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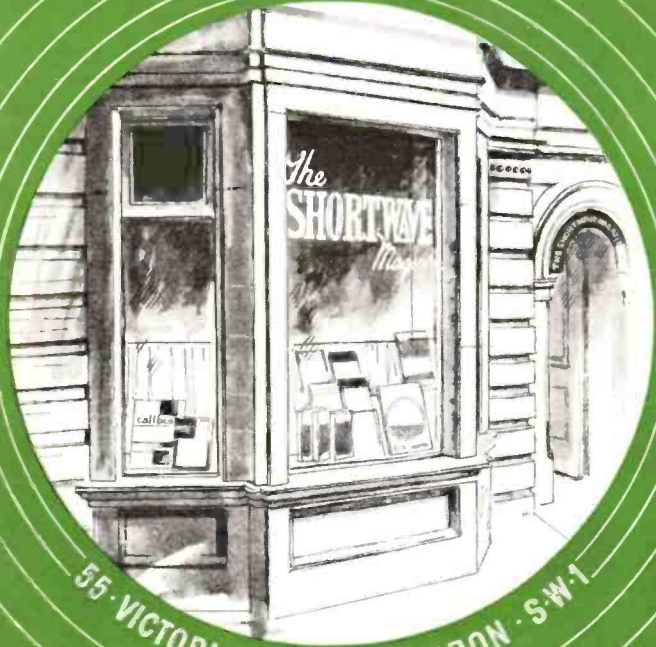
# SHORT WAVE *Magazine*

VOL. XXVIII

JUNE, 1970

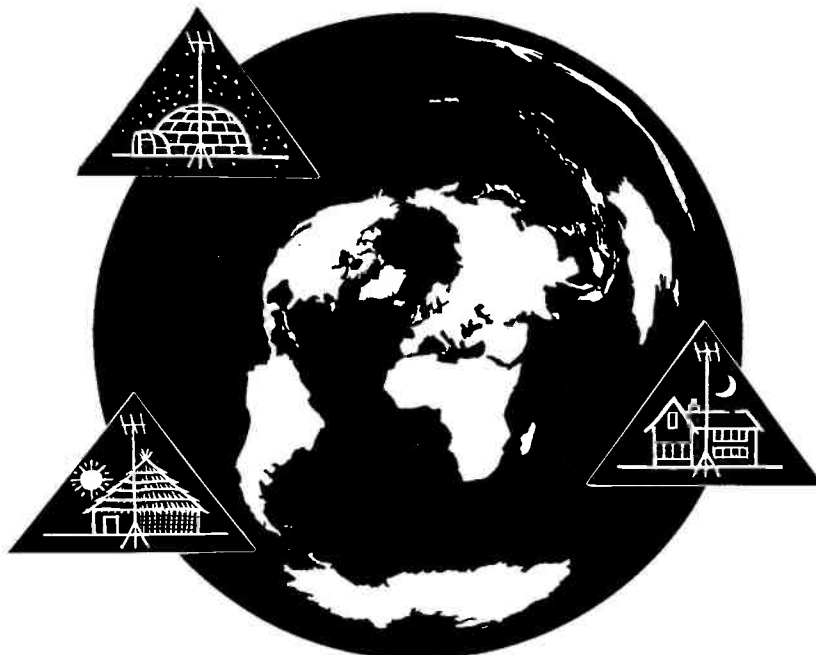
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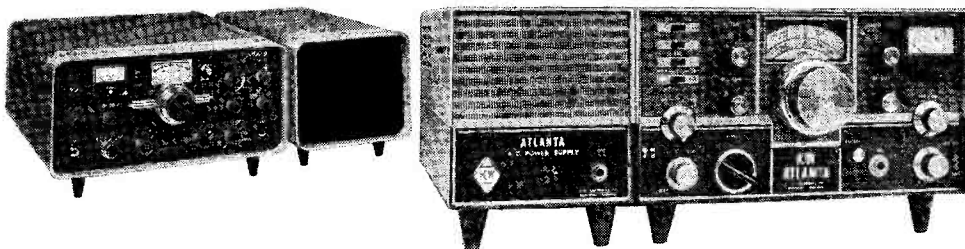


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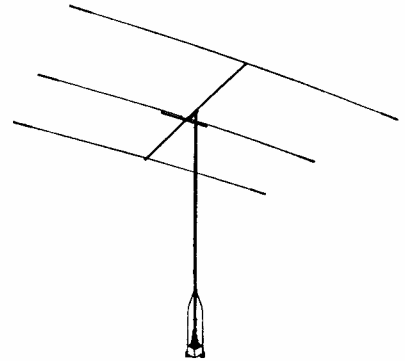
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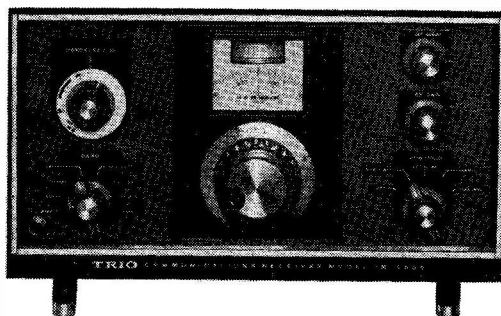
\* Illuminated dials permit easy tuning and band spread readings. \* Continuous coverage from 550 KHz to 30 MHz and direct reading dial on amateur bands. \* Close calibration accuracy with an excellent anti-backlash mechanism. \* A mechanical filter enabling superb selectivity with ordinary IF transformers. \* One RF and two audio stages of amplification, insuring high sensitivity and selectivity. \* A Product Detector making possible clear SSB reception.

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\* Frequency Ranges: Band A 550-1600 KHz, B 1.6-4.8 MHz, C 4.8-14.5 MHz, D 10.5-30 MHz. \* Sensitivity: 2 $\mu$ V for 10dB S/N Ratio (at 10MHz) \* Selectivity:  $\pm$  5 KHz at -50dB \* Power Consumption: 45 watts \* Audio Power Output: 1.5 watts \* Tube & Diode Complement: 6BA6 $\times$ 3, 6BE6 $\times$ 2, 6AQ8 $\times$ 2, 6AQ5, SW-05 $\times$ 2, SW-05 $\times$ 2, IN60 $\times$ 2. \* Dimensions: Width 15", Height 7", Depth 10".

### Model JR-500SE CRYSTAL CONTROL TYPE DOUBLE CONVERSION COMMUNICATION RECEIVER

\* Superior stability performance is obtained by the use of a crystal controlled first local oscillator and also, a VFO type 2nd oscillator. \* Frequency Range: 3.5 MHz-29.7 MHz (7 Bands) \* Hi-Sensitivity: 1.5 $\mu$ V for 10dB S/N Ratio (at 14MHz) \* Hi-Selectivity:  $\pm$  2KHz at -6dB  $\pm$  6KHz at -60dB \* Dimensions: Width 13", Height 7", Depth 10".



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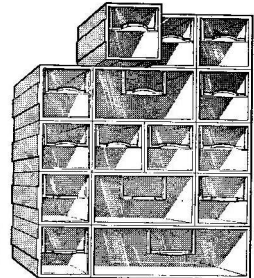
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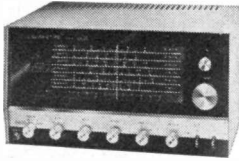
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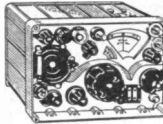
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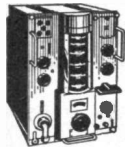


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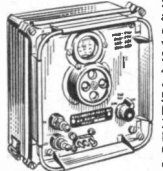
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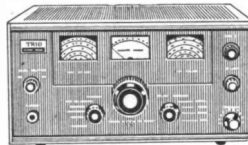


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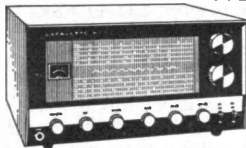
**TRIO 9R-59DE**

4 band covering 550 Kc/s. to 30 Mc/s. continuous and electrical bandspread on 10, 15, 20, 40, and 80 metres. 8 valve plus 7 diode circuit. 4/8 ohm output and phone jack. SSB-CW - ANL. Variable BFO. S meter. Sep. bandspread dial. IF frequency 455 Kc/s. audio output 1.5w. Variable RF and AF gain controls 115/250v. A.C. Size: 15" x 15" x 10" with instruction manual, £42. Carr. paid.



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**TRIO JR-500SE AMATEUR RECEIVER**

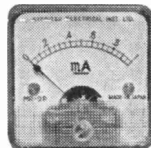


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750mA	27/6	3v DC	27/6	300v AC	27/6
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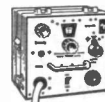


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Fellow near me got a real bargain second-hand car—the dealer gave him £25 more than anyone else for his trade-in, which of course made him very happy. "Really pays to shop around," he says, "I got £25 I wouldn't otherwise have got." Quite true, it does indeed pay to shop around, but I hate to tell the poor clown that he's bought a heap of trouble for £50 above its true value. They never learn!! Shop around, lads, compare prices, but look at quality and condition as well, talk to people, and for goodness sake be sure you're buying wisely. Talking of buying wisely (ah ha! Here it comes, I knew there'd be a catch!) look at second-hand Sommerkamp gear. Seriously, the second-hand Sommerkamp market gives me cause to be rather chuffed with myself. Reading the small ads, one sees a fair old selection of modern equipment for sale, but surprisingly few Sommerkamps (or Inoue's for that matter) and the few you do see are not much under list price. Come to think of it, a three year old FR-100B costing £112 new is still fetching £80-£90. Must be a moral somewhere.

Still harking on good buys—any of you remember me showing the Super 600GT transceiver at the 1968 Exhibit? You probably won't remember because I didn't push it. Anyway, nearly two years has gone by since they first came on the JA market and during those two years, they've been modded and prodded to some purpose. Mr. Hirakawa (whose company makes them) showed me the latest model when I was in Tokyo and I was very impressed indeed. So much so that I'm importing them in quantity to sell at £180 or less complete. Should be here around the end of the month—so come along and try one out. I should also mention their linear—very nice 1500W, electronically regulated screen voltage, grounded grid. Around £100. By the time you read this we should have supplies of the new FT dx 560. Sorry to disappoint you, lads, but it's the same as the FT-500 except that the AM facility is missing and the front panel styling is slightly different. Even the price is the same!

Incidentally, we are the proud possessors of a Star SR-200 sent to us some time ago without any identification whatsoever. Would the owner please not be so coy—tell us if you want us to repair it, buy it, flog it, or just admire it.

Talking of flogging, we've got loads of stuff in stock, Rx's, Tx's, transceivers both new and second-hand, as well as Tavasu aeriels, ammeters, capacitors, chokes, coils, converters, connectors, crystal calibrators, CW monitors, filters 9MHz K.V.G., 455 kHz Kokusai, Medco H.P. and L.P., knobs, microphones, morse keys, electronic keyers, regulated low voltage power supplies, resistors, speech compressors, SWR meters, enamelled copper wire, valves, etc., etc. Tell you what—send me a large s.a.e. and I'll send you lots of guff. Got gear to flog? If it's nice, we'll buy it of flog it for you on 5% commission.

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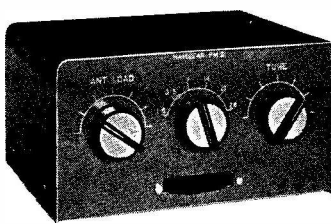
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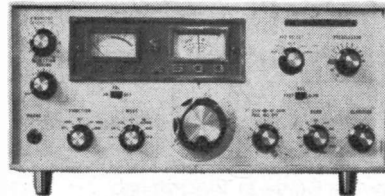
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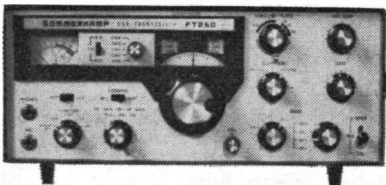
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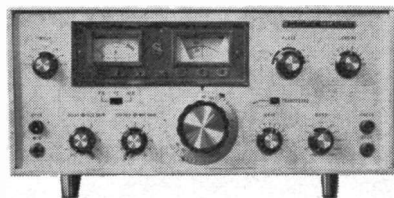
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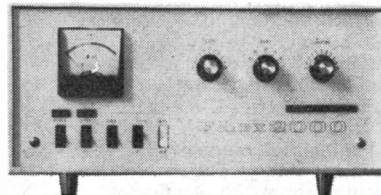
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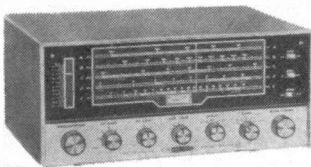
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# The SHORT-WAVE Magazine

## E D I T O R I A L

**Reflection** *In these days of rapid development in the art of electronics—for it is now an art as well as a science—the field is so vast that no one individual can have much knowledge, and certainly very little experience, outside his own particular range of activity. The cleverest men are those who realise how little they know and how much there is to learn.*

*As radio amateurs, many of us are not bound by the limitations of the professional radio engineer, who has to keep his mind on the particular aspect of the subject that earns him his living. As free-lance radio men, we can range over the whole field at will—whether it be communication, HF or VHF, CW or phone; UHF experimental work; audio and high-fidelity engineering; recording; transistory in all its many new and developing applications; the enormous field for what are known as “electronic devices,” meaning those used for switching, counting, computing, sampling, checking, heating and even cooling; amateur television transmission; remote control by radio—and a great many more lines of development to which electronics can be applied.*

*All this gives the intelligent amateur a wider range of interest than the professional and it can be said that many an amateur is, thereby, a more competent practical man than his professional confrère. Of course, this cannot apply in every case or even in the majority, but it is beginning to become evident to an increasing extent.*

*And it is this fact that enables the amateur to hold his own in the field and to make him a useful, as well as a very important, member of the whole fraternity of radio men.*

*Austin Forsyth,  
G6FO.*

---

## LOW IMPEDANCE AERIAL FEED AND THE PROBLEM OF TVI

DISCUSSING PRACTICAL ARRANGEMENTS TO MINIMISE  
HARMONIC RADIATION WITH HF BAND SYSTEMS

I. E. HILL (G6HL)

*There can be little doubt that till all TV is on the colour-frequency channels in Bands IV and V, the problem of TVI will continue for many amateurs operating in our HF Bands. As has so often been said, each case is an individual one and much patience and neighbourly co-operation is usually necessary to effect a cure acceptable to all parties concerned—and that does not necessarily mean that the cure is for the amateur concerned to close down during TV hours. Any licensed AT-station operator should display a degree of firmness when confronted with neighbour-complaints, for he also has his rights. It should be made clear to them that their co-operation is needed in clearing the trouble. Staff of the Ministry's Radio Interference Branch, by now highly experienced in dealing with TVI where amateurs are concerned, can be very helpful and their aid and advice should be sought without hesitation. This article discusses, from the practical point of view, further work that can be done at any amateur station to make sure that, to start with, harmonic radiation is minimal.—Editor.*

**P**ARTICULARLY for the 28, 21 and 14 mHz bands, trap multi-band aerials are attractive and can take the form of rotatable Yagis or vertical Ground Planes. Both offer SWR below 2 : 1 over an adequate bandwidth and a low impedance feed usually at or about 50 ohms. At first examination such aerials should be easy to feed using 50-ohm coaxial cable from a  $\pi$ -output amplifier with an effective Low Pass Filter inserted in the line to reduce harmonic radiation. This can be done and radiated harmonics held within accept-

able limits but there are difficulties, particularly with vertical aerials and in fringe TV reception areas. In addition to being a multi-band aerial resonating at the design frequencies a trap aerial, and also most other types, will produce quite a lot of radiation at higher frequencies in the TV band and need very little harmonic input to cause trouble. The radiation pattern at these frequencies will also most likely be quite different from that at the design frequencies.

At his present QTH the writer is surrounded by tall fir and other trees which make erection of a beam rather difficult and therefore preference has been given to a Hi-Gain 12AVQ multi-band trap Ground Plane supported on a 50 foot pole and fed with 52-ohm coax. The Linear Amplifier is variously any one of several having either 4CX/250 or 4CX/350 valves with  $\pi$ -section output and operating in Class-AB1. The 52-ohm output is switched from the PA's through a multi-section Low Pass Filter (of the type described recently in the *Magazine*) and also a SWR Indicator, to any one of several low-impedance feed aerials, or alternatively, to a 52-ohm dummy load.

The 12AVQ Trap Ground Plane has near 1 : 1 SWR at resonance and less than 2 : 1 anywhere within the three amateur bands 28, 21 and 14 mHz. This means that the LPF is not always operating into design impedance and the result is increased attenuation in the passband, *i.e.*, loss of output power. By the insertion of an Aerial Tuning Unit between the LPF and aerial feeder the load presented to the LPF can by adjustment be maintained at a constant level throughout each band although the aerial will still present varying SWR on the other side of the ATU. There is the additional advantage that the ATU will provide yet another tuned circuit at the operating frequency and hence further harmonic attenuation.

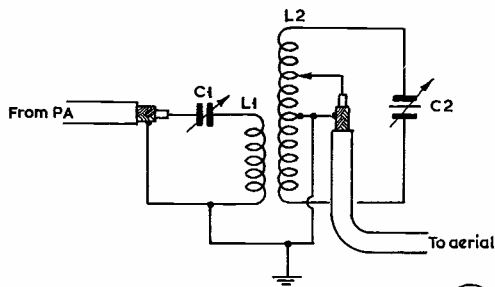


Fig. 1. A.T.U. - using split-stator capacitor

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Fig. 1. L1 is mounted inside and central with respect to L2. The aerial coax feed outer is strapped to the centre of L2.

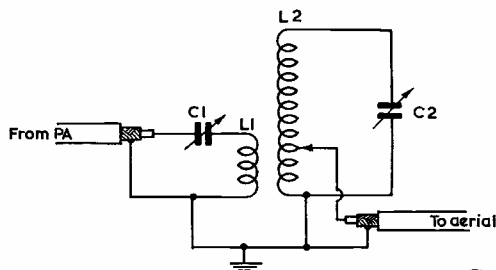


Fig. 2. A.T.U. - using single capacitors

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Fig. 2. L1 is mounted inside and at the earthy end of L2.



Freq. Band	C1 max pF	C2, max pF		L1, 2in. dia.	L2, 2½in. dia.
		split-stator	single		
28 mHz	300	100	50	2 turns, 14g.	5 turns, 3/16 in. dia. copper tube
21 mHz	300	100	50	2 turns, 14g.	7 turns, 3/16 in. dia. copper tube
14 mHz	300	150	75	3 turns, 14g.	10 turns, 3/16 in. dia. copper tube
7 mHz	500	200	100	6 turns, 14g.	18 turns, 12g. enam.
3.5 mHz	500	300	150	10 turns, 14g.	42 turns, 14g. copper

Fig. 3. Coil sizes for the ATU's. L1 is wound at 8 turns per inch for spacing.

**ATU Construction**

To minimise adjustment when band changing and to give flexibility in trying other TVI precautions referred to later it was decided to have a separate ATU for each frequency and switch between them. This also avoids the danger with a tapped ATU that the unused part of the circuit happens to resonate at an unwanted harmonic frequency.

The unit actually built covered only the 28, 21 and 14 mHz bands but details of similar coaxial-to-coaxial ATU's are given for 7 and 3.5 mHz.

Three separate ATU's were built into one 17in. x 12in. screened chassis behind a 19in. x 10½in. panel, on which switch and capacitor controls were located. The 28 mHz coil was placed centrally with the 14 and 21 mHz coils on either side and mounted at right angles to each other to minimise coupling. Input and output coaxial cables were switched. Coaxial switches would be preferable but are not essential if care is taken to minimise lead length and use stout conductors. If it is decided to earth coils not in use care must be taken not to form coupling loops of the shorting leads and thus defeat the objective. It is probably best to rely on good spacing and coil orientation to avoid unwanted inter-ATU coupling and leave out of use coils earthed only by the output coaxial ground connection.

Depending on materials available, and most amateur construction is dictated by contents of the junk box, the ATU's can take several constructional forms. Using split-stator capacitors the configuration of Fig. 1 is attractive, principally because rubbing contacts are avoided in the resonant RF tank. Capacitors should be 100 µµF per section for the higher frequency bands and larger for the lower frequencies. An alternative using single capacitors is shown at Fig. 2 and in this case a maximum of 50 µµF will be adequate for the higher frequencies. Coil and capacitor sizes for all five HF

Fundamental Band	Harmonics mHz
14 mHz	42, 56, 70
21 mHz	42, 63
28 mHz	56

Fig. 4. Potentially troublesome harmonics, referred to Band I TV channels.

bands are given in Fig. 3. C1 can be connected as indicated, in which case both stator and rotor must be adequately insulated from chassis and earth, or alternatively L1 can be connected directly to the coaxial cable and C1 between the other end of L1 and earth.

Resonance is obtained by adjustment of C2, coupling to the aerial by varying the tap position on L2 and coupling to the PA by adjustment of C1.

**Adjustment and Tuning of PA and ATU**

Switch to the band required and connect the PA output to the dummy load via the SWR Indicator and Low Pass Filter. Adjust PA tune and loading in the case of *pi*-output, or PA tune and link if this system is used, until a maximum "forward" reading is given by the SWRI and PA input is correct. Switching the SWRI to "reverse" should give a zero or near zero reading. An RF ammeter, connected by short lead in series with the dummy load, will give an approximate indication of power output ( $W=I^2R$ ). For a Class-AB1 amplifier the output power should be at least 50% of input and progressively greater for Class-B or Class-C operation.

Now switch PA and aerial feeder to the appropriate ATU, still via LPF and SWRI. Switch SWRI to "reverse" and adjust ATU tune C2 and coupling C1 until a zero or near-zero reading is obtained. Switch SWRI to "forward" and note that a full-scale reading should be obtainable falling to zero or near-zero on "reverse." At this stage check PA input; if it does not reasonably correspond with the input obtained when feeding the dummy load readjust the aerial taps on the ATU and continue the tuning process until loading is correct. An alternative method of adjusting the aerial taps is to insert another SWRI in the aerial feeder and adjust taps for zero or near-zero in the "reverse"

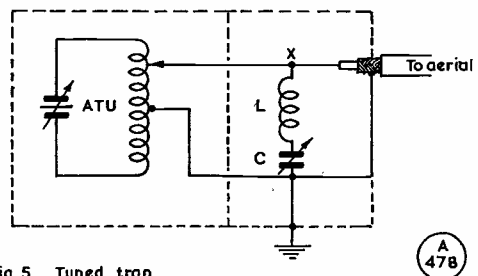


Fig. 5. Tuned trap

Fig. 5. Tuned trap, details as given in Fig. 6, p.208.

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Freq. mHz	42	56	63	70
C max. value, pF	50	50	50	50
L number of turns	6	5	5	4

Fig. 6. Values for a tuned trap—see text. Coil L wound with 14g., 8 t.p.i. to ½ in dia.

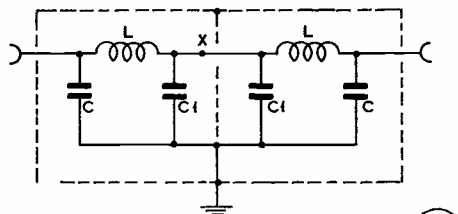


Fig. 7. Half-wave filter



Fig. 7. Circuitry for a half-wave filter—and see Fig. 8 for values, by bands.

position. The lowest reading obtained will relate to the SWR of the aerial system. This SWRI or at least its diodes must be disconnected after adjustments are complete otherwise it may add to TVI.

Switch PA and ATU to the next band and repeat the process.

**Additional TVI Precautions**

Having made ATU's for each separate band and provided suitable low-impedance switching between them it is attractive in fringe TV reception areas to consider some additional TVI precautions between ATU and aerial. The problem is also now somewhat simplified because each band can be considered individually and additional precautions taken in relation to the local TV channel frequency. Offending frequencies are likely to be as in Fig. 4, p.207.

**Series Tuned Trap**

The simplest way to secure some attenuation of the unwanted harmonic is to connect a series tuned trap across the aerial feeder and resonate at the unwanted frequency. Unfortunately the adjustment is rather critical and incorrect adjustment can even increase the level of unwanted harmonic. For operation at all frequencies in an amateur band variable tuning of the trap is necessary. If fixed or limited frequency operation is acceptable this method has some attraction but otherwise it is better avoided. For those who insist on trying it the trap is connected as in Fig. 5 and suitable values are listed in Fig. 6. Obtain preliminary adjustment by inserting a temporary direct short from point X to earth and adjusting C until the circuit LC resonates with a GDO set to the appropriate harmonic frequency. Check final adjustment using a harmonic indicator (as SHORT WAVE MAGAZINE, April '70).

Band	C and C1, pF	L, 12g., 8 t.p.i.
28 mHz	110	6 turns, ½ in. inside dia.
21 mHz	150	7½ turns, ½ in. inside dia.
14 mHz	220	6½ turns, ¾ in. inside dia.
7 mHz	500	10½ turns, ¾ in. inside dia.
3.5 mHz	800	12 turns, 1 in. inside dia.

Fig. 8. Values for a half-wave filter—see text.

**Half-Wave Filter**

Half-wave filters or "Harmonicers," as they were once called, are attractive but offer low attenuation only in the band for which they are designed. They are therefore single-band devices, attenuation increasing at the higher harmonics. At 42 mHz attenuation of a 14 mHz filter is low but better than that of a simple trap and it is relatively broad-band in operation. The 56 mHz attenuation by a 14 mHz filter begins to be useful. An added attraction is that the filter is symmetrical and input and output impedance similar. The filter is illustrated in Fig. 7 and L and C values given in Fig. 8.

Preliminary adjustment is effected by disconnecting input and output, shorting point X directly to screen and earth and, using a GDO, adjusting coil spacing until the circuit LC resonates at the design frequency (frequency of band in use, not harmonic). Once adjusted the short is removed and the filters can be sealed and left in circuit. Fundamental frequency loss will be negligible and some attenuation will be obtained on the harmonics, increasing with the higher multiples. Switching between filters will be effected as the ATU's are changed.

**Low Pass Filters**

The final alternative is to use an additional low-pass filter but in this case designing the filter to give maximum attenuation of the offending harmonic. The type of filter described in the February 1970 issue of the Magazine is conventional and gives maximum theoretical attenuation of 100 dB at 42 mHz followed by a dip to 60 dB at 56 mHz and thereafter steadily rising. This is a suitable and effective design for attenuation over the whole TV band but to increase attenuation at say 56 mHz (TV Ch. 3) a filter can be designed for a higher cut-off frequency and maximum attenuation in the region 56-59 mHz. Using the parameters defined in the earlier article a three-stage filter can easily be built to give maximum attenuation at the offending harmonic frequency and is switched into operation as the ATU's are changed.

**Caution**

By now we have got a Linear PA with pi-output feeding a multi-section LPF into a resonant ATU through a three-section LPF to a resonant aerial. Overall harmonic attenuation should be very good but still

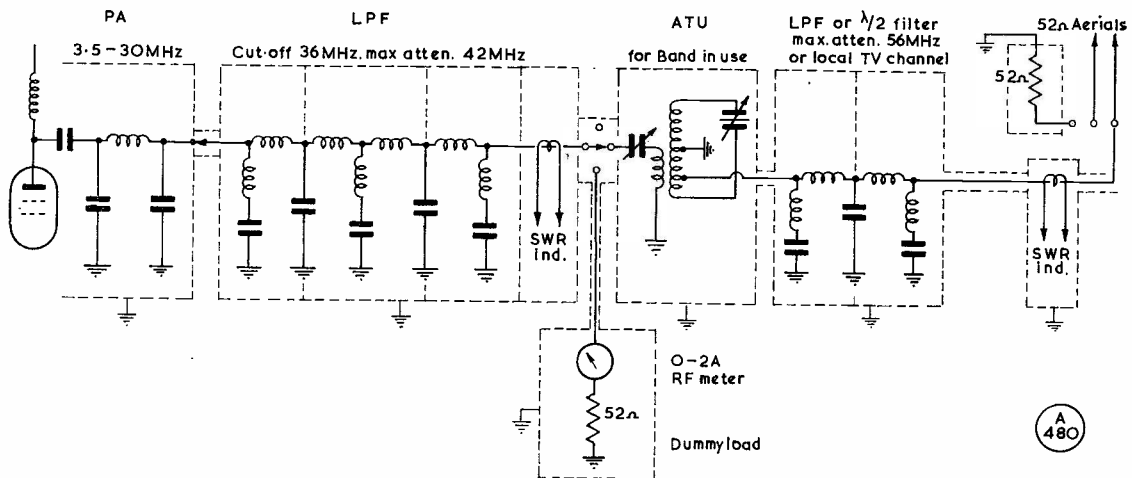


Fig. 9. The output circuit complete, as evolved from the approach argued in the article by G6HL. Here we see the final layout, from PA stage, through LPF to ATU, with LPF for local TV channel, into aerial(s) or dummy load at first LPF position.

a harmonic indicator may show trouble. This can be overload of the harmonic indicator itself by fundamental RF, and the remedy is to reduce input coupling and/or insert a High Pass Filter. More likely it is rectification, harmonic generation and reradiation from nearby TV receivers, masthead preamplifiers, corroded aerials or "rusty bolt effect" in nearby metal work. These are the difficult troubles to isolate. Start by checking when the TV signal is off the air and TV receivers are presumably switched off; if the harmonic persists then D/F activity is required with a portable harmonic indicator. The likelihood is that it will be a slow and frustrating job. The writer found one neighbour had a Band 1/111 aerial with a peculiar stub matching system which should have resulted in zero DC ohms at the feed point but in fact showed 50 ohms on an Avometer—the effect of corrosion and a source of harmonic trouble. So if the transmitter is well screened (and this includes *all* supply lines),

and effective output filtering has been followed don't be too discouraged by an initial indication that harmonics are still around; by now its probably not the transmitter at fault! It might even be worth suggesting to neighbours that tinted telly on Bands IV or V gives much better entertainment than Band I steam!

**Finale**

The writer's first licence, years ago, insisted that there should be no direct connection between the aerial and the transmitter tank coil but as the purpose was only to keep DC off the aerial the insertion of a fixed condenser was adequate precaution. In those days prevention of BCI was relatively simple even when working in the BC band. It is interesting to identify the circuitry which can now go between the PA tank and aerial of a modern transmitter—most of it to keep goggle-box gazers from the door bell! Refer Fig. 9 above!

**BATC CONVENTION—REMINDER**

The British Amateur Television Club's 21st anniversary convention takes place over July 25-26, at Churchill College, Cambridge. It will be an event of considerable interest not only to members of the Club but also to visitors (who will be very welcome) wanting to know more about amateur TV transmission and reception, for which the 70-centimetre (430 MHz band) is mainly used; there will be much apparatus for operation at these frequencies on view. There will also be lectures and discussion-sessions on matters of A/TV interest. Detailed information from: D. S. Reid, 71A Rose Valley, Brentwood, Essex.



Right, the new Cambion shielded variable coils for printed-circuit applications. These coils are completely protected from electrostatic and electro-magnetic interference effects, and are virtually temperature-proof. The inductance ranges cover 12 to 120 mH.

## NOTES ON THE K.W. VESPA Mk.II

AS MODIFIED TO THE LATEST  
STANDARD

E. P. ESSERY (G3KFE)

*The Vespa is, and always has been, a very nice job and this article will be of interest to owners or prospective buyers of the Transmitter, either new or second-hand. The photographs have been chosen to show the general layout and method of construction of modern amateur-band equipment.*

—Editor.

THE subject of these notes is the K.W. Vespa Mark II transmitter; the earlier Mark I was looked at in SHORT WAVE MAGAZINE back in August 1968, and anyone with a copy of that issue could well re-read it in conjunction with this article.

Coverage is all of Top Band, Eighty, Forty, Twenty, the CW and SSB areas of Fifteen, and three segments of 200 kHz bandwidth in the 28 MHz band, namely, 28·0, 28·4 and 28·6 as the LF band edges of each segment. This of course leaves a sizeable area of Ten uncovered, and a small, but from the DX-er's point of view significant, part of 21 MHz.

Presentation is very much along the lines of the KW-2000 and 2000A series of transceivers. As between the Mark I and Mark II Vespas, the only obvious difference is in the legend on the tuning-dial bezel and the weight of the PSU.

The subject transmitter has had several vicissitudes, which have progressively brought it from the standard of one of the earliest Mark II transmitters up to just about the most recent build-standard-currently available new from K.W. Electronics, who make it. In its original owners hands the PA stage suffered from misuse, resulting in a melted PA valve and a soggy mess where the  $\pi$ -tank had once been. It was rebuilt by K.W. with a new PA valve and the  $\pi$ -coil replaced by the later glass-fibre version, in which condition your reviewer bought it.

In this form it has had about a year of knockabout use on the bands, with the reservation that as the writer spends long hours in his shack doing things not connected with Amateur Radio, it likewise spends long hours with power on but in the "receive" condition, so that if a few spare moments occur it can be put to immediate use. The only difficulty during this period was that one 6HF5 was wrecked by a short on the ATU reflecting back into the PA and over stressing the valve, which indeed was flashed over internally. A few days later the standing anode-current started to rise—always a sign of the imminent demise of one of these valves.

At this point the transmitter was fitted with the ALC modification and a new 6HF5, for a further period of service. A few months later a similar rise in anode current was observed as a result of a similar mishap—

this time the aerial lead-in was not connected when the PA was switched over from the dummy load, in the mistaken idea that the aerial was still fully tuned from the previous evening's DX-chasing! This time, K.W. Electronics suggested it should be brought to the latest standard, with the current 6LQ6 PA valve built in, a modification-kit for which is available from the firm. (They also gave the writer to understand that the improvement was so great that all earlier ones traded-in were being endowed with the 6LQ6 valve before being put on the re-sale lists.)

### Tx as Modified

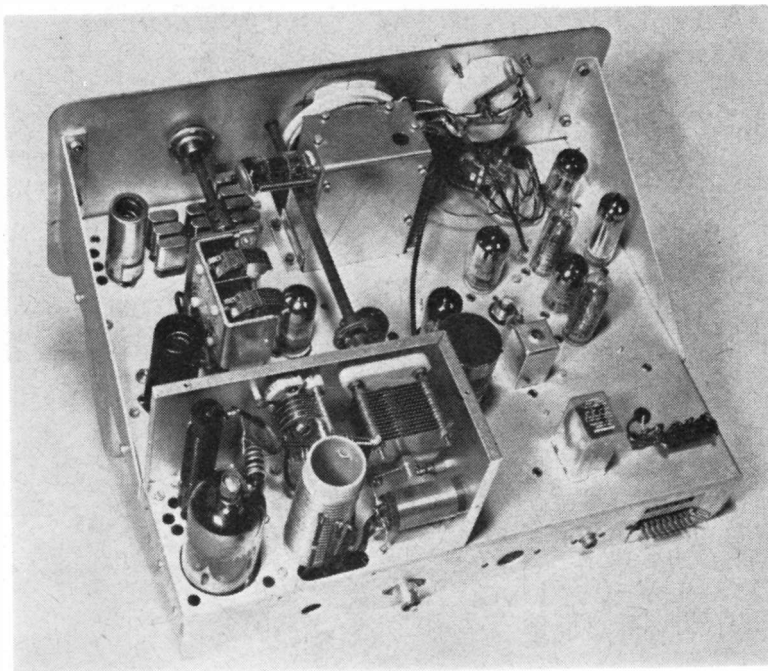
The transmitter duly modified was proved to be absolutely transformed. It always was a fine job, as experience with the original Mark I had proved, and with the 6LQ6 PA and ALC it is now one of the best on the market. The power output is equal to or better than the maker's quoted figure on all bands, stability is impressive, and the whole thing is as docile as a lamb.

An impressive demonstration of the stability in practical use was given recently, when the rig was fired up from stone-cold on Ten to work an old buddy who was said to be about. The power to the shack was connected, receiver and transmitter switched on, and all netted on to the frequency. A contact of nearly an hour under extreme weak-signal conditions resulted, when any significant drift at either end would have resulted in a lost contact with the heavy QRM existing on the band at the time.

### Keep it Cool

It is, of course, not possible to put the PA on full carrier-output conditions for hours on end, due to the ratings of the output valve, but it can be said that sustained operation on SSB or CW telegraphy does not cause it any worry so long as the cabinet is not covered by piles of magazines, *Call Books* and whatever—in other words, free ventilation is important. The PSU on the Mark I was remarked on for its cool running, but the Mark II, with its greater power output, has a PSU that normally runs quite warm, albeit not unreasonably so—it has been run for several hours cocooned in a pile of papers deliberately and no harm resulted. It gets warm, but that is all.

The frontal appearance of the KW-2000, 2000A and the various Marks of Vespa is so familiar to readers that the photographs have deliberately concentrated on the innards and the Power Unit. For those few who may not have seen one, either in advertisements or "in the flesh," suffice it to say that it is very acceptable from the start and it grows on you to the point where this writer at



*Upper chassis view of the K.W. Vespa Mk.II—PA stage at lower left.*

least would be very loth to part with his Vespa!

The cabinet is of metal-gauze type, for good ventilation, and the PA is fully screened within the compartment. (The screening has of course been removed for the photographs.) Ventilation is very good, as the stream of hot air rising from the PA compartment shows, and the VFO does not seem to be seriously affected by the close proximity of the output stage as far as heat transfer is concerned.

From the underside, a keen eye will surely discern a piece of insulation-tape near the connector for the power supplies; this was, it must be stressed *not* part of the original transmitter, but was put there by your reviewer for his own convenience in getting into one of the bias leads.

#### Quality and Keying

SSB quality is extremely good with a crystal microphone; external control for either "push-to-talk" or an outboard foot switch is available on the mike socket. This facility is used by the writer to control the Tx whether CW or Phone is being used, the transmitter having built-in aerial change-over facilities and spare contacts of the change-over relay available for muting the receiver and operating a linear from the same switch. Thus full control of the station is available at the touch of a button.

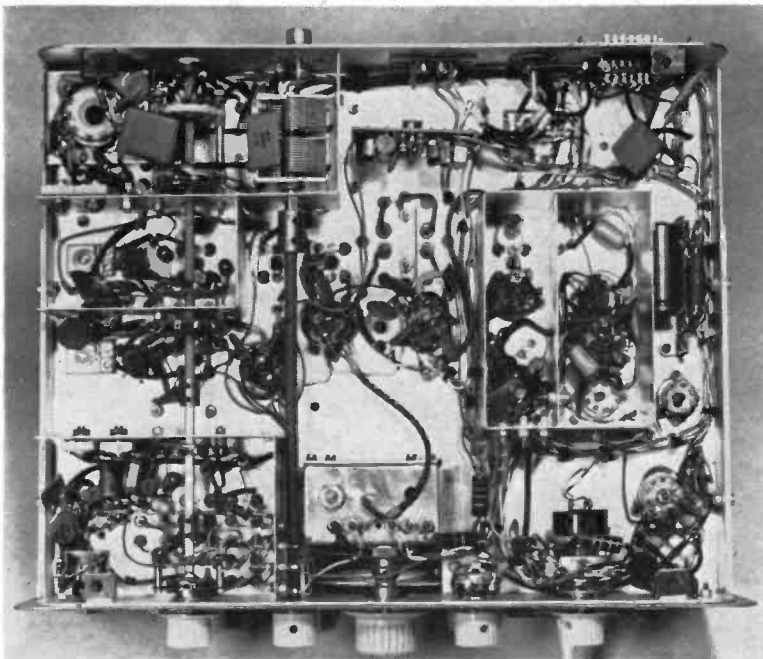
With the recommended key-click filter fitted, the CW quality is excellent, although one has to remember to turn the AF gain to zero or remove the mike-plug, depending on whether one is controlling the rig from the

switch on the transmitter, or externally. For Top Band, as far as CW is concerned, one has a problem, insofar as the standing current of 25 mA is more than 10 watts input! However, it is possible to overcome this quite successfully by reducing the standing current to *just* zero by adjustment of the pre-set potentiometer on the PSU, and inserting carrier under key-down conditions in the QRP notch until the anode current is ten watts. Indeed, it is possible to do this in the QRO notch and still achieve the desired 10 watts input. However, one could wish the authorities would allow SSB rigs used under these conditions to be run correctly, with the higher standing current for Class-AB1 operation, and set a figure for the maximum *output* power; this would then result in the advantage, in terms of low harmonic radiation, of correct PA stage operation. Nonetheless, it must be said the signal is extremely fine when keyed on any band, provided the specified key-click filter is used on the keying leads.

#### General Observations

With the 200 kHz band-segments, the dial reading accuracy is very good, it being quite possible to set within 1 kHz of a desired spot "blind"—indeed your reviewer tends to rely more on the Vespa dial than that of the receiver with its calibrator!

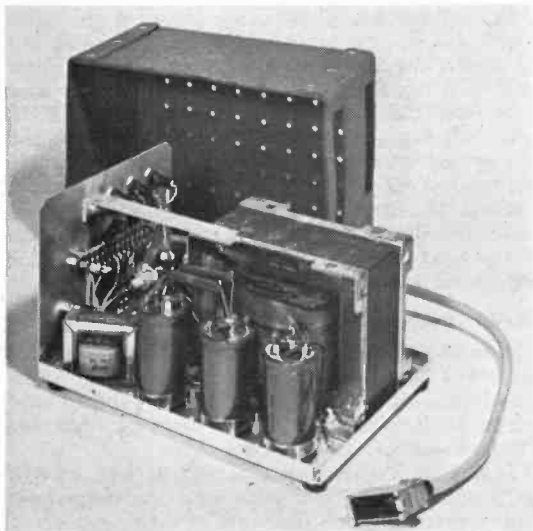
Tuning-up is quite easy, although, as with all SSB rigs, one must read *and understand* the instructions before attempting to do this! As for the ruggedness of the PA in the present form, all that needs to be said is that since it was brought up to 6LQ6 standard, an o/c



*Under chassis layout and wiring, Vespa Mk.II. — PA stage at upper left.*

feeder in the 2-el. beam for Ten has occurred and, as it happened, when the beam was first brought into use; the rig was operated into the open feeder for several seconds before the reason for the reverse current was apparent and the switch thrown back to "receive." No signs of damage were apparent, either at the time or since.

If you prefer "separates" rather than a transceiver, then this is the one for you. If you screw the power-pack



*Power Supply Unit for the Vespa Mk.II.*

in its fibre case to the underside of the operating-table you have just the Tx and the Rx visible, plus a loud-speaker if you prefer. Neat, tidy, and eminently practical. If you couple it to a reasonable aerial system, then you are all set to work the DX on your chosen band. At this location it was even possible to do this through the Cup Final with no TVI complaints!

Speaking of TVI, one must comment that there is no such thing as a TVI-proof rig. This one can be run into a screened dummy load with no interference to a TV alongside on any band, which is the first criterion for dealing with TVI. If it is run through a low-pass filter in a matched coaxial line, to an ATU and thence to the aerial, and if the TV set is treated correctly, operation is possible on all the HF bands; but a change of TV set or a bit of corrosion in the aerial of either the Tx or the TV/Rx and the balance may well be upset. However, the Vespa is as good in this respect as the best.

Summing-up: This is a good buy, and will give hours of pleasure, with no trouble if it is treated right. It will stand a reasonable amount of abuse, and it looks good. What more could you want for your money?

#### **U.K. CALL BOOK OUT OF PRINT**

The U.K. (G) *Call Book*, 1970 Edn., published by the RSGB, is now out of print and will not again be available till the new (1971) edition appears, about September.

#### **NEW PREFIX LIST**

Our new Prefix List—reviewed on p.94 of the April issue of *SHORT WAVE MAGAZINE*—is now priced at 2s. As before, it comes free with the *DX Zone Map* (14s. 9d., including postage and packing).

# DETERMINING VALUES FOR A CLAPP OSCILLATOR

## SIMPLIFIED MATHEMATICAL APPROACH

W. G. BORLAND (G3NXM)

ONE of the most popular oscillators used in Amateur Radio equipment is the Clapp Oscillator and many articles and reports have been written about it. There is, however, one great disadvantage and that is the complexity of the calculations to determine the component values for an oscillator to cover any given frequencies, and as a result most amateurs have to resort to the "cut-and-try" method, which can be both time consuming and frustrating.

Fig. 1 is a typical Clapp Oscillator and the reason for the difficulty in calculating values soon becomes apparent. C1a and C1b are in parallel and the result is in series with C2a and C2b. Thus, if the value of any one of them is altered the effective capacity of the circuit is also altered but not to the same extent as the change in any one of the capacitors.

Eventually, after a lot of trial and error the writer was able to evolve a graphical method of determining capacitor values. Whilst this is not as accurate as mathematical calculations, the result should be within 2% and so sufficiently close for the final alignment to be carried out by means of the trimmer and the core of the inductance. The graphical method of determining component values is divided into three stages. The resultant capacity of C1a and C1b in parallel will be referred to as C1, and the result of C2a and C2b in series as C2; the term Cv is the total effective change in capacity of the circuit (swing).

### Stage 1

First of all the values of C2a and C2b have to be decided. Most articles on the Clapp Oscillator recommend .001 μF and the circuit is calculated on these values. As C2a and C2b are in series, the resultant capacity C2 is 500 pF. Secondly, the value of the tuning capacitor has to be chosen. For the purposes of this article it has been taken as 4-18 pF, a swing of 14 pF. As the minimum value of 4 pF will be included in the value of C1b, the swing or variable of 0-14 pF will be taken for C1a. We have now reached the point where the only variation possible will be in the value of C1b.

Assume C1b is taken as 10 pF: When C1a is at a minimum, the total capacity in the circuit is  $\frac{500 \times 10}{510}$  of 9.8 pF. When C1a is at maximum C1 will be 24 pF (10 + 14), and the effective capacity of the circuit will be  $\frac{500 \times 24}{524}$  or 22.9 pF. This gives a variation of capacity in the circuit (Cv) of from 9.8 to 22.9 or 13.1 pF. If C1b is now taken as 50 pF the values of total effective capacity will be  $\frac{500 \times 50}{550} = 45.4$  pF, and  $\frac{500 \times 64}{564} =$

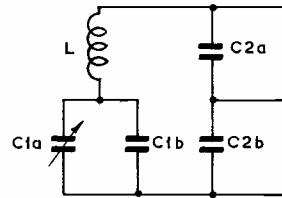


Fig.1. A typical Clapp oscillator

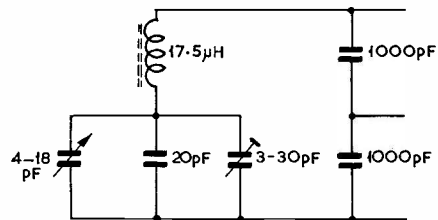


Fig. 4. Clapp oscillator for 5-5.5 MHz

F 126

56.7 pF, which makes Cv 11.3 pF. The values of Cv are shown in the Table in Fig. 2, p.214.

The last step in Stage 1 is to plot on a piece of graph paper the values of C1b against Cv and this is shown as Curve "A" in Fig. 3. This curve should be carefully drawn and kept as it will apply for all Clapp Oscillators irrespective of frequency as long as C1a is 4-18 pF and C2a and C2b are each 1,000 pF (.001 μF).

### Stage 2

The effective capacity of the circuit for the actual Oscillator frequencies have now to be found. For the purposes of this article it has been decided to design a VFO to cover 5.0 to 5.5 mHz. The standard formula is used and therefore,

$$C_s = \frac{C_v \times f_1^2}{f_2^2 - f_1^2}$$

$$= \frac{C_v \times 5^2}{5.5^2 - 5^2}$$

$$C_s = C_v \times 4.75$$

Bearing in mind the values of Cv on the graph in Fig. 3, we can then say,

if Cv = 9, then Cs = 9 x 4.75 = 42.75

and if Cv = 12, then Cs = 12 x 4.75 = 57.00  
These two points are plotted on the graph in Fig. 3 and joined together; this is called curve "B" although it happens to be a straight line. The point of intersection gives a value of 53 pF for C1b. This of course includes the minimum value of 4 pF of C1a, so it is likely that

C1a pF	C1b pF	Total Effective Capacity pF	Capacity Swing (Cv) pF
0—14	10	9.8 — 22.9	13.1
0—14	50	45.4 — 56.7	11.3
0—14	100	83.3 — 92.8	9.5
0—14	125	100.0 — 108.7	8.7
0—14	150	115.4 — 123.5	8.1

Fig. 2. Table showing effective variation in total capacity dependent on value of C1b.

C1b will comprise a 27 pF fixed capacitor in parallel with a 3-30 pF trimmer.

**Stage 3**

To calculate the value of the inductance it is first of all necessary to work out the effective capacity of the circuit with C1a at minimum and at maximum value, which is:—

$$Min. = \frac{500 \times 53}{553} = 47.9 \text{ pF,}$$

$$\text{and } Max. = \frac{500 \times (53 + 14)}{567} = 59.1 \text{ pF.}$$

The value of the inductance can now be calculated and is,

$$L = \frac{25330}{f^2 \times C} = \frac{25330}{5.5^2 \times 47.9} = 17.5 \mu\text{H}$$

As a check the value of L can be calculated from the higher value of C and is,

$$L = \frac{25330}{5^2 \times 59.1} = 17.2 \mu\text{H}$$

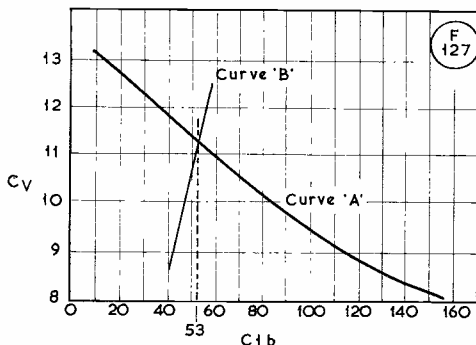


Fig.3 Graph of effective capacitance against C1b

**Conclusion**

The graphical method of determining component values is slightly inaccurate as is shown by the difference in the inductance values—but this is only in the order of 2%, and is quite acceptable. The inductance should in any case be adjustable by means of the core and the circuit can be aligned quite easily by means of this core and the 3-30 pF trimmer mentioned in Stage 2 shown in Fig. 4, p.213.

Should you wish the VFO to cover a different band then Stage 2 is calculated to arrive at a new Curve "B." (The same Curve "A" can be used.) After having found the point of intersection Stage 3 is carried out. Of course, if you wish to use a different tuning capacitor then you will have to redraw Curve "A" as well.

Some may think the foregoing is a lot of trouble to arrive at the answers but all the necessary calculations can be done on a piece of paper no larger than a page of the Magazine. And it also means once the circuit has been built it has only to be aligned. There is no need to "cut-and-try."

**AMATEUR RADIO FUND—CHESHIRE HOMES**

With reference to the note on p.363 of the August 1969 SHORT WAVE MAGAZINE, we are informed that since then some £165 has been donated. This has enabled receivers to be supplied to Cheshire Homes at Llanhenock and Green Hill House, nr. Banbury. Three more Homes were to have been fitted up during October, and at two others demonstrations had been arranged. Two Homes have each a patient very keen to become fully licensed—as this involves a Tx as well, there is an immediate financial problem. In the meantime, the organisers (who are working in an entirely voluntary capacity) have had requests for literature likely to assist aspirants for a licence—we suggest that anyone having a now-unwanted copy of the *Guide to Amateur Radio* or the *Radio Amateur Examination Manual* should send it to the Appeal Organiser.

In all, seven Cheshire Homes have been equipped with amateur-band receivers, entirely from donated funds. In many other cases, the nearest local Amateur Radio Club is being most helpful. A great deal of hard behind-the-scenes work is involved to make this effort a success—and reports from Cheshire Homes already on the air indicate how much it is appreciated.

Donations, and also any unwanted Rx/Tx equipment in reasonable working order—but, please, no junk—offered "to await collection," should be sent to: Cheshire Homes Amateur Radio Network Fund, W. M. Clarke, G3VUC, Fillace Park, Horrabridge, Yelverton, Devon. Remittances should be made payable to *CHARN Fund* and (to keep expenses down) receipts will not be issued unless requested.

This appeal has the official approval of the Cheshire Foundation. We also commend it (like the R.A.I.B.C., which already has the support of many readers) as a worthy charity in the Amateur Radio context.



## FITTING A PRODUCT DETECTOR

FOR THE KT-340, HE-30, 9R-59  
AND SIMILAR RECEIVERS

I. G. BAVE

**T**HE performance of the Lafayette KT-340 receiver on the reception of SSB signals can be greatly enhanced by the adoption of the product detector unit described in this article. The circuit of the Lafayette HE-30 and the Trio 9R-59 are similar to that of the KT-340 so users of these receivers will also be able to fit this unit in exactly the same way. The actual circuit of the unit is the usual orthodox one which has been used in other receivers from time to time, but in this instance it is built in such a way that the constructor can adapt it into his receiver without drilling, component removal or alterations to the original.

### Procedure

Before starting the work it is suggested that the constructor has before him the original diagram (Pictorial

2 in the KT-340) and to read through the article in order to get familiar with the construction and wiring instructions for the unit.

The first step is to cut and drill a piece of 18 gauge aluminium, also the small fork-shaped piece, exactly as shown in Fig. 1. Make sure that the measurements are strictly adhered to; the constructor will see why when fitting into the limited space available on the receiver chassis. When cut and bent the unit frame should appear as in Fig. 2. Cut a piece of narrow-gauge tag strip, making sure that six tags are left on the strip, drill and bolt it on to the unit frame, at the same time bolt on the soldering tag, the fork piece, and the B7G valve holder (the pins facing inwards), as in Fig. 3.

The  $8 + 8 \mu\text{F}$  (C6, C7) capacitor is held in position at the back of the unit frame, either by an elastic band or an old capacitor clip taken from the "junk" box, as indicated in Fig. 4.

Fig. 5 shows the complete wiring up of the unit. It is advisable to use coloured wires coming from the unit as this will ensure that the correct wires are connected in the right position inside the receiver when following the wiring instructions. These wires should be about 12 ins. long for easy handling and cut to the required length before soldering.

To fit the completed unit on the receiver chassis

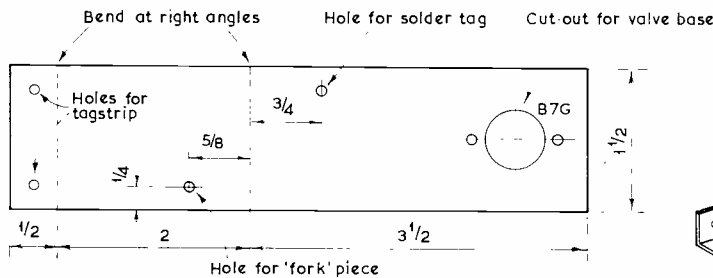


Fig. 1

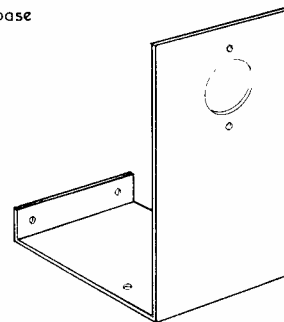
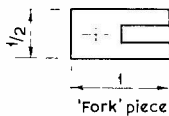


Fig. 2

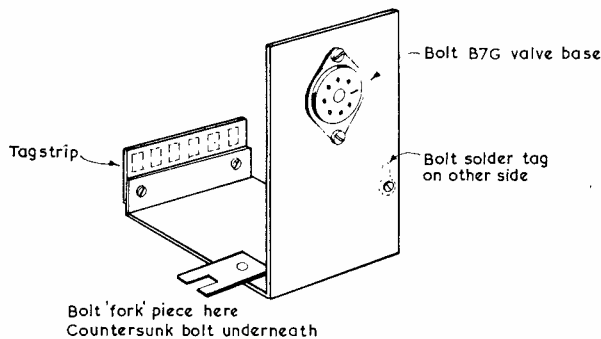


Fig. 3

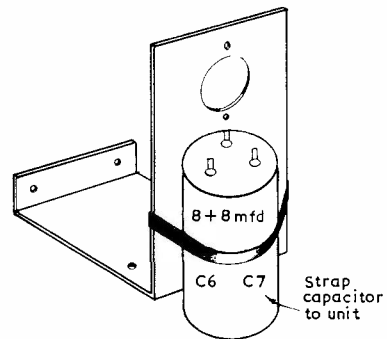


Fig. 4

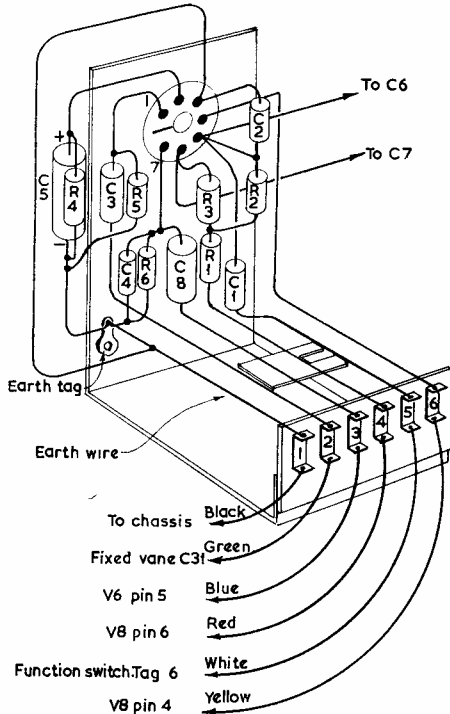


Fig. 5



Fig. 5. The physical wiring diagram for the Product Detector unit.

proceed as follows: Looking towards the back of the receiver it will be found that the tuning condenser frame is held down by two Phillips screws; slacken off the screw to the right and slide the fork piece attached to the unit under this screw then fasten; this will hold the unit quite firm for all practical purposes.

The last stage is, with the pictorial diagram of the original receiver for reference, to find at the back of the chassis a series of holes. Into the nearest of these push the Black, Red and Yellow wires. Solder *black* to earth tag (E). Solder *red* wire to V8 (6AQ5), pin 6; *yellow* wire to V8, pin 4. Bring the *green* wire across the top of the chassis and push down into the cut-out immediately under the pilot lamp and solder to the fixed vanes of C31(2) (BFO Q-Multiplier control). Bring the *blue* wire across the chassis and push down the hole in chassis near IF transformer (T4) and solder to V6 (6BA6), pin 5. Take the *white* wire across the chassis, through the hole nearest to the function switch, and solder to tag 6 of the function switch. Plug the 6BE6 valve into the unit.

**Checking and Testing**

Before switching on the receiver, check to make certain that the unit is wired up to the receiver as described. Tune in to SSB signals as follows: With the function switch to Q-Mult, set the IF control to the " 3

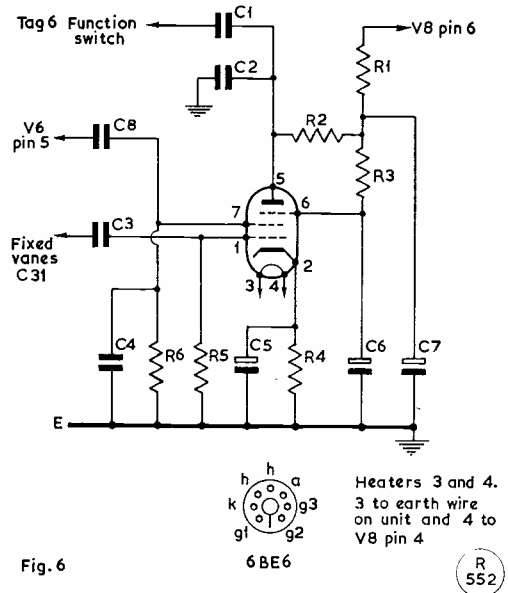


Fig. 6



Fig. 6. Circuit of the Product Detector, for which values are given in the accompanying table.

**Table of Values**

Fig. 6. Circuit of the Product Detector Unit

C1 = .01 μF, paper,	C8 = 10 μμF, silver
C2 = 330 μF, silver	mica
C3, C4 = 100 μF, silver	R1 = 10,000 ohms
C5 = 25 μF, 25v.	R2 = 47,000 ohms
C6, C7 = 8 μF, 275v.	R3, R6 = 100,000 ohms
	R4 = 220 ohms
	R5 = 22,000 ohms
	Valve = 6BE6

All resistors rated 1/2-watt

o'clock" position, using the AF gain as a volume control; with the Rx main tuning on the required band, simply "glide" into the SSB signal. It will be found speech clarity can be obtained without trouble, using the bandspread. One great benefit with this unit is that the AF gain can be used to control volume as opposed to using the IF control, which was inclined to alter frequency when receiving SSB signals. The writer has built this unit into his own KT-340 receiver and found it a great boon and most certainly would not be without it now.

**HONOUR FOR G4TZ**

Mr. Cedric Benham, CBE, G4TZ, of Painton & Co., Ltd., Northampton, has had conferred upon him the Fellowship of the City & Guilds of London Institute. This is a distinction in the technological field which is granted very sparingly. In G4TZ's case, the citation states "for his contributions to the design and development of a range of high-quality components for the professional electronics industry."

## ELECTRONIC MORSE CODE GENERATORS

### USING DIGITAL SYSTEMS WITH INTEGRATED CIRCUITS TO PRODUCE SYMBOLS AUTOMATICALLY

#### Part I

G. E. GOODWIN (G3MNQ)

*This article deals with modern circuit concepts which will be familiar to some readers, interesting and instructive to many—but at first reading almost totally incomprehensible to those who have not yet caught up with the possibilities inherent in automatic, or “timed,” circuits using semi-conductors. In this discussion, our contributor gives a lucid description of the integrated circuit (IC) configurations which can be applied to the practical problem of transmitting Morse Code automatically. The circuit elements themselves are cheap and readily available on the surplus market. It is a matter of shopping around to find what is required—but before you can do that, you must have a thorough understanding of the principles involved. This article, to appear in several parts, should make that clear. In fact, it is all a good deal easier than it may look.*

—Editor.

THERE are times when it could be advantageous, desirable or necessary for a transmitting station to send Morse code automatically—either wholly or partially. Amongst the advantages is the release of the operator from the purely repetitive job of calling CQ, etc., which can lead to fatigue due to boredom, whilst the desirability of automatic operation can arise during the transmitting period of meteor-scatter tests when the operator is possibly checking tape recordings of signals just received, and can leave the task of sending information to some electro-mechanical device—or in this case, purely electronic device. Necessity arises during the operation of beacon stations which are generally placed in some remote location and since they operate continuously and unmanned need to have some means of automatic keying as a means of identification.

Electro-mechanical devices are not new and have been used for many years in various guises. Among these are the systems using photo-electric cells and lamps in conjunction with a large, slowly rotating disc with slots cut in the periphery representing the characters to be sent, and magnetic tape loops on to which have been keyed the characters using an AF oscillator and played back continuously on a tape recorder. Both of these use electric motors and other parts which are subject to wear or short working life which can lead to unreliability.

A purely electronic device can be made without these disadvantages and use of the integrated circuits currently on the surplus market can lead to extremely reliable

systems being evolved. To a radio-minded person digital circuits and integrated circuits are perhaps something of a mystery since he will be more used to valves or transistors which are biased to operate linearly over their operating range. In digital circuits the transistors switch between the states of full and zero conduction, *i.e.*, they are either switched on or off, the time taken to change between these two states being very small.

Morse code lends itself to digital operation since it is basically an on-off mode of modulation and also because there is a definite relationship between the length of the characters and the spaces between them. This is generally taken as one dash being equivalent to three dots; space between dots or dashes in a character is one dot and the space between characters is three dots. The length of the dot therefore, determines the speed at which the code is sent and for a standard of twelve words per minute this is about one sixth of a second. Thus any word or group of letters, a call-sign for instance, can be broken down into individual dots some of which will be joined together to form dashes. If a number of electronic circuits are set up, some of which are arranged to produce a positive output when a dot is required, the others giving zero output for a space, these can be “scanned” by other electronic circuits so that their outputs appear sequentially, reproducing the original character. Diagrammatically, this is shown in Fig. 1, p.218.

A complete call-sign or other word can be made up by this method purely by increasing the number of circuits which produce positive or zero outputs and arranging for them to be scanned in sequence.

In Figs. 1 and 2 it will be noticed that each “dot” making up the complete character has been given a number. This is because each of the electronic circuits can be used any number of times to generate any part of a character by the addition or omission of diodes. For instance, CQ can be broken down in the same way as G3 as shown in Fig. 2, and by this simple modification the circuit generating the positive output in line 6 in Fig. 1 can be made to produce the zero output required for line 6 in Fig. 2. (This will become clear when the circuits are discussed in detail.)

The process need not stop at call-signs and CQ's but could go on to produce a whole message. If this process of using the same circuits many times was not used the generator would become rather inflexible since it is sometimes required to change the information to suit differing conditions. Take a CQ call, for instance; this could consist of the following:

[over

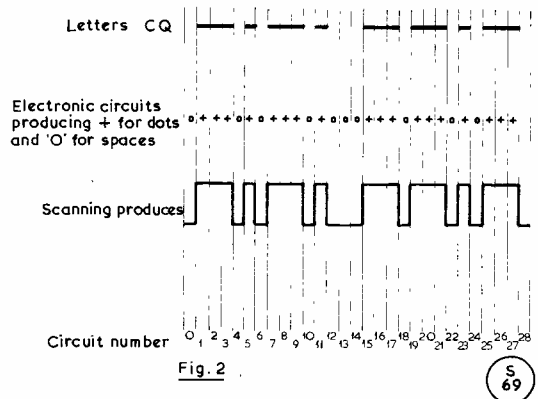
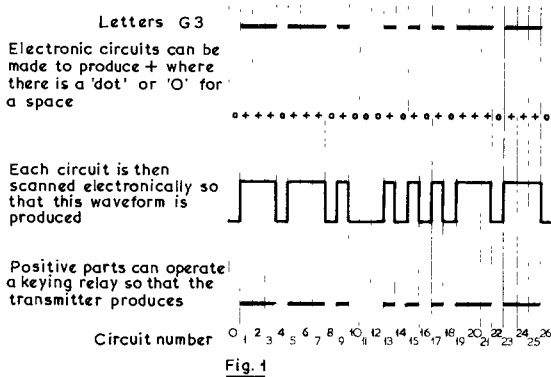


Fig. 1. Showing how "G3" is broken down into dots and then reconstructed to form the original letters. Fig. 2. As Fig. 1, but here the letters are "CQ."

- (a) CQ (sent three times)
  - (b) Band identification (of which there are nine in common use)
  - (c) Call-sign (sent three times)
- i.e., the following is sent:—

*CQ CQ CQ 2 de G3MNQ G3MNQ G3MNQ*

and this is sent as many times as thought necessary. It has been found to be more economical to have electronic circuits which produce CQ once only and then scan this three times to make up the required CQ CQ CQ. Similarly with the call-sign. Each band ident. has to be made up separately and can be manually selected with a switch to suit the band in use. The production of three CQ's and three call-signs with a band identification in between them calls for the inclusion of a control system or programmer, so that the correct information is selected in the proper order. This is where the use of integrated circuits becomes economical as they are cheaper, more reliable and occupy less space than separate components.

The circuit which is used to produce the build-up of dots, dashes or spaces is a development of that shown in Fig. 3, opposite.

**Circuitry**

Inputs A and B are connected to circuits which are either zero or positive, and if either or both of these are at zero, current will flow from the positive supply rail, through R, through the diode to the zero point, and the output will be at zero except for a small voltage drop across the diode which can usually be ignored. If A and B are connected to a positive potential, current cannot flow through the diodes and the output becomes positive. The circuit is known as an "AND Gate" because A and B must be positive for the output to be positive. The output will normally be loaded and this can be represented by RL. R and RL are in series across the power supply and form a potential divider, therefore RL must be very much greater than R if the output is to be nearly at the supply voltage.

If the positive supply is made zero the output will be at zero no matter what happens to the inputs since the diodes will be reverse biased by having positive on the cathodes and zero on the anodes. By this means it is possible to make the output positive only when it is required to be so even if both the inputs go positive. A number of these circuits are set up with the positive supply rail connected to numbers 1, 2, 3, 5, 7, 8, 9, etc., as shown by the positive signs in Fig. 2, while the zero line is taken to numbers 4, 6, 10, etc. The outputs of each AND gate are connected together through diodes which isolate one gate from another, as shown in Fig. 4.

If the inputs AB, CD, and so on are connected to some sort of electronic scanner which first puts a positive potential on both A and B, then on C and D, then E and F, etc., throughout the entire number of gates set up, the output line will follow the excursions shown in Fig. 1. When it reaches the end of the CQ the scanner can be "reset" back to the beginning; thus, CQ can be generated an infinite number of times.

A number of positive rails can be used to change the code produced and this is achieved by using diodes to connect each AND gate to the required line when a positive output is needed from that particular gate. The diodes serve to isolate one positive rail from another so that current cannot flow between them. This is shown in Fig. 5.

Only one of the rails is positive at any one time, the others being zero, and the inputs AB, CD, etc. are made positive in turn as before. The output line now follows the code determined by whichever line is made positive, either CQ or G3, as shown in Figs. 1 and 2, for instance. For these the output from gates 1-5 is positive whenever the inputs both go positive but 6 is positive only when the call-sign is being generated, hence a diode is connected only between this gate and the G3 positive rail. Similarly on gate 8 a positive is required only when CQ is being generated, and one diode between the gate and the CQ positive rail is used. On gate 10 positive output is not required for either CQ or G3 hence no diodes are connected to the positive rails. This process is repeated for as many gates as is required to produce the wanted code.

More positive rails can be added and connected to the required gates by diodes in the same manner as shown. The positive rails are then made positive or zero by electronic means so that the required message or call is built up. This is the task of the programmer, which can be designed to sequence correctly the CQ call (or any other call—MS calls for instance) and also control the number of times it is sent.

The "electronic scanner" referred to is capable of energising the inputs to the AND gates and also of being reset to zero, *i.e.*, returned to the beginning, at the end of each part of the CQ or other call. Its operation and that of the programmer is somewhat complex and must be analysed in detail.

**Digital Circuits**

As previously mentioned digital circuits can be considered to be in one of two states, *i.e.*, either on or off, so that the output potentials are either at the positive supply potential or at earth potential, or very close to these values. They may stay at either of these potentials for a very short time, for instance an output may be at zero for most of the time but occasionally move very rapidly up to the positive line and then return to zero. This excursion is called a positive pulse because the beginning or leading edge went in the conventionally upward or positive direction, Fig. 6A, p.220. Although the pulse is shown as going between zero and positive it could move between any two potentials, even negative ones, but as long as it moves to a more positive potential it is known as a positive-going, or simply positive pulse. There will always be a finite, measurable time for the pulse to change from one level to the other and back again and these are called the rise and fall times. These and the pulse-width are measured with respect to time

and may last for a fraction of a millionth of a second or, in the case of some of the pulses in the programmer, for several seconds.

The pulse could just as easily be the other way up, in Fig. 6B, overleaf, and would then be called a negative pulse. All previous comments about voltage levels, etc., apply here as well.

**Oscillators**

Circuits which will generate such pulses as we are considering come under the general heading of oscillators and those which produce them continuously are *free-running oscillators*. Circuits for these are many and various, each having its own advantages and disadvantages. One which is suitable for use in the programmer is the unijunction oscillator as in Fig. 7, p.220. The UJT itself does not produce a very big pulse but when used in conjunction with an amplifier the output switches between the supply rail and zero. In Fig. 7 the pulse width depends on the value of "C" while the number of pulses per second depends on both "C" and "R." With the values shown the pulse width is about 100 microseconds ( $\mu$ S) at a rate of 3 to 12 pulses per second.

Such an oscillator can form the basis of a programmer for a code generator, the number of pulses being directly related to the speed of the code produced, which is under the control of the operator. The oscillator is used to drive the "electronic scanner," each such pulse being used to move the scanner on by one position.

Another type of pulse generator suitable for programmers is a circuit which will produce a pulse only when it is required to do so—this is known as a *triggered oscillator*. Such a circuit (Fig. 8) is called a monostable since it has only one stable state and it will always return to this state after being triggered into its unstable con-

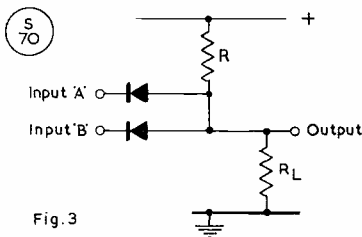


Fig. 3

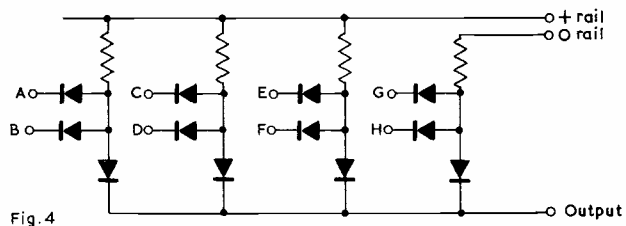


Fig. 4

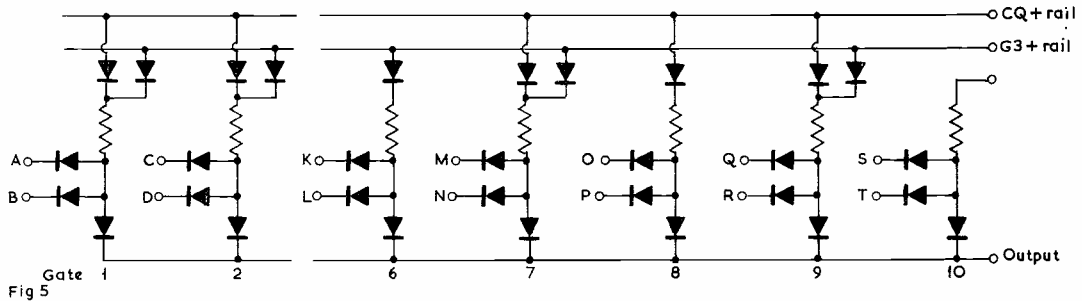


Fig 5

Fig. 3. Simple diode AND-gate. Fig. 4. AND gates in a selection matrix. Fig. 5. Section of a selection matrix with two positive rails.

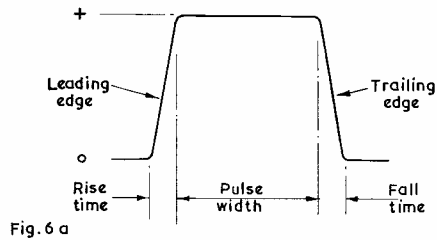


Fig. 6 a

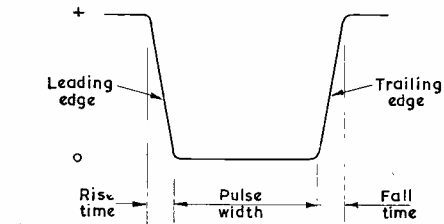


Fig. 6 b

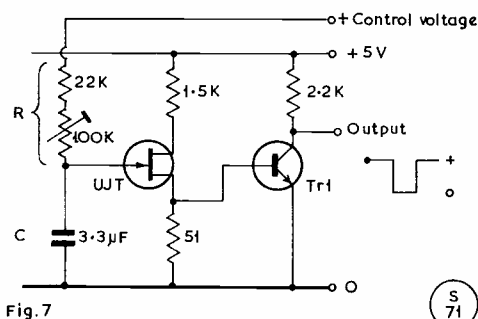


Fig. 7

Fig. 6A. Positive pulse. Fig. 6B. Negative pulse. Fig. 7. Unijunction oscillator.

dition by an external pulse.

In Fig. 8 the output at Tr2 collector will be zero in the stable state. On the application of a positive pulse to one of the inputs the output will go up to the supply rail for the time determined by "C" and "R." After this time the output returns to zero, producing a positive pulse, which with the values shown will have a width of about 1.3 milliseconds (mS). Alternatively, the output could be taken from Tr1 collector where the output would normally be positive and fall to zero for the duration of the pulse, producing a negative-going pulse which is almost exactly opposite that from Tr2. Such circuits can be considered to be *amplifiers* since they require only a very small pulse to trigger them and produce an appreciable amount of power in return. They find a use in the programmers in producing pulses which will reset the electronic scanner after it has scanned the required number of AND gates.

## Gates

These are circuits which change the state of their output only when the input conditions are correct. They have two or more inputs and usually only one output which may or may not move in the same direction as the input, *i.e.*, they may be inverting or non-inverting.

The simple AND gate has already been considered, but it is worth noting that if very much power is required from it, it is used to drive an emitter follower, as in Fig. 9. This is non-inverting since both inputs must go positive for the output to be positive. The inverting version of this is called a "NAND gate" and instead of an emitter follower it uses an amplifier to produce the inversion, as Fig. 10. Here both inputs must go positive for the output to go in a negative direction *i.e.*, fall, from the supply rail voltage to zero.

Another type of gate used in the programmer is the "OR gate" and this will give output when one *or* more of the inputs go positive (Fig. 11). Input A or input B going positive will raise the base potential of the transistor, reverse-biasing the other diode so that it has no effect. The emitter will follow the base potential and produce a non-inverted output. Other configurations of the OR gate are used, as shown in Figs. 12 and 13. Fig. 12 would apply where the inputs can supply only a very small amount of power as, say, the simple AND gate. It is in fact two emitter followers using a common load resistor and retains the high input and low output impedance qualities of an ordinary emitter follower. Fig. 13 is similar to the diode version except that resistors are used in place of the diodes.

The inverting form of the OR gate is also possible, this being called the "NOR gate," as Figs. 14A and B. Once again the amplifier produces the inversion. This amplifier can of course exist on its own without being associated with a gate and it is used in some places in programmers, where pulses require inversion to suit the input of another circuit. This is shown in Fig. 14B where only one input is used for this purpose.

The number of inputs has always been shown as two but there is no reason why these should not be increased to suit individual applications but there is usually some limit to how far this can be taken, especially with the resistive inputs.

## Bistables or Flip-Flops

These are circuits consisting of two or more transistors which are arranged to have two stable stages and can be triggered into either of them by external trigger pulses in a similar way to the monostable, the difference being that these stay in their new state until another trigger pulse arrives. By slight rearrangement the state of the circuit can be changed by applying a change in DC potential, and circuits exist where both of these changes can be implemented. By now, of course, things are getting fairly complicated(!) and it is here that integrated circuits come to the rescue, since they can accommodate both types of input and some of them another sort as well which is a variation of the trigger mode. These devices can pack up to 12 or more transistors, 16 or more diodes and 20 or more resistors into a package not much bigger than a single transistor and on the surplus market they are often of similar price. All the constructor has to do is arrange for power supplies,

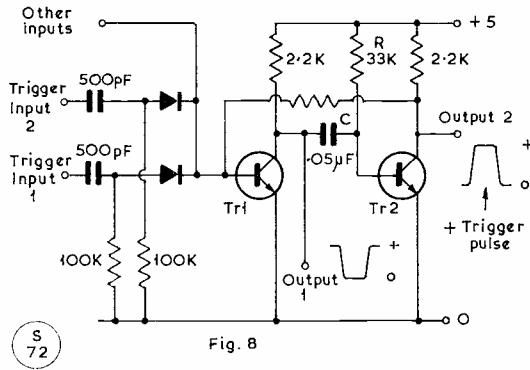


Fig. 8

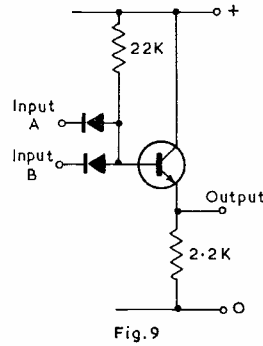


Fig. 9

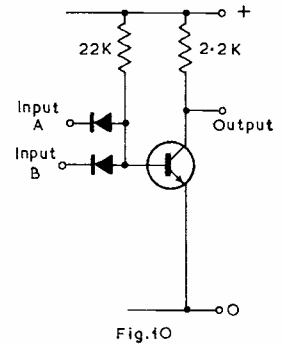


Fig. 10

Fig. 8. Monostable circuit, where Tr1, Tr2 can be 2N2926. Fig. 9. Diode AND-gate with 2N2926 emitter follower. Fig. 10. Diode transistor NAND-gate—see text.

inputs and outputs—perhaps 8 or 10 wires and the device will operate. There are several varieties on the market, by far the most versatile being the “JK flip-flop,” which

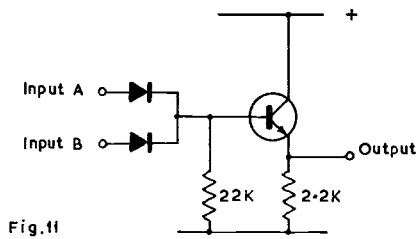


Fig. 11

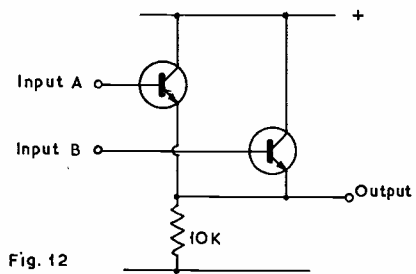


Fig. 12

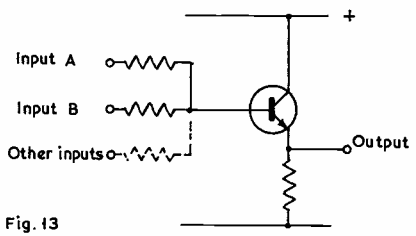


Fig. 13

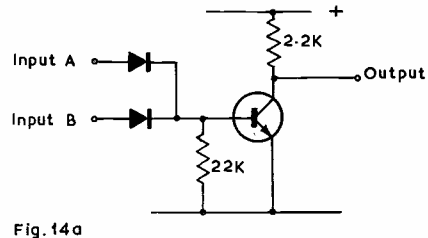


Fig. 14a

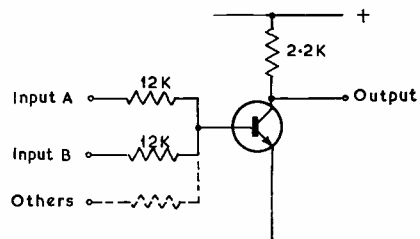


Fig. 14b

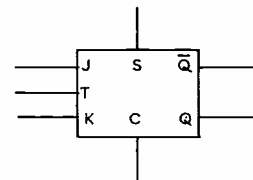


Fig. 15

Fig. 14A. Diode-transistor NOR-gate. Fig. 14B. Resistor-transistor NOR-gate. Fig. 15. Symbol for JK flip-flop.

Fig. 11. Diode OR-gate with 2N2926 emitter follower. Fig. 12. Transistor OR-gate using 2N2926 emitter-followers with common load. Fig. 13. Resistor-transistor OR-gate.

can be used in triggered and DC modes with the DC over-riding the trigger. This can be useful in the scanner since the oscillator can operate into the trigger input and the monostables used for resetting can operate into the DC inputs.

(To be continued)

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S 74

## THE MOBILE SCENE

### NOTES, PICTURES, COMMENTS AND THE EVENTS TO COME

**F**IRST point to note for the information of all interested is that the proposed A.R.M.S. Rally at Alconbury on July 5 has been *cancelled*, due to unforeseen circumstances. A new date for this popular and important Rally event will be notified as soon as alternative arrangements can be made.

Second point is that we now have fuller details covering several other of the Rallies already notified. These are given under the Calendar heading.

Thirdly, some additional interesting Rally fixtures have been brought into the Calendar. Fourthly, the attention of Rally organisers is specially directed to the notes on p.159 of the May issue of SHORT WAVE MAGAZINE.

With over 3,000 U.K. amateurs now licensed /M—an increasing proportion of whom are G8/3's—large attendances can be expected at this Season's events. All we need is the weather!

\* \* \*

The "Tulip Time" Rally arranged by the Spalding Amateur Radio Society at Surfleet, Lincs. on May 3 attracted, in perfect weather, some 150 amateurs with their families, this being the first such event attempted by the Club. Trade stands, housed in a marquee, covered a comprehensive range, and the raffle prizes are described as "numerous and varied." (Incidentally, they had the glamorous "Miss Tulip Time" there to make the draw for the raffle!) About 30 /M's were actually talked in, mainly by G3VPR on Top Band, there being comparatively little traffic for G3XBS on two metres. All in all, the Spalding group feel that it was a worth-while effort which went off very well.

#### MOBILE RALLY CALENDAR

**June 14:** R. N. Amateur Radio Society's tenth anniversary Rally at the R.N. Signal School, H.M.S. *Mercury*, Leydene, Nr. Petersfield, Hants.

**June 14:** Pembroke & District Amateur Radio Club "Bucket-and-Spade" Party at Regency Hall, Saundersfoot, Nr. Tenby, Pembrokeshire, with talk-in on 1875 kHz and 144.35 MHz. Advance notification of attendance is requested, to enable suitable catering arrangements to be made; lunch can be booked.—J. Hogg, GW8DMD, 2 Pembroke Road, Pembroke Dock, Pems., West Wales.

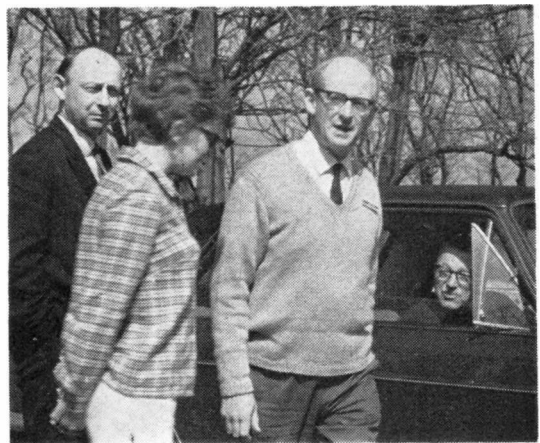
**June 14:** Nunsfield House Community Association Amateur Radio Group Rally at Elvaston Castle, near Derby. Location is 5 miles S.E. of Derby on the B.5010 running between the A.6 and A.6005 highways; local sign-posting will be in position and talk-in given on 160m. (G3EEO/A) and two metres (G3ZBI/A). There will be a trade show, judging of /M rigs, a prize draw and other activities. Plenty of

parking space, over 250 acres of pleasant woods and grassland, with many ideal picnic spots. Further information:—P. Neal, G3WUFU, 94 Jubilee Road, Shelton Lock, Derby, DE2-9FD.

**June 20-21:** Anglian Mobile Rally at the Suffolk Show Ground, Ipswich, two-day event with lectures and demonstrations on the Saturday; facilities for all-night caravan parking. On Sunday 21st the Rally itself will include numerous side-shows for the family and children; some 20 trade stands of radio amateur interest; bring-and-buy sale—first session 11.30 a.m. and another at 2.0 p.m.; grand draw for over 50 prizes; talk-in on Top Band and Eighty, signing GB3AMR; admission 1s. per person (children six); refreshments available all day. Entrance to the Suffolk Ground off Bucklesham Road. General information from: D. W. N. Thomas, G8BVE, 9 Burlington Road, Ipswich (55200), Suffolk. Trade enquiries (stands, etc.) to: B. Garnham, G3SJO, 17 Park Avenue, Colchester (78842), Essex.

**June 21:** The University of Swansea Radio Society emphasise that their Mobile Rally at Singleton Park (off the A.4067), Swansea, will be "the type of outing for all the family." There are local amenities and attractions in and around the Park, which is beside Swansea Bay—and Swansea can look beautiful if the sun is shining! There will be talk-in on Top Band and two metres, with refreshments available on site—P. Regan, Radio Society, Union House, University College, Swansea, SA2-8PP.

**June 28:** Thirteenth South-West of England Mobile Rally at Longleat Park—seat of the Marquis of Bath, a stately-home long open to the public, with many unique attractions (like that Lion Park!). Entrance is off the A.362, Frome-Warminster, and you pay to go in. Talk-in will be given by G3TAD/P, 1920 kHz; G3JMY/P, 70.425 MHz; and G6YB/P, 144.25 MHz, opening on the air at 10.0 a.m. clock. There will be the usual tented trade show, a big raffle and a display by the 37th Wessex/Welch



Seen at the Thanet Mobile Rally on May 3—left to right, G3DNR, G8DLO (YL) and G3JMB. In the car, none other than G3DAH, of "VHF Bands," from Herne Bay.



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Impression of part of the car park for the big North Midlands Mobile Rally at Drayton Manor Park, near Tamworth, Staffs., on April 19.

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- Signal Regt. Ample car parking and picnic space, in a lovely setting unique in the South-West. For many years now this Rally has attracted a large attendance; all they need for another very successful occasion is the Wx.—J. Thorn, G3PQE, Jessamine House, Chapel Allerton, Axbridge, Somerset.
- July 5:** Cornish Radio Amateur Club Mobile Rally at the County Secondary School, St. Ives. Plenty of under-cover accommodation if wet; all the usual family attractions; refreshments available on site; and talk-in, opening at 10.0 a.m. clock, on 1873 kHz, 70.38 mHz and 144.19 mHz.—M. C. Locke, G3NKE, Hillside, Kehelland, Camborne, Cornwall.
- July 5:** A.R.M.S. Rally at Alconbury **cancelled**. New venue and arrangements to be notified later.
- July 5:** The annual South Shields & District Amateur Radio Club Rally will be held at Bents Park Recreation Ground, Coast Road, South Shields, with talk-in on 1980 kHz and 145.8 mHz, opening at 11.0 a.m. As in previous years this event will feature trade stands, competitions and prize draws; refreshments will be on sale. This is the South Shields Club's eleventh annual occasion and once again they look forward to welcoming visitors old and new, from far and near.—D. Forster, G3KZZ, 41 Marlborough Street, South Shields, Co. Durham.
- July 12:** Worcester & District Amateur Radio Club Mobile Rally at Hill County Secondary School, Upton-on-Severn, Worcs. Competitions, sports and games also raffles and trade stalls, with light refreshments available.—A. Ryan, G3VJN, Ahayweh, Bridge Street, Lower Moor, Pershore, Worcs.
- July 19:** Mobile Rally at Teignmouth, South Devon, near the Golf Club, with G3TXG/A giving talk-in on Top Band. Essentially a get-together, organised by the Exeter Amateur Radio Society, for members of their own and neighbouring Clubs, also amateurs on holiday in the district. No refreshments available at the site, so bring your own picnic.—G. Wheatcroft, G3HMY, 27 Lower Wear Road, Countess Wear, Exeter, EX2-7BQ, Devon.
- July 19:** Rally to be organised by the Scarborough Amateur Radio Society, at Burmston Road Barracks.
- July 26:** Saltash & District Amateur Radio Club's Rally, at Saltash School, Weardle Hill, Saltash, with talk-in stations on 160m. and two metres, signing

GB3SAL. Enquiries to: J. A. Ennis, G3XWA, 19 Coombe Road, Saltash, PL12-4ER, Cornwall.

- August 16:** The well-known Rally event at Derby, the 13th in their series, organised by the Derby & District Amateur Radio Society, at Rykneld Schools, Derby (*Details later*).
- August 16:** Torbay Amateur Radio Society Mobile Rally, at Newton Abbot Rugby Club ground, on the main Newton Abbot-Exeter road. Details: L. Webber, G3GDW, 43 Lime Tree Walk, Newton Abbot, South Devon.
- August 23:** Bromsgrove & District Amateur Radio Club Mobile Picnic at Hartlebury Castle, now the Worcestershire County Museum. Talk-in on Top Band and two metres, signing, G3VGG/A.—J. Dufrane, 44 Hazelton Road, Marlbrook, Bromsgrove, Worcs.
- August 23:** Swindon & District Amateur Radio Club Mobile Rally at Wroughton, near Swindon, Wilts. (*details later*).
- August 30:** Preston Amateur Radio Society Rally at Preston, Lancs. (*details later*).
- September 20:** Peterborough Mobile Rally (*details later*).

As already mentioned, we would be glad to have reports, with photographs, of all Rally events—see p.159, May issue, SHORT WAVE MAGAZINE, for details. Address for all items to be included under this heading is: "The Mobile Scene," SHORT WAVE MAGAZINE, BUCKINGHAM.

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#### NO RECEIPTS UNLESS WANTED

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## “CQ TWO de G3YKR/P”

EXPEDITION TO LUNDY ISLAND,  
MARCH 25-31

J. RUSH (G3YKR)

**L**UNDY is a stark and bleak island,  $3\frac{1}{4}$  miles long by  $\frac{1}{2}$ -mile wide; situated in the Bristol Channel, it feels the full force of the Atlantic gales. The twenty-five or so islanders are weather-beaten and tanned. The wind never ceases, and the Island's life, horses, goats, sheep and rabbits, all wild, are much hardier than their mainland contemporaries.

The Island's fascination begins as soon as it is sighted from the mainland. Lundy has a wild history, like something out of King Arthur's Knights. It has always been apart from the rest of England, the home of kings and slaves, knights and pirates. Now, however, the island is owned by the National Trust, and tourism is its trade. Day trips are run to Lundy now. A landing by rowing boat from the steamer anchored in the bay; a long steep walk up the cliff path from the beach; a moment to pause and look at the ruins of Marisco Castle and the new South Lighthouse; the tiny village clustered around the tiny church; and the Marisco Tavern, where opening hours are at the discretion of the inn-keeper; a pint or two and then back to the boat, with always a last glance over the shoulder as, shrouded in mist, the island slips away, a taste of the wilderness that brings strange joy to the hearts of city-dwellers.

It was here that the Wycliffe Scout Group was planning its Easter expedition. For a week we were to climb its cliffs, explore its caves, dive in its waters and live in the Old Lighthouse on top of the island, a 90ft. tower, disused and abandoned, replaced by modern lights at the North and South ends.

Radio was almost an afterthought. When G8DAD and G8DLS realised that they were both going, a two-metre expedition seemed possible and somewhere along the line the writer managed to join in from the rival organisation, the Air Training Corps.

As a site for an Amateur Radio expedition, Lundy is really fine business—a rare QTH, 300ft. a.s.l. and an all-round sea path take-off, comfortable operating conditions and battery charging facilities. Last amateur operation from the Island, as far as we know, was in 1967 by an Army group.

Accordingly, permission was sought to operate, and *Daystrom Ltd.*, in Gloucester were approached about gear. They very kindly lent us an HW-17A and 12-volt power supply for the duration. An 8-element Yagi was purchased from *J-Beam*. Three batteries were obtained and a 15ft. scaffolding pole was inexplicably added to the kit. That left us one day, in which the whole rig was set up and tested—it all worked, which did much to ease our peace of mind. Thus prepared (or unprepared!) for our first DX-pedition, we were ready for departure.

### Getting There

Leaving Stonehouse at 5 a.m. to catch the tide in

Ilfracombe, we duly arrived after a journey that was uneventful, apart from a walk up Porlock Hill! The Scout Expedition Vehicle, designed around a Ford Custom cab, could not carry kit and 20 people up the hill in low gear without suffocating them in its exhaust fumes! We were met by a doubtful fisherman who was uncertain of the chances of landing on Lundy, but the promise of his hire fee was enough. Two hours later we anchored in the bay and were able to disembark through the surf. The gear was taken up to the Old Light behind the two tractors that the Island owns, the only Prophets of the Almighty Internal Combustion Engine on Lundy.

The rig was set up that afternoon. Original plans to fix the aerial to the top of the lighthouse failed due to its unsafe condition and its temperature! Thus we moved to the house at its foot, where at least there was a fire, with the aerial on our miraculous pole, securely guyed by the Scouts.

### On The Air

That evening operation commenced. It was wonderful to feel *wanted*, when the school QTH had proved so inadequate for VHF working. After such little publicity we were amazed at how quickly the word of our presence on Lundy spread around South Wales and the Midlands. Conditions were not very good at the best of times, only the evening of March 29 providing a slight opening to any distance, giving us our best DX to G3YUA in Leicester. For the most part, contacts were made into Wales and Devon and Somerset. A number of Midland stations were worked, but nothing was heard out of EI or GI or the London and South-East directions, although the beam was often headed their way.

After a day underground, or cliff-hanging with the sea crashing and foaming below you, it was welcome to get back to a good meal, but frightening to return to a decision—the Marisco Tavern or two metres; invariably at least one succumbed to temptation! Both Mike, G8DLS, and the writer were sorely frustrated after the evening of the 29th—both of us had been making merry while Pete, G8DAD, had been making contacts. About 50 different stations were worked in the end and all QSL's have now been sent off.

### Results

In all the whole expedition was an unquestionable success. Although no great DX was heard or worked, we were well pleased with ourselves and the gear, both of which performed excellently, providing mugs and batteries were kept charged! We proved to ourselves that expeditions need not always be mud and tents. There are now many plans in the air, but the best laid plans of mice and men . . . !

Finally, our thanks to Daystrom for the rig, to the Agent on the island for permission to operate, to the Scouts for their tremendous help in many little ways and for laying it all on in the first place, and to G3KQW for batteries.

But above all our thanks go to the two GW's we overheard in QSO on Two after all had been packed up on the last evening, saying “Have you worked G3YKR/P on Lundy? They're a great bunch of lads. That's just how Amateur Radio should be.” *Thank you.*

# COMMUNICATION and DX NEWS

*E. P. Essery, G3KFE*

**T**HERE are times when one wonders, after listening around the bands for a while, why one ever bothers to come on the air when all the lids in creation seem to settle on whatever frequency one is using; but there are times, on the other hand, when one just has to sit back and admire the efficiency of a station handling a pile-up of massive proportions.

There has been plenty of opportunity for the Top Band types to do the latter during the period—but before we look into the doings of the month, let us first scan the results of the MDT (*Magazine Daylight Test on Top Band*) which was tried out on April 12. The general consensus was that conditions were poor during the day, but picked up considerably during the last hour or so of the Test period, an opinion expressed on p.167 last time. However, what was not so expected, was that while lots of people were in fact on—and getting out over good distances—just about everyone seemed to be of the opinion that there was a certain lack of activity!

Perhaps the most interesting reports came from opposite ends of the country: GM3KLA (Haroldswick, Unst, Shetland) had a long way to go before his signals even hit the mainland; from the signals

he heard, it is clear that people in the North Midlands were putting quite good signal levels into his receiver—but either Bill was not radiating his RF or the others were not listening, as not a single contact was registered, in spite of CQ calls and attempts to raise the stations he heard.

At the other end of the distance scale comes GC2CNC (Jersey) who also has a fairly long haul before he hits the mainland; but in addition he had to contend with the difficulties posed by a short aerial draped out of a window within inches of a steel-framed building, and the local electrical noise from the 120 flats which surround him. Up to 2.30 p.m. or so, things were passable, with contacts to G2JL in Penzance, G3YMK in Hayling Island and a couple of Swanage chaps. Others heard and called but not worked included G2DC, G3IRS, and G3YYF; but during the afternoon the commercial noises on the band made life virtually impossible.

A G5RV aerial and Tiger transmitter were in use at G3YYF, who seemed to have managed a few contacts of interest, including a new country in PAØPN, raised just after the end of the Test period. G3IRS, of course, is well known as the R.A.F. station at Locking, Somerset; this time it was being driven by

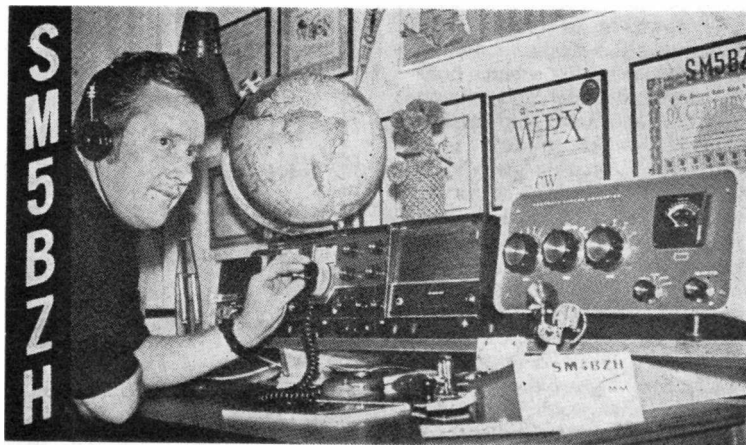
G3ZDW, who served a long period as an SWL before getting his own call. G3IRS made G3IGW and G3VRW, Yorkshire and Lancashire, as his two best QSO's.

GM3HLQ (Strathaven, Lanarkshire) came on, to work G3YUV and G13WSS as his two best, plus several other GM's. Here again the big beef was that so many of the G stations just were not on the *qui vive* for the Jocks.

That covers the reporters not mentioned last time round. Of the chaps who reported last month just in time for their calls to be recorded in the "Late Flash" on p.167 as the copy went down, G3VFA (Broadstairs) was on, using his Joystick on top of a 50-foot mast and 9 watts from an A.T.5 transmitter. His two best contacts registered were undoubtedly those with G3XDY at 168 miles and with PAØPN, who gave a report of 28 dB over S9.

Drew, GM3YOR (Kirkcaldy) had a quarter-wave wire, which raised G3WQN, G3WCM, G3YJG, and G3WTA in the northern counties, plus some other GM's; again there was the story of lots of G's heard and called but not hooked. Down in Portsmouth, G3MEW was feeling somewhat the worse for wear and did not come on, but heard quite

Seppo Lilia, SM5BZH, Slansbarsvagen 132, Enköping S-199 00, runs Swan equipment (a 350 with the Linear) and has a Hy-Gain 14AVQ ground-plane on the output side. He can be heard or worked on the DX bands as SM4BZH/MM, and this picture is also his QSL card.



a selection of stations around Southern England during the period 1100-1200, all SSB. He got the impression that conditions in the South were pretty rough; and G3XNS (Crawley) rather bore this out with his crop of contacts, possibly the longest log of all apart from G3VFA, but without exception below the 100-mile mark.

G3XDY (Cleethorpes) not only figured in a lot of the logs, but also he did a bit of analysis of the stuff being heard. The only one who sounded at all due to sky-wave propagation was GM3YCB, heard peaking RST-349 and dropping down to zero in the fades. To the North, G3WTA was the star turn, and in the opposite direction, G3VFA and G3YRA/A, both in Kent—not to mention PAØPN over the water.

Though G3SKC (West Drayton) and G3GMK (Southampton) found conditions pretty poor, they still made contacts—but again in both cases, the general run of things seemed to be 60-70 miles. G3YRA/A set himself up a “DX-pedition” for the weekend with the help of a buddy, and cursed himself for thinking of it most of that wet weekend. Saturday was a complete washout, but on Sunday morning they did get over to W1BB/1—and heard the “news from W1AW” well after daylight. In the tests, they appeared in many logs, not surprisingly, since they had 400 feet of wire with one end up at 150 feet—a fourteen-storey block makes a good pole.

One of the reasons for G3WTA putting out such a good signal from Morpeth is the three miles of wire down in the radial system. Mike used this against a full-wave at 66 feet driven by a home-brewed transistorised exciter, and penetrated into GM and down into the South Midlands—which brings us to G3OGR (Upton-on-Severn) who used the Tx described in our April issue (“Easy Top Band Transmitter”) to make quite a few contacts out to the 60-70 mile mark with a low quarter-wave end-fed wire.

G8HX (Mansfield) was handicapped by poor conditions—which, he suspects, were more created by tracking of high-voltage power-line insulators than anything else. However, Frank braved the damp noises

and towards the end of the period when, as would be expected, things were beginning to pick up, raised G3CHN at Bolt Tail, Devon, and G3XSA in Chingford.

Summarising, a much better-supported exercise than it seemed, with propagation conditions better in the North and Scotland than the Midlands and South, but lots of fun had by all. All this activity was, of course, *daylight* operating.

\* \* \*

Now, a very brief look at the rest of the Top Band clip; we shall have to skip a bit to get it all in, but everyone's Table entries have been included.

A general vote of thanks slowed things up a little on his last night for G3SVK, operating as GM3SVK/P from Berwick. During his mammoth tour of the Scottish counties he racked up a total of 2821 QSO's,

the only poor night being from Moray, when conditions on Top Band were absolutely foul, and, although Fred was at times getting down into the London area, his signals were very weak and there appeared to be some evidence of “one-way propagation”—on this night only 75 QSO's were made. G3LQI, G3YNC and G3YGP also added to the entertainment during the period under review, not to mention the GC lads, who came up from Sark, Alderney, and Guernsey under GC3YPV/A.

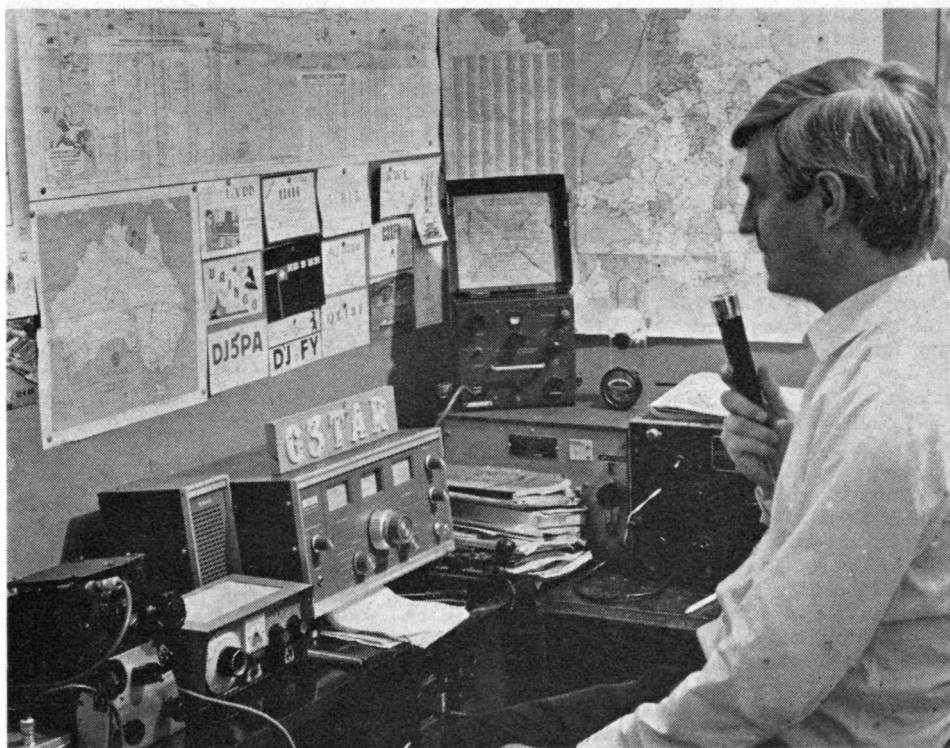
G3CED (Broadstairs) who has already appeared as the G3VFA operator for MDT, writes in to say a word of thanks to 9H1BL and G3WPO for their efforts in sorting things out and getting as many G's as could be over to 9H1 contacts, as well as to A1 for sending the cards out so promptly for all the QSO's.

#### SIX-BAND DX TABLE

(All-Time Post War)

Station	Countries	28 mHz	21 mHz	14 mHz	7 mHz	3.5 mHz	1.8 mHz
W6AM	349	148	159	349	143	118	7
G3DO	338	205	243	331	90	83	9
G2DC	338	172	310	329	167	116	20
G3NOF	319	195	222	307	38	60	4
G3LZQ	259	140	156	208	72	38	8
G3KMA	254	194	186	189	130	55	11
G3IGW	211	128	153	168	131	105	47
G3WTV	192	124	118	152	70	72	—
9H1BL	180	111	110	137	64	54	8
G4RS	175	81	112	124	46	41	13
G3RJB	168	75	54	153	60	37	8
G3XBY	164	108	115	102	70	56	6
G3PQF	162	105	47	100	84	65	13
G3VPS	139	49	44	120	59	38	14
G3YDX	124	69	62	40	40	36	8
G3WPO	104	35	24	66	49	31	24
G3XAP	100	44	46	45	56	30	13
G3VLX	51	7	12	20	7	27	19

Note: Placings this month are based on the “Countries” Column. Claims must be made at least every three months to retain a place.



Station of G3TAR, owned and operated by R. E. Roberts, 108A Weston Road, Lichfield, Staffs. After many years as an SWL, he was licensed in 1964. The main interest being Top Band, fixed or mobile, he is fortunate in having garden-space sufficient to accommodate a straight half-wave for 160 metres—how many of us would wish that we could put up the same! For Top Band mobile, he runs an A.T.5 Tx with home-built receiver and whip aerial, a combination which is giving him excellent results on 160 metres. G3TAR is also VHF-orientated, and has a full range of gear to make his signal heard on 2m./4m. By occupation, he is a TV field engineer and—by vote of the members—chairman of the Lichfield Amateur Radio Society.

Back to the discussion about JA QSO's on Top Band: Bandit Bill himself—no less—recently had lawfull occasions in JA-land, and met JA3AA, who wants the DX merchants to listen for him on 1910 kHz around 2100z. JA3AA's signal should be a force to be reckoned with in this particular context—he has a rhombic with 200-metre sides and 30 metres high tacked on to the end of Yaesu Musen FL-400 and FL-2000 transmitting gear. This one should interest GW3UUZ and owners of similar-sized aerials, but it is just about the toughest possible proposition as far as Top Band from the U.K. is concerned.

GM3ZDH (Glasgow) uses an A.T.5 with a "5RV" aerial which is strapped as a T-top fed through an ATU against ground, and comes in with a first entry to the Ladder and a lot of news, most of which is taken in elsewhere. Another first letter and

table entry from G3YPM (Swanage) who has taken up deadly battle with near neighbour G3YPT in the table—a matter which should be of interest to those county chasers who have been finding difficulty in scratching up a Dorset QSO.

#### Forty and Eighty

9H1BL (Paola, Malta, G.C.) sums up both bands as just plain awful, Forty being a question of trying to work a QSO under a jammer jamming a jammer jamming a commercial! However, through it all G6ZY/M/CN was picked out and worked as one item of note. However, students of the Tables will have noted that 9H1BL now has a score on Top Band—which most of us knew anyway after trying to work him!—but he also managed, for a best QSO, one with GM3WDF/M which has, our spies tell us, provoked the latter into laying down plans for

trying to work W on Top Band from the mobile.

G3YMH (Staines) got a lift out of life this time, as a result of taking unto himself a Minimitter transmitter which now puts him at full power on all five bands. The first trial, on Eighty, yielded a contact with 3Z1GA and a marked desire to QSY. Forty was given a going-over with the new rig—the old B2-into-linear arrangement had a tendency to want to chirp a bit—giving contacts in North and South America plus YT and other European QSO's to get the feel of the new box.

The ground-plane used on Forty by G3XAP (Stowmarket) is now down for maintenance, but during the period it was in use—November to March—some 945 W/VE stations were worked, in 44 States, plus 56 Countries. This result, leaving as it does only a small way to go for a

WAS on Forty, means that once the ground-plane is back in service, G3XAP will once again desert Top Band in favour of some serious 7 mHz sessions to complete his set.

As for G2DC (Ringwood), Jack put very little time in on 40/80m., as he has been spending most of it either searching for a goat with a good appetite for grass or, in the continued absence of the animal, mowing it himself. However, enough effort was spent on these bands to note that the usual ZL gang were still breaking through up to mid-April but then disappeared for another summer.

Neither did G2HKU (Sheppey) work these bands much—the reason, as in so many cases, being simply the counter-attraction of the Top Band county expeditions. However one of interest to prefix-wallahs was PA6VRZ, a VERON station which was set up on a camp-site.

The only long list for either band came from G3WTV (Torquay), having a last fling before placing his nose regretfully to the A-level grindstone. 7 mHz gave SSB contacts with CR4BC, HR2AJS, OA4BC, TF2WKF, TG8IA, TG9GF, TI2CAP, UK9AAN, VP2KF, VP2VI, VP9BK, VP9GE, YV's, W's, 4Z4 and 9Y4KR. Turning to Eighty, one finds CN8GM, CR4BC, CT2AT, C31CT, EP2DX, EP2FB, HV3SJ, TF2WKF, TF5TP, VE, VO, VP9GE, K2RSR/VP9, XE, KZ, YV's, 4Z4, 6W8DY and 9H1BA. Some fling!

#### Contests and Awards

The three weekends of the Grafton affair went off quite merrily, although on the AM night one could have wished that for once the SSB chaps would have yielded place to the competitors and given them as little QRM as possible. On the CW and SSB sessions GM3WDF/P was out operating from a water-tower at 90ft. with an inverted-Vee, which laid down an enormous signal in the South. Grafton's contest has, over the years, become part of the familiar scene of Top Band, and in doing so has changed from a local to a national affair.

During the period of the Mayflower Celebrations, an official award is offered by the Plymouth Club: Between March 1970 and November 1971 you have to make either one contact with GB2USA, three members of PRC, or any three stations in Plymouth city. For all the details on this one, contact G3KFN (74 Tavistock Road, Stoke, Plymouth, Devon).

The Blackwater Valley Award is being sponsored by Farnborough and District group for contacts with stations in Berkshire, Hampshire and Surrey, in four classes graded in order of difficulty. Details from Martin Crayton, 47 Lye Copse Avenue, Hawley, Farnborough. (Both these awards are open to SWL's.)

#### Special Activities

County-chasers on the look-out for Fermanagh will be interested to hear of the GB3FRE station, being set up in conjunction with the Fermanagh Festival, June 19-28. All bands are to be operated, some CW during the day, but mainly phone during the evenings, from 7 till 11.30, clock. For more details, GI3ZIA is the chap to contact at 10 Church Street, Enniskillen.

Turning back to that note on p.179 last month, the Dundalk lads now advise that the callsign which was to be used for the May-time Festival was indeed EI1DMF—which will have stirred up some more interest and QSO's with the new prefix.

Limerick Radio Club have to take your scribe severely to task for getting the dates of their EI0AO expedition completely muddled. This one is in fact dated May 30—June 1. The confusion arose because Whit weekend is celebrated in its proper place on the calendar in EI-land, whereas our swinging society chooses to disregard the religious festival and fix the dates as the Spring Bank Holiday, although it is universally called Whit weekend! The expedition, of course, is to Bere Island, as mentioned last time, and

#### "FIRST-YEAR-OF-OPERATION" LADDER

##### Top Band Only

Callsign	Date Licensed	Counties	Countries
<i>Phone and CW</i>			
G3YMH	3/6/69	80	16
G3YXM	1/12/69	72	14
G3YPM	20/8/69	71	16
G3YPT	20/8/69	63	14
GM3YOR	30/7/69	62	10
GM3ZDH	24/3/70	23	5
<i>CW Only</i>			
G3YMH	3/6/69	67	16
G3YPT	20/8/69	58	14
GM3ZDH	24/3/70	17	5
G3YXM	1/12/69	14	8

*A first entry for this ladder must contain a statement of the date of first licensing or of commencing operations, if later.*

the QSL's go to EI5BX.

Still with the EI lads, IRTS are sponsoring two awards which will be of interest and teach geography. One is based on Irish counties. Work all 26 EI counties for Class 1 of this one. The other is based on the four Provinces—Connacht, Leinster, Munster, and Ulster. To qualify, work one in the first and last of these, and four stations in the other two provinces, making ten QSO's in total. All the details from Donal Donergan, EI2CC, 47 Hazelbrook Drive, Terenure, Dublin 6. One suspects this award will result in some DX-peditions being mounted to the rarer parts.

During the period June 10 to June 26, VE3EWY will be on the bands from Dominica, St. Lucia, and St. Vincent. CW frequencies to be 14025, 21025, and 28025 kHz, plus 7005 and 3505 kHz for the LF chaps. SSB will be 28600, 21245 for U.K. and DX (21300 for U.S. stations), 14195 (14205 for W's), 7095 and 7200, 3795 and 3685, the last being for the benefit of the VK's. All frequencies kHz of course. The rig is a Galaxy, with a Hy-Gain 14-AVQ aerial.

Canterbury, Kent, is running a Canterbury Becket Festival, and from July 19-26 there will be a special-activity station on, using GB2CF as the call, and particularly interested in making contacts with other Canterbury stations; in the other Canterburys too for preference—but they have no actual objection to QSO's with others, even to the point where there will be a special QSL card printed. For skeds drop a

## Reporting the HF Bands

line to G8CUC, 7 Old Fold, Whitstable. Already the group have received much help, from *K.W. Electronics* and *J-Beams*, not to mention Mills Scaffold, who are helping with the mast and the temporary accommodation which will, it is hoped, be sited in the centre of Canterbury.

### Looking at the HF Bands

Here, as with all our DX bands, part-and-parcel of the fascination lies in conditions, and how far one can predict the trends from "feel" and weather sense.

Twenty is probably the best bet at any given time, and indeed for those London area stations with Ch. 1 TV the only band insofar as the others are not capable of sustaining DX traffic out of TV hours. Twenty has, on occasion, been open all through the night, but the advent of summer conditions has made the 21 and 28 MHz bands erratic, to put it mildly.

If you work a "G3YUA" on any of the HF Bands you are on a loser—the real one assures us that he is, for the moment anyway, only available on VHF.

G3WTV (Torquay) looked at most of the weird call signs and prefixes that were about during the period, and made himself a selection; to add to these there were CE, CR6's, CT2AK, HK3, HK6, HR1KIS, HT1MC, HU2CEN, HV2CUN, JW7UH, KP4ES, KV4FZ, OX5AP, PJ9VR, PY8OL, TF2WKF, UA9EU, UA9MT, UA9VB, UK9CAE, AX's in assorted shapes, VP9GE, VP5NB, YV's, ZM's, 3A2EE, 5Z4JP, 7Z3AB, 8P6BQ, 9K2BF, 9Y4VV and others.

W6AM (Long Beach, California) has a problem; although Don is probably the Top Dog in terms of sheer countries worked, he finds, on checking the records that there are three countries worked for 5-Band DXCC from the mobile in motion which have *not* been raised from the Rhombic Farm! Old man Murphy and his Law have struck again!

There seem to be more and more Maritime Mobiles about these days; G2NJ (Peterborough) notes hearing LU1AA calling "LU8AEU/MM" on the key one evening in mid-April.

G3NOF (Yeovil) found the usual summer pattern emerging, with

VK/ZL/W6 on the long path in the early mornings, plus some Pacific stuff on the short path from 1700 to 2300. Gotaways included KS6CY, HL9VA, YB1AAK, but contact was made with AX9XI, AXØLD, CEØAE, CP5DB, HS4ADB, JA6YG, JY1, KP4ES, KR6KG, KV4FZ, OY9LV, TA2SC, VP7NA, VU2KT, VU2OLK, W6's, XW8DK, YVØAI, ZM's, ZM3PO/C (on Chatham Is.), 6Y5EM, 6Y5SR, 7Z3AB, 8P6BC and 9M2DW.

Welcome to a new correspondent in the form of G3ZHI, who, at the time of writing had had just three weeks of operation on the bands with an NCX-5 and "5RV" aerial. Twenty yielded LU7FAG, 6Y5LA, VU2BEO, HR2WTA, UW9EA, 8R1J, ZL, HK6JM, 9G1FD, VR2EK, 8P6BQ, AX's, VP2VI, PZ4AV, ZB2BY, HS1ACW, KP4FS and CE4BF; and, believe it or not, the majority of his crop were hooked in a session of three days during the period alluded to earlier. It all spells out "DX-minded ex-SWL" to these old eyes. G3ZHI is at Maltby.

9H1BL comes back into the plot at this point. Already we have noted his somewhat jaundiced outlook on the two lower-frequency bands, but it seems as if CW on

Twenty provided at least part of the cure, QSO's being registered with 9M8FC, K5MWZ/KH6, KH6IJ, AX, ZM and others of like interest.

Only one contact on Twenty appears in the G3XAP letter as worthy of notice, on CW with 8R1J. However, the location was not of so much importance as the fact that it represented the magic 100th country worked—congratulations, Phil.

G2DC found that, although 20m. has a nasty habit of being chock-full of European signals during the day, the morning spell from say, 0600 to 1000z, was pretty rewarding in terms of DX. The W's started to roll in around midday or just after, and then would remain audible round the clock till 0730. CR4BV, KG6AKR, OX5AP, UWØIJ, VR2FT, VE5LT, KH6GLU, KH6RS, VK1-6 and ZL1-4 were all worked, not to mention all W call areas and the first eight VE ones.

Mostly morning sessions at G2HKU (Sheppey), when he could spare the time from chasing GM3SVK/P round Scotland; thus we find AX3ANO, AX3AQK, ZL3JQ, ZL3SE, and 9H1BG all booked at around 0700. One late one—2300—was with 6Y5SR, both on SSB and CW. CW was also



In our May issue, the subject of "The Other Man's Station" feature was G3WVD, Ilkley, Yorkshire. Here we see another part of the G3WVD set-up. Each plug-point is separately switched and fused and there is ample space for experimental and constructional work. He also has plenty of room for aerials, and facilities for an earthing system that should show a very low resistance.

used for contacts with OA4KF, VE, YV5CKR, but not YV0AI, who was given up as a bad job after an hour of waiting for him to call for "two's." G2HKU reckons that here is a very good case for some private lessons from G3SVK in getting the business through neatly, quickly, and tidily.

It takes a bit of getting used to after operating Top Band, concludes G3YMH (Staines) after trying out his Minimitter and dipole on Twenty; but he rapidly got the feel of things. His first attempt was a KP4 who balked him—not too encouraging!—and then the dreaded TVI bug struck and put him off *all* bands other than 160m.—the TV owners have all three programmes clear on UHF, an apology for an aerial on VHF, and insist they *must* use the VHF channel. It seems like the old, old, story—the only answer is to move! However, before this snag cropped up, contacts were made with W3NNT, OK, UW3, YO, YU, SM, YT, W2MDW, TA, W2USJ, VE3UU, VE3FGG, W8MEI,

UK5, K9RJO (all CW), plus, I1LEG raised at 59 both ways on AM.

### Fifteen Metres

Never a mention of this band in the letter from W6AM, which suggests that Don is still concentrating elsewhere in his efforts—now happily completed—to make the century on each band for the 5BDXCC. As for your conductor, Don provided him with a thrill of a different kind when the envelope of the letter was noted—stamped with four of the five-cent "Amateur Radio" issue, which the franking machine had obligingly dealt with just about as kindly as possible. A nice design; but a mildly sour note in that your conductor notes the waveform is of an AM signal!

Keith, G3WTV, is obviously an out-and-out Phone merchant, with a list for Fifteen as long as your arm; but he writes a hand that looks *almost* as bad as the G3KFE one—so fingers are crossed that the calls shown are correct. CE's, CN8, CR4BC, CR6GA, CR7IZ, CX1JM, CX2CN, DU1FH, EL2BZ, EP2DX, HL9VL, HS3ACP, HS5ABD, KL7FQQ, KR6, KZ5WR, OA, OH0NI, OX, PJ9VR, TA1NF, TF2WKF, UA0, UA9, VE8, VP9GE, VK's, VU2OLK, YV, 4S7PB, 4Z4AI, 7Z3AB and 9Y4MM.

GM3JDR (Wick) managed to mend the keyer towards the end of the period, but has found more interest in the building of an integrated-circuit type to replace it, and in working the SSB. Taking his CW first, Don offers HC1OS, AX7SM, OI3KN, and VS6BL. By contrast, the SSB list is enormous, running to more than a page of the GM3JDR letter: EA9AA, WA5GUU/KL7, 5H3LV/A, 9V1PA, ZS6BDO, A2CAH, UV9PP, AX's, VP9GE, CR7EE, CX7BF, LU, KP4GI, CR6YS, 9J2PV, HS4ABW, ZD9BN, VO2AH/MM (near Vietnam), HS3ACP, VQ8CZ, MP4BBA, KZ5DF, CR6EQ, CR6MT, EL2CB, 9M2VI, HV3SJ, 6W8AL, XW8CY, TJ1AW, EP2YL, HK4CAV, YV7GW, YV4UA, 9Q5PR, VP5NB, DX1HML, VP2VI, PZ1BD, TU2AX, 8P6BQ, ZY7AF, ZX1MB, FP8AP, ZP5DY, CP6EP, VP5TH, 3V8AL, 91 assorted JA's, and all W call areas—constituting only a selection from the list. All the exercise moving furniture and such

must have given GM3JDR renewed energy!

The TVI problem limits G3NOF on Fifteen, so his contacts are relatively few; but on the other hand Don always follows the top DX'ers precept and listens round. Thus it was that he came across VR6TC, KX6II and VR4EZ, all heard, with JA7ACM/MM, JH1QC, ZD3D, 9M2VI and 9V1PA worked.

Although, as already remarked, G3ZHI has got off to a flying start with his gear, he already displays a selective attitude to his reports; only HP1SC/MM and 9J2PV, both raised around 1715, are considered worthy of mention.

Fifteen at 9H1BL was an all-SSB business this time, with VP7NH, CT2AT, HT1MG, ZD9BN, AP2MR, VQ8CZ, VQ8CR, 5H3LV/A and ZD9BM as the highlights.

G2DC is a difficult customer to please, and although he found band conditions pretty fair on the whole, Jack was more than a little disturbed by a "thing" sitting on 21025 kHz, apparently RTTY, but squirting out horrible clicks over about 20 kHz on either side. Through it all Jack managed to contact AX2AU, HS3ACP, JX5CI, KH6IF, KR6AE, MP4BEU, UJ8AB, UA0YD in Zone 23, VK9BA, VS6AA (who, incidentally will be on his way back to U.K. by the time this reaches print), VS6BL, VS6BA, VS9MZ, YB3DC, YB3CC and 9M2FK.

### Here and There

G3YPB is the Hq. station of F.O.C., as many will be aware; but it is understood that it has been agreed with the MinPosTel people that committee members of the Club may operate it /A for periods of a month at a time; G2HKU has the honour this month, so G3YPB/A will be another station on Sheppey for the collectors.

Another snippet of news from Ted concerned his old friend ON4CC, who was badly injured when his car crashed and was wrecked. In another car accident ON4ZO and his wife were badly hurt, and their son killed; to them all go our sympathy.

Some QSL information, as usual, from G3NOF who mentions VR5LT, to VK6WT; 9Y4US to K8NSA; KS6CY to Dept. of Education,

### TOP BAND COUNTIES LADDER

Station	Confirmed	Worked
<i>Phone and CW</i>		
G2NJ	98	98
G2HKU	96	98
G3WPO	94	96
G13WSS	92	95
G3VLX	91	98
G3XTJ	86	94
G8HX	85	89
G3XDY	79	95
G3KFE	52	78
G3LXD	44	68
<i>Phone only</i>		
G2NJ	98	98
G3VGB	90	95
G3WPO	90	91
G3PQF	88	98
G3XTJ	68	84
G3XDY	53	86
G13WSS	50	44

(Failure to report for three months entails removal from the Table. Claims may be made at any time. Six months of "Nil" reports will also result in deletion.)



Pago Pago, U.S. Samoa 96920; OY9LV to W3HNC; HS5ABD to W6DQX; W9EVI/ZD5 to P.O. Box 7557, Johannesburg, South Africa; VU2VAE to K2UOP; HS2ACA to DK1RR; XW8DK to WA6NFC; JY1 to P.O. Box 1055, Amman; ZB2BY to GW3DIX; ZD3D to P.O. Box 10, Bathurst; ZM3PO/C to ZM2AFZ; VP5NB and VP5TH to WA5GFS, P.O. Box 462, Chichasha, Okla., 73018, U.S.A.; KX6II to KX6DB; CP5DB to P.O. Box 1620, Cocabamba; XW8DK to WA6NFC; FØRT /FC/P to W2CTN; and ZS3HT to WB2NQR or the Bureau.

G3RWL writes in to raise a "point of order" on the Bermuda Contest mentioned last month, and the top prize. Re-reading VP9MI's original letter, one is left in doubt as to whether the top prize-winner *only* gets the trip to Bermuda or whether it means all those who make *area* top spot. There is an ambiguity. Probably the best way to sort this one out, if a serious entry is being planned, would be to drop a line to VP9MI. Thanks, G3RWL, for bringing this element of doubt to the fore.

#### Ten Metres

Here, of course, the transition to summer conditions has been most

marked. During the first half of April, things were really good, especially to Africa and the East, but towards the end of the period, the band became distinctly "iffy."

G2DC worked AX2QL, CR7CN, CR7CG, KR8BU, LU1DEN, RI8AEE (in Tashkent), MP4TDA, UL7XL, UAØBX, VS6AF, XW8BP, XW8CR, ZE3JO, ZD8RC, 9G1FN and 9J2RQ, all of course on CW.

From mid-April till May 8, no W's were heard on the band by G3NOF, although they came back with a bang then, from 1700 right through till 2300, mainly W2, W4, and W8. Around 1600 there have been several odd openings to various parts such as S.E. Asia, and ZL's on the long path coming in about 2000—the first at this time that Don has noted for ten years, although they were common enough in previous cycles. CR4BC, CR6IY, CR6MH, CR7CH, CR7FM, DU1FH, EP2DX, HS5ABD, JH1ECG, KG6AQY, KV4AD, MP4BHL, VK9GN, VP5NB, VP5TH (both on Grand Turk), VP8KD, VP8KL, VP9GE, VU2DK, VU2OLK, VU2TP, W's, (including several W6's), W9EVI /ZD5, YB1AN, YBØAB, ZL3JO, ZS's, 4Z4HF, 5H3LV/A, 7Q7JG, 7Q7LZ, 9J2BC, 9J2VX, 9M2VI, 9V1PX and 9Y4US were all booked in, indicating the nature of the

change in conditions quite noticeably.

And there you have it; a band where *neglect* is half the trouble rather than any serious lack of sunspots and propagation. A band to be savoured this year if at all, not least because if it is not given a whirl *this autumn* it will probably be pretty useless for DX for several years other than relatively local contacts of the VHF-propagation variety. And there can be no doubt about it, the pressure on spectrum space is such that *any* of our bands which are not used enough are going to be looked at carefully with a view to re-allocating them to other services. What will be needed for Ten during the coming years will be as much local-nattering and RAEN or whatever concentrated on to it, just to make sure of occupancy.

#### Conclusion

Once again the time comes for us to sign off; the deadline for our next is **June 8**—addressed as always to: CDXN, SHORT WAVE MAGAZINE, BUCKINGHAM. And, *please* regard the *deadline* as "arrival at Buckingham," and not dropping the letter in the post-box that day! 73 *es BCNU, G3KFE.*

#### AMATEUR RADIO TECHNIQUES

This is a very useful general reference book of 160 pages, with index, in nine separate sections covering Semiconductors; Components and Construction; Receiver Topics; Oscillators, their characteristics and circuitry; Transmitter Topics; Audio and Modulation; Power Supply circuitry and construction; Aerial Design, erection and matching units; and Fault Finding Procedures and Testing. There are over 350 diagrams, mainly circuitry, and much detailed information on the wide range of topics discussed. *Amateur Radio Techniques*, price 14s. 3d. post free, immediate delivery from stock. Publications Dept., Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

#### SOME ARE REALLY KEEN

Geoff. Green, Hong Kong, found he would have to wait some months for the local R.A.E. held annually—so he flew to England to take the examination here (which he passed) and then returned to Hong Kong able to claim a local licence under the reciprocity agreement. After his 18,000-mile round trip, he is now VS6DA.

#### UNIQUE CLUB RECORD

The first wireless club in this country was formed at Derby in 1911—and even in those days it had its own call sign, QIX. That same club is now the Derby & District Amateur Radio Society, with a continuous record of 60 years of Amateur Radio, in all the forms it has taken over those years. The Club of today, preparing for its diamond jubilee celebrations, also has its own call signs—G2DJ, G3ERD and G8DBY—and is as active as ever, with a large and enthusiastic membership. Their next important event will be the well-known Mobile Rally, at Derby, on August 16.

#### RAIBC ACCOUNTS

From their last annual statement, we see that the Radio Amateur Invalid & Bedfast Club can show a surplus on the year's working of £304, with cash assets now totalling about the same amount. Grants to members of RAIBC for the year came to about £300, and donations amounted to nearly £350. Of course, the "surplus of income over expenditure" is achieved only by the devoted, unpaid work of the hon. secretary, Mrs. Frances Woolley, G3LWY, assisted by her husband, G3ESR. The RAIBC is surely the U.K. radio amateur's own charity.

CONDITIONS during the last month have been better than the level of activity would suggest. The Cornish and French beacons have been logged quite regularly at G3DAH, although contacts with those areas have been hard to come by. Still, contacts *have* been made, and after the long dreary spell we have been having, were very welcome. It does serve to illustrate the point, which has often been made, that an apparently empty band frequently can be brought to life with a few CQ calls instead of a quick listen around and then QRT. Propagation on Two has been better than on either 70 cm. or 70 MHz, which have been pretty undistinguished, with the exception of the auroral opening on Four on April 21.

This aurora was not as intense or as extensive as that of March 8, and produced better results on Two than on the lower frequency band, although the first indications were observed earlier, from about 1500 hrs. GMT on Four, and it was not until about 1900 BST that it could be said to have opened up on Two. Stations logged at G3DAH were: G2CIW, who was *Ar* or *T9* depending upon the beam heading; G3VPI, G3LQR and G3LTF (they never miss, those two, do they?); G3USB, who never did go *Ar* although G3EDD from the same area did; SM7BAE, G3BHW, LX1SI, very much weaker than he was in March; PAØFAS, DL1SN, LA7BI, who appeared for about two minutes and was never heard again; GM3TFY, GM2DRD, GM4HR, SK6AB, DL3YBA, G3PQR and OZ6OL. No SP, (or 3A2), were heard, and GM3JFG from Invergordon was reported on, but was not heard in Herne Bay. Optimum beam heading was East of North, but swung North at times, particularly for the GM's. If the curtain is horizontally extensive, the geometry must be such that headings will change somewhat for widely different locations. Pressure in Central England at the time was 1015 mB, and the weather generally was fair.

The next event of any significance was the May Contest. Superb weather conditions over most of the country, both during and immediately preceding the contest had brought good propagation with them, and the portables were having

# VHF BANDS

A. H. DORMER, G3DAH

a field day in more senses than one. There was some criticism of the timing of the event, divided into two sections as it was to cope with the domestic and the IARU contests which were running concurrently, by the portable stations who were heard complaining that it was a lot of work to put in for a very short time—but they must surely have felt compensated when it was all over and the scores totted up, since, unless something had gone terribly wrong, the totals must have been quite high, and all the U/V radiation on the mountain tops must have done them some good!

Continental activity was high in places. There were many French stations on at good strength, not all portable either, a good smattering of DJ/DL, but the PAØ's did not seem to be there in their usual numbers. The G2JF contact with F1BF in QRA CF44f at 700 km. or so, and the QSO between a Paris station and F9RY in Corsica, were indicative of good extended tropo, while the advent of HB9AEN/P in QRA DG13b at the end of, and just after, the contest, to give many British stations their first Swiss contact, wound the whole thing up very nicely. Once again the South seemed to have the best of the opening, although the Welsh portables were very much to the fore, working Continentals throughout much of the time. In the Midlands

it seems that the DX was there, but the QSB was very troublesome, although that didn't stop G6CW in Nottingham from logging some twenty French stations on SSB alone.

Operating techniques appeared to be good, and it looks as if the practice of disqualifying persistent offenders is paying off. Scores were considerably up on the 1969 totals. GW3TQZ/P was passing 340 towards the end, and GW3OXD/P with over 270 and GW3SLJ/P with over 260, must be up among the leaders. GWNUE/P, last year's winner with 165 QSO's, was not heard as such this year, but rumour has it that the fine lead of 'TQZ may have had something to do with Geoff's expertise.

Apart from these outstanding occasions, there seem to have been rather more "lifts" North/South than East/West, and this is in accordance with the pressure patterns during the month.

## VHFCC Awards

Richard Baker, G8DLP of King's Bromley, Staffs, gains the two-metre Award in what must be record time, as it was not until February this year that he made a start on two metres. The gear used consisted of a transmitter running twelve watts to a QV03-10 and a 5-ele beam at 30ft. Two converters were available, a home-built valve job and a Mosfet solid-state module affair. The main receiver is also home-built, and is based on an Electronics design, with an EA-12 as a stand-by. Since then, however, Richard has made up a QV06-40A PA with series-gate modulation and now, as can be vouched from personal experience, puts out a potent signal into the South of England from a QTH in open country at 150ft. a.s.l. He is also equipped for 70 cm. operation.

The motive force behind the collection of the necessary QSL cards has been his two sons, who have also prepared an analysis of results from which it is numerically possible to pinpoint the G8/3 stations as being by far the worst offenders when it comes to sending a QSL, even when the outgoing card has been sent direct with an s.a.e.! Only some 50% have bothered to reply, compared with the 100% response from operators who have

been licensed for five years or more. These figures substantiate the many comments received from claimants for this Award.

G8COK, Dave Powell, gains the Award for operation on two metres from Hatch End in Middlesex, where he has a QTH at 200ft. a.s.l. He runs a QQV03-10 with thirteen watts input, modulated by a pair of 6AQ5's, to a 4-element beam of home construction at 20ft. The converter uses a 2N3823 in the RF stage, followed by 2N3819 second RF and mixer stages. The main receiver is a B.40 tuned over 24-26 MHz. This result is the more creditable since Dave spends thirty weeks of the year as a student at Southampton University from whence he is not QRV. Nevertheless, he has clocked up more than 300 contacts with different stations on the two-metre band.

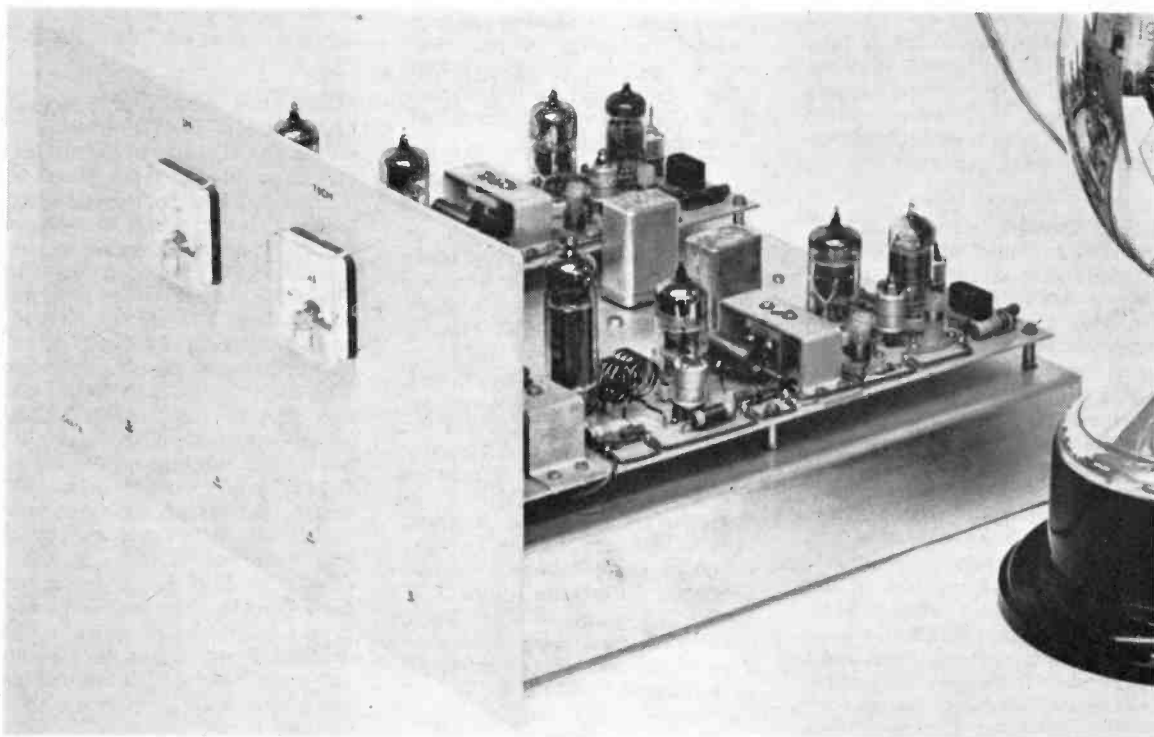
From Woodford Bridge in Essex, Richard Clark, G8BXC, also achieves the two-metre Award. He runs 150 watts of NBFM to a QQV06-40A and a six-over-six slot

fed Yagi at 35ft. The converter is transistorised with a GMO378A front end, feeding into a G.209R receiver. The QTH is at 50ft. a.s.l. only, and is badly screened in all directions except to the North West.

Roger Swann, G8BHI, operates from Blackfield near Southampton, and holds some 800 QSL cards for contacts on two metres since he started in March, 1968. RF into the four-element Yagi at 27ft. has never exceeded 25 watts on AM, or 20 watts on NBFM. Two converters are in use, one using a cascode E88CC + 6CW4, and the other a TIS88 pre-amplifier followed by a BF180 + TIS34. The IF strip is a double-conversion affair tuning 24-26 MHz and then 2 MHz, and is home-built. Roger has been a reader of *SHORT WAVE MAGAZINE* since issue number one, and recalls nostalgically the MPT4 Hartley oscillator described therein. Unfortunately, after his return from VQ4 land in 1946, he found that all the pre-war issues had been given away, and this has caused a certain

amount of despondency. He feels great concern, as do so many, at the lack of activity on 70 cm., and asks for articles on simple equipment for that band, pointing out that while it is still possible to get cheap W.D. surplus equipment for two metres, there is very little of it about for 432 MHz, and that since many of the G8/3 licensees are still at school, cost is a prime factor. This Column certainly agrees with these sentiments, and the Editor is always ready to consider manuscripts on these lines. The 70 cm. gear at G8BHI consists of a QQV02-6 tripler feeding a QQV02-6 PA. The antenna at present is an 8/8 slot, but will eventually be replaced by a 14-element Yagi. Three converters can be brought into use—a 6CW4 + E88CC, or BF180 + BF180 + TIS34, or TIS88's in cascode + BF180 mixer. To date, contacts have been made with G, GW, ON and F.

G3DNR, Paul O'Brien, is on two metres from Broadstairs in Kent, and it is interesting to notice that



A beautifully-engineered dual-band transmitter for two metres/70 centimetres, designed and constructed by Mike Hearsey, G8ATK (Farnham, Sy.). It was shown at the recent London VHF Convention—as reported in these columns—and earned him the prize for the best example of home-constructed equipment.

his claim for the Award consists entirely of EU callsigns—he being near enough to the Continent for the purpose. All stations were worked with a low-power transmitter running only five watts input to a QQV02-6 and feeding an eight-over-eight slot at 40ft. For reception, a 6CW4 pre-amp feeds a 6CW4 converter, the IF strip being an HRO tuning 4-6 mHz. The QSL return rate is 68% overall, with the PA's showing an exceptional rate of 97%.

Finally, Dave Goadby, G8BZN, gains the two-metre Award for operations from Hinckley in Leicestershire. Although running 150 watts of series-gate modulated power to a QQV06-40A at the present time, most of the contacts were made with a 20-watt rig and an 8-ele Yagi during weekends only.

#### Aggregate Tables

But few claims have been received to date for the proposed Aggregate Tables, which were to be introduced if the demand were there. Details were given on p.106 of the April 1970 issue, but briefly the Table will be designed to show claims for total countries and counties worked on two metres or 70 cm. from January 1969 onwards. Further claims would be very welcome so that this scheme could get off to a good start.

#### Conventions

The Sixteenth International VHF/UHF Convention at the Winning Post Hotel at Whitton on April 25 was another great success. So much so, that arrangements have been made to repeat the event at the same venue on April 24 next year. Some 350 visitors arrived for the afternoon session and 138 stayed for the dinner. EI, GI and GW were all represented, and the U.S.A. by W6GTJ, Jack Butrovich, who now operates as GI5ALP from Londonderry, and whose two-metre SSB will be missed when he returns to the United States in July of this year. Trade shows were provided by J-Beam, Burns Electronics (who were showing their new filters and a very nice VHF/UHF wavemeter), Microwave Modules, Garex Electronics, Echelford Communications and C. G. James Electronics.

Among the home-constructed equipment on display was the G3RPE transmitter for 10 kmHz

which was used for the F2FO/P contact at 35 km, together with the associated receiver. G3EEZ was showing a receiver for 13, 9 and 3 cm., mostly transistor, and G8AOL brought along a hybrid ring mixer for 23 cm. which was attracting a lot of attention. The 1962 VHF Committee Cup for the best exhibit went to Mike Hearsey, G8ATK, for his very fine dual-band printed circuit exciter for two metres and 70 cm.—see picture p.233.

As in previous years, the afternoon session consisted of lectures, this time on the "Trident" project for a U.K. amateur satellite; microwave communication; NBFM techniques; VHF propagation *via* trans-equatorial scatter and digital beam antenna control. After-dinner speakers included the guest of honour, Howard Steele, Director of Engineering of the ITA, and Dr. Saxton, President of the RSGB, both of whom emphasised the need to make the fullest possible use of the frequencies which have been allotted for amateur use in the VHF spectrum, since it is only under those circumstances that we can hope to enlist the support of the professionals, which will be so much needed when the World Administrative Radio Conference in 1971 considers frequency allocations.

The British Amateur Television Club Convention takes place at Churchill College, Cambridge, over the weekend of July 25-26. Lectures, films and video tapes, together with visits to local ATV stations and a TV transmission equipment manufacturer are all scheduled, with a dinner on the Saturday evening. Accommodation is available in the College over Friday and Saturday nights for visitors and any ladies who may accompany them. From the programme received, it would appear that this will be a most enjoyable and instructive event, and details may be obtained from D. S. Reid, 71A, Rose Valley Road, Brentwood, Essex, not later than June 15. This convention marks the 21st Anniversary of the BATC.

Rather a long way ahead, but nonetheless the important for that, is the 1971 Midlands VHF Convention which is being organised by

G3OXD, of the Albright & Wilson Amateur Radio Society, under the aegis of G6FK, who has been responsible for this event in the past. The *locale* chosen is the Company's premises near Birmingham, where admirable facilities for lectures, refreshment and parking are available, and which is very easily reached, lying as it does close to the junction of the M5, M6 and M1 motorways. G3AOS is the chairman for the event, which is scheduled for June 19, 1971, and further details may be obtained from Graham Badger, G3OHC (50 Essex Road, Four Oaks, Sutton Coldfield, Warks.). If G3OXD can lay on this event as well as they can organise their Field Day operations, and with Fred Smith adding the touch of finesse which has characterised previous conventions, it should be a pretty good show.

\* \* \*

The First EI VHF Convention will have come and gone by the time these notes appear, but arrangements have been made for an account of the proceedings to appear in a subsequent issue of "VHF Bands."

\* \* \*

May 10 was the date for the annual Convention of French amateurs in the Pas de Calais area of Department 62. The Faisan Doré Hotel at Courset provided both ample space for the Convention and an excellent lunch. There is increasing interest in matters VHF among the Old Timers on the HF bands, who are now finding TVI rearing its ugly head, and among F1/3 calls which are appearing so rapidly. Included with many well-known VHF calls were F1AOY and F1APQ; F2XO, whose impeccable English can be heard most evenings on 145 mHz; F1BCI, who worked over 100 British stations during the May contest; and F1BF, who was operating from St. Etienne in QRA CF44f, South of Lyon, during the same Contest. Although only running a nominal two watts, which dropped to one watt as the batteries ran down towards the end of the event, the QTH at over 1,000ft. certainly helped him with his score of more than 100 contacts. ON4LO represented Belgium, and from him came the sad news that the annual VHF Convention in Knokke is now

a thing of the past. G2JF and G3DAH were the only representatives from the U.K.

**Meetings and Special Events**

The South Bucks. VHF Club have their bring-and-buy surplus equipment sale on July 7 at Bassetbury Manor, High Wycombe, starting at 8 p.m. There will also be a talk on VHF Construction. Details of Club meetings may be obtained from R. Idiens, 77 Amersham Road, High Wycombe, Bucks.

\* \* \*

The May meeting of the South East UHF/VHF Group was addressed by Heath Rees, G3HWR, who demonstrated how simple it is to get on to 13 cm. He went through the design of both receiving and transmitting equipment, and confirmed operation by practical demonstration. The next meeting of the Group is on June 19 at Keynes College, University of Kent, Canterbury, when Tony Griffiths, G3MED, will be talking about receiving techniques on VHF. Further details from G3DAH, *QTHR*.

**Good-Show Department**

Congratulations to Johnny Stace, G3CCH, of Scunthorpe in Lincolnshire. On May 6 he had a M/S contact with TF3EA in Iceland for the first two metre G/TF QSO. The exchange took from 0400 to 0624 GMT. Although many pings and bursts were heard during the first two hours, it was not until 0602z that both calls were exchanged with reports and RR both ways. It is particularly pleasing to record the achievement, since it is known that Johnny has devoted much of his time recently to concentrating on this path, although without neglecting his regular transmissions to OH. This gives him 26 countries worked on 144 MHz, his 25th being the fine M/S contact with OY2BS in the Faroes on November 15 last year.

\* \* \*

G3EEZ and G3BNL have pushed out their previous 3 cm. record from 45 miles to 54 miles with a contact over the Clee Hill-Nymphsfield path on April 5. Weather and propagation conditions were good, and RS-59 signals were exchanged. The equipment used was the same as that

detailed in "VHF Bands" for March. Congratulations.

\* \* \*

Congratulations also to Bill Hawthorne of Aylesbury, Bucks., who becomes the first holder of the RSGB Supreme Award with 15 countries and 60 counties worked on Two; 9 countries and 40 counties on 70 cm; and 3 countries and 20 counties worked on 23 cm. The last card to come in was that from OE2OML for a two-metre contact last year, so Bill must have been on the edge of the chair for quite some time.

**Overseas News**

*From GD:* GD2HDZ (Laxey, L.o.M.) reports a growing interest in VHF on the Island. Quite a few stations are now equipped with mobile or portable gear, and a fine Sunday brings them out to selected high spots. Calls include GD3FOC, GD3JAE and GD3EGF among others. The 70 cm. Cumulative Contests were apparently a dead loss on the Island, as indeed they were in so many other places, due to the poor propagation conditions.

'HDZ made contact on 70 cm. with the Cambridge University expedition, GD3TPF/P, and although this may not sound extraordinary, a look at a contour map will show that it was. It might almost have been a new "First"—GD to GD on 70 cm., but one seems to recall that a previous expedition has already done that.

Arthur also experienced his first two-metre aurora on March 8, and was shattered by the babel at the low end of the band. He raises the point that during an aurora, the whole band, or a much larger segment of it, should be used for CW operation. This would need some sort of international agreement of course, and it is not certain whether it would find favour since the choicest DX at these times is often a target of fleeting opportunity, and having to tune the whole two mHz for a signal would certainly raise problems. *From OK:* Although opportunities for working Czechoslovakia on VHF are rare, readers may care to note that the prefixes OK1, OK2 and OK3 are used by holders of full licences. OK4 is used on merchant ships. OK5 and OK6 are reserved

**THREE BAND ANNUAL VHF TABLE**

*January to December, 1970*

Station	FOUR METRES		TWO METRES		70 CENTIMETRES		TOTAL pts.
	Counties	Countries	Counties	Countries	Counties	Countries	
G3OHH	29	3	33	3	5	2	75
G3DAH	17	2	43	9	2	1	74
G2JF	—	—	35	8	15	4	62
G2AXI	14	2	34	7	3	1	61
G3EKP	14	4	18	5	4	3	48
EI6AS	5	4	39	9	—	—	47
G8APZ	—	—	31	3	11	1	46
GD2HDZ	—	—	27	4	4	3	38
G15ALP	5	3	19	7	—	—	34
G8BKR	—	—	18	3	4	2	27
G8AUN	—	—	19	3	—	—	22
G3COJ	—	—	11	4	5	1	21
G3IAR	5	1	12	3	—	—	21
G8BWW	—	—	14	4	—	—	18

The Three-Band Annual Tables show total claims to date from the year commencing January 1970. Readers are reminded that claims should be sent as heretofore to: "VHF Bands," SHORT WAVE MAGAZINE, BUCKINGHAM. Summaries by bands will be published at regular intervals. It doesn't matter if you think that you have little chance of reaching the top of the Table, your friends still like to know how you are doing, so send those claims in!

for special-activity stations (*cf.* our GB). OK7 is used by non-amateur experimental stations operating on amateur frequencies (don't like the sound of that!), and holders of reciprocal licences use OK8. The OL series of call signs is allocated to holders of novice licences who are only permitted to use Top Band and two metres, with a power limit of ten watts. Full licence holders may use up to 300 watts.

**From DL:** Reciprocal licences for Germany, may now be obtained from DARC International Affairs, Muhlenstrasse 27, D-5601, Doenberg, German Federal Republic.

**From EI:** Reciprocal licences for Eire, and temporary licences for operation for up to 30 days in that country, are available on application to: Department of Posts & Telegraphs, (G.B.), Radio Section, Hamman Buildings, O'Connell Street, Dublin 1.

**From PA0:** PA0CML has now worked over 1,000 different U.K. stations and more than 1,000 German, all on two metres. Those who hear Cor regularly will not perhaps be all that surprised, since his two-metre signal is one of the strongest coming out of Holland. His QTH at Katwyk is only 30 yards from the sea, and even though he lost his *very* long Yagi during the storms last winter, he still has a 16-element beam at 60ft. a.s.l. and an all-water path to the whole of the East Coast of Britain.

#### Equipment News

New ratings have just been announced by Mullards for their OA210 and OA211 silicon rectifiers. These offer 2.5 amps maximum mean forward current as opposed to the old rating of 500 mA, with the p.i.v. unchanged at 400 volts and 800 volts respectively. Unlike the popular BY100 type, these rectifiers are also available in stud mountings, which can often lead to a tidier and more compact layout, as well as an increased maximum forward current rating, when used on a heat sink, to six amps. Fine for the QRO rig power supply!

\* \* \*

High-Q ceramic resonators are becoming available at reasonable prices. These devices offer a Q-factor which is nearly ten times better than the more usual LC circuit.

Further, alignment problems are eased, since temperature drift is almost non-existent, and the tolerances on some of the standard 465 kHz IF types are down to  $\pm 1$  kHz. Space saving is also a bonus, as they are quite small and, since there is no magnetic field produced, do not need to be screened. When used with an IC such as the Mullard TAD100, the result can be both stable and compact.

#### Expeditions

G8AEJ will be on holiday in the Norfolk area over the period May 30 to June 6 and will be water-borne with two-metre gear. He raises a point which has been brought up before in this connection. Under such circumstances, one has to obtain a /M licence from the P. & T. One is *not* /MM within territorial waters. Incidentally, although the rough winter weather took its toll of G8AEJ's 23 cm. parabola, he hopes to have it back in commission by the time this note appears.

\* \* \*

G8AMG, G8APZ, G8CIT and G8AZU will be operating portable from the top of Snowdon during the IARU contest of July 4-5. They will have low power AM on two metres only, with VFO control and a ten-element beam. However, this should not prevent them being heard over a fairly wide area, as has been the case with similar expeditions in the past. G8AMG will also be mobile in GM during the first week of June. Input will be 40 watts on two metres and 70 cm., with VFO control.

\* \* \*

Snowdon will be getting crowded during July, since Geoff Barnes, G3AOS, and a party consisting of G3UPB, G3MAX, G8BJL and G8CJQ (the junior op.), will also be going there for the contest in that month. They will have AM and SSB equipment for two metres, and possibly for the higher frequency bands also. As a matter of interest, many operators must have heard the regular skeds between G3AOS and G6AG over something like a 140-mile path. 'AOS is on SSB and 'AG on QRO NBFM, and they very seldom seem to miss!

\* \* \*

A note for those who are interested in the G3VER/P (Verulam Club) expedition to the northern counties at the beginning of August. The Club will operate during the SSB contest on August 10, and will resume skeds five minutes after the end of it.

\* \* \*

By the time this reaches you, the G3BA/G3BHT expedition, signing EI2AX/P, will be turning for home—the operation was to conclude by Sunday 31st. It is to be hoped that conditions have been good enough for full advantage to have been taken of this interesting GDX foray—at any rate, we can be sure that G3BA/G3BHT, with all their experience of going /P in Eire, put all they knew into it.

#### Club Activity—VHF

From G8AUN comes the news that the Norfolk Amateur Radio Club has at last found themselves a good /P site on the North Norfolk coast. They tried it out during the May contest, and got 141 QSO's, with the best DX a GM at Montrose and GD2HDZ. They have acquired a Honda 800E generator from the proceeds of a club sale, and should be active in future VHF contests.

\* \* \*

Many operators will have worked the RAF Sealand Amateur Radio Club, GW3ITZ, out portable near Wrexham in Denbighshire during the May two-metre contest. Receiving equipment in use there was a pair of RA-17's and an FET converter, made by G8BLH, using TIS88's with a split output for the two receivers. Measured sensitivity was 0.8  $\mu$ V for 10 dB sig/noise, and the cross-modulation performance was very good, as might have been expected. Operators included GW3UOO, GW8AAP and GW8BBR, who between them maintained the high standard one has come to expect from this Club.

#### News Items

G8CAI is now G3ZHH/G6AFE/T and operates from Harlesden in North West London. He is particularly interested in making contacts on the key, and is on two metres from 10.30 p.m. each evening on 144.044 MHz. It now appears that G8BQX was operating /P rather than /M from GM as reported last month. He had an 8-ele Yagi at

30ft., and although he heard three English stations, he was unable to raise any of them. His best DX was about 130 miles.

G3VPS (Hailsham, Sussex) is *not* one of those who finds that four metres is a quiet band. He has knocked up 1,000 contacts in the last 23 months! Most of these were made on a mobile rig in the Sussex area, and he has now worked 150 different 4m. stations in two countries and eighteen counties. The equipment is a much-modified B.44 Mk. II with a whip and four quarter-wave radials made from copper draught excluder strip on top of the fibre glass body of the three-wheeler. It is very much to be doubted if any station in Kent could show the same result!

A welcome back to the two-metre band for G8CTT (Chislehurst, Kent) who has returned home after a prolonged stay in hospital with

concussion after a nasty motorcycle accident. G8BMI (Keighley, Yorks.) is selling the HW-30 and looking for a Creed 7B, so more RTTY activity can be expected from the Northern Heights area. Surprising comment from G3DY, who has been licensed for thirty years . . . "I have never yet caught an aurora on two metres." G6CW in Nottingham has now worked over 175 SSB stations on two metres, which is some indication of the popularity of this mode.

GB3SC, the Sutton Coldfield beacon on 70 cm., is now in full operation. Frequency is 433.5 mHz with thirty watts of RF into the antenna, and it is regularly receivable in Herne Bay, about 5 dB down on the GB3GEC signal. Antennae are beamed North and South-East, and FSK modulation is used with the mark frequency 600 Hz up on the space.

### Contests

It is proposed to lay on another VHF RTTY contest on September 13-14. Bands are two metres and 70 cm., with four metres for a separate U.K.-only event to be run concurrently. Operation is restricted to stations in Zones 14 and 15. Further details may be obtained from G8CDW, 89 Linden Gardens, Enfield.

Forthcoming events are: 432 mHz (Open) over May 30-31, Microwave (1296 and up) contest on June 14; and the 144 mHz (Open), which coincides with the IARU contest, on July 4-5.

### Deadline

Deadline for the next issue is June 6. The address for all VHF claims, news and comment is: "VHF Bands," SHORT WAVE MAGAZINE, Buckingham. Cheers for now and 73 de G3DAH.

## INSTRUMENTS, ELECTRONICS AND AUTOMATION EXHIBITION

*Olympia, May 11-16, 1970*

THE IEA Exhibition at Olympia over the week commencing May 11, was undoubtedly one of the most impressive affairs presented in this country, if not in Europe. Nearly 1,000 exhibitors from twelve countries were displaying their newest products, and the result was an imposing array of expensive know-how—expensive, that is, when looked at from the amateur point of view. Inevitably, most of the hardware had little, if any, direct application for amateur use, and where it did, in the field of test equipment for example, prices were pretty steep, but it was impossible not to be impressed with the high quality of both design and finish, in felicitous contrast with some of the shoddy articles to be seen nowadays in other markets.

With the increasing use of SSB on all bands, the oscilloscope is becoming more of a *must* than ever, and two models appeared to be reasonably priced and suitable for amateur use. These were the Philips PM3200, marketed by Pye Unicam Ltd., of Cambridge, and the Tequipment S43. The PM3200 offers DC to 10 mHz with 2mV sensitivity and a time-base from 0.1  $\mu$ sec to 0.5 sec. It is a portable instrument and costs £125. The Tequipment model has a time base going from 1  $\mu$ sec to 0.5 sec and a range of plug-in Y amplifiers covering a sensitivity down to 2 mV and a frequency range up to 25 mHz. Prices vary depending upon the amplifier selected, but are around the £120 mark.

Erie Electronics Ltd., in addition to their own extensive range of components, are now handling the Japanese Toshiba range of semiconductors. Among all the familiar types of device with unfamiliar nomenclatures, the 2SC551 looks a good bet on 144 mHz. Output

is 14 watts for 70% efficiency, and the price is reasonable.

Enquiries were made at the Magnetic Devices Ltd., stand about their Series 951 coaxial relays which have now disappeared from the Electroniques catalogue, and an assurance was given that these are still available at around the 35s. mark direct from the manufacturers, in singles if required. This is good news, since they are suitable for use up to 450 mHz, and although they will not reliably switch 100 watts (and it must be said that they were not designed to do so), they will carry it.

Both Marconi-Osram and Mullards were showing the conduction cooled versions of the 4CX250 series, the former carrying the identification CCS1 and the latter YL-1321. The electrical characteristics of these two types are identical, and both offer considerable space and cost saving with the elimination of the blower associated with the operation of other types of external-anode valves.

An unusual piece of equipment was found on the G. and E. Bradley, now Bradley Electronics, stand. This was a varactor tripler, using the BAY66, the whole thing ready to go for 432 mHz operation. The interesting thing about it was that the firm will apparently set up the device for a frequency specified by the customer, and as this is done on a spectrum analyser, a clean result can be expected, which saves a lot of fiddling, and will eliminate most of the spurious resulting from the all too frequent maladjustment arising from lack of experience and expensive test equipment. The output is of the order of 12 watts for 15 watts input, and the price will be about £30.

Concurrently with the IEA Exhibition, a smaller Electronics Exhibition was run at the Kensington Close Hotel, and here the Eddystone stand was of particular appeal from the amateur point of view. The comprehensive range of receivers on display included a new version of the popular EC10, which now incorporates a carrier level meter and a fine tuning control. A.H.D

## SPECIAL-ACTIVITY STATIONS

During the next couple of months or so, the AT-stations as listed here are scheduled to make a public appearance—having been granted duration-only call-signs for the purpose indicated in these notices. As we have explained before, the P. & T. Dept. will grant such licences on application by any amateur who is to be personally responsible for the proper operation of the station.

**GB3VM, June 13:** To be operated by the Shefford & District Amateur Radio Society for the Fête at the Vauxhall Motors Sports Ground, Kimpton Road, Luton, running Top Band AM and AM/SSB on 3.7, 7.1 and 14.2 MHz, also two-metre AM.—C. W. Stedman, G3XWS, 10 Wychwood Avenue, Luton, Beds.

**GB3FRE, June 19-28:** In conjunction with the Fermanagh Festival, N. Ireland, operating on all bands 10-160m., mainly during periods 7.0-11.30 p.m. daily. Objectives of the station, and of the Festival itself, are to create an active local interest in Amateur Radio; to give amateurs world-wide the opportunity to work a rare county; and to project the GI tourist image. This is the second appearance of GB3FRE; last year, 800 stations were worked in six continents. As on that occasion, a special QSL card will confirm all contacts.—S. MacMahon, G13ZIA, 10 Church Street, Enniskillen, Co. Fermanagh, Northern Ireland.

**GB3GHS, June 22-27:** At Garendon High School, to commemorate the centenary of the 1870 Education Act, running all bands 10 to 160m.—D. R. Doughty, G3FLS, Garendon School, Thorpe Hall, Loughborough, Leics.

**GB3GWC, June 26-July 6:** In connection with the George Watson's College centenary celebrations—the College is a well-known Scottish public school. Operation will be on all bands Two to Eighty. It is particularly hoped that exiled Watsonians holding amateur licences will take the chance to contact their old School.—T. Simpson, GM3BCD, George Watson's College, Colinton Road, Edinburgh, 10.

**G2DQI/A-G3MIN/A, July 4:** On the air for the exhibition station to be run for the Worthing Schools Radio Society, at the High School for Boys, on the occasion of the annual fête. Operation will be 10-80m. AM, 15m. SSB and two-metre AM. Skeds will be welcome, especially with amateurs still at school. A special QSL card will confirm contacts.—Worthing Schools Radio Society, c/o C. Garcia, L6X, High School for Boys, Bolsover Road, Worthing, Sussex.

**GB3FON, July 11-26:** Arranged by the Amateur Radio Club of Nottingham in collaboration with the organisers of the Festival of Nottingham, Wollaton Park, the station will operate SSB on the following spot frequencies: 1920, 3760, 7060, 14260, 21360 and 28660 kHz,  $\pm 5$  kHz. It will have antennae

supported by a 60ft. lattice tower, so should be easily located by visitors. A special commemorative QSL card is being printed.—Hon. secretary, Amateur Radio Club of Nottingham, Woodthorpe House, Mansfield Road, Nottingham.

**GB2LS, July 16-18:** Put on by Liverpool & District Amateur Radio Society in conjunction with the annual Liverpool Show, running all bands HF and VHF.—P. Storey, G3YBH, 29 Chalfont Road, Allerton, Liverpool, 18. (Tel.: Garston 7114.)

**GB3WRA, September 5:** Operating from the 24th annual Wycombe Show, on The Rye, High Wycombe, on all bands 10-160m., AM/CW/SSB. Visitors will be very welcome.—A. C. Butcher, G3FSN, 70 Hughenden Avenue, High Wycombe, Bucks.

We shall be glad to give publicity in this space to similar notices, which should be set out in the form shown here, and addressed to: "Special-Activity," SHORT WAVE MAGAZINE, BUCKINGHAM.

## G3BZU MORSE RUNS

We are asked by the Royal Naval Amateur Radio Society to bring to notice that their QRQ CW runs are being re-started—schedule is the first Tuesday of every month, on 3520 kHz from 1900z, at speeds from 20 to 40 w.p.m. And if you can write down at 40's with no errors you are doing pretty well. The sending is, of course, "perfect," in the sense that an auto-transmitter is used, with the correct dot-dash relationship at all speeds. (It is this ratio that makes fast stuff readable, as distinct from the stuttering hand-operated keys, spewing out dots quite disproportionate to dash speed and length.) Copies of what you can write down from G3BZU, at whatever speed from 20 to 40 w.p.m., should be sent to: QRQ Manager, R.N.A.R.S., Hq. G3BZU, H.M.S. *Mercury*, Leydene, Petersfield, Hants. Certificates are issued for correct transcripts at the different speeds.

## NEW LEAFLET ON METRIC UNITS

We are asked to announce that a new (free) leaflet on going metric is now available. It sets out the commoner metric units, and their accepted symbols, for 14 everyday quantities, including length, area, capacity, temperature and weight. In the U.K., the metric system now coming into use is the International System of Units, known by the abbreviation SI. The units involved in this system are sufficient for all present needs of technology, science, commerce and industry, as well as those of daily life. One rather odd casualty in the general change-over is that the degree Centigrade, °C, now becomes the "degree Celsius," also shown as °C. Unfortunately, the leaflet does not give equivalents, nor conversions, e.g., that 100 km = 62.1 miles, 1 kg is 2.2 lbs., or that 10 litres is equal to 2.2 gallons. Copies of *Going Metric* can be obtained without charge on application to: Information Division, Dept. 4, Metrication Board, 22 Kingsway, London, W.C.2.



# THE MONTH WITH THE CLUBS

By "Club Secretary"

(Deadline for July issue: June 5)

(Please address all reports for this feature to "Club Secretary," SHORT WAVE MAGAZINE, Buckingham.)

ONE of the services the local Club can give its members, which is not often done, is to start a library of useful books on various Amateur Radio topics. Such obvious titles as the *Radio Communication Handbook*, and the *ARRL Radio Amateur's Handbook* go without saying; indeed the majority of the members may have their own copies, but there are ever newcomers who need an introduction to the techniques. More important, one would think, are such titles as G3OGR's book, *Amateur Radio*, which is such a useful primer for the chap studying for R.A.E., and at least one—preferably more—of the books on Aerials; one or more on VHF, and so on. A club librarian, with a system of booking the volumes in and out, is of course essential if the library is to be maintained intact after the initial expense of setting it up. A group subscription to some of the periodicals in our field of interest is another possibility. The idea is a sort of miniaturised version of the libraries run by the larger companies, all of which more than earn their keep by the mere fact of enabling users to return to half-forgotten formulae, or in keeping the old-timers right up to date with current developments.

## Round The Clubs

That gentle "rhubarb" last time about the shortage or reports from North of the Border brought forth at least one reply, and a most interesting and informative letter at that. The *Mid-Lanarkshire* Group have about 25 members, who foregather at the YMCA, Brandon Street, Motherwell, on the third Friday of each month, the start being timed for 7.30. June 19 sees GM3NKG doing the honours, his subject being "Mobile Radio." On the following day, the lads have a trip to Prestwick set up; this one is their annual outing, with all the seats on the coach already booked. The hon. sec., GM3ULP/GM6ADR/T, whose address of course appears in the Panel on p.242, mentions that if anyone who cares to attend, whether as a prospective member or just for a passing visit, has trouble getting there, a phone call to his home address after six in the evening will bring full directions. Good Show!

Another nice letter from Scotland covers the *Lothians* activities for June. VHF Tx Construction is down for June 11, and on the 25th there is the AGM, at which, GM8BPL hints, he hopes a new secretary can be found.

Your scribe has often commented on the few YL's in the club movement, and the fact that almost all of them hold an office of some sort. Ardent DX-chaser Maureen, G3XVC, takes on a new chore as hon. secretary of the newly-formed *Dartford Heath D/F Club*. So far

there are about 25 members, who take part in regular D/F events, the dates of immediate interest being May 31, June 21, and July 12, Sunday afternoons, starting from the Horse and Groom, Dartford Heath at 3 p.m. For details, contact G3XVC at the address in the Panel.

If you can't fight 'em—join! This philosophy results in the call G8BYE belonging to Sheila, p.r.o. of the *Stourbridge* crowd—she is related to G3UNV and married to G3VDM. This gang always were a go-ahead lot, and it is interesting to an old member to note from the *Newsletter* how many of the chaps he knew back in the mid-50's are still around and active in the group. Nowadays, they have their meetings at the Scout Hq., South Road, Stourbridge, where they operate G6OI—the Club station. The regular date seems to be the first Tuesday in each month. July sees them going out and about, with a visit to Woolferton BBC—limited numbers—and, on the 4th, a run up the Welshpool and Llanfair Railway, for which they have a whole coach reserved, and a station on the air at the Llanfair Caereinion terminus. This should be a fascinating day out.

On now to *Kingston*, where the chaps specially ask for us to mention how they enjoyed the talk by G3ORI in April. For June 10, G3OSQ is down to discuss Biasing, Coupling and Decoupling in transistor circuits, and there is also a /P expedition on the books for June 21.

Another YL hon. sec. appears in the lists; this time Frances, G3LWY, who does such fine work for RAIBC; not just as secretary, but also in writing *Radial*, organising all the doings of a crowd whose full members are all either blind or invalids, appearing on their nets (which, incidentally are at 1000 clock on Tuesdays and 1400 on Thursdays, between 3650 and 3700 kHz) and Heaven-only-knows what else besides. Besides the full members, there are the other people—the supporters, who make this very good Club into the thriving outfit it is, by way of their help, in all sorts of unexpected directions.

At *Acton Brentford and Chiswick*, the lads are going to put their Contest Transmitter through its paces at the meeting on July 16. The venue, as ever, is the Chiswick Trades and Social Club, 66 High Road, Chiswick.

Newton House Community Centre, 203 Droylsden Road, Newton Heath, Manchester 10 is the place where the *Manchester* chaps have the club Hq. They recently held an AGM, and for June 3 have a Junk Sale arranged. In the offing are talks on "Chassis-Bashing" by the chairman, and G3JIB on Computers. A nice thought at the AGM was the decision to cut the sub. by half for senior citizens.

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June is a most important month for the **Derby (Nunfield House)** gang. Friday June 5 is, obviously, down for the last-minute NFD preparations, and on the 12th there is a similar exercise to be done for the Rally, which is, as already announced, on June 14. The remaining Fridays in the month are being deliberately left open for the inquests! Nunfield House is in Boulton Lane, Alvaston.

The other group in **Derby**—the Derby & District Amateur Radio Society, soon to celebrate its Diamond Jubilee, now one of the strongest radio amateur Clubs in the country—have Hq. at 119 Green Lane. Room 4 is the place, and it is understood some modifications are going on to make it more suitable. Apart from the regular Wednesday sessions there, with talks and whatever, there is NFD and a special-event effort at St. Nicholas' School, Allestree.

**Mansfield** are still at the New Inn, Westgate, on the first Friday in each month, and the programme of talks is going down well. They have an SWL senior member who makes it his task to help the others in their initial stumblings. Incidentally, that SWL really knows the game; he actually had a ticket before the War—but he was going to activate it for the first time during his Army leave over the weekend of September 2-3, 1939. However, it was an SP call, and he was in the Polish Army, so his call never did get actuated. Hard luck!

\* \* \*

Miles away from the nearest TV aerial, the **Peterborough** chaps spend their summer Sunday afternoons at their riverside hideaway at Alwalton, where they can add picnicking and boating to their /P activities. This sounds really ideal for a nice outing—for details, get in touch with G3KPO—the Panel on p.242 gives his address.

**A.R.M.S.** deals with the tribe of mobileers, whether licensed or SWL, and puts out *Mobile News*, which seems to have improved in its content of late months—although it must be said that this is probably as much as anything due to members contributing more articles of interest. A good read, this one.

There are three items on the **Verulam** plate for June; the 3rd is an informal at Salisbury Hall, London Colney, when the lads will be trying out some D/F tackle as well as putting G3VER on the air. June 17 is Bill Bailey, G2QB's, night, when he will again be recalling the early days in his own special style. To round off, the D/F gear will be used in earnest on June 21, from a starting-point which can be obtained by contacting the hon. sec. Venue for the G2QB "do" is, of course, the Council Chamber in St. Albans Town Hall.

For details of the **Cray Valley** meeting for June, we have to refer you to G3KGM, address as Panel; this is a bit unusual for this crew, who are usually right up to date; but they have just been through the AGM and had a little change-round which reflects itself into the Secretaries' Panel.

At **East Worcs.**, the lads have bookings at the Old People's Centre, Park Road, Redditch, on June 11 and 25th; but we have no details as to what is arranged.

Weekly sessions are favoured at **Spen Valley**, the venue being the Grammar School, Heckmondwike. J. Marsden of West Riding Electronics, Ltd. has the floor on June 4, to answer the question "What's New?" and

on the 18th there is an Open Meeting. Transistors at RF is an interesting subject, and will be explored on June 26 by G3TAY.

A Natter Nite on the first Friday in the small hall, and the formal on the third Friday in the large room at the Railwaymen's Hall, 58 Whytecliffe Road, Purley, is the form the **Purley** group syllabus takes. Thus for this month there is a Natter on June 5, and on the 19th the all-important AGM.

**Shefford** have June 4 down for a final review of Operation NFD, and the treasurer's half-yearly report. On the 11th, they again convene at the Church Hall in Amphill Road, to agree on what went wrong! June 13 sees them signing GB3VM, and on June 18, there is an evening devoted to programme planning. Finally, there is June 25, when they will be "going out" to look at the Signalling System on British Rail—presumably the stretch where "Mallard" became the fastest steam engine in history.

The recent AGM of the Radio Club of **Nottingham** resulted in a general shuffle-round and a new Secretary takes over. He offers, for June 4, a Bring-and-Buy Sale; for the 11th, Mr. Garrard of Texas Instruments, who will be talking about Transistor Transmitters; and for the 18th a meeting devoted to final arrangements for their GB3FON effort. This leaves June 25; on this evening the lads can relax and enjoy an Open Night. A good start indeed by a new committee.

Unfortunately we are not quite up to date on the **Cornish** doings, and so we have to refer you to the hon. sec. for details—but we *can* say there will, as always, be plenty, with a main meeting at Camborne, as well as the Newquay session, and other activities.

**University College, Swansea** have a Mobile Rally, down for June 21, at Singleton Park on the A.4067, with various events which are detailed elsewhere; no doubt much of the month will be taken up with the preparation and clearing up. For details of the club meetings, a contact with the hon. secretary is needed—see Panel.

**Limerick City Short Wave Club** claims to be the only DX Club in Ireland; membership is open to anyone, and there are certain awards, and services to members on offer, including a query service; for details, drop a line to the hon. sec. at the address in the Panel.

That hint of change of Hq. for **Northern Heights** was made permanent at the recent AGM, so now they are staying at the Peat Pitts Inn, Ogden, Halifax. Here they are to be found on June 3, when the postponed talk on RAEN will be given by G3MBQ, and June 17, when there is a Surplus Equipment Sale. July 1 sees G3UBI doing a thing on DX-peditioning.

A mention of a new formation next. The **Axe Vale** group has been formed to cater for people in the West Dorset and East Devon area. At the moment they are getting together on the first Friday of each month in hotels in the Lyme Regis district, but there is an early prospect of more permanent quarters. New members are, of course very welcome indeed, and should in the first instance contact the hon. secretary.

Each year the **Liverpool** group put on a stand at the Liverpool Show, using the callign GB2LS; this year's event is slated for July 16-18. The impact of this and of NFD on the June programme is most marked. June 2

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Heads down for the "mock R.A.E." held recently by the Silverthorn Radio Club, which has become a yearly event to help Silverthorn members through the Exam. A very good idea that might well be emulated by other Clubs.

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and 9 are given over respectively to final arrangements and the inquest for NFD. June 16 is planning and June 30 a Work Night for the Liverpool Show, which leaves only the 23rd to be accounted for; this one is down for planning for the Region 1 VHF contest.

**Dorking** have an informal on June 9 at the Wheatsheaf but on the 23rd there is a change of venue to the Cock at Headley Heath, where they will be assembled after the run, and a VHF Mobile night; wives and girl-friends welcome.

A new cover appears on the **Bristol** club *Newsletter*, designed by G8CJZ; and they have also made a change of format from foolscap to the International A4 size; a most readable effort—but, sadly, no details of either June meetings or the venue! For these, contact G3SXY, as in the Panel, p.242.

At **Lowestoft** the form is a meeting on alternate Fridays; but if there are any amateurs in the area who would like to make contact during a holiday trip the tads will make a special effort—for all the details get in louch with their secretary—see Panel.

**Echelford** have two evenings booked at the Hall, St. Martins Court, Kingston Crescent, Ashford, Middx., on June 8 and 25th. For the former, they have booked Mike Dormer, G3DAH who will take as his theme "VHF Today," but on the latter there is a Surplus Equipment Sale (any connection?) at which the auctioneer will be G2FNK.

At **North Kent** the lads have just gone through the AGM phase, and so there is nothing very formal teed up for June. On June 11 there will be an inquest on NFD, and the other date—June 25—is a general natter night during which the Club station will be on the air.

For the June meeting of the **Southdown** crew, on June 1, there is the fourth Annual General Meeting to be gone through; it is interesting to note that at first it was doubted if there was enough activity to form a club but in the event, 40 joined at that inaugural meeting—now the membership has risen as high at 100, of whom about half are licensed. The Hq., incidentally, is the Victoria Hotel in Latimer Street, Eastbourne.

Normally the **Wirral DX Association** chaps get together in each other's homes, and this remains the form for June; the last Thursday in each month is the date, and for the details one must contact the hon. sec., G3OKA, in advance. However, they are changing their tactics for July and August, due to the summer season, and are having a natter and "lubrication" session at a pub. called the Red Cat in Greasby.

Derek Purchase, G3LXP, is coming to **Bishops Stortford** in June to give his well-known talk and show on Mobile Operation. This one is for June 15, at the British Legion, Wind Hill, visitors and new members being of course welcome.

It is quite some time since last we heard from **Bedford**; but it seems they are still alive and kicking very strongly. They have a room at the Dolphin, The Broadway, Bedford, by kindness of the landlord and his wife, who helped in many ways to get them set up in the comfort they now enjoy, and they are duly grateful. The routine is weekly meetings each Thursday, and they try to have something of interest laid on every week, by way of talks, Film Shows, and other activities. One notices also a nice balance of interest among the members, as between HF merchants, VHF types, natterers and DX-ers, and constructors—which in itself always goes to make a Club more viable.

A certain amount of reshuffling goes on at **Chippenham** in order to fit in NFD. The D/F event for June is brought forward to June 2, leaving the following weekend free for field-day—for which, incidentally, volunteers are needed badly at putting-up and taking-down times, as well as during the interesting bit. Their NFD site is at Monkton Park, near the School; and the same spot will be revisited a week later when they are to set up a demonstration station for the School fête.

"Transistors I have known" is the theme taken by G3XGP at **Solihull** on June 16, when the lads get together at the Manor House. However, before that, there is a demonstration station at Solihull Carnival, when the calls G3GEI/P and GB3SOL will be heard on 160m. and the HF bands respectively.

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To meet the **Edgware** lads you go to the St. Georges Hall, 51 Flower Lane, Mill Hill, where, on June 8, there will be a Junk Sale. On June 23, G3HVA, who is one of the few London or South-East stations to be clear of TVI problems, will display his own brand of How-to-do-It. This one should be a sell-out with the locals and anyone near enough to pay a visit.

Unusually, **Crystal Palace** have a Saturday meeting as a regular thing; the third one in each month, at Emmanuel Church Hall, Barry Road, East Dulwich. This gives June 20, when G3SBV and G3IIR will be discussing Metal Work and Finishing.

Yet another YL comes up in the hon. sec. job; this time from **Hull**, where the group get together at 592 Hessele Road, Hull. June 5 is set aside for an SWL Night, after the final NFD bits are sorted out. June 12 sees G3AGX discussing Life as a Radio Operator in the

Merchant Navy. A Practical evening comes next, on June 19, while on June 26, G3PQY and G3SSA will be jointly giving a talk on "Making the Best of your TV Viewing."

June 10 and 24 are the dates for the **North Devon** chaps; on the former G3EDW will discuss his stay in Zambia, and on the latter there will be a good old-fashioned ragchew. Both at Crinnis, High Wall, Sticklepath, Barnstaple, Devon.

Nice to hear from **Bromsgrove** after a long interval, but with a familiar handwriting on the letter which indicates that the old secretary is back in office, as he has been certainly since your conductor first wrote this piece. There are various activities going on, but for details we have to refer you to said secretary—or you can pluck up your courage and turn up at the Royal Oak, in Barley Mow Lane, Catshill, Bromsgrove.

#### *Names and Addresses of Club Secretaries reporting in this issue :*

**ACTON, BRENTFORD & CHISWICK:** W. G. Dyer, G3GEH, 188 Gunnersbury Avenue, Acton, London W.3.  
**A.R.M.S.:** N. A. S. Fitch, G3FPK, 40 Eskdale Gardens, Purley, Surrey, CR2-1EZ.  
**AXE VALE:** J. W. Cross, Coverdale, Woodmead Road, Lyme Regis, Dorset.  
**BARRY** (Coll. of Further Education): D. H. Adams, GW3VBP, College of Further Education, Colcot Road, Barry, Glam., South Wales.  
**BEDFORD:** J. Bennett, G3FWA, 47 Ibbett Close, Kempston, Bedford.  
**BISHOPS STORTFORD:** A. Stanley, G3WUR, 43 Havers Lane, Bishops Stortford (S7251), Herts.  
**BRISTOL:** E. J. Davies, G3SXY, 72 North View, Bristol, BS6-7PZ (33284).  
**B.A.R.T.G.:** D. J. Goacher, G3LLZ, 51 Norman Road, Gorse Hill, Swindon (21740).  
**BROMSGROVE:** J. Dufrane, 44 Hazelton Road, Marlbrook, Bromsgrove, Worcs.  
**BURNHAM BEECHES:** D. Waring, 209 Wentworth Avenue, Britwell Estate, Slough, Bucks.  
**CHIPPENHAM:** P. Strand, G3UTO, 8 Brookwell Close, Chippenham (3723), Wilts.  
**CORNISH:** J. Farrar, G3UCQ, Elm Cottage, Venton League, Hayle, Cornwall.  
**COVENTRY:** C. Jaynes, 20 Belgrave Road, Wyken, Coventry.  
**CRAY VALLEY:** D. MacLennan, G3KGM, 52 Pinewood Avenue, Sidcup, Kent (01-300 0767).  
**CRAWLEY:** G. Bowden, 51 Leighlands, Pound Hill, Crawley, Sussex.  
**CRYSTAL PALACE:** G. M. C. Stone, G3FZL, 11 Liphook Crescent, London, S.E.23 (01-699 6940).  
**DARTFORD HEATH D/F:** Mrs. M. Worbey, G3XVC, 13 Havelock Road, Dartford (22889), Kent.  
**DERBY:** F. C. Ward, G3CVV, 5 Uplands Avenue, Littleover, Derby (21931, DE3-7GE).  
**DERBY** (Nunfield House): N. J. Gregory, G3LCV, 21 Back Lane, Chellaston (3516), Derby.  
**DORKING:** R. Greenwood, G3LBA, 8 Deacon Close, Downside, Cobham, Surrey.  
**EAST WORCS:** R. J. Mutton, G3EVT, Summerhayes, Mill Lane, Alcester (2041).  
**ECHELFORD:** R. Hewes, G3TDR, 24 Brightside Avenue, Laleham-on-Thames, Middx. (Staines 56513).  
**EDGWARE:** E. H. Godfrey, G3GC, 15 Oxenpark Avenue, Preston Road, Wembley, Middx.  
**EXETER:** G. Wheatcroft, G3HMY, 27 Lower Wear Road, Countess Wear Exeter, Devon, EX2-7BQ.  
**GREENFORD:** F. C. Reid, G3VMD, 34 Carlton Avenue, Harlington, Middx. (01-848 0235).  
**GUILDFORD:** R. L. F. Ramsay, G3ARM, Rock Hill, Sidney Road, Guildford, Surrey.  
**HEREFORD:** S. Jesson, 181 Kings Acre Road, Hereford (3237).  
**HULL:** Mrs. M. E. Longson, 4 Chester Road, Wold Road, Hull, HU5-5QE.  
**KINGSTON:** N. Dudman, Dunham Lodge, 88 Sandy Lane, Teddington, Middx.  
**LIMERICK CITY:** P. J. Macnamara, 7 Colbert Park, Janesboro, Limerick, Ireland.  
**LINCOLN:** G. O'Connor, 61 Steep Hill, Lincoln (24113).  
**LIVERPOOL:** K. Wood, G3WCS, 90 Childwall Valley Road, Liverpool, 16.

**LOTHIANS:** W. Marshall, GM8BPL, 15 Craighleith Hill, Edinburgh, EH4-2EF.  
**LOWESTOFT:** L. Taylor, G3JMU, 121 London Road North, Lowestoft (3069).  
**MAIDSTONE:** A. S. Walter, G3WKL, 31 Lansdowne Avenue, Maidstone, Kent.  
**MANCHESTER:** A. Langfield, G3IOA, 201 St. Mary's Road, Moston, Manchester M10-0BN (061-681 5406).  
**MANSFIELD:** F. N. F. Bewley, G8HX, 116 Westfield Lane, Mansfield, Notts.  
**MID-LANARKSHIRE:** G. A. Hunter, GM3ULP, The Bungalow, Broonside Braes, Camp Road, Motherwell, Lanarks.  
**MID-SUSSEX:** E. J. Letts, G3RXJ, 87 Meadow Lane, Burgess Hill (3552), Sussex.  
**NORFOLK:** G. Purcell, 29 Seton Road, Taverham, Norwich. (Drayton 459).  
**NORTH DEVON:** H. G. Hughes, G4GC, Crinnis, High Wall, Sticklepath, Barnstaple, Devon.  
**NORTHERN HEIGHTS:** A. Robinson, G3MDW, Candy Cabin, Ogden, Halifax (44329).  
**NORTH KENT:** A. Watt, G3WZI, 67 Glenhurst Avenue, Bexley (Crayford 22564).  
**NORTH LEEDS:** P. B. Furringier, G3MZF, 3 Ruthven View, Leeds, LS8-3RQ.  
**NOTTINGHAM:** J. Smith, 21 Duke Street, Arnold, Nottingham (265921), NG5-6GP.  
**PETERBOROUGH:** D. Byrne, G3KPO, Jersey House, Eye (351), Peterborough.  
**PLYMOUTH:** L. D. Dawe, G3SPI, 345 Crown Hill Road, Plymouth, PL5-2LL.  
**PURLEY:** A. Frost, G3FTQ, 62 Gonville Road, Thornton Heath, Surrey, CR4-6DB.  
**R.A.I.B.C.:** Mrs. F. Woolley, G3LWY, 331 Wigan Lane, Wigan, Lancs.  
**READING:** P. J. Bendall, G3NBU, 89 Hexham Road, Reading.  
**SALTASH:** J. Ennis, G3XWA, 19 Coombe Road, Saltash, Cornwall, PL12-4ER.  
**SHEFFORD:** C. W. Stedman, G3XWS, 10 Wychwood Avenue, Luton, Beds.  
**SOLIHULL:** H. D. L. Clark, G3YOY, 18 Marsland Road, Olton, Solihull (021-706 0485).  
**SOUTHDOWN:** L. Tagliaferro, 9 Tugwell Road, Hampden Park, Eastbourne (54244), Sussex.  
**SPEN VALLEY:** N. Pride, G8BSC, 100 Raikes Lane, Birstall, Leeds (Batley 3925).  
**STOURBRIDGE:** Mrs. S. Cliff, G8BYE, Manorways, 49 Manor Lane, Halesowen, Worcs.  
**SURREY:** S. A. Morley, G3FWR, 22 Old Farleigh Road, Selsdon, South Croydon, CR2-8PP (01-657 3258).  
**TAUNTON:** P. Jones, G3PWJ, 20 Chilton Street, Bridgwater, Somerset.  
**TORBAY:** L. H. Webber, G3GDW, 43 Lime Tree Walk, Newton Abbot, South Devon.  
**UNIVERSITY COLLEGE, SWANSEA:** R. Wilcox, GW3TSH, Room 520, Neuadd Lewis Jones, University College, Singleton Park, Swansea, SA2-8PS.  
**VERULAM:** W. C. Dennis, G3NCK, 129 Colney Heath Lane, St. Albans, Herts.  
**WIRRAL** (DX Association): J. A. Share, G3OKA, Trelawney, 21 Curlender Close, Bidston, Birkenhead, L41-7BN.  
**WORCESTER:** R. L. Avery, G3YQD, 24 Alexander Avenue, Droitwich (3943), Worcs.



At the Northern Radio Societies annual convention at Belle Vue, Manchester, on April 26, the winners for the best Club stand were South Manchester Radio Club. All the equipment on display was home-constructed, and very fine it was, too, as regards both scope and workmanship. South Manchester, some of whose members are shown here, holds two calls, G3FVA and G3UHF.

Every Tuesday at No. 2 Guardroom at Sobraon Barracks Burton Road, the Lincoln chaps assemble. June 2 is naturally going to be a "final preparations for NFD" session—and with all those competitive types Lincoln ought to be in there with a chance. June 9 is an away-fixture—a trip round Lincoln Power Station. What looks like another evening out comes on June 16 with a Treasure Hunt. The last two evenings—June 23 and 30th—are both left as Open Nights.

Mid-Sussex have a blank in the programme for June 4, which will no doubt be filled by the time this is in print; then on June 18 the lads will all be going out in their cars to Jack-and-Jill, Clayton, near Hassocks. This event is an "open" to which all comers are more than welcome.

Another group reporting after a longish spell of absence is Exeter, where the AGM resulted in the previous secretary being re-elected. They now have a nice newsletter, and meetings every first Tuesday of the month, at YMCA, St. Davids Hill, Exeter. The lecture on June 2 will be devoted to "Aerials—and what Follows."

Coventry have their usual weekly programme, alternating Nights-on-the-Air with more formal events. The former come up on June 12 and 26—and if you don't want to go on the air you can help add up the NFD score or take Morse practice. June 5, of course, is devoted to making sure there are enough points for all to count up from NFD; while June 18 is down for a VHF Treasure Trail exercise, the implication being that the lads will be going out for a spell of fresh air.

BARTG is the group that provide for the needs of

the RTTY (radio teleprinter) chaps. They have contests and a very good *Newsletter*. Anyone with an interest in RTTY should regard membership as essential, if only for the *Newsletter*.

Hereford are still a little out of phase with us on deadlines, so we have only the very full April and May programme to hand. However, we gather they recently had a big "purge" in the shack and will in future be doing something about keeping it that way. Aerials have also been put up for the Club Tx at Hq., Civil Defence Headquarters, Gaol Street, Hereford.

At Guildford there has been a recent change of secretary, the name and address of the new incumbent now appearing in the Panel; and it is to him we must refer you if thinking of becoming a member or visiting this Club.

It seems only yesterday that Maidstone YMCA were moving into their new shack at the Sports Centre. But now we have news that they are going to be off the air till the contractors can get their tower removed to its new place to make room for an extension to the building—but there is consolation insofar as the rearrangement of facilities that will take place when the new building is completed should have the effect of giving them a second shack so that both their calls may be run simultaneously without interference.

Sadly, our knowledge of Worcester doings is limited to April and May; during the latter month the main pre-occupation seems to have been beating the pants off all the other local Clubs at skittles—or at least they hope so! For details of dates and so on, we have, therefore to refer you to the hon. secretary—see Panel. [over

We are in the same case as far as **Plymouth** are concerned, but the main reason here is that the AGM was in May; and no doubt we shall shortly hear of a first-class programme for the whole of the coming year. The address of the new Secretary appears in our Panel.

**Surrey** just missed the boat last time, when they would have been advising the AGM results—but this means we have no details of the current situation. G3FWR can give you the details on application to his address in the Panel, and it only remains to note that the venue is the Swan and Sugarloaf in South Croydon.

**Taunton** likewise—but they wrote in specially to publicise the fact that all their meetings are now being held at The Control Centre, County Hall, The Crescent, Taunton.

**Reading** next, where the form is alternate weeks for meetings—June 23 is specially noted for a Constructional Contest. However, it is understood there has been some difficulty in locating the Hq., so give G3NBU a call for information.

**North Leeds** write to let us know that after a spell “in the wilderness” they have at last found new Hq.—but they were so excited about it that they forgot to tell us where! So try G3MZF—see address Panel—for this essential information.

**Saltash** put out a nice newsletter which they call *Tamar Pegasus*, and its compiler notes in the issue in our hands that he has passed the R.A.E.—congratulations! As for their meetings, these are at Burraton Toc-H Hall, Warraton Road, on the first and third Friday in each month. For this month, June 5 is given over to a demonstration of the fine arts of receiver alignment; and on the 19th you had better be at Hq. sharp at 7.30 for the Fox Hunt, as that is the time the “hounds” are scheduled to start searching.

The new secretary of **Burnham Beeches** says it is some time since last his Club has had a mention—and certainly they have never before reported in all the long years your conductor has been carrying the load of “Month with The Clubs.” They have Hq. at Farnham Common Village Hall, where they may be found on June 1, for final NFD briefing; on the 15th for a Film Show; and on the 29th when the Club station G3WIR will be on the air.

**Torbay** have had their AGM, with results to the general satisfaction, and now have Field Day arrangements in hand.

Over at **Norfolk**, they have meetings for final arrangements for Field Day on June 1; on the 8th, they booked for a discussion on VFO's, both HF and VHF; and June 29 sees their big summer sale.

At **Crawley**, formal meetings are held on the fourth Wednesday in each month at Trinity Congregational Church Hall, Ifield Road—full details about the goings-on of this active and successful Club from secretary G3YVR.

An impressive compilation called *The Jungle Drum* arrived just in time to catch this issue. It proved to be the well-written newsletter of the Radio Society, **Barry** Coll. of Further Education—Barry being a busy South Wales port and local holiday centre. It discusses not only the results but also comments and criticisms regarding their third annual contest, held recently. In fact, the

report says “the comments were almost unanimously critical”! Oh, well, as we can tell anybody, it is impossible to please all the people all the time—all you can ever hope to do is to keep some of them happy for part of it! In accordance with the normal scholastic schedule, Club activities cease officially on June 11, restarting on September 24. In the meantime, the locals will keep in touch *via* their Top Band net and will “arrange to meet at various watering places”—wonder what that means!

June in **Greenford** includes two dates at Room 1, The Community Centre, Oldfield Lane, Greenford. There is Friday, June 12, when they have obtained G3GC, who will come to talk about TV Aerials; and June 26, when G3VMD will be directing his points specifically at the SWL's, in a general talk on Amateur Radio and its many varied facets.

### Deadline

So—there it is once again. Deadline for next time is **June 5**, with all your July plans noted—dates, times, places, and any other details. Address it, as always, to “Club Secretary,” *SHORT WAVE MAGAZINE*, BUCKINGHAM. Till then *73 es GL*.

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### “EXPLAINING BINARY CODES”

This article, in the February issue of *SHORT WAVE MAGAZINE*, has drawn the following comment from G8CSH (Upton-on-Severn, Worcs.):

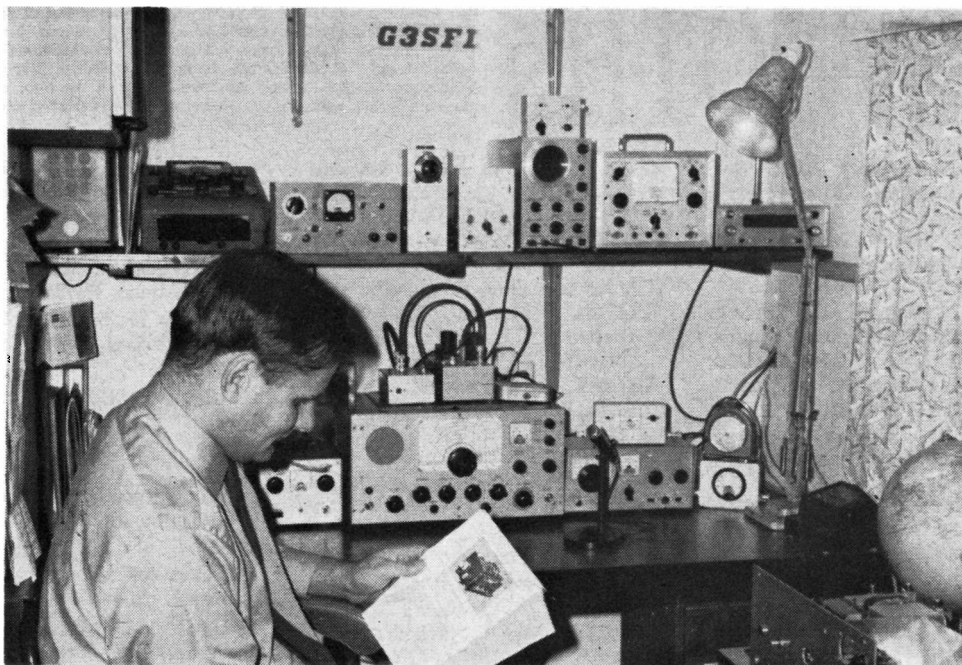
“It was pleasing to find the excellent article by G3UGK on the subject of Binary Codes. There must be a number of subjects like this on the periphery of Amateur Radio which could well do with a bit more airing, and I welcome your policy in giving space to them.

“However, I would like to point out that the four rules given by G3UGK for converting from decimal are unnecessarily complicated. The one simple rule is: Just keep dividing by 2 and writing the remainder as the next most significant binary digit. For the example he gives (converting 89 to binary):  $89/2 = 44$ , binary remainder 1;  $44/2 = 22$ , rem. 0;  $22/2 = 11$ , rem. 0;  $11/2 = 5$ , rem. 1;  $5/2 = 2$ , rem. 1;  $2/2 = 1$ , rem. 0;  $1/2$ , binary remainder 1. Taking the binary remainders, the answer is thus 1011001.

“Reversing this procedure gives a quick rule for converting back from binary to decimal, thus: Starting with the most significant digit, double, and add the next digit on the right in the line, continuing until all are exhausted. For example, 1011001: Double 1, add 0 = 2; double 2, add 1 = 5; double 5, add 1 = 11; double 11, add 0 = 22; double 22, add 0 = 44; double 44, add 1 = 89—which exhausts the 1011001, and gives us the original number.

“There are equally simple ways of dealing with fractional numbers. These rules are, of course, just special cases of conversion between decimal and any base. If one is so inclined, many happy hours can be spent re-learning a lot of arithmetic—but I have said enough.”

(To follow this with full understanding, the original article by G3UGK in the February issue should be re-read.—*Editor.*)



## ***THE OTHER MAN'S STATION***

**G3SFL**

THE station of G3SFL—Frank Harrison, 42 Woodlands Road, Cleadon, Co. Durham—was licensed in July 1963. He built his shack as a lean-to on one wall of his garage, and since then has accumulated an almost totally home-constructed station. In the early days G3SFL ran a K.W. Vanguard on all the bands it covered, but this has now gone.

Looking at our picture, the station consists of, bottom right to left: A commercial beam rotator; RF meter, surmounted by a barometer; a 160-metre Tx with 6BW6 PA and built-in PSU—on top of it is an SWR bridge; a G3RKK-type Mk. I Rx; on it a two-metre converter consisting of E88CC-6AK5-12AT7, with 6CW4 pre-amplifier; and the two-metre transmitter, which runs a QQV03-10 in the PA, with separate PSU.

On the top shelf are, right to left: Transistorised Rx for 160 metres; wide-range audio oscillator; 3BP1 oscilloscope; a transistor tester; GDO; stabilised LT power unit; a commercial multimeter, and a speaker.

G3SFL is now in the process of constructing a Sideband filter rig, intended for operation over the range 10 to 80 metres. This is in the partially-completed state.

As chairman of the local South Shields & District Amateur Radio Club, Frank has always encouraged interest in home-built gear—indeed, he has himself won

the Club's constructional contest on several occasions. His equipment is always available for display when the Club visits the local Flower Show in August and has a station on the air, and has also been shown at other exhibitions. He has contributed to *SHORT WAVE MAGAZINE* on occasion, the last being a Tx/Rx rig for mobile operation on 160 metres. (Our issue for February, 1968). Here, we see him studying the article on an "Integrated Digital Morse Key" in the October 1969 *Magazine*.

### **CORRECTIONS AND AMENDMENTS**

About his article "Construction of An Outside Shack," in our May issue, G3LXD says that if hardboard is to be used externally (exposed to wind and weather) it is essential that it be primed and painted. It is advisable to use a proprietary primer, but oddments and left-overs will normally mix together for the top-coating. Subsequent painting will help to keep the weather out.

\* \* \*

Reference the table of values on p.143 of the May issue, the values for C4, C6, C10 should, of course, have been shown as .001  $\mu$ F, and not as given; likewise, C13 is a 200  $\mu$ F electrolytic.

# NEW QTH'S

This space is available for the publication of the addresses of all holders of new U.K. call signs, as issued, or changes of address of transmitters already licensed. All addresses published here are reprinted in the U.K. section of the "RADIO AMATEUR CALL BOOK" in preparation. QTH's are inserted as they are received, up to the limit of the space allowance each month. Please write clearly and address on a separate slip to QTH Section.

- E19CB**, Limerick City Short Wave Radio Club, 7 Colbert Park, Janesboro.
- G3YOT**, G. Wright, 56 Queensway, Bamber Bridge, Preston, Lancs. PR5 6UD.
- G3YSK**, J. Button, 13 Taplings Road, Weeke, Winchester, Hants.
- G3YVT**, Dr. K. W. B. Rostron, Penquite, Lelant, St. Ives, Cornwall. (Tel. Hayle 2107.)
- G3YZO**, R. T. O. Wilson, 34 Beaudesert Road, Handsworth, Birmingham, 20.
- G3ZAC**, R. G. Butler, 2 Grace Meadows, Bewsbury Cross Lane, Whitfield, Dover, Kent.
- GM3ZBE**, A. M. Allan, 3 Urquhart Street, Aberdeen, AB2 1PL.
- G3ZBV**, C. K. Rostron, Penquite, Lelant, St. Ives, Cornwall. (Tel. Hayle 2107.)
- G3ZCF**, R. J. Trebilcock, 15 Dane Close, Stotfold, Hitchin, Herts.
- G3ZDC**, J. D. B. Hyde, 76 Wavendene Avenue, Thorpe, Egham, Surrey.
- G3ZDF**, J. J. Kirk, 69 Farnham Close, Rainham, Kent.
- G3ZDR**, W. C. Stampton, 67 Medhurst Crescent, Gravesend, Kent.
- G3ZEL**, E. Chappell, Treen, Porthcurno, Penzance, Cornwall. (Tel. St. Buryan 415.)
- G3ZEO**, S. J. Wilders, 45 Tabors Avenue, Great Baddow, Chelmsford, Essex. (Tel. Chelmsford 71754.)
- G3ZFK**, D. Buonaquisti, 24 Somerville Avenue, Leeds, LS14 6BG. (Tel. Leeds 640121.)
- G3ZFN**, R. Gidlow, 55 Stowupland Road, Stowmarket, Suffolk, IP14 5AN.
- G3ZFO**, J. E. Hall, 2 Sheridan Close, Enderby, Leicester, LE9 5QW. (Tel. Narborough 4723.)
- G3ZGA**, J. E. Hart, 10 Nursery Grove, Leeds, LS17 7AL.
- G3ZGB**, J. W. R. Hill, 329 The Hides, Harlow, Essex.
- G3ZGS**, W. M. Moore, 81 Park Hall Road, Walsall, Staffs, WS5 3HS.
- G3ZGT**, B. Druce, 6 Kennedy Drive, Goole, Yorkshire.
- G3ZGX**, D. J. D. Banks, Sirimon, Bossingham, Canterbury, Kent. (Tel. Stelling Minnis 352.)
- G3ZHP**, D. Marsden, 5 Smithy Lane, Skelmanthorpe, Huddersfield, Yorkshire, HD8 9OF.
- G3ZHM**, J. Mather, 6 York Road, Torpoint, Cornwall. (Tel. Torpoint 496.)
- G3ZHW**, J. Byrne, 52 Cookson Road, Seaforth, Liverpool, Lancs., L21 4NU. (Tel. 051-928 1063.)
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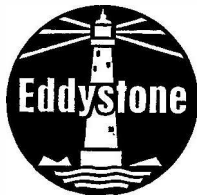


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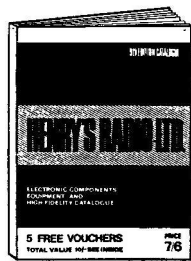
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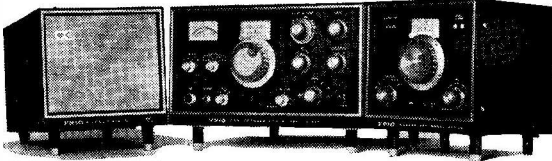
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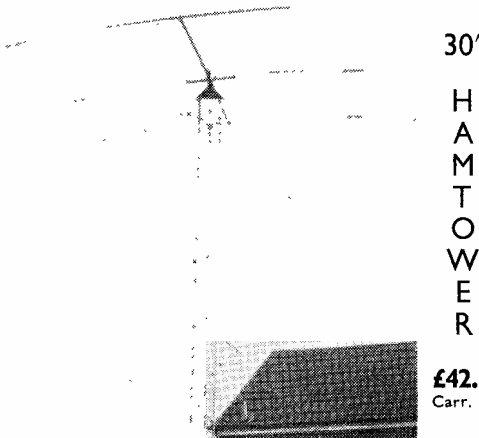
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**DISPOSING:** T.W. Communicator Two, complete, £40. Lafayette HA-600 receiver, £32. Codar T.28 Rx, £8. Codar A.T.5 Tx, £10. Codar mobile PSU, 80s. Codar AC/PSU, £6. Codar 12/RC remote control unit, 60s. (Or take complete Codar outfit with all connectors for £30.) Cubical Quad for 10 metres, £5. Minitenna beam for Ten, 60s. Omni-Vee antenna for two metres, 40s. Two halo's with stacking kit, 40s. Gotham all-band vertical Ae., 60s. Partridge Joystick, 40s. Also a quantity of test gear and accessories, and 230/117v. transformers.—Street, G3DKS, QTHR. (Ring 01-606 8991, or 01-449 4934.)

**WANTED:** To buy or borrow, handbook or any information on G.E.C. BRT-402E receiver.—Buckingham, 122 Scots Lane, Coventry, Warks., CV6-2DN.

**SELLING:** Codar A.T.5 Tx, in mint condition, £12-10s.; mains PSU, 50s.—Watmough, G3WXB, 128A Baldwins Lane, Croxley Green, Rickmansworth, Herts. (Tel: Watford 27499.)

**FOR SALE:** Labgear LG.50 Tx, £15. Codar station control unit, 80s. Class-D Wavemeter, 60s. Buyers collect.—Tagg, G8IX, QTHR, or ring Stoke-on-Trent 24941.

**SALE:** Lafayette HE-80 Rx, 550 kHz to 30 MHz and 142 to 148 MHz coverage, in very good condition, price £30. Also a K.W. Vanguard AM/CW Tx, coverage 10 to 80m., £25 or near offer.—Baxter, 25 Elmwood Road, Dundee (66241), Scotland.

**WANTED:** CRM-1 Unit in good condition and preferably with manual. Also 100 VPS Strobe Fork.—Lodge, 173 Townhill Road, Swansea, Glam., South Wales.

**SELL:** Marconi "Base Tx." working on two metres, QQV06-40A, high-level modulation; G8ARV/Mullard solid-state 2m. Tx, 2 watts AM, BLY-33 PA, complete with PC5 modulator and 48 mHz xtal, £7-10s. Wilcox-Gay VFO, coverage 1-20 mHz, roller inductors, 70s. Variac, 10 amp., as new, mains input, 0-300v. output, 90s. Hallicrafters receiver, coverage 550 kHz to 32 mHz, with amateur bands spread, £12-10s. R.1155N Rx, 160m. model, with built-in output stage, £6. All items carriage at cost. **WANTED:** QRO modulator, 100-150w.—Pugh, G8BSR, 178 Compton Road, Wolverhampton (29201), Staffs.

**FOR SALE:** K.W. Vanguard Mk. II AM/CW Tx, works 10-80m. bands, price £30, prefer buyer collects.—Homewood, GM3BGW, 32 Sandylands Road, Cupar, Fife, Scotland.

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**WANTED:** Eddystone 840C receiver, also Vanguard Tx with Top Band modification. Both must be in new condition and perfect working order. Good price paid for the genuine article.—Clarke, G3DWA, Westaway, School Lane, Newton-with-Scales, near Kirkham, Lancs. PR4-3RT.

**FOR SALE:** Heathkit Mohican GC-1U Rx, good condition, price £18. National NC-100X, covering 550 kHz to 30 mHz, double-superhet from 6 mHz up, with xtal filter and S-meter, cabinet fair only but performance excellent, £12 10s. Eddystone bug key, perfect, 50s. BC-453, 60s.—Timms, 22 Padway, Penwortham, Preston (43098), Lancs.

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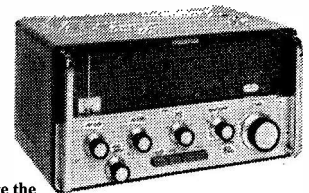
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**BARGAIN:** Swan Transceiver with Vox, crystal calibrator,, Model-22 outlet box including switching for external VFO, plus PSU and speaker. Additional extras: Model-420 External VFO, Model-406B miniature external VFO for mobile use, DC/PSU. All equipment in excellent condition, complete with manuals (original cost £400), asking £250 all-in.—Morgan, G3KGC, Chelmsford Lodge, Valeside, Hertford (5545), Herts.

**FOR SALE:** Heathkit HW-30, £20. Also Teletype Model 5BY36A1 110v. electric typewriter, 39-way plug, needs decoder and terminal unit for RTTY, in full working order, offers? Two SCR-522 receiver sections complete but untested, and a SCR-522 Tx for breakdown, all 30s. each. Carriage extra, but would prefer buyers to collect evenings after 8 p.m., or weekends.—Theasby, G8BMI, QTHR.

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**EMIGRATING:** For Quick Sale, a Heathkit DX-40U with VF-1U VFO, price £22. National HRO, with PSU and coil packs, £18. DA-1 El-Bug, £10.—Sear, G3VOK, 21 Priestleys, Luton, Beds.

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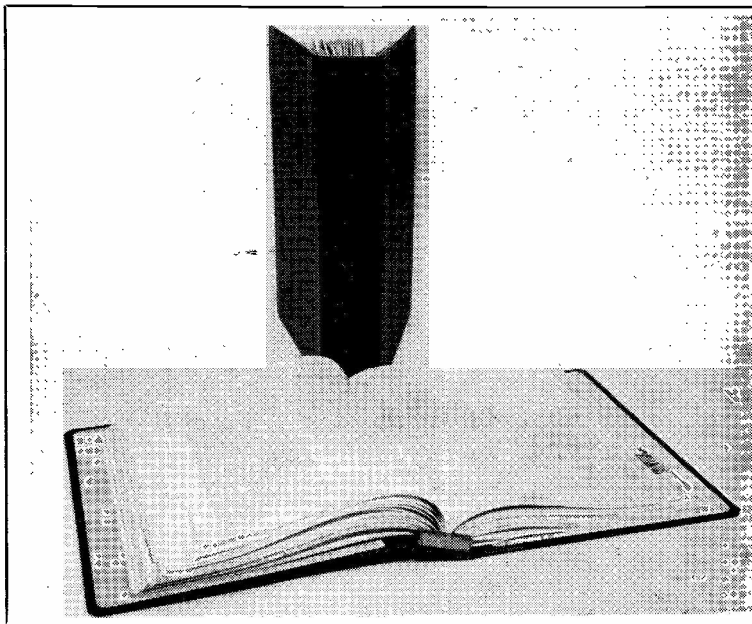
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