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## Editorial

The work of Arthur Porter, G2CDX, as the former Editor of Cambeam has been widely acclaimed, and has rightly earned for him the Clubs highest award,

To follow an established success is no sinecure. The new Editor, off alas!, to a slow start, due partly to a change of QTH, will strive to maintain the high standard already set, and to that end will welcome the continued co-operation of members in providing the news.

Owing to the use of material left over from the previous issue, some items have of necessity been curtailed. In future issues it is hoped to expand the Club News to include more details of members' activities and plans. Please keep the news rolling in.

73

G3BBY - G6BBY/T  
A.D.Wiles,  
41, Brampton Road,  
CAMBRIDGE.

PEN PORTRAIT NO. 4.  
Arthur Porter, G2CDX

All the previous pen portraits have had one thing in Common, not one of them is employed in the Radio trade. Our subject for this issue also has this common link, for Arthur Porter, G2CDX is employed by the Agricultural Research Council to do Food Research (One of his colleagues is. Arnold Tomalin, G3PTB, who is our guest Auctioneer.)

Arthur first became interested in Radio in the 1920's and along with many others began his hobby by assembling a kit of parts, a "Mallard Master Three", and started logging European DX on the medium waves.

His interest in Clubs dates from these early days and he soon joined the Cambridge Wireless Society which met in those days at the Hermitage in Silver Street Street. For a short time he acted as Treasurer, but Interest in the Club waned when radios began to be Produced. The Club was wound up and the balance; sent off to the Wireless for the Blind Fund.

A series of short wave receivers was then constructed and listening began mainly at this stage on the broadcast bands .

The Artificial aerial licence 2CDX was obtained in 1936 for "Experimental Purposes" on 1.7, 7 and 14 Mc/s, and it is interesting to note that the G.P.O, would not extend this to cover the 56 Mc/s band until "further experience has been acquired". The interest in V.H.F. had already started.

Arthur was always ready to give a hand on NFD's, etc, and has vivid recollections of Standing On a rubber mat to adjust the H.T - about a dozen 120 volts (nominal), dry batteries,.

Just before he obtained his A.A call another club was started and, Arthur BBS 2328 became its secretary. He still has a Notebook with jottings from this period with Committee call signs of

G5JO, G2PL, G2XV and G5PU. Also non-licenced members, P. Broom, S.Kharbanda, (now G5DQ and G2PU respectively) and many other names that conjure up memories.

After the war, Arthur, now married and with a family, had less time for amateur radio but turned his interest to television and constructed several receivers and experimented with T.V aerials. This also meant that some test gear had to be made and signal sources, scopes, etc, were all built, invariably these, were soon modified .

When the present Club was started in 1950 Arthur became the first secretary and has now seen the Club expand to its present size. After a stint as Chairman, Arthur is back as secretary for one year only as he is expecting to be transferred to Norwich in the Autumn of 1967.

Approached by the Chesterton Evening Centre a few years ago he started a Radio Hobbies class which, after two years, was turned into a R.A.E. Course, (the only one in the area). There was no alternative but to sit the exam himself and to swot up the morse. After a nerve-wracking wait the results were announced and the old call of G2CDX applied for and granted.

In October 1964 he was awarded a "Four Metres and Down Certificate" and at the present' time has worked 13 countries all on phone on less than 30 watts. His aim is to get the "Senior 4 Metres and Down Certificate" before

he moves to Norwich,,

At the 1965 Annual Dinner, Arthur's excellent work as Editor of the Cambeam was fittingly rewarded by the award, of the Granfield Trophy for that year.

#### FROM OTHER JOURNALS

The accent is on transistorised equipment in most of the articles mentioned below.

The G.D.O. has been described as the second most useful piece of equipment in the shack. If you do not possess one, or already have an A.C. driven model, you will be interested in the Transistorised G.D.O. described in the R.S.G.B. Bulletin, for April 1966.

The May 1966 issue of the same journal presents another useful and battery-economising device in the mains P.S.U. for Transistorised Equipment,

Two articles in the <sup>W</sup>ireless World for April 1966 are of more than passing interest. The first, Attenuation in Coaxial Cables by G3NVR, is written with special reference to amateur installations, and contains some useful advice on keeping track of those elusive dbs. The second is the very comprehensive survey of communication receivers, covering some 40 sets with prices ranging from -£25.10.0. to £2,700('), Detailed specifications are also given. This is required reading for anyone whose BC 348 is about to de-function!

Finally, T.V. enthusiasts are recommended to read about the Transistor T.V. Camera described in Practical T.V. for August 1966.

### KIWI AT LARGE

Meet Glenn Kingston, ZL2AFD/G3UZC. New Zealand Post Office Microwave Engineer from Hastings, who is on a working trip round the world. After a very brief stay in the U.S.A. Glenn is making the round of telecommunication centres in this country and is shortly to leave Cambridge for Coventry where he expects to spend 2 months genning up on commercial UHF and the more exotic frequencies. He is then taking a holiday touring through Europe en route to his home town.

Some interesting and mouth-watering details of the ZL licence conditions emerged in the course of a personal QSO with Cambeam. Licences are granted after a technical examination and a proficiency test in morse at 12 w.p.m.. For one year the new Ham can operate on 80, 144 or upwards, CW or phone. The licence fee is 30/-, If 50 contacts have been made by the end of the year, then a further successful, morse test at 15 w.p.m. allows operation on all bands, including 6 metres. The fee remains at 30/-. This includes portable and mobile operation. (British Post Office please copy),

Glenn, whose main activity is on 80 m says that T.V.I, in reverse can be very troublesome on 50 Mc/s. but that the band is much used. Top band enthusiasts are few, but all other bands are well occupied. There are some 2000 hams in New Zeal and out of a total population of 2½ million. Proportionally this represents about 36000 licences in Great Britain. Did someone say that bands are already overcrowded?

Glenn wishes to thank all members of CADARC who have made his stay in Cambridge so pleasant and will take back happy memories of his short but welcome stay with us. Good luck O.M. and maybe one of our dx fans will have the pleasure of working you in the near future.

THE INVERTED V AERIAL .  
Contributed\_by\_E. C. Papworth.

A 4" wave vertical has many advantages over a horizontal dipole in that it has a very low angle of radiation (ideal for DX working)} it can be erected in a small space and it has a useful gain over a dipole. A good aerial could work out, if these advantages were combined, with the bi-directional radiation patterns of a dipole

The inverted V has these features, and has been used with great advantage by many amateurs the world over, both for transmitting and receiving. Basically the inverted V is a dipole suspended from its centre but it can be suspended with its centre at its lowest point i.e. like a letter V. Suspending the aerial in this way has no detrimental effect on its performance,, This means that it is quite possible to suspend two of the aerials for two bands in diamond fashion,

An inverted V takes up very little space as several aerials need only one mast and can be used as guys as well if wire of sufficient strength is used. In this way it is quite possible to use one mast 30ft. high to support a 132ft.V for 160 m, and 80 a, a 67ft V for 40 m, two V's for 20 m and 15 m and a V for 10 m, (See fig, 2 and table 1),

TABLE 1.\_

BAND	f 1	f 2	ANGLE A
80 m	67 ft.	67 ft.	90 to 135°
40 m	34 ft.	34 ft	"
20 m	17ft.5 in,	17ft.5 in.	"
15 m	11ft 4 in	11ft.4 in.	"
10 m	8ft.	8ft.	"

NOTE.

5% is added to a normal ¼ wave in the case of an inverted V.

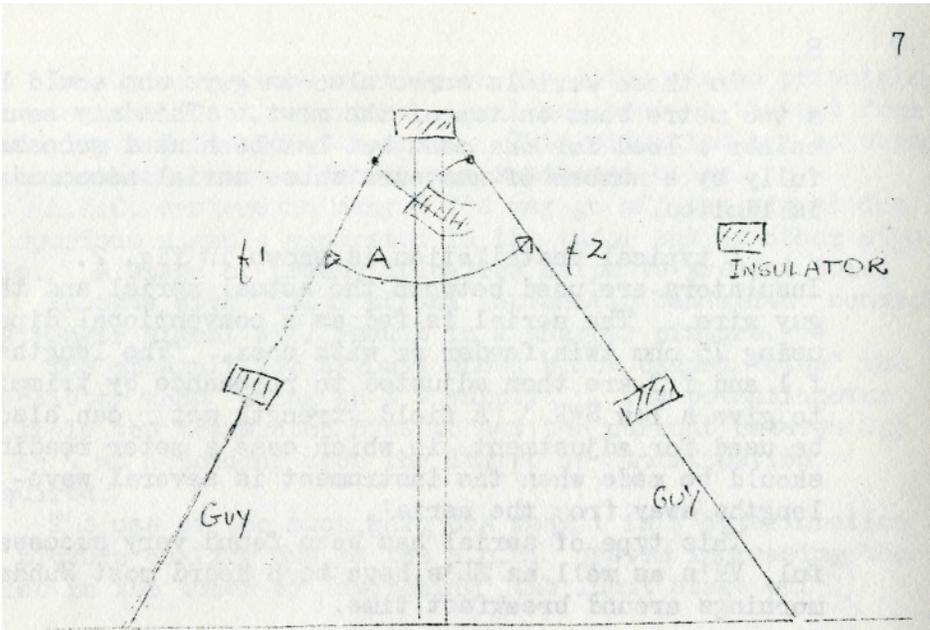


FIG 1

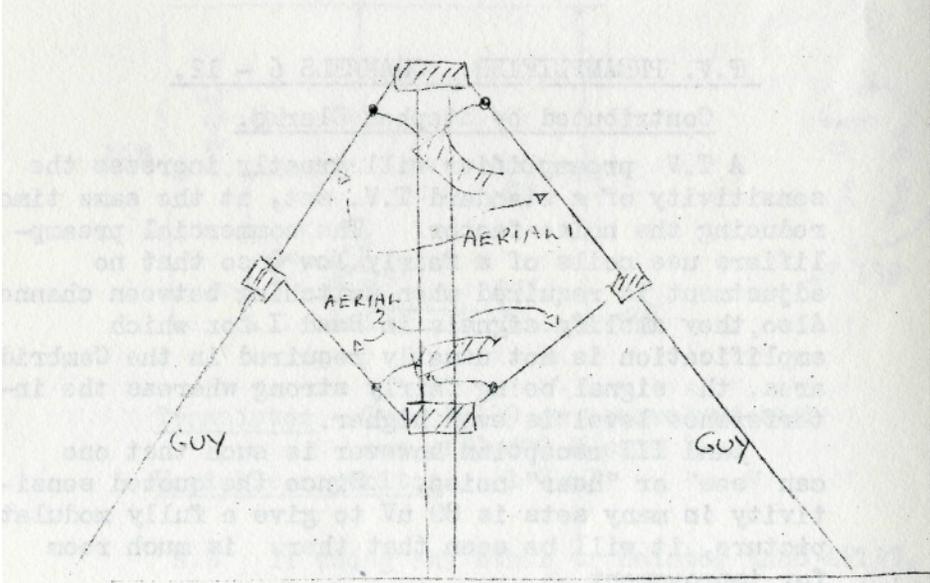


FIG 2

As these aerials serve also as guys one could have a two metre beam on top of the mast. This may sound rather a load for one mast but has been used successfully by a number of amateurs, whose aerial accommodation is limited,

A typical installation is shown in fig. 2. Insulators are used between the actual aerial and the guy wire. The aerial is fed as a conventional dipole using 75 ohm twin feeder or with coax. The lengths  $f_1$  and  $f_2$  are then adjusted to resonance by trimming to give a low SWR. A field strength meter can also be used for adjustment in which case a meter reading should be made when the instrument is several wavelengths away from the aerial,

This type of aerial has been found very successful, VE's as well as ZL's have been heard most Sunday mornings around breakfast time.

T.V. PREAMPLIFIER; CHANNELS 6 -12,  
Contributed by Stephen Clarke .

A T.V. preamplifier will greatly increase the sensitivity of a standard T.V. set, at the same time reducing the noise factor. The commercial preamplifiers use coils of a fairly low  $Q$  so that no adjustment is required when switching between channels. Also they amplify signals in Band I for which amplification is not usually required in the Cambridge area, the signal being fairly strong whereas the interference level is even higher.

Band III reception however is such that one can "see" or "hear" noise. Since the quoted sensitivity in many sets is 80  $\mu$ V to give a fully modulated picture, it will be seen that there is much room for improvement

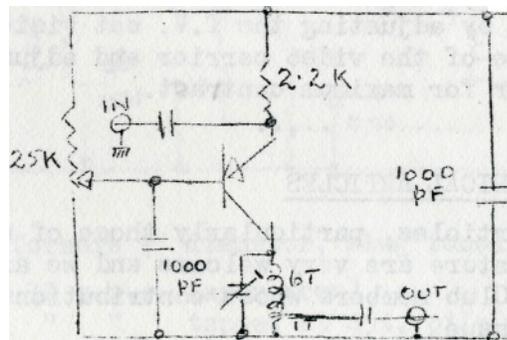
In a.g.c. systems working on the gated vision principle noise on the black reference signal may prevent the set from producing a full set of tones. This situation may be cured as may others, some of which are mentioned below.

A.F.C. systems in many T.V's may go off the signal due to spurious signals generated in the tuner and by other signals. A stage of preamplification helps to prevent this.

In sets with Miller effect automatic bandwidth control a stronger signal will result in a sharper picture.

The preamplifier circuit shown below cannot "blow" the transistor when using an 8 V supply. The potentiometer controls the transistor bias to set the current between 0 mA or 5 mA depending upon the degree of **amplification** required.

The use of too much gain can result in a deterioration in picture quality due to the a.g.c. system increasing the noise in the tuner by "switching" the input stage off.



Transistor Type AF139 or equivalent with  
cut - off > 400 M/cs Variable  
capacitor 1-8 pF

## Construction

All leads carrying the signal should be of minimum length. A miniature non-inductive resistor is recommended for the 2.2 k ohm emitter load. 1/10 watt is adequate

The coil is 7 turns of 18 g tinned copper wire and is  $\frac{3}{8}$ " long,  $\frac{1}{4}$ " or  $\frac{3}{16}$ " diameter. This is not very critical since the coil will cover a wide range.

The output circuit can conveniently be constructed in a valve can with the transistor half in and half out. If an indoor aerial is in use the whole assembly can easily be fitted in the aerial base.

## Results

In Girton with the preamplifier used with an indoor aerial, channels 6 and 11 are received at viewable strength while channels 7 (Continental 809 lines), 8, 10, 12 may be received using a 2 metre beam. The amplifier can best be tuned for maximum gain by adjusting the T.V. set vision to the sound side of the video carrier and adjusting the amplifier for maximum contrast.

## TECHNICAL ARTICLES

Technical articles, particularly those of a constructional nature are very welcome and we are grateful to the Club members whose contributions appear in this issue.

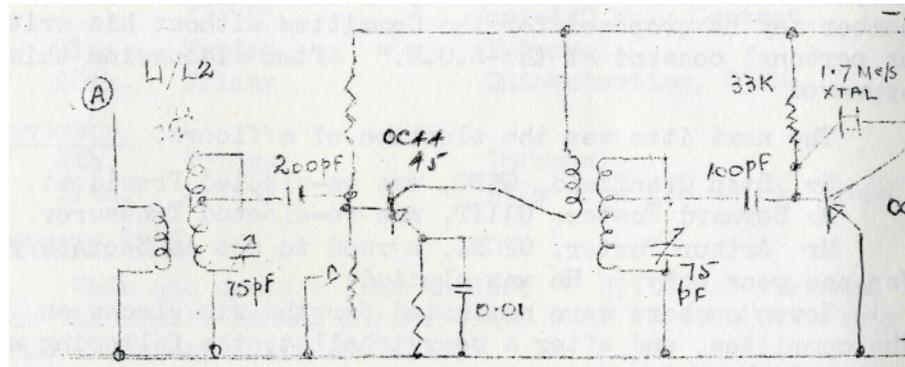
Articles for publication should, if possible, occupy one or two pages including diagrams (one-page requires approximately 350 words). Diagrams should be drawn to column width ( about  $4\frac{1}{2}$ " to 5") this makes for easy copying.

# A CRYSTAL CONTROLLER CONVERTOR FOR 160M

Contributed by Stan Granfield G5BQ

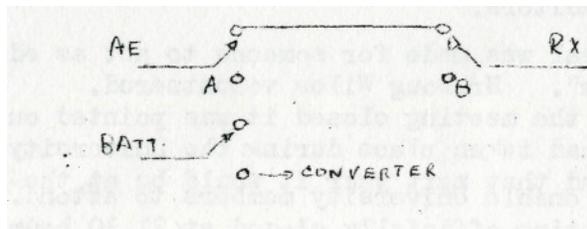
The following simple Xtal-controlled converter which enables the 160 m band to be tuned on the long wave band is described by courtesy of the South London Mobile Club.

The first transistor is a straightforward R.F. amplifier and the second combines the function of oscillator and mixer. If the specified 1.7 Mc/s crystal is used the low frequency end is restricted to 1.85 Mc/s, but there seems to be no reason why a lower frequency such as 1.65 Mc/s should not be used and the whole band covered. A 3-pole switch is used to switch the battery and also to transfer the aerial.



All formers  $\frac{1}{2}$  diameter, slug tuned.

- L 1 10t 32 s.w.g layer wound
- L 2 60t " " tapped at 45t, pile wound
- L 3 20t " " layer wound,
- L 4 as L2.



ANNUAL GENERAL MEETING 1965-1966

The 16th, Annual General Meeting was held on Friday March 25th, 1966

It was gratifying to see a reasonable turnout of members this year. After the formal preliminaries, Stan Granfield, (The President) reviewed the year's activities, This was followed by the Treasurer's statement which was adopted, after slight modification, to remove two items of income that rightly belonged to the year 1966,

Howard Waton (the retiring Secretary) then introduced the proposed modification to rule 6, by the addition of "No member may be proposed for the Committee without his written or personal consent at the A.G.M." After discussion this was approved

The next item was the, election of officers,,

Mr Stan Granfield, G5BQ, was re-elected President,  
Mr. Bernard Foster, G3IIT, was re-elected Treasurer  
Mr Arthur Porter, G2CDX, agreed to act as Secretary for one year only. He was elected.

Seven members were nominated for the six places on the committee, and after a secret ballot, the following were declared elected; -

Mr Richard Baker	G3USB
Mr John Carter	G30WB
Mr Jerry Chapman	G3PTQ
Mr Les Beeson	G3IVB,
Mr Peter Long	G6AAU
Mr Howard Waton	G3GGJ

Messrs Doug Wiles, G3BBY and Doug Free, G3HBP were appointed Auditors,

An appeal was made for someone to act as editor for the "Cambeam". Mr. Doug Wiles volunteered.

Before the meeting closed it was pointed out that the A.G.M. had taken, place during the University vacation.

It was agreed that next year it would be at the beginning of March to enable University members to attend.

The meeting officially closed at 21.30 hours

EVENTS DIARY.

September

23rd, Friday ,	Informal
24th Saturday	Leisure Opportunities Fair at the Guildhall, 11 a.m. to 8 p.m.
30th Friday	Briefing the Regional Rep.

October

7th. Friday	Informal.
14th. Friday	Bumper Sale
15th/I6th Saturday/	21 28 Mc/s Contest and 420 Mc/s Contest.
21st. Friday	Informal
28th, Friday	Quickstarting, Q5UM.

November

4th. Friday	Informal
11th. Friday	Film Show (to be confirmed)

January 1967

This one casts a long shadow. G3IIT has Arranged for the Club's Annual Dinner to be held at the University Arms on Friday 20th. 1967.

/M CLUB MEMBERS,

We would like to compile a list of members who are /M on top band. Please let the Secretary have particulars.

Among those known to be active are G5JO, G2PU, G3JMJ, G3GGJ and G3PTQ - we are sure there are others.

STRAYS.

The Committee have appointed a small technical sub-committee to examine and report back their recommendations for making the Club Station fully operational. The two members are Richard Baker, G3USB and Les Beeson G3IVB.

The mains voltage at the Club has recently been raised from 200 to 250 volts. Resulting in appreciably higher temperatures from the heaters and the necessity of checking the transformer tapings on the equipment that we already have.

The 2-metre station is now nominally complete (subject to voltage adjustment) but has not yet had a try-out on the air.

We seem to have lost at least one element from the newly-erected beam during the recent gale so perhaps we need another aerial rigging party soon.

Arnold Tomalin G3PTB, who is now Chairman of the Norfolk Amateur Radio Club, came over from Norwich on April 15th to act as auctioneer at the Junk Sale which he conducted in his usual inimitable fashion. We were delighted to see several new faces at recent meetings, they included.'-

Jim	W3ZGG	Babraham
D. T. Grafham	G3MKG	R.A.F. Oakington
T. A. Thomas	GW8AID	Papworth
G. C. Rolfe		Cambridge
D. Pearce		Cambridge

## IN YOUR SHACK

Cambeam will be glad to have details of members projects and particularly of any problems met and overcome, A recent inquiry showed that, considerable constructional activity is taking place in a number of local shacks.

G3UUY (David) is making a 2 -metre portable transmitter-receiver., housed in a 6" x 6" x 6" aluminium case. The receiver section, already completed, has logged local stations, the transmitter section will be finished shortly. David has promised full details to Club members when the equipment is operational. It has been suggested that this would make a very interesting and useful Club project,

G6AAU (Peter) is in the throes of antenna construction.

Stephen Lilley has constructed a transistorised T.V. camera of miniature proportions and is awaiting scan and focus coils to finish the job. This camera will also be demonstrated at the Club.

G5BQ, (Stan) in addition to working on a broadcast receiver is also collecting material for a T.V. Camera.

G3MKG (Don) has a 2 metre transmitter under construction. This will be a full power job. Should be plenty of local activity on this band before long!

## LATE NEWS

Arnold Tomalin GBPTB, has been elected Chairman of the Norfolk Amateur Radio Club, We send our congratulations, Tommy, and hope that your exalted position will not debar you from continuing the painless extraction job you do so well at Cambridge.

Copies of the N.A.T.C. Magazine, CHALLENGE, have been received and can be read at the Club, The Editor of Cambeam (getting in a sly one here) hopes that readers will note the very high proportion of contributed articles 'Nuff sed?

Non-transmitting members who are desirous of obtaining their ticket will be interested to know that RAE technical classes are being conducted at Ely by Ian Waters, G8ADE -G6KKD/T, Morse instruction is given by G3CZA,.

The Fen Net is in session on 144.8 Mc/s most evenings at 21.00 hrs,. Call signs heard so far include G3KGR, G3IAG, G8QM and G3REH.

The Club will shortly lose another stalwart in G30WB, Nick Carter, whose now QTH will be in Kent. Nick is disposing of a large quantity of gear, which it will not be possible for him to take with him. He will be available for some time at weekends and would welcome a visit from Club members.

The Editor acknowledges the help given by G2CDX and G3GGJ in compiling and presenting this issue of Cambeam.