

# CQ-TV

no 57

*The Journal of  
the British Amateur  
Television Club*



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	S. Woodward	44 Winton Road, Reading, Berks.

## Introduction.

The club was founded in 1949 to inform, instruct and co-ordinate the activities of amateur radio enthusiasts experimenting with television transmission, and to liaise with other enthusiasts engaged on similar work overseas. The club is affiliated to the Radio Society of Great Britain, and has a membership of over 800 at the present time. Of these, about one third reside abroad; in particular, there is much amateur activity in Australia, Canada, France, the Netherlands, and the U.S.A.

Experiments carried out by BATC members have been mainly in two directions: R.F. and video. As few members have the resources to build both sorts of equipment, many have combined to form constructional groups, to hold lectures, and to take part in local exhibitions. There are local groups of this type in various places. The Hon. Secretary will be pleased to let you know the names and addresses of members in your district.

## Club Standards.

On the video side, the standards recommended are such that a normal domestic TV set can be used as a monitor, with waveforms similar to BBC-ITA. For interchangeability, members are recommended to arrange all video outputs at the one volt level, whites positive syncs negative; pulses at the two volt level negative going with all signals at 75 ohm impedance. Belling-Lee plugs and sockets are preferred.

## Slow-Scan Picture Transmission.

Another branch of the hobby has become popular: slow-scan television. The line and frame rates (25 c/s and one frame in 5 seconds) are sufficiently slow to permit pictures to be tape-recorded or transmitted, using band widths of the order of three or four kc/s only.

## Transmitting Licence.

On the radio side, the experimenter must hold a GPO amateur vision licence, costing £2 per annum, but not requiring a knowledge of morse. Operation is permitted in the 70 cm band and on shorter wavelengths. Full details can be obtained from the GPO Radio Branch, St. Martins le Grand, London, E.C.1.

## Camera Tubes.

Vidicon camera tubes, rejected by the manufacturers for minor blemishes are available to Club members for a nominal price and can be sent to any part of the world. Reject monoscopes are available in the U.K. only for £7.10s. information on the procedure for ordering a tube, and for ordering vidicon scan and focus coils can be obtained from the Hon. Secretary.

## International Ham Convention-Knokke

Erik Plattecuw  
ON4LP

During the International Ham Convention at Knokke on September 17th, there was for the first time in Belgium a demonstration of amateur television. Belgian amateurs are not permitted to radiate television signals and the system did work in closed circuit.

About 200 persons were present in the "Wiener Weinstube" when at 17 p.m. the meeting started with the projection of a little 8 mm film, made by ON4LP and entitled "Ham TV", showing the shacks and equipment of ON4RT and PAOCOB and TV pictures received in 1964 from PAOCOB by ON4LP. Then, Willy Van Marck, ON4RT, described his equipment with his home built transistorised vidicon camera and fully interlaced sync. generator.

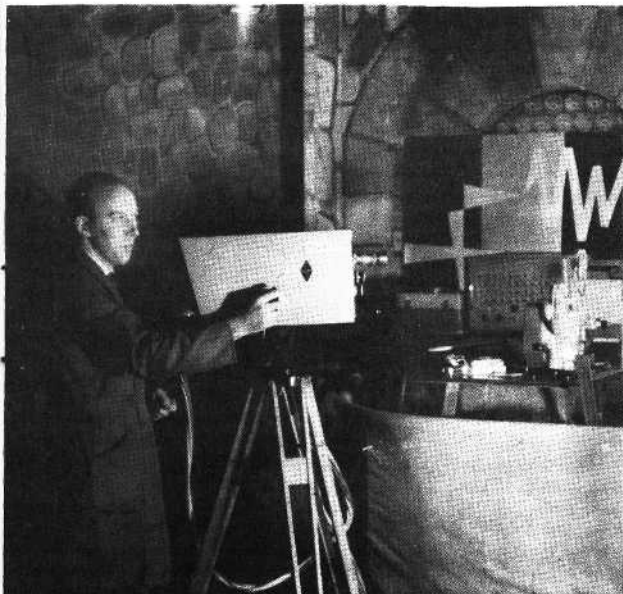
The final lecture was given by J.E. Tanner, G6NDT/T on slow-scan TV demonstrating with the slow-scan monitor from Grant Dixon.

Ham TV amateurs present at this meeting were G6ABA/T, G6OUO/T, G6OUH/T, G6NDT/T, F2AC, ON4RT and ON4LP.

The Ham TV stand was set up by Louis Van Marck and Etienne Hublau, ON4YV was the cameraman, ON4LP took care of the switching and all the equipment was built by ON4RT.

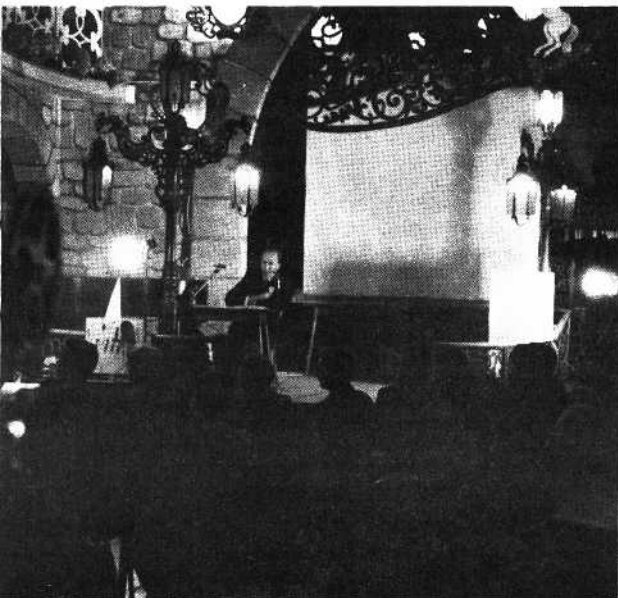
Many thanks to J. Tanner for his kind help and co-operation and also to the whole BATC team. (ON4LP).

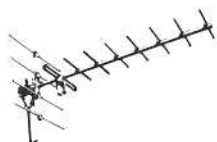
John Tanner was presented with a trophy for his contribution to the Knokke Ham Convention. John gave a demonstration of slow scan television to about 200 amateurs.



The above photo shows Willy Van Marck (ON4RT) operating his vidicon camera.

Below, a lecture in progress at Knokke.





### Results of the First Amateur Television Contest.

Only seven entries were received for the contest although several other stations were known to be on. Unfortunately the rules did not cater for one way contacts and points claimed for one way contacts have been subtracted from claimed scores.

Ian Waters has offered to organise the next contest, which will probably be held sometime during the first half of 1966. The rules will make allowance for one way working and the contest will be timed so as not to clash with the R.S.G.B. sound contest. Meanwhile any comments and suggestions should be sent to Ian.

Finally, congratulations to Len Dent G6GDR/T and thanks for your support to all those that took part.

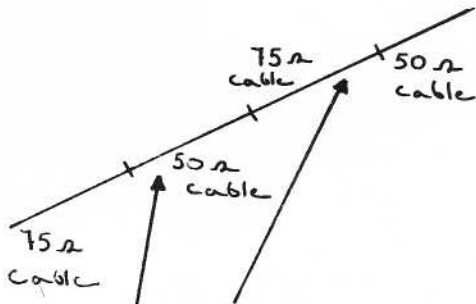
### RESULTS

Position	Station	Total Points	Stations Worked
1	G6GDR/T	1026	G6WJ/T, NDT/T, OPB/T, OOU/T, MEO/T
2	G6OPB/T	590	GDR/T, MEO/T, OOU/T.
3	G6MEO/T	580	OPB/T, OOU/T, NDT/T, GDR/T.
4	G6OOU/T	464	OPB/T, NDT/T, GDR/T, MEO/T.
5	G6NDT/T	244	OOU/T, MEO/T, GDR/T.
6	EI3AN	180	EI4Q.
	EI4Q	180	EI3AN.

### THIS MONTH'S SHORT CUTS:-

Matching an aerial array? - Try these ideas for simple matching:-

(1) 50  $\Omega$  to 75  $\Omega$  transformer

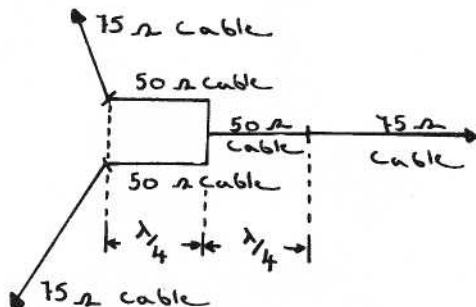


These two lengths to be 29' long at the operating frequency.

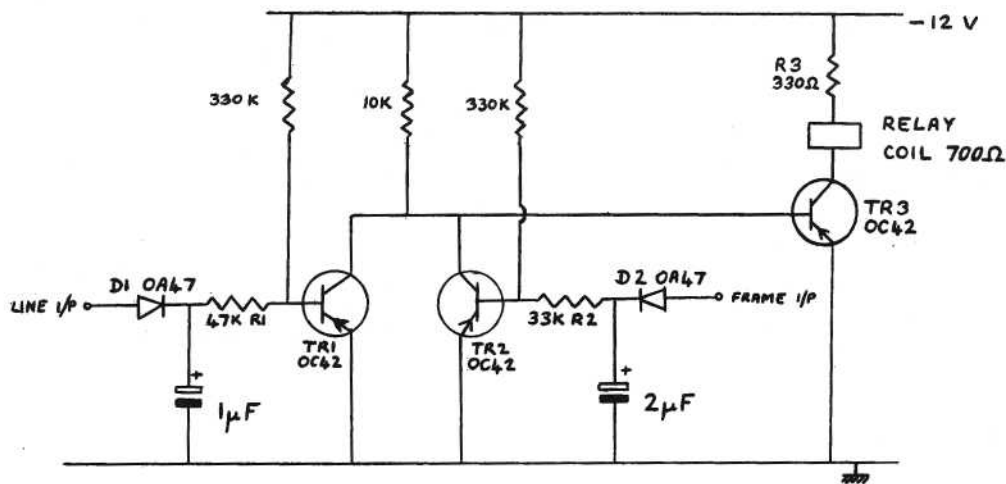
To calculate the physical length of 29' at 70cm. using cable having velocity factor 0.8:-

$$\text{Length} = 70 \times 0.8 \times \frac{29}{360} = 4.5 \text{ cms.}$$

(2) To match two 75  $\Omega$  arrays to a 75  $\Omega$  cable



SLOW SCAN VIDICON TUBES An offer has been made to negotiate for some 7290 vidicons for those people who have already built some slow scan gear. Would those interested please contact Grant Dixon.

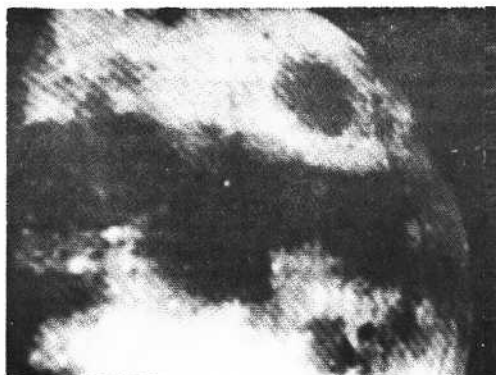


## Fail-Safe Scan Protection

by D.B. Lawton G6ABE/T

Inputs to the circuit are taken from the line and frame scan coils and are rectified by the diodes to provide a positive voltage between base and emitter of TR1 and TR2 - (note the polarity of input smoothing capacitors). The purpose of R1 and R2 is to provide a high input impedance so as not to distort the scanning waveforms, although it is not necessary to obtain the inputs from the scan coils if another source is available. The presence of the positive voltage cuts the transistors TR1 and TR2 off thus giving a high negative voltage on their collector. The collectors of TR1 and TR2 are connected to the base of TR3 and the high negative voltage at the base causes TR3 to conduct heavily operating the relay. If either input or both fail, TR1 or TR2 will conduct as the case may be, thus bringing TR3 base positive and cutting TR3 off. The relay de-energises and this can be used to switch off the vidicon supplies, saving the tube from burning out.

The transistors used are not important and any similar type can be used. The relay used in the writer's case was a 700Ω type which operated with 10 ma collector current. R3 is not important and was only inserted in circuit to reduce TR3 dissipation, i.e. 10 ma flowing, 3.3v dropped across R3, 7v across relay ∴ only 1.7v across transistor. By experimenting with other transistors and R3, other types of Relay may be used.



What is it?

Solution next time.....



# Television Society

# Lecture

## Professional Amateur or Amateur Professional?

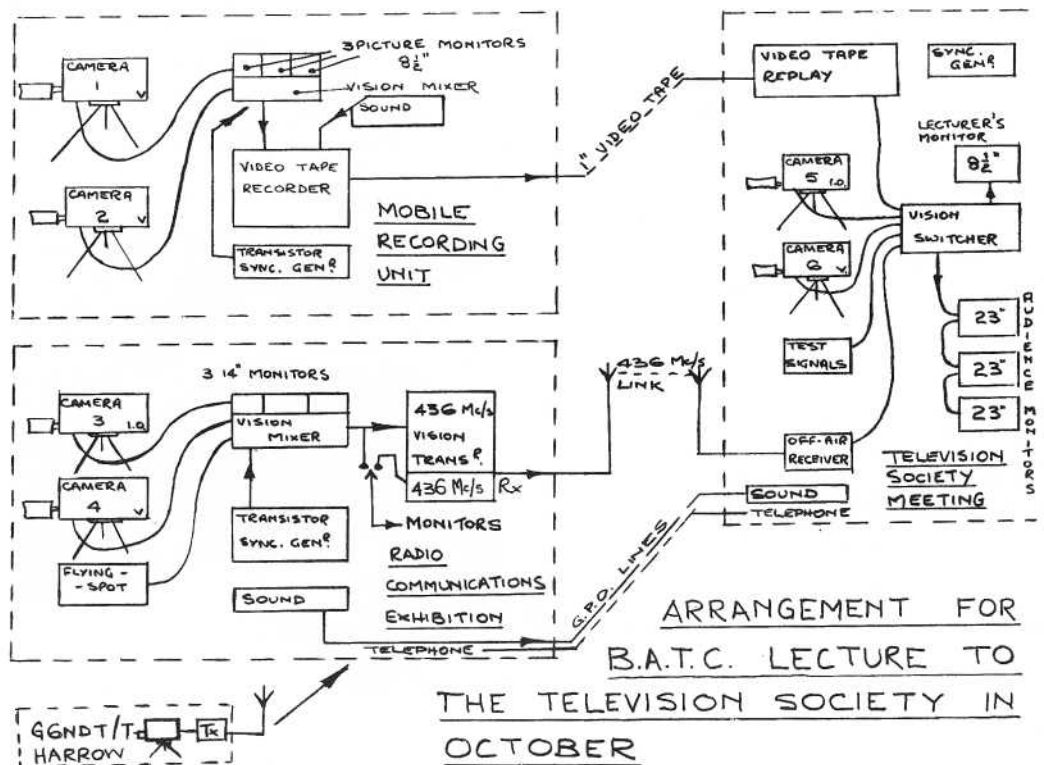
A new look at the British Amateur Television Club. This was the title given to a lecture presented to the Television Society by the B.A.T.C. in October 1965. What form should the lecture take - how could it be made different from the lecture given in 1959. Those were points raised at a meeting to discuss the lecture. It was decided that demonstrations should play a large part in the programme, but how could this be achieved? A simple closed circuit camera is excellent for the Garden Fete but hardly adequate for the Television Society and in any case the B.A.T.C. is capable of something better. It was finally decided to mount an "over-the-air" contribution.

Many active members live well out of range of even the most powerful amateur television transmitter. In order to bring some of their activities to the meeting, John Tanner, David Mann and John Noakes spent a hectic weekend touring the country making video recordings of selected members on a borrowed one inch helicol scan video tape recorder.

Prestatyn, Flintshire was first port of call where an interview with John Lawrence was recorded showing him in his shack discussing sequential colour and his other activities. Then off to Manchester to meet Peter Lambert who discussed his reasons for being an amateur television enthusiast. Gordon Sharpley was seen on an over-the-air contact.

The crew of three, by this time feeling rather weary, pressed on to Ross-on-Wye to interview Grant Dixon about his slow-scan experiments. The unit arrived at Ross at about 4.30 p.m. and the recording was complete by 7. All the equipment was packed up for the last time and the crew left for London, arriving back in the early hours of Monday morning after a tiring but rewarding weekend. About 750 miles were covered and just over 30 minutes recording made in 24 hours!

In the meantime it was realised that the International Radio Communications Exhibition was being held in London at the same time as the Tel-



# JOHN TANNER REPORTS

evision Society Lecture. This could be used as the source of "off air" pictures and would serve to show the B.A.T.C. in action at the major amateur event of the year.

The B.A.T.C. demonstration at the Radio Communication Exhibition was primarily to show the Club's activities to the public, as is the usual aim at this Exhibition. A wide range of equipment was, therefore, installed to give a complete view of the scope of the Club's activities. As the installation was to be used to contribute to the Television Society Lecture, a transmitter was installed and as licence regulations required this to be accompanied by a receiver it was decided to arrange the stand in the form of a working amateur television station.

During the week several amateur television stations in the London area made contact with the Exhibition station, in particularly G6NDT/T, who contributed many hours of transmission.

For the lecture two cameras and a Flying-Spot Scanner working on 405 lines were used. These fed a 20 watt transmitter (working at 436 Mc/s) via a simple A-B mixer. A 24 element remotely rotatable aerial was used to feed pictures from the Seymour Hall to the I.T.A. Conference Suite where the lecture was given. An Image Orthicon Camera mounted above the Exhibition in a gallery gave a general view of the Exhibition. A vidicon was used for close ups of faces and equipment. Some special caption slides were made for the flying-spot equipment. Those who organised the stand were Dave Buck, Terry Lane, Dick Crook and Norman Hampton.

As it seemed unlikely that a combining unit could be made in time for the Exhibition, the sound was sent to the meeting by land line. This overcame licence problems as well as enabling the maximum effort to be available for the vision equipment and transmitter.

All that remained now were the arrangements for the lecture itself. Another 24 element yagi was erected on the roof of the I.T.A. building with a transistor pre-amp feeding a specially tuned V.H.F. T.V. tuner in front of a vision receiver giving out 1 volt of video. The video tape machine provided the recorded source of programme, and to complete the picture, two live cameras were installed - one a simple transistorised vidicon; the other an older 3" Image Orthicon. Various test signals were also available to complete the local installation. All the sources were available on a vision switching panel, with the incoming sound from the Exhibition, and the tape sound fed into the P.A. equipment in the ITA Conference Suite.

Michael Cox presented the lecture with John Ware conducting the demonstration and interviews at the Radio Communications Exhibition, while John Tanner appeared on the recording as interviewer. Without the enthusiastic help and efforts of a great many members of the club, the whole undertaking would have been impossible - a quick glance at the block diagram of the demonstration reveals the complexity of the installation.

Summing up, the 1965 lecture to the Television Society put the B.A.T.C. to the test - the outcome showed that with a combined effort, a really comprehensive demonstration could be mounted. The use of video tape was an experiment which showed what a useful tool this could be for similar lectures where people or things of interest are too remote or inaccessible.

Finally, thanks are due to Messrs. Audio-Video Rentals Ltd., who provided the video tape machine, to the G.P.O. who provided the communications with the Seymour Hall, to the Chief Engineer of ABC Television for the 23" monitors; to the engineers at the ITA for their patience and help while we were installing the equipment, and to Messrs. B.I.C.C. and J. Beam Aerials who provided the low loss feeder and the aerial arrays, which made such a difference to the pictures received at Seymour Hall. Also thanks to all the members of B.A.T.C. and their wives who put in so much work and made so many cups of tea.

## Cover photo

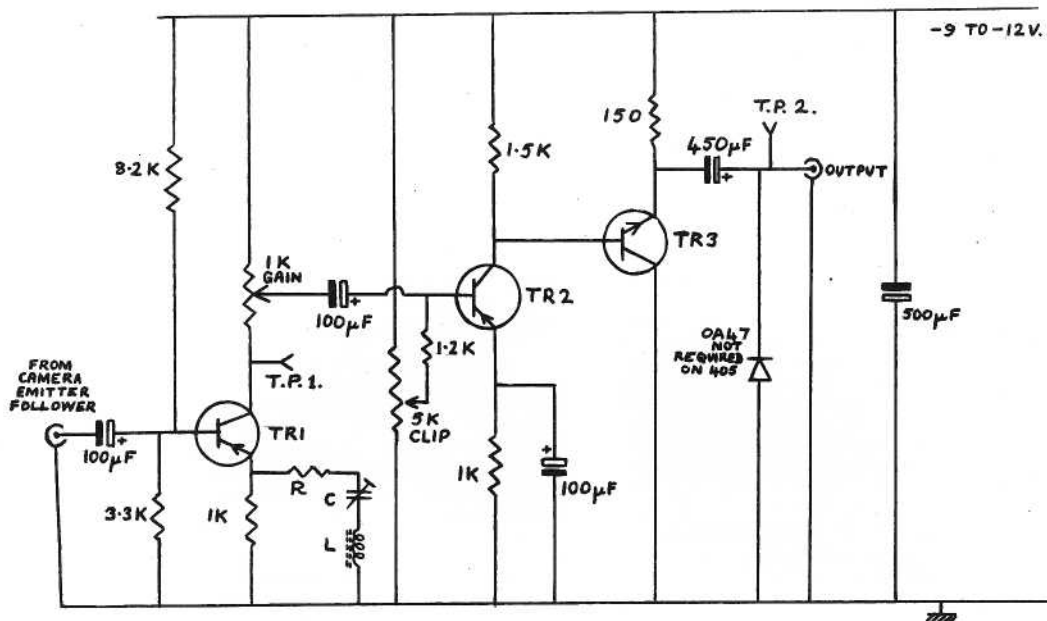
The cover photo shows John Lawrence in his shack demonstrating his vidicon camera. John's main interest lies in colour television. In the foreground can be seen his colour bar generator and a direct viewing colour monitor (sequential colour). This photo was taken at the time of the video tape recording session for the Television Society lecture

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## 450 Mc/s. Tripler.

The November edition of the Mullard Technical communications (vol. 8 No. 78) contains an article on a tripler to give 450 mc/s. Output from 30 watts input with 75% efficiency. Zero input power is required at the P.A. stage. This would be just the job for a portable transmitter. Grant Dixon who supplied this information has the article which is available on loan from him. (see inside cover for details of Club facilities).

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## A VISION PROCESSING AMPLIFIER

by David Taylor G6SDB/T

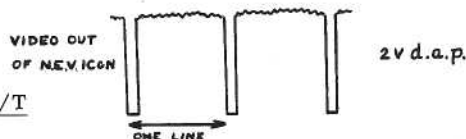
There have been available for some time now transistor T.V. Cameras, such as the Nev Icon or EMI-8, which are intended for use with internal R.F. oscillator and diode modulator.

The video output of these cameras, i.e. before the diode modulator, is about 1-3v D.A.P., with very little vision. The unit to be described converts this into standard waveform and has sufficient gain in hand to feed the grid of the video output valve.

## CIRCUIT

T.R.1. is a hi-peaker and signal inverter. The unmarked LCR in the emitter circuit determine the shape of the response curve and in the prototype were an oscillator coil (transistor), a 500 pf trimmer and 82Ω respectively.

The signal, now negative going is passed on to the gain control, a 1KΩ pot. In the original a wire-wound pot was used with no noticeable deterioration of picture quality. From the gain control it passes to T.R.2 which clips the signal, the position of the clipping being set by the 5KΩ pot.





T.R.2. now amplifies the video of the signal to the required level and the positive going o/p is fed to the emitter follower T.R.3.

## TRANSISTORS

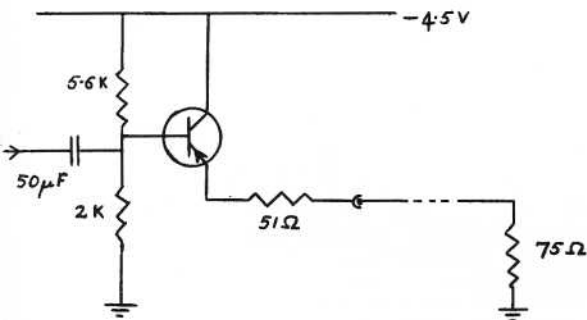
- T.R.1. } OC170, OC171, AF114, 5, 6, 7 or any  
T.R.2. } VHF diffused PNP transistor.  
T.R.3. } An NPN silicon HF transistor. In prototype a C111 and a ZT20 were successfully tried.

## SETTING UP

Connect the unit to a 9-12v supply and turn the gain pot fully up, adjust the clip control until the waveform clips evenly and reduce again. Readjust gain and clip controls as required.

## USE

The prototype has been used on several occasions with commercial T.V.'s. The receiver is set up for normal use and then tuned to a blank channel. Each time a test point has been found on the grid of the video output valve. The signal from the unit is applied to the test point, the vision detector diode acting as a D.C. restorer, working on sync bottoms (works for 405 lines only). No trouble from break through has been experienced.



This emitter follower is suitable for feeding coaxial cable. A suitable transistor should have a collector current of 50 mA and a cut off frequency of between 5-10 Mc/s depending on the band width required.

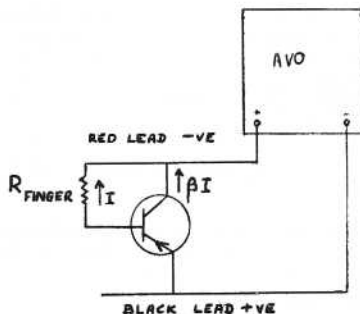
## Testing Transistors with a Multimeter. M.G. Nutt.

This note describes a simple method of checking a transistor with an AVO or similar multimeter.

When the meter is on ohms, the normally positive lead is connected to the negative side of the internal battery.

For a PNP transistor, connect the red lead to the collector and the black lead to the emitter. The meter now reads the leakage current of the transistor. With a wet finger, touch the collector and base simultaneously. A small base current should flow, and be amplified by the transistor causing an appreciable deflection of the pointer. The higher the  $\beta$  the higher the current that flows.

For an NPN transistor, connect the black lead to the collector and the red to the emitter, and proceed as before.



70 cm. pre amplifier (the Birmingham effect). With BBC 2 in the Birmingham Area on full power, trouble may be experienced with the transistorised pre amplifier described in CQ-TV No. 55. The signals from BBC 2 and ITV beat together and produce a resultant signal at approximately 433.5 mc/s. One suggestion has been received from Malcolm Sparrow for reducing this problem.

A tuned circuit is fitted between the input socket and the emitter of the transistor and presents a high impedance at 70 cms.

C 1.5pF

L 1.5turns 18S.W.G.  
 $\frac{1}{2}$ " diameter, tap at  $\frac{1}{2}$  turn  
from earth.



The Northern Convention held at Belle Vue, Manchester, was very successful thanks to Gordon Sharpley G3LEE/T, G6SOG/T, G6ABE/T, GW3JGA, G6OTA/T, G6REH/T and many others. After one or two plug and socket problems which seem to be present at all important occasions the equipment worked well. It is hoped to make this a regular event.

F. Walklett of Chorley, Lancs., is now licenced as G6ABO/T and is constructing a 70 cms. Converter as published in CQ-TV. He would like to obtain a 4 x 150 A and base for his transmitter which will be grid modulated with vision or sound. The aerial is a 6 over 6 slot as in CQ-TV.

Peter Rushworth G6RXB/T is looking for contacts in the Coventry area. He has a test card C Monoscope and Transistorised Sync Pulse Generator working and a Vidicon Camera under construction.

Richard Grindley of Coventry is now licenced as G6ABP/T and is also looking for other "television types" in the area.

Ernest Hoare G6RZD/T of Southwick, Sussex is having good results with his vision transmissions. His transmitter is a QQVO6-40 tripler QQVO6-40 P.A. with 30 watts input to an 8 over 8 slot aerial. The vision modulator is as described in CQ-TV52. Ernest has nearly finished the 40 x 150 A power amplifier in CQ-TV 46. The picture source is a vidicon camera. On the receiving side he uses a Bush TV63 with a converter.

C.R. Sparks is looking for a flying spot scanner so if you have a spare one please contact Mr. Sparks at this address:- 16, Conifer Close, Church Crookham, ALDRSHOT, Hants.,

John Thompson G3NWU of West Hartlepool, County Durham, is building a vidicon camera and soon expects to carry out receiver tests with G3ILD. John's aerials are 8 over 8 for 70 cms and 6 over 6 for 2 meters. The QTH is about 70 feet above sea level.

Michael Hastings of Radlett, Herts., has started building the 70 cms. transmitter described in Practical Television so that he will be ready to transmit vision as soon as he gets a licence.

Alan Masson GM3PSP of Edinburgh is building a flying-spot scanner and hopes to raise some local activity when he starts television transmissions.

David Young of Welwyn Garden City is progressing with his Telecine equipment. The motor control circuit is finished and will be used with a G.B. L516 projector.

A. Dix of Backwell near Bristol, has got his transistorised vidicon camera working satisfactorily.

John Gay G6AAB/T of Yeovil, Somerset should have his camera working and be radiating vision using a transmitter belonging to John Plowman.

Steve Fogerty ZL2ASF of New Zealand says that the activity is rising and that ZL2TAR and Steve himself, should be running 4 x 150 A's at 150 watts by Christmas. Also that ZL2TCX and ZL2TAY are interested in amateur television.

The Slade Radio Society G3SRS has several members who have built television equipment e.g., cameras and Flying-Spot scanners. An invitation is extended to anyone in the Birmingham area to come along.

D. Bloxham of 14 Highland Road, Southsea, Portsmouth, would like to build or acquire a colour projection receiver. Would anyone who could help please contact him.

### FRIENDS SCHOOL TELEVISION

by Nicholas Salmon.

Three years ago, the school was loaned a television camera chain for use as a teaching aid. Members of the Radio Club were naturally very interested in it and soon mastered the operating technique. This was the beginning of the group we now call FSTV.

Apart from learning exactly how each part of the circuit works, our job has been to man the equipment when it is used out of lesson time. Thus, we have been engaged in relaying a swimming match to a larger audience than is possible in the bath itself and relaying part of the Speech Day service to an overflow audience, to quote two examples. We made an interesting contribution to the school play in that the effects men were able to see the movement of the play on a monitor backstage and so time their effects precisely.

However, at the end of last term, we decided to give the school an entertainment over a new medium, that of TV. We think that this venture probably breaks new ground, as far as boarding schools are concerned! We took over the school hall and turned it into a TV studio, using the lighting that is normally used with the stage. Caption stands and announcer's and music group sets were erected as well as sets for particular items. The programme included 'Drama, Comedy, Talk and Music,' and was introduced with an original tune, called 'Refraction'. Technically, we had two cameras, each mounted with a monitor for view-finding on trolleys borrowed from the school kitchen. The studio output fed two 27" monitors in adjacent classrooms.

Although the studio routine was very unorganised, we didn't have to stop completely through faults, and the programme as a whole was a great success with school and staff. We are hoping to do another in December.

## Flying-Spot Scanning.

Very satisfactory results can be obtained with much cheaper equipment; a flying-spot scanner using 5FP7 or MW22.14 scanner and 931A photocell can be built for about £10. Such units will handle positive or negative transparencies, or can be adapted for telecine.

## Club Publications and Facilities.

The Club has published a booklet on amateur television which is now almost out of print, but a quarterly magazine, "CQ-TV", is issued free to members, containing circuits, constructional articles, photographs, and news of member's activities. A few back copies are available at 2/- each from the Hon. Secretary, and earlier editions are available on 35 mm. film strips at 10/6 each, each of which consists of ten issues of CQ-TV. These are available from Grant Dixon.

Grant-Dixon also has an almost complete set of Mullard Technical Communications which are available on loan.

Headed Note Paper and Lapel Badges may be purchased from Malcolm Sparrow. The Lapel Badges are available as either buttonhole or brooch types at 3/6d. Also to special order these are available with call sign attached.

Plastic Adhesive Badges are also available from Malcolm Sparrow. These are for sticking to amateur equipment and cost 1/6d.

## Tape Lectures.

Some recorded lectures are available on loan from Grant Dixon. The titles include:-

Flying Spot Scanning  
Getting Started in Amateur Television  
Slow Scan Television  
Amateur Colour Television  
70 cm.Reception.

## Technical Queries.

These should be as precise as possible and will be answered by volunteers in their spare time. B.A.T.C. cannot supply full circuits and comprehensive data other than those which appear in CQ-TV. Queries should be sent to the Hon. Secretary.

## Components.

Members requiring special components are invited to register their needs with the Hon. Secretary. Help will be given whenever possible, but this does not cover items which may be purchased in the normal way.

## Club Convention.

The Club holds a Convention in London once every two years. During the Convention, which takes place on a Saturday, the general meeting is held, when officers of the club are elected, and any other matters discussed freely.

## TV References.

New members will find the following books helpful:-

BBC TV Engineering series (4 vols.), Amos and Birkinshaw. Published by Iliffe.

TV Engineering D.G. Fink. Published by McGraw-Hill.

TV Engineering Handbook. Edited by D.G. Fink. Published by McGraw-Hill.

Colour Television. P.S. Carnt & G.B. Towns- end, Published by Iliffe.

Sound & TV Broadcasting - General Principles. K. R. Sturley. Published by Iliffe.

## CQ-TV

Contributions to the magazine are welcome and members are asked to send in news of their activities, and in particular, to send in articles or any practical hints they may pick up in the course of their amateur TV experiments.

## Membership.

Membership costs 10s. (\$2) per annum, payable on the 1st January. New members are asked to enclose 1s. per month remaining of the current year plus 10s. for the following year.

Details are available from the Hon. Secretary of B.A.T.C.



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Reading 56256

4, Trafford Rd

Reading.

READ

**CQ-TV**

TO KEEP IN TOUCH WITH  
AMATEUR TELEVISION ACTIVITIES