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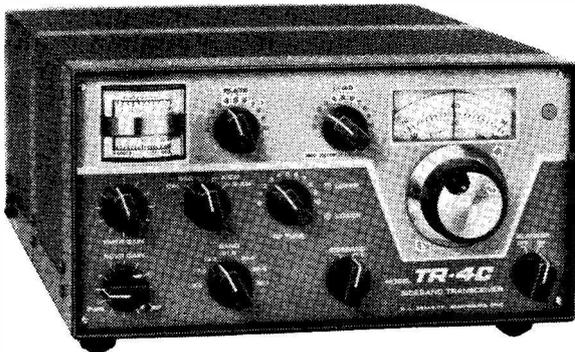
WORLD WIDE COMMUNICATION

Radio Shack Ltd ★

London's Amateur Radio Stockists

Just around the corner from West Hampstead Underground Station

Drake has made The Best better!



The New DRAKE TR-4C Transceiver

The Drake TR-4C is a product of years of transceiver experience and design improvements. The resulting performance makes it one of the finest transceivers available. Its operating handiness is not only evident in circuit design, but also in packaging. Compact and lightweight, it is ideal for mobile use, portable excursions, and vacations. USB, LSB, CW or AM operation is at your finger tips with 300 watts P.E.P. of communications power.

INCLUDED FEATURES ;

- **300 Watts PEP** input on SSB, 260 watts input on CW.
- **Complete Amateur Band Coverage** ; 80 through 15 metre bands complete and 28.5-29.1 MHz of 10 metres. Rest of 10 metre band obtained with accessory crystals.
- **Separate Sideband Filters** ; separate USB and LSB filters eliminate oscillator shifting and insure long term carrier vs filter alignment.
- **Nominal 1.7 ; 1 Filter Shape Factor** ; These filters stand among the industry's finest with 6 dB bandwidth of 2.1 kHz (chosen to slice thru QRM), 60 dB bandwidth of only 3.6 kHz and 100 dB ultimate rejection.
- **Provision For Highly Effective Accessory Noise Blanker.**
- **Heavy Irridited Cadmium Plated Chassis.**
- **CW Side Tone Oscillator** for monitoring your CW transmission.
- **Finish** ; scratch resistant epoxy paint.
- **Crystal Calibrator** built-in.
- **VFO Indicator Light** eliminates confusion of which main tuning knob controls the frequency when using an RV-4C remote VFO.
- **Automatic CW Transmit Receive Switching** sometimes called "semi" break-in.
- **Full AGC** with Drake dual time constant system confines a 60 dB signal change to a 3 dB audio change.
- **Effective Transmitting AGC** insures clean SSB output.
- **Solid State Permeability Tuned VFO** for low drift and accurate 1 kHz divisions on all bands. New easy to read dual concentric dials.
- **VOX or PTT** for use on AM or SSB.
- **Receiver S-Meter** automatically switches to indicate transmitting AGC on transit.
- **Transmitter Plate Ammeter** indicates **Relative RF Output** by depressing load control shaft.
- **Adjustable Pi-Network** output circuit.

DRAKE — SALES — SERVICE

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Just around the corner from West Hampstead Underground Station

Telephone : 01-624 7174 Cables : Radio Shack, London, N.W.6
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Radio Shack Ltd ★

London's Amateur Radio Stockists

Just around the corner from West Hampstead Underground Station

Drake has made The Best better!



The New DRAKE R-4C Receiver

FEATURES

- Solid State Linear permeability-tuned VFO with 1 kHz dial divisions. Gear driven dual circular dials. High mechanical, electrical and temperature stability.
- Covers amateur bands with crystals furnished. Covers all of 8,040, 20 and 15 metres, and 28.5-29.0 MHz of 10 metres.
- Covers 160 metres with accessory crystal. In addition to the amateur bands, tunes any fifteen 500 kHz ranges between 1.5 and 30 MHz. 5.0-6.0 MHz not recommended. Can be used for MARS, WWV, CB Marine and Shortwave Broadcasts.
- Superior selectivity: 2.4 kHz 8-pole filter provided in SSB positions. 8.0 kHz, 6-pole selectivity for AM. Optional filters of .25, .5, 1.5 and 6.0 kHz bandwidths available.
- Smooth and precise passband tuning.
- Tunable notch filter attenuates carriers within passband.
- Transceive capability. May be used to transceive with the T-4X, T-4XB or T-4XC Transmitters. Illuminated dial shows which PTO is in use.
- USB, LSB, AM and CW on all bands.
- AGC with fast attack and two release times for SSB and AM, or fast release for break-in CW. AGC also may be switched off.
- New high efficiency accessory noise blanker that operates in all modes.
- Crystal lattice filter in first IF prevents cross-modulation and desensitisation due to strong adjacent channel signals.
- Excellent overload and intermodulation characteristics.
- 25 kHz calibrator permits working closer to band edges and segments.
- Scratch resistant epoxy paint finish.

DRAKE — SALES — SERVICE

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LOWE ELECTRONICS

119 Cavendish Road, Matlock, Derbyshire, DE4 3HE

Tel. Matlock 2817 or 2430 9 a.m. - 9 p.m.

John: G3PCY

Bill: G3UBO

Alan: G3MME

Hours : Tuesday to Saturday 9-5.30 (closed for lunch 1-2 and all day Monday).

Service and Sales : A good range of our equipment is available (evenings and weekends only) at the following : John G3JYG, 16 Harvard Road, Ringmer, Lewes, Sussex. Tel : Ringmer 812071. Sim GM3SAN, 19 Ellismuir Road, Baillieston, Nr. Glasgow. Tel : 041-771 0364. Alan GW3YSA, 35 Pen y Waun, Efail Isaf, Nr. Pontypridd, Glam. Tel : Newton Llantwit 3809. Peter Ward G3XWX, 47 Radstock Avenue, Ward End, Birmingham, B36 8HD.

Service only (evenings and weekends) : Dave Dryden G3BKQ, 205 Main Street, Thornton, Leics.

MAIN DISTRIBUTORS FOR YAESU MUSEN EQUIPMENT

In view of the uncertainty of prices and VAT and as the pre-VAT mad rush to buy has died down, it might be a good time to advertise some of our lesser-known bits and pieces, and at the same time, as well as advertising them, see if we can't give you some helpful hint and tips.

Yaesu News

FT101 owners—we now have AM filters in stock—indispensible for the 2m. ma. Price £18 + VAT. Write for details of fitting or arrange a day when we can do it.

FTdx401 owners—we thoroughly recommend our tune-up device which requires 9 volts and plugs into the mike socket. This is a high output pulsed tone of 10 millisees. on and 50 millisees. off. This 20% duty cycle means you can load up your FTdx 401 (or any other SSB rig) at full power to achieve optimum loading conditions without over-running the P.A. Using this device we have run an FTdx 401 at FULL POWER for an hour without the slightest sign of distress. We are very pleased with this little idea and anyone running high power (particularly applicable to linears) will find it invaluable. For blind or handicapped operators—this is the answer. We like it, and at the price of £1.50 + VAT for a kit, or £3.00 + VAT assembled on a P.C. board, it represents a worthwhile addition. However, please note two very important points—one—it does not absolve you from treating your rig to a 50 ohm (or about) antenna and—two—please don't load up right on top of a QSO. The poor chap struggling to copy a weak signal will swear at us, not you!

Mobile News

We still have a few FT75's at pre-revaluation prices, so if you are thinking of a mobile rig, the FT 75 fits into the smallest of cars and gives a very good account of itself both for local and DX working. There is a great deal to be said for a compact, trouble free, push button rig for mobile—it looks good and it PERFORMS.

Station Accessories

The uncertainty of import prices gives us a chance to advertise the station accessories which we have in stock and which we rarely get a chance to describe in any detail.

Aerials

We always have a wide selection in stock ranging from 4 element wide spaced single beam, three quads and verticals to 2m Yagis and 2m. whips. For the man who wants a big beam—give us a yell, because we generally find that, price for price, our Japanese beams out-perform all others in quality and performance. In the medium price range we find the American Polygon quad a good buy and in the lower price range our verticals take some beating.

Asahi Echo 8G

Here is a trap vertical requiring no guys and no radials (although radials can give greater performance) covering 40m. to-10m. with a low SWR at a very low price of £20 (+VAT) including carriage. It stands about 21ft. high and is an excellent performer.

Diamond DP 104

A compact trap vertical for 20, 15 and 10m. Low SWR on all bands and only stands some 11ft. high. Excellent for portable or where neighbours are a nuisance. £19 + VAT carriage paid.

Diamond DP 103

80 and 40m. trap vertical about 25ft. high. Light guying advisable (ropes provided). My own feeling is that an 80m. dipole will outperform an 80m. vertical, but if you haven't room for a dipole, then the DP103 will work well for you. Radials not essential, but they always help. Tune for the bit of the band you use most, but remember that, as with ALL loaded verticals, tuning is fairly sharp. Price £25 + VAT carriage paid.

Diamond DP 105

Covering all bands 80 to 10, standing about 25ft. high and again benefiting from light guying (provided). A popular antenna for the man who hasn't room for an 80m. dipole. Price £35 + VAT carriage paid. In connection with the above aerials, the questions we are mostly asked are:—

1. Do I need an ATU ? No, definitely not.
2. Do I need radials ? No, provided the vertical is post mounted at ground level, but radials do improve performance and if you can lay them out it isn't a bad idea.
3. Can I mount it on a chimney ? Yes you can, but here radials are essential.
4. What coax does it need ? Coax straight from the Transmitter into the aerial—ideally 50 ohm but 75 ohm won't harm anything.

All in all, the vertical is probably the easiest to erect, easiest to tune for lowest SWR and least likely to attract any of all Amateur aerials, and the performance, while not up to a good beam or quad, is surprisingly good.

Mobile Aerials

We stock the very popular G-whip range amongst which are the Tri-lander, multi-mobile and, a new product, the Flexiwhip which has a coil spring built in. These are all-band mobile whips featuring helical loading on the H.F. bands with centre loading on the L.F. bands. The Multi-mobile has the advantage of up to 4 band operation without coil changing—requires patience in tuning, but once tuned for the desired bands, requires no coil changing or switching—simply switch the transmitter to the desired band. For portable operation, the "extends rod" can be used to increase the whip length for better performance without

appreciably altering the point of resonance . . . If you can't work him on the move, pull over to the side, add the "extendarod" and try again !

For the L.F. Mobileer—the 160/80m. or Ranger 160 is a good buy.
G-Whip Prices—Carriage (50p) + VAT extra.
 Tribander (20, 15 & 10) £10.50 Multimobile (20, 15 & 10) £12.50.
 L.F. Coils (40, 80 and 160m.), £4.00. Top whip sections, £1.00.
 Duo-banded (80/80m.), £9.00. Ranger 160m., £8.00.
 Flexi-whip, £15.00. Coils, £4.00 each.
 Base section for all G-Whips, £1.50. Extendarod, £4.80.
 Please note that carriage and VAT are EXTRA.

V.H.F. antennas

We stock a good range of 2m. "J" Beams from the simple 4 element up to the Farabeam and 8 over 8. We have them in stock and can ship either British Rail Express (50p extra) or by Securicor 24 hour service (£2.00 extra). We have both 50 and 75 ohm versions, so please advise us which you want.

"J" Beam Prices + VAT + Carriage.

2/4 element, £2.90	2/6Y 6 element, £3.50
2/8Y 8 element, £4.20	2/10 10 element, £9.00
2/14P 14 element Farabeam, £14.30	2/12 Double 6 slot fed, £6.80
2/16 Double 8 slot fed, £8.40	
2/10XY Crossed 10 element, £12.20	

Please add VAT and Carriage.

2m. Mobile Whips

We consider the Diamond 3 vertical gutter mounting whip to be a best buy. A beautifully finished antenna, mounted in seconds, which requires no holes or other mods to the vehicle. Complete with 4m. coax. Very flexible—drive straight into your garage. Considering the performance, quality and finish of this antenna, the price is very reasonable at £10 plus VAT. Carriage 50p.

Antenna Accessories

SWR Meters

Probably the most important accessory in the shack—we stock two models—the well known and very popular Hansen SWR 3 and the twin meter Asahi. The Hansen has a single meter which is switched to read forward or reflected power, and has a sensitivity pot which enables it to be used with a wide variety of rigs of different power outputs. It gives a useful reading on as low as 160m. and as high as 2m. Price £5 + VAT, post paid.

The Asahi has the advantage of twin meters so that both forward and reflected power may be monitored simultaneously. It also has a sensitivity pot and is useful from 160 to 2m. Price £8 + VAT, post paid.

Both the above are of 50 ohm nominal impedance, but may be altered to 75 ohms by simply substituting 100 ohm resistors for the 150 ohm resistors fitted.

Coax sockets in both cases are SO 239 as fitted to all Yaesu gear and require PL259 plugs which we can supply at 30p (plus VAT) each post paid. If you use 1/2" coax (UR43 or similar) we can also supply PL259 reducers at 10p each (plus VAT), post paid.

One or two points which you may find interesting. When your SWR meter reads 1 : 1 you may have a perfect match, but try and bear in mind the following:—

1. The diodes used in any Amateur type SWR meter require a certain voltage across them before they conduct, so that your apparent 1 : 1 SWR may be due to the diode nearly, but not quite, conducting. Hence you should always momentarily check your SWR at a higher power. (No need to wreck the PA—just sufficient to check SWR).

2. The coax cable you are using has losses. Take a look at the table of losses below and consider that with 150 feet of nice new UR 70 on 10m., the forward power drops off 3.9 dB by the time it reaches the antenna. By the time the reflected power gets back to the SWR meter, it has dropped another 3.9 dB. Hence there is a built in 7.8 dB differential between forward and reflected power. This means, of course, that even if your 10m. aerial has blown away, your SWR meter will still read around 2.5 : 1 which could thoroughly bamboozle you ! It is instructive to stick a 2m. Yagi at the end of a long length of coax—check the SWR. Remove the Yagi and check again. You may get quite a surprise !

The moral to this tale is—use the SWR meter as a guide but be aware of its limitations.

When you first put up an antenna, it makes sense to plot the SWR on graph paper, starting at one end of the band and taking readings every 25 kHz on 80 and 40, every 50 kHz on 20 and 15 and every 100 kHz on 10. This way you can see where your lowest SWR occurs and, if that point isn't where you want it, you can bring it where you want it by lengthening or shortening the elements. On multi-band antennas—adjustment on one band can affect the others so keep on checking all bands until you get an acceptable compromise.

V.H.F. SWR Meters

Inductive and capacitive reactance which at H.F. is negligible, becomes a nuisance on 2m. and renders the normal SWR meter a bit suspect. It also, in the case of many modern 2m. transceivers with PA protection, causes the PA to cut off due to the slight added reactance being just sufficient to operate the protection circuit. We are therefore importing a new SWR meter specifically designed for 2m. and 70 cms. Not unfortunately more expensive than the H.F. variety, but not too out of the way at £14 plus VAT, post paid.

Cable

We stock :-
UR43 8p/m. plus VAT
UR73 1p " " "
UR67 22p/m " " "
75 ohm twin feeder 3p/m.
300 ohm twin feeder 5p/m

POSTAGE EXTRA. Please allow plenty and we'll refund the balance.

Choice of coax—for H.F. use, unless you are running high power, UR 43 (RG 58/U) or UR 70 is probably good enough assuming you don't have too long a run, but for V.H.F., for goodness sake get the best—it is false economy to save money on coax ! A short length of UR 43 is acceptable for mobile use, but for a Yagi on a mast you really ought to lash out on UR 67 (RG 8/U). This of course applies to receiving as well as transmitting antennas (unless of course you don't mind losing most of your signal in the coax !).

Cable Losses

You will find this table useful as a guide to choosing a cable.

	144	432
	MHz	MHz

Cable	Nominal Impedance	Attenuation dB/100 ft.
UR67 Coax (RG8/U)	50 ohms 0.3	0.45 0.66 0.83 0.98 2.5 4.8
UR43 Coax (RG58/U)	50 ohms 0.68	0.00 1.5 1.9 2.2 5.7 10.4
UR70 Coax	72 ohms .80	1.17 1.76 2.23 2.6 6.7 12.2
75 ohm twin	75 ohms .31	.52 .88 1.23 1.5 5.1 8.2
300 ohm twin	300 ohms .21	.33 .48 .61 .71 1.82 3.29

The obvious lesson to be learnt from this is that the most expensive coax can work out to be the cheapest in the long run. It is also pretty obvious that the use of a balun and twin feeder can work out cheaper and more efficient (see under "Baluns").

Rotators

We stock the well known CDR range which for years have been used by Amateurs all over the world. AR22-R, £25 + VAT; TR44, £45 + VAT and HAM-M at £70 + VAT. All complete with remote indicator/control box and carriage paid by Securicor.

Choice of Rotator

The number of chaps who use an AR22 to turn a hefty H.F. beam is legion. It is a tribute to the ruggedness of the AR22-R that they get away with it for so long—but sooner or later the gears strip. The fact is that the AR22-R is designed for 2m. beams. For something bigger, up to light 3 element trap beams (TA 33 jnr. for example) the TR 44 is the shot. For the heaviest of beams, the extra ruggedness of the HAM-M ensures a long trouble-free life. At Matlock we use a Ham M—it has been on top of the tower for many years and will remain there for many years to come !

Rotator Cable

Four core for the AR22-R at 15p/metre and 12 core for the TR44 and Ham-M at 30p/m. Actually the latter two require a rather odd cable—8 core, two cores of which are 18 ga. and the remaining 6 are 22 ga. This cable will allow operation up to about 50 yards away. A special cable like this costs rather a lot, so we sell standard 12 core and parallel 2 lots of 3 wires to give the required extra thickness. The cable we sell is well on top of the requirement—can be used for remote operation well in excess of the claimed 50 yards.

Baluns

A balun transforms the unbalanced output of a transmitter into a balanced output suitable for loading inherently balanced antennas. As all dipoles and the majority of beams and quads fall into this category, it makes good sense to use a balun. It is not, of course, essential to do so, but we feel that the return on a small outlay makes it very well worth while. In the case of an 80m. dipole for example, I can't help feeling that there is everything to be said for making a folded dipole out of 300 ohm ribbon and feeding it with 300 ohm ribbon in conjunction with a 4 : 1 balun at the transmitter. The advantages of a lower line loss and, more important, broader band width make it really attractive. The only snag being that 300 ohm line is possibly more antisocial than a single, barely visible wire. Another way 300 ohm line can be used to advantage is by using it to feed your beam. Provided the length of 300 ohm line is a half wave length or multiple of half wavelength it can be used to feed a dipole, beam, quad, or trap dipole very successfully. Bearing in mind its velocity factor of about 0.8, a length of about 55 feet is a wave length on 20 m., 11 on 15m. and 2 wavelengths on 10m. The losses in 55 feet of 300 ohm ribbon are negligible as is the cost. In this case of course you must use a 1 : 1 balun at the transmitter. If you want even lower losses and even lower cost, make your own 600 ohm open wire feeder, but this time forget the velocity factor. A smart thing to do is to start off with the feeder about 5 feet too long and trim it until the SWR is respectable on all bands.

Looking back at the bit on SWR meters—I mentioned that due to line losses, the measured SWR could be very optimistic indeed. Replacing lossy coax with some low loss twin feeder may show you what your SWR REALLY is. Blame the twin feeder if you like, or blame me, but much better to get your antenna SWR respectable ! Having done this your friends won't believe that you're still running barefoot.

Balun Prices

Popular H2P balun 1 : 1 ratio is £4.80 + VAT, post paid.
H2P balun 4 : 1 ratio is £4.80 + VAT, post paid.
Rugged Kirk 5075 B 1 : 1 2 kW broad band £7.50 + VAT, post paid.
Kirk 5075 D LF 1 : 1 2 kW specially optimised for 160, 80 or 40m. dipoles £7.50 + VAT, post paid.

Talking of antennas generally we should perhaps mention that we are firmly of the opinion that as the modern transmitter requires a 50 ohm or thereabouts antenna, it makes sense to load directly or via a balun into such an antenna.

We do not like the alternative of trying to make a high impedance

antenna (long wire, G5RV, Windom, etc.) look like 50 ohms by means of a Z match or A.T.U. Experience shows that by and large P.A. troubles stem from high impedance antennas—and you, these troubles can and usually are overcome with experience. But why invite trouble when it isn't necessary?

In the case of antennas for receiving only, much of what I have said does not apply. On the contrary, a long wire (as long and as high as possible) in conjunction with an ATU takes a lot of beating for receiving. It has the great merit of low cost and simplicity, and the improvement in reception by the addition of an ATU (preferably home made from one of the many designs extant) is well worth it. Nothing to stop the listener buying a transmitting antenna, but there is really no necessity to go and spend a lot of money, because the improvement in reception is not proportional to the cost.

Wattmeters

This is the final item I'd like to mention in connection with antennas. This is a properly terminated dummy load/wattmeter, aimed at the serious VHF man—it is a direct reading wattmeter with a constant 50 ohm impedance right up to 500 MHz making it ideal for power measurements at 2m. and 70 cms. Switched scale 20 or 120W f.s.d. and the large log scale makes low power readings possible to less than 500 mW. If you are H.F. only, forget it—you can get a dummy load much cheaper, but a 2m. or 70 cm. dummy load is a very different matter. Add to this the fact that the signal and the sum becomes objectionable, then you must agree that it is very well worth £35 plus VAT.

Microphones

We stock the well known Yaesu YD844 table mike at £13 plus VAT and the even more widely known YD846 hand mikes at £5 plus VAT. These are both 50K dynamic with PTT and fitted normal 3 contact jack plug. They plug into all Yaesu gear which is not already provided with a mike.

Headsets

In common with everybody else, the headsets we sell are the universal low impedance padded stereo Hi Fi sets. The reason we don't sell proper communication headsets is that they cost rather a lot of money and the stereo sets, due to mass production and mass marketing, represent much better value for money. However, all the stereo sets on the market suffer from two snags for Amateur use :-

1. They are stereo
2. They are very sensitive

They can be converted to monaural by simply chopping off the lead going to the chassis on the stereo plug, and substituting the lead which goes to the ring. The fact that they are very sensitive means that unless the A.F. gain control is turned right down, it will take the top of your head off. The snag is that with the AF gain right down, residual hum tends to be a real nuisance and this hum becomes objectionable. The cure is simple—an attenuator, consisting of just two small resistors—a 10 ohm across the plug of the headset and a 100 ohm in series with the signal lead. Having done these simple mods the headsets become really good for Amateur use. Good quality sound and very comfortable to wear. Full instructions in detail with sketches, on the above modifications with every set. Price £3, post paid + VAT.

Valves

For common valves like 6BA6's, 6BE6's, 6AU6, etc., etc., we recommend you go to one of the large London dealers in valves—we simply cannot compete with their prices. Honestly if we want a common valve, we get it from RST or Z & I rather than go to our Wholesaler—it's cheaper. We recommend you do the same.

Where we can be of service to the Amateur is to stock some of the valves he can't get easily, particularly those used in Yaesu equipment as under :-

6AH6, 6BZ6, 6CB6A, 6CL6, 6UBA, 6EW6, 6EH7, 6BM8, 12BY7A.
All at 60p each + VAT, post paid. 6GK6, £1.20 + VAT, post paid.
PA Valves 6JM6A, £1.50 each + VAT, post paid.

6J56C, 6KD6, £2.00 each + VAT, post paid.
These are supplied in matched pairs at no extra cost.
Finally we must mention that we still have some 4CX250 valve bases in stock complete with chimneys. Brand new £3 plus VAT, post paid.

Service

Ask anyone who has dealt with us—he is our best advertisement.

Second Hand Equipment

We always have the best selection in the best condition, fully checked, serviced and guaranteed. If it is not to your liking, you simply pick up the 'phone and tell us. We collect and you get your money back less the cost of carriage. This takes all the risk out of buying second-hand. A S.A.E. will get you our latest second-hand list and a large envelope with a 6p stamp on will get you our complete catalogue which runs to over 50 pages, and includes circuit diagrams of all new gear.

Trade-Ins

We are always happy to trade in used equipment if it is something we can recommend to another customer. We don't mind if it's faulty because we service all the second hand gear before resale anyway.

Hire Purchase

We can arrange Hire Purchase terms on both new and second hand gear. The deposit is a mere 10% and repayment may be spread over 12, 18, 24 or 36 months. Your trade-in gear is perfectly acceptable as a deposit.

Agents

Don't forget that our Agents, Sim, in Glasgow, John in Sussex, Alan in S. Wales, and Peter in Birmingham can demonstrate and supply Yaesu gear, have second-hand gear for sale, have a wide range of accessories and are available evenings and weekends to help you, advise you or just chat to you. Why not 'phone them if you have any problems?

In the case of Peter in Birmingham, he is operating full time from his home and although not yet on the 'phone is available pretty well any time. Five minutes from the Gravely Hill interchange (Spaghetti Junction) put him pretty close to you.

LOWE ELECTRONICS

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This service will be available to callers, mail and telephone customers ; just another part of the finest service available to the U.K. Amateurs. We hope you'll give it a try ! We'll despatch your order the same day if humanly possible by whatever means you wish.

You may order anything which we sell by this high speed service, including used equipment, up to the limit of your Access card.

NOW IS YOUR LAST CHANCE!

Don't forget all prices go up by 10% V.A.T. in April on everything which we sell except Caslon Clocks. You'd be wise to make that possible change in your station now !

H.P. With inflation and V.A.T. you may as well get the goods on H.P.!

EXAMPLES OF HIRE PURCHASE
Monthly Repayments over :

Model	Deposit	1 Year		H.P. Price	1½ Years		H.P. Price	2 Years		H.P. Price	3 Years		H.P. Price
FR50B	£7-00	5-£6 ; 7-£5	£74-00	16-£4 ; 2-£3	£77-00	2-£4 ; 22-£3	£81-00	11-£3 ; 25-£2	£90-00				
FR400SDX	£16-00	6-£14 ; 6-£13	£178-00	9-£10 ; 9-£9	£187-00	12-£8 ; 12-£7	£196-00	18-£6 ; 18-£5	£214-00				
FT1FT75	£12-50	3-£11 ; 9-£10	£135-50	3-£8 ; 15-£7	£141-50	16-£6 ; 8-£5	£148-50	6-£5 ; 30-£4	£162-50				
FTJFF200	£18-00	5-£15 ; 7-£14	£191-00	3-£11 ; 15-£10	£201-00	1-£9 ; 23-£8	£211-00	32-£6 ; 4-£5	£230-00				
FT-101	£26-00	6-£22 ; 6-£21	£284-00	2-£16 ; 16-£15	£298-00	22-£12 ; 2-£11	£312-00	27-£9 ; 9-£8	£341-00				
FT-401	£23-00	5-£20 ; 7-£19	£256-00	12-£11 ; 6-£13	£269-00	19-£11 ; 5-£10	£282-00	33-£8 ; 3-£7	£308-00				
FT-2FB	£9-00	7-£8 ; 5-£7	£100-00	6-£6 ; 12-£5	£105-00	6-£5 ; 18-£4	£111-00	4-£4 ; 32-£3	£121-00				
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YC-305	£9-00	2-£8 ; 10-£7	£95-00	1-£6 ; 17-£5	£100-00	1-£5 ; 23-£4	£106-00	35-£3 ; 1-£2	£116-00				
YC-305D	£12-00	4-£10 ; 8-£9	£124-00	11-£7 ; 7-£6	£131-00	6-£6 ; 18-£5	£138-00	31-£4 ; 5-£3	£151-00				
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NEW FT-501. We regret delivery has been delayed and these will not now be available until June. Due to the revaluation of the yen our special offer cannot apply.

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Model	Drive Power	Output Power	Current	Price
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All the amplifiers operate on 13.8v. D.C.

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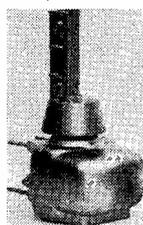
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ROTATORS CDE and HY-GAIN



AR20



AR22

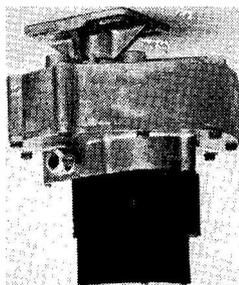


TR44



HAM-M

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TR44 This model is also for HF beams as the AR22R but carries a 500 lbs. load and has better braking. The control unit requires a 7-wire cable, £47 (75p).

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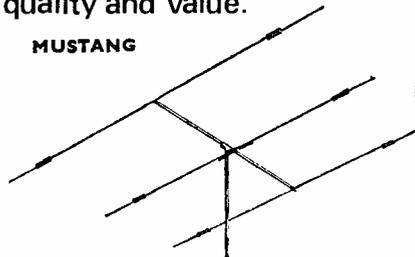
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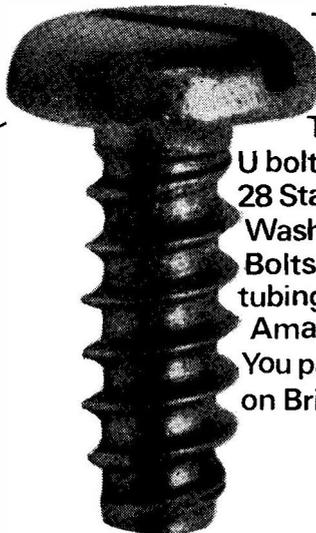
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MEMBER OF THE AMATEUR RADIO RETAILERS ASSOCIATION



To add to the problem of VAT, prices of all equipment originating in Japan including SOMMERKAMP gear will now be increased by approximately 10% due to the revaluation of the yen which will eventually of course adversely affect second hand items. Thanks to the pre-VAT rush our stocks of used equipment are much lower than normal but at the time of going to press we still have several excellent items as shown below and if this appears in print before 1st April the opportunity still exists to buy without the imposition of VAT.

Collins KWM-2 Transceiver complete with Collins PSU. Little used and mint condition.

Collins KWM-2 Transceiver. gain with Collins PSU. Excellent.

Collins 75A-4 Receiver. Fitted 3 filters plus 1 spare. This is, without doubt, one of the finest 75A4's to pass through our hands and is in truly immaculate condition **£225.00**

Collins KWS-1 Transmitter. A rare transmitter indeed. Of matching appearance to the 75A-4 and with a kilowatt capability due to 4CX250's in the final. Less power supplies **£200.00**

Eddystone EA12 Receiver. In excellent condition **£145.00**

Eddystone EA12 Receiver. Absolutely immaculate, complete with speaker/plinth **£150.00**

KW2000 Transmitter. Good clean condition **£117.50**

Trio JR-310 Receiver. As new in all respects **£66.50**

Trio JR-310 Receiver. Very good condition **£61.00**

Trio JR-500 Receivers. Several in stock from **£45.00**

Lafayette HA-350 Receiver. Good condition **£61.50**

Heath HW-101 Transceiver. Less PSU. Most excellent condition **£81.50**

Heath HW-100 Transceiver. With both AC and DC PSU's... **£135.00**

ALL ITEMS ARE PRICED TO INCLUDE CARRIAGE

PLEASE NOTE : Our used equipment stocks are continually changing. An S.A.E. will bring you the latest list.

Home demonstration service on new gear available from our agents:
SOUTHERN: J.H. Associates Ltd. (Jeff Harris G3LWM), Cricketfield Lane, Bishops Stortford, Herts. Tel. 0279-56347.
NORTHERN: J. Rowley, G3KAE, Castle Rise, West Ayton, Scarborough, Yorks. Tel. West Ayton 3039.

ELECTRON HOUSE, 508-514 ALUM ROCK ROAD, BIRMINGHAM 8.

Osker Block SWR200

Power Meters. The ultimate in SWR/

Power Bridges ... **£19.25**

TCC SWR Bridges—

C3042 Single meter model **£5.00**

TCC SWR Power

Bridges—C3005 Twin meter model **£7.85**

Sansei Miniature SWR/

Power Meter SE406... **£3.80**

Medco Filters. The best on the market.

FL504 and FL75A, 50 ohm Belling connectors ... **£6.00**

FL50B and FL75B 75 ohm PL 259 connectors ... **£6.50**

FL40 High Pass **£2.35**

Copal Clocks

All types ex-stock. Illustrated list by return.

Amphenol PL259 connectors ... ea. **30p**

Belling coaxial connectors ... ea. **10p**

50 ohm Heavy Duty coax (carriage extra) yd. **22p**

J Beam Antennas

Illustrated catalogue on receipt of S.A.E. Full range in stock.

G-Whip Antennas

All ex-stock, catalogue by return.

Shure Microphones

Model 201 Hand ... **£5.75**

Model 444 Desk ... **£13.25**

Mosley Antennas

TA31 Jnr. ... **£15.50**

TA32 Jnr. E ... **£25.00**

TA33 Jnr. E ... **£35.50**

Hy-Gain Antennas

12-AVQ vertical ... **£16.50**

14-AVQ vertical ... **£24.50**

18-AVT/WB vertical ... **£35.50**

LC-80Q Loading coil ... **£7.50**

TH3 Jnr. 3 ele beam ... **£51.50**

TH3 Mk. III 3 ele beam... **£75.00**

TH6 DXK 6 ele beam ... **£97.00**

BN-86 Balun **£8.00**

(Carriage extra on Mosley/Hy-Gain)

Rotators—all post paid

Stolle Memomatic 3001... **£22.40**

Stolle Automatic 2010 ... **£25.00**

CDE AR20 **£20.40**

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Standard pairs **£2.90**

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MEMBER OF THE AMATEUR RADIO RETAILERS ASSOCIATION

We would like to clarify a few points which have come to light of late. Firstly, we are not in a "part time" business or an off-shoot of any other business. We are fully employed manufacturing and supplying the radio amateur. We do have a number of professional and Government outlets but only for our amateur market equipment—modified for frequency coverage usually. This means that we are freely available to answer questions and provide a first class service to our customers.

Secondly, all the equipment advertised unless we specifically say so (e.g. second-hand equipment) is designed and made here in Huddersfield.

Finally, in order to provide the service and standard of equipment design and alignment, we have had over the last five years to invest in a considerable amount of professional quality test equipment. The final results can only be as good as the standards used. To this end we have purchased a brand new current production, 3000 MHz spectrum analyser. This sweeps from 1000 MHz max. bandwidth for observing the complete spurious output content of our equipment, down to a 10 kHz minimum sweep for checking the intermodulation level of the desired signal. This was necessary to aid in the development of the Europa transverter. It will be also used to check intermodulation and spurious content of every Europa coming off the final test bench.

PLEASE NOTE THAT ALL PRICES QUOTED THIS MONTH ARE VAT INCLUSIVE

NEW ! SSM EUROPA 10 TO 2 METRE SSB TRANSVERTER

This unit plugs straight into Yaesu SSB equipment. Although it is compatible with all 28-30 MHz transceivers or separate transmitter/receiver arrangements. Receiver converter specification is the same as our Sentinels. Transmit converter uses two QVQ03/10 and a QVQ06/40 P.A. Overall size: 9" x 4 1/2" front panel 4" deep. Price: **£64.35** less valves. QVQ03/10, **£1.37**; QVQ06/40, **£11.00**.

3CG CRYSTAL CONTROLLED CALIBRATION GENERATOR, £17.60.

SPECIFICATION COVERING ALL OUR VHF CONVERTERS

- ★ Noise figure 2 dB. Gain 30 dB.
- ★ Protected dual gate MOSFETs in RF and mixers for excellent overload and cross modulation characteristics.
- ★ All housed in aluminium cases, stove enamelled silver hammer with black trim.

THE SENTINEL 2 METRE OR 4 METRE DUAL GATE MOSFET CONVERTER

By far the most popular converters. Stock IFs for 2 metres: 2-4 MHz, 4-6 MHz, 9-11 MHz, 14-16 MHz, 18-20 MHz, 23-25 MHz, 24-26 MHz, 27-29.7 MHz, 28-30 MHz; 4 metre IFs: 28-28.7 MHz. Size: 2 1/2" x 3" x 1 1/2" except the 2-4 MHz and 4-6 MHz which being double conversion are 2 1/2" x 4" x 1 1/2". Price: **£15.12**.

Now becoming very popular :

THE SENTINEL X DUAL GATE MOSFET 2 METRE CONVERTER

This 2 metre converter is a de luxe version of our well established Sentinel converter. Contains internal mains power supplier but can be used with external batteries. It features an RF gain control to reduce cross modulation and overload of the main receiver and may be switched between mains and battery. Size: 5" x 1 3/4" front panel 4" deep. It uses fundamental crystals on the required frequency, i.e. no multiplication. IFs from stock: 4-6 MHz, 2-4 MHz, 27-29.7 MHz, 28-30 MHz. Price including P.S.U. **£21.45**.

THE SENTINEL M.F.

Receives 2 metres on a conventional M.W. B.C. receiver, particularly useful for use with a car radio. IF output 0.5 to 1.5 MHz for 144-145 and 145-146 MHz in two switched bands. "OFF" position switches M.W. aerial straight through to receiver. Double conversion design with two switched crystal oscillators. No frequency multiplication. Size: 5" x 1 3/4" front panel 4" deep. Price: **£20.62**.

Want to improve your present 2 metre receive system ?

THE SENTINEL LOW NOISE FET 2 METRE PRE-AMPLIFIER

- ★ Low noise figure 1 dB. Transistors selected for low noise figure.
- ★ Gain 18 dB. 12v. D.C. at 5 mA. Isolated supply lines.
- ★ Very good for bringing converted business gear up to scratch. Also helps IF breakthrough by increasing the wanted 2 metre signals and gives greater selectivity. Price: **£7.15**.

Want to receive 70 cms, cheaply but well ?

SM70 70 cms. CONVERTER

- ★ Low noise figure 4-5 dB.
- ★ IF output 144-146 MHz. By using the 70 cm. converter with a 2 metre converter you can have a high performance 70 cm. unit at a low price, **£15.12**.

T.B.C. 1. Top band to Medium Wave converters. Price: **£8.25**.

SOLID STATE 9 MHz GENERATOR—£12.10 less filter and crystals, **£17.50** with XF-9A filter and USB and LSB crystals.

MAGNETIC DEVICES 951. 12v. coax change over relay, **£4.12**.

The mobile rally season has arrived. We will be attending most of the Midlands and Northern events. We supply over a dozen amateur retail outlets around the country who should be able to supply equipment from the other rallies.

Although we cannot give an ex-stock delivery of the SSM Europa at the moment, we believe that all other units should be ex-stock, but you can always ring for confirmation. Call in any time to have a look at the stuff. G3MXG.

NORTH WEST ELECTRICS, G3MAX

769, STOCKPORT ROAD, LEVENSHULME,
MANCHESTER, 19.

Phone: 061-224 4911

EDDYSTONE RECEIVERS & DIECAST BOXES. TRIO RECEIVERS. JACKSON CAPACITORS & DRIVES. DENCO COILS.

TRANSFORMER. Specially wound for Digital instruments. 200 volt 40 mA HT. 6 volt 1A. Two windings LT. Will supply 6v. 2A. or 12v. 1A. CT $2\frac{1}{2}'' \times 2'' \times 2\frac{1}{4}''$, £1.50, post 25p.

TRANSFORMER for clock, £1.25, post 25p.

TRANSFORMER. Ex. Equip. potted. 4 x 6.4v. at 2A. each winding tapped at 5v. and 2.5v. size $4\frac{1}{2}'' \times 3'' \times 3''$, £1.75, post 50p.

INSTRUMENT CONTROL KNOBS. Black and bright Ali. centre, $\frac{1}{4}''$ brass insert with grub screw. 1", $1\frac{1}{4}''$ and $1\frac{1}{2}''$ dia., 15p each, post 5p each. Any excess refunded.

DIECAST BOXES. With fitted lid. Post 10p per box.

Cat. No. 7969P $3\frac{1}{2}'' \times 1\frac{1}{2}'' \times 1\frac{7}{32}''$,	39p
Cat. No. 7134P $4\frac{1}{2}'' \times 2\frac{1}{2}'' \times 1''$,	46p
Cat. No. 6908P $4\frac{1}{2}'' \times 3\frac{1}{2}'' \times 2''$,	65p
Cat. No. 6827P $7\frac{1}{2}'' \times 4\frac{1}{2}'' \times 2''$,	£1.04
Cat. No. 6357P $7\frac{1}{2}'' \times 4\frac{1}{2}'' \times 3''$,	£1.13

Sizes shown are approx. internal dia.

ALI. MINI BOXES. With fitted lid. Post 5p per box.

$3'' \times 2'' \times 1''$, 33p	$5\frac{1}{2}'' \times 4'' \times 1\frac{1}{2}''$, 43p
$4'' \times 2\frac{1}{2}'' \times 1\frac{1}{2}''$, 38p	$4\frac{1}{2}'' \times 2\frac{1}{2}'' \times 2\frac{1}{2}''$, 38p
$4'' \times 4'' \times 1\frac{1}{2}''$, 38p	$5'' \times 2\frac{1}{2}'' \times 1\frac{1}{2}''$, 38p

FINNED ALUMINIUM HEAT SINKS. $5'' \times 2''$ ready drilled for TO3, 25p. $5'' \times 4''$ undrilled, 37p. $5'' \times 8''$, undrilled, 65p, post 10p.

POLYPROPYLENE ROPE. 500 lb. Strain. 100 yd. reel, £1, post 15p. (This item is now in stock).

CONSTANT VOLTAGE TRANSFORMER. Brand new. Advance. 60 watts 230v., £7, carr. £1.

DENCO COILS. Most ranges in stock, 40p ea., post paid.

CONTROL UNIT, TYPE 384. This unit contains : $3\frac{1}{2}''$ desyn indicator. 5 mA right hand zero meter $1\frac{1}{2}''$ dia. 6 var. res. with gear drive on 2.2 DP push buttons. 2-1 pole 12 way. 1-8 pole 5 way, 2 bank switches. 3-62, 2-42 ohm 5W res. Excellent value, 87p, post 27p.

IF STRIP. Ex R3673 Rx. 7.5 MHz with circuit. Less valves. 8 B7G PTFE holders. Sealed relay twin 500 ohm coil. 12 pin plug and socket, 50p, post 20p.

CONVERTER 20 to 90 MHz. 7.5 MHz IF. Ex 3673 Rx. 2/EF91's. 1-616 Osc., £1.25, post 20p. Some less valves, 75p, post 20p. Supplied with circuit.

Business Hours : Tuesday-Friday, 9.30 a.m. to 6.00 p.m.

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COMPONENTS

FOR

FREQUENCY COUNTERS & CLOCKS

8 DIGIT READOUT BOARD ASSEMBLY, £4.50, post 10p. Printed to use ZM1020 1" dia. end readout tubes. Front board takes holders for ZM1020s and 74141N Nixie drivers. Back board takes 7490 and 7475 Quad latch. Boards mount back to back to make an ideal assembly for frequency counter, etc. Board size : $10'' \times 2\frac{1}{2}''$. Front or back board available, £2.25 ea.

READOUT BOARD. 4 Digit, uses GNP7 wire ended, side viewing tubes. 7490 dividers, 7475 latch and 74141N Nixie driver. Printed for reset 0, can be wired to reset 9. Size : $4\frac{1}{2}'' \times 3''$. £1.50, post 5p.

GNP7. Wire ended side viewing. A7001 Wire-ended side viewing, £1.50 ea. Post Paid.

TIME BASE BOARD. Gives all pulses needed to control readout for counter. Uses 7400 Osc. 1 MHz. 6 off 7490 Divider chain to 1 cycle. 7474 clocked dual D, 7413 Schmitt trigger. 7400 pulse outputs. 2N3708 latch output. Size : $4\frac{3}{8}'' \times 2\frac{1}{2}''$. Use BC107 to drive 8 latches, £1.50, post 5p.

PRINTED BOARD FOR 72710N op amp. Counter front end. $2\frac{1}{2}'' \times 1\frac{1}{2}''$, 45p, post paid.

PRINTED CIRCUIT HOLDERS FOR ZM1020, 28p each, post 5p. 8 way ribbon cable for connecting boards, 20p yd., post 5p. yd. (8 x 4" sections required for linking boards.)

READOUT TUBES. ZM1020 1" dia. end viewing, £1.50 each with holder, 4 for £5, post paid. Supplied with Chassis or printed circuit holders.

DIGITAL CLOCK BOARD. 4 digit 12 hour. Uses 7 off SN7490's. 1-SN7413, 3-SN74141, 1-C407. Printed to use A7001 midget side viewing tubes, £1.50, post 5p. $4\frac{1}{2}''$ square.

A7001 TUBES. Full set of parts for 12 hour clock, £20, post paid.

NEW TEXAS I.C.'s. 7400, 22p; 7413, 40p; 7490, 86p; 7474, 45p; 74141, £1.12; 7475, 55p; 72710, 46p; 72741, 75p. Post 5p each.

ALL BOARDS ARE HIGH QUALITY PRINT ON FIBRE GLASS. HOLDERS FOR I.C.'s. Low profile 14 or 16 pin, 15p each, postage 5p each and including up to 5 off.

WE WELCOME ALL ENQUIRIES HOWEVER SMALL
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YOUR MIDLAND STOCKISTS

Stabilised P.S.U. 240v. A.C. input, 3-6-7.5-9v. D.C. output 4A., £3.75, 16p Carr.
Packs of connecting wire, 5 x 5 yds., flexible or solid, 20p, 10p Carr.
Packs of resistors, assorted values, 75p, 16p Carr.
Packs of capacitors, assorted values, 75p, 16p Carr.
Recording tape by well known manufacturer, (not boxed), 5in. STD, 38p, 16p Carr.; 5in. LP and 5½in. STD, 45p, 16p Carr.; 5½in. LP and 7in. STD, 60p, 16p Carr.; 7in. LP, 80p, 16p Carr.
CI134 valves (equiv. to QQVO 3-20A.), £5.00, 16p Carr.
Ferric chloride liquid, 500 ML, 52p, 16p Carr.
Super servisol switch cleaner aerosol, 40p, 16p Carr.
Invertor transformer with circuit, 12v. D.C. to 230v. A.C. 40w. approx. 50 Hz, £3.25 16p Carr.
Cassette tapes by Scotch, Philips, EMI, BASF, Agfa, C60, 52p, 8p Carr.; C90, 74p, 8p Carr.; CI20, £1.09, 8p Carr.
Finiguns Hammerite paint, 250 ML, 40p, 16p Carr.; 500 ML, 80p, 16p Carr.; ½ gal., £2.45, Carr. at cost; 1 gal., £3.00, carr. at cost. Colours: black, silver, red, deep green, deep blue, blue, bronze, green.
WE STOCK A COMPREHENSIVE RANGE OF R.S. COMPONENTS, J. BEAM AERIALS AND FITTINGS

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FT101 Transceiver 160-10M. £255.00
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PRICES SUBJECT TO CURRENCY REVALUATION

TRIO
9R-59 DS receiver 5-30 MHz £49.50
JR310 receiver, 80-10M £75.00
SP5D speaker £4.50

PRICES SUBJECT TO CURRENCY REVALUATION

KW
2000E transceiver, 160-10M £265.00 with A.C. P.S.U.
202 receiver, 160-10M £140.00 speaker for above £8.00
204 transmitter, 160-10M £160.00

EDDYSTONE
CI10 Mk. II receiver, 5-30 MHz £86.00

TEST METERS

			Carr.
TMK	TP10S	2K/V	£6.77, 21p
	TP55	20K/V	£8.91, 21p
	500	30K/V	£13.00, 21p
	700B	50K/V	£29.96, 25p
Sanwa	P2B	2K/V	£5.77, 21p
	JPSD	2K/V	£6.93, 21p
	U50DX	20K/V	£9.90, 21p
	A303TRD	20K/V	£13.00, 21p
AVO	380CE	33-3K/V	£18.90, 21p
	Mk. IV	20K/V	£45.00, 25p
	Reace	T-1K	£2.40, 16p
Brazennose	200H	20K/V	£4.80, 21p

TEST EQUIPMENT

Osker power meter		
SWR 200 52/75 Ω	£18.50, 25p	
Tech TE-15 GDO 44 280 MHz	£13.50, 25p	
KW 107 ATU/SWR meter	£46.00, 29p	
KW 101 SWR meter	£8.25, 25p	
KW 103 SWR/power meter	£12.50, 25p	
Raymart Bandchecker	£5.25, 25p	

AERIALS

Bantey fibreglass 2M ½ wave	£4.35	Carriage
Halsol 160M whip	£7.40	at cost
G whip 160M Ranger	£7.50	approx.
G whip 160/80M	£9.00	£1.00

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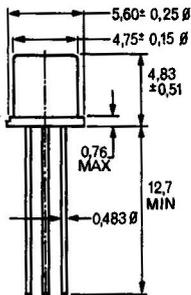


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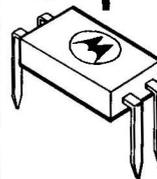
device of the month ZN414



The Ferranti ZN414 is a complete a.m. radio circuit which operates from 1.1 to 1.8 volts and requires only battery, earphones and antenna plus a tuning capacitor and two decoupling capacitors. The ZN414 features: medium and long waveband, good stability on assembly, no setting up of IF coils, plus much more.

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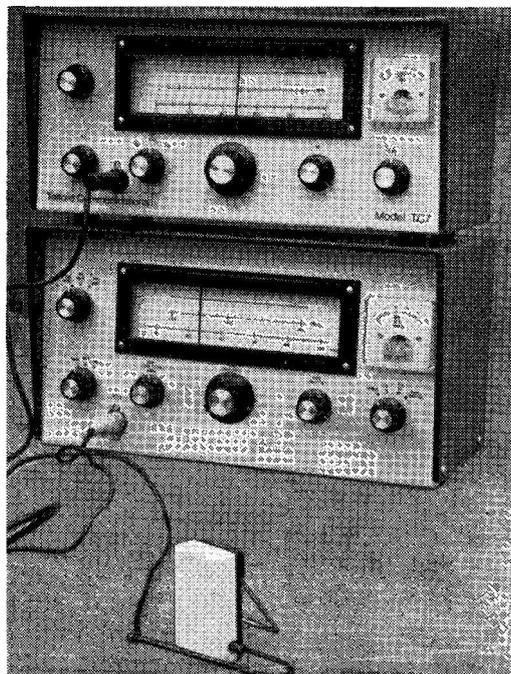


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- * Reduces Component Count in Portable Radios by Two Transformers and Two Transistors
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motorola ¼ watt audio amplifier **50p**
MFC4000

TELFORD COMMUNICATIONS



TC7 Tunable I.F.
AM/FM/CW/SSB. Flywheel drive. Any 2 MHz coverage to order in the range 20 to 30 MHz. Mains or 12 volt negative earth operation. Spare capacity on mains operation to power converters or QRP Tx's etc. 'S' Meter. Noise Limiter. Dual gate mosfets in R.F. and Mixer. 1.6 MHz 2nd. I.F. Built in monitor loudspeaker. Ext. L.S./Phones jack on front panel. Case size 12" x 5½" x 6½". Visor front, finished in attractive dark grey hammer stove enamel, with cream front panel, black dial escutcheon and knobs. Weight 5½ lbs. PLEASE STATE CLEARLY YOUR REQUIRED I.F. WHEN ORDERING.
Price: Including 'Securicor' delivery £43.00.
By personal collection from our works, £40.00.

TC9 2 Metre Transmitter
AM on crystal control, AM or FM on VFO control. One crystal at specified frequency included. All solid state. 10 Watts RF output. Fully metered. Mains operated, stabilised PSU. Aerial changeover and control/muting relays, AM/FM, modulator, Flywheel driven VFO, all included. Case size 12" x 7" x 6½", with visor front and finish to match TC7. Weight 1½ lbs. Press to talk microphone supplied. D.C. operation feasible. PLEASE STATE CLEARLY YOUR REQUIRED XTAL FREQUENCY WHEN ORDERING.
Price. Including 'Securicor' delivery £73.00.
By personal collection from our works £70.00.

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Cascode neutralised R.F. stage using fets. Dual gate mixer. Circuitry and performance equivalent to similar types costing 50% more. Any I.F. to order in the range 2 to 30 MHz. Three I.F. outputs via emitter followers for contest use etc. to feed up to three Tunable I.F.'s. Typical conversion gain 20 dB. Typical noise figure 2.8 dB. 9 to 15 volt D.C. operation, isolated earth. Supplied in plain aluminium box, 4½" x 2½" x 1½" with Belling Lee R.F. and I.F. sockets, and power sockets. Crystal included. PLEASE STATE CLEARLY YOUR REQUIRED I.F. WHEN ORDERING.
Price £12.00.

TC7 Bandsearcher Module
Electronic tuning unit for use with our TC7 Tunable I.F. Enables the whole 2 MHz band to be automatically searched for calling stations once every minute. Supplied in plain aluminium box, with flying leads for connection to TC7 ancillary socket. Switch provided for selection of manual or automatic tuning.
Price £4.00.

2 Metre Aerial Filter
Insertion loss not greater than 1 dB. Attenuation at plus and minus 12 MHz, typically 25 dB. Power handling capability 10 watts. Ideal for use with TC9 Tx. 75 ohm matching impedance. Belling Lee input and output sockets. Supplied in diecast box, 4½ x 2½ x 1½.
Price £5.00.

Further details of all units and current delivery positions on request. (S.A.E. please.) Terms C.W.O or 10% deposit with balance Pro-forma invoice. H.P. terms available.

VAT at Standard rate will be added to all prices from April 1st.

TELFORD COMMUNICATIONS
78B HIGH STREET, BRIDGNORTH,
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(G8ARS)

(Photo by G8BJ)

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"G's" only 1973	70p

MAPS

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Mercator Projection — Much DX Information — in colour. Second Edition 65p

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In colour with Country/Prefix Supplement Revised to January 1972 85p

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State boundaries and prefixes, size 24" by 30", paper 60p

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Standard Log (New Glossy Cover)	55p
Receiving Station Log	45p

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Single, 12" L.P. Advanced with book	£2.75
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NEW—HEATHKIT 2-METRE TRANSCEIVER HW-202



OPTIONAL EXTRAS:
Tone Burst Encoder
Regulated A.C. Power Supplies

Coming in May

Features -

All solid-state design
Can be completely aligned without instruments

Multi-channel capability—
independent pushbutton selection of 6 transmit and 6 receive crystals

10-Watts Minimum Output—
designed to operate into even an infinite VSWR without failure

Optional Tone Burst Encoder—
mounts inside, gives front-panel selection of four presettable tones

Available with a full-line of accessories—
for both mobile and fixed operation

Includes push-to-talk mike—
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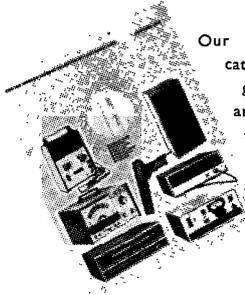
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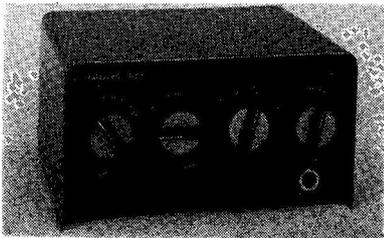
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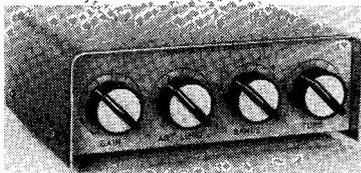
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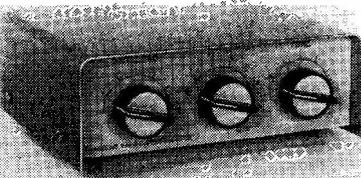
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APRIL, 1973

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E D I T O R I A L

Mobile

Ever since the Post Office brought mobile operation within the orbit of Amateur Radio in this country, there has been a steady increase in the number of cars fitted for transmission and reception on our bands while actually on the move. There are now about 3,700 U.K. amateurs licensed mobile, covering between them all amateur bands.

There are many ways in which an installation can be designed for mobile working, and many different types of vehicle in which it can be fitted—from the smoothly-engineered job built into a high-priced sports saloon or smart estate car, to the bread-board lash-up accommodated on the back seat of a grunting old buggy. Whatever the vehicle, there are numerous practical problems to be solved: The band to use, type of receiver and transmitter, power supply, suppression, change-over, aerial arrangement and full control in safety under traffic conditions on the road—as well as whether the installation is to be built in as a permanent fixture, or made removable.

Amateur mobile operation is still mainly on our 160 and 2 metre bands (which in themselves pose quite different problems of major design) with a certain amount of /M activity on several of the HF channels.

Many of these stations are intended to be /PM, in the sense that they can be operated either strictly /M while actually on the move, or /P at a fixed site for field-day and similar activities, in the latter case with an aerial system beyond what can be carried on a moving car. Whatever the intention, it would seem that there should be a clear differentiation between /P and /M working, under such conditions. A station signing “mobile” should, surely, be on a public road with the wheels turning and, if temporarily stationary, should in any case be working into the mobile aerial system as normally carried on the car when on the move. Under all other conditions—using its fitted gear, but with the car parked and a specially erected aerial—the station should sign /P. Thus, it can be seen that by making the aerial system the deciding factor, a fair definition of “mobile operation” can be obtained.

* * * *

And in this context, remember the “Solo Mobile Tests” proposed for April 8, May 20, June 10 and July 8—see p.34, March issue for details. Do send in a report!

*Austin Forsyth
G6FO*

COMMUNICATION and DX NEWS

E. P. Essery, G3KFE

EX-R.A.F. types may have wondered, after the War, where all the gremlins which used to plague them went to; to which G3KFE can suggest that possibly the King of the Gremlins—or at least a Crown Prince—is at the moment of writing lurking in the inside of his previously-trusty transmitter. What is more, just as soon as any attempt is made to drag forth the oscilloscope or the test-meter he goes into hiding, from which he can only be dislodged by putting away the test-gear. One would not mind the incoming signal going down by a couple of S-points, nor even the outgoing one doing the same at inconvenient moments; but when all the spare energy thus released is turned to working local TV sets, the joke has gone too far. Has anyone a *reliable* anti-gremlin specific?

However, one should not be deterred from taking a look at the

bands, even if one fears to switch the transmitter on! Looking at things generally, while we are out of the grip of Winter and all that it means in the Amateur Radio sense, it is, to sensitive ears, possible to notice that the bands are opening just a bit earlier, and closing a little later, presaging the full blossoming of Spring conditions, and the DX they bring.

Farewell

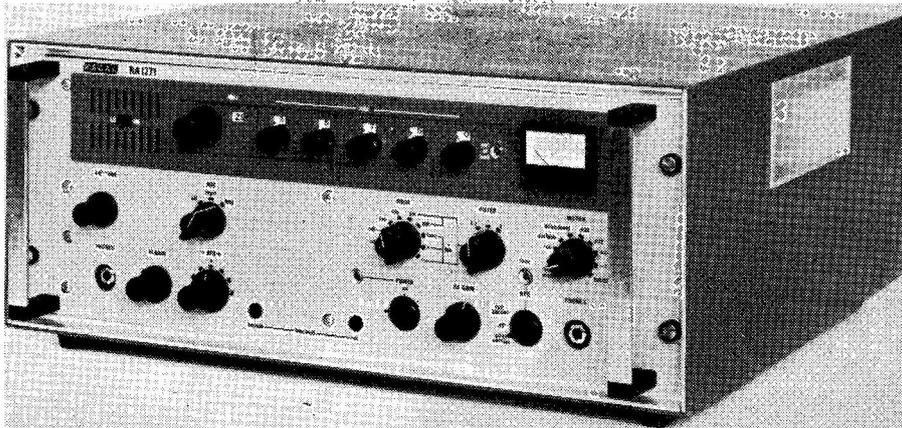
Before entering into our monthly look at the bands, it falls to your scribe's sad lot to record the death, on the evening of February 21, of Jack Drudge-Coates, G2DC, after a stroke by which he lost both the use of his keying-hand and his voice. He seemed to lose any wish to go on. Ever since the present writer took over the task of writing CDXN each month, Jack regularly supported us with long and informative letters detailing not only the

DX available on the bands but also his assessment of conditions. Jack was a top-flight operator by world standards, mainly on CW, although latterly he had taken to using SSB on occasion. While Amateur Radio as a whole will sadly miss the G2DC signal, from Top Band to Ten, your conductor's sense of personal loss of a good friend and mentor goes more deeply.

For the record, he was 78 years of age, a Lt. Col. (retired) of Royal Signals and during his long Service career pre-War had himself originated much DX, with exotic callsigns, from such countries as India and the Middle East, where at that time Amateur Radio was quite unknown. *R.I.P.*

Twenty

Let G3UZ (Goring-by-Sea) have the first say; while George's poor old heart bleeds at the sight of his list of gotaways, he has the very



A new commercial all-band receiver for professional use—the RA.1771, manufactured by Racal Communications, Ltd., is a solid-state design covering 15 kHz to 30 MHz in one-megacycle steps, with a decade synthesiser giving 10 Hz readings within each range—the frequency reading as set up in the picture is 29,357.50 kHz. Tuning accuracy is within 5 cycles of the wanted frequency. Modes can be AM/CW/MCW/SSB (either side) or DSB/ISB, the BFO for CW reception giving 3 kHz about tune. High stability is achieved by a frequency synthesiser referred to a built-in frequency standard. Various modules are available at option to provide for specialised user requirements, e.g., FSK for RTTY working, ISB or AFC operation. The muting circuitry is such that the RA.1771 will withstand "splash" input signals of up to 30v. RF at the frequency on tune.

relevant comment to make, that if there was no QSB or QRM to make the going suitably difficult, much of the interest of the chase would evaporate. That the interest did *not* disappear is shown by a CW list including UA9AAG, UA9DW, UA9WAP, UA9SI, UK9MAA, UA9CAZ, UK9HAB, UA9NX, UW9TW, UA9CCC, UI8LA, UH8DR, UKEAE, UL7GAP, UL7GAR, UA0TD, VOIKE, VO1AW, XW8BP, 9H1BT, VQ9M, 9H1AQ, OY1M, 4X4JU, HS3AHL, VE1AFY, FW3SW, PY7BOS, OX3JW, VE1PZ and KV4AA.

After a long silence and a longer personal absence from view, it is nice to see the handwriting of G3SVK (London, E.17) appearing again. Fred's silence is explained by his becoming wed and, later, the arrival of a daughter, not to mention a move of QTH. Like all good DX'ers, Fred was ever a believer in preparation before operation, and so last summer time was spent in laying down plenty of radials and earth spikes in the garden, for the 111 feet of Marconi aerial in use for Top Band, not to mention giving the old 8KW trap dipole something against which to reference itself. As for the machinery in the shack, it is still the same KW-2000A which has given out thousands of contacts from the rarer parts of the British Isles. All that remains, he says, is for him to get off Top Band and *work* someone!

Coming back to the Editor's comments last time on Slow-Scan TV, we have a spirited defence by G4BSU, whose favourite mode this is; he compares SS/TV today with SSB in the 1950's, and gives a run-down on the costs of his (home-brew) SS/TV gear. For those who have been interested by the correspondence, perhaps the most important point G4BSU makes is that 14,230 kHz is probably the favourite frequency for Slow-Scan, to which we could add 21,340 kHz. If, having recorded the noises on either of those frequencies, you want to try your hand at resolving it, a worth-while purchase would be a copy of the "Slow-Scan Television" booklet put out by B.A.T.C., obtainable at 53p post free from G6STO/T, *QTH*.

They all seem to be tackling the specialist modes these days! G3DCS



Jack Cresswell, G4AMF, of 4 Hall Street, Hoyland, nr. Barnsley, Yorkshire, passed his R.A.E. in 1971. He is keen on Army Cadet Force activities and operates on the national A.C.F. network. The rig as shown here consists of K.W. gear, with an ATU and a Heathkit signal generator. He also has a home-built digital frequency counter and Z-match for Top Band, where he can often be found.

(Ipswich) returns to the fray, Enver having for some time been engaged in mortal combat with a Teleprinter and TU on Twenty. Somewhat wryly, he remarks that he has progressed from printing "The quick brown fox jumps over the lazy dog" to occasionally receiving "Now is the time to come to the aid of the party!" *Real* progress, that. On a more serious note, Enver has successfully copied RTTY signals from W, UB5SR and ZS3B, although the fact that his machine is set for 50 bauds and some stations run a bit slower has caused a few complications. On a different tack, G3DCS has realised the possibilities in an RTTY TU for QRM-free CW reception using the filters therein—which is a thought that offers interesting possibilities, used in conjunction with a tone oscillator. By way of normal mode contacts, the recent contest provided a string of W's on Fifteen and Twenty, but, alas, no new countries.

G3VLX (Chislehurst) has had a change of rig, the new box being a K.W. Atlanta, whose extra bit of power seems to help in raising the stations. One notes SSB QSO's with CR6TP, ZS6AUL, PY2DVH, ZP5CF, VU2EJ, 4S7SW and 7X2BK on Twenty, the ZP being an all-time new country on any band.

For W6AM (Palos Verdes Peninsula) there were SSB contacts with ZS2AA, 1S1A (Spratley), ZD9DC (Gough), YK1AA, MP4TBM, SV0WK, VK0WW, XT2AF, XT2AF and VQ9M. CW was not neglected, with QSO's registered with 1S1A, and DM2AWO/A in East Berlin.

For G3ZPF (Dudley) it was a lean month with examinations and the preparations therefor taking almost all his time, saving a part of a couple of weekends—however, David reckons that when he has passed them he'll be laughing all the way to the bank! The short spell on Twenty yielded SSB contacts with ZC4DS, 9C9MJ, SU1MR, A4FA, YS1FQM, CN8CG, IC8FMM, HI8XIK, IV5ZWY, FO8AU (who qualified as the catch of the month) 4W1BC, W1, W2, W4, W8 and VE8CK.

GW4BLE (Newport, Mon.) has now had the go-ahead from the authorities for normal working (*i.e.*, he is TVI clear) but is still playing things with some degree of caution. At the time of his letter, only one day of operation had been possible, but what the offering lacked in quantity was made up for in quality, four of the following being new ones for him—FG7XL, M1C, VQ9HCS, VQ9R, 4X25UF, 9H1BX and 9V1RL, all of them being taken

on SSB.

The trouble, says Ted, G2HKU (Sheppey), is that he likes working non-DX stuff too much. Add to that the fact that the grass is already too long, the weeds are "sharpening their teeth," the fish are making noises, and the male blackbirds in the garden are courting—so the gardening will soon reduce his DX'ing time still further! It was not quite as bad as that, really, with SSB contacts to IT9GCQ, SV0WW, ZL1AWI, ZL1VN, ZL3RS and ZL3SE.

There is quite a story to account for the absence of G3DNF (Leeds) from these pages for such a long time. Gordon, it seems, managed to

BRIEF DX DATA

A51PN	Pradhan is QRV on 14295 kHz, SSB around noon, with FT-101, FT-2100, and dipole.
VE8DJ	Is in Zone 1, Dave McKerrow, asking for QSL's by way of VE3DAM.
VR1AA	Is going on leave, and will by publication date be QRT, but expects to return in September for another 2-year tour.
VQ9HCS	Also QRT, but says he will be operating from Astove and Farquhar after he returns.
YA0CDRC	Box 279, Kabul. Favoured spots seem to be 21316 kHz or near around 1030-1230z, and 14285 kHz at about 1300z.
ZS2MI	Leo has been heard on 21316 kHz at 1410z, working to a list by ZS6LW, who is his QSL manager. Also 7084 kHz at 2100z.
1S1A	HS3DR and the boys made 4432 QSO's from Stratley; credit goes to the S.E. Asia stations, VS6DR in particular, who kept 24-hour watch on 7085 and 14342 kHz, during the journey both ways, in case of any emergency.
7P8	7P8AC is understood to be going QRT, but expects to be QRV in about a month from 3D6-land. QSL via W2GLU.

Reporting the HF Bands

scrape up the cards for his DXCC, and duly got the sheepskin. He then gave up DX for the while in favour of trying to learn the knack of transistor RF amplifier design and construction to produce *docile* transmitters—he has now emerged from his hibernation with 1½ watts of transistor RF on Fifteen, after a first essay with ten semi-conductorised watts on Top Band. Having proved his 21 MHz box to work on the long-wire, Gordon then pulled the wire down in favour of a two-element collinear, end-fed, aimed on the States. He is now hunting QRP DX on the basis of "milliwatts per mile" as a figure of merit, and promises more reports in due course. Even on the longwire, contacts have been made with W1QMY, UK9CAE, and PY7AES with good reports.

This Heathkit QRP transceiver, the HW-7, seems to be causing quite a wave of QRP activity, if the reports coming in from G2NJ of Peterborough are anything to go by. Nick mentions G3KPT as having made two QSO's so far with U.S.A. on Twenty running all of 2.5 watts input, and ON4TA with his 700 milliwatts as having worked UW1YY, UK1CUA and UK3DAA.

A late flash from G3VLX shows that Deryck has again kept up the pressure, with more SSB booked in, to FG7TG, HKCCW, EA8HH, CO8QS, PZ1BC, YV5AVX.

Fifteen Metres

A band which its supporters always claim to be far better than Twenty when the two are equally lively, due to the lesser amount of QRM. Maybe they have a point.

G2YL (Tadworth) recently returned from her trip to S.E. Asia, where she met 9M2DQ and his wife, and had a very pleasant few hours there, working G8LY, G5AFA, and G6RC on Fifteen from James's shack, and also meeting 9M2FR.

G3ZPF, as already mentioned, found time short while preparing for his exams, but he did put in a little effort on Fifteen, to work

SSB with FL8DS, GD3FXN, VP2VAM, VK6HE, HR3AC, 3E1KC, EP2SP, W1, W2, W3 and W4.

W6AM doesn't make a meal of 21 MHz, preferring 20m. as his favourite (as all leading DX'ers do) but Don doesn't miss much of what goes on, and he raised W1YRC (QSL Manager for the 1S1A expedition), JD1AHC in Marcus on both CW and Phone, and 1S1A on Spratley.

Not content with registering a new country on Twenty, G3VLX did the same trick again on Fifteen, where we note TI2KF, ZS6HY, PY1DAB and ZE7JC, the latter being the new one. In addition, a later report mentions HC2TV, LU3DJS, LU1DAB, ZP3CA, YV5BPH and WA0GEV, the last two being a struggle in Spanish with the aid of a *Ham's Interpreter!*

Ten Metres

As has been indicated in these pages before, Ten has not by any reckoning disappeared from the DX scene, although it is true to say that the long-distance openings are more North-South than in any lateral directions. G3VLX does not neglect the precaution of at least having a look to see if anything is buzzing, and his new K.W. Atlanta rang the bell with 9J2WR and CR7AF.

Ten is not a usual band to hear from G2HKU about, but it sounds as though Ted must have chosen the right moment to have a look at it; the peep resulted in contacts with EA8URE, ZC4BI and 9J2XZ, all SSB.

During the course of some TVI tests with the Post Office people, GW4BLE noticed the band was open to South America, around 1830z, and on the following day TU2DF was worked in the Ivory Coast, at RS-54 both ways.

About Eighty

To cope with the QRM, particularly at the DX end of the band, needs fortitude of no mean order,

particularly when a certain duck is going through the motions of dying very audibly all over the channel, complete with chorus from the whistler's mother-in-law. However, life is more peaceful down at the CW end, and here what little time on the air was available to G3RFG (Henlow) was spent, giving CW contacts with CO2JY, K2PXX, K2SIG, W1FTX, W1GFT, W1YWV, WA2LGX, WA2LQZ, W4WRY, WB4HQE, W9WKU/4 and W9BR, just to prove Stan had not lost the knack.

A favoured frequency with the W's for 80m. DX'ing is just above our upper limit—say 3802-3804 kHz. Here, W6AM prowled on occasion, and Don was rewarded by SSB QSO's with 1S1A, YJ8GH and KG6JBO, while the DX segment at the CW end served for contacts with VS2SAB and again 1S1A, who was therefore rung up on four bands, CW and Phone.

Eighty seems to have an attraction for G2HKU—at least, this month!—as Ted worked HK3LT, YV2OE, YV5BTS, K3GJD/P3, 9H1BX and 9H5C.

The regular early-morning stint on the band which has been the practice at GW4BLE did not turn out too well this month, and the only ones considered by Stephen to be worth noting were contacts with VE3BBM, ZL4KF, KP4DHD, PJ2CW, VP2MY, KZ5JF and W1-2-3, all around 3790 kHz between 0700 and 0800z.

Forty Metres

This seems to be a band on which no DX could possibly be worked—unless one is provoked into trying it seriously! Apart from a reasonable aerial (say, a ground-plane at roof-height with a fair take-off) the main requirement is undoubtedly an RF attenuator for the receiver, or a near-perfect first mixer stage to hold the unwanted noise generated by all the megawatt-commercials around and in the band to a low level at the frequency you actually want. Do that, and the DX is there for the calling, both CW and SSB, but for the average receiver used in the ordinary way, with full RF gain, they just get buried in the noise.

G3VLX had an early 40m. session one morning, and heard VK2ALK calling CQ. Deryck called him, and

to his surprise raised the VK. As if that were not enough in the way of surprises for one morning, at the end of the QSO, G3VLX in his turn was called by VK2AVA! Both the VK's had two-element beams up, but G3VLX runs a thin-wire inverted-Vee made up of 26-gauge wire strung up with terylene sewing thread. As the contact was surely long-path, the distance must run all of 14,000 miles.

By way of G2NJ, we hear that ON4TA has continued his QRP work on the band. When one considers the noisy state of it most of the time, it really is amazing just what he can do—Phone at RS-57 with G8PT on one watt, while 700 milliwatts of CW was enough to make solid contacts with GD3FBS and F9OV. Another enthusiast for QRP is G3GQE, who worked G2NJ on one watt of Phone for a solid 57 report.

Top Band

G3SVK has been, as mentioned elsewhere, less active of late for various reasons, but eventually the old bug bit deeply again, and his 111 feet of wire, of which 38 feet is vertical, was loaded up on Top Band. So far the score is G, GW, GM, GD, G1, EI, DL, OK, OE, HB9, W, KV4, VE, VO, and PA0. That leaves at least six European

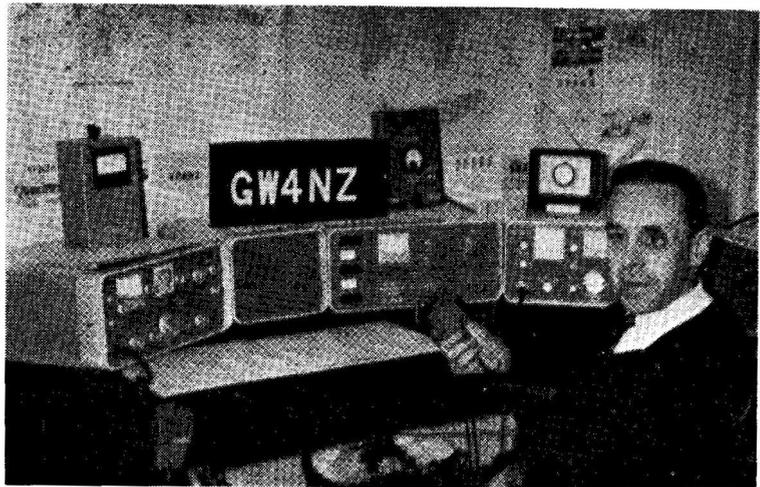
countries available to bring the score up to a round twenty countries. The reports from over the Pond have been quite fair, averaging around RST 569. In the intervals, there has been the more local pleasure of working the FOC members to be found on Top Band, to keep his hand in.

For your conductor, the event of the month was when 5Z4KL was heard on 1803, bobbling in the noise at 229, and apparently with no-one hearing him well enough to justify a call. However, a SWL report on the circumstance yielded a quick return QSL from André, which at least proves that despite what some people say, G3KFE's one remaining useful ear is not all made of cloth!

Tit-Bits

Last time, we mentioned that G3RFG was wondering who was the oldest active amateur. A reader (we can't read his signature!) says he has a letter from VE1LG, who, at the date of his letter back in 1969, said he was 94 and still operating; which would make him 98 now!

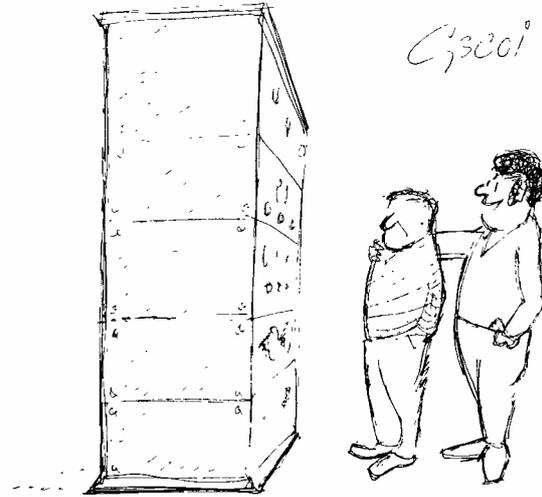
Jock Perrett writes to say that having been on leave from 5Z4-land, he is now ready for the "off" in Malawi, just so soon as the rig arrives—it is expected about the time this piece was being written up—when he will be signing 7Q7DW,



GW4NZ, Syd Roberts, licensed pre-War, runs K.W. equipment, with ancillaries, and is at 70 Cimla Road, Neath, Glam., South Wales—this is also his QSL card.

with an FT-101, first to a 5RV aerial, and then, when the bamboos are dried out, to a Quad. Oddly enough, another station is starting up in Malawi—ex-9J2KP has also opted for 7Q7 and has his KW-2000 there already, but at the moment of writing awaits clearance of the formalities for the issue of a ticket.

Possibly the most interesting of the competitive events to be noted this time is the **Bermuda Contest**, the Phone leg of which is April 21-22, 0001z Saturday to 0200z on the Sunday. Exchange RST plus your *county*, and you will get back from the VP9's RST plus a parish, the abbreviations for which are Dev, Ham, Pag, Pem, San, Smi, Sou, Stg and War (nine parishes in all). Each completed QSO counts 3 points, the multiplier being the number of parishes worked on each band. (Previous winners *ineligible* for two years for an award). Presentation of the top prizes at the Bermuda Club's annual banquet on October 18—transport and hotel accommodation for a week's stay at one of the Bermudan leading hotels will be provided by the Society! This event, with its astonishingly attractive prize (which must be worth some £100's) will demand some pretty hot operating—it has been won rather too easily in the past, with a small U.K. entry. Logs to be received not later than June 30, at the Radio Society of



“ . . . “ Yes, OM, it will load into anything—preferably a three ton truck . . . ”

Bermuda, PO Box 275, Hamilton, Bermuda.

Conclusion

That is that, for another month at least. If anyone wrote in to CDXN, and has not had a mention, it will be because of mail dislocation due to the rail chaos—the mail inwards was running very late, and to meet the deadline your conductor had to clear this early—a form of two-way squeeze on him! For next time, the deadline will be **April 10**,

latest addressed as always to: “CDXN,” SHORT WAVE MAGAZINE, BUCKINGHAM, MK18 1RQ.

Closing dates for the next few issues will be **May 8**, **June 12**, **July 10** and **August 14**—these are all Tuesdays, and are final dates to catch this feature. If you write from overseas, allow at least five days by airmail. If from the U.K., two days first-class posting. We cannot take in late reports.—*Editor*.



The new Redifon “Omega Navigator” receiver will give a ship positions accurate to within about one mile on ocean passages across the world. It is, of course, a satellite-referred device and is now installed in the new ship m.v. “Orbita” of the Pacific Steam Navigation Co., Ltd.

SIDEBAND TRANSVERTER FOR TWO METRES

SOME RELEVANT DETAIL
DRAWINGS —
SETTING-UP PROCEDURE

J. D. V. LUDLOW (GW3ZTH) and
C. J. DUNBAR (GW8EHK)

Part II

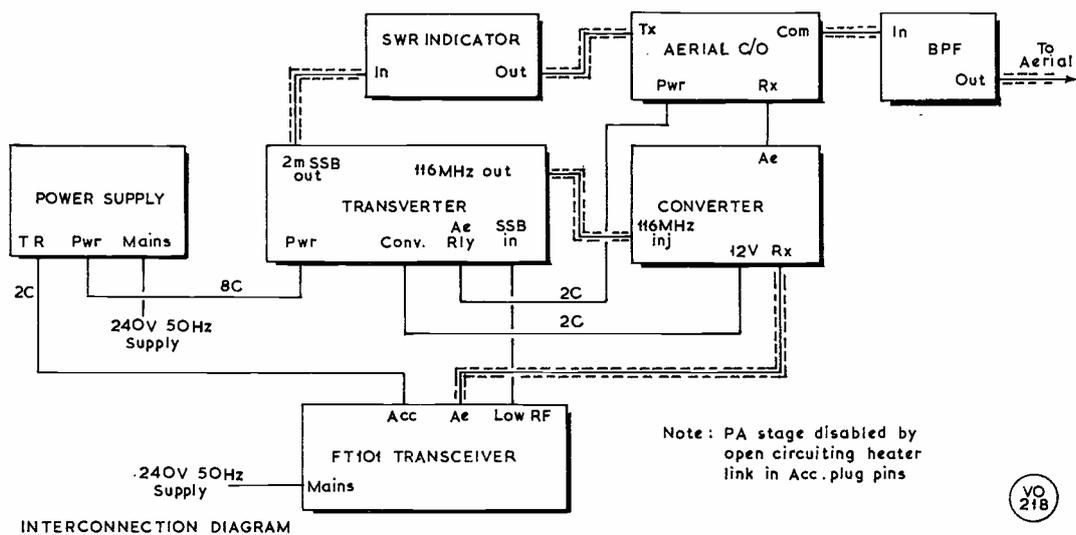
GOING on now from p.31, March: Remove the PA valve, close RL1 and check that the buffer amplifier anode current is within its ratings for the safe anode dissipation. Should all be well note the mixer anode current—this should be a nominal 24 mA. With Tc3 resonated, V5 anode current should rise to about 30 mA. Reduce this to around 28 mA by loosening the coupling between L6 and 7. Then insert some 28-30 MHz carrier from the SSB prime mover until the anode current rises by one or two milliamps. Resonate Tc4 for maximum output over 144-146 MHz—measured by means of an absorption wavemeter. At this point the 116 MHz component should be at a much lower level at the mixer anode. The alignment of the buffer amplifier is straightforward—adjust the coupling between L8 and L11 for maximum output. Should the buffer amplifier run into grid current reduce the coupling until the valve draws no grid current. With the buffer connected to a dummy load *via* a reflectometer adjust VC2 for maximum output—connecting it back into the PA grid circuitry when this has been com-

pleted. After ensuring that all supplies have been removed, insert the PA valve into its socket and attach the anode connectors—allow a minute or so for its filaments to reach their operating temperature and then establish the supplies momentarily, noting the standing anode current; with 600v. on the anodes this should not be more than 30 mA—set the PA bias pot. until this figure has been reached. With no 28 MHz injection rotate the PA tank circuit controls; there should be no sign of instability—the PA anode current should remain at its preset figure. Increase the standing anode current momentarily, by means of VR1, to say 100 mA and repeat the exercise; the PA stage should not show any signs of instability under any condition—should it do so this will have to be rectified before going on any further.

If all is well connect a dummy load to the aerial socket *via* a reflectometer and apply some 28 MHz carrier; adjust the buffer amplifier, PA grid circuit and PA tank circuit for maximum forward power as indicated on the reflectometer. Increase the PA HT to 800v. and the carrier level until the PA anode current reaches not more than 200 mA and re-check the tank tuning and loading; the optimum position for the link is slightly over-coupled past the point of maximum output. The output should fall to zero in sympathy with the reduction of the inserted 28 MHz carrier. Finally, connect the antenna to the transverter through the reflectometer and bandpass filter and repeat the loading instructions; switch to USB with the SSB prime mover; set to 29.41 MHz and it should be possible to raise someone locally to check out the signal for you.

Band-Pass Coupler (p.91)

In Fig. 4, the band-pass coupler between the PA and the driver is as shown, using either a *Denco* Maxi-Q DP5 blue-range coil or the home-wound version can be



INTERCONNECTION DIAGRAM

Interconnection diagram with FT-101 as prime mover.



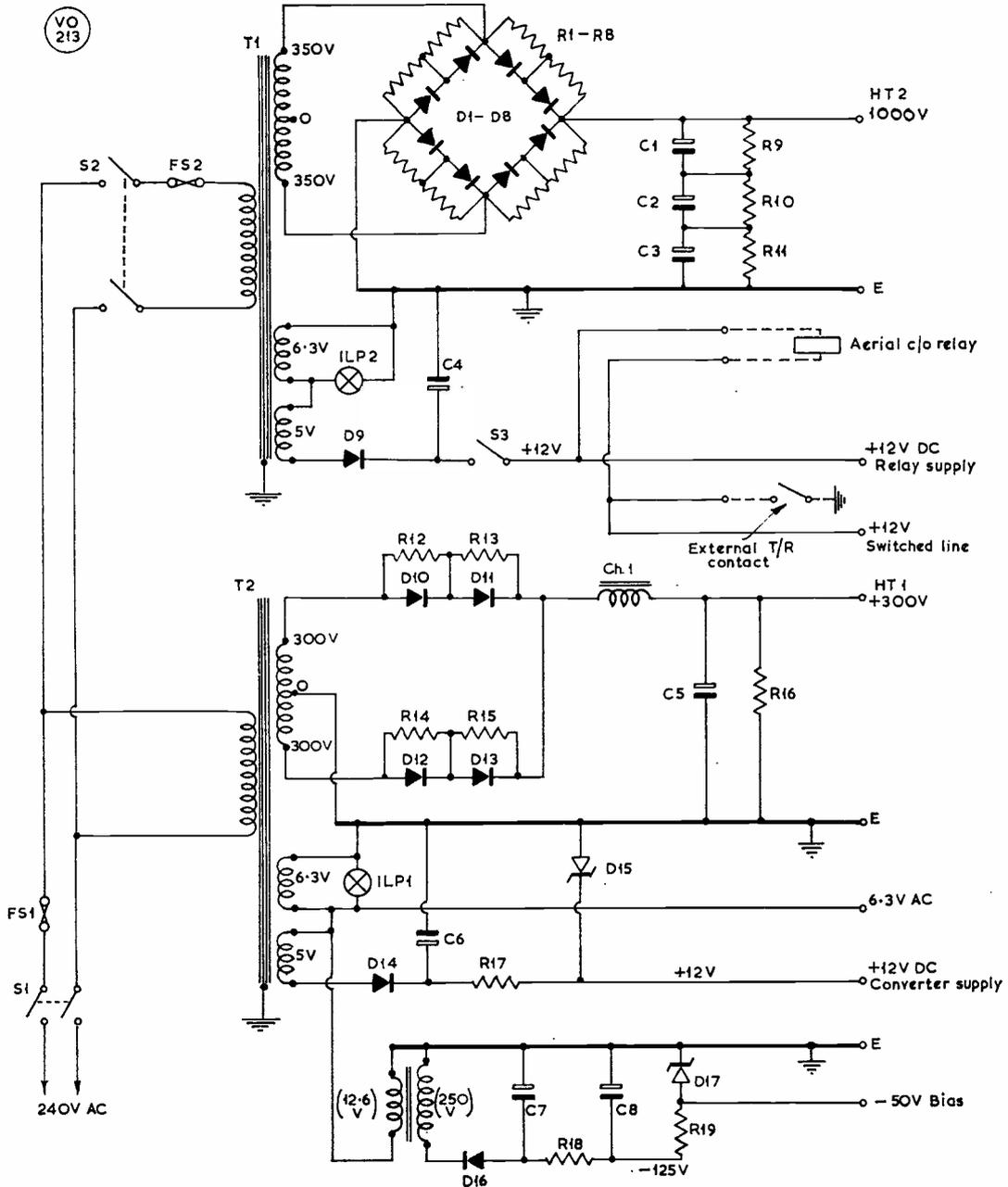
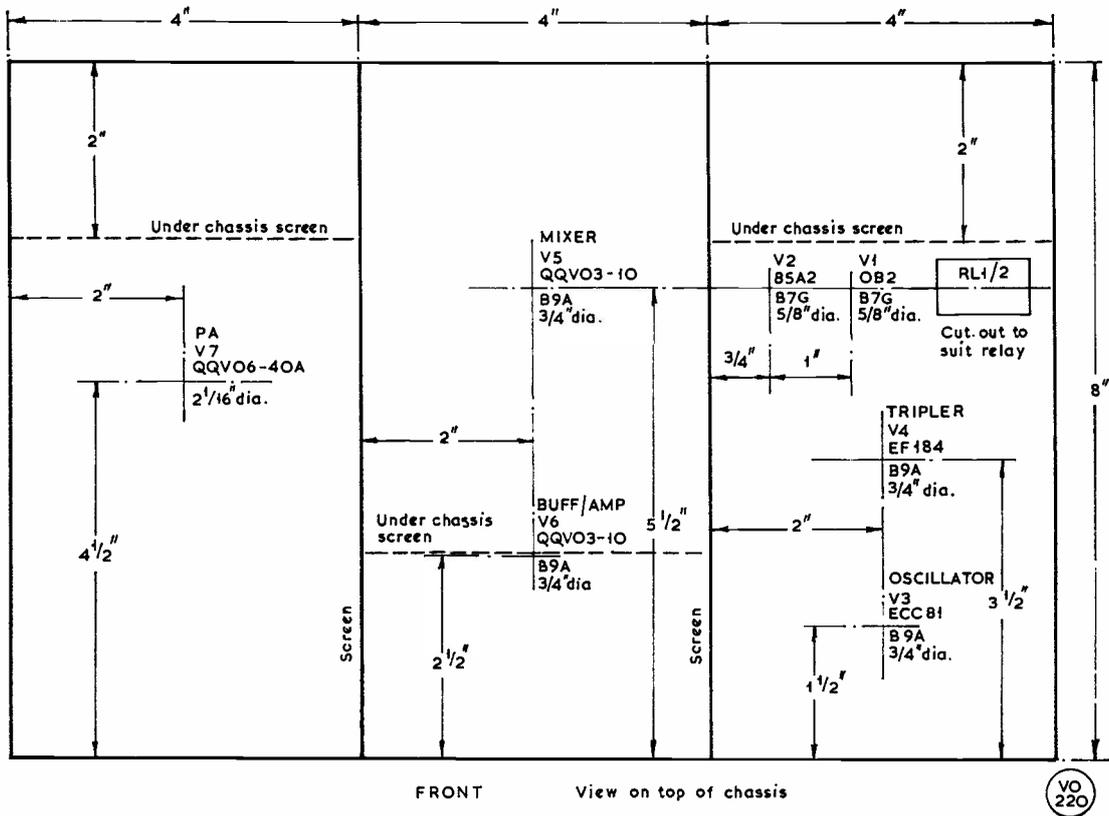


Fig. 2. Transverter Power Supply circuitry



Layout of Transverter, showing placement of major components on 12 x 8 x 2 1/2 inch chassis.

Table of Values

Fig. 2. Power Supply Circuitry

C1, C2 = 100 μF, 450v.	D9, D10, D11, D12, D13, D14,
C3, C5 = 500 μF, 25v.	D16 = BY100, 1N4006
C4, C6 = 32 μF, 350v.	D15 = 12v. 1w. zener
R1, R2, R3, R4, R5, R6, R7, R8, R12, R13, R14, R15 = 270,000 ohms, 1w.	D17 = 50v. 1w. zener
R9, R10, R16 = 150,000 ohms, 2w.	T1 = 350-0-350v. 150 mA, 6-3v. 1A, 5v. 1A.
R17 = For 12v. supply	T2 = 300-0-300v. 150 mA, 6-3v. 4A, 5v. 1A.
R18 = 270 ohms, 1w.	T3 = 12-6v. heater xformer
R19 = 680 ohms, 2w.	FS1 = 1-5 amp fuse
Ch1 = 10 Hy 150 mA choke	FS2 = 850 mA, anti-surge
D1, D2, D3, D4, D5, D6, D7, D8 = BY127, 1N4007, or similar 1,000v. p.i.v., 1 amp.	

Notes: All resistors are carbon. Transformers have standard primaries, or as required. T3 is reverse-connected. Condensers C7, C8, should have cans insulated. S1, S2 are DPST and S3 SPST, all toggle rated 250v. 3 amp. Indicator lamps are 6-3v. 300 mA.

used. This can consist of a primary of 6 1/2 turns of 22g. enam., spaced wire dia., on a 3/8 in. dust cored former; for the secondary, two turns of the same over-wound at the cold end of the primary. The coil is set-up by arrangement of the core.

Results and Observations

Every transmitter emits some spuri, even professionally designed and constructed commercial ones. The G.P.O. requirements lay down that not more than 2.5 μW may be emitted outside the pass band of the channel in use; this is better than 80 dB down on 25 watts so we should aim for 90 dB or better. To achieve this it is recommended that the xtal oscillator chain starts off with a VHF xtal such as 38-666 MHz or 116 MHz; avoid 29 MHz as the 5th harmonic comes up in the band; also avoid 58 MHz because the 2nd and 3rd harmonics would generate two inband mixing products from the 10-metre drive signal. Further, use a 28-30 MHz band-pass coupler between the SSB prime mover and the transverter input socket. Keep all interconnecting leads short. Recently, the '3ZTH signal was copied locally on 10 metres due to a 4ft. length of coax from the FT-101 to the transverter. At least five bandpass coupled circuits between the mixer and antenna should be employed and

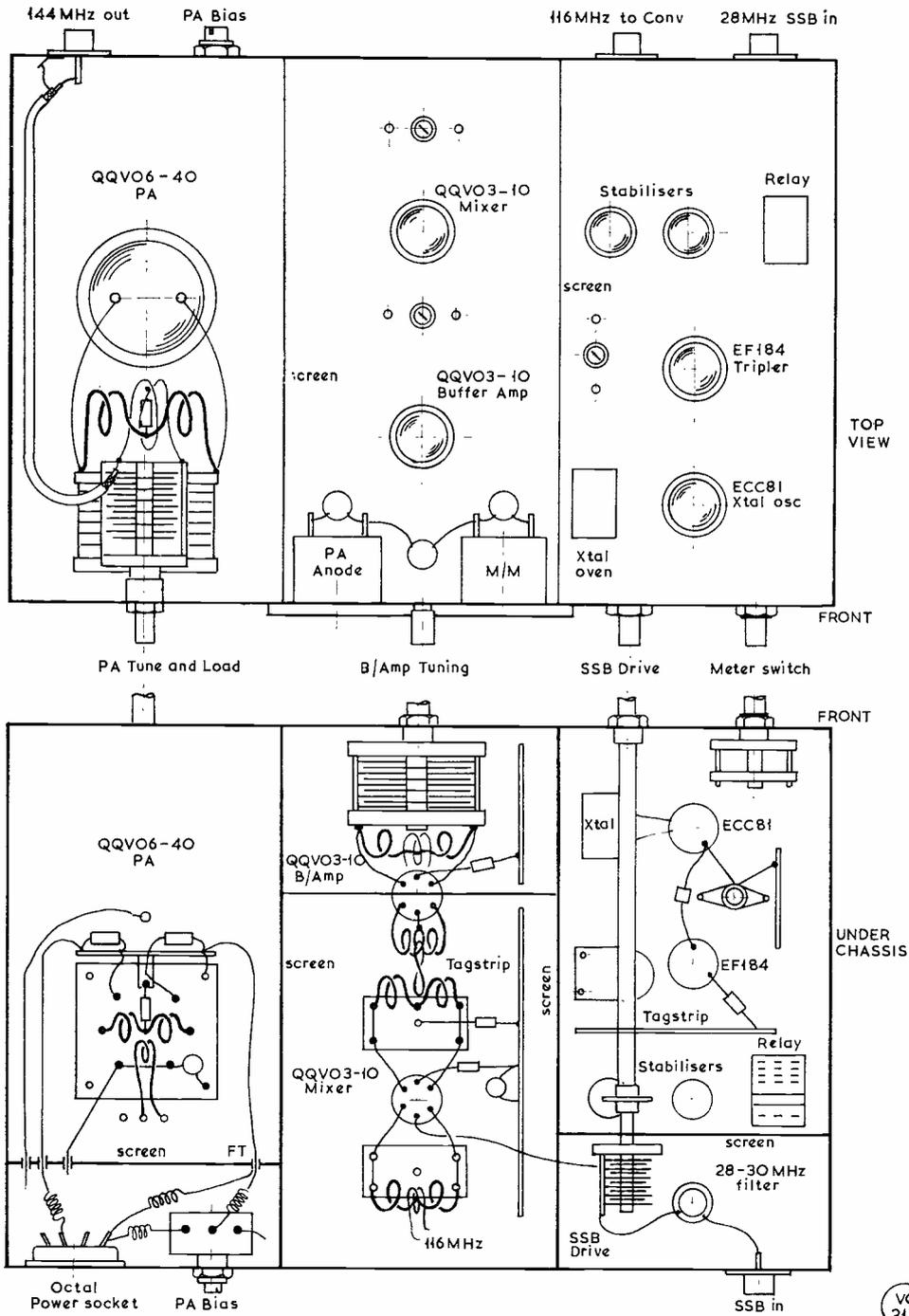


Fig. 3

VO 216

Construction underside of Transverter chassis

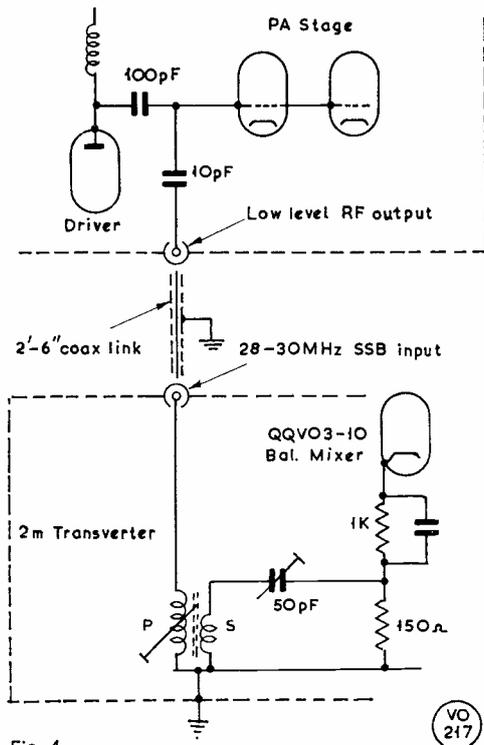
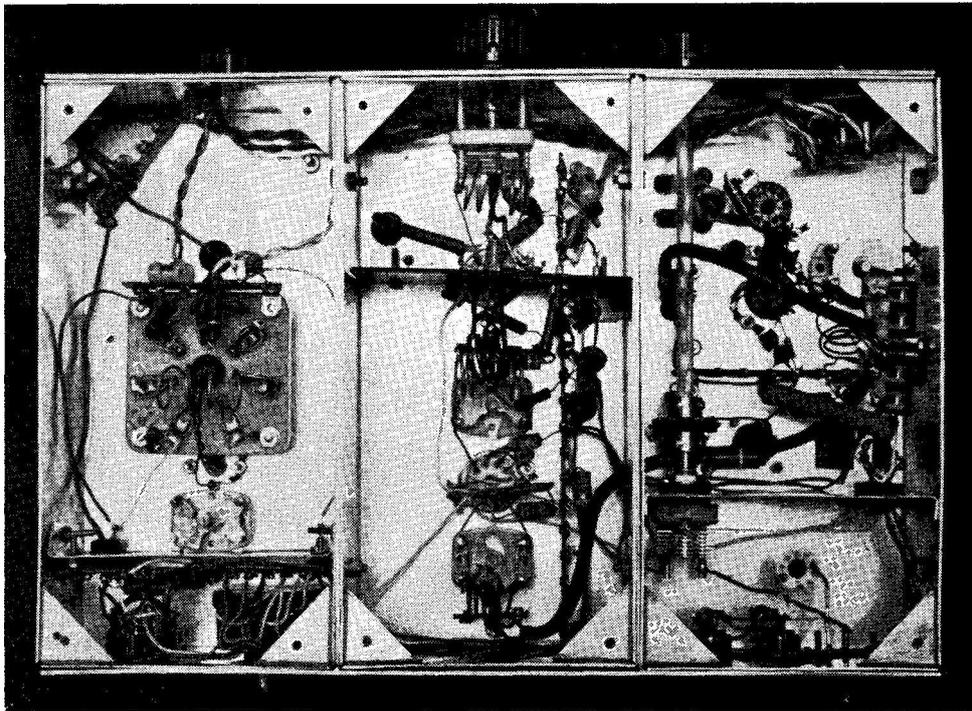


Fig. 4

Under the SSB Transverter with QQVO6-40A PA base at left. The balanced mixer/buffer amplifier chassis is at centre, with BA section above the mixer—note screens across valve-holders. The right-hand screened enclosure accommodates the oscillator/tripler chassis.

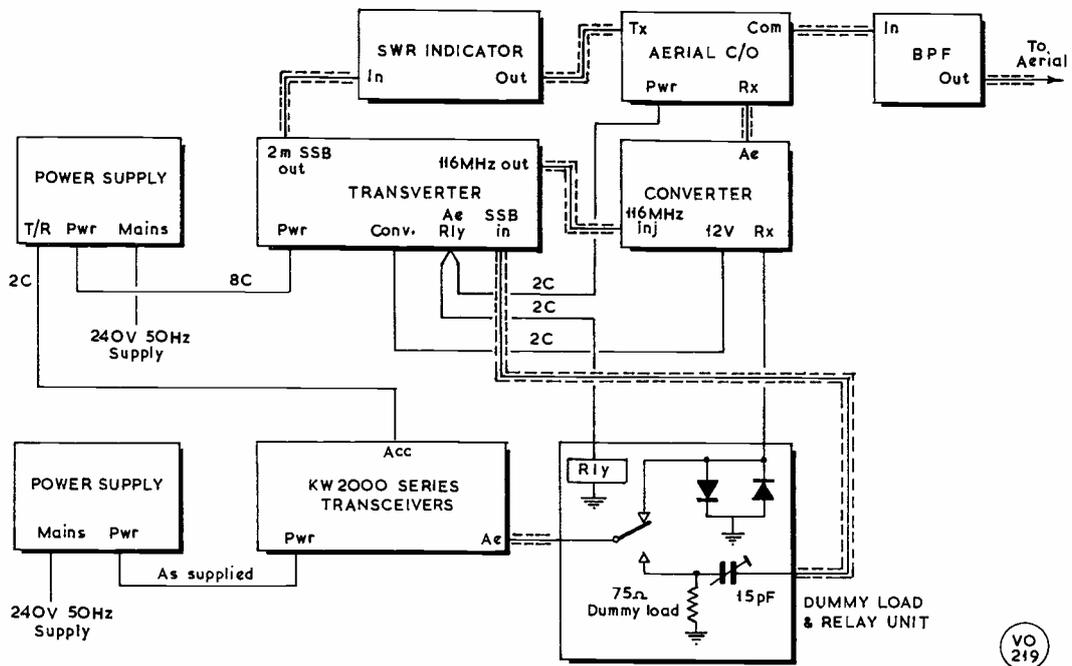
the use of a bandpass coupled filter between aerial and transverter is also recommended. These precautions should reduce any spuri to an acceptable value.

What about the inband ones? The use of a HF filter rig is highly recommended. Beware of SSB transceivers with 465 kHz filters because the discrimination against the image at 10 metres is very poor. If you must use such a rig employ additional tuned circuits between the SSB prime mover and the transverter. Local splatter can be a problem—avoid overdriving the mixer and succeeding stages, linearity being the watch word to produce smooth output.

The transverter as described here has now been in use continuously for six months and no serious problems have been encountered. In this period twelve countries and fifty-nine countries have been worked. Compare this with your logs over a similar period and remember this has been obtained from Glamorgan—a notoriously poor VHF location.

When using a KW-2000 type transceiver as prime mover, a dummy load must be provided, capable of dissipating much of the RF output, e.g., 13 one-K 5w. carbon resistors in parallel. This load should be canned, with an oil filling. (See G3FCW article, p.95).

Diode protection will also be needed on the IF



INTERCONNECTION DIAGRAM

Interconnection diagram with transceivers of the KW-2000 series as prime mover.

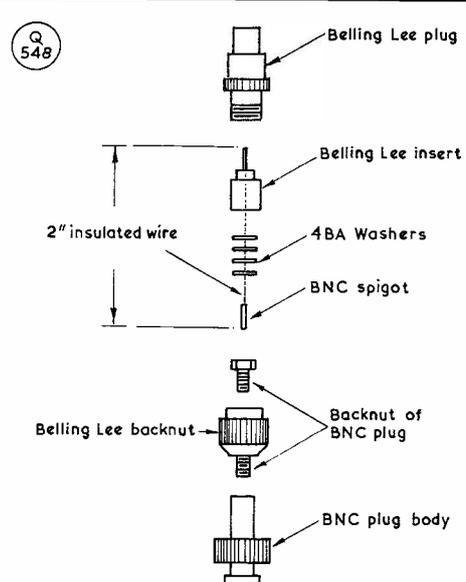
transformer link to safeguard the mixer FET.

Editorial Note: We understand that several models of this Transverter have been constructed and that all have performed very satisfactorily.

CO-ADAPTOR BELLING/BNC

To complete the story on p.28 last month, a Belling Lee-to-BNC-adaptor is also quite a simple job. Ream out the cable entry end of a B/L plug to take the threaded portion of the back nut from a BNC plug. (Note that the BNC plug with a dimension of $\frac{3}{8}$ in. across the flat of the nut is required.) To the spigot of the B/L plug solder a piece of insulated wire, to the other end of which the spigot from the BNC plug is soldered so that the total length from tip to tip of the two spigots is two inches. Drop over this wire four $\frac{3}{8}$ in. diameter washers and screw the back nut of the B/L plug into position. The threaded portion of the BNC backnut now protrudes from the end of the B/L plug and the body of the BNC plug is screwed to it.

The diagram shows the assembly. *A.H.D.*



To keep in touch with the world of Amateur Radio, read "Short Wave Magazine" regularly

FRONT-END TUNING

TO REDUCE CROSS-MODULATION —GETTING RID OF THE HASH ON FORTY

R. A. PENFOLD

THE 40-metre band is somewhat neglected by many amateurs and SWL's. There are probably two main reasons for this, (1) For G's, the band is only 100 kHz wide, and (2) It is next to the 39-metre broadcast band, some BC stations actually transmitting on frequencies within 7.0—7.1 MHz.

It is this 39-metre band, and the broadcast stations in it, which are the main cause of the trouble, as this produces an abnormally high degree of cross-modulation in the receiver front end. This can in turn result in weak DX stations being lost in the noise. Many of the older-type receivers are virtually useless on Forty at times, due to the rather old fashioned front-end circuitry which they employ.

Cross-modulation is a form of intermodulation distortion. This type of distortion occurs when two or more signals are passed through an amplifier with non-linear characteristics. The effect of the distortion is to reproduce the sum and difference frequencies of all the various input frequencies. The level of the spurious frequencies is proportional to the extent of the non-linearity of the amplifier, and the strength of the applied signals.

Most of the frequencies produced by cross modulation lie well outside the passband of the receiver's front end, and can therefore be disregarded. Certain frequencies produced will, however, fall within the front end's passband, and it is these which cause the interference. Fig. 1 shows how two frequencies when cross modulated can produce such frequencies—and also how this distortion can hinder the reception of weaker signals, even though the two frequencies which are

producing the distortion lie outside the IF passband of the receiver (they must of course lie within the passband of the receiver front-end). The diagram shows the distortion products produced by only a single carrier-wave, and one modulating frequency. Actually, there would be several carrier waves, and possibly some *thousands* of modulating frequencies! Thus, many thousands of new frequencies would be produced, these sounding rather like ordinary background noise from the receiver, except that the level of the noise will vary with the modulation levels of the offending stations.

Adding an ATU

To reduce cross modulation it is necessary to overcome distortion in the receiver RF and mixer stages. If the receiver is of an older type, replacing the front-end valves with modern miniatures may help a little, but there would still be problems with cross modulation, as no front end is completely distortion free. An attenuator can be added between aerial and receiver, and this will reduce the strength of the signals at the input, and thus minimise the risk of over-driving the front-end stages, therefore also reducing cross modulation.

This means that the level of the required transmission will also be reduced, although an attenuator would give an apparent improvement in performance.

Another method of reducing cross-modulation is to put in an aerial tuning unit, which will reduce the RF bandwidth of the receiver. Thus, unwanted signals are attenuated before they reach the receiver, the required signals being virtually unaltered in level. This also gives greatly improved image rejection to the receiver.

In order to obtain a sufficiently narrow bandwidth, the ATU requires at least two tuned circuits. To reduce loading so as to obtain high-Q, a fairly loose coupling needs to be used between the two tuned circuits.

The circuit diagram of an ATU constructed by the author to meet these requirements is as Fig. 2, p.94. L1 is the aerial input winding, which couples the input signal to the first tuned circuit, L2. The second tuned winding is L3, this being coupled to L2 by the low value capacitor, C2. Capacitors with values as low as C2

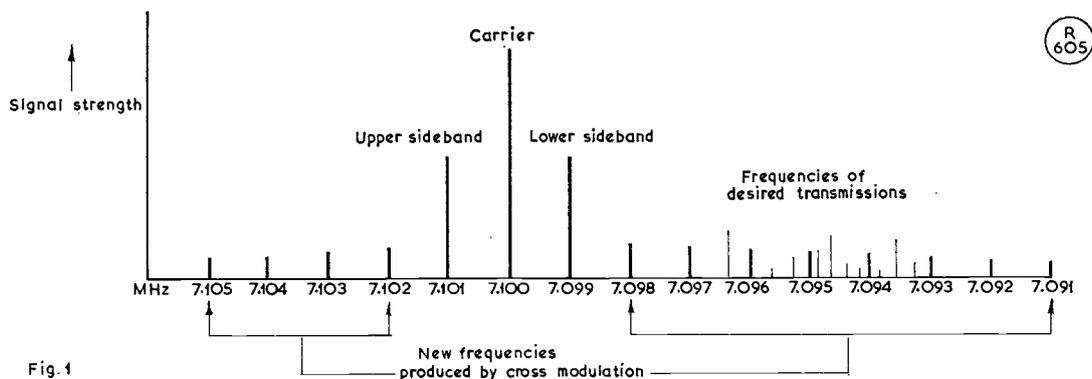


Fig. 1

Fig. 1. Showing new frequencies ("beats") produced by cross-modulation and interfering with desired transmissions.

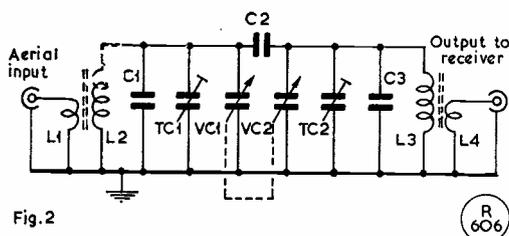


Fig. 2

Fig. 2. Circuit of the front-end tuner described in the text. Values can be: C1, C3, 180 pF, silvered mica; C2, very small capacity, 1.8 pF (see text); TC1, TC2, 10-80 pF compression trimmer; VC1, VC2, 25 + 25 pF air-spaced two-gang tuning capacitor; L2, L3, 20 turns 30g. enam. on *Denco* or similar coil formers with B9A base, and fitted with ferrite cores; L1, L4, 4 turns 30g. enam. put on adjacent to L2, L3.

(1.8 pF) are difficult to obtain, although they are available from some of the larger component retailers—but C2 could be contrived by twisting together two short lengths of insulated wire, say half-an-inch.

The output from the ATU is coupled to the receiver via the low impedance winding, L4. C1—TC1—TC2—C3 are used to adjust the two tuned circuits to the centre of the 40m. band, with VC1/VC2 at half maximum capacity; these then tune the unit to the desired area of the band.

Construction

The prototype was built on a home-made aluminium chassis measuring 5 x 3 x 1½ in., fitted with a front panel of 4 x 3 in. Coax sockets mounted on the rear of the chassis are used for input and output. Coils L1-L4 are wound on a couple of *Denco* ¾ in. diameter formers, which have bases to plug into standard B9A valveholders. The two coils are identical: L2, L3 consist of 20 turns of 30g. enam., and L1, L4 are of 4 turns, wound immediately above L2, L3. To ensure rigidity the windings should be glued to the former using polystyrene cement, or a similar adhesive. The two coils should be fitted with the appropriate ferrite cores.

Other Points

A simple point-to-point wiring system is used. The cable between the ATU and the receiver must be screened for the unit to avoid direct pick-up.

Such an ATU can of course be operated on other bands providing the inductance of the tuning coils is altered to suit the desired band. The unit is, however, likely to give less benefit on other bands—with the exception of perhaps Top Band, which we share with powerful maritime transmissions, and lying near Medium-Wave broadcast band.

On our HF bands, such a front-end unit can give a very noticeable increase in the image rejection of a superhet receiver having a low frequency IF in the region of 465 kHz.

For correct operation on other bands it will be necessary to adjust the value of the miniscule capacity C2. For operation at double the frequency its value would be halved, while for operation at half the frequency, its

value would be doubled. (Twisted wires will usually do the trick.)

By adding a *third* tuned circuit the performance of the unit can be even further improved. This modification is as Fig. 3 below. The additional coil, L5, is identical to the other two tuned circuits, L2, L3—but careful alignment of this circuit is required for optimum results. You can reach a point where you are juggling with too many variables!

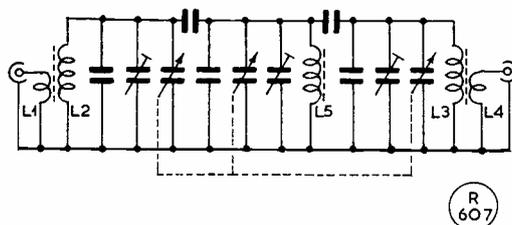


Fig. 3. To increase performance, a third tuned circuit, L5, can be added—as L2, L3—though adjustment and tuning would be more difficult.

RTTY CONTEST RESULTS

For the radio-teletype contest sponsored by the Canadian Amateur Radio Teletype Group over October 14-16, 1972 (results for which are just out), they had 115 single-operator entries from all over the world—but only three U.K. stations are listed: G3OZF gained 16th place, with 199 contacts on five bands 10-80m., his best being 14 MHz (97 QSO's), with WAC gained; G3LDI also worked the five bands, with 76 contacts for 63rd place; and G3RQY came 83rd with 58 QSO's on four bands. The three leaders, world-wide, were ZS3FB, LU2ESB and YV5AS, with astronomical scores up in the millions. All the first 18 stations made over a million points. Some stations used considerable power: YV5AS ran 2 kW; KZ5BH, 800 watts; K4AGC and VE7UBC with a kilowatt apiece are just examples.

INTERESTING CASE—AND A WARNING

It was recently reported in the public print that one Gerald Paul of Pyrford, Surrey, collected a fine with costs of £35 for listening-in on the London Fire Brigade transmissions on VHF. Not content with this judgement, he took his case to appeal and was, naturally, well slapped down by Lord Widgery, L.C.J., who pointed out that the defendant was committing an offence under the Wireless Telegraphy Act—even if his motives were entirely innocent and blameless. The Lord Chief Justice might also have explained that—as we have frequently said in these pages—radio transmissions by many other services (police, hospital, aircraft, shipping and such) are equally protected under the law against eavesdropping by the curious, and that the Ministry will always prosecute where a case can be proved.

INEXPENSIVE DUMMY LOAD

50-OHM NON-REACTIVE —
CONSERVATIVE 50w.
DISSIPATION

G. DENBY (G3FCW)

USE a dummy load? Why bother. This opinion, although perhaps seldom voiced, is thought often enough, if we are honest with ourselves. Putting the transmitter on the air for a (quick) test is the usual practice. And the result? Yet another signal to add to the general QRM. So the band is quiet? Does that excuse the seemingly interminable carrier on two metres?

Not just AT-stations, either. Shore stations have often to instruct ships testing on 500 kHz to QRT. This on an international distress frequency, too. There is seldom a call sign sent, and the station stays unidentified, creating havoc under the cloak of anonymity.

Moralising? Perhaps, but there is merit in being good neighbourly. In keeping your test signals to yourself—in the shack where they belong. Without wishing to “throw the book about,” Clause 4(1) of our Licence does make the point clear. Of course we all mean well,

and many more dummy loads would be used if more people had them. Commercial models are available, too.

Resistors

However, the unit shown here is simple enough to build but does entail the use of non-inductive resistors (*i.e.*, not wirewound). There is no problem if one is only needing to dissipate a watt or two, but tens of watts, and the problem of a large non-inductive resistor becomes apparent. This difficulty faced the writer, like many other people.

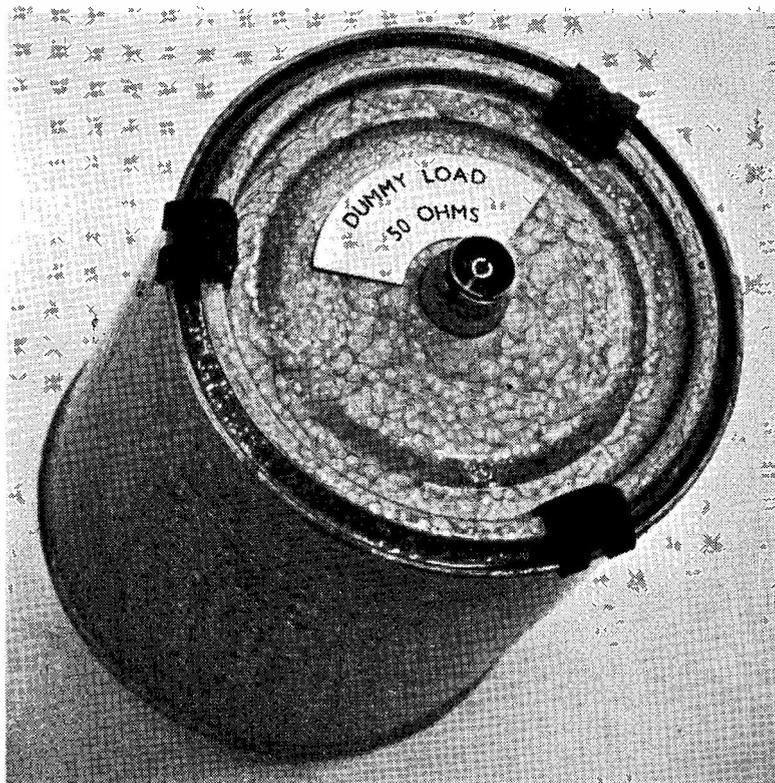
A trip into Town one day gave the opportunity to see some normally unfamiliar radio shops, and in one particular window there was this box full of old style large 500-ohm 5-watt carbon resistors, at 10 for 5p—which in turn triggered the almost subconscious Ohms Law calculation that ten resistors in parallel would give 50 ohms of resistance with 50 watts dissipation. 5p never changed hands more quickly!

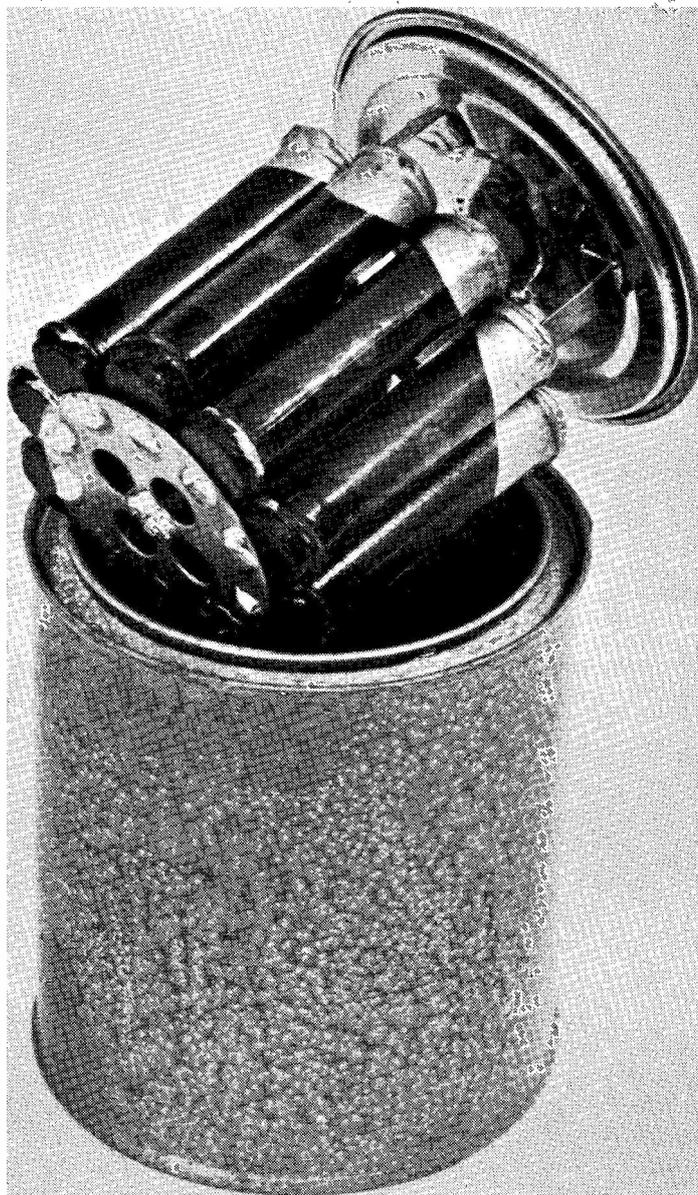
Construction

The general construction will be apparent from the photographs. If the container resembles a 2 lb. “Golden Syrup” tin this is no coincidence. The tin was cleaned with paint remover and the seams, although no doubt tight, were run over with solder with a 150 watt iron just to be sure.

A hole was drilled in the lid to take the coax socket.

The completed 50-ohm 50-watt Dummy Load as discussed in the text. The whole thing can be built into, say, a “Golden Syrup” tin, or something similar, suitably dished up and containing the heat-dissipating oil—see text.





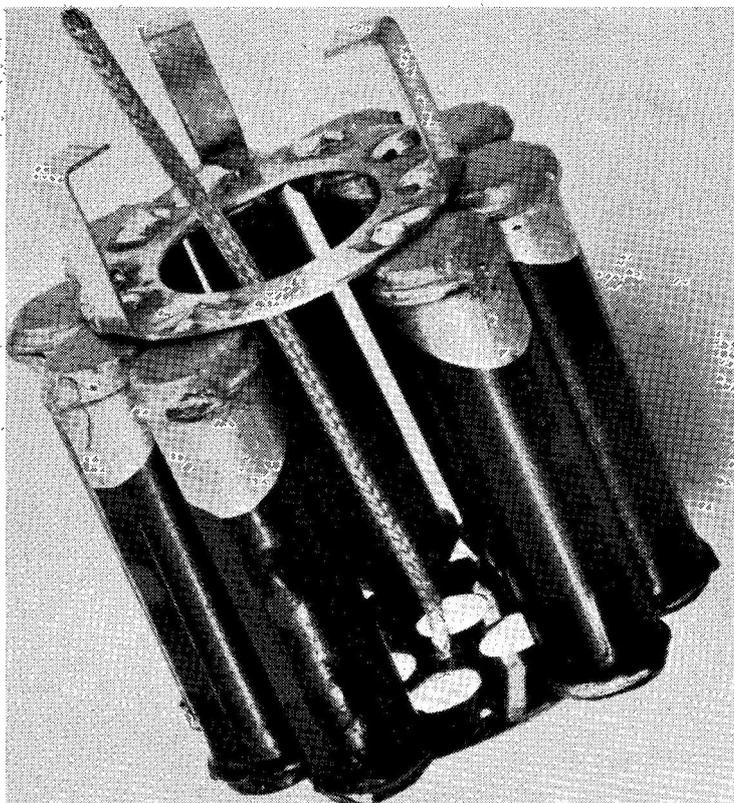
This detail is to show the holes in the bottom disc to help circulation of the oil coolant—which, in this simple application, can be ordinary domestic cooking oil.

The socket flange was soldered to the underside of the lid, again using the large iron, running plenty of solder round to make a seal. It is a good idea to insert a plug in the socket, as the insulation may temporarily soften if the soldering is prolonged, and the plug will hold the socket pin in position. To make sure of a good seal the underside of the socket is liberally covered with *Araldite*.

The resistors are mounted between a 2in. diam. disc

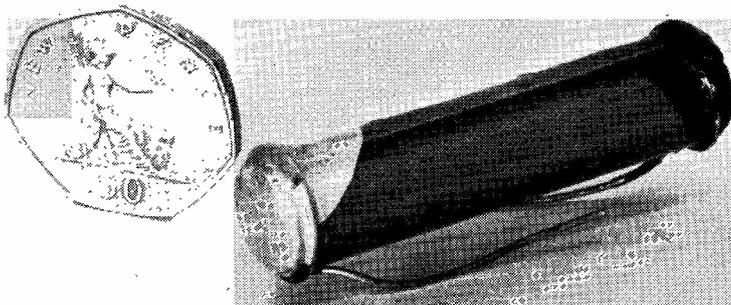
of 22g. copper at the bottom, and a similar sized ring of copper at the top. To make the ring first cut a $1\frac{1}{2}$ in. diam. hole with a socket punch. Brass or tinplate would do equally well, but aluminium is out due to difficulties in soldering. Four $\frac{3}{8}$ in. diam. holes are drilled in the bottom disc to assist circulation of the oil coolant. A length of screening from a scrap of coax cable was used as the connection from the bottom disc to the coax socket. Three lugs are included on the top ring which are

The 50-watt 50-ohm compact load nest as put together by G3FCW. The last (tenth) resistor has not been connected to show the general construction. When completed the assembly is soldered to the underside of the container lid.



bent up and soldered to the underside of the lid. The tin is then given a coat of hammer finish enamel, and a small label added with dry-print lettering. (The three lid retaining clips were conveniently supplied on the tin of enamel). Discussing this project with fellow members of the Club produced a majority opinion that there should be a vent. No conclusive arguments were put forward, it was just "felt" to be "right". Accordingly, a 1 mm. hole was drilled in the lid opposite the label.

Although transformer oil would no doubt be the ideal with which to fill the tin, it is thought the availability of an odd pint may depend on who your friends are. A more easily obtained product is the ordinary household cooking oil of your favourite brand. Cover the resistors, but leave a little air space under the lid. After all, this oil is intended to work happily in excess of 350°F. and if your dummy load is dissipating sufficient power to fry chips, then the writer would rather not know. Don't tell the man from the Ministry either.



To make up the "soak load" old style 5-watt carbon resistors are the ideal thing. If you've not got them in the junk-box, they can usually be found by shopping around, in either 50 or 75-ohm values—an Ohm's Law computation will determine how they should be connected.

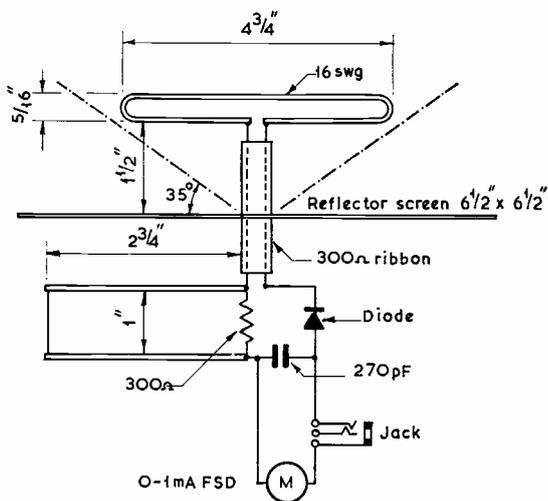


Fig. 1. Circuitry and general construction of the UHF field-strength meter. The wings of the reflector panel can be bent to improve directivity—see Fig. 2.

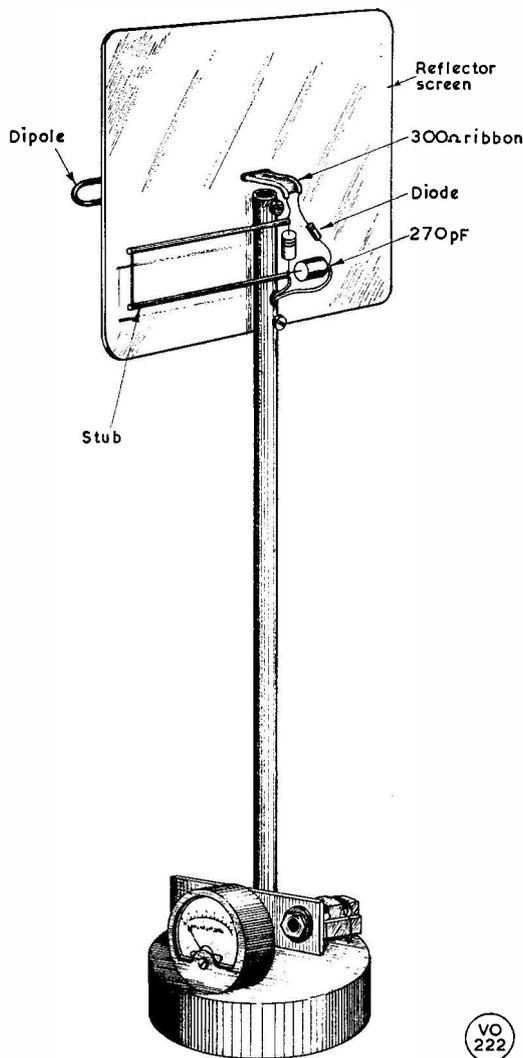
F/S METER FOR 23 CENTIMETRES

SIMPLE AND EFFECTIVE PORTABLE INSTRUMENT

FOR anyone starting up on 23 cm., some sort of indicator of radiation performance is essential. One cannot just rely upon finding another station on the band when you want one, and, in any case, one cannot expect another operator to spend a lot of his time doing tests for you. The quick, and in almost every way the most satisfactory, answer lies in the Field Strength Meter. The following notes describe a simple device of this kind.

Above is the general scheme. The antenna is a horizontal folded dipole fed by a length of 300-ohm ribbon which also supports it. If desired, the dipole may be supported by a piece of p.t.f.e. rod, but in view of its small size and weight this is not essential. The ribbon passes straight through the centre of a square sheet of aluminium serving as a plane reflector, which in turn is bolted to a 14in. length of $\frac{3}{8}$ th dural tube, the lower end of this being screwed into a suitable base plate. (If you can run to thin brass or copper sheet, so much the better.) Immediately behind the reflector one end of the ribbon is connected to a xtal diode and the other to a 300-ohm resistor, the purpose of which will become apparent later.

The output from this network, after suitable decoupling, is fed *via* a hole in the dural tube down to the base of the instrument. A 500 microamp or 1 mA meter is used as the indicator, and this is mounted on a strip of p.t.f.e. by means of its own terminals in such a manner that it is free to revolve round the bottom of the dural

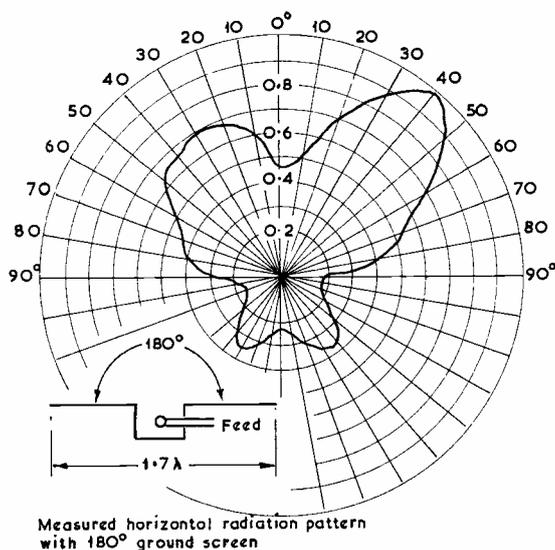


tube. This strip also carries a closed circuit jack to enable high impedance headphones to be used for monitoring modulated signals. The output leads are taken up through the base and connected to the meter, taking care that enough length is allowed for rotation. This form of construction makes a very neat job and the meter can be swung into any convenient position to face the observer when readings are being taken.

The 300-ohm resistor mentioned is only used during the adjustment of the matching stub and is then removed. As may be seen from the drawing, this stub consists of two 3in. lengths of 28g. tinned copper wire spaced one inch apart.

With the Tx running and the instrument placed so that the meter reads about half scale, a shorting bar is fitted to the ends of the stub remote from the resistor and gradually moved inwards until a maximum is noted on the meter. The shorting bar is then soldered into that

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position and the surplus ends, as well as the resistor, are snipped off. This matching will show something like a 25% increase over the reading with the resistor alone.

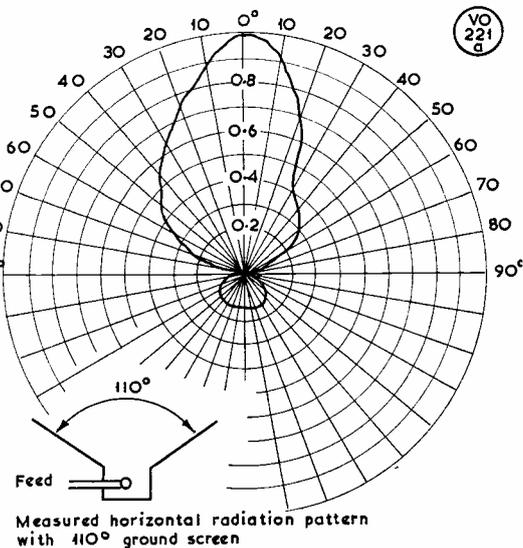


Fig. 2. Polar diagrams obtained with the F/S Meter—note the improvement with the reflector wings at 110°.

SPECIALLY ON THE AIR

There are several new entries under this heading, as below. Those concerned with organisation of Special-Event stations are reminded that we should be given the details on a separate sheet, set out as shown here, and addressed "Specially on The Air," SHORT WAVE MAGAZINE, BUCKINGHAM, MK18 1RQ.

GB3BSP, April 21-23: For the Banks Steam Party, to be held at Hoole Lane, Banks, Nr. Southport, Lancs., over the Easter Holiday and organised by Ainsdale Radio Club, running all bands 2-160m., with talk-in for visitors on Top Band, 70.26 and 145 MHz. QSL's and information: G3LWK or G3VNQ, both *QTHR*.

GB3STF, May 12-13: From the Grammar School, Priory Road, Spalding, Lincs., by the Spalding & District Amateur Radio Society, running CW/SSB on all bands 10-160m. (and AM on two metres), all contacts to be confirmed by special QSL card—Details from R. Harrison, G3VPR, 38 Park Avenue, Spalding, Lincs.

GB2OCC, May 16-June 15: To be operated by Keele University Amateur Radio Society, in co-operation with other North Staffs. groups, for the Newcastle-Under-Lyme Octocentenary Charter Celebrations. Operator and SWL assistance is requested for station manning. Contact G3COY or G3UOK, *QTHR*, telephone *Stoke-on-Trent* 44875 or *Keele Park* 371, extn. 128.

GB3HCF, May 25-June 3: For the Hereford Cider Festival, mounted by the Hereford Amateur Radio

Society, running all HF bands (but mainly 20m. and 80m.) also RTTY. Enquiries: S. Jesson, 181 Kings Acre, Hereford, HR4 OSP.

GB2BWS, May 30-June 2: For the Bath & West Show, from the Shepton Mallet, Somerset, showground. Loan of equipment and operating assistance are solicited, conferring free admission for car and/or caravan. Anyone who can help is asked to get in touch with R. B. Holman, G2DYM, The Old Saw Mills, White Ball, Wellington, Somerset.

GB2FJE, June 13-14: From the Shefford Community Centre, put on by the Shefford & District Amateur Radio Society, operating 2m. and 160m. AM, 10-15-20m. SSB. Contacts to be QSL's by special card.—D. Pike, G3VMI, 11 Hazel Grove, Stotfold, Hitchin, Herts.

GB3HCW, June 30-July 7: Operating all bands Top to two metres, with three stations on the air. This event is in conjunction with the Hanworth Carnival Week.—V. W. Higgs, G3VWJ, 205 Commercial Road, Staines, Middlesex, TW18 2QT.

GB2GB, August: Station to be operated from Brunel's famous old steamship *Great Britain*, now dry-docked, at Bristol, for the City's charter anniversary celebrations. GB2GB will be available for operation by visiting licensed amateurs during the entire month. Contacts will be QSL'd by special card. Information from G. Mather, G3GKA, 8 Hills Close, Keynsham, Bristol.

LOOKING AT THE K.W. ATLANTA

NOTES ON AN HF-BAND
TRANSCEIVER

F. G. RAYER, A.I.E.R.E. (G3OGR)

THOUGH home-built gear is usually run at G3OGR, one corner has been retained for commercial equipment. The need for this arose when making sure that there was always *something* in an air-worthy condition. With home-made apparatus, there often seemed to be something new to try—some new circuit, or modification which would for lesser or greater periods cause a receiver, a transmitter, a PSU or whatever to be temporarily out of use.

This inclination to try something new or different could usually be resisted with commercial equipment. Therefore, a station consisting of the latter could be left in working order—and in fact over the years QSO's have probably been made about equally with home-built and commercially manufactured gear.

Around 1960/61 a K.W. Victor kit was purchased, and made up into the "commercially manufactured" standby. (Though the Victor could be purchased ready-made, as this one was not, perhaps the correct definition would be that of classifying it as a commercially designed item.) This transmitter with a CR-100 remained as the "always air-worthy" section of the station side by side with the home-made section where 6BW6's, 807's, 6146's, 254M's, a solitary 813, TZ40's and other valves came and went, screen grid modulated, anode modulated, carrier controlled, and who knows what else, together with home-made receivers with or without Q-multipliers, bandspread, varieties of product detectors, and other endless variations.

As the K.W. Victor gave excellent results with no trouble at all right up to a belated decision that the commercial always air-worthy gear should be SSB, it is not surprising that the decision was to invest in another piece of K.W. equipment.

This, then, is how the K.W. "Atlanta" came to occupy the position of the old Victor, and has so remained ever since—a matter of only a little over two years (which is actually a brief period, compared with the years the Victor was kept).

What the Atlanta Is

As it would be impracticable to discuss every detail, this must of necessity be brief. The "Atlanta" is a 500-watt p.e.p. transceiver (125w. AM or 350w. CW rating) with two 6LQ6's in the PA, with matching speaker and power supply. There is 3.5-29.7 MHz coverage of the amateur bands, a crystal calibrator, automatic linearity control, grid block keying, optional sideband selection, and the other features usually associated with modern transceivers.

Panel controls are for band selection, grid and PA tuning, RF and AF gain, VFO tuning, coarse and fine loading, carrier balance, microphone gain, sideband

selection, tune-up and CW, calibrator and VFO calibration adjustment, as well as the usual combined S-meter/PA meter. The back panel drop has provision for an external VFO, PA bias adjustment, aerial and external relay.

Receiving, main circuit functions are met by a 12BZ6 RF amplifier, 12BE6 mixer, 6EW6 and 12BA6 IF stages, 6BN8 audio and AGC amplifier, 12AX7 amplifier and 6GK6 output stage. The crystal calibrator takes a 12BA6 and there is an OA2 voltage regulator. When transmitting, apart from stages which do double service in the usual way, there are mixer, 6GK6 driver, and 2/6LQ6 PA stages, with a 7360 beam-deflection balanced modulator. The VFO is transistor, and the carrier oscillator a 12BA6.

All this is cased in the modern day manner, dimensions being about 10½ in. wide, 5½ in. high and 13½ in. deep, the power supply with speaker being 5½ in. wide, and of similar height and depth. Each of the two units weighs about 18 lbs. (See picture opposite).

Receiving

On first trying the equipment in the "receive" mode, the lack of spurious responses was most noticeable. Earlier, a well-known transceiver had been in use, having a 5.2 MHz IF, and with this (incidentally, in correct working order and adjustment) 80m. signals could read S8 on the 20m. band. As an example, when tuned to 14.1 MHz, with the IF at 5.2 MHz and the VFO working LF of the signal frequency, the VFO was on 8.9 MHz—thus, a 3.7 MHz signal mixing with the 8.9 MHz from the VFO also produced 5.2 MHz. As a result, 80m. signals could be tuned in across the 20m. band. This effect was particularly bad with multi-band aerial systems. It arises, of course, from the choice of VFO and IF frequencies, combined with insufficient pre-mixer selectivity to eliminate the 2nd channel response.

This irritating effect was entirely absent in the K.W. "Atlanta"—20m. signals did not have to be sought amid noises from 80m., and it was not necessary to use only a 20m. dipole for this band, as had been needed earlier.

It terms of sensitivity, selectivity, ease of tuning generally, and calibration at 100 kHz points (checked by the crystal) no fault at all could be found. Sensitivity and selectivity were as good as claimed by *K.W. Electronics, Ltd.* and there was a general feeling that anything which could be heard on any band was receivable with this equipment.

Transmitting

The Atlanta has a "Tune" position for the CW switch, which allows tuning the PA at reduced power (SG voltage is reduced). This is mentioned first because an earlier transceiver had no such provision, and initial tune-up was with the PA valves able to draw full power—in fact, if adjustments were not getting nearly right within about 10 seconds, the anodes grew visibly red, and it was necessary to switch off for a short time, then continue. This, perhaps, is not too important when using a dipole which will be correctly adjusted to give a suitable load. But when using an aerial of multi-band type, with a tuner, adjustments of PA tuning, loading, and



tuner controls do take a little time.

So the benefit of the lower-power tune position of the switch was felt to be really worth while. With a tuner and multi-band aerial system, it allows for leisurely adjustment of the tuner, to obtain best reading on an SWR meter between transceiver and tuner, apart from saving the PA valves.

When the equipment was tuned up in the manner described in the quite detailed manual, signal reports are of good voice quality. If a scope is brought out, output looks correct on this.

A complete station, for one band, thus need be nothing more than the transceiver with its power supply, a push-to-talk mike, and a dipole plugged directly in. For other bands, the aerial system naturally has to be changed to suit. It might consist of a multi-band trap dipole, or one of the various well-known multi-band end, or centre-fed, arrangements, with its matching or tuning unit. As would be expected, a transceiver like the K.W. "Atlanta" is *not* suitable for direct operation into an end-fed half-wave, or some such untunable Ae. system.

Given a normal aerial, normal conditions, and normal operating ability such a transceiver can give contact with all continents in practically a single sitting—where the user goes from there is purely a matter of inclination and time available.

Conclusions

Since having the "Atlanta" (over two years) some limitation, awkwardness, or other feeling regarding its working and operation, which might inspire a desire to change it for something else, has simply never arisen.

There it sits, to do its job as called upon. This was the situation with the old K.W. Victor, which gave unflinching satisfaction for a number of years, and was dispensed with eventually only because there is not space enough to keep everything! It is expected that the K.W. "Atlanta" will go on in the same way. In any case, if anything does go wrong, the factory from which it came is no farther across the world than Kent—and one knows that *K.W. Electronics, Ltd.* give a first-class service on their equipment.

MARCONI ATC RADAR OVERSEAS

Marconi Radar Systems Ltd. have gained a £750,000 contract to provide Subang Airport, Kuala Lumpur, Malaysia, with a highly advanced air traffic control capability well suited to cater for the rising volume of air traffic in that part of the world.

The 50-centimetre radar station, the most powerful ever built for civil use, is to be sited 20 miles from Subang Airport on top of a 6,000ft. mountain to give full coverage of the whole of Malaysian airspace. Equipment includes a massive aerial, over 67ft. wide and 13ft. high, which will produce a beamwidth of only 1.7°, giving excellent definition. The transmitter/receiver unit provides a peak output power of 500 kW, and the display system at Subang will use the latest fully-transistorised 16in. fixed coil display, able to accept either raw radar or to plot extracted synthetic radar information. A fully transistorised dual-channel signal processing system will further improve clarity of the radar picture, and ensure more effective coverage under all conditions.

CRYSTAL MICROPHONE AMPLIFIER

LOW OUTPUT IMPEDANCE — LPF
INCORPORATED

A. LANGTON

CRYSTAL microphones of reasonable quality for communication purposes are available quite cheaply; they have a high output, usually several hundred millivolts. To realise this output it is necessary to work into a high impedance. The circuit described here has a very high input impedance and a very low output impedance, useful for working into a long cable, and also includes a low-pass filter, the whole unit being small enough to be built into the case or handle of the microphone. Voltage gain is 0.85.

The input stage is a source-follower and the input impedance of about 30 megohms imposes very little loading on the microphone, enabling full output voltage to be developed. C1 is a bootstrapping capacitor; without this the input impedance is about 3 megohms. The high value of source resistor gives a gain approaching unity, about 0.95. Because of the spread of FET characteristics a potentiometer is included to set the drain current to 0.5 mA (5v. across R4), a value which gives optimum temperature stability. The range of bias should be enough for any MPF103. Items R5, R6, C2 and C3 form an active low-pass filter with a roll-off at 3 kHz. Response is 6 dB down at 3.8 kHz. The BC109 emitter-follower has a high input impedance, necessary for the correct working of the filter. It loads the source follower very lightly and keeps the overall gain as high as possible. Output impedance is very low;

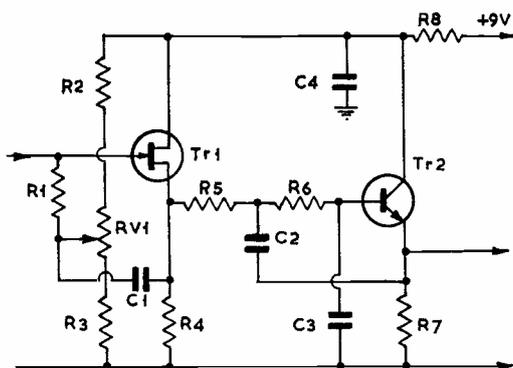


Fig. 1

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Fig. 1. Circuit of Mic. Pre-Amplifier, for which values can be: C1, .068 μ F; C2, .002 μ F; C3, 560 μ F; C4, 50 μ F, 50v.; R1, 3.3 megohm; R2, R5, R6, 47K; R3, 15K; R4, 10K; R7, 2.2K; R8, 470 ohms; RV1, 22K miniature pot'meter; Tr1, MPF103; Tr2, BC109. All resistors rated quarter-watt.

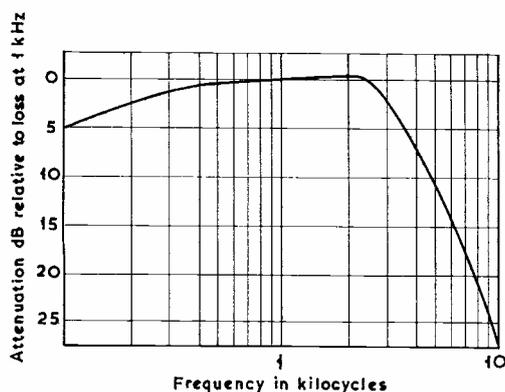


Fig. 2

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Fig. 2. Attenuation-response curve of the Pre-Amplifier discussed in the article.

the preamplifier will deliver 2.5v. peak-to-peak into a 600-ohm load before distortion occurs.

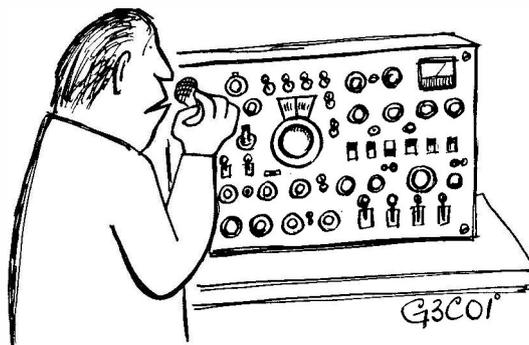
Because of the high input impedance, leads to the microphone must be of low capacity and as short as possible. The ideal is to build the unit into the case using either an etched circuit or 0.1 inch matrix *Veroboard*. Note that the FET lead arrangement is unusual—the gate connection is *not* the centre lead.

RTTY BULLETIN TRANSMISSION

An international news transmission for those able to copy on teleprinter is now being run (from a Danish source) every Thursday evening at 2000z on or near 3580 kHz, using 170-cycle shift.

U.K. LICENCE FIGURES

As at year's end, there were 18,178 U.K. radio amateur licences in issue, taking both categories together. Of these, 3,680 were licensed mobile. The B-licences amounted to 3714/826.



"... changeover here can be a bit complicated ..."

Oscar VI

OPERATION is still erratic, so it looks as if the idea of switching the transponder off during the week in order to give full coverage over the weekends is not working according to plan. There is some evidence that the device is more often operational for orbits to the West of us than for those to the East.

It is well worth while checking orbits which cross 52°N beyond the 2,000 mile range (45° East or West), and even those which do not cross that latitude at all. Those near the North Pole are giving very good results with VE.

Answering CQ calls is proving more productive of contacts than long CQ transmissions. For the newcomer, remember that the Doppler shift frequency may be changing quite rapidly, and that the reply to your CQ may well come on a frequency outside the passband of your Rx, so tune a few kHz each side of your own signal.

Apart from the general comments about the inability to predict when an orbit will be usable, reports indicate that we have now reached the position where it is becoming difficult to find new calls to work. It appears that the novelty has worn off for many operators, particularly in view of the time-wasting chore of setting up the gear(s) for passes which never materialise, and that we are now down to the bedrock of serious effort by devoted observers. Please send reports of all contacts to G2BVN, QTHR, for collation and onward transmission to AMSAT. Special report forms are obtainable from him.

Reports

G3BHW was called by a 9Y4 on orbit No. 1831, but the QSO was clobbered by CQ calls from chaps who had obviously not checked the channel first. The report is of interest, though, as orbit No. 1831 crossed 52°N at 33°W, and if 9Y4 is on, then VP2, VP7 and VP9 should be possible. G3DAH was called by a YK on orbit No. 1550, but that contact was also lost in QRM. GM3ZVB reports hearing an HK, even further afield.

G3NHE has added GM and YU to his score. He has now worked three different YU's after struggling for months to get just one!

VHF BANDS

A. H. DORMER, G3DAH

GM3ZVB, in spite of his low power, has made it with G, DK and F, and with higher power coming along, should provide that long-looked-for QSO with GM for many of us. He reports that the SK4MPI beacon on 2m. went auroral via Oscar during the display on February 21.

G6RH, in an interesting and comprehensive report of his Oscar activities, raises the point about Oscar operators using the top end of the band for CW when communicating through the device. Since working through the satellite is an international exercise, and since such transmissions occur but briefly throughout the day, this practice is unlikely to cause serious QRM to operators in Zone D. Such "bend-

ing" of the Zone Plan need not, therefore, be criticised on this score. Perhaps more serious is the adoption, on a more permanent basis, of frequencies in Zone D by various nets and groups in the South, with the consequent interference to DX contacts with GI and GM.

Bob Holmes also confirms the phenomenon reported by G5ZT that there appears to be an inordinate time delay in the receipt of the 10m. return signals from the transponder which cannot be accounted for by the satellite/earth range. He notes further that he has heard his own signals 3-5 minutes after the predicted orbit time when the pass has been over the North Pole, i.e. at the end of S/N transit.

SWL Gordon Smith in Aberdeen sends in an impressive list of prefixes heard which includes FC6ABP, GM3ZBE, LX1FI and EP2, to bring his total to 34.

Tables

Orbital Predictions, as heretofore, are for crossing times at 52°N, but may be related *approximately* to equatorial crossings by deducting about 40 minutes from them for a N/S pass and about 15 minutes for a S/N path. The maximum duration of any pass is about 23 minutes.

G3COJ and G6RH among others have drawn attention to the fact that European Russia and the Ukraine have several different prefixes and it has now been decided that the Operating Results Table shall show *prefixes* worked, so future claims for inclusion in the Table should take account of this

OSCAR VI — Prediction Data

Orbit	Date	Time (GMT)	Position	Direction
2173	Apr. 7	0747	30°E	N/S
2174		0942	2°E	N/S
2175		1137	27°W	N/S
2176		1658	43°E	S/N
2179		1853	15°E	S/N
2180		2048	14°W	S/N
2186	Apr. 8	0647	45°E	N/S
2187		0842	17°E	N/S
2188		1037	12°W	N/S
2192		1753	29°E	S/N
2193		1948	1°E	S/N
2194		2143	29°W	S/N

Times shown are for crossings at 52°N. Orbits beyond 45° E or W are not included. To calculate later orbits, deduct 5.15 minutes and add 1.29°E each 25 orbits. Orbits shown are for weekend operations only in view of the revised AMSAT procedure.

decision. Confusion is the more confounded because of the change of call sign allocation in Russia, for example UA3KAA, a Club call, has now become UK1AAA, and the procedure we are now adopting will take care of this.

The Operating Results Table has the air of getting unwieldy, and consideration is now being given to publishing it at less frequent intervals or in a shortened form. Perhaps it would continue to sustain interest if only the more unusual prefixes were included? As a try-out this month, herewith the *additions* to the results already published.

OSCAR VI TABLE

Station	Countries	Prefixes	
G6RH	33	UR	(326)
G3WPO	33	GI, GM, UT, SV	(379)
G3BHW	33	UB, UY, 4X4	(312)
EI6AS	32	UA	(437)
G3NHE	32	GM, UK	(426)
G3COJ	30	EA, OE, ON, OZ, TF, UR, VE, YU	(128)
G4AJC	27	HG, LZ, OE, OZ, UK, UR, YU	(191)
G3DAH	21	HG, LZ, UA	(106)
G4ATX	20	EI, GI, LA, LZ, OZ, UR, W	(89)

Aurora

A very informative report and analysis of the two-metre Aurora of February 21/22 comes from GM2DRD. First indications of possible *Ar* activity were visual displays in Forfar at around 1800 hrs., and a quick check on Ch. IV TV showed that there was a radio effect also. Initially, contacts were made with Northern European stations outside the country, and it was not until after 11 p.m. that the first Southern G stations began to appear, contacts then being made with G3CCH, G3LTF, G3JYP and G3TQZ at signal strengths between 5 & 8A. The manifestation on the next day was much weaker, the visual display also being limited, and the only contact to the South was again with G3LTF, although PA, LA and GM were worked at similar signal strengths to those of the previous evening.

GM3ZVB (Edinburgh) was also in on this Aurora, and logged G, GM, GW, DL, DM, OZ, PA and LA. His 8-ele. beam is tilted at 30° to the horizontal for Oscar operation, and although one might have expected that this would lead to improved reflection from the elevated auroral curtain, Robert observed no particular gain from this.

Over in Bridgend, South Wales, GW3ZTH worked GM3ZVB and GM3UAG with GM3ZVL as a gotaway. Both he and GW3WRE observed that signals peaked between 2330z and 0030z, so it looks as if, as usual, the phenomenon in the South appeared later, and was usable for a shorter time than in the North.

Contests

February saw the last of the 432 MHz Cumulatives and propagation conditions for all the seven sections seem to have been almost uniformly poor, a result not unexpected at this time of the year. As a stimulus to activity it can hardly be claimed that they succeeded, as an exercise in frustration, they did! Better luck next time!

Conditions were patchy for the 144 MHz CW event on February 4. Generally, more DX was being worked in the afternoon than in the morning, since it was then that the Continentals appeared. DJ9DL and DC6EQ were working up into the Midlands with good reports both ways, and several PAØ were available. G3NEO in Sheffield was logged working DL5BV, and G3BA made it with DJ1KA. GC2FZC was putting a good signal into the North. Best scores heard were around the 60 mark, which does not indicate a very high level of activity for an event of this duration and mode.

The 70 MHz Open on February 18 was also somewhat disappointing due to poor conditions, although G3VPK (Witham, Essex) was heard having a scratchy, albeit successful, QSO with GM. Two Welsh portables, GW4ABR in Newtown, Mon., and GW4BUC (Wrexham) seemed to be doing pretty well from their elevated sites, while the rest of us plodded on, and considered ourselves lucky if we broke the 50 mark.

The weekend of March 3/4 saw the 144/432 MHz Open and the 144 MHz Fixed Station events running

concurrently for much of the time, and this has provoked some criticism from both fixed station operators and from the portables. The former were faced with the choice of staying off the air on the Saturday in order to have the chance of working the DX portables on the Sunday, risking thereby a drop in propagation and so poorer scores, or going on and working the portables, so denying themselves the chance of getting a few points from them the following day. From the point of view of the portable station operator, the situation was confusing and time-wasting, since DX stations outside the contests, whom they had worked on the first day, were calling them again the following day and either had to be ignored, or worked without gaining any further points. Since more than one band was involved the confusion was compounded.

Conditions on 2m. were above average on both days, the nearer Continentals being available for much of the time, and a surprise opening into HB9 around 1 a.m. on the Sunday morning caught many on the hop. The HB9 beacon was at good strength for a couple of hours or so, and HB9ADJ/P in DG56j and HB9AEN/P in DG13b, both up around the 3,000 metres a.s.l. mark, were really having themselves a ball working G and GW. A few German stations made a brief appearance around midday, as did some French and Dutch stations. 70 cm. was poor and activity low.

Although, without knowing the range, contact scores do not mean much, it may be interesting to note that the West Kent Club, operating as G3WKS/P in Rutland, fared as follows: 2m., 217 contacts in 6 countries and 35 counties, best DX PAØJOU/P at 495 km; 70 cm, 28 contacts in 2 countries and 16 counties, best DX GW4BBP/P (Merioneth) at 197 km.

A problem was raised by several AM station operators in the Midlands who were transmitting in Zones A and B and creating plenty of QRM for their neighbours. Stations were heard in the South operating in the top half of the band and calling for DX contacts in the North. They had obviously never heard the QRM up there at close quarters. Both these practices are

largely self-defeating, and observance of the geographical Band Plan, which was created to avoid this sort of situation, would not only have been desirable and more productive, but would also have been less anti-social.

IARU Region 1 Contests

The 2m. contests in September and October last year were but poorly supported from the U.K. For example, there were only five British stations for the whole of the 364 entries in the 144 MHz Fixed Station section, and possibly the coincidence of national events accounts for this. Congratulations must go to G3OHH who, in 45th place, led our field. The situation was a little better in the 144 MHz Portable section, where there were eight British entries, headed by GW3BA/P, out of 303. However, there were 8 U.K. stations in the first 16 of 50 entries for 432 MHz/P section, and here, as in previous years, GW3LTF/P headed the list. It was on 1296 MHz that we really came into our own. All but 15 entries of a total of 49 were from this country, and we filled the first 15 places. GW3LTF/P was again first in the field. Nice going!

Forthcoming Events

Look out for the 70 MHz portable on April 15 and the 144/432 MHz Open during May 5/6.

The Mid-Severn Valley Teleprinter Group have a 2m. contest on May 13. Details from G3NUE, *QTHR*.

Conventions

For those who may have missed the reminder last month, the 19th International VHF/UHF/SHF Convention takes place at the Winning Post Hotel, Whitton, Twickenham, Middlesex on Saturday April 7, to be followed by discussion groups on Sunday between 1000-1400 hrs. Lectures, trade show, bring-and-buy sale and raffle as usual. Tickets are available from A. Wheeler, (35 Doughty Street, London, WC1N 2AE) at £2.25 including the dinner, £2 for dinner only and 50p for lectures only. See you there!

The UK FM Group (London) held their 1973 Convention at Weybridge on February 24. Some 170 amateurs turned up to hear an interesting

THREE BAND ANNUAL VHF TABLE

January to December, 1973

Station	FOUR METRES		TWO METRES		70 CENTIMETRES		TOTAL Points
	Counties	Countries	Counties	Countries	Counties	Countries	
G4BEL	8	2	42	8	23	4	87
GD2HDZ	12	2	40	5	10	2	71
G3DAH	14	2	40	8	5	1	70
G3OHH	23	2	30	4	8	2	69
G3NHE	—	—	43	7	13	2	65
G2AXI	20	2	33	3	6	1	65
G8FUI	—	—	42	5	15	2	64
G8EOP	—	—	33	3	26	2	64
G3FIJ	13	2	26	5	12	1	59
G8FMK	—	—	30	2	16	1	49
GW3ZTH	—	—	37	7	—	—	44
G3BW	—	—	37	6	—	—	43
G4AEQ	—	—	25	2	13	3	43
G3SMU	10	3	5	2	16	3	39
G3XDY	—	—	27	7	—	—	34
G4AJE	—	—	28	5	—	—	33
G4BKG	—	—	28	4	—	—	32
G8CBU	—	—	23	2	5	1	31
G8GNC	—	—	28	2	—	—	30
G8BXX	—	—	20	1	8	1	30
G8COG	—	—	23	3	—	—	26
GM3ZVB	—	—	21	4	—	—	25
G8DGR	—	—	16	2	6	1	25
GW3DOL	—	—	20	4	—	—	24
GM3ZVL	—	—	16	6	1	1	24
G8DOT	—	—	20	3	—	—	23
G8BKR	—	—	14	2	4	1	21
G8EMS	—	—	16	2	2	1	21
G8GBV	—	—	14	2	3	1	20
G3WHK	—	—	17	3	—	—	20
G4AEZ	—	—	16	1	—	—	17
G8FUL	—	—	13	2	—	—	15
GW8CMA	—	—	11	3	—	—	14
G8GXE	—	—	12	1	—	—	13
G3EKP	4	2	2	1	2	2	13
G8GJB	—	—	10	1	—	—	11
GW8CGH	—	—	7	2	—	—	9

The Table shows claims to date from January 1st, 1973. It will run through to December 31, 1973. Your claims should be sent to:—"VHF Bands," SHORT WAVE MAGAZINE, BUCKINGHAM, MK18 1RQ, as they accrue.

programme of lectures by various experts which, presumably by design, had little to do with mobile FM operation—the possible exception being that given by G3SXX, who dealt with the technical and operating aspects of the Cambridge repeater. Of the 60 odd mobiles present, a quick check showed that about 80% were on FM and 20% on AM, but the talk-in stations were equipped to deal with both modes. This was a well-run affair, and Mike Tooley, G8CKT, and his team are to be congratulated on making it so.

The Scottish VHF Convention this year will be held in Edinburgh on September 29. The venue is likely to be the University. Full details nearer the time.

The Scottish Scene

GM3FYB and GM6ZV have joined the ranks of the "Liner 2" operators. The former, in particular, should have little trouble putting a good signal into G from his excellent Dunfermline site. GM3BQA has now got a 4CX250B linear for SSB which is going great guns.

About The VHF Spectra

GM3TNT operates from the radio station at Rhu Staffnish in Kintyre and, having been to the site, your conductor is not in the least surprised to hear that he is laying down a fine 4-metre signal into G, GI and EI, so his request for skeds on that band should be productive well down to England—*QTHR*, and s.a.e., please.

GM3BCD has a 2m. transceiver almost complete and is proposing to take it with him on holiday and so add a Scottish accent to the Continental QRM. GM3ZVL is now fully QRV on 70 cm. using a solid-state 2m. transceiver to drive a BA110 varactor tripler, giving him 100 mW out at present although higher power is envisaged. The tripler also acts as a mixer on receive with 288 MHz injection to give an output on 2m. for the converter and this makes for a very compact

installation. The beam is an 18-ele. at 40ft.

News Items

Four Metres

Norman Guy, G2DN, reports that he has heard from G3FET/ZC4 that he will be continuing his tests on 70 MHz during March, April and May this year, although he will be able to listen at weekends only and cannot give any specific times. After May, the situation should be a little easier and he will quote exact listening periods. Now that ZB2VHF is back on the air, he should *not* be called on 70-26 MHz. These tests reinforce the argument that ZB2VHF should be moved from the mobile calling channel on 4m.

Two Metres

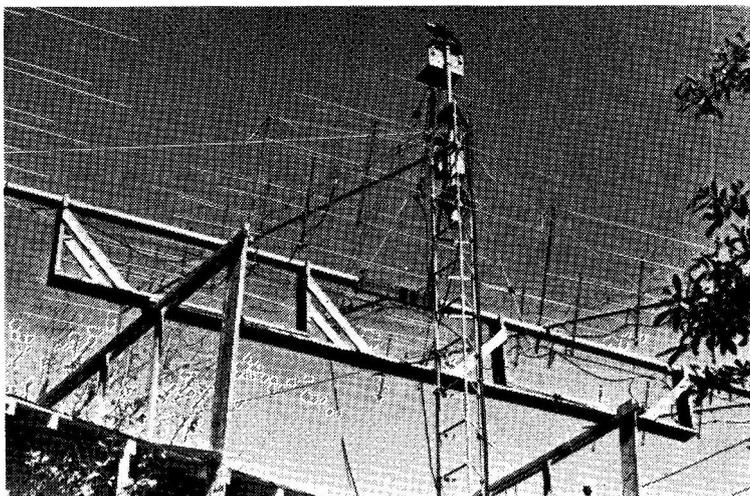
GW3ZTH (Bridgend) has now got his 4CX250B linear on the air, and is joined in SSB operation by GW8BXQ/A in Pembroke Dock and GW8CFU (Haverford West)—a couple for the DX-chasers. Geoff Spencer, GW8FOL, is also up on SSB from Anglesey with a '640A running about 80 watts p.e.p. to a 10-ele. at 60ft. He is willing to arrange a sked with anyone wanting Anglesey; s.a.e. to *QTHR*.

John Standen, now G4BSU and ex-G8AGL, is up on 2m. SSB from near Pidsea in Yorks. and reports that he has received an OK from MPT to transmit SS/TV on the band. G8DGR, Newbury, Berks. has finished the 4X150A linear which gives him some 90 watts of AM (series gate mod.) and FM.

G3XBY is using a 15-turn helix antenna on 2m. and, in spite of the fact that it is only 6ft. above ground at present, is getting good results. Although there is a cross-polarisation loss associated with this type of antenna, it is not great and, in view of the simple construction and the considerable gain which can be obtained from a helix, it seems odd that more use is not made of the



D. Holding, G8EDL, with Brian Coleman, G8AZU (right), presented a persuasive and convincing talk on getting going on 70 centimetres at the U.K. FM Group (London) convention at Weybridge on February 24 last. G8AZU was a member, with G8APZ and G8DKK, of the team which did so much last year to popularise Seventycems by their Sunday forays with /P gear to attractive DX sites.



Bob Sutherland, W6PO, of 4040 Fernwood Street, San Mateo, California 94403, U.S.A., is one of the several W6's keen on E-M-E working—for which he has built this very elaborate 430 MHz antenna system. He would be much interested to hear from U.K. operators who would care to discuss skeds.

principle, particularly on 432 MHz and above.

G3DAH (Herne Bay) will be temporarily QRT on this, and all other bands, from March 24 preparatory to a move of QTH.

70 Centimetres

G8BYV (Norfolk) has found 70 cm. conditions to have been better this year than last. He has already had some good DL and PA contacts, and his skeds with G8BAV over a 160 km path have been holding up well. He also reports good reception of the DJ2LF beacon on 432.080 MHz and the German repeater around 432.5 MHz. Judging by the reports coming in, this is contrary to the general experience, and one can only hope that the openings will become more widespread. Certainly, the unusual temperature and pressure conditions on March 10 produced some very nice G and EU DX, with G3KMS in Bolton and G3NHE in Sheffield

at remarkably good signal strength for long periods in the South. G3VZO has now been appointed beacon keeper at Durham, so it should not be *too* long before we have the 70 cm. beacon on 432.05 MHz operating from there, and this should provide a useful addition to the beacon service. (Still no news of resumption of operations from GB3GEC). Continental beacons which should be receivable in this country are: DL0SZ on 432.008 MHz; OZ7IGY, 432.018 MHz; PA0VD, 432.025 MHz; DL1XV on 433.0 MHz; and DL7HGA, 433.485 MHz.

G8EMS in Leeds is now QRV again on 70 cm. after a rebuild. He runs 36 watts input to a '320A, antenna is a Multibeam at 45ft. and Rx a *Microwave Modules* converter into an Eddystone 888A. He would like to hear from anyone more than 100 miles from his QTH who might wish to run skeds during the Easter holidays.

DX-Peditions

G4BRT and G8FHB will be operating from various good sites in GM between March 30 and April 8. They will have FM and SSB on 2m. and AM/FM on 70 cm. Frequencies in accordance with the Band Plan. They will open up on 2m. each evening at 7 p.m. and QSY to 70 cm. if requested to do so. They will call on 70 cm. between 9 and 9.30 p.m. in any case.

GM8EKF will be operating portable from Jersey during April 1-8. Transmission will be AM on 144.390 MHz.

Deadline for the next issue is **April 6**. The address for news, views and comment is: "VHF Bands," SHORT WAVE MAGAZINE, BUCKINGHAM, MK18 1RQ. Cheers for now and *vy 73 de G3DAH*.

Editorial Note: Because of severe mail dislocation (due to the railway trouble) during the critical period, some correspondence arrived too late for this feature.

THE MOBILE SCENE

Following are the dates for the coming Season's Mobile Rally fixtures—there may be a few more to come, for which we should have details as soon as possible.

Note that, after a hiatus of a couple of years or so, the Amateur Radio Mobile Society (A.R.M.S.) is getting back into the Rally scene with plans to lay on a big event "somewhere in the Midlands" on June 17, venue to be notified later.

The Preston Amateur Radio Society now tell us that their Rally up in Lancashire will be on August 19, instead of as previously notified.

April 1: Annual White Rose Rally, at the High School, Ring Road, West Park, Leeds 16, junction of the A.6120 (ring road) and A.660, opening at 11.30 a.m.—R. J. Nettleton, 129 Stainbeck Lane, Leeds, LS27 2EB, for details.

April 15: North Midlands Mobile Rally at Drayton Manor Park, near Tamworth, as last year.

May 6: Tulip-Time Rally, at Sunfleet on the A.16, four miles north of Spalding, Lincs.—Informaton from R. Harrison, G3VPR, 38 Park Avenue, Spalding, Lincs.

May 13: South Leicestershire Mobile Rally at Westfield Activity Centre, Rosemary Way, Hinckley, opening at 11.0 a.m. Talk-in by G3ZOP/A on Top Band, G8CGW/A on two-metre AM/FM, and G3WPB/A on 2m. SSB. There will also be a bring-and-buy stall. Trade stands are to be organised and applications are invited. Details from J. Elliott, G8CGW, 92 Hinckley Road, Barwell, Leicester.

May 20: RAIBC gathering at the Fairground, Broadlands Estate, Romsey, Hants., in conjunction with the Southampton Group—Mrs. Frances Woolley, G3LWY, Woodclose, Penselwood, Wincanton, Somerset.

May 20: Otley Radio Society's Northern Mobile Rally at Moor Grange School, Ring Road, Leeds, offering all the usual attractions.—D. G. Mott, 17 Newall Carr Road, Otley, Yorkshire.

May 27: Hull & District Mobile Rally at Bishop Burton, near Beverley, Yorkshire. Organiser L. D. Colley, G3AGX, 13 Ferry Road, Wawme, Nr. Hull, HU7 5XU, East Yorks.

May 27: Maidstone Mobile Rally at YMCA Sports Centre, Melrose Close, opening at 11.0 a.m. All main events under cover, talk-in by GB3YSC on 2-4-80-160m. Contact A. S. Walter, G3WXL, 4 Oak Farm Gardens, Headcorn, Kent.

June 10: The fourth Elvaston Castle Mobile Rally in the grounds of the Castle Country Park, off the B.5010 south-east of Derby. Talk-in on 2-4-160m. by G3EEO and G3ZBI. A bring-and-buy sale and

various other attractions.—I. Cage, G8GBV, 25 Petersham Drive, Alvaston, Derby, DE2 0JU.

June 17: Amateur Radio Mobile Society Rally in the Midlands—*details later.*

June 24: West of England Mobile Rally at Longleat House, near Warminster, Wilts. This will be the usual good show, put on for many years now in a particularly attractive setting—the house and park alone are well worth a visit.—Rally details from A. H. Williams, G8CKJ, 58 Britannia Road, Kingswood, Bristol.

July 8: Upton-on-Severn Mobile Rally, organised by the Worcester & District Amateur Radio Club. Details: B. A. Jones, G8ASO, 12 Woodside Road, Larkhill, Worcester, WR5 2EG.

August 12: Torbay annual Mobile Rally at Newton Abbot Rugby Club ground, with talk-in, the usual stands and competitions.—L. H. Webber, G3GDW, 43 Lime Tree Walk, Newton Abbot, Devon.

August 12: The 1973 Mobile Rally at Derby, organised by the Derby & District Amateur Radio Society, to be held at the Rykneld School in Bedford Street, as in previous years. Ample accommodation if wet, free entrance and plenty of parking space, many attractions for all comers. This is a well-established annual event, which regularly attracts a large attendance.—F. C. Ward, G2CVV, 5 Uplands Avenue, Littleover, Derby, DE3 7GE.

August 19: Preston (North Lincs.) Annual Mobile Rally at Kimberley Barracks, Deepdale Road, Preston, Lincs., with free car park, trade stalls, refreshments and a bring-and-buy offering. Talk-in will be given on Top Band and two metres.—Contact man G. W. Earnshaw, G3ZXC, 12 Withy Parade, Fulwood, Preston, Lincs., PR2 4JN.

August 26: Town & Country Festival Rally, National Agricultural Centre, Kenilworth, Warwickshire.

September 23: Harlow & District Mobile Rally, this year at Netteswell School, Harlow, to give more space and scope for their activities.—V. Heard, 106 Vicarage Road, Harlow, Essex.

* * *

SOLO MOBILE EXPEDITIONS

The idea for these was outlined on p.34 of our last and the dates chosen are Sundays, from about noon till 5.30 p.m. or so, on April 8, May 20, June 10 and July 11. Please report results, giving location or area covered, band(s) used and best contacts made as soon as possible after these dates to: "Solo Mobile", SHORT WAVE MAGAZINE, BUCKINGHAM, MK18 1RQ.

THE MONTH WITH THE CLUBS

By "Club Secretary"

(Deadline for May issue: April 5)

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

YOUR conductor, this month, having nothing of any importance to say, we will refrain from saying it and get down to the reports!

Nationals

Here we might as well make a start with **Nigeria**, still with us, happily, despite their dire predictions. And, which is maybe more important, one notices a footnote in the current *Newsletter*, which makes it seem likely that at last there is some faint prospect that new licences may be granted in the foreseeable future. This is something which, if it comes to fruition, could revitalise the whole society.

The big news for **R.A.I.B.C.** is the organisation of their Picnic at the Fairground, Broadlands Estate, Romsey, Hants, to take place on Sunday, May 20. It is understood that trains from London will be met at Romsey if prior notice is given. By road, the Fairground is at the A.27 on the Romsey By-pass. That our invalid and bedfast colleagues should be able to look forward to such a social event is thanks to Lord Louis Mountbatten for use of his land, and the Southampton Group who will be taking on the duties of "heavy gang" for the day.

Now to **A.R.M.S.** who cater for the mobile enthusiasts, by way of *Mobile News* each month and much besides. The issue in front of us carries a good piece on the selection of a site for /P operation, with its radio properties in mind.

The writer was rather amused by the **B.A.T.C.** magazine this time, covering the method of reporting on TV signals for which the simple RST is inappropriate. Their code is a BT one with B detailing the picture carrier qualities and T the sound. They define B9 plus as being a situation where the signal is so strong that 400 volts AC should be available from the aerial feeder!

Talking of humour, one always finds some in the **R.N.A.R.S. Newsletter**, these naval types being unable to survive for long without it!

West Country

Here we make a start with **Yeovil** who have their place at the Youth Centre, 31 The Park, and foregather there every Thursday evening. April 12 is the big date for the coming month, when G3XFW is to give a talk on the Club 144 MHz transmitter. Looking forward a bit, we note the Annual General Meeting comes up on May 10.

Talking of AGM's the **Cornish** group have theirs on

April 5, at the SWRB clubroom at Pool, Camborne. In addition to the main meeting there is an offshoot of the club at Newquay—Treviglas School, on April 4 and 18—and another, newly formed, at Penzance. The latter are, as yet, without a Hq. place, so if you want to make contact with them, a contact either with the secretary (see Panel, or, in this special case, with G3UCQ, *QTHR*) will give the very latest news on the venue, and the meeting dates; until the Hq. problem is settled, these can only provisionally be noted as the second Tuesday and the fourth Thursday in the month.

Port Talbot have their Annual Social on April 10, at the Rail and Transport Club, Station Road—admission is free and any amateurs, and their YL's or XYL's, are welcome. The normal meetings of the group are also at this venue, on the second Tuesday in each month; and they try always to maintain a good and varied programme.

Hereford meet at the County Control, Civil Defence Headquarters, in the ominously-named Gaol Street, in the town. For April, we notice they have a film show—quite possibly dealing with Ultrasonics—on the 6th, and a Quiz on the licence regulations part (Part I) of the R.A.E. comes on the 20th.

Southerly

It seems quite a while since last we heard from **Havering**, although we knew they were progressing well. Now we have some more details, which tell us they are at the British Legion Hq., 54 Western Road, Romford, Essex, with bookings for April 4 and 18. On the first of these NFD will be discussed and to pick up on other points of club business, while the 18th will be for G3KFW to tackle RF Measurements and Digital Frequency Meters.

April 18 is also the date for **Verulam**, in their temporary meeting-place in the Market Hall, St. Albans. G8FNT, who is an Applications Engineer with Plessey, will be talking about that company's range of micro-circuits.

A change of Hq. has necessitated a change of date also, at **Reigate**. The new place is the Committee Room, St. Mark's Church Hall, Alma Road, not far from Reigate station; the Hall is at the back of the church, and is approached through the drive on the left of the church itself. This is the venue for the Annual General Meeting, on April 17, which is a "must" for all members. Also in April, there is the Informal session, this being at the

“Marquess of Granby,” on April 3—the latter venue, by the way, is in nearby Redhill. The annual dinner and dance also falls in April, on the 14th, at Russ Hill Hotel.

Kingston have also moved their home base, to the 3rd Tolworth Group Scout Hut, Stirling Walk, Raeburn Avenue, Surbiton, at the rear of Surbiton Lagoon. April 11 is the date, and the subject will be Circuit Board Techniques.

We do not appear to have the latest details from **Mid-Sussex** as to exactly what is going on in April, but we know the general arrangement is one of get-togethers on alternate Thursdays in the month, at Marle Place, Leylands Road, Burgess Hill. If you are thinking of turning up, perhaps a telephone call or letter to G3RXJ (address as Panel) would be a good idea to get the latest gen.

No vagueness about **Sutton and Cheam**—it's the Annual General Meeting on April 17, at “The Harrow” Cheam.

The venue for the **Southgate** session in April is, as usual, the Civil Defence Hut, Bowes Road, opposite the

Arnos Grove Piccadilly Line station, the date to watch for being Thursday, April 12. However, at the time of writing, the detailed programme for the evening is not known—doubtless the hon. secretary (see Panel) could assist here.

On to **Edgware**, at the Watling Community Centre, 145 Orange Hill Road. April 12 is a Constructor Contest; April 26 is Informal; and a hint of warming weather coming is given by the note that they also have a D/F event down for Sunday, April 15, starting at 2.30 from Queensbury Circle.

It is always nice to hear from a Club whose scribe radiates confidence in the group he represents, in the way G8AAT does for **North Bucks**. From his letter we get it that they get together on the second Monday in every month at the Wolverton Youth Club. This makes it April 9, and the speaker G3BA, talking about DX-peditions. As an added attraction there is a visit to the Telephone Exchange at Bedford on April 16.

The **Worthing** hon. secretary writes to let us know that the Borough Council have agreed to print a further

Names and Addresses of Club Secretaries reporting in this Issue :

ACTON, BRENTFORD & CHISWICK: W. G. Dyer, G3GEH, 188 Gunnersbury Avenue, Acton, London, W3-8LB.
 A.R.M.S.: N. A. S. Fitch, G3FPK, 40 Eskdale Gardens, Purley, Surrey, CR2-1EZ.
 BARKING: H. G. Davidson, G3FZP, 223 Salisbury Avenue, Barking.
 B.A.T.C.: J. J. Rose, G6STO/T, Pinchbeck Farmhouse, Mill Lane, Surton-by-Stow, Lincs. (Stow 356.)
 BISHOPS STORTFORD: E. P. Essery, G3KFE, 17 Ascot Close, Parsonage Lane, Bishops Stortford (S2501), Herts.
 BOLTON: S. MacDonald, G4AQB, 8 Archer Avenue, Bolton (20668), BL2-2SJ.
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 WOLVERHAMPTON: J. P. H. Burden, G3UBX, 28 Coalway Road, Wolverhampton, WV3-7LX.
 WORCESTER: B. A. Jones, G8ASO, 12 Woodside Road, Larkhill, Worcester (2v208), WR5-2EG.
 WORTHING: G. Hooper, G8ETL, 12 Bramble Crescent, Durrington, Worthing (62913), Sussex.
 YEOVIL: D. L. McLean, G3NOF, 9 Cedar Grove, Yeovil, Somerset.
 YORK: K. R. Cass, G3WVO, 4 Heworth Village York.

For many years now, the president of Derby & District Amateur Radio Society has been the eminent surgeon Mr. A. G. G. Melville, FRCS, here seen (on right) presenting his annual trophy to Brian Goodall, G8BUB, at Derby's recent dinner and dance. On this occasion, the prize was for the D/F Contest.



supply of QSL cards for free issue to interested amateurs. For details, contact G8ETL, *see* Panel, and at the same time he will give you the rundown on the latest goings-on at the Club.

Every Thursday you will find the **Barking** crowd at their new venue at Westbury Recreation Centre, Westbury School, Ripple Road, and, indeed, on Tuesdays too, if you are keen to learn Morse at the class held on the latter evening. The highlight for April will come on the 5th, when they have the tape-and-slide lecture on ARRL Headquarters.

One of our "regular customers" comes next, from **Acton Brentford and Chiswick**, whose Secretary has been the same since before your conductor started this piece. He writes this month to say the meeting is on April 17, at 66 High Road, Chiswick, the home of the Chiswick Trades and Social Club. The matter in hand is by way of a general discussion of members' problems.

The Midlands

This clip starts at **Hinckley**, where the newly-formed group has already about *sixty* members on its books. In the near future we notice they have a Mobile Rally, at Westfield Activity Centre, Hinckley, on May 13. In the way of more usual activities, they assemble on April 11 for a talk on Direction Finding, and April 25 is set aside for G3NLY to take SWL Aerials at HF for his theme; both these two are in the Demonstration Room at Hinckley Technical College, at 7.30 p.m.

A change of headquarters for **Worcester** means that for the time being they will be gathering the clans at the Old Pheasant in New Street, Worcester, where they have a private room available. Monday, April 2 sees the Chairman, G3WGY, talking about VHF Techniques,

while on April 14 comes the annual Construction Contest.

We seem to have got out of step with the **Solihull** news, having only last month's details to hand. However, we know they have Hq. for the formal meeting at the Manor House, High Street, and an informal at the Malt Shovel in the same street of Solihull. For dates, and the rest of the gen, we must refer you to G4ABV—*see* Panel, opposite.

At **Wirral** they are for the moment getting together at the Community Centre, Carr Bridge Road, Woodchurch, as their usual place is for five months to come undergoing a major facelift. For April, we note a talk on the "Latest from Solid State" slated for April 4 and a pre-NFD session on April 18. In addition there is a visit to R.A.F. Sealand for a Quiz on April 12.

Friday is the night for **Coventry**, at Baden-Powell House, St. Nicholas Street, Radford Road. The advertised programme runs rather like this: April 6, a lecture on Horticulture(!); April 13 and 20, both Nights-on-the-Air; while on April 27 there will be a demonstration and lecture organised by the well-known firm of J-Beam Aerials.

South Manchester are keen chaps, with a meeting on

CLUB SECRETARIES — ALERT!

Closing dates for this feature for the next few months will be April 5, May 3, June 7 and July 5, for arrival at the following address: "Club Secretary", Short Wave Magazine, Buckingham, MK18 1RQ. Late reports cannot be taken in.

each Friday and Monday. Friday is the main event, with Mondays given over to VHF, at the club shack at "Greeba," Shady Lane, Manchester 23. Looking at the Fridays, we see March 30 for a Mystery Talk by G3HZM; April 6 a Home-brew Mini-Hi-Fi by G3WFT; April 13 a talk about VHF working through *Oscar VI*; a blank on April 20 (for Easter); and on April 27 a Home-Construction Contest.

Open Day

The Open Day each year at GCHQ, Cheltenham has by now become one of the events of the year for those who can attend. This year's will be at the Canteen, GCHQ, Benhall, Gloucester Road, Cheltenham, starting at 7.30 p.m. The usual high standard of exhibits will be maintained and there will also be a bumper raffle. Ample car parking is available. If you can make an appearance on Friday, April 27, you should make the effort, as the show will be well worth seeing.

Scotland and North

It is pleasing to hear, as we do from Lincoln, that

their attendances are once again rising, as new members join and old ones put in a re-appearance. On April 4 G3EBH takes up the subject of Aerials, and on the 11th there is an Open Night. April 18 is given over to films, and they mention that they have booked some good ones for this. As for April 25, this is down for a Treasure Hunt.

Some months ago we mentioned the re-formation of a group at Wigan and we now hear from them again. They have alternate Thursday evenings, at the Poolstock Cricket Club pavilion, and by the sound of it there is plenty of enthusiasm and drive about—Good! The main need in the way of new members at the moment is for licensed types, to balance the large influx of keen SWL's.

A private room in the White Lion, Moor Lane is the home of the Bolton crowd, where they get together on the third Tuesday in every month. New members, says the Hon. secretary, G4AQB, will also be very welcome here.

If you want to get to know the Bury and Rossendale lads, you must find the George Hotel, Market Street, Bury, on the second Tuesday in each month. The April 10 date is given over to a talk on HF Aerials by G3JAG.

A special-event station signing GB3MSF will be on the air from Morpeth Spring Festival between April 17 and May 5, says the letter from Northumbria, the group running it. The normal meetings of the Club are held at 3 Wheatsheaf Yard, Morpeth, every Thursday evening.

Nunfield House Community Association, Derby, has its own Amateur Radio Group, which seems to be very active, particularly in the field of construction projects for members, and also direction-finding events. (The latest details on meetings are announced on Friday mornings on the local "Radio Derby," for the meeting that evening). The Hq. is at the Community Associations place at Nunfield House, Boulton Lane, Alvaston, Derby. For April, we have a D/F Practice Run on the 1st, followed by the inquest on Project No. 2 on the 6th; the 13th and 20th are still open at the time of writing; on the 27th there is a bring-and-buy sale.

Every Wednesday night sees the Star Club get together, but on the first meeting of the month there is something special organised, usually a tape-and-slide talk, the current series being from Mullard and including such subjects as History of Radio/TV Transmitters, Receiving Equipment and so on. Visitors and new members are all welcome, at the New Inn Hotel, Bramley Town Street, Leeds 13.

Up to Scotland now, to the West of Scotland lads; they have Wednesdays set aside for constructional projects, VHF, and problem-shooting, while the Friday evenings see them at lectures, films, demonstrations, and so on, not to mention the Morse classes on the same evening. Looking forward a little, we notice the Annual General Meeting coming up on May 5, at 81 Virginia Street, Glasgow G2. This seems a very active and keen group, with a strong organisation.

It is quite a time since we heard from the Heriot-Watt University, Edinburgh, where, we now understand from GM8FWS things have been set back in motion again. Anyone interested in becoming a member should get in touch with him—QTH as in Panel, p.110.

SHORT CLUB NOTICES

CLUB NAME	HEADQUARTERS LOCATION	MEETING MONTHLY
Bishops Stortford	British Legion Club, Windhill	April 16
Bristol	24 Bright Street, Barton Hill, Bristol	April 3, 10, 17, 24
Cheltenham Group	Royal Crescent Hotel, Clarence Street	April 5
Chiltern	Ernest Turner, Ltd., Totteridge Avenue, High Wycombe	April 10, 24
Cray Valley	Congregational Church Hall, Court Road, London, S.E.9	April 5, 19
Derby	119 Green Lane, Derby	April 4, 11, 18, 25
Dunstable Downs	77 High Street South, Dunstable	April 6, 13, 27
Echelford	St. Martins Court, Kingston Crescent, Ashford, Middlesex	April 9, 26
Harrow	Harrow Sea Cadets Hq., Woodlands Road, Harrow	April 6, 13, 27
Midland	Midland Institute, Margaret Street, Birmingham 3	April 17
Sheffield	Church Hall, Ampthill Road	April 5, 12, 26
Surrey	"Swan and Sugarloaf," South Croydon	April 17 (AGM)
White Rose	83 Town Street, Armley, Leeds 13	April 4, 11, 18, 25
Wolverhampton	Neachells Cottage, Stockwell End, Tettenhall	April 2, 9, 16, 30
York	British Legion, 61 Micklegate	April 5, 12, 19, 26

N.B.— in each case, the Secretary's name and address appears in the Panel, p.110.

Members of the Cornish Amateur Radio Club looking over one of the transceivers they used for the recent Marconi anniversary occasion, from Poldhu site. This picture well suggests the wild and rugged coastline down in West Cornwall.



Finale

We seem once again to have come to the bottom of the pile of reports; your next letters should detail the events your group are running in the month of May, to be of most publicity value, and should include the dates, the details, and the address of the Headquarters—if it is a bit hard to find, some directions might help. Finally, of course, we want the name and address of the Secretary, both for the Panel, and also for our files, in case we have a letter from an SWL looking for a Club in your area. The deadline for next time is **April 5**, addressed to "CLUB SECRETARY," SHORT WAVE MAGAZINE, BUCKINGHAM, MK18 1RQ. Till then, 73.

* * *

Editorial Note: Again this month, numerous Club reports were received too late. This was

not altogether the fault of the scribes/hon. secretaries concerned, because the continuing rail dislocation had been causing long delays (sometimes up to five days) in the delivery of even 1st class mail.

Because it is never mentioned by the *media* (which concentrate on commuters' difficulties in the London area) it is simply not understood by the great majority of people that the Post Office moves the mails mainly by train and not by some private communications system of its own—though vans are, of course, used where no rail connections exist.

Anyway, it was just not possible for us to hold up this feature to accommodate late arrivals, because we ourselves have tight deadlines to meet if the issue is to be out on time.

N.R.S.A. ANNUAL CONVENTION

This year the Northern Radio Societies' Association Annual Convention will be held at the Forum Hall, Wythenshawe, Manchester on Sunday, May 6, 11.0 a.m. till 6.0 p.m. The hall is on the south side of Manchester, a few minutes off the M.56 and with good approaches from the centre of the City. Manufacturers and distributors of Amateur Radio equipment will be exhibiting and the member-societies of the Association will have individual stands. Talk-in will be given on 2-4-160m., signing GB2NRS. Raffle tickets for a bumper draw will be available during the day. For further information: P. Taylor, G8BCG, 2 Columbia Avenue, Gorton,

Manchester, M18 7LG.

INTERESTING CLUB RESULT

From the latest *Chiltern Carrier*, newsletter of the Chiltern Amateur Radio Club, we get it that their marker generators (a kit assembly distributed privately) produced a gain of £117 on a turn-over of £673 for the project. The Club's profit on operations for the year was £104—so obviously it was their enterprising scheme that made that possible. The next such project in hand is a frequency-counter and a 200 MHz pre-scaler. We note, however, that there was a small loss on their Mobile Rally last year.

*"Short Wave Magazine" covers the whole field of Amateur Radio
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NEW QTH's

This space is available for the publication of the addresses of all holders of new U.K. callsigns, as issued or changes of address of transmitters already licensed. All addresses published here will be 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.

- G3FMM**, C. H. Doley, 10 Apsley Grove, Dorridge, Solihull, Warks., B93 8QP. (Tel. Knowle 4398.) (Re-issue.)
- GM4ASY**, D. J. Yeaman, 5 Chartwell Road, Bishopton, Renfrewshire.
- G4AVT**, V. S. Evans, Beacon View, Parbold Hill, Lancs., WN8 7TG.
- G4BJT**, M. J. Ware, 45 Clothorn Road, Didsbury, Manchester, M20 0BP. (Tel. 061-445 6805.)
- G4BOS**, E. Bland, 15 Cecil Street, Lytham, Lytham St. Annes, Lancs., FY8 5NN. (Tel. Lytham 5790.)
- G4BPV**, P. R. Barker, 141 Falmouth Road, Redruth, Cornwall.
- G4BPW**, D. F. Reynolds (ex-G8DQY), 224 Station Road, Rolleston, Burton-on-Trent, Staffs. (Tel. Tutbury 3395.)
- G4BRM**, A. Long, 265 Henley Road, Coventry, Warks., CV2 1AW.
- G4BRU**, A. Lambe, Glenview, off Tresawls Road, Truro, Cornwall.
- G4BSC**, J. R. Wells, 96 Newhaven Road, Orford, Warrington, Lancs., WA2 0NS.
- G4BSF**, R. E. Small (ex-G8GHS), Corfe House, Corfe, Taunton, Somerset. (Tel. Blagdon Hill 230.)
- GI4BTG**, H. W. B. Davidson, 2 Ardeen Avenue, Newtonabbey, Co. Antrim, Northern Ireland.
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- GM4BTW**, I. Jolly, 2 Breadalbane Mews, Oban, Argyllshire.
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- G8HDF**, D. V. Goble, 43 Daniel Close, Lancing, Sussex.
- G8HDG**, H. C. Goble, 43 Daniel Close, Lancing, Sussex.
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- G3CDC**, C. S. Harrison, Fosse Ridge, Doverbeck Drive, Shelt Hill, Woodborough, Nots., NG14 6ER. (Tel. Woodborough 3361.)
- G3DAH**, A. H. Dormer, Dalkeith, 43 Mickleburgh Avenue, Herne Bay, Kent, CT6 6HA (Tel: Herne Bay 4558)
- G3JKR**, K. S. J. Rancombe, 6 Park Drive, Rustington, Sussex, BN16 3DZ.
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- G3NYK**, A. J. Melia, 67-A Deben Avenue, Martlesham Heath, Ipswich, Suffolk, IP5 7QR.
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- G3VWL**, R. E. Kemp, 21 Orme Road, Worthing, Sussex.
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- GW8CGH**, D. C. Pickering, 26 Heol Ganol, Sarn, Bridgend, Glam.
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- G8GSF**, J. Sleeman, No. 24, 11th Row, Ashington, Northumberland, NE63 8QQ.
- AMENDMENT**
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WALKIE-TALKIE: No. 88 ex-W.D. 14-valve four channel transmitter/receiver unit, £5, post/packing 62p. **No. 19 Sets,** ex-W.D. used transceiver valved unit, only £5, carriage £1. **Salvage** telemeter unit, multi-valve receiver, speaker and tape unit, sealed cartons, cost vast money, £3.75, carriage 75p. **Surplus** telephone hand-sets, 97½p, post/packing 17½p. **Ex-W.D.** tank aerials, 4-ft. top sections, three for 75p, post/packing 25p. **Switched ex-W.D.** unused moving-coil 19 Set microphone and headphone sets, at £2.50, p/p 25p. Unused **American ex-W.D.** quality feather-weight low-resistance headphones, £1.50, p/p 13p. **Auto-transformers.** unused. 240v. to 110v. at 75 watts, £1.25, p/p 25p. **Staff car** aerials, 87½p, post 12½p. **Counters,** four-figure, 2,300 ohm, £1.25, p/p 12½p. **Headphones,** 4 x 1 x 1-in., moving-coil low-resistance ex-W.D., padded and unused, £1.25, post/packing 25p. **Speech** recorders, Remington salvage, valved, for AC mains, cost vast amount, £5, carriage 75p. **Chart Board,** ex-W.D. A.M. type, for air speed, wind speed and distance, vernier calibration, in original cartons, cost vast money, £5.25, post/packing 75p. Callers welcome.—**Southern Surplus Merchants, Ltd., 66 London Road, Kingston-upon-Thames, Surrey.** (Tel: 01-546 9263).

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READERS

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FOR SALE: Grundig 625-line TV camera, all solid-state, German manual and circuit, not commercially used and as new, £35; G.E.C. 17-in. monitor, all solid-state, as new but faulty, £15.—**Martin, 114 Briggs Fold Road, Egerton, Bolton (57775), Lancs.**

SELLING: HRO-5M, excellent condition and performance, miniature valves, ten coilpacks, including 20m. bandspread, PSU and speaker, £25 or near offer.—**Blenard, 21 Meadowbank Avenue, Allerton, Bradford (491523), Yorks. BD15 7BP.**

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SALE: Trio 9R-59 receiver, coverage 0.5-30 MHz, very good condition, **£20.**—Wenlock, G3UNZ, 48 Newhall Street, Cannock, Staffs.

SALE: Eddystone 750 (see "Short Wave Magazine," May 1969), with speaker, manual, spare valves, in good condition, **£36.** Prefer buyer collects, or pays carriage. WANTED: Two 813's and bases.—Moon, G3YAX, QTHR. (Tel: Warrington 37138).

FOR SALE: DX-100U Tx, **£30;** AR88LF, **£30;** HRO Rx, **£15** or near offer. Carriage extra.—Bushell, GW3OSV, Park East, Clarbeston Road, Pems., West Wales.

SELLING: KW-2000B, complete with AC/PSU, nice condition, **£150.**—Hurst, 31 Avondale Road, Fleet (5831), Hants.

SALE: No. 46 Sets, Tx/Rx, coverage 3-9 MHz, brand new in maker's carton, complete with carrying case, headphones, mic., and aerial, **£11** each or **£20** a pair. Two-metre FET pre-amps run in cascode for low noise and high gain, built in aluminium case 3-in. by 2-in. by 1-in., 9/12v. negative earth, 12 dB gain, **£2.50.** Two-metre FET converters, conversion gain of 18 dB. 28-30 MHz IF only, 9/12v. negative earth. **£8;** MW to Top Band converters, ideal for mobile, **£2.50.** Tx's and Rx's built to instructions at reasonable cost. All prices include carriage.—Godwin, 10 Windmill Hill, Saltash, Cornwall.

SALE: Redifon R.50M marine receiver, coverage 13 kHz to 32 MHz in eight bands, with speaker and PSU. **£80** or near offer.—Stott, 241 Holyhead Road, Coventry (593216), Warks.

FOR SALE: Complete amateur television camera and units, comprising: Marconi 405/525/625 commercial TV studio equipment, at present in use, with shift supply, scan generator, picture monitor, waveform 'scope monitor, control panel, video amplifier, gamma match, two power supplies, camera with complete duplicate spare units and one SPG, can be seen working anytime, first offer of **£100** secures. Requires 10 cwt. van to collect.—Jones, G5ZT-G6ABC/T, QTHR. Tel: 0752 776552 (Plymouth).

WANTED: Small automatic rotator; also oscilloscope, suitable as tuning indicator, only.—Coldwell, 172 Bradway Road, Sheffield, Yorks., S17 4QX.

SELLING: KW-2000 with AC/DC PSU, very good condition, **£120;** Pve Base Tx with '640 PA, modified, working on 2m., **£25;** two-metre transistor converter, IF 4-6 MHz. **£5.** Can deliver reasonable distance.—Cator, G4AED, 72 Vicarage Walk, Watton, Thetford, Norfolk.

WANTED: Koln E-52B receiver and/or spare parts, units, valves. (N. Ireland).—Box No. 5129, Short Wave Magazine Ltd., 55 Victoria Street, London, SW1H-0HF.

FOR SALE: FL-2000B linear, perfect condition, **£115;** FT-2FB with AC/PSU, hardly used and as new, **£95;** Collins 312-B4 control unit, good condition, offers?—Kendrick, G3RDW, Long Drive, Roman Road, Little Aston, Sutton Coldfield, Warks.

SELLING: New K.W. Atlanta, separate VFO, perfect condition, only 5 hours' use (through illness), **£165;** Heathkit HW-12A 80m. transceiver, new, with mic., speaker, DC/PSU, 4 hours' mobile SWL use, factory aligned and tested, **£65.** Buyer to test and collect. Greater London area.—Sissons, 25 Southlands Grove, Bickley, Bromley, Kent. (Tel: 01-464 3646).

WANTED: B.2 transmitter/receiver, complete or sections thereof (transmitter, receiver, power pack).—Tee, G8UA, 33 Red Lees Road, Cliviger, Burnley, Lancs.

SELLING: KW-2000A DC/PSU, £25; Heath SB-610 scope, £33; K.W. Pepmeter, £6.—Thurlow, 25 Sandilands, Croydon, Surrey. (Tel: 01-654 2761).

SALE: Self-supporting mast, with nine 4-ft. sections, centre plates, pole and bolts, £30.—Skinner, 61 Dudley Road, Bedfont, Middx.

FOR SALE: KW-2000B with AC/PSU, perfect condition, £170; also DC/PSU and loading coils for G-Whip aerial, 160 and 40m.—Bates, G3DF, 99 Rodenhurst Road, London SW4. (Tel: 01-674 1881).

EXCHANGE: Pair of 28 MHz walkie-talkie transistor transceivers FOR home-built 2m. transistor transmitter gear, or W-H-Y?—Box No. 5130, Short Wave Magazine Ltd., 55 Victoria Street, London, SW1H-0HF.

WANTED: Trio 9R-59DS receiver, details and price please.—Taylor, 7 Long Meadows Drive, Lacey, Grimsby (71409), Lincs.

SELLING: RECEIVERS: Collins 51-J, coverage 0.5-30.5 MHz; Eddystone 770R, coverage 19-165 MHz; Converter, 36-1000 MHz. Silicon rectifiers, 1250v./1½ amp., 10p each; s.a.e. please.—Wright, 249 Sandy Lane, Hindley, Wigan (55948), Lancs.

SALE: UHF receiver, tunable front-end, with IF unit 1000 to 2600 MHz, and 2300 to 4450 MHz, £15, Avometer Model 7 test meter, £16.50.—Box No. 5128, Short Wave Magazine Ltd., 55 Victoria Street, London, SW1H-0HF.

WANTED: For SWL station at the "Star Short Wave Club," New Inn Hotel, Bramley Town Street, Bramley, Leeds 13, an Eddystone 888A receiver with speaker and S-meter, must be in mint condition, cash paid. Club meetings every Wednesday at 8 p.m., please call or write.—Leeman, G4BUU, 115 Ascot Drive, Seacroft, Leeds LS14 1HX, Yorkshire.

SALE: Creed 7B 'printer (80 + 80v.), £10. Teletype 15 'printer, with perforator, PSU, tools and manual, £20. Heathkit 10-12U 'scope, £15. AR-22 replacement motor, £2.—Quantrill, G3OPF, 10 Milford Avenue, Stony Stratford, Bucks.

CLEARING SHACK: Signal generator, No. 6 'Scope, Test Set Type 102, "Command" Tx and modulator, T.U.5B type tuners, RF-27 for 24 to 25 MHz, two-metre PA (metered), HRO coil packs, audio amplifiers, one-inch and 5-in. CRT, VR-97 with time-base, 3BP1, CRT for 339, and other items, all in good condition. Offers?—Ward, G3HBM, 7 Regent Street, Burnham-on-Sea (2152), Somerset.

EXCHANGE: AR88D, Trio 9R-59DS receivers and BC-221 frequency meter, all in good condition, FOR Eddystone 770R or W-H-Y VHF-wise?—Ring Bedford, Merthyr Tydfil 2786 (Glam., South Wales).

FOR SALE: R.C.A. HF sweep generator, with 115v. AC PSU, 5 to 70 MHz in three bands, £10. U.S.A. Bendix signal generator, 1-130A, 100 to 155 MHz, nice job, £10. Small oscilloscope, TS-34/AP, 110v. AC, in carrying case, £10. Valve tester, very clean, 110v. AC, £5. New 60-ft. telescopic tubular masts (U.S.A.), crated, £20. American Rx R361/GR, 230v. AC, coverage 225 to 400 MHz, xtal controlled, £16. Freq. meter BC-906D, £3. Diode test meters (1 mA f.s.d.) TS.268, in case, £1.25. PSU, 24v. AC, 24v. 36v. AC out, £1. PSU, 240v. AC, 12v. 2A AC out, £1. New 4CX250B's, £5. All plus carriage.—McCaig, GM3BQA, Woodlands, North Berwick, East Lothian, Scotland. (Tel: North Berwick 2519, after 7.0 p.m.).

Due to Warehouse Clearance we have a few low powered F.M. VHF Wireless Station Type A, A.F.V. No. 88. Contained in two units (1) Transmitter/Receiver, (2) 12 volt Power Unit and L.F. Amplifier. The Tx and Rx are contained in a waterproof diecast alloy case, using a total of 14 valves, operates on four switched channels which are Crystal controlled.

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SALE: Gonsett G-66B receiver, transistor PSU for 6/12v. or 115v. operation, £50. Heathkit DX-100U transmitter, £28.—Jones, G3PSZ, Millcombe Down, Northlew, Okehampton, Devon. (Tel: Hatherleigh 213).

SELLING: Panda "Cub" Tx, coverage 10 to 160 metres, new VFO, etc., as "Short Wave Magazine," price £12.50, buyer to collect.—Holloway, G2DGW, QTHR, or ring Waltham Cross (Herts.) 34275.

WANTED: Circuit or manual for Redifon R.50M receiver.—Fisher, 27 Malvern Road, Maidenhead, Berks., or ring Maidenhead 30068, evenings.

WANTED: KW-160, Codar A.T.5 or similar Top Band transmitter. Home-built or faulty unit considered.—Box No. 5132, Short Wave Magazine, Ltd., 55 Victoria Street, London, SW1H-0HF.

FOR SALE: Pye Ranger rig, consisting two mobiles and one fixed station, all working, price £20, buyer to collect.—Ring Pettitt, 01-590 3618 (Romford, Essex).

MAY Issue Short Wave Magazine due out on Friday, April 27. Single copies at 30p post free can be supplied to orders reaching us by Wednesday 25th, for despatch on Thursday 26th, the day before publication. These copies go out flat in an envelope, first-class posting. Orders with remittance to:—Circulation Dept., Short Wave Magazine, Ltd., 55 Victoria Street, London, SW1H-0HF.

SALE: K.W. 52-ohm dummy load, unused, £5; K.W. Ezee-Match, £3; Codar PR-30X preselector, £6; 19 Set variometer, £1; K.W. Atlanta, ten months old, little used as standby equipment, £160.—Caw, G4ALV, QTHR. (Tel: 01-460 3852).

FOR SALE: Eddystone EC-10 Mk. I receiver, good condition, £30. Buyer collects.—Ring Collier, 021-422 5196 (Birmingham), evenings.

WANTED: Ex-R.A.F. T.1154 transmitters, models K, H and M only; equipment less meters and valves acceptable. £10 offered, and £2 towards carriage. (Co. Durham).—Box No. 5131, Short Wave Magazine Ltd., 55 Victoria Street, London, SW1H-0HF.

FOR SALE: Brand new transistors: BCY-31, 20p; OC-84, 17½p; OC-139, 17½p; OC-200, 20p; postage and packing, 5p.—Page, G3KWC, QTHR. (Tel: Stamford 4012).

SELLING: BC-221 complete with charts, £18; RA-1 Rx, without case, £10; "Cannonball" SSB exciter, £15. Also PA valves and junk. Will haggle.—Ring Rees, G3SRR, 01-573 4951.

SELLING: Heathkit DX-100U with manual, £35; Codar A.T.5 with 250 M/S mains PSU and home-built 12v. PSU, £20. Can deliver up to 50 miles.—Field, G3XTT, QTHR.

SALE: Eddystone S.750 receiver in good condition, £40 or near offer; Trio TR-2200 Tx/Rx, FM 6 channel, £50 or near offer.—Kemp, G8CWZ, 28 Croft Avenue, Richmond, Yorks.

SALE: New Trio 599 "Special" communications receiver, owner going abroad, used one hour only (cost £185), bargain at £145.—Ring Howard, 01-693 8775 (after 6.30 p.m., Mon-Fri.).

OFFERING: Pye "Cambridge," six channels, also Pye base station. Both in good condition and with crystals for 70-26 MHz. Offers, please?—Burgess, G3VPT, QTHR. (Tel: Norwich 898715).

SELLING: Nos. 19 and 52 Sets, both with PSU, £9.—Small, 23 Butts Way, Norton Canes, Cannock, Staffs. (Tel: Heath Hayes 79367).

OFFERING: Labgear LG-300 transmitter, complete. Property of late G3NY. Offers invited.—Snowden, Swainsea Lane, Pickering, Yorks.

SELLING: Heath DX-60B transmitter complete with HG-10B all-band VFO and ceramic mic., all in excellent condition, £50.—Corper, G3ZQJ, 60 John Wilson Street, Woolwich, London, S.E.18.

SALE: Mosley Mustang three-element beam, fibre-glass protective coating, assembled but unused, £30.—Fell, G3LIQ, QTHR. (Tel: 0482-500020, Hull).

SELLING: Heath SB-610 monitor 'scope, mint condition, £35; Home-built mobile PSU, suit HW-12, £10; home-built Codar A.T.5 with mobile PSU, £10.—Linney, G3VQL, QTHR. (Tel: Shrewsbury 51733).

OFFERING: New Lafayette five-band AM/CW/SSB communications receiver, with Trio speaker, £35 or near offer (list price £55).—Ring Waters, Stoke Fleming 447 (Devon).

FOR SALE: A few dash-mounted High-Band Rangers, modified for two metres, cases re-sprayed as new, without Tx and first oscillator crystals, complete with mic. and cradle, £7 each. Carriage 75p.—Burgess, G3VPT, QTHR.

SALE: Skywood communications receiver, as new, boxed, £18 or near offer.—Fife, 65 Fountainhall Road, Edinburgh. (Tel: 031-667 3540).

SELLING: Pye AM-10B/V Cambridge, high-band, clean condition, working, ideal for conversion to two metres, less accessories, £16. One six-channel set, £18.50. Carriage paid.—Ring Jackson, 061-792 1214, ext. 21. (Manchester).

SALE: Yaesu Musen FR-DX400 receiver, with 100/25 kHz calibrator, absolutely mint, little used, £95; Hamgear 160m. converter (converts from 7 MHz), brand new, £7; Collins mechanical filter Type F.455Z1, 2.7 kHz bandwidth, £8.—Hough, G3XTN, 55 Fishponds Road, Kenilworth (56828), Warks., CV8 1EY.

WANTED: For RTTY: Terminal unit ATM type FSY.1.1 (AP.10038) and PSU, or similar type terminal unit.—Lumb, 4 Rydall Street, Leeds LS11 9LF.

EXCHANGE: KW-202 with speaker, calibrator and manual, 8 months old FOR Hammarlund HQ-180A or HQ-170A. Must be in good condition.—Ring Gower, 01-595 6792 after 6 p.m.

WANTED: Pye Pioneer service manual, buy or borrow.—Reiss, 34 Nursery Lane, Moortown, Leeds, 17. (Tel: 0532 683884, evenings).

SELLING: Swan 350 transceiver with PSU and VFO-410, £140; HRO-500 solid-state communications receiver, coverage 5 kHz to 30 MHz, £350.—Ring Gale, 01-998 2337.

FOR SALE: FR-100B, good condition, excellent performance, £70; BC-639A with matching PSU, 100-155 MHz, £15. Buyers collect. Emsac receiver ATU, as new, £4 post paid.—Burton, 159 Redworth Road, Shildon, Co. Durham.

SALE: Hammarlund SP-400X communications receiver, coverage 1.25-40 MHz, £39; TF-144G, £12; TF-948, 20-80 MHz, AM/FM, £12; TF-885 video oscillator, £19; 1000 pF disc ceramic capacitors, 25 for 45p.—Whitbread, G8AYN, QTHR. (Tel: Crayford 24625).

SELLING: KW-2000B with AC/PSU, manual and Shure 201 mic., 8 months old, little used, £170.—Stenhouse, G3MAY, QTHR, or ring 01-808 0197.

CLEARING WORKSHOP: 60-watt CW transmitter, built-in PSU, £8; 150-watt amplifier, £4; 19 Set, £6; PSU for 19 Set, £4; Avo valve voltmeter, Type CT-38, £15; Collector's item: 1929 (approx.) Osram "Melody Master," offers? Other items. s.a.e. please.—Caid, 24 Hill Street, Tillicoultry, Scotland.

SELLING: National NCX-5 Mk. II with NCX/A PSU, as new, £175; Solartron D-300 scope with service manual, £17.50; Pye PTC-2007, Tx working on 144.30 MHz, tunable Rx, 15-watt AM with mic., £10; 4m. mobile transceiver, 3-channel Tx, tunable Rx, 10-watt AM, with T-17 mic. and separate PSU, £15. All "or near offer."—Moxey, G3MOE, 11 Westbury Road, Cheltenham (0242-24217), Glos.

SALE: KW-2000A with AC/PSU, handbook, mic., spare valves, SWR bridge, RF indicator, good condition, £165 or near offer.—Leach, G4AMZ, 27 Grosvenor Road, Heaton Moor, Stockport, Cheshire.

SELL OR EXCHANGE: R.209 Mk. II Rx, 12v. DC, all amateur bands, good condition, £8.50 carriage extra. Call or write.—Page, 20 Allen Street, Maidstone, Kent.

SELLING: Unmarked 898 dial, £4.50; Joystick and 3A tuner, £8.50. Rotary coil, 50p; Sinclair Q.16 hi-fi speaker, 8-ohms, £6; Eddystone power pack, 6v. to 250v. at 85 mA., £3; Offers invited for 1968 to 1972 RSGB "Bulletins" and approx. 50 copies "Short Wave Magazine."—Garlick, 135 Rookhill Road, Pontefract, Yorkshire.

FOR SALE: Heathkit HW-17A 2m. transceiver and HW-17-1 mobile PSU and HWA-17-2 FM adaptor, with 5 crystals and handbooks, £60; Pye AM-10D Cambridge High-Band, as new, £30; U.S.A. VHF Rx Type R2/ARR3, 13-valve superhet., £6; DL6SW converter, IF 28-30 MHz, £6; Cavity Wavemeter Type TS-184A for 70 cm., with PSU and manual, as new, £7; Heathkit Apache Tx, 80-10m., with SB-10/U SSB adaptor, no mods., with manual, £55; Rx/Tx Type RT/34/APS13, for 70cm., £3; Digital adding machine, 9-face readout, working and modern, £20. And some two-metre items, s.a.e. for details.—Sheedy, G8EWO, 24 Thornwood Road, London, SE13 5RG.

SALE: Murphy 960D VHF Tx/Rx, dash-mounted, AM, 12-watt output, partly transistorised, very clean condition, £12; Murphy 320 VHF Tx/Rx, dash-mounted, AM, 6-watt output, good condition, transistorised PSU, £8; Murphy 801A VHF Tx/Rx, dash-mounted, 6-watt output, vibrator PSU, £6; Murphy 801A less PSU, £4.50; all complete with battery leads and mics., suitable for conversion to 2 or 4 metres. Murphy base station, Low-Band, AM, 320A final, with mic., £15; Cambridge AM-10B Low-Band, complete with control box, mic., speaker and cables, very clean, £22; ditto High-Band, £25; Cambridge mounting brackets for dash or boot models, £1. Carriage extra.—Dickson, GM3DIE, 91 Milton Road West, Edinburgh 15. (Tel: 031-669 1416, after 6 p.m.).

SELL OR EXCHANGE: Lafayette HA-600 receiver, little used and in good condition, £30 or PART EXCHANGE for JR-310.—Ring Longshawe, Banbury 4218, office hours.

SALE: Telford Communications TC-7, tunable IF 28-30 MHz, with matching two-metre converter, recently overhauled, £33 or near offer.—McCartney, 1 Lockhart Place, Hawick, Roxburghshire, Scotland.

FOR SALE: Hallcrafters SX-16 receiver, coverage 550 kHz to 61 MHz, with xtal filter, BFO, etc., spare valves and handbook, £15. Two-metre valve converter and pre-amp, IF 4.6 MHz, £6. Bantex 2m. 3-wave whip aerial, £2.—Taylor, 30 Cavendish Way, Mickleover, Derby.

FOR SALE: Service Sheets, 1946 to '56 era, about 2,500 in all from "Trader," "Trading," "Radio Retailer" and manufacturers, in spring back binders with Newnes 1952 Manual, £40 or near offer. Also 100 obsolete valves, 1946-'56, 2v., 4v., 6v. and "universal" types, new and unused, 10p each. Buyers to collect.—Bingham, 9 Beechwood Avenue, Tilehurst, Reading, Berks., RG3 5BJ. (Tel: Reading 28494).

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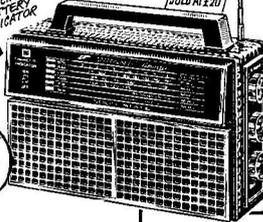
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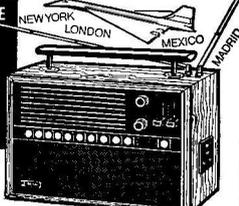
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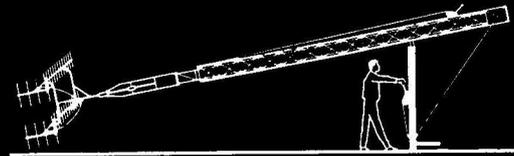
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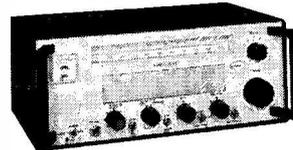
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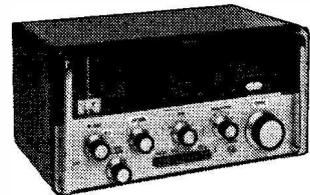
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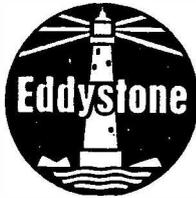
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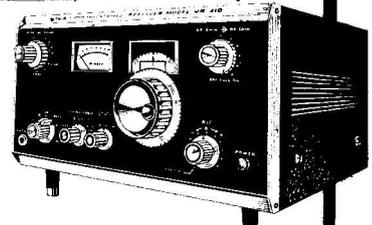
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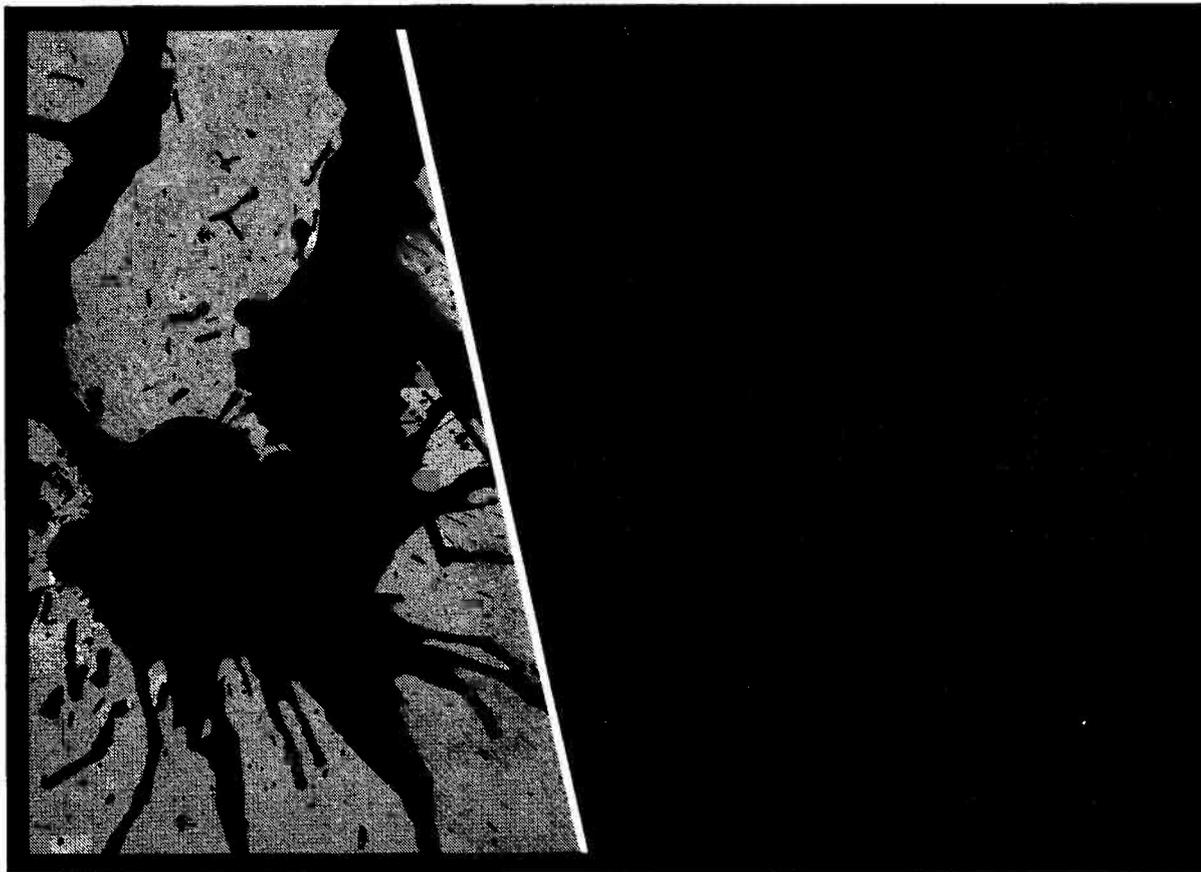
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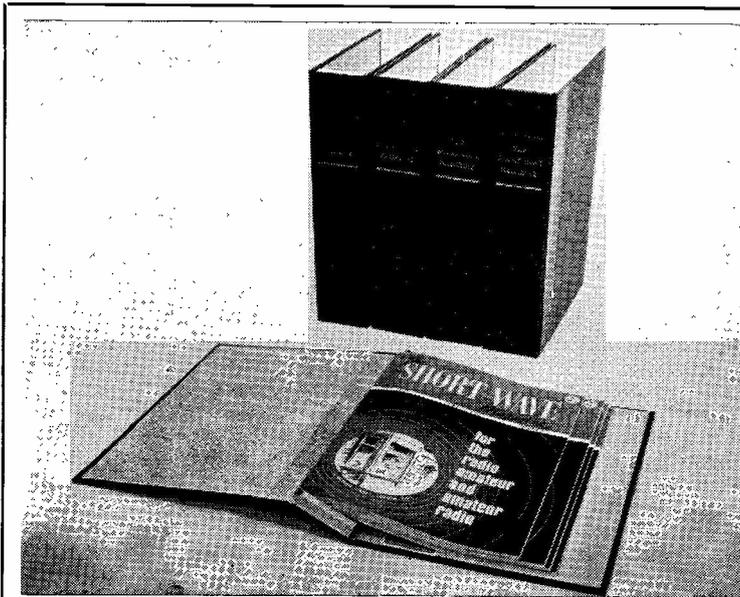
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