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CQ - TV

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Annual Subscription 4,

Editor's Note:

Dear OMs,

The news this month is chiefly of forthcoming exhibitions. Ivan Howard reports that sometime in November he is giving a full scale show to the Letchworth Radio Club. More important, however, is the offer of space by the BSGB for a demonstration of Amateur TV at the BSGB show, from the afternoon of Wed. Nov 22nd to Sat. Nov 25th.

As this will be our first public show in London, we have pointed out to the BSGB that we must either put on a good show, or none at all. We hope to have sufficient space to show G2DUS's camera in action, with lamps, monitors receivers etc. However, Ivan cannot be expected to do all the work himself, and I am asking for help in putting up the stand, and possibly, but not so essentially, in manning it. Unfortunately, I am at College at the time, and cannot get away myself. What we need is someone with some time to put together the various photo and posters that we have into some reasonable shape, to leave Ivan free to do the technical side. Perhaps you could help by doing a poster at home? Is anyone prepared to undertake the organisation of the whole thing for me? Remember, it must be a good show to impress the higgerant. In addition to live camera stuff, we want to show telecine and telestill gear, so please let me know if you have anything you could lend, WRITE SOON. THIS IS URGENT.

The licence situation remains unchanged; the GPO now have the matter under consideration. It is interesting to note that three of our members are now ready to put pictures out over the air; it will take the issuing of the licences to get us to equal the record in the USA, where there are now some 17 active amateur TV transmitters. Maybe the exhibition will turn the scales. Anyway, write quickly, volunteers....

73s to you,

M.Barlow, G3CVO.

THIS MONTH'S SHORT NOTES.....

IN spite of what is said on Page 8, '30VO will be on 3770 kc/s fone and 3550 or 3580 kc/s on until Dec. 7th, with 3 watts only. Pse zero beat with powerful carriers to keep the channel clear. Will look for calls at 2100, 2200, 2300 most nights. I will call CQ-TV at 5 mins past if nothing is heard.

EMI state that the persistence of the various Emiscope tubes is: Normal TV tube 3×10^{-4} secs (i.e possibly short enough for us), and their proper film scanning tube has a persistence of 1×10^{-7} secs. They reckon a normal blue tube has the same afterglow as their TV tubes, 3×10^{-4} secs. THEY also have a PEO with an output of 300,000 amps/lumen. 14 stage job.

HAVE you seen the new Phillips projection set? Very fb, and cheap!

GRANT DIXON, 25 Wye St., Ross-on-Wye wants to borrow issues 1-4 of CQ-TV. He also wants gen on German or American Image converters (Infra red), and information on optical arrangements for IFT work.

G3ETI still wants that 35mm 1000-2000 ft drum, empty. Also a 230 v 50cs 1 phase synchronous motor, and gen on the TR3182A.

WHO is jealous of Pye's walkie-talkie turret TV camera??? (Me, too!).

NO, Algernon's Brown Bag is not a lady from the Congo.....

THE GPO say that we may not get round them by using BBC syno. Messages must be in plain language, so it does not make any difference whether we use our syno or theirs. (Oh no?). WE DON'T. But the subject of TV licences for hams is still under consideration. They say.

CONGRATULATIONS to PAMZI, Hendrik de Waard, and his wife Paula, on their recent marriage. Perhaps you will be able to make those skeds now, am??

CONGRATULATIONS to Wally Oliver, on his election as Hon. Sec. of the Morecambe and District Radio Engineer's Society.

MEMBERS of The Television Society are reminded that a lecture on Amateur Television Transmission will be given to the Engineering Section at 164 Shaftesbury Ave, on Dec 14th next, 1900hrs. Grip by '30VO, + demonstratic we hope by 2DUS.

COPYRIGHT in films used for Amateur TV purposes: Kodak will give no ruling Pathe state that they will be glad to discuss the matter when the licences are released.

WE regret that no reply has been received from the Short Wave Listener to five letters asking why our reports have not appeared in that mag. It is suggested that pending developments, members do not order this mag. for news of the BATO.

CAN YOU DO ANYTHING TO HELP US AT THE RSGB EXHIBITION?

-BASIC VIDEO AMPLIFIER DESIGN-

By W.Oliver.

One of the main features governing the definition of a TV system is the bandwidth of the video signal generated by the camera unit. Assuming a 30 c/s frame frequency, this bandwidth is given by:
 $f = 13CN^2 \times 10^{-6}$ megacycles, where C = picture aspect ratio, and N = No. of scanning lines.

With the BBC 405 line system, this gives a bandwidth of 2.75 mc/s, the corresponding American standards (325 line, 60 c/s frame) giving 4 Mc

It is therefore required to build a video amplifier chain with a reasonably flat amplitude/frequency response to 2.75 Mc/s.

Fig. 1 shows the basic voltage amplifier circuit, which can be redrawn as the equivalent circuit, Fig. 2. The frequency at which the

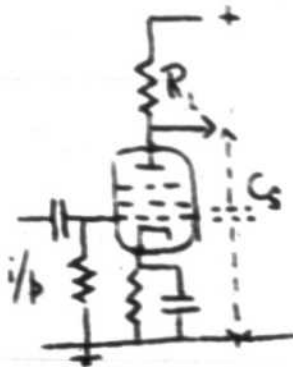


Fig. 1 Basic oct.

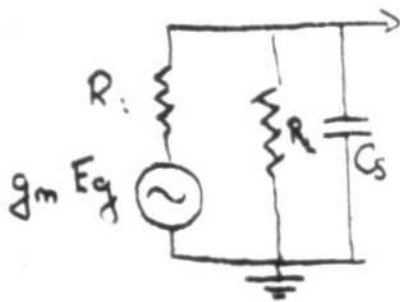


Fig. 2 Equivalent oct.

output will have fallen 30% (6dBs) will be that frequency where the reactance of the shunt capacity C_s is equal to the ohmic value of the anode load R_1 .

To take an example: Let $C_s = 50$ pF, $R_1 = 25K$, $f = \text{freq}$, for o/p 6dBs down; then

$$R_1 = \frac{1}{2\pi f C_s}, \quad \text{whence } f = 132 \text{ kc/s approx.}$$

The gain G of such a stage is given by

$G = g_m \times R_1$, where g_m is the mutual conductance of the tube in mA/V, R_1 is the anode load in $K\Omega$, and $R_1 \gg R$.

With the previous figures, and using an EF50 with $g_m = 6.5$ mA/V

$$\text{then } G = 6.5 \times 25, \text{ i.e. } G = 160 \text{ times.}$$

Conversely, for TV work, f is about 3 mc/s.

$$\text{i.e. } R_1 = \frac{10^{12}}{2\pi \times 3 \times 10^6 \times 50} \\ = 1,000 \text{ ohms approx.}$$

The gain of the stage is now only $6.5 \times 1 = 6.5$ times.

With this simple amplifier, then, increasing the bandwidth

reduces the gain to such a low figure as to make necessary a large number of amplifying stages to get any reasonable gain. This is expensive, and introduces noise. Other means must be found, and some points are immediately apparent:

For any VF amplifier, C_s should be as small as possible, and $E_{a,k}$ should be as high as possible.

A useful comparison between tubes is given by the figures of merit, $[N]$, where

$$[N] = \frac{E_{a,k}}{C_{g,k} + C_{a,k} + (1/\mu)C_{g,a}}.$$

The principle cause of loss of gain at high frequencies is the valve output capacity plus stray wiring capacities, C_s . It is possible to compensate for this capacity in various ways.

1. Shunt Correction.

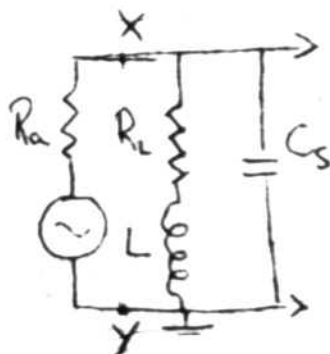


Fig 3 Equivalent ckt

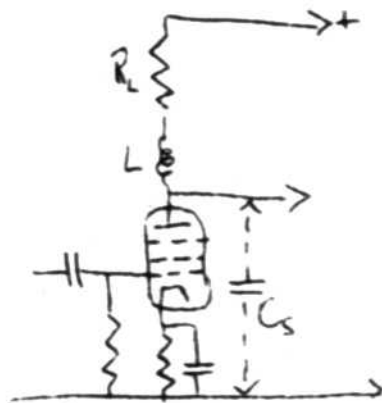


Fig 4 Actual ckt.

A small inductance L is placed in series with the anode load R_L . Now, if the circuit to the right of XY in Fig 3 can be made to have constant impedance over the video frequency range, the overall response will be substantially flat.

The reactance of an inductance rises with frequency, so if its value is correct, it will offset the loss due to C_s by increasing the load, and the response will be better than before.

Correct values are: $L = 0.5 C_s R_L^2$.

and f (bandwidth) = $0.5 R_L / 2\pi L$.

To be continued.

PAGTV MET EN ALGEMEEN OPEROOP!!! (or something...)

Your contributor has just returned from a very pleasant 10 days stay with PAGZX, of the Groningen Amateur TV unit, and of course, a visit was made to the Tx location at Winschoten.

The Netherlands is an ideal country for TV, being so very flat. Nevertheless, no commercial TV is available, with the result that the various TV groups of V.E.R.O.N are hard pressed to give demonstrations all over the place. When not at a Fair or exhibition, the Groningen Tx is kept at the small town of Winschoten, some 25 miles from Groningen itself. A visitor notices the lack of TV antennae - except of course, on the roofs of PAGZX and BE. The 70 watt 145 mc/s tx gives reasonable pictures at this range, but at the intermediate town of Hoogezand (PAGHA, BF, etc) about 12 miles from the Tx, no deterioration in picture quality is noticeable. There are some 20 viewers in the area, and some 50 in the whole country - many running DX TV Rx's on AP., SC, and Eiffel Tower.

The studio at PAGVT is on the top floor of a wholesale store, the floor below consisting of a huge supply of all types of tools, cables, electrical fittings, etc. The studio is very well equipped. (No comment!). An inner wall of cardboard and wood gives a light background to productions, for which some 250 sq. ft of floor space are available. Lighting is by means of overhead banks (600watts!), and by movable 250 watt beehive silvered lamps on stands. The "Control Room" is behind another wall, shaded from the studio lights. Here are the monitors, and sound and vision transmitters. A 3 ele. Yagi array is on the roof. The camera itself has been rebuilt and tidied up, and the various units now slide in and out. A very well made focussing and iris mount is operated from the rear of the camera, which is mounted on a neat tripod on wheels.

One thing which struck me very forcibly was the lack of a good commercial receiver to judge results against. It may not have struck you before, but these chaps for the most part have never seen a good BBC picture, have no receivers that are known to be good, no test pattern generators, nor even Signal generators going above 30 mc/s. With no regular commercial transmissions to line up on, these chaps have certainly done wonders, and it is a pity that some enterprising manufacturer does not present the group with a commercial Rx for test purposes, and the advertisement.

The equipment, and the pictures were beyond reproach, and provided a very pleasant climax to a very interesting and enjoyable holiday. Well done, ones, and keep up the good work!

DATA ON SURPLUS CRTS SUITABLE FOR IFT SCANNING

BY A.E.SALE

The most suitable types are the following tubes:
C.H. Range/Amplitude.

VCR85	
VCR140	
VCR524A	Photographic blue, 5kV, post defloctn acceln.
VCR511	* CHL/GCI stations. 12" dia. Liable to burn....
CV836	= 5BP4 = 1802P4
ACR1	These two used in early GL sets, Mics i and ii. 5" dia.
ACR2X	Originally designed as IFT scanners. White screen.
	* Equivalents are ACR8, ACR11, OV1583, OV1581.

Other tubes quite suitable, but may be more scarce,

are the:

VCR112	5". RF monitor.
VCR530	6". 60 rpm PFI.
VCR84 & 87	12" & 6" dual layer. ACR19.
ACP22	Coast artillery. 5kV. Short persist. CA No 1 mk V.
VCR84	Early C.H.
VCR524	Dual layer. 3 1/2". A.I Mk ix.
ACR15	Training set (army). High actinic blue. GN for IFTs.

Other blue or white tubes are OVs 269, 274, 300, 307, 954, 958, 959, 963, 1518, 1529, 2786, 3774, 3776. OV nos of above tubes (not in order) are OVs 255, 836, 1112, 1379, 1380, 1383, 1391, 1511. -ther nos. of all tubes are VCR97 mod, VORX156, VOR530 mod, VOR 518, VCR529, V1020, V1023, (32)267, NOs 5, 9, 10, 14, Ws 1071, 1921, 1851, 6601, ZCs 0123, 0697, 3081, 3595, 13369, and ZAL3075.

Now you can start looking for the right tube!

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FURTHER REFERENCES FOR YOUR READING LIST:

"A Complete 420 Mc/s Amateur TV Station".....Radio & Telev. News,
May, June, July 1950.
"Video Frequency Amplifier Testing".....Electronic Eng. June 1949.
Marconi EMI TV System.....J.I.E.E. Dec 1938.
The Vidicon.....Proc.I.R.E. Feb 1950.
* Highly recommended. Covers IFTs, pulsers, PSUs, Rx and Tx. Vy fb.

Many thanks to the contributors to this feature.

DON'T FORGET TO COME AND SEE US AT THE RSGB EXHIBITION - WE HOPE!

"WHAT THE OTHER BLOKE IS DOING...."

G3ETI (Wirral) is now in a position to give anyone a test pattern and/or picture as soon as the licences are released(?). He sends some photos; fb too. Not the YL test card we were waiting for though; much more prosaic! Ian also suggests the use of FM SYNC to give better looking. Any comments, men? '3ETI has also tried

borrowing the BBC's sync, with good results. (See "Shorts"). He hopes to show his telecine equipment at the RSOB exhibition. Ray HILLS (RAF, Poling) is still struggling along against odds. His AVO has now given it up as a bad job, but Ray is persevering with the RX side. He did hope to be out about Nov. 3rd, but may get the extra 6 months now.....

Tony Sale is now a qualified Radar officer, and sends in a useful list of CRT data. He has been very busy building and demonstrating his 6th radio controlled robot at various "do's", but has had time to get his Telecine gear into better order. He now has a better scanning tube, & is rebuilding the optical side.

Fred Pilkington (Littleport) asks for a list of TV stations active. He is hoping to get PASVT in Cambridge. He also wants some BATO QSL cards. These will be issued when we get that license, on!

Tony GILBEY (Chelmsford) says little, but can be assumed to know the right people, as he now has a 9" and two 12" tubes, gratis. Hmmm.

Wally OLIVER (Morecambe) is working on DX reception of S.C. He has become an "Assoc. I.R.E.". He says: "...terrific grip value...."! He is having a good look at various things TV and cine on "official" visits of the Morecambe Club, of which he is Hon. Sec.

Fred WOOD (Bexley Heath) is now working at Faraday House, but has not yet managed to order a 5527 by phone... Fred has a 12" tube, and is working on a 931A pre-amp and IPT. He has a Williamson amp. for sound!

George HAYLOCK G2DHV 63, Lewisham Hill, SE13 has now returned to the BBC TV Service, and hopes to have some inside information for us...

Ivan HOWARD G2DUS (Stotfold) has not had time to build his No. 2 camera and mixing unit, due to the pressure of work, exhibitions, etc. He has now added a small shading generator to the camera, but has been having some trouble with QRM in the camera amp. Ivan hopes to show his gear at the RSOB exhibition, and possibly also to the TV Society in December. By then, the other camera should be working.



OTHER BLOKEISSS Contd.

Fred ROSE G3ELV made the Birmingham radio show his excuse for coming and having a quick look at some of the TV gear in the South. At the cost of one car differential, a fairly successful visit was paid to 2DUS. A few minutes after Fred left, 3BHH (Durham) arrived too! Fred now has a Mazda TV scanning tube, and is ready with telecine pictures WHEN... He found the Parkin freq. divider very difficult to maintain, so is now running a series of multivibrators from a 100 kc/s Xtal. He is sending the cct along to CQ-TV. A 6J6 pulse mixer and 68J7 limiter give no trouble. Fred has been thinking about the RF side, and suggests suppressor grid mod of an EF55, etc as suitable. Comments psc. 3BHH's gamble with a 5527 has not come off, so he is trying different means. Good luck, on. He too has been getting S.O as DX TV.

Grant DIXON (Ross-on-Wye) has been trying to use Infra red Image tubes as "Image-Dissectors", by covering the viewing face with black paint, piercing a small pin hole, and scanning the picture over this hole by an external field, the picture being picked up by a PEO in the usual way. He finds that English tubes have too small a spacing to allow of successful scanning. Nice bit of research there, on. Good luck.

Bob STYRING (Sheffield) has been busy at College, and also with a HiFi audio amp. His DX tv Rx is well on the way, and he also has a useful cct giving 2.5 kV from a 6H6! Gen psc, on.

Dave BISHOP (Weymouth) has been having fun with boats and klystrons. He finds S.O is a little unreliable down there! However, we understand that the coastguard no longer have him on their "Wanted" list. Influence...? G3CVO has been doing 3 months.... at E.M.I.'s. No comment, but some very useful ideas seem to have sprung up at this QTH. The 420 mc/s modulator is awaiting tests on a Rx. CONSTRUCTION OF A 5765 KO/S TRANSMITTER IS IN HAND. Psc note!

AND from overseas:

The Groningen group have been exhibiting their equipment at various Trade Fairs, etc. The camera has been rebuilt, and a shading generator has been added. Results are very good, but lack of Rxs is no help. ZS6GX has been on leave, and should have something built up by now. He says the ZS's are not licensed as such for TV, but all they need do is ASK!!

VE3EAB wrote the RSGB complaining that we had not mentioned any W's or VE's as being active. Oh to have an RCA factory here! He is going to keep us in touch with TV events in W and VE.

VR2BC, at Nadi in FIJI (!) writes in for gen. He is normally ZL2RP, and is promptly appointed our ZL/VK representative! Let us know any TV developments, commercial or ham, on. Well, we seem to be getting around!