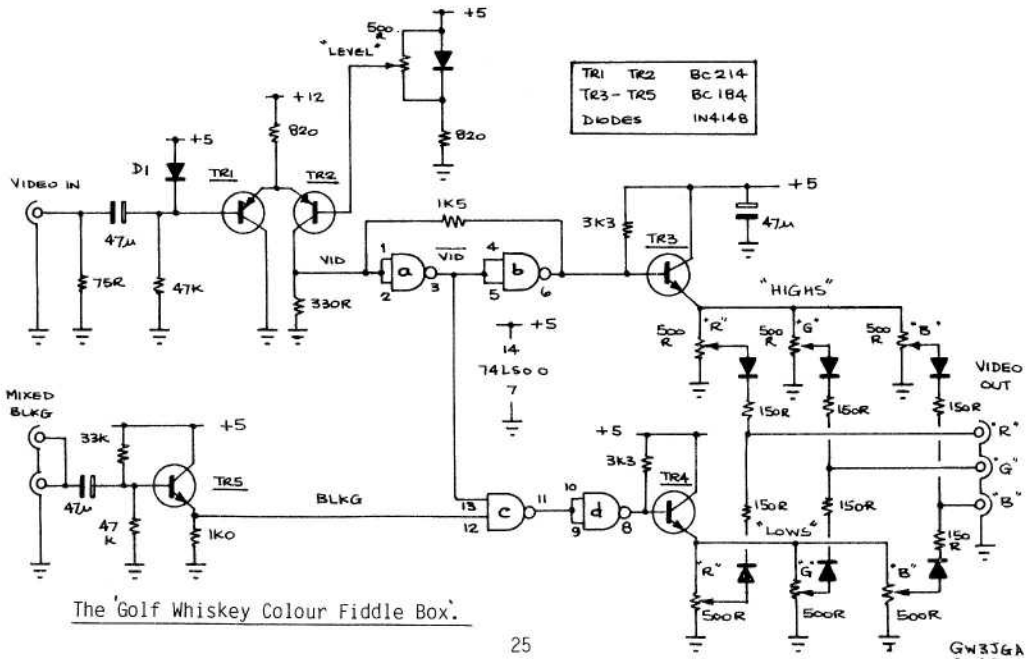
In this edition of Circuit Notebook we return to a home-brew circuit, the 'Golf Whiskey Colour Fiddle Box', as seen in operation at the recent BATC Leicester exhibition.

The purpose of this circuit is to synthesise a two-colour picture from a monochrome camera input. Ideal for simple colour captions, digital clock etc., this is how it works:

The monochrome video input is fed to the long-tailed pair Tr1, Tr2. The video is DC restored to the +5 volt supply by D1 and amplified video appears at the collector of Tr2. The base of Tr2 is taken to the "level" control which enables the output of Tr2 to be "windowed" through the video signal.

Gates a and b of the 74LS00 form a Schmitt trigger with a non-inverted output going to Tr3 and an inverted output via gates c and d to Tr4. For video signals above the level control setting, Tr3 will be turned on and Tr4 off. The R.G.B. outputs will be determined by the settings of the upper R.G.B. potentiometers. For video signals below the levelcontrol setting Tr3 will be turned off and Tr4 on. The R.G.B. outputs will then be determined by the settings of the lower R.G.B. potentiometers. Because Tr4 would normally be on during blanking and would result in R.G.B. outputs, it is necessary to blank the inverted video signal to Tr4. This is done by gate c. Mixed blanking for this purpose is fed from the buffer stage Tr5.

All outputs are 0.7 volts p-p when terminated in 75 Ohms and are suitable for feeding into the BATC (GW8PBX) PAL colour coder.



The 'Golf Whiskey Colour Fiddle Box'.

GW3JGA
GW8PBX

TV ON THE AIR

compiled by Andy Emmerson G8PTH

One of the pleasantest parts of writing this column is the way the letters continue to roll in: as I have said before, this is a great blessing as it saves me from having to invent the whole thing. Getting letters is always nice and when they are friendly and all about ATV this is a great boost to the morale. So let's see what you have to say.

Top of the pile is a missive from John Anthony, G8ZPP, in Bromham near Bedford, who joined the BATC quite recently. He bought a Fortop TVT 432 and managed to work Graham "Contest King" Shirville G3VZV with it. Video sources are a Commodore VIC colour computer and a Sharp monochrome camera. The aerial in use is a Jaybeam 12 element yagi and the ubiquitous MM converter feeds received signals to a choice of mono or colour TVs. John has ordered a MML 432/50 transistor linear and says Microwave Modules perform a mod for ATV on this device for an additional £5 + VAT. John is keen to have other video contacts and asks people 'south of Watford' in particular to keep an ear open.

Roger Bunney's DX-TV column in 'Television' magazine now carries regular mentions of ATV activity and Roger now has a call himself, though I don't think he has found time to transmit ATV yet. ATVers who have achieved 'superstar' status in that column include G8RYC (Ely) and G8SUY (Teynham, near Faversham). In 'Practical Wireless' too, ATV gets regular coverage in Ron Ham's column and Ron has done a lot to popularise TV through the Wireless Museum at the Chalk Pits in Sussex. The museum is at Amberley and regularly holds special open days. One of these was on September 27th when the Worthing ATV group gave a most impressive demonstration. Apart from the group's display tent where they had several receivers working, their mobile crew with camera, recorder and transmitter were wandering around the 36 acre museum site interviewing and filming fellow exhibitors and visitors to the special event. At one time they were seen with all their gear filming and joyriding on top of the museum's 1920s Leyland bus. Ron Ham kindly sent this report and says thanks a million to the lads who put themselves out so willingly to give pleasure to others - they were G3UEQ, G4JEI, G6AIW and G8s KOE, VEH, WXS, XEU, XRX and ZWM. Sounds like a lot of fun and I must try and get down to their next event.

G4BPO, the Martlesham Research Laboratories ATV crew have had a few mentions in the past. Well, here's another. I am told I always get their callsigns wrong so I'll play safe and leave them out this time but I must say that they have got it together with the transmitter now and are putting out a powerful signal. Yours truly managed to swap P1½ signals with them, which is not bad for a 53 mile path. Martlesham is in Suffolk near Ipswich and the lads will be pleased to have further contacts - listen out for them on 144.75 especially on Sundays and in contests.

During August there were several DX lifts. In the October 'Short Wave Magazine' it is mentioned that Phil Johnson, GJ8KNV, made several fast-scan tv QSOs with OK stations; if Phil is a member perhaps he would like to tell us more! In this column I try to keep the personal opinions of yours truly to a minimum and so it is because of the total lack of correspondence and not my own personal disinterest which accounts for the absence of slow-scan material in this feature. I do occasionally hear from the lads in Essex that they are forming a SSTV net on two metres and SSTVers may care to note that the number of broadcasters putting out SSTV has grown - from one to two! During

1981 both Israel Radio and Radio Sweden carried out experimental SSTV transmissions and more are apparently expected. Cop Macdonald, VE1BFL, who had a lot to do with pioneering the SSTV mode, prepared the Radio Sweden test and a shot which he took and sent to Popular Electronics is reproduced alongside.

Continuing the 'World News' theme, here is a follow-up to the bandpass filter article in the last issue. At least one constructor is in process of building this and Jean, F2XO, in Boulogne adds that the sizes of copper pipe mentioned in the article are widely available in plumbers' merchants in France. I haven't heard yet what the UK situation is.

In the republic of Ireland interest in ATV seems to be stirring - I have had enquiries about ATV from Thomas Trimble, EI8AHB, in County Longford and from Angus Cullinan, EI4ABB, of County Galway. Perhaps someone can let us know if the Irish Minister of Posts and Telegraphs has been approached on the subject ofpermission for ATV transmissions. By all accounts there is plenty of 'unusual' TV flying about in some parts of Eire - apart from the pirate 'Channel 3' in Dublin I hear there are unofficial relays of BBC and ITV in Band III and even a pirate microwave link to feed one of these relay stations. I've always been in favour of free enterprise myself ...

From southern California comes a letter from Tom, W6ORG, who with his wife Maryann, WB6YSS, produces the PC Electronics modules. He has decided to join the BATC (good lad) after seeing tapes of BATC presentations - seems like the special effects caught his eye. Rapidly changing the subject, G3VZV says activity on 24 cm is expanding in his area: there are now four stations in Bedfordshire able to transmit and receive 24 cm TV. The main problem is generating sensible power levels with solid state devices and Graham says if anyone knows a source of a 10 watt 5dB gain device please let him know! This does sound rather a tall order at amateur prices, though I am sure such things do exist. He adds that obviously MM with their new 10 watt PA (£109) don't! The hardware for GB3TV is progressing well, he says. I think this goes to show there are still some applications where you can't beat valves. Twenty four cm is a case in point: high voltage power supplies are scarcely difficult to build and the components can often be picked up for a song at rallies - you know, those comfortingly monstrous 1000-0-1000v transformers which people almost pay you to take away. I had a letter recently from DF5QZ who is a valve fan: he manages to get 220 watts peak sync power from a TH308 on 24 cm and I bet you solid state folk cannot match that. I have got to admit my calculator was unable to work out how you could get 220 watts out when you only had 150W dc in but several people manage to achieve this nowadays so I had better not ask any more wally questions. But do keep a lookout for exotic valves: they can pay off. I have just acquired a YD1270 for my new 70 cm linear: this is plug compatible with the familiar 2C39 and has a gain of 19 dB and 200W anode dissipation. A similar type is Eimac's Y579A. New prices are in the £200+ region so only surplus examples come into consideration.

Our final letter comes from Bill, G2HCG, who has been putting out TV and a strong signal on two metres lately. He says he has been ploughing a lonely furrow in the Bournemouth area with 150W fast-scan TV plus slow-scan on all bands. Bill's QTH is at Barton on Sea, near New Milton, with a perfect (but exposed) takeoff over the cliffs to the south. TV contacts have been made with Jersey and Guernsey and G8MCQ has been receiving the signals 10 miles to the west in Bournemouth. Bill's phone number is New Milton 617090 and he would be pleased to arrange skeds with any other ATVers in the district. Activity night is usually Tuesdays. When I received Bill's letter the call sign seemed vaguely familiar and a look in an old VHF manual confirmed that it was he who devised the skeleton slot aerial feed. Bill's TV tx employs a MM 28 to 432 transverter and a home built 28 MHz VFO: these drive a 4CX250B final which is grid modulated

using an 'old hat but effective' circuit which Bill found in the July 1973 issue of '73 Magazine'. He adds that grid modulating the 250B has the advantage that one only has to produce a few watts of straight 70cm RF for drive and there are no rpoblems of linearity of power amps. However, to get the grid mod to behave properly all power supplies to the 4CX250B must be fully variable. Bill's example runs typically at Vg_1 200, Ig_1 2mA, Vg_2 220, Ig_2 1mA negative,Va 1500 and Ia 100 mA. The double beam scope showing line video into the modulator and rectified RF out is a revealing and absolute must. (How true, how true!) I suppose folk who are really keen can follow the G4FRX articles on PSUs for 4CX250Bs in the 'Short Wave Magazine', though I fear I understand very little of it. But that's why I stick to 2C39s and similar devices. Enough of that ...

More superstars in our midst! Rod G8VBC and G3XKX appeared early December in the Midlands ITV programme 'ATV Today'. They filmed in G3XKX's shack and Rod appeared in vision via a 70cm link (noise free). Thanks to Trevor Brown for this info: Trevor adds that Thames TV wanted to do a similar report on ATV in the London area for 'Reporting London' and I hope this will lead to something, certainly we have put them in touch with the G4HMG/G8LES crowd!

From Farndon, Cheshire comes a letter signed by Paul G3TZO, who seeks to inspire further TV activity in the Chester area. The Chester group operated in the recent International ATV Contest using the call GW8GIZ/P, and were amazed at the level of local activity hitherto unknown. The location was Rhosemor (1000 ft ASL). Despite flat conditions and the rival attractions of the Telford rally they managed to work over 20 stations. Those QRV both tx and rx include Roy GW8FVY, Dave GW4FGC, Alan G4EZO, Colin G3RLA, John GW8FNX and Paul himself G3TZO. Paul says he has just about cracked the problems of spurii from his G4DYP exciter, which drives the ubiquitous MHW-710 module. Activity is mostly Monday and Thursday evenings, on 145.275. The local Chester club recently had a visit from the two Steves of Fortop and got quite enthusiastic about the prospect of the 24 cm repeater at Stoke.

Talking of commercial matters, I understand from SOTA Ltd. that all parts for making the EDL 432P 60 watt linear (which used a 2C39 tube) have been disposed of and they can no longer supply this much loved PA. This is a great shame as the EDL worked very well: unlike some other comparably priced PAs it was actually linear. A constructional article may appear in the next issue (if yours truly gets the time to finish the Chinese copy he is building!)

And finally, yes this time it really is finally, news of TV Not on the Air Actually from Norrie Macdonald GM4BVU up in Hamilton, Lanarks. Norrie is a regular correspondent now and the latest progress report includes SPG, CPG and colour boards all constructed to 'CQ-TV' or 'ATV Handbook' designs. An Ikegami VR-522 camera and a Hitachi VHS video recorder complete the video gear available. RF activity is delayed due to the imminent risk of the 88 element Multibeam up-ending the house to which it was attached! Norrie hopes to solve this problem with a 30' tower and heat up the Scottish airwaves with plenty of ATV.

That's it, no more space. Please keep your reports flowing in, especially from far-away places, to me at 4 Mount Pleasant, Blean Common, Canterbury, Kent, CT2 9EU.

24cm TV LINEAR AMPLIFIER

by Jurgen Dahms, DCØDA. from "der TV Amateur" March 1980

This unit may be used as a linear amplifier giving about 1W output for 10mW in or, by using the video modulator,Tr4, may be used to deliver about 250mW RMS of ATV for a drive of around 4mW.

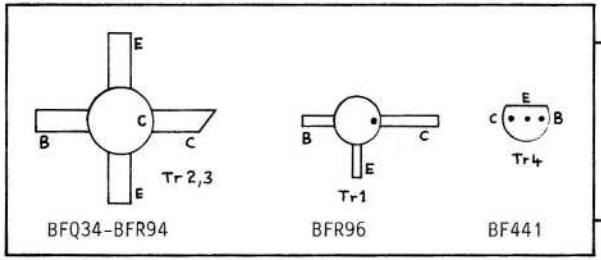
The amplifier uses three transistors which are matched on their inputs and outputs with L/C transformer networks. A total gain of around 20dB can be realized which may drive a 2C39A linear amplifier whose cathode can be video modulated, for this higher power a large heatsink should be provided for Tr2 and 3. When used as a straight amplifier the base and collector wiring of Tr3 should be the same as that in Tr2. When using the described video modulator the drive to the unit should be reduced to around 4-5mW in order that the amplifier should remain linear. It is not recommended that component values be altered since they have been optimized for this design.

All trimmers are plastic foil types. The PC board is made from double sided epoxy copper laminate 1/16" thick. The print pattern is shown full size (printing process permitting) in Fig.2. Fig's 3 and 4 show the component layout for both print and ground plane sides of the board. The video modulator, if required is built using point-to-point wiring. Small PC board pads may be glued to the board to facilitate construction (Fig.4), the original article used ceramic chip capacitors for this purpose but if these are not available, 1n sub-min ceramic capacitors with VERY short leads should be wired from those pads shown in Fig.4.

The input/output coaxial sockets should be square flanged BNC types. These are mounted directly onto the ground plane side of the PC board. The PTFE protrusion and meatal surround should be trimmed off flush with the flange to enable the socket to fit flat onto the PC board. After installing the socket, solder the connection pin to the PC board printed track.

Tr1 sits in a 5mm hole. Small grooves should be filed into the sides of the hole to enable the emitter leads to be bent down and soldered to the earth plane. The base and collector lugs should lie flat on the copper tracks but should be cut off to a suitable length. Tr2 and 3 require 7mm holes and are mounted from the ground plane side. Grooves should be filed in the holes to take the base and collector lugs which are bent up from the transistor and folded down onto the stripline where they are soldered. The emitter lugs should be soldered flat against the ground plane (Fig.4) the heatsinks will stand vertical.

Earth connections for the trimmers are made by passing their legs through the board in the holes indicated. Diode D1 is wired against the body of Tr1 and in contact with it. A little heatsink compound should be used for thermal transfer. Diode D2 is mounted onto the heatsink for Tr2 in a similar manner.



Ch1,3,5	0.47uH
Ch2	2½t .3mm enamelled copper, 3mm dia.
Ch4,6	2t 1mm silver plated copper, 3mm dia.
Ch7	1uH
Ch8	5t on ferrite bead.

Ch1,3,5,7 may be purchased from component suppliers.

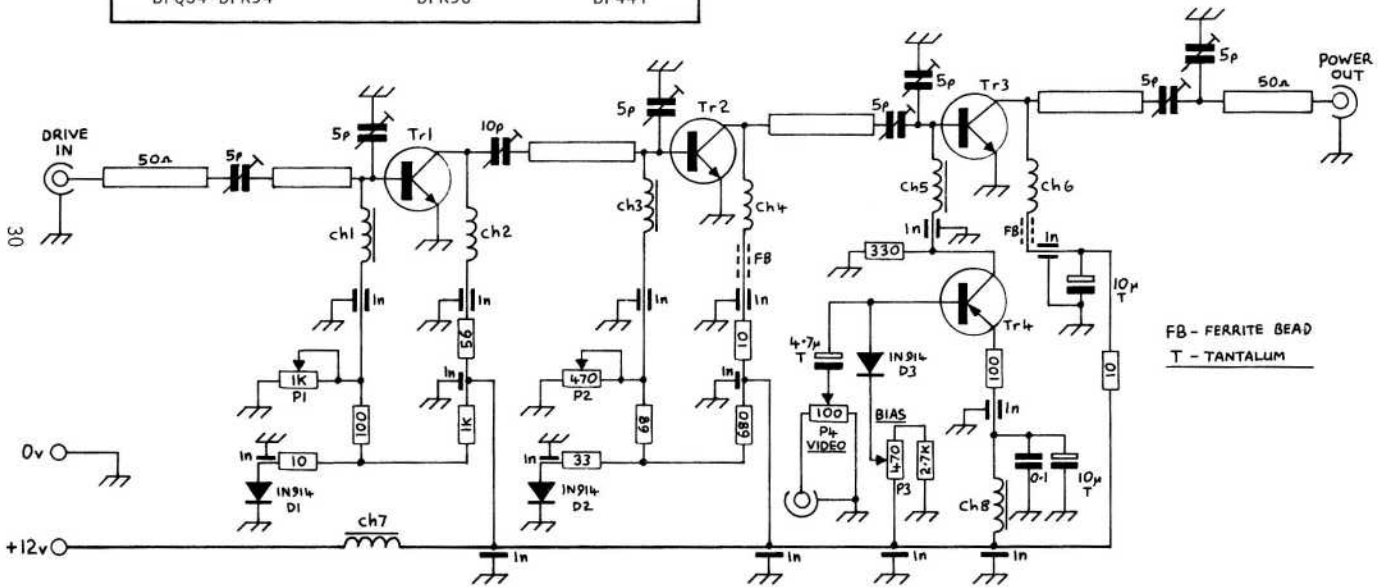


Fig.1 24cm ATV LINEAR AMPLIFIER/MODULATOR.

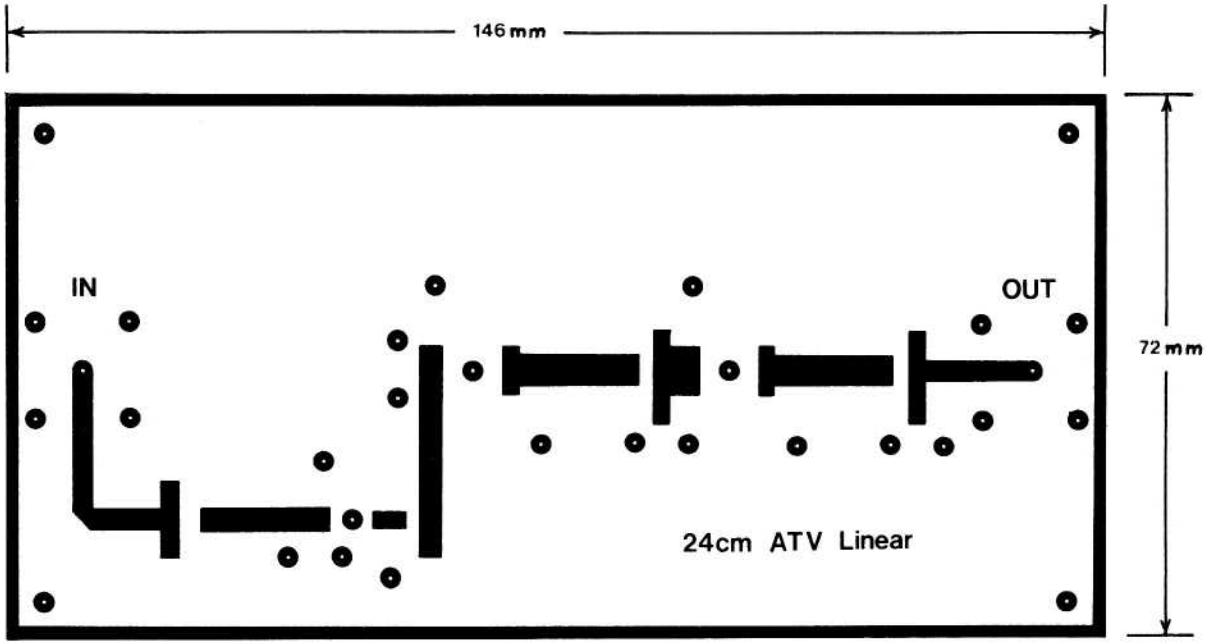


Fig.2 PRINTED CIRCUIT LAYOUT

ALIGNMENT

With no drive applied, set the quiescent current of Tr1 to about 20mA and Tr2 and 3 to between 60 and 100mA using P1,2 and 3. Connect a 50 Ohm resistive load to the output and apply drive. Tune the trimmers for maximum output. If this unit is to be video modulated apply 1 volt p-p of composite video at the modulator input and, whilst viewing the output on a RF probe connected to a monitor advance P4 to about half-way and adjust P3 for a linear picture. The final setting of these two controls may be found by experimentation.

Grateful thanks to Andy Emmerson, G8PTH for the translation from the German.

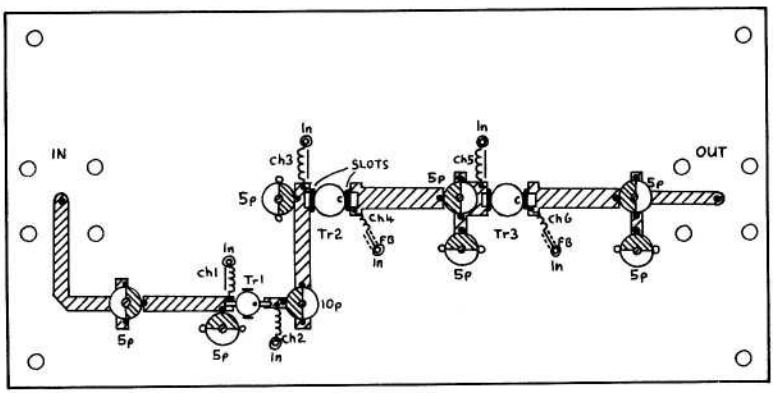


Fig.3 LAYOUT DIAGRAM (print side)

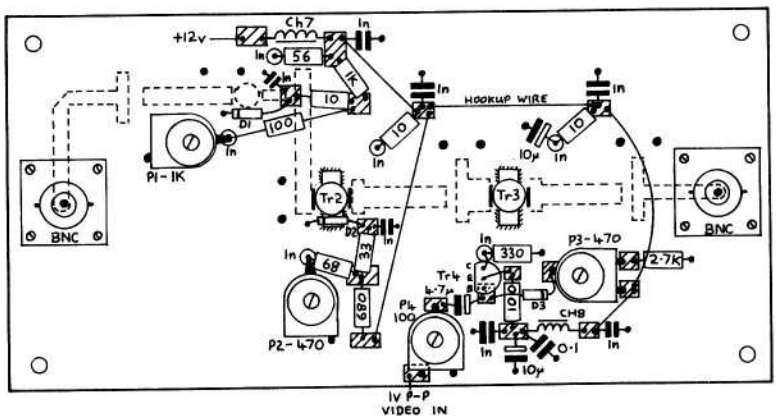


Fig.4 LAYOUT DIAGRAM (ground plane side)

MORE NOTES ON THE PC ELECTRONICS TXA5/PA5 TRANSMITTER COMBINATION

At the time of writing well over thirty of these handy units are in use in the UK. To this date there have been no reports of failure, even when one was left transmitting into an open circuit for five minutes! Fortunately the devices are almost indestructible but experience shows that to get the best results the following points should be observed.

RF INSTABILITY.
There must be adequate RF screening between the driver board and the PA module. Observe the RF decoupling and grounding instructions on the manufacturer's data sheets. Keep all leads as short as possible, ideally no longer than four inches, and avoid wires passing directly under the PCB.

OUTPUT POWER.
A significant increase will be achieved by raising the supply voltage to 14 or 14.5 volts compared with 12 volt operation. The PA module must be in free air. Mounting it inside a cabinet will cause it to cook and reduce output power.

HOW TO DRIVE IT.
To obtain a linear output you must be able to observe the detected RF output on a scope. Only then can you make the appropriate adjustments to achieve maximum linearity, modulation depth and power. Employ the minimum bias necessary to achieve full output power (deflection on the scope), using the video gain control to adjust modulation depth. Several designs have been published for RF probes, mostly employing detector wires placed between the screen and the foam dielectric of a coaxial cable (see new BATC ATV Handbook, RSGB VHF/UHF Handbook). An even better solution is the Admiralty UHF reflectometer units available at rallies for between £5 and £10. These can be inserted in the transmission line and being to top Government spec. they have negligible insertion loss. They can also be used to drive power and SWR meters. The diode probes will be marked either H (high) or L (low sensitivity). Take H if a choice is available.

CONNECTING THE UNITS.
When connecting the driver board to the PA use as little wire as possible. If in doubt measure the length of the connecting cable and make sure the length is nowhere near 1/4 wavelength of any frequency between 400 and 500 MHz. You may find some very strange effects otherwise - e.g. total loss of power.

BANDWIDTH.
The modulator has a quoted bandwidth of 8 MHz but in fact has a useful bandwidth approaching 100 MHz! Thus any broadband spurious input signals (e.g. high order harmonics of colour subcarrier frequency) will be faithfully reproduced and will blot out local broadcast TV reception. (Actual case history!)

AUDIO SUBCARRIER.
The method described in the manufacturer's leaflet is unsuitable for use in Europe since one of the sidebands would fall outside the 70 cm band. Also practical experience shows that it is difficult to prevent the sound trap degrading the HF video and colour subcarrier response. The effect of intercarrier sound is best achieved with a separate sound transmitter and aerial on the appropriate frequency.

ALTERNATIVE CARRIER FREQUENCIES.
Relay selection of one of two crystals (manufacturer's method) is of course satisfactory. A more economical method was described in CQ-TV no. 113.

G8PTH.

THE LID OFF 24cm TV

by S Berry, G4LRT

The following is a collection of notes, references, ideas and experiences connected with many aspects of 24cm amateur television. It is also intended as a reference bibliography to guide TVers towards sources of further information.

AERIALS

For ATV purposes one would generally consider the beam aerial because of the gain such an aerial provides. When ATV repeaters become operational there will undoubtedly be a need for omni-directional earials of which there are a number of designs [12],[13].

For the purposes of this article the frequency referred to as 24cm will be around 1260MHz. Which is approximately in the centre of the ATV channel allocation according to the proposed bandplan.

THE BEAM

The commercially made 15/15 slot-fed Yagi by J-Beam, although very popular and a good aerial, has a gain at 24cm of around 10dBd which may not be considered sufficient for ATV purposes.

The Quad Loop Yagi, although at one time manufactured commercially is, unfortunately no longer available, however, it is a very good design and well worth serious consideration for home construction. Designs and information may be found in [1], [2], [3]. The articles give dimensions for 1296MHz, to scale them for ATV frequencies simply multiply the element lengths by the factor $\frac{1296}{1260}$ This is the most important change but element spacings should also be scaled by multiplying the given dimensions by the same factor. Element widths, thickness and boom diameter can be as specified. Since the elements of this aerial are a little fragile, it may be mounted upside down to discourage birds using it as a perch. The bandwidth of the Quad Loop Yagi should be wide enough to encompass the majority of the ATV allocation without significant falloff of gain.

The Tonna 23 element Yagi has a gain of 15.5dBd and a quoted bandwidth of 1285 - 1305MHz. The physical length is 1.64M and the elements are a little fragile. Power splitters and stacking frames are available to enable a four aerial array to be constructed. The gain at 24cm is unknown. (supplier:- Randam Electronics).

There are designs for long Yagis in [18] and [4]. A four element design is shown in [20].

THE HELIX (or Helical) AERIAL

The helix is a very interesting design and could be the answer to fairly simple home-brewing for ATV. The aerial has a very wide bandwidth, is capable of fairly high gain and produces circular polarization. [5], [6].
There will be a loss of around 3dB when working a station using either vertical or horizontal polarization but, if a station is worked using circular polarization but of the oposite rotation a loss of well over 20dB would be experienced. It is essential therefore that, from the outset, a standard is adopted.

Editors note.
The BATC suggest that right hand circular polarization be adopted for ATV, ie, the spiral is wound in a clockwise direction or, if a normal right hand threaded screw or bolt is studied, the helix should be wound in the same sense or direction.

To increase or decrease the gain of a helix it is necessary only to add or remove turns of the aerial spiral. Provided there are a minimum of about six turns this will not alter the feed impedance to any significant degree. There is a catch though! The feed impedance is about 140 Ohms therefore, to match to a 50 Ohm cable a three-to-one transformation is required. Fig.1 shows a method of making a $\lambda/4$ transformer together with an equation for calculating the required dimensions.

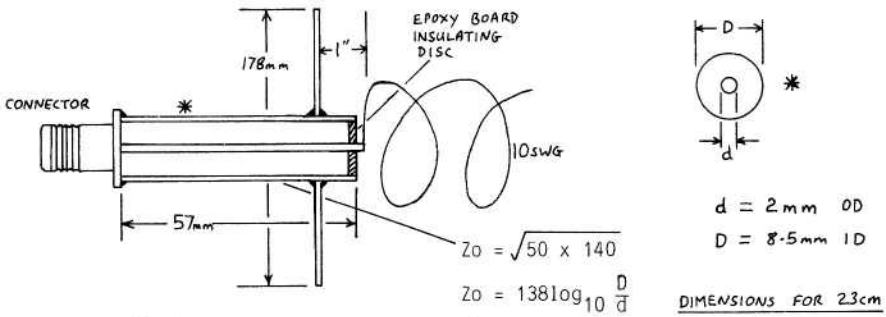
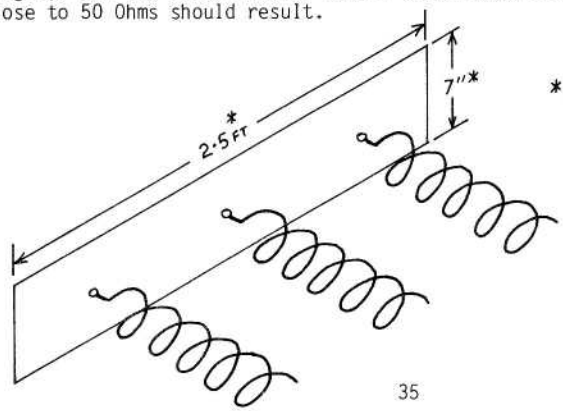


Fig.1

If three helical aerials were mounted onto a common mesh or plate reflector (Fig.2), and the three coaxial feeder cables connected together, an impedance close to 50 Ohms should result.



*suggested dimensions only

Fig.2

The three cables MUST be the same length (to at least 1/8"). A combiner such as that suggested in Fig.3 may be made and housed in a diecast box. The PC board must have all three tracks the same length.

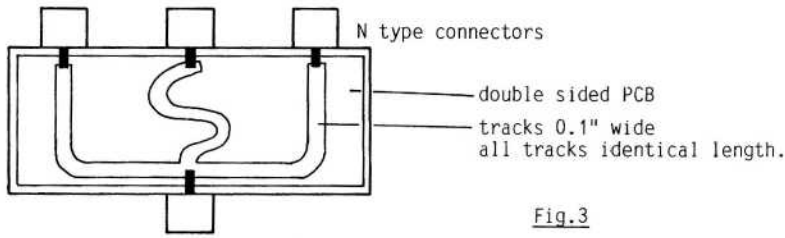


Fig.3

Fig.4 shows the basic construction of a helical aerial [29].

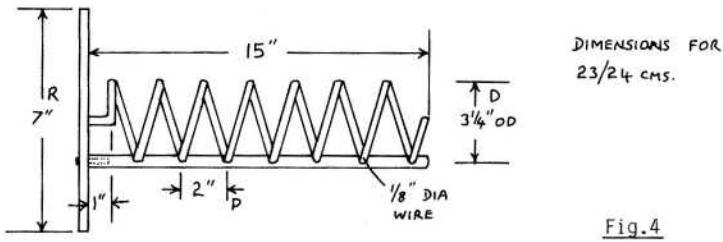


Fig.4

The properties of the helical aerial are determined by the diameter of the spiral D and the pitch P and depends upon the resultant effects of the radiation taking place all along the helical conductor. The gain of the aerial depends on the number of turns in the helix. The diameter of the reflector R should be at least one half-wavelength. The diameter of the helix D should be about $\frac{\lambda}{3}$ and the pitch P about $\frac{\lambda}{4}$.

A typical helix aerial having a 7-turn helix has a gain of approximately 12dB over a 2:1 frequency range.

The reflector plate should be made from aluminium, brass or copper sheet. For the helix support a single plastic rod may be used. Holes should be drilled at the distance of the pitch P. These should be slightly angled to roughly conform to the angle of the turns. The helix is then threaded through these holes and the rod fixed to the backplane.

THE DISH

The dish aerial [7] can be constructed to exhibit higher gains than those associated with the Yagi aerial. The gain from a dish is dependant on the dish area. To add 3dB gain the area of the reflector must be doubled, eg. from 4ft to 5.6ft in diameter. A 4 ft dish at 24cm will have a gain (assuming correct illumination) of about 20dBi. There are two main types of dish feed usually adopted for 24cm, they are; the dipole and disc and the circular waveguide or "beercan" feed [8].

CORNER REFLECTOR

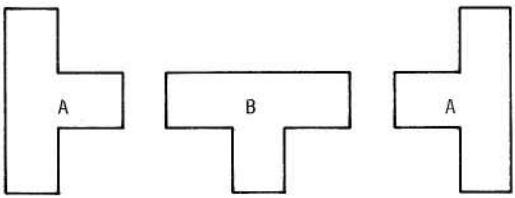
This is a very simple aerial which consists of a reflector plate formed in a 'V' shape with a dipole across the centre. The aerial is easy to build and match and has a reasonably wide bandwidth. Gains of around 13dBd may be obtained using ordinary techniques [9]. Word has it that J-Beam are to bring out such an aerial about now but no further details are available at the time of writing.

COLINEAR

VHF Communications have articles on both 6 [21] and 40 [17] element colinear aerials.

Most of the above aerials may be stacked and/or bayed. Phasing harnesses are available for commercial makes. For home-brew aerials several types of harness have been published [10] and [11].

The relatively short cable lengths involved at these frequencies make it possible for a four-way phasing harness to be made using N type connectors and tee pieces. Fig.5 shows the construction.



A = UG107 A/V 'T'
B = UG107 B/V 'T'
Return loss >17dB @ 1240MHz
Return loss >20dB @ 1300MHz

Fig.5

There is one type of aerial recently released onto the amateur market which has a flat response over the complete 24cm ATV range. The aerial is the 23 or 46 element "Hamburger" made in Germany and sold in this country by muTek limited, Bradworthy, Holsworthy, Devon. EX22 7TU. (SAE for details).

FEEDERS

Only the best coaxial feeders should be used. Table 1 lists some of the more popular types in current use.

cable type	nominal impedance Ohms	overall diameter mm	loss per 10 metres @ 1260MHz	velocity factor
Andrew Heliax LDF4-50	50	16	1.1dB	0.875
Uniradio UR67	50	10.3	2.6dB	0.66
Uniradio UR70	75	5.8	6.0dB	
Uniradio UR74	50	23	0.45dB	0.66
Uniradio UR76	50	5	6.0dB	0.66
Uniradio UR79	50	21	0.9dB	0.96

COAXIAL CONNECTORS

For large diameter coax use N type. For small use BNC and for Heliax use the special n type connectors specially made for that cable.

Do not try to use the usual poor quality connectors often associated with amateur radio equipment.

PRE-AMPLIFIERS

Mast-head pre-amplifiers are strongly recommended at 24cm. To overcome transmit/receive switching problems at mast head, try using two seperate aerials mounted on a cross-boom and seperated by about three feet or so. This system is used to good effect by many stations on 1296MHz. There are several commercial amplifiers available, among which are those by Microwave Modules, meTec limited and Piper Communications.

Many designs have been published including [15], [19] and [26]. It is a good idea to use a filter between the pre-amp and a converter to reduce image noise, [23] [24].

POWER AMPLIFIERS

Just about the only valve obtainable to give powers over about 3 Watts is the 2C39A. Several designs have been published using these valves which typically have a power gain of around 10dB. [16],[22],[25],[26],[27]. The amplifier may be used as a linear to amplify a TV modulated signal or it may be directly modulated with video, (provided the stage is not a frequency multiplier). A suitable cathode modulator is described elsewhere in this magazine.

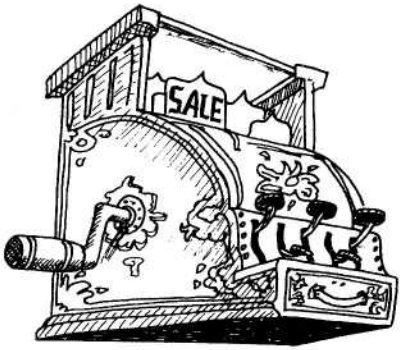
REFERENCES

RCHB: Radio Communication Handbook
RC: Radio Communication Magazine
VHFC: VHF Communication Magazine

[1]	Long QLY for 1296MHz	RC	Jan 75	24
[2]	Modifications to the QLY	RC	Sep 78	783
[3]	Feedback on the G3JVL loop	RC	Jan 79	41
	The G3JVL loop Yagi	RC	July 76	525
	More on the G3JVL QLY	RC	July 79	636
[4]	G8AZM Yagi	RC	Aug 71	547
	Notes on the G8AZM Yagi	RC	Mar 74	158
[5]	Circular polarization at UHF	VHFC	2/73	110
[6]	70cm helical aerial	VHFC	3/74	149
[7]	A 23cm dish aerial	VHF/UHF manual		
[8]	Tube radiators for dish (13cm) (scale for 24cm)	VHFC	4/76	207
[9]	Trough reflectors	VHF/UHF manual		
[10]	Power splitter/combiner	RC	Dec 74	857
[11]	Microstrip splitters/combiners	RC	Dec 75	923
[12]	Alford slot	RC	Aug 81	732
[13]	Clover leaf for 23cm	VHFC	4/79	203
[14]	Coaxial connectors	RC	81	
[15]	•NE64535 Pre-amplifiers for 23 and 13cm	VHFC	1/80	2
[16]	3" x 3" cavity for 23cm	RCHB	Jan 76	25
[17]	40 el colinear for 23cm - 16-18dB gain	VHFC	2/75	108
[18]	Long Yagi for 1296	VHFC	1/75	32
[19]	Using RF pre-amps on 1.3	RC	June/July	80
[20]	4 element for 23	VHFC	3/71	132
			2/75	106
[21]	6 element colinear for 24cm	VHFC	2/74	
[22]	2C39A 4 stage amplifier	VHFC	3/75	146
[23]	Interdigital bandpass filters for 24cm	VHFC	4/76	215
			1/78	2
[24]	Three stage BFR34A pre-amp for 23cm	VHFC	4/77	221
[25]	Diecast box slabline 2C39A PA for 23cm	RCHB		
[26]	Improvements to the 2C39A tripler for 1.3GHz	RC	Apr 79	342
[27]	A 1296MHz PA	RC	Mar 75	209
[28]	Mods, to N connectors for FHJ-4 cable	RC	Mar 79	238
[29]	A helical aerial	VHF/UHF manual		

FURTHER INFORMATION

Hybrid ring mixer receiver for 23cm	RC	Feb 71	117
Designing paraboloids	RC	Apr 71	244
Designing horns	RC	Feb 72	81
	RC	Apr 72	229
Simple RX mixer for 23	RC	Feb 79	131
	RC	Aug 79	735
Power monitor/VSWR bridge	RC	Jan 76	27
70/23cm tripler using 5 1N914 diodes for 2W output	RC	Sep 72	608
Stacking and baying information	VHFC	3/74	147
An ATV-transmitter for the 24cm band	VHFC	1/81	25
Home-made finger stock	VHFC	2/77	85
A linear amplifier for 1250MHz using the BFQ68	VHFC	2/81	95



MARKET PLACE

ADVERTISING RATES:

Classifieds - 3p per word.
Full page - cover £20.
Full page - inside £18
Smaller displays - proportional.

Advertisements are placed in this column free of charge to paid-up members.
If possible an address label from a recent CQ-TV magazine should accompany your ad.

—for sale—

G8GQS SALES LIST

CAMERAS

PYE studio camera,7" viewfinder,PSU,control panel, camera cable - as new condition 4 lens turret, vidicon etc.....£75.00
PYE Mk.5 studio camera. Ex-BBC broadcast type with viewfinder,CCU,PSU,control panel, I.O. tube,circuits, spares - 4 lens turret.....£75.00
SET OF 4 LENSES for above camera (TV 88 mount)..... £60.00
CAMERA CABLE Mk.4B for broadcast cameras, various lengths.....£15.00
EMI camera, ex-BBC. Viewfinder,PSU,CCU,control panel,4 lens turret,circuits, needs some work doing on it but could be made very nice.....£75.00
EMI camera as above but no control panel. Model 203,late S/No.....£60.00
EMI vidicon camera, viewfinder, 4 lens turret, PSU/CCU, no tube, no cable. A bit rough but ideal basis for re-build. Collect only.....£10.00
PLUMBICON camera by Fernseh. Incomplete, good for rebuild, solid-state, has yoke and scans. High quality.....£10.00
5. SPARES for broadcast TV cameras and modules etc. Phone for details.
6. LIGHT seperation box. L in, R.G.B. and L out. Dicroic mirrors.....£25.00

STUDIO EQUIPMENT

7. MARCONI SPG, solid-state,big Mk.4 style. L drive, F drive, M blanking and sync. internal crystal or mains lock.....£15.00
8. NTSC encoder, ex BBC, 19" rack.....£12.00
9. MARCONI pulse and bar generator, solid-state, rack mount.....£20.00
21. VIDEO D.A. by ABC TV,4 channel 5 outputs each, solid. 19" rack.....£15.00
22. PULSE D.A. by EMI, 6 units in 19" frame, 5 outputs each, solid.....£18.00

MONITORS

23. 14" MONITOR. Pye solid-state, broadcast quality, fan cooled, working order, nice, circuits.....£35.00
24. 14" EMI monitor. Solid-state, circuits.....£25.00
25. 14" COLOUR monitor. German, no data,no EHT, Hybrid.....£25.00
26. 5" BBC MONITOR. Fits BBC type frame, working order, circuits, solid-state, mains or 12volt.....£40.00
50. SOUND faders, rotary BBC type, 600 Ohms, old but good.....£1.00

RADIO GEAR

60. PYE 70cm pocketphone, with leather case, fitted SU8 plus two repeater crystals, circuits, battery.....£65.00

LATE ITEMS

VARATOL 1 (I think!) 4" to 20" rear lens unit...£1.00 to owner of complete zoom.+P&P
VIDICON,1" scan-coils, for solid-state circuits.....£3.75 inc. postage.
WANTED IVC VTR 700 or 800 series...cash waiting.

All above please phone Brian Summers, G8GQS on 0427 3940

PHILIPS colour camera, 3 tube with zoom type P060?.....£1,000:00
TEN-TO-ONE servo zoom, TV88 mount for I.O. cameras.....£100:00
M & B radio, Tel: Leeds 35649

WB9LVI SSTV converter unit (built by G3MNQ). Approx ½ original cost. Offers around £100. minimum. Needs small picture pull fault corrected, otherwise OK. Going QRT on SSTV. G2JR (QTHR) Tel:0203 455021

47uH inductors, as used in the colour mixer clamp circuits in CQ-TV 116. Encapsulated like large tantalum beads. Set of 4 for £1.00 inc. postage.
Dave Wilson, 4 Harkness Close, Bletchley, Milton Keynes, Bucks. MK2 3NB

THREE ECM25 extension leads @ £4.50 each.
THREE VMC3 ten-pin connector branch cords @ £4.50 each.
TWENTY FIVE ECM5 extension leads @ £2.50 each.
VARIOUS plugs and splicing units.
TWENTY reels of 1" National video tape @ £7.50 each.
All believed new and unused (old stock). To purchase or haggle phone Mr.M.L.Field on (01) 807 1661 during shop hours.

FREE! SONY service manuals for the following items - first come first served, so just send £1 (£1.50 for heavy items marked *) PLUS SAE for returning your money if you are unsuccessful. The manuals are free but postage is not!
CAMERAS. DXC-500P, AVC-3250/3260, AVC-4600CE, DXC-5000P/CG-101P.
EFFECTS GENERATORS SEG-200P/JB-200, SEG-2CE/JB-3.
VCRs VO-1601D/VP-1001D, VO-1600, *UV-340, *EV-320CE, DVK-2400ACE (two copies), AV-3600, AV-3620CE.
MONITORS CVM-195LCE, PVM-200CE.
MIKE ECM-22P.
CASSETTE RECORDERS TC-121, TC-124S, TC-129.
Andrew Emmerson, G8PTH, 4 Mount Pleasant, Blean Common, CANTERBURY, Kent, CT2 9EU
MONOSCOPE CAMERAS FOR SALE
Surplus to collection: Marconi mobile and Pye rackmount, both £30. phone for details. Monoscope tubes still purchased and exchanged.
Andrew Emmerson, G8PTH. Phone: Blean (0227 77) 471.

BLEAN VIDEO SYSTEMS for PC Electronics and Fortop transmitters, ready-made or modules. Send large SAE for details and beginners' guide to ATV.
Blean Video Systems, 4 Mount Pleasant, Blean Common, CANTERBURY, Kent. CT2 9EU.

—wanted—

SONY random access controller type RX 353CE for use with VO2631 U'Matic recorder.
Mike Featherstone, 9 Kidderminster Drive, Chapel Park, Newcastle-on-Tyne, NE5 1TZ.

CIRCUIT required for Ikegami video tape recorder model TVR-301-4E.
John Ambrose, 20 George Street, Hemel Hempstead, Herts, HP2 5HJ.

SONY VIDEO TAPE wanted for CV-2100-ACE recorder. ½" tape 7" spool.
G.D.Davies, G2FXA. 35 Kensington Road, Stockton-on-Tees, Cleveland, TS18 4DQ

CIRCUIT and modifications from 405 to 625 for a NEV camera.
R.Cooke, G3DOX. 7 Manor Way, Boreham Wood, Herts.

ANYONE know of a scrap Mullard valve tester? Collector needs some paxolin test cards.
J.Brown,G3LPB. 1 Silverdale Road, Falmouth, Cornwall, TR11 4HW.

FORTOP LTD

MANUFACTURERS AND SUPPLIERS OF RADIO EQUIPMENT

TvT 432 TV TRANSMITTER

* 15 WATT MIN OUTPUT (20 WATT TYPICAL)
* SYNC PULSE CLAMP
* EXCELLENT VIDEO BANDWIDTH FOR COLOUR OR MONO TRANSMISSIONS
* 12 - 13.5 volt SUPPLY
* UP TO 3 CRYSTAL CONTROLLED FREQUENCIES FROM FRONT PANEL SWITCH.
* 435 or 437 MHz SUPPLIED AS STANDARD. (state which)
* SUPPLIED READY TO OPERATE.
* SMALL SIZE.

£143·75 + P & P

TVC 435/40 TV CONVERTER

* LOW NOISE R.F. AMP.
* ZENER STABILIZED OSCILLATOR.
* HI-Q OUTPUT FILTER.
* COVERS WHOLE OF 70cms.

WHEN USED WITH A STANDARD UHF TV SET THIS UNIT PROVIDES A HIGH-PERFORMANCE AMATEUR TV RECEIVER.

£24·95 + P & P

ALL PRICES INCLUDE VAT @ 15%

OTHER PRODUCTS INCLUDE:- 23cm TV RECEIVE CONVERTER, VIDEO MONITORS, S/HAND TV CAMERAS AND LENSES. SEND LARGE SAE FOR DETAILS.

Sales Address: 13 Cotehill Road, Werrington, Stoke - on - Trent, STAFFS.
Tel: ASH BANK 2607