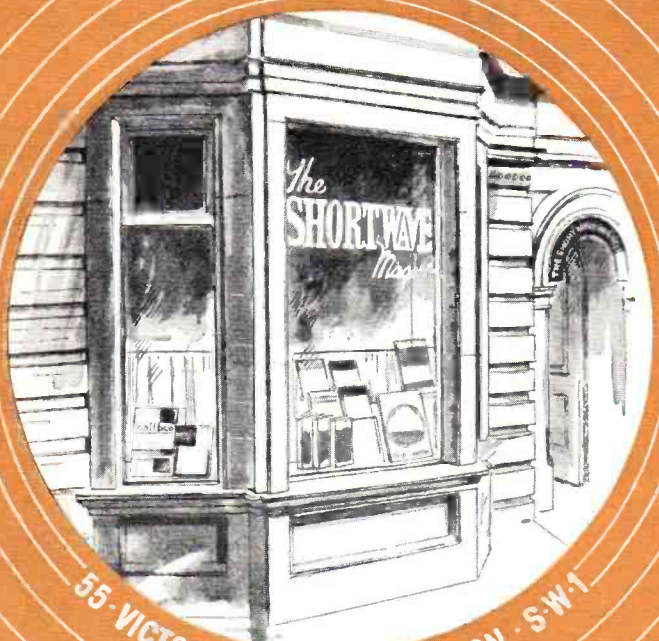
The SHORT WAVE Magazine

25p

VOL. XXX AUGUST, 1972 NUMBER 6



for the radio amateur and amateur radio

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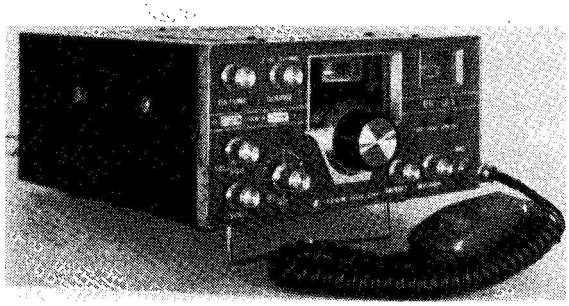
2m. Converter. We stock a very nice 2m. converter designed and manufactured by Sim, our Northern Representative. It features a dual gate 3N159 r.f. amp and dual gate 40602 mixer. It requires 12v. d.c. and the I.F. is 28–30 MHz. Quite honestly, I don't think you'll find a better converter at the price, **£13·50** plus 15p postage.



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All transistor 25W input 2m. FM transceiver, fixed station or mobile.

Power supply : 12–13·5v. d.c. (negative earth) or 234v. a.c.

24 channel : 144·48, 144·60 and 145·00 fitted as standard, but other channels available.

0·4 microvolt for 20 dB quieting. Adjustable deviation, built-in SWR meter, RIT. Complete with PTT dynamic microphone, **£120.**

IC-21 VFO **£30.**

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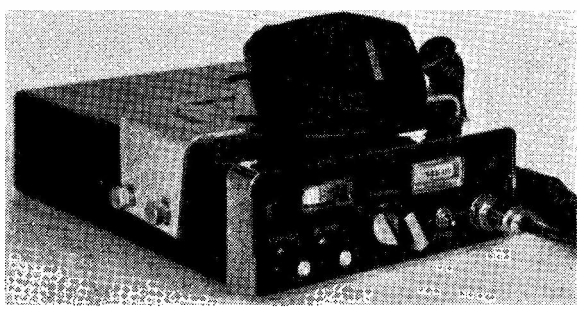

There is no doubt that this mobile FM gear is becoming more and more popular. Quite rightly, so because of the advantages of FM. Lack of TVI, broadcast quality speech (except the nit who shouts into the mike of course !), noise-free reception, etc., etc. The fact that they are crystal controlled is not the drawback you might expect—they all use the same channels and hence, wherever you are, you have every chance of working someone with similar equipment. The IC–20 and FT–2F are small enough to fit in any car without major surgery and are the complete answer for a compact mobile rig at a reasonable price. Any of the above can be fitted with an extra internal AM detector incorporating its own I.F. and A.G.C. system for **£10** extra.

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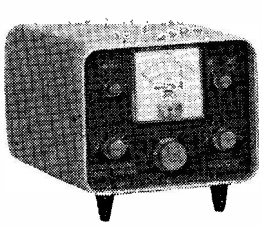

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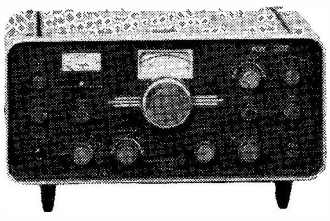

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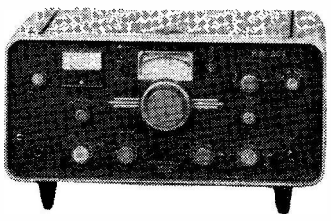

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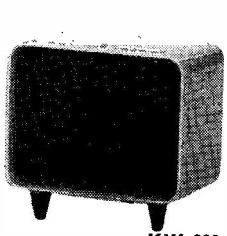

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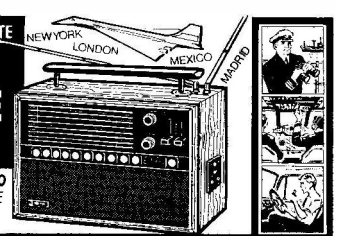

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SHORT WAVE MAGAZINE

(GB3SWM)

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CONTENTS

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FOR THE RADIO AMATEUR AND AMATEUR RADIO

The SHORT-WAVE Magazine

EDITORIAL

Communication

For about 25 years—and it is now just 35 since SHORT WAVE MAGAZINE first appeared—we have laid stress, and conditioned our policies, upon the fact that the motive force in Amateur Radio is the desire to communicate—be it "across the parish or across the world." Radio amateurs as individuals may have other hobby interests, even some outside radio altogether, but in the great majority of cases they become licensed in order to go on the air.

Years ago, going on the air meant starting up with CW on what are now the DX bands, with phone working as very much a secondary consideration. In fact, in some circles it was considered not quite the thing to use telephony at all unless you ran a large station (itself thought a little vulgar) avowedly designed and operated for phone working exclusively. The normal ploy was to work CW, the DX contact being asked "stand by while I try my phone" only if conditions seemed good enough to make the test worth while; after making the phone transmission, the sending station would revert immediately to CW, before going back for the report; whether or not the DX station copied the phone was incidental to the fact that communication had been established between the two stations.

What, you may reasonably ask, is the point of all this? Nowadays, you could say, things are quite different. Most people start up on phone and, anyway, with the CW and phone band areas separated, "tests" of the sort they used to do years ago are no longer practicable. Either you are on CW or you are on phone, only a minority of operators being organised to work both as a matter of course.

Which, in fact, makes our point: That there should be far more CW worked by U.K. stations on all bands, Top to Two. So far as DX is concerned, on any band CW is an easier and more reliable—and nearly always a faster—means of communication than phone. It is also more economical, in terms of equipment and frequency-space, than telephony; and it calls for the sort of operating skill that has a fascination of its own.

With the conditions now prevailing on the HF bands, the effect of congestion would be reduced, many more solid contacts made, and much more DX worked if there was a return to the idea of CW as a principle, rather than regarding phone as the norm.

Austin Forsyth, G6FO.

WORLD-WIDE COMMUNICATION

COMMUNICATION and DX NEWS

E. P. Essery, G3KFE

FOR the current month we have had a letter from G3ORP (Maidstone) to say he has been forced to QRT by threats of *physical violence* and damage to his equipment by a person who claims to suffer TVI but will not allow anyone in to see this phenomenon. No—not G3ORP, not the Rediffusion engineer, not even the GPO. He goes on to say that he will enforce G3ORP's close-down by "other means," whatever that may imply—apparently throwing stones at the shack window is about the size of it.

This misguided, demented creature is not really to be blamed. After all, for thirty years we in this country have been doing all we can to foster the impression among the more idiotic of our population the idea that by combining forces you can ignore the law of the land and substitute for it the law of whatever mob you happen to have at your beck.

But—and this is the terrifying part of the whole business—the man, who has set himself as above all law, and calmly makes all sorts of threats, *is allowed to get away with it*! Yes, in the wrong though he be, not a single one of the stems of law and authority who are involved is prepared to move—not the local GPO who want a form which the man won't fill in, not the Rediffusion company whose equipment is generating the trouble (as far as can be seen) and who just don't know how to start dealing with their problem, nor the police who consider that in throwing stones at shack windows the man is not yet going beyond the bounds and causing a breach of the peace. Not one of them.

Isn't it about time that every amateur in this country rose up in wrath, threw his filters out of the windows and said "To hell with the neighbours—if they get TVI this week, hard luck; let them refer their boxes of electronic junk to where they belong—in their maker's Design Query Departments." Perhaps if someone wrote to the daily press, and named a day for such a protest, between us we would wipe up every TV in the land! How's that for *us* being lawless, for a change?

The Bands

Thunder static, S9 rain static, gardening, decorating, and flat bands when you do contrive to escape to the shack, about sums it up this month—oh, and you could add, for the writer at least, that when he did manage to hear anything worth working, it would not come back to his call! But never mind, it's all in the game, and it will soon be autumn, when things perk up to their best.

DA/DL stations could well note a letter which has come in from DA2YO (R.A.F. Wildenrath). Don says that a "British Forces Germany" net is beginning to blossom, with, already, a dozen joining in; he wants us to ask anyone else who is in the right category to fire up the rig on 3765 kHz, plus or minus the QRM, on Wednesday evenings at 1900z—and to invite also those who expect to become holders of DA calls in the near future. It sounds a fine idea, and worthy of support.

Ten Metres

Sometimes "damned with faint praise," sometimes treated as a local-natter band, and most times just plain disregarded.

G3LEQ (Knutsford) last reported about ten years ago from Tunbridge Wells, and has since then spent a period in GI. He has now kitted himself out with Yaesu FL-DX400, and FR-SDX400, with one of Hygain's 18-AVT/WB aerials; at the time of writing he had been steering this machinery for just eighteen days. On Ten, there were contacts with SM3KL and DJ3OC in a short-skip opening, but since the band has been so flat, Gordon has been trying to arrange a local net on 28·6 MHz.

It can't have been *too* dead, though, because 9M2DQ (Penang) mentions in a letter that at the end of June he had, on the two previous days, been working G's again on Ten. although 21 MHz had been much affected by fade-outs.

G2DC (Ringwood) has the opposite state to report—he has checked Ten often, but did not once find an opening, which must be the first time Jack has not worked something on 10m. since your conductor started writing this piece.

Not all are defeated—G3RFG (Lower Stondon) has been on at the right times, which means he has exchanged CW reports and details with CT1VX, DJ1ZT, DL1GN, DL7DH, DM4WER, EA2IK, EA3WQ, EL2CU, HB9ASZ, HG1KSO, HG5CF, I1KTC, KP4DHD, LA6B, LU3AU, SM's, UA's and VK6SA, not to mention gotaways such as LU2ECO, LU8BAO, PY1BTX, PY2EWF and VK3AZY. Incidentally, Stan reckons the reason he failed to connect with these last had nothing to do with conditions, but much to do with aerials.

Eighty

Now, here's a band! Your conductor came up on 80m. an hour or two ago, to look for the DL/DA net mentioned earlier, but found them nicely buried under splatter. Now, later in the evening the frequency is occupied by a group discussing the G3UGK argument last month on the relative effectiveness of Beams and Linears—but apparently without having read the piece, and certainly without knowing either your scribe or G3UGK. But that's not all—G3KFE has been listening for twenty minutes to them, they are all umpty-over S9, and he still cannot tell you what the call-signs of the group were. Why—because only once have they signed, and then so fast as to make sure no-one could ever copy all three calls!

G3RFG braved the CW end, and his only reward was a gotaway, CX7BBX. Otherwise—*Nix*. A somewhat similar situation faced G2DC; the usual early-morning W's,

but so much QRM and QRN that it was not worth trying to work them.

G4AFJ (Nottingham) was one of the lads who actuated C31FA and, interestingly, he also managed a QSO with C31EF on Twenty, which must be somewhat of a record. On Eighty the pile-up had to be heard to be believed, and many Europeans were worked, although oddly enough Forty proved a bit of a disappointment.

A short note from G3ACR (Burton-on-Trent) advises that his annual foray on Eighty as GD3ACR/P will be from August 11 to 21, using CW only.

One of the country's senior citizens is happy in his retirement; G4APH (Padiham) saw and bought a copy of SHORT WAVE MAGAZINE five years ago, and was reminded of the fact that he was pounding brass forty years ago. When he retired, he went back to school again, passed the R.A.E. in May 1971 and is now happily on the air with an AR88D, and a KW Viceroy, some of the local lads having hung up a 120-foot wire for him. Now, he is paddling round Eighty of a morning, and enjoying the fun—he has already met several other pensioners on the band. G4APH is on the 69 mark in years—so we can wish him many happy years of Amateur Radio and, if he chooses to go for it, all the DX in the world.

Clanger of the month, once again, sighs G3DCS (Ipswich) who this time managed to load the rig up on Eighty into the 14 MHz dipole—moral, check the VSWR *before* the CQ! As if that were not enough, the G3DCS scrawl is wobblier than usual this time—he was sharing the table with a YL using an electric sewing-machine, to give his note a bit of vibro-massage treatment. Not to worry, we can still read it.

Forty

The mind boggles!

Nonetheless, this is not such a bad band as many people make out; there is DX there to be had for those who can drive their machinery to its best advantage or have an attenuator in front of the receiver. The latter tool is in use for listening sessions at G3KFE, ahead of the old 888, and it certainly does help to dig out the DX, both on CW and SSB.

G3RFG tackled 40m. in his usual style, and from the noise and fury

Torbay Amateur Radio Society station G3NJA/A on the occasion of the recent Torquay Trades Fair, when G3UIQ (Mary Yates, the Fair Queen) was working a PY who said he'd never before had contact with a queen! Others in the picture are G3GDW, G3LHJ and G3VTQ. In Amateur Radio terms this is a picture of exceptional interest—a YL operator, licensed in her own right, who also qualifies in the beauty queen context!

winkled out K4YKZ, KP3DLW, VE1ASJ, VE3GBK, W1EWD, W1HRJ, W2GOW and W3CFJ, all on the key, of course.

Things were none too hot on Forty, opines G2DC, who found plenty of W's during the 0530-0700z period, and one bonzer in the shape of LU3AU, with a twenty-over-nine signal; it transpired that he was using a kilowatt to a dipole at 150 feet, which accounted for the size of signal. In terms of QSO's, on CW, it adds up to LU3AU, PY1ADE, PY5OS, VP2SU, all W call areas, VE1-3 and VE7.

We have already mentioned G3ORP's troubles; but during the month before he was forced to QRT, he worked K1LBB, K2YXY, K8NCS, WB4NNO, WA2COO/1, ZL3IS, CX9BT, W4ATE, K8HLR, VE3ENK and WB2PBO, all with 569 reports or better.

G4AFJ, in discussing his Andorra trip, mentions that the lads received many requests to QSY for contacts on 7 MHz, but the results there were rather disappointing, not many successes being registered.

Although he has been licensed since back in 1968, for various reasons, G3XWK (Hastings) is only now becoming operational on the air—let us hope the length of the wait was worth the effort!

An inverted-Vee at 45ft. is used on this band by G3VLX (Chislehurst), and has shown signs of yielding results, to the point where Deryck found himself being called by the DX. This delightful situation, with CX2AX, did not result in a QSO, though, as an I8 station took umbrage and sat on the frequency insisting on a QSO with G3VLX and drowning out the CX in the process. There were a few consolation prizes to be had though, such as 9H1BX, CR4BC, UB5EC, PY1CAD, UA1IG, UA1AAW, LX1SM, ZS1MH and WA9OTH/P/TF. All around 7085 kHz and all SSB.

Not one but two OHØ stations appear in the log from G2HKU (Sheppey) in the shape of OH2BMF /OHØ, and OH2XM/OHØ.

Only one early-morning stint is reported by G4AMT (Penzance) this being partly to let G4AMJ catch up, and partly because most days the weather and sea conditions were good enough for fishing! That one morning accounted for K2UME/4, W3AX, K8HUT, W2GOW and CO2DR.

G2NJ (Peterborough) brings up a valid point when he says there is good work still being done on Forty with low power—he cites recent contacts, all hundred percenters, with G2BUL, G3UNC/P, PAØRCH and ON4TA, all using less than one watt. Indeed, your conductor seems to recall

ON4TA, who has been around since 1923, as being worked from the club station at the salt-mine, one lunch time when he was running 150 *milli*watts, swapping 589 both ways to make our 150 watts look somewhat ridiculous!

Now Top Band

G3ORP first, and he seems to have concentrated on DX in the more accepted meaning of "outside one's own continent" with such contacts as VE1ZZ, VP8KF, EL2CB and five QSO's with PY1DVG, all in the latter half of June.

GW3QN's M. & G. transceiver seems to have been giving a reasonable account of itself, at least in the realm of counties worked, on CW and SSB, as the entry in that table shows.

On to G3YMH (Staines) who is now, at least for a few weeks, released from durance vile at Cambridge, and so is able to operate a little more. For him, the best part of the month was the earlier days, when ZP9AY and PY1DVG were worked, although EL2CB, KV4FZ and EP2BQ managed to get away. On the more domestic scene, Ron has much favourable comment on the signal from GM3VPE/P in Skye, who were strong enough in Staines to flatten the static.

The results are to hand of one of the more popular Top Band contests, that from Grafton Radio Society; it has developed from a local fillip to activity, into a national contest. For this time, we gather the winner was G3YUV, who entered all three modes—his SSB plus CW aggregate of 155 put him above G3UPV, with G3YMH chasing him hard in third place. A couple of OK's had very creditable scores in the CW leg.

G2HKU says "conditions have been bad,, because he has been occupied in the garden and with decorating!" That's about the best excuse for inactivity we have had for some time in this piece; but in a more serious vein, Ted did in fact manage to make a go of it on CW with GC3ZES/A, GM3FXM, GW3HGL/P, GW3XHG, and on SSB with GMVPE/P, GM3XVX/A, GM4BBL for Shetland, and PAØPN.

It is pleasant this time to note some new data in the Tables—if the competition gets to be active enough, who knows—old 'KFE may well be persuaded to fire up his electric bomb on the band and try to work out of his own country, or county!

Here and There

John Morris, G3ABG, writes from Cannock with a copy of the results of the popular WAB contest activities. The leader in the LF Phone section was G3ZSS, leading SWL being Bob Treacher. The HF Phone was picked up by SM4DHF, with S. Lowe winning the SWL side. The HF CW went to G8KU, with no SWL entries—sad to say. Then came the LF CW, won by G3SSO, the only SWL entry being from Tim Thornton. Already the preparations are going ahead for the 1973 contest—all the details on the WAB/HAB activity can be obtained from G3ABG, 9 Fairmount Drive, Cannock—but keep 'em short—the poor chap has up to twenty letters a day to deal with, as well as organising the thing *and* going to work!

The 1971 *CQ WW Phone* results "rush" looks interesting. U.K. stations appear in the lists on Twenty —congratulations G3FXB and on Eighty, congratulations to G3XVY. On Top Band, GM3YCB was first, GM4ANR/P second and GM3YOR sixth—the latter scored five times as many points as the top W, K1PBW! A fine effort by all concerned.

A couple of contests come up this time which are worth a look over. The first is the European DX, the CW leg from 0001z to 2359, August 12-13, logs to be in by September 15, and the Phone leg the same times over the weekend September 9-10, for which the log date is October 15.

The other one is the All-Asian DX CW affair, over August 26 and 27, 1000 to 1600z. All bands, swap RST plus your *age*, or RST plus 00 if a YL, multiplier based on the number of Asian prefixes. Contacts with KA's don't count. Logs to JARL Contest Committee, Central Post Office, Box 377, Tokyo, Japan. Include one IRC and addressed envelope for a copy of the results.

For the RTTY merchants, the BARTG RTTY contest falls on the weekend between the ones already mentioned, namely August 19-20, 1500z to 1800z. Details from Bo V. Ohlsson, SM4CMG, Box 1258, S-710 41, Fellingsbro, Sweden.

Talking about RTTY, we have to hand some results from the BARTG Spring Contest, in which the U.K. was represented by eight stations, out of a total entry of 83, scattered over all six continents, and including such as YA1OS, who at times found his AC line in Kabul going down to 100 volts from 220!

Twenty

One could wish the "Eye Wans" would stop "doing their thing" all over the DX, as well as hoping the creepy-crawlies will go away; but, QRM or no QRM, this is where most of the action is.

Your conductor has obtained

BRIEF DX DATA

Call	Details
AC3PT	14277 kHz, 1416z. QSL to address in *Call Book*. Is is believed VU2IRA may be in AC3 soon.
TT8AC	Will be QRT throughout August.
XW8EV	Marc, reported on 14, 21, 28 MHz CW — try 21 MHz around 1130z. QSL *via* K3NAS.
YK1AA	Twenty SSB around 0800 and 1800, 14120 and 14290 kHz.
ZS2MI	New operator, Jacky, usually around 14225 kHz, at 0600 and 1400z. Has also been heard on about 3795 kHz from 2330z, working into Europe; QSL *via* ZS6LW.
VP1JP	August 12, hopes to be on from Ambergris Cay; try 14170 kHz, around 2300z.
HM1EJ	Park, QRV 21220, 21300 kHz around 1700-1900z, looking for SSB contacts with GC, GD and GI.
VA	VA2VO, QSL *via* W2GHK; VA6NC, via Box 5986, Postal Station L, Edmonton, Alberta. VA8RA is VE8RA.
FO8DM	Society Islands. Mano is on Huahine Island; try 14110 kHz around 0600. QSL via FO8DF, Boite Postale 1825, Papette, Tahiti.
SU1MI	YL Moona, on 14036, from 0200-0400 daily with slow CW. QSL *via* W3HNK. She looks out for W's, 14032 kHz, same time at weekends.
TL8DG	There is a phoney about, giving correct name and home QTH for QSL's—the real TL8DG is presently TR8DG.

much quiet amusement sitting on and around 14195 kHz of an evening, just listening to what goes on, and trying to see how one could break in and work one of the DX stations without apparently giving someone else heart failure. But we are assured it *can* be done.

On a slightly more serious note, G3LEQ reports on his first sight of things after a long lay-off. He logged SSB contacts with SV1CB, SV1KB, OD5GU, VE3BUV, YV4AAA, YV4GD, 9H1BX, and 9M2DW, while CW proficiency was maintained with loads of East Coast W's, and bigger loads of Iron Curtain types, including UY5PR, UW1DB, UP2BAO, UK6LAA and UK1CUA—as Gordon says, not very interesting *per se*, but the reports are good enough to give him the hope that he will be able to raise the DX once he hears it.

G2HKU spent little time operating this month but he did manage to work W7ISG (for Nevada), HP1IE and K4II/KH6, all on CW, while W7RS in Oregon succumbed to his SSB's seductive tones.

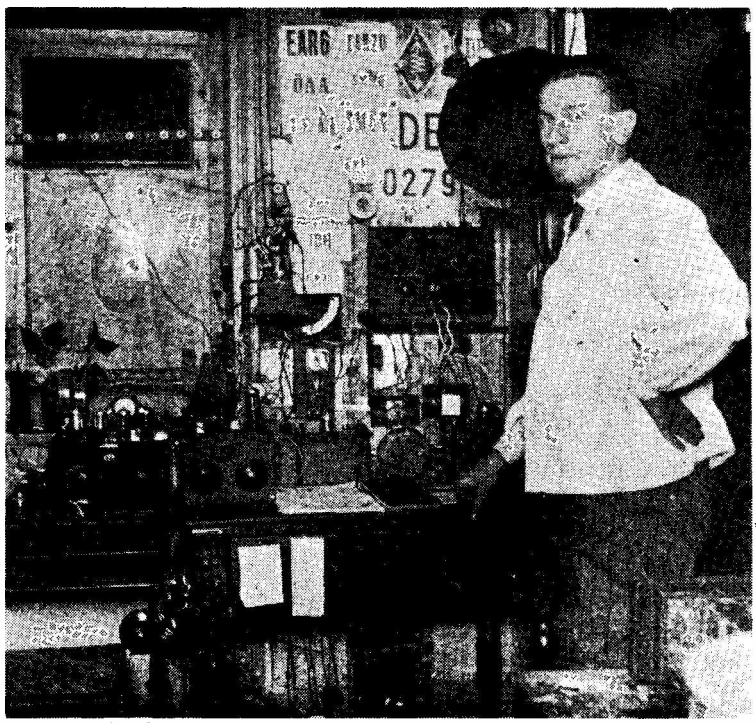
G2DC found 20m. somewhat patchy, and comments that we are now almost at the end of the Central Pacific stations for the time being, till they reappear around and after the Equinox. The CW method was in use, even though those screws persist in making a nuisance, to make contact with such as FO8DR, HP1IE, lots of JA's, K4II/KH6, KH6IJ, TI2PZ, VK2-7, VK8ZZ, YN1CW, all W call areas, VE1-7 and 5W1AK.

Twenty for G3RFG meant contacts with, for example, K7AKW, OA4AHO, SV1HA, UL7JAC, VE1UL, VE3AHB, VE6ARH, VE7AIJ, VE7CH, VK7CH, WØBC, W2CDU, W4GCW, WB4ADT, W5ISF, W5JML, W6DJW, WA6CXK, W7SF, W7YF, W8TAI. W8WCZ and W9UET, with a couple of gotaways in HC1HV and YV6NQ.

As for G3DCS, he is living in hopes for the coming month, when he will be at home on holiday and so able to play wireless rather more; but for this month, he settled for CW to UV9PG, various W's and PY2FCA, with SSB out to UR5OE and ISØBUP.

Quite apart from his rhombic farm, W6AM is very active with his kilowatt of CW from the car, in which mode he is up to 188 countries worked. As a sample of his /M we may mention that he has had recent contact with ZM2AFZ, KL7HEI, UK2LAB, VE3EU, CX5RV, XE1WWE, G2PL, VK3XB, UAØXAD, DLØGBG/P, DLØKO/P, DLØBS/P, F9RO, G6ZO, UKØZAD, FB8XX, SM2BYC, FOØRV, TI2CF, G6BQ, JA8BZL/1, KA6EWO, LU6EF, SM6CNX/MM, HP1IE, VK2AGI, KH6FLC, YJ8RJ, K6RA/M, JH1DJD, W7IE/MM Region 2, LU6FA, YV5BZ, CE2RF, ZL2IR, UK1ABA, SM5BNX, VP9GO, VP9AF and KB6DA. On a rather different note, W6AM recently went to Minneapolis and met some of the leading DX men in that area—such as WØHP who has a full 7 MHz Quad on top of a hill; and WØHZ with a beam on a 125-foot pole, which covers as well as the usual three bands, 7 MHz, 144 MHz and their six metres.

Twenty SSB is a *forte* at G3ZPF (Dudley), and he seems to have had no mean degree of success, reporting as he does contacts with UR5OC, OD5CX, OD5GU, OD5FH, HRIXAP, 4S7AB, 7Q7BC, FC2CF, 4X4BS, IC8CQF, LG6LG, LZ9ØD, 5Z4NC and PZ1DR.



Another old timer picture. The station of Oscar Zinser, DL1CJ, now of Wilhelmstrasse 6, 7547 Wildblad, in the New Forest area of West Germany, as it was in 1924. At that time his c/s would have been in the D4-- sequence, as then allotted to German amateur stations. In those days, "wireless" always meant a rat's nest of connecting leads without any regard to appearance!

Nice to hear again from G3ZAY (Orpington) who is at the time of writing giving his Quads a going-over, both as preventive maintenance and to get the VSWR down to a more civilised figure than 5 : 1. Before the aerials were dropped, though, contact was made with G3MUL/CE3. 9M2DQ, ZL4IF, TI8PE, FR7AI/T, KH6HLK, W's, various stations in the Caribbean, 9K2AM and 9J2DT; heard but not worked was PQØMI.

The absence of G4AMJ (St. Ives), last month was due to the exams.—he reckons he had little enough time for eating and sleeping, leave alone hours in the shack! Never mind, when relief came, the rig fired up and activity commenced, contact was made with (CW) VP9GK, 9U5GBR, KP4DGE, FY7AI, PQØMI, 8P6AE, OH2XM/OHØ, JW5CI and XV5AC; the SSB tally looks like UK1ZFI,

Reporting the HF Bands

XE1QH, VP9GE, CE2FB/MM, LZ9ØD, PY's, JY9VO and ZD3D.

GW3ZQN bewails the fact that although his 90 watts input can get him anywhere within reason, he loses so many good QSO's half-way through, simply because the W has a local with a kilowatt who opens up at the other end of the band. Thanks to the release from O-Levels, Simon can now sit up late—so late, indeed that he falls asleep over the rig! But he has worked PZ1DR and EL7D, plus W's, and would have worked more if the W's and I's were restrained to QRP.

Back to 160

A couple of comments managed to be overlooked earlier on—G3XAP (Stowmarket) will be recalled as bewailing, earlier in the year, his inability to work out of Europe on Top Band. Now he has even more to complain of—since he worked his first W in January Phil has progressed so fast he only needs VK/ZL for his WAC on Top Band! He should complain!

A different sort of complaint is brought up by G2HKU, and that is the "thing" sounding a bit like a printer which is just HF of DHJ —it is strong enough to wipe up fully half of the PAØ allocation of 10 kHz in Top Band, and over there it is all of the forty-over-nine jumbo size.

Fifteen

Were you to have been allowed only one band a month, for the period under review, it is debatable whether one would not have been well advised to pick 21 MHz, as the best combination with low QRM, plenty of DX when open, and closed not too often. Let us now see what the reports make of it.

Considered overall, the band was poor, in the view of G4AMT, although Terry used CW with a will to work WN1, WN2, WN4, WN5, WA6FNB, W7SJ, WN7QWS, 5X5NK; and SSB accounted for W1, W5, W9, VS9MB, 4W1AF, 5Z4NR, 5Z4MO, ZS4LW, ZS6ARS, CR7FM and 9X5VA.

Taking the CW pickings first, from the report of G4AMJ, we find such as 9L1GC, JA, CT2AO, W1AW and other W's, KX6EB, OA5NBO, 9V1QK, UG6AD, 9J4LA/P, OHØMA, 5X5NK, 9J2, ZS6KT, WN1-4, WN8 and 9. The SSB clip shows SXØE/72, VS9MB, MP4MBB, UH8HE, WB2AQC/9G1, PZ1AK, 9X5NA, 5VZYH, OD5HF, JY6FC, MP4MBC, 9J2, VP9GE, 9Q5DX, VQ9R, ZD8JK, HC2DX/8, 5X5NA, 5Z4, 6W8AL, 5H3JR, VU2HLU, MP4MBQ, CR3RY, LU, PY, UF6VAA, YA1OS, EA8GK, JY9GR, ZD3M and ZC4RS.

G3ZAY has just one station to mention on Fifteen this month; but since it means that at last he can say he is WAZ it is quite important. Zone 23 it was, and JTØAE the chap who did the trick.

In spite of the rolls of DX other stations worked, G3ZPF was far from convinced. Indeed he says "the band was not worth a light, leave alone a CQ call!"

Not so G3DCS, who with his limited time resources must have a care to pick the good spells—he used only CW on Fifteen for CR4AG, VE3ALL, JA2INL, CE5FX, CP7GM and 9L1GC.

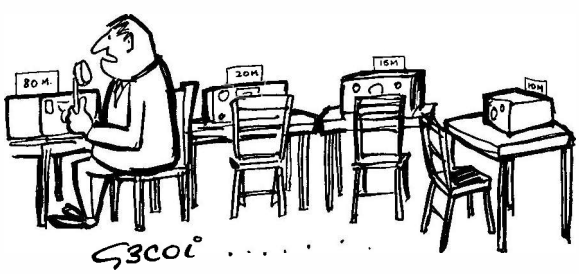
A particular point noted by G3RFG was the "thing"—believed in the nature of an electronic variant of a banyan tree—which seemed to be meant to be on 21·022, with whiskers every fifteen kHz plus 21·007 to boot, which blighted the band on June 30 all day. Not deterred, Stan carried on, and managed to key with JR1FVC, JA3NLF, JA7MUH, KØHUU, KØQIX, K6KQH, K6WD, K7PJF, WAØWZR, WA5NLF, W6FTQ, WA6NHD, W7GQI, W7GYF and W7QC.

G3LEQ, trying out his new gear, naturally worked a lot of Europeans, finding out what the aerial can do—but he did go out of Europe on SSB to work a few YV's in their contest.

Let G2DC have the last word about 15m.—he describes it as being patchy, and often not up to what the predictions would have led one to expect. Nonetheless, it was worth a look, which yielded FPØAA, HC2CK, lots of JA, JTØAE, MP4BHM, PY's, LU's, PJ8WP, VK9AP, VU2DK, UWØIX, UAØER, UKØCAS, ZP5AL, ZS6KY, ZS6KT, ZE6JE, 9L1JT, all W call areas, and VE1-7.

Linear or Beam

This discussion was largely academic until it was fanned into furious life by G3UGK's piece last month, Phil having become suddenly the most unpopular man in all DX-dom for his views—about the kindliest one being along the lines of "he has obviously never owned a beam, and he can't count pound notes!" Most of the others who commented were funny but unprintable, and the one or two who took the whole thing seriously resulted in your scribe receiving only the burnt edges of the paper they were written on. Summing it up, it is a 100% vote in favour of a beam —and *see* G3NMH's piece on



" . . . We like to avoid wafer switches for band changing . . . "

At the recent Hull Mobile Rally were, left to immediate right, G3WWD, G4AQA and YS1AG/G5AYU, with the latter's XYL.

p.346 this month (which must end the discussion.—*Editor*).

One tailpiece to a letter deserves a condolence; from G3ZPF who finds Dudley Council Planning committee to be very block-headed—they refused his planning application for either a mini-quad *or* a TA-33.

Odds and Ends

By the time this comes to print, S2 calls will be filling the bands—S21AB, S21EW, S21UH, and S21YC are said to have been issued to Red Cross operators now in Dacca holding licences from European countries, mainly HB9 and ON.

A new prefix, hailing from the Dasht-l-Lut Desert in Iran is OR4ES, current till the end of August, as indeed is G3WTM/OX from Greenland, on Twenty most days.

If you are short of a card from 3W8D in Vietnam during the period March '65 till September '68, your second chance is to write to Bull Milroy, GW5RMA, now at Little Birches, Cilcain Road, Pantymwyn, Flints., who has the logs with him and some of the cards. Incidentally, we understand 3W8D was accepted later by FCC and ARRL.

A new one in the way of reefs is a recently-activated spot; LA4C was the call, and many will be wailing and gnashing teeth over the loss of a contact with a place called Ferkin Reef—what a name!

There seems to be little likelihood of much activity from XU1AA, the operator Tony now being back in U.K., but there will be short spasms as and when VE7IR can get there.

It is of interest to note that YU3GP/P, from the Dalmatian Islands, was operated by SMØEEJ, to whom all the QSL cards should be directed. Another one of the rare spots to have been activated in the recent past was Mellish Reef, as VK9JW, with a group of operators led by VK3JW.

During October, the Nigerian prefix will be 5N5, this being in recognition of that country's 12th anniversary. QSL to P.O. Box 68, Kaduna.

If you worked VP8KF, you can send the card to Box 59, Port Stanley—he seems to have had a ball on Top Band. Also on that band (although no news of the start had been received at the time of writing) were two expeditions. One, covering PJ6, VP2K and VP2L, by KV4FZ, was to have been up by July 20; the other covers FMØ, VP2E and VP2V, by K5AAD and WA5ZNY, was to start on July 12.

Signature

We have come to the end of our piece for yet another month; it remains to say the deadline for September is to arrive first post on **August 7**, addressed as ever to CDXN, SHORT WAVE MAGAZINE, BUCKINGHAM. 73, *BCNU*.

COUNTIES TABLE

TOP BAND

Callsign	Counties CW	Counties Phone	Total Score
GM3YOR	61	32	93
GW3ZQN	26	50	76
G3VLX	33	41	74
G3YPT	44	8	52
G4ALG	31	17	48
GW3WSU	—	44	44
G4AXP	—	43	43
G3DCS	14	—	14

This Table will run till December 31, 1972. *Starting date January* 1, 1972. *Any mode goes.*

The sort of gear they auction up in Leeds in aid of RAIBC funds. Next sale is in two parts, on Sept. 6 and 27th, by the Star Short Wave Club, at the New Inn Hotel, Bramley Town Street, Leeds, 13. More donated equipment would be welcomed for these sales. The contact-man is the Club secretary, T. Leeman, G8BUU, 115 Askett Drive, Seacroft, Leeds, LS14-1HX, Yorkshire.

* * * THE MOBILE SCENE * * *

MORE RALLY REPORTS AND PICTURES— THE FORTHCOMING EVENTS

It is so unusual as to deserve a mention. A reader who was present at a recent Rally and was photographed for this feature as having one of the prize-winning /M rigs, wrote in beseeching us *not* to print the picture. At first, we thought it must be YL (or XYL) trouble, he being not where he was supposed to be, or with somebody different—till we found that the prize was for having the worst-looking mobile lash-up in the car park! Anonymity will be preserved, as requested!

* * *

For the Verulam (St. Albans) Mobile Rally on June 17, in spite of it being a Saturday (never, in the ordinary way, a good day for a Rally) they had 130 cars and 153 people signing in, of whom 113 were licensed. They were lucky to have a warm and sunny day! Visitors came from miles around, the most distant being G3HFW from Yorkshire and G8BDJ, up from the Sussex coast. There were several trade stands, doing quite well and present by invitation, and on the non-radio side there were many attractions for the family—Salisbury Hall being a 16th century moated country house, with an aircraft museum (the Hall was used during the last War as the design centre for the de Havilland Mosquito, a very successful all-wood aircraft), a miniature steam railway and early stationary machinery. The prizes were presented by Lord Orr-Ewing, G5OG, who lives in the neighbourhood.

* * *

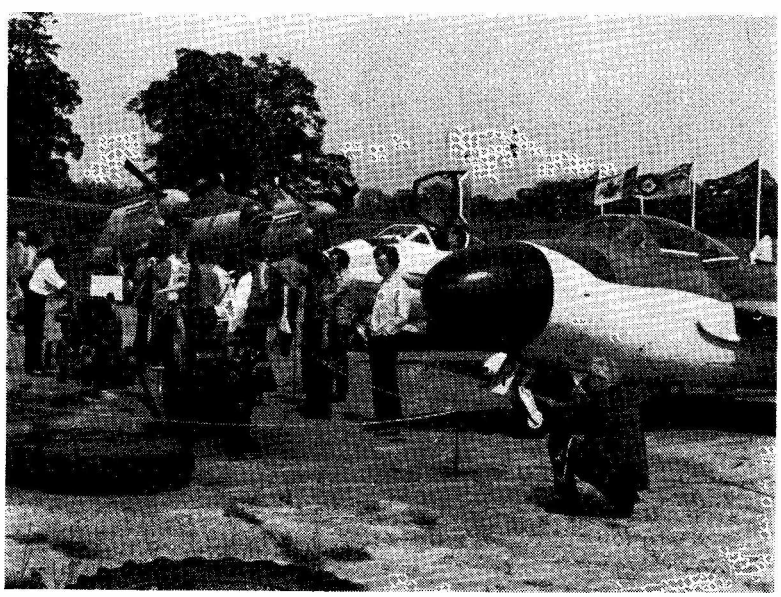
The next day, Sunday June 18, the Colchester and Ipswich Clubs joined forces to put on their fourth Anglian Mobile Rally, at the Suffolk Show Ground. In spite of off-putting weather, the "gate" was estimated at 1,100 people and, as well as the radio interest, entertainment was provided for all the family—this included radio-controlled model cars, a miniature passenger-carrying railway and a model aircraft display. These were all free to those on the ground, being covered by the 20p entrance charge for adults only. Sixteen trade stands were put on, and talk-in was provided on four bands 2-4-80-160m., with a 20m. station to work the DX and a 70-centimetre A/TV link over a distance of about four miles. Altogether, a successful occasion, in spite of the Wx.

* * *

For the West of England Mobile Rally at Longleat on June 25, they "even had sun"—so says the report. The estimated total attendance comes to 2,300 and some 620 people actually signed in. This is always a popular and successful Rally, held at a most attractive site. An interesting innovation was a "competitive DX station", signing G6YB/P on 14 MHz, any licensed amateur being given five minutes to work what he could; 14 operators had a go at this, the winner being GW3ZQN, who got the valuable prize of a Heathkit balun.

The Longleat talk-in results are interesting. On Top Band, 60 /M's were worked; on two metres, 19 mobiles—and on 80m., they had no less than 46 /M's worked; this suggests that many more mobileers are fitting the commercial /M gear now available.

Trade results are thought to have been satisfactory—some visitors were heard saying they had "spent over £40," "I spent £20", and so forth. But the organisers, wisely, are conducting a survey to find out how the 20+ traders really got on, the idea being that for a future occasion they would have a more limited number of trade stands, likely to do well on the basis of the average Longleat crowd potential. (You see, the organisation of a big Rally is quite something, nowadays).



Scene at the Verulam event on June 17—part of the static display at Salisbury Hall, near St. Albans, with, in the background, a version of the famous all-wood Mosquito aircraft, extensively used by Bomber Command during Hitler's War. Verulam had a good turn-out, some 150 people signing in.

Picture taken at Longleat Mobile Rally on June 25, being a get-together of the Radio Amateur Invalid Bedfast Club. The lady at centre is Mrs. Frances Woolley, G3LWY, with her husband G3ESR behind at her right. It is these two who are the executive officials of the R.A.I.B.C., which does so much for the 400+ members of the association, one of the charities in the Amateur Radio field.

A very interesting side-result was that the Royal Signals and the Royal Navy visiting stations both succeeded in working the yachts representing the Services in the Trans-Atlantic Yacht Race.

With it all went a nicely-produced (numbered) programme setting out all the essential Rally details selling for 5p towards expenses. All in all, the Bristol Group are to be congratulated on having put on their usual effective show, this being the 15th Mobile Rally in their series.

* * *

THE RALLY CALENDAR

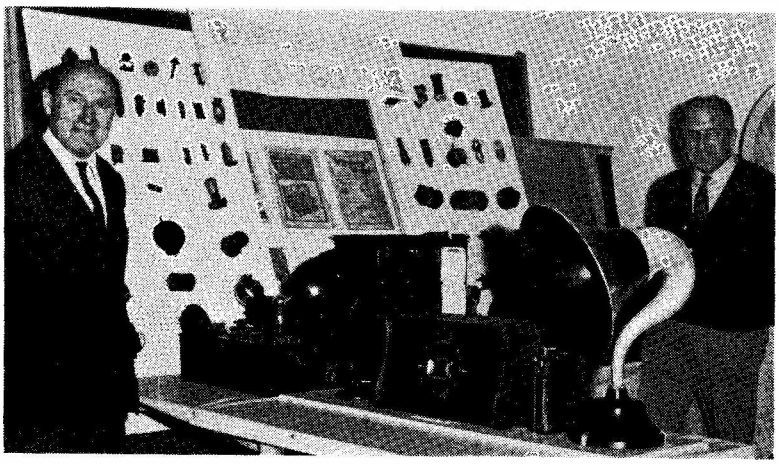
August 6: RSGB Mobile Rally at Woburn Abbey, Beds., on the A.418 off the M.1. There is an entrance charge of 40p per vehicle, and talk-in on four bands.

August 13: Torbay Amateur Radio Society Mobile Rally at the Rugby Football Ground opposite Newton Abbot Race Course, with indoor accommodation, licensed bar and refreshments. Talk-in by G3NJA on 1865 kHz, with G8CYR/A on two metres and GB3TMR on the HF bands, looking for the DX.—L. G. Webber, G3GDW, 43 Lime Tree Walk, Newton Abbot, Devon.

August 13: The well-known annual Derby Mobile Rally, at Rykneld School, Bedford Street, Derby, with free admission, ample parking and covered accommodation (if wet). Talk-in by G3ERD/A on 160m. and G2DJ/A on two metres. There will be a junk sale, prize draw, trade exhibition, competitions and displays, with refreshments available on site. The Rally opens (at the School) at 11.0 a.m. and further details can be obtained from T. Darn, G3FGY, *QTHR.*

August 20: Saltash & District Amateur Radio Club Rally at Saltash Grammar School, with all the usual side-shows and activities, most of which can be under cover. Ample free parking on site. Details from:

Auction sale at the Anglian Mobile Rally on June 18, with G3SGJ doing the calling. (Looks like a couple of useful rolls of 16g. hard-drawn in the foreground). Garb of the bystanders suggests the poor Wx they had for the event.



Collection of early wireless equipment shown at the East Anglian event, entitled "Radio Bygones"—and very interesting, too.

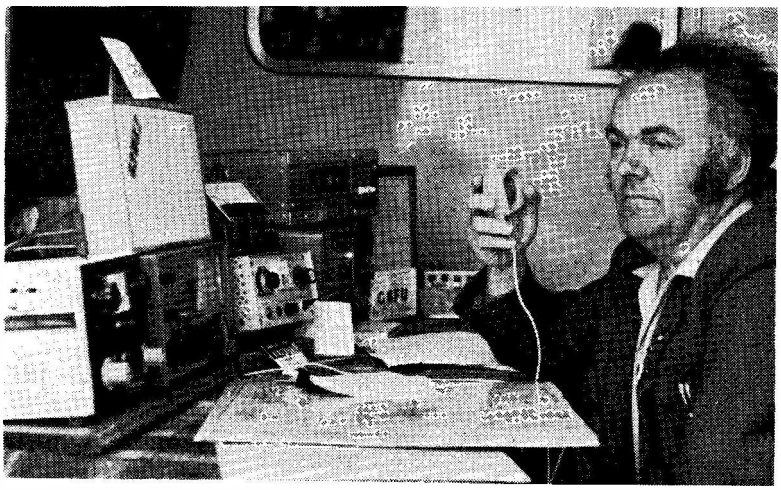
At the Longleat Mobile Rally they had G6YB/P as the "visitors' competition station"—the idea being that anyone holding a full licence could have a 5-minute stab at working the best DX. It was supervised by G3JMY (left) and 14 operators sat down to the gear, which seems to have included everything.

I. Aldridge, G4AJU, 302 St. Peter's Road, Manadon, Plymouth, Devon PL5 3DU.

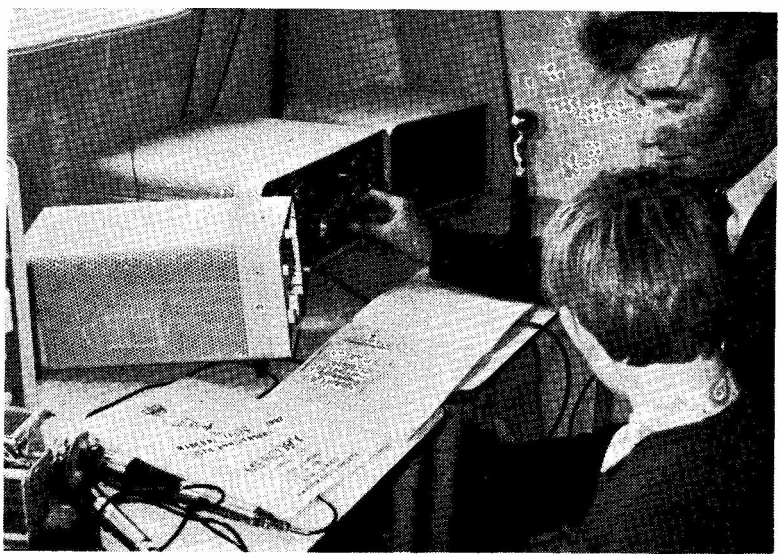
August 20: Bromsgrove & District Amateur Radio Club Mobile Picnic in the grounds of Avon Croft Museum, Bromsgrove.—J. Dufrane, 44 Hazelton Road, Bromsgrove, Worcs.

August 20: Mobile Rally organised by the East Kent Radio Society at Westgate Hall, Canterbury, opening at 12 noon, with free parking immediately adjacent. Attractions will include (apart from the ancient City of Canterbury itself) trade stands and side shows, with the sea not far away. Taking the M.2, Canterbury is about 1½-hrs. from London. Talk-in stations on 1980 kHz and 145·00 MHz will be sited to give good signal strength along the motorway. For those unfamiliar with the district (or without /M gear for a talk-in) a sketch-map is available for the price of an s.a.e.; one or two more trade stands could possibly be accommodated—all on application to: P. S. Nicholson, G3VJF, 21 Woodvale Avenue, Chestfield, Whitstable, Kent.

August 26-27: Stratford-on-Avon Radio Club Mobile Rally at the National Agricultural Centre, Kenilworth, Warwickshire, which offers splendid facilities for an event of this kind. As the Rally will coincide with the National Town & Country Festival and the Stoneleigh Transport Carnival, there will be plenty of interest for the whole family—including a vintage car and motor-cycle display, working steam-powered machinery, and all the other attractions of an Agricultural Show in the heart of England. A special HF-band station GB3TCF will operate in the Crendon building. Further information from: M. J. W. Webb, G3OOQ, 14 Townsend Road, Tiddington, Stratford-on-Avon (*5973*), Warwickshire. Should be a very nice day out.



Top Band talk-in station for the fourth Anglian Mobile Rally on June 18, with G3ZLA doing the operating. He seemed to have a nice lot of gear for the job.



The Royal Signals station at Longleat on June 25, signing G4RS, worked the Army-sponsored entry in the Trans-Atlantic Yacht race. They used K.W. Electronics gear.

August 27: Mobile Rally at Kimberley Barracks, Deepdale Road, Preston, offered by the Preston Amateur Radio Society for 12 noon till about 5.0 p.m., with talk-in on 2m./160m. Ample free parking, refreshments and licensed bar. Details: G. W. Earnshaw, G3ZXC, 12 Whithy Parade, Fulwood, Preston, Lancs., PR2 4JN.

September 24: Harlow & District Amateur Radio Society annual Rally at Magdalen Laver Village Hall, as in previous years. For details: V. Heard, 106 Vicarage Wood, Harlow, Essex.

October 1st: Peterborough Radio and Electronic Society Rally, to be held at Walton School, Mountsteven Avenue, Peterborough, 11.0 a.m. till 5.0 p.m., with talk-in by G3QS on 1980 kHz and G8FFC on 145·00 MHz. Entrance fee of 10p will also cover price of raffle ticket.—A. H. Jackson, 57 Peterborough Road, Castor (*353*), Peterborough.

MORE ABOUT BEAMS v. LINEARS

H. PERKINS, D.L.C. (Hons.), G3NMH

By way of being a reply to the article on this subject by G3UGK in our July issue.—Editor.

HAVING read with great interest the correspondence in the June and July issues concerning "Beams v. Linears" I would like to put forward the following as a simple formula.

If one is running only a few watts of RF then an increase in power is the answer as this will cause a decrease in the waiting time before one gets a reply to a call. If, however, one has average power output of, say, 100w. p.e.p. then, without doubt, the answer is "get a beam."

G3UGK says that it really doesn't matter which linear one uses if the RF output is 400w. p.e.p. and with this I completely agree. To dismiss beams by stating that it would be hard to get 6 dB of gain from one would indicate that he has never switched from a dipole to a quad to see the difference! Certainly, I have never had any difficulty in achieving better than 6 dB with a Quad and in many instances the latter will enable one to work stations which are otherwise completely inaudible! Having done many tests under both marginal and "band-open" conditions, the Quad will be approximately 8 dB up on the dipole. However, repeated tests have shown G3UGK to be quite correct in presuming the average tri-band beam to be inferior to the Quad.

With regard to comments concerning the size of the Quad there is one important factor overlooked and that is that the turning radius of the Quad is smaller than than of the tri-bander; the person with the narrow garden can sometimes get a Quad in whereas the element tips of a tri-bander would overhang the neighbours' gardens. G3UGK mentions that the appearance of the Quad may not please the local planning authority and some Quads can be anything but aesthetically pleasing. I would suggest that your readers when applying for a mast/tower for amateur purposes should apply for a tower "to carry a transmitting aerial." Most amateurs change the antenna at some time or other and one should therefore try to get planning approval without being specific about the actual type of aerial. I certainly have never been asked what *type* of antenna was to be erected on the top of towers for which planning approval has been obtained, from three different planning authorities.

G3UGK states that "a small army is needed to hoist the thing (Quad) into the air." I can only say that it can be done *single-handed*! If tackled logically it is straightforward and I never cease to be amazed at the army of people and tractors required by some amateurs in their efforts to get a Quad airborne. The methods are as follows:—

(1) On a guyed mast, use the gin-pole technique.
(2) On an un-guyed tower, assemble the Quad around the tower and with a pulley at the top of the tower and a line up to the top and down to the Quad boom, the whole thing can be hoisted by one person.
(3) On a guyed tower. This is very difficult as it needs two people whilst the rest of the "army" brew tea, open tins, solder on co-ax plugs or chat up the other fellow's wife while he's up the top of the tower. The technique is to use the same line-and-pulley at the top of the tower which is attached to the boom of the Quad. A second cord is taken from the Quad boom to the second "volunteer" whose function is to pull the Quad out from the guys whilst the other fellow hoists vertically upwards.

Once up, the "brute" will give you 8 dB. of forward gain and, what is possibly even more important, a very useful 20 dB or more of front/back ratio for attenuating those unwanted signals off the back. I have yet to hear of a linear with a front/back ratio! (G3UGK states that a linear will do all that a beam does and a whole lot more!)

A further incorrect statement made which must be cleared up is that concerning prices of quads. I know the fibreglass type mentioned was £65 and this is a lot of anyone's money, but if it's the one to which I think G3UGK is referring, then it should also be mentioned that that particular Quad weighs only 21 lbs. (the same as an average tri-band beam of the Yagi type), has a balun provided and can be converted to a 3 or 4 element Quad—in other words one gets a super-quality Quad plus extras. He is not correct in stating that cheaper Quads do not have optimum spacing as there is one on the market at £27 of the bamboo type. And as regards bamboos I can only say that having left some damaged ones lying in long grass for two years completely overgrown, the saw had to be applied in order to get them small enough for the refuse collectors to take them away when a bit of tidying-up was done!

I cannot speak for all types of rotator but one of the most popular types on the market does not need all the regular servicing, lubricating and checking. Mind you, my experience is limited to a 4-element Quad at 105ft. for five years without any trouble. The antenna only weighed 130 lbs., too!

" . . . Having a bit of Vox trouble here . . . "

USING THE TRIAC

INTERESTING POWER-CONTROL DEVICE — CIRCUITRY AND APPLICATIONS

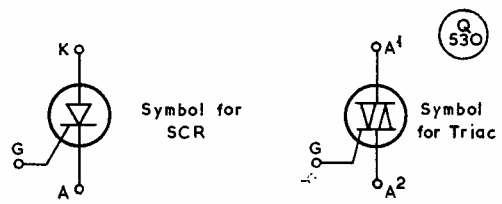
J. S. CUSHING (G3KHC)

A TRIAC is a small solid-state device which can control a considerable amount of electrical power, but is no bigger than the average transistor. Its immediate application for day-to-day use in the workshop is controlling electric hand drills, small motors, heat of soldering irons and brightness of room or bench lighting. The simple circuitry shown here can *not* be relied on to control circuits containing appreciable inductance—for example induction motors and fluorescent lighting so that unfortunately this rules out controlling mains driven power units as these include a transformer with a considerable primary inductance.

A triac is closely related to an SCR (silicon controlled-rectifier, see Fig. 1A) which is essentially a diode that will not conduct until a small current at low voltage is applied to its gate (G). This gate current does not have to be continuous; a short pulse is enough to trigger an SCR which will then continue to pass current until the flow of current is externally interrupted. When this happens the SCR reverts to a nonconducting state until again triggered. The same happens if the voltage across the diode drops to a low value, as happens every half-cycle if AC is applied, the SCR then becoming non-conductive and remaining so until triggered.

An SCR is a single diode so in AC circuits will only pass positive cycles and used in a control circuit will not allow full power to pass. This trouble is overcome if a triac is used (Fig. 1B) for it incorporates two diodes arranged so it will pass positive *and* negative cycles. Apart from this it behaves as an SCR and will not conduct until a current pulse is applied to the gate connection. There are obviously many ways of supplying a current pulse to trigger an SCR or triac; for use as a speed controller, etc. it can be done quite easily by using one resistor, one capacitor and a special form of diode called a diac (Fig. 2).

A diac has two interesting characteristics. First, it will not conduct below about 30 volts and secondly it then conducts in either direction. The principle behind Fig. 2 can now be explained. Suppose DC is connected across R & C. At switch-on no voltage will be present across C, but as soon as power is switched on C will commence charging and after an interval (depending on the value of C, R and the voltage) C will be charged to 30 volts. The diac now conducts, so passing a pulse of current through the triac's gate as C discharges. The theory becomes more complicated when AC is considered as R & C of Fig. 2 also form a phase-delay network, but what happens in practise is straightforward enough: Remembering C's value will be fixed but R's may be varied we can look at Fig. 3. Shortly after the start of the positive half-cycle enough volts will be across the triac for it to conduct, but is unable to for the gate has not yet been triggered. As the half-cycle continues, if



(a) Silicon controlled Rectifier. (b) Triac

Fig.1.

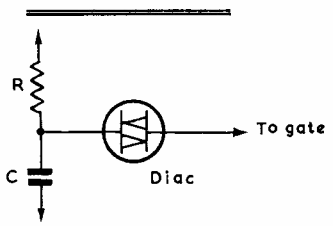


Fig. 2 Phase delay network and symbol for Diac

R is low in value the triac will be triggered at, say, the point marked L in Fig. 3 and very nearly all the half-cycle is passed. In other words a motor, or whatever, runs very little short of full power. On the other hand, if R is high in value, triggering will occur near the end of the half-cycle, indicated as H in Fig. 3, so very little power flows. M indicates triggering at a medium value of R so triggering will happen about half-way through a half-cycle. When the half-cycle ends voltage at the triac will be zero and it will turn off, remaining off until triggered on during the next half-cycle. The fact that half cycles are alternately positive and negative is of no importance. Both triac and diac are "bi-directional" —that is, they work both ways.

Practical Application

Fig. 4 gives the full circuit. The mains are brought in through a 3-core cable with the earth lead firmly anchored to case and output socket earth. A double-pole switch in live and neutral leads is a master switch and also

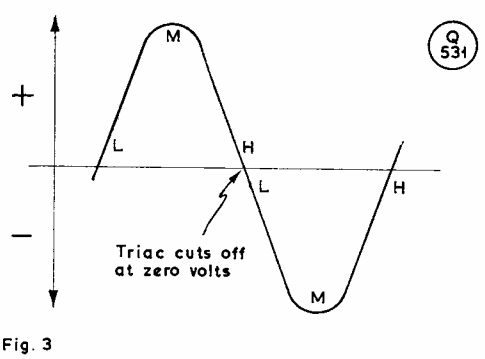


Fig. 3

Fig. 3. To show approximately on AC cycle when Triac is triggered on, with VR1 (or R of Fig. 2) set for L, low resistance; M, medium resistance; and H, high resistance—and see text.

the isolating switch when at "off." The neon is an indicating lamp to show power is on, while C1 is intended to reduce interference. Resistor R1 and diodes D1, D2 are to discharge C2 when the mains voltage is momentarily zero every half cycle. VR1 and C2 are R & C of Fig. 2, the phase shift network. VR2 is a form of safety device, set by first turning VR1 to maximum and then adjusting VR2 so the drill, say, is turning slowly. By doing this the drill cannot be stopped but will still be live. Further filtering is provided by C3, R2. The triac (Tr) is RCA type 40486, rated at 400 p.i.v. at 6 amps. This may be less easily obtained than similar types and a substitute should have similar or better p.i.v. ratings. A diac should be obtained without difficulty.

Construction

Any convenient form of construction may be used, though it is wise to built it into a stout metal box which cannot be easily opened, and to be *quite* sure the box as well as the earth lead of the output socket has been efficiently earthed to the mains. The shaft of VR1 must also be earthed. If a full 6 amps. is required, the triac can be mounted on a large heat-sink, but for moderate loads a small slip-on heat sink is easy to use. The type to fit a 40486 is like a coarse toothed cog wheel made of anodised aluminium.

Although in theory this triac will control over one kW if a large heat-sink is used or about 4-500 watts without, it is recommended very careful checks are made if these powers are drawn, as a triac will burn out if pressed too hard. To play safe, loads of 200/250 watts should not be exceeded. This may seem a very generous safety factor, but in view of the electrically fragile nature of solid-state devices in general, not forgetting the price factor, this does not seem too cautious!

Induction motors, fluorescent lights and any gear which incorporates inductance should not be used with this circuit as the triac will almost certainly fail.

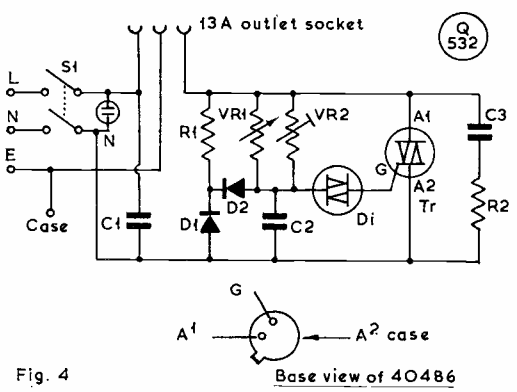


Fig. 4

Fig. 4. Circuit of the device, for which values can be : C1, C2, C3, 0.1uF, 300v. AC working ; R1, 33K, 1w.; R2, 1K, ½w.; VR1, 500K log. pot.; 500K, pre-set ; D1, D2, 100 p.i.v., one amp.; Tr, Triac R.C.A. Type 40486, or similar ; Di, Diac, Type ST2 ; N, panel neon, with series resistor. Designed for 13-amp. ring mains ; for use with 5 or 15 amp. supply sockets, fit fuses at unit input. See text for discussion.

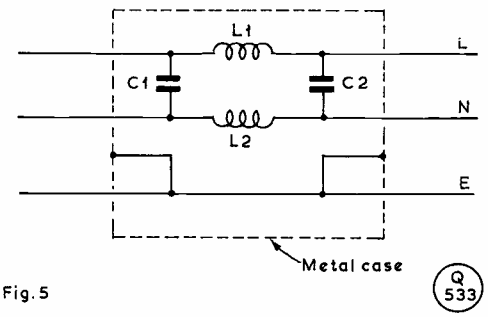


Fig. 5

Fig. 5. Suggested filter circuit where interference is found to be troublesome—see text. C1, C2 can be .01 to 0.1 uF ; L1, L2, 18g. enam. close-wound on wooden dowel about 5in. long by one inch diameter.

Applications—and The Snag!

Uses for this controller outside the workshop are fairly obvious and the XYL may discover its value with food mixers and electric irons! It could be useful under-running photo-flood lamps, warming up mains voltage projector lamps and could have darkroom uses.

Such a useful and easily-made gadget must have some snag—and this one has, in that interference is generated, because a triac switches on very rapidly so producing a steep leading edge waveform, an almost certain way of producing strong harmonics. This interference travels along and is radiated from mains wiring and will affect any mains-powered receiver, or one using a wire aerial. Neighbour's BC sets of this type may be affected (though these types of receiver are not common) and your own Rx certainly will, but it will be found to decrease as frequency is raised. Fortunately, TV sets do not seem affected at all and usual type of battery transistor set with ferrite rod aerials are only troubled near the controller or if placed very close to mains wiring.

The level of interference is hardly severe and complaints seem unlikely if used now and then while drilling a few holes, but for more continuous use a filter is recommended. Completely suppressing this type of interference is not easy but a simple filter of the type shown in Fig. 5 is helpful. Similar windings on ferrite rods are said to be better and a bifiliar winding on a ferrite rod is claimed to be good for a simple filter. There is then an interesting field for experiment in this type of suppression.

ROMANCE OF MACQUARIE Is.

Every now and again, the name of the remote Antarctic island of Macquarie comes into the DX news, with an amateur station on the air from there. Macquarie is in the Australian area of the Antarctic, and recently VKØRC has been active on 20 metres, scoring (according to our *DX Zone Map*) for Zone 30. The interesting thing is that Macquarie saw the establishment of one of the first wireless stations in these regions, by the great Australian explorer Sir Douglas Mawson, more than 60 years ago. Its purpose then was to provide met. information for the Australian Govt.

AN LF-BAND TRANSMITTER

INTERESTING CONSTRUCTIONAL PROJECT FOR THE BEGINNER LICENSEE—OR AS AUXILIARY RIG FOR THE MAIN STATION

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

THERE is still plenty of scope for running 10-15 watts of AM on 160m. and 80m., and a lot of interest in working these bands in this mode. For the "build-it-himself" type there is the great advantage that such a transmitter is very easily constructed, need not cost much, and is likely to be singularly trouble-free.

The transmitter described here is quite typical of such equipment, and full details are given, so it should be a successful project for even those without a strong home-construction bent.

Fig. 1 is the circuit. V1 is the VFO-buffer, giving output on 1·75-2·0 MHz. V2 is a straight amplifier on 160 metres and doubler to 80m., VR1 being pre-set for suitable PA grid drive. V3 is the PA, a 5763, a nice miniature type capable of taking a maximum input of 15 watts. S7/S8 select V2 coils and the portion of L4 in use, for 160/80m. operation. To avoid the business of coil winding, L1, L2 and L3 are easily obtained as ready-made inductors.

The transmitter illustrated was made to push into the back of a surplus cabinet. It would have been smarter to use a new panel and cabinet, and the 15 x 9 x 8in. Type W case-and-panel, produced by various suppliers, would be ideal.

Full transmit-receive switching is included in the transmitter, to give change-over without relays.

The audio section is intended for a crystal microphone. The amplifier V4 has a pre-set audio gain control VR2. The phase splitter V5 drives V6 and V7, and this easily produces full high-level modulation of the PA.

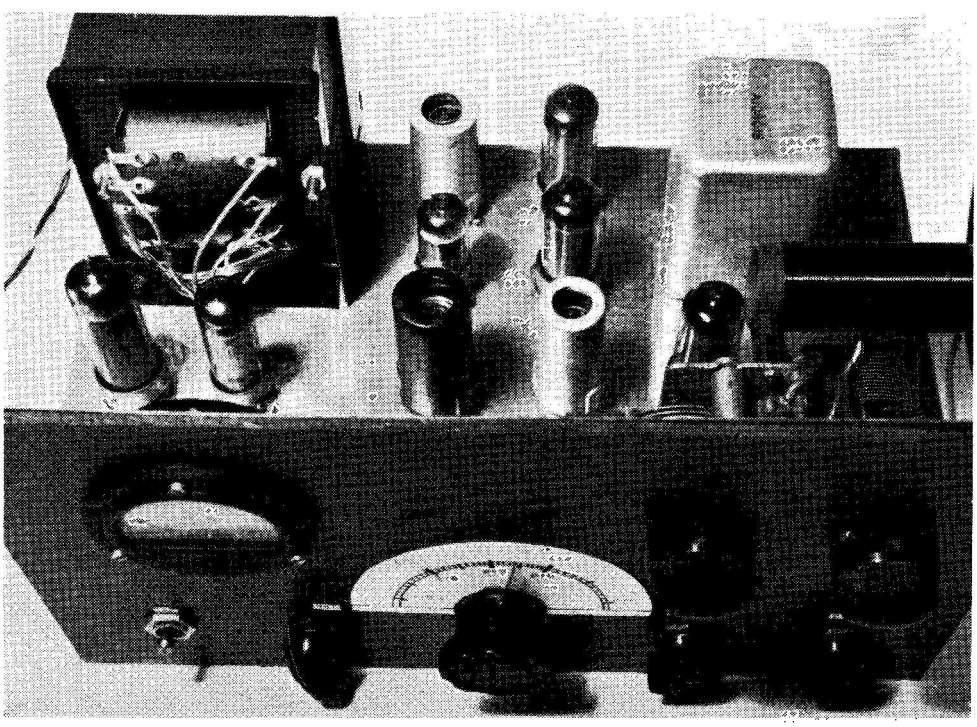
Power supplies are from the transformer listed. This has two 6·3v. 2A windings for RF and AF sections, and a winding for the EZ81 heater. The HT secondary is 300-0-300v. 120 mA. The measured HT line voltage on the model illustrated was 310v.

S1 applies HT to the VFO and V2 only, for tuning adjustments. A test-meter can be clipped across R7, to measure PA grid current. After adjusting VR1, this meter is removed and need not be used again here.

S2 applies HT to V1 and V2, or to the bleeder R22. S3 switches the aerial from the PA tank to the receiver. S4 shorts the receiver input on "transmit." S5 silences the receiver speaker, to avoid feedback when transmitting. S6 applies HT to the modulator and PA.

Top of Chassis

Fig. 2 shows drilling dimensions for a 12 x 7 x 3in. chassis. The full 3in. depth is required, unless VC1 is to be above the chassis in a screened box. The panel is



Showing general layout and construction of the prototype

7in. high. Actual dimensions could be changed quite readily, if necessary.

VC2 and VC3/4 or bolted to the panel. A short lead runs from the frame of each to a tag by V3. The lead from C13 goes through a hole near tag 1 of V3. Meter leads are tucked back against the chassis. An 0-50 mA meter, or more sensitive one shunted for about 50 mA full-scale, is satisfactory.

Secondary leads from the mains transformer pass through a grommet, as in Fig. 3. Connections shown are for the listed transformer. Colour-coded leads simplify wiring when the chassis is turned over—say, *red* for rectifier heater, *yellow* for rectifier anodes, and *blue* for heaters. Other transformers of suitable rating would do. Some will need a 5v. heater rectifier. Silicon rectifiers (1000 p.i.v. 1A), each with a 47-ohm series resistor, are also suitable.

Skirted holders and screening cans are required for V1, V2, V4 and V5. It is as well to complete drilling before components are fixed.

Nearly all wiring is under the chassis, as shown in detail in Fig. 4. Heater, HT, and audio circuit leads are run against the chassis.

The VFO

This tunes from 1·75-2·0 MHz, with a few degrees unused at the extreme limits of rotation of VC1. While operating on Top Band only 1·8-2·0 MHz will be used. For 80 metres, the VFO is tuned from 1·75-1·9 MHz, and frequencies are doubled. The listed close tolerance capacitors makes a trimmer unnecessary. L1 is a *Denco Yellow Range* 3 coil. Pins 6 and 8 are joined, Fig. 4, to place both whindings in series. The threaded rod projects above the chassis, for inductance adjustments.

VC1 is on a strong bracket, lined up with a ball drive bolted to the chassis front and panel. A small tag strip supports RFC1. Connections in this stage should be rigid, short and direct, to avoid random changes in frequency. The VFO wasfound to be very easily made and satisfactory. RFC1 and RFC2 are miniature cored chokes as used in transistor equipment. Fitting larger short wave type chokes did not show any advantage.

The OA2 regulator provides a stabilised supply of 150v., the OA2 drawing 5-30 mA. To test the VFO, apply about 150v., set VC1 almost fully closed, and rotate the core of L1 until the beat is heard at 1·75 MHz on a receiver. If C1, C2 and C3 are close-tolerance, band coverage should then be satisfactory.

Doubler Stage

This is V2, the valve acting simply as a straight buffer amplifier on 160 metres. S7 selects the coils L2 or L3. These coils are resonant at about the centre of the band, and are left after the cores have been adjusted.

L2 is a *Denco Red Range* 2 coil. The small winding is completely removed. The outer end of the remaining winding is then cut, and 28 turns are unwound. The end is re-soldered to the pin, and the coil fitted as in Fig. 4.

L3 is a *Denco Blue Range* 2 coil, with the small winding taken off. It is connected as shown. S7 and S8 are opposite each other on a 2-pole 2-way switch, and leads should run as in Fig. 4. No instability from stray coupling was found. Take care to wire the switch so that when L3 is in circuit (160m.) the whole of L4 is also in use.

Table of Values

Fig. 1. Circuit of the LF Band Transmitter

R1 = 56,000 ohms
R2 = 3,300 ohms
R3 = 100,000 ohms
R4 = 12,000 ohms 5w.
R5 = 100,000 ohms
R6 = 22,000 ohms
R7 = 470 ohms
R8 = 5,600 ohms 2w.
R9 = 2·2 megohms
R10 = 47,000 ohms
R11 = 220,000 ohms
R12 = 220,000 ohms
R13 = 2,200 ohms
R14 = 22,000 ohms
R15 = 1 megohm
R16 = 47,000 ohms 5%
R17 = 47,000 ohms 5%
R18 = 1,500 ohms
R19 = 270,000 ohms 5%
R20 = 270,000 ohms 5%
R21 = 270 ohms 2w.
R22 = 40,000 ohms 5w. or 220,000 ohms, 2w.
R23 = 6,800 ohms 2w.
VR1 = 50,000 ohms, 2w. or 3w.
VR2 = 500,000 ohms, log pot.

C1 = 150 $\mu\mu$F 1%
C2 = 1000 $\mu\mu$F 1%
C3 = 1000 $\mu\mu$F 1%
C4 = 0·1 μF
C5 = 100 $\mu\mu$F
C6 = 0·01 μF
C7 = 100 $\mu\mu$F
C8 = 0·01 μF
C9 = 0·01 μF
C10 = 100 $\mu\mu$F
C11 = 1000 $\mu\mu$F, 1kV
C12 = 1000 $\mu\mu$F, 1 kV
C13 = 1000 $\mu\mu$F, 1kV
C14 = 40 $\mu\mu$F
C15 = 8 μF, 350v.
C16 = 1000 $\mu\mu$F
C17 = 2000 $\mu\mu$F
C18 = 0·01 μF
C19 = 0·01 μF
C20 = 50 μF, 50v.
C21 = 1000 $\mu\mu$F, 1kV
C22 = 1000 $\mu\mu$F, 1kV
C23 = 8 + 16 μF, 500v.
VC1 = 75 $\mu\mu$F, SW tuning variable type
VC2 = 300 $\mu\mu$F or 500 $\mu\mu$F non-midget tuning type
VC3/4 = 2/500 $\mu\mu$F, gang
L1 = *Denco* Yellow Range 3
L2 = *Denco* Red Range 2 (28 turns removed)
L3 = *Denco* Blue Range 2
L4 = 70 turns 22g. enam., 1in. dia., centre-tapped
RFC1 = 2·5 mH midget cored choke
RFC2 = 2·5mH midget cored choke
RFC3 = 2·5 60mA SW type choke
V1 = 12AT7
V2 = 6AM6
V3 = 5763
V4 = 12AX7
V5 = 6C4
V6 = 6BW6
V7 = 6BW6
V8 = OA2
V9 = EZ81

Notes: 6 off B9A skirted holders, cans. 3 off B7G skirted holders, cans. 250 mA fuse and holder. T1 P.8000 ohm CT to 7,500 ohm (*see text*). T2 *Elstone* MT/MU: 300-0-300v. 120 mA, 6·3v. 1A, 6·3v. 2A, 6·3v. 2A. L5 120 mA smoothing choke. S1 Rotary or toggle single pole. S2/6 5-pole 2-way. S7/8 2-pole 2-way. Ball drive. Co-axial sockets. 50 mA or similar meter. Speaker socket strip. Chassis about 12 x 7 x 3 inches. Panel about 12 x 7 inches. Screen, knobs, tag-strips, etc.

With wiring completed up to R7, the buffer-doubler can be tested if required. Clip a 5 mA or 10 mA meter, or multi-range test meter, across R7—that is, positive to chassis. V3 should be in place, and VR1 set to about middle position. Set the VFO to 1·9 MHz and band switch to 160m. Rotate the core of L3 to find a peak in grid current, as shown by the test meter. Switch to 80 metres, tune the VFO to about 3·7 MHz, and similarly rotate the core of L2 for maximum grid current.

Grid Current Adjustment

The 5763 PA is listed as requiring 3 mA grid current, and this gives about 66v. bias across the 22K grid resistor. Input/output tests were made with a RF power meter, and no falling off of output was found until grid current dropped well below 2 mA. So VR1 is adjusted until grid current lies between 2 mA and 3 mA over the tuning range of the VFO.

R7 can remain permanently in circuit, so that the lower end of R6 need not be unsoldered, to check grid current. The shunting effect of R7 on the usual type of meter is insignificant.

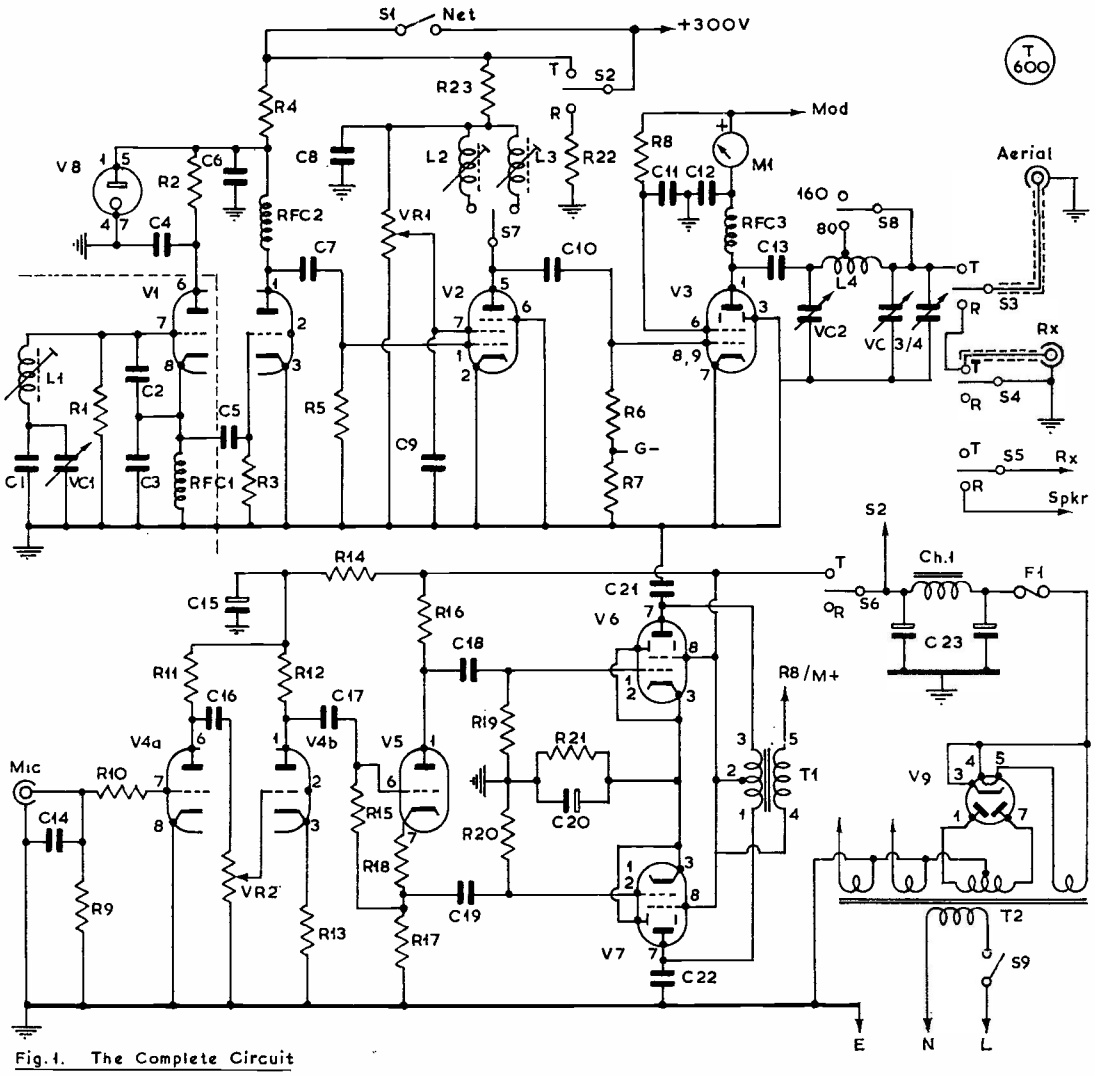


Fig. 1. The Complete Circuit

Fig. 1. Circuitry complete of the LF Band Transmitter

The cores of L2 and L3, and setting of VR1, may be touched up when the transmitter is working. They can then be left and need no further attention. Run 6BA nuts on the threads of L2 and L3, to lock them.

Power Amplifier

L4 is wound on a paxolin tube 1in. in diameter and 2¾in. long. It has 70 turns of 22g. enamelled wire, wound side by side. Then winding, twist a small loop at the centre turn, and solder a stout, well-insulated lead, which passes to S8. The coil is mounted on the back of VC2, using a 1in. 6BA bolt and spacer, or extra nuts.

This coil was found to allow the PA to be loaded into non-reactive loads of 70 ohms to 1,000 ohms impedance, throughout both LF bands. Be sure S7 and S8 are wired that V2 and V3 are both on the same band.

The 5763 will be found to key readily in the cathode circuit. No provision for CW was included in this transmitter, but it can be added.

Transmit/Receive Switch

This is quite straightforward. Fig. 5 shows the switch in the "receive" position. The aerial is connected to the receiver, and the speaker muting circuit is closed.

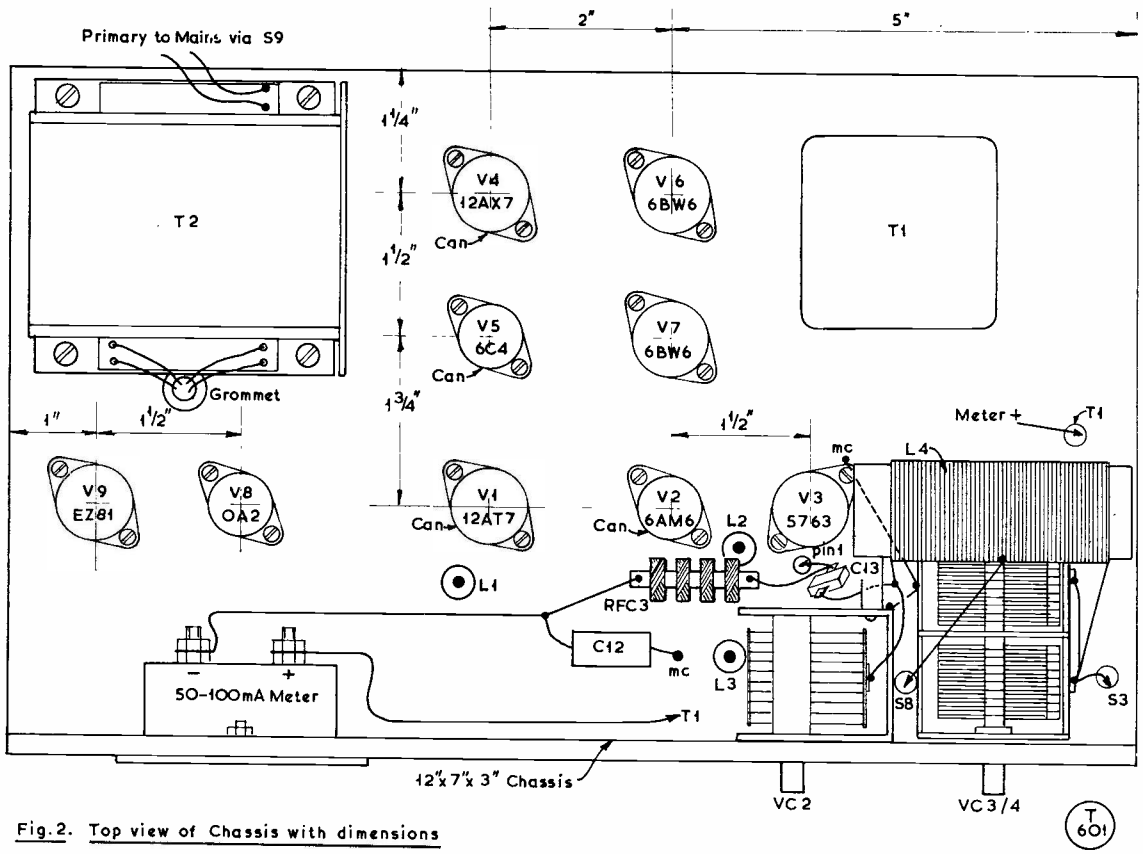


Fig.2. Top view of Chassis with dimensions

Fig. 2. Suggested upper-chassis layout plan for the Transmitter

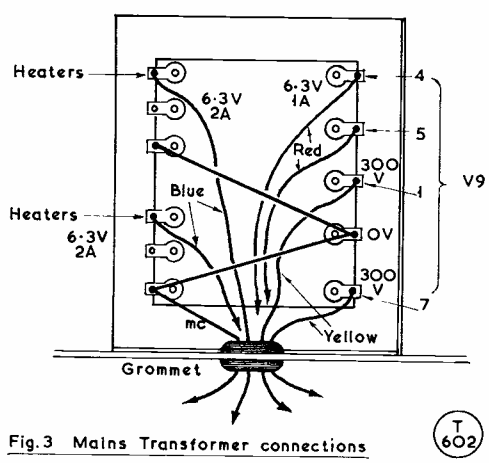


Fig.3 Mains Transformer connections

Fig. 3. Mains transformer connections

HT is applied to R22 (the HT bleeder) only.

With the switch at "transmit," the aerial goes to VC3/4. The receiver aerial is shorted to chassis. S5 opens to silence the speaker. S2 applies HT to V1 and V2. S6 puts HT on the PA and audio sections.

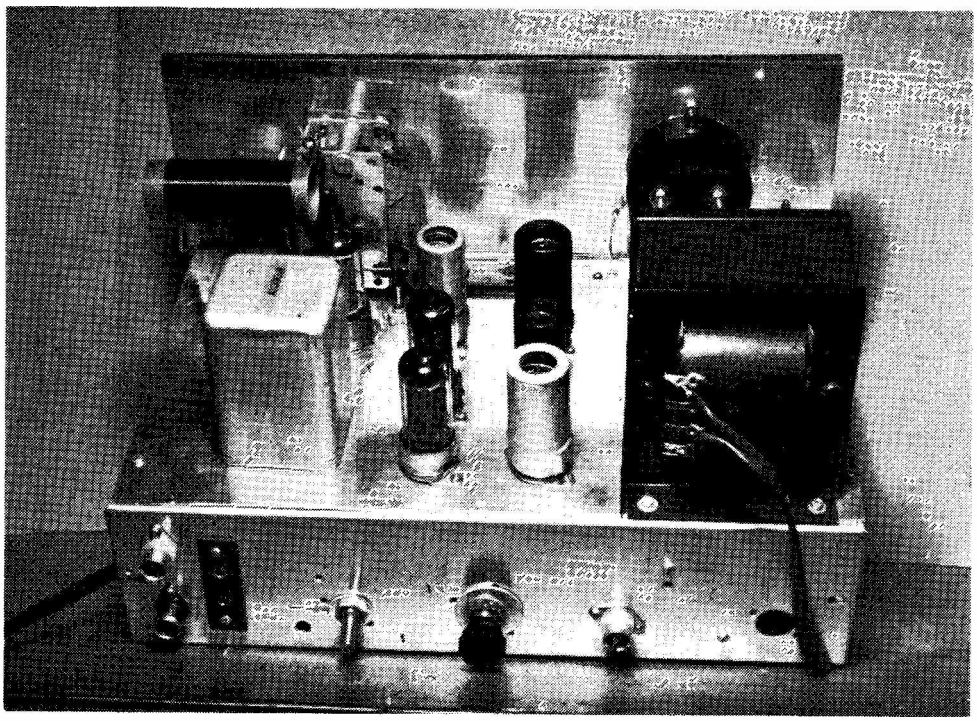
Under the chassis (Fig. 4) twin leads pass from S1 ("Net") to the send-receive switch. These two leads are against the front runner, and should be coloured so that the HT positive 300v. line can be identified.

The aerial and receiver leads are 75 ohms or similar coax, with brading taken to the chassis. Two co-axial sockets were fitted at the back, so that an aerial lead and coax cable from the receiver aerial terminal may be plugged in. The speaker muting leads are twisted together.

One lead from the secondary of the receiver output transformer to the loudspeaker is cut, and extended so that plugs can be put in the speaker muting sockets.

Audio Amplifier

It was found that no internal screening of leads was needed, if grid connections were run against the chassis. This is very important with V4. The external microphone



Rear view of LF Band Transmitter

lead must be screened in the usual way (using single-core screened lead with the brading earthed).

Component values give some emphasis in the middle register. When first testing the equipment, set VR2 for comfortable speaking. This control can then be left Instability may result with VR2 at maximum gain with *no* microphone connected.

The 6BW6's can easily give full modulation of the PA The aim should be to set VR1 to suit the microphone, at its usual distance, and with the normal speaking voice. No other adjustment of VR1 is then necessary. The PA must be loaded to its usual input, using a lamp load, other artificial load, or an aerial.

Speech quality can be checked with a receiver It is necessary to remove the Rx aerial lead altogether and turn the RF again well down, to avoid overloading. Strong feedback between speaker and microphone must also be prevented. The signal should sound fully modulated, and of good quality.

If headphones are preferred for this test, form a few turns of insulated wire into a coil, to hold near L4. A crystal diode is required in one phone lead to the coil. Bring the coil only near enough L4 to give reasonable headphone volume.

Modulation Transformer

Space was allowed for a Woden UMØ, but subsequently a modulation transformer from the surplus SCR-522 equipment was fitted. This was for 2/12A6's to an 832, and only seldom seen nowadays. However, the transformers sold for 2-metre gear 2/EL84 or 6BW6's to a QQV03/10 are suitable. In practice, a ratio of about 1 : 1 to 1·5 : 1 will be found perfectly satisfactory.

VFO Calibration

A pointer fitted to the ball-drive travels over a scale on the panel. This scale is calibrated after building is complete.

Accurate calibration is most easily achieved by using a 100 kHz crystal marker in conjunction with the receiver. Make a check, and adjust the core of L1 so that VFO coverage is 1·75-2·0 MHz, with about equal unused movement of VC1 at its fully-open and fully-closed settings.

Select 1·8, 1·9 and 2·0 MHz harmonics of the crystal in turn, with the receiver, on each occasion tuning the VFO to the same frequency (zero beat with the heterodyne produced) and marking its scale appropriately.

For 80m., 1·8 MHz on the VFO corresponds to 3·6 MHz, and 1·9 MHz to 3·8 MHz, so these can be marked. Then tune the receiver to the crystal pips on 3·5 MHz and 3·7 MHz, and put these frequencies on the scale. For the 160m. calibration, 3·7 corresponds to 1·85 MHz, and 3·9 to 1·95 MHz, so these can be written

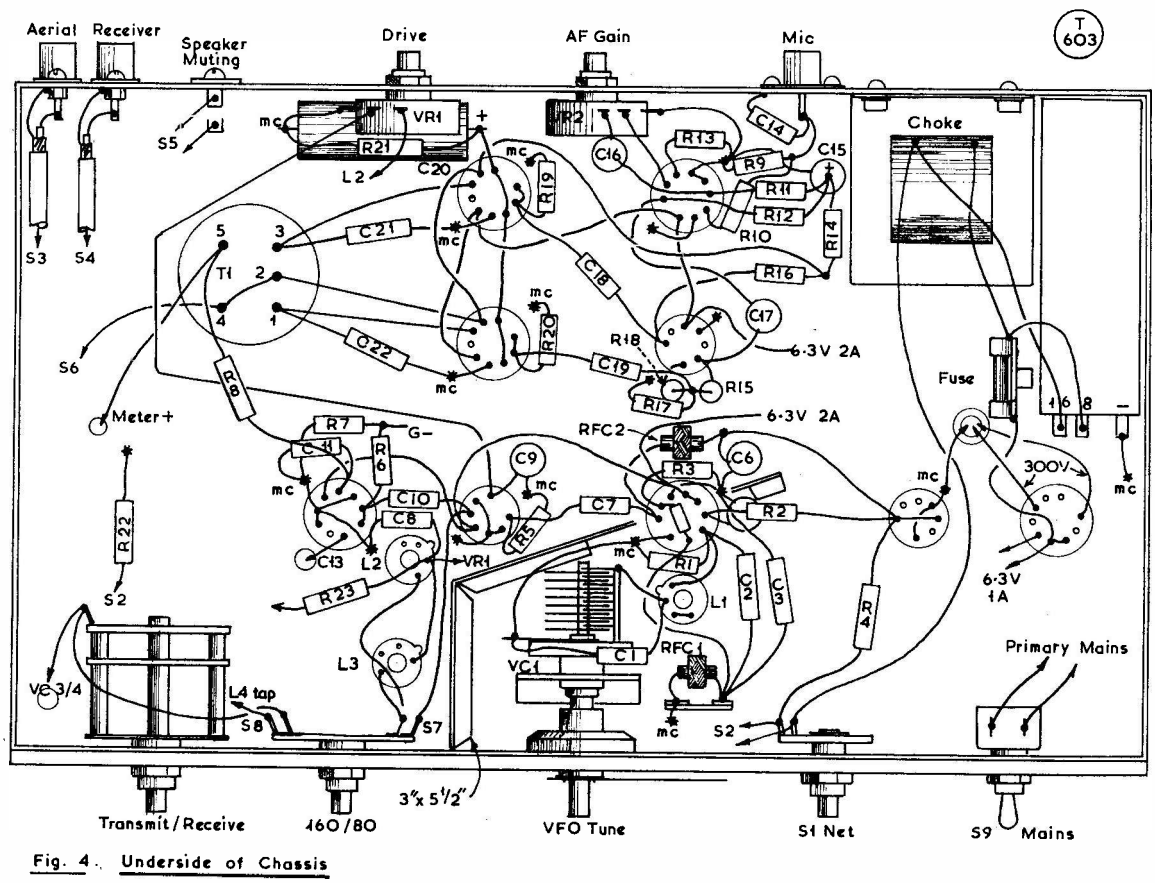


Fig. 4. Underside of Chassis

Fig. 4. Diagrammatic for under-chassis layout and wiring

in. This will give enough actual markings for the 10 kHz points to be put in by estimating them.

Testing

With S1 closed, the HT line was 380v., with 240v. at the anode of V2. The regulated supply should read 150v. Adjust L2, L3, and VR1 for about 2-3 mA grid current over both bands.

Probably the simplest artificial load is a 15 watt 200/250v. household lamp, connected to a coax plug inserted in the aerial socket. Close VC2, and VC3/4. Switch to "transmit," and rotate VC2 for minimum anode current, as shown by the meter. Open VC3/4 to increase loading and input, meanwhile adjusting VC2 for minimum current, as before. Continue this until the anode current has reached the required figure. Measure the PA anode voltage, to determine the PA input, which must of course be under 10 watts on Top Band. (Input in watts = Current x Voltage). Thus 30 mA at 300v. would be 9 watts, while 40 mA at 300v. would be 12 watts (for 80m. only). These inputs should light a 15-watt lamp well.

When using an aerial, the loading procedure is similar to that with the lamp. The net switch is closed to spot the transmitter frequency with the receiver. Subsequently, the single T/R switch gives complete change-over from transmission to reception, as required.

Aerials

For 80m., a dipole about 126-128ft. long, fed in the centre with 75 ohm co-axial cable, can be expected to give good results. If your 150w. Tx gives S9 in the other man's receiver, this Tx should give about S7. The exact top length may need adjusting.

On 160m., space for a dipole is unlikely, so an end-fed wire is generally used. Fortunately, such a wire is also likely to give good results on 80m., so both bands can be used. A tuner should be placed between the transmitter and aerial, and with its aid any reasonably long wire can load the transmitter, and radiate well. For

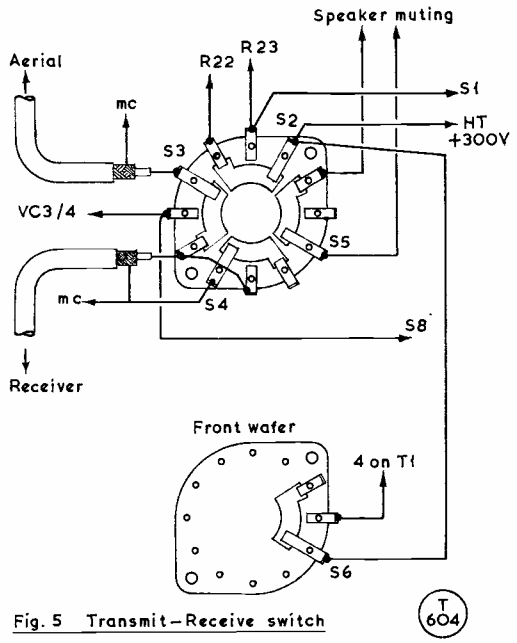


Fig. 5. Send-Receive Switching for the LF Band Transmitter

ITEMS OF INTEREST

We have recently published (p.83, April and p.217, June) pictures of FI8QQ, Saigon, in 1925-'26, and now F8QQ, Nice. A real old timer, he mentions that he learnt Morse in 1910, on his first home-built receiver (a crystal set) by listening to the news transmissions from Lands End Radio (now GLD) at 11.0 p.m. each night, these being intended as general broadcasts for Atlantic shipping.

* * *

On June 27, it was announced that H.M. The Queen has been pleased to name a new Astronomer Royal—an honorary, unpaid appointment, dating since 1675, which has been held by a long line of distinguished astronomers. The latest holder of the office is Sir Martin Ryle, F.R.S., of the University of Cambridge, and the first radio astronomer to have the title bestowed on him. Sir Martin is also G3CY, so a little of the reflected glory rubs off for Amateur Radio.

* * *

The British Amateur Television Club (B.A.T.C.), the organisation concerning itself with A/TV transmission and reception, mainly in our 430 MHz band, will hold its 1972 convention on Saturday, September 16, at the I.T.A. Hq., 70 Brompton Road, Knightsbridge, London, with a programme running from 10.30 a.m. till 6.30 p.m. on that day. A wide range of topics will be covered and details can be obtained from: D. S. Reid, 58 Weald Road, Brentwood, Essex. (Send an s.a.e.).

* * *

The latest I.T.A. UHF relay station, at Lancaster, radiates on 495·25/501·25 MHz, giving a 6 MHz separation between sound and vision carriers. The maximum e.r.p. (effective radiated power) is 10 kW, and the aerial height 604ft. a.s.l. The highest TV transmitting mast in the world is thought to be that for station KTHI, Fargo, North Dakota, which soars to 2,063 feet, remarkable for a man-made structure of conventional design.

* * *

The proportion of G8/3's not going on to take the Morse Test for the full Amateur Radio qualification is disappointingly high. As has so often been said, Morse is easy enough to learn (to the required amateur 12 w.p.m. standard) if tackled with determination. There are a great many amateurs who are entirely self-taught, and nowadays there are aids to learning the Code which the old timer never had. And, like riding a bicycle, once acquired it is never forgotten—though lack of practice over long periods will slow one down, speed can soon be restored, as any CW man will tell you.

* * *

A recent Swissair travel brochure interested us. Entitled just *CQ* it lists seven holiday centres in the five countries HB9, HBØ, DL, OE and CT1 where the usual holiday facilities are offered *plus* a built-in amateur station consisting of a Yaesu FT-400, with all the desirable ancillaries—such as an RF wattmeter, desk microphone and ETM-3 squeeze keyer—the antennae consisting of a 10-15-20m. beam, a five-band ground-plane and a four-band Windom. You can get a local callsign/operating permit by virtue of holding a current U.K. full licence (there are no VHF or Top Band facilities) and this can be fixed up in advance by the tour firm concerned; the well-illustrated brochure gives full details. If you are interested in such a holiday write, *not* to us but to: Top Tour Ham Club, CH-9470 Buchs, Switzerland, asking for Swissair brochure *CQ*.

160m. the wire ought to be at least 130ft. or so long, but more helps. Any length can be used, provided the tuning arrangements cater for it. A good and widespread earth system is also helpful.

For 160m. Only

A transceiver or other equipment covering Eighty may be available. If so, the Tx described here can be constructed for 160m. only. Place a 30 $\mu\mu$F air-spaced or ceramic trimmer across C1 and adjust this and the core of L1 for 1·8-2·0 MHz coverage. Omit S7 and L2, and also the tap on L4, and S8. The transmitter can then be run at up to 10 watts input, with excellent efficiency and modulation.

CODAR—CHANGE OF ADDRESS

This well-known firm can now be found at Valcon Works, Burrell Buildings, Churchill Industrial Estate, Lancing, Sussex.

FREQUENCY MODULATION

GENERATING AN FM SIGNAL — PITFALLS AND PRACTICAL POSSIBILITIES —THE VARICAP DIODE

Part II

A. J. HENK (G8DIK)

GOING on from where we left off—on p.287 of the July issue of SHORT WAVE MAGAZINE—we come now to consider the amplitudes of the sideband components. These are determined by rather complex equations, known as Bessel Functions. It is not intended to drag complex mathematics into this article, so a simple plot of the amplitudes of the first three sidebands, *i.e.*, f_c, $f_c \pm f_m$, $f_c \pm 2f_m$ and $f_c \pm 3f_m$, and how they vary with the modulation index, B, is shown in Fig. 6. From these curves, it is possible to calculate the bandwidth occupied by an FM signal with any practical value of f_d.

Let us have a look, using these curves, at the bandwidth occupied when our AM signal with 3 kHz f_m is replaced by an FM signal of the same f_m and a deviation of, say, 2 kHz. We are assuming, of course, that the frequency modulator has a very low distortion characteristic. The modulation index is first calculated:

$$B = \frac{f_d}{f_m}, \quad B = \frac{2}{3}, \quad = 0{\cdot}67$$

This value of B is plotted on the curves in Fig. 6 and it can be seen that, at this value of B, the carrier has fallen slightly below its unmodulated amplitude, the first sidebands ($f_c \pm 3$ kHz) are at about 0·35 of the unmodulated carrier amplitude, the second order sidebands ($f_c \pm 6$ kHz) are 0·1 of the unmodulated carrier, and the third order sidebands ($f_c \pm 9$ kHz) are negligibly small (certainly well below our 40 dB limit case). The bandwidth of this signal is therefore that represented by the highest significant sideband; in this case, as the highest significant sideband is the second ($f_c \pm 6$ kHz), the bandwidth of this signal is 12 kHz. Compare this with the bandwidth of the AM signal which was 30 kHz. This FM signal does not make the most of this type of modulation, but still gives a useful performance, and makes a good illustration.

We shall return to these curves when we examine the licence regulations, and use them to derive the parameters of a signal which will make the most satisfactory use of the allotted bandwidth on the 144-146 MHz amateur bands. (And for that matter, 70 cm.).

Too Many Ways of Generating FM

When we start examining ways of producing FM we are faced with a bewildering variety of possibilities. These include such devices as active reactances, *i.e.*, valves or transistors with feedback to make them look like variable inductors or capacitors; many different ways of producing phase modulation and then modifying it to look like FM; saturable inductors; mechanically variable capacitors (including capacity microphones), and so on. The most promising of these, the active reactances, can be replaced nowadays with simpler devices. Phase modulation is unsatisfactory for normal amateur use because of the inconveniently large frequency multiplication factors required after the modulator in order to produce an adequate deviation at low audio frequencies.

The device to be recommended for amateur use is much simpler and cheaper than any of the other systems, and on this we shall concentrate our attention in this article. It is the varicap diode.

The varicap diode is, in effect, an electrically variable capacitor. In construction, it is essentially a normal semi-conductor diode with the usual *p-n* junction. The diode is reverse biased so that no direct current flows, but there is always some capacity existing across the junction, at the depletion layer in the semi-conductor. The width of the depletion layer, and therefore the capacity of the diode, varies with the degree of reverse bias applied. By impressing the audio frequency voltage to this reverse bias, the capacitance will change with the audio signal, and if this capacity is connected across the

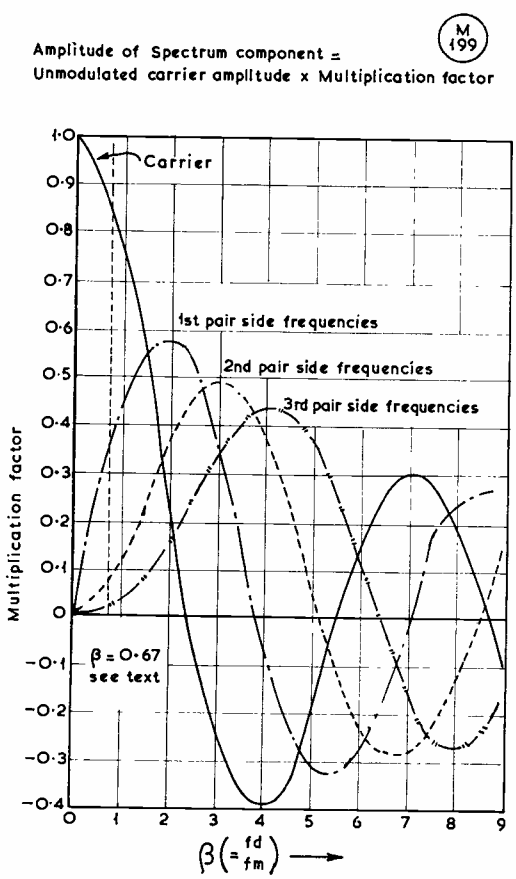


Fig.6 Relative Amplitudes of the Spectrum components of an FM signal.

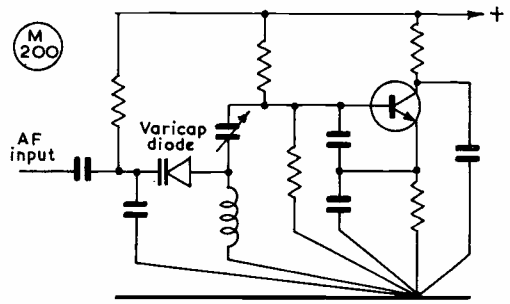


Fig. 7 Use of a Varicap Diode to Frequency Modulate an Oscillator

coil of an L/C oscillator, the oscillation frequency will change with the AF.

Fig. 7 shows one possible arrangement. The varicap is connected in parallel with the tuning inductor as far as the RF is concerned, but is reverse biased by the positive supply. On this bias is superimposed the AF input *via* the input coupling capacitor. Changing the bias therefore changes the frequency of oscillation of the (perfectly standard) oscillator, producing FM. A suitable diode for this circuit is the Mullard type BA-102, and its variable capacitance characteristics are shown in Fig. 8.

Pitfalls

Passing reference will be made to one widespread method of using varicaps, for no other reason than to warn of the dangers associated with it! This is the practice of "pulling" crystal oscillators with varicaps and, for that matter, in other ways. Quartz crystals are designed, as a general rule, to hold the frequency of an oscillator as constant as possible, and to resist attempts to move the frequency away from its design value. If a crystal oscillator is to be "pulled", it is essential that the crystal be suitable for this type of operation—if not, the crystal may well be induced to go off at other frequencies in addition to that in the wanted band, causing severe spurious radiations. This will only happen when modulation is applied and unless the cause is realised it can prove almost impossible to diagnose. More important, it can happen without the awareness of the operator and cause severe interference. Another effect which can occur (and is sometimes heard in the author's area with very strong stations) arises from the fact that, in order to produce sufficient deviation, large changes in capacity are required across the crystal. If the capacitance increases beyond that with which the crystal will oscillate, the oscillator stops, the carrier falls straight to zero, and this break-up, apart from producing severe distortion, also produces interfering sidebands similar to those resulting from severe over-modulation. The author has heard this extending well beyond the edges of the 144-146 MHz band.

Practical Possibilities

We will now turn our attention to ways of using the voltage-controlled oscillator described above as a basic building brick in a practical FM transmitter. In this section, it will be assumed that the transmitter is for 145 MHz although, of course, the systems can be scaled to any realistic frequency. The requirement for frequency stability must be met with FM just as with AM, and this precludes any use of an L-C oscillator operating either directly on 145 MHz or on a sub-multiple with frequency multipliers—a stability of 1 in 10^3, normally obtained with a good L-C oscillator, is far from adequate on two metres. Small improvements can be made by careful design, but even a tenfold improvement, (very unlikely) results in an uncertainty of 15 kHz. The oscillator just described works very well on a frequency of about 5 MH and we can transpose this to the required output frequency in two principal ways.

The most familiar of these is the mixer, a block diagram of which appears at Fig. 9. Its operation is straightforward: The voltage controlled oscillator, (VCO), running at 5 MHz, is mixed with a crystal-controlled signal at 140 MHz. The mixer output contains three components (among many others) on 140, 140 +5 and 140 —5 MHz. The filter selects the 145 MHz wanted component, while suppressing the others. The main difficulty with this design is the required filter characteristic—it must provide sufficient rejection out of the band such that the total power from all the unwanted signals together is at least 60 dB down (one millionth) relative to the 145 MHz component. This is a tall order but it can be done with careful filter design and "watertight" screening. It can be seen that any change in frequency of the VCO will appear in the output. This means that 10 kHz deviation at the VCO produces 10 kHz at 145 MHz. It also means that tuning the VCO (by a capacitor for example) tunes the output and VFO operation is possible.

A second, rather more complex method, is the phase-lock loop, shown in block diagram form in Fig. 10. This is a method of "locking" one oscillator to another. It

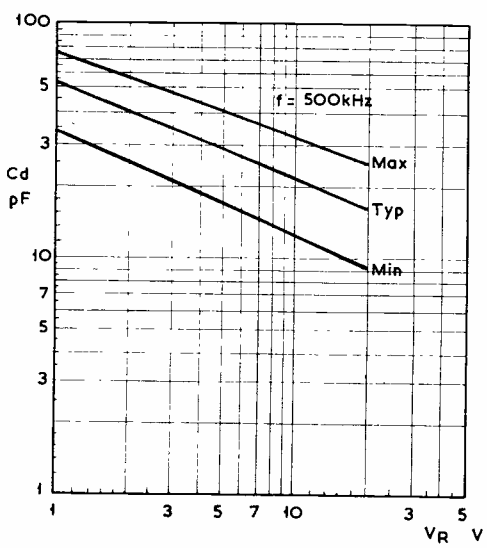


Fig. 8 Variation of Diode capacitance with Reverse voltage

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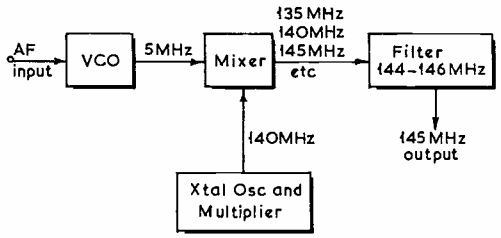


Fig. 9 Mixer method of generating an F.M. signal on 145MHz

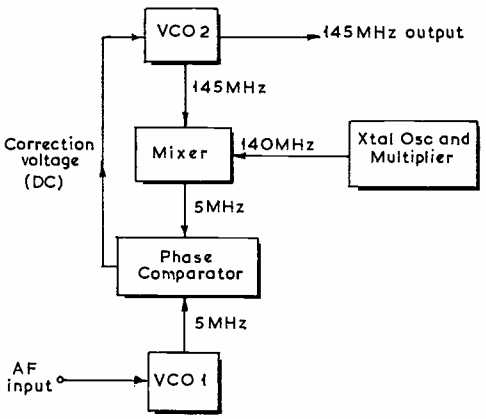


Fig. 10 The Phaselock Loop

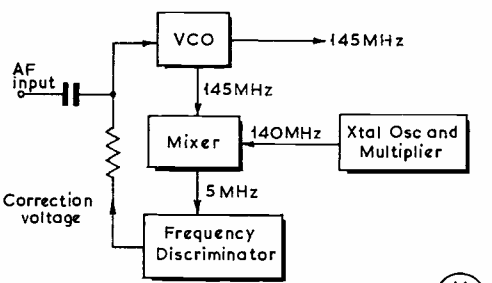


Fig. 11 The Frequency Lock Loop

has the advantage that the signal can be generated at the final carrier frequency, but is complicated and requires the same sort of filtering as does the mixer type. However, for the purposes of explanation, this has been omitted. This is not recommended for amateur construction unless full familiarity is acquired with phase-lock loop design. The voltage controlled oscillator VC02 operates on the final carrier frequency, in this example 145 MHz. Its output is mixed with that of a crystal oscillator on 140 MHz, producing a 5 MHz difference frequency. (It is here that the filtering, referred to above, becomes important). The VCO to which modulation is applied also runs at 5 MHz, and these 5 MHz signals are fed to a phase comparator. This is a device which produces an output voltage proportional to the phase difference between the signals. This "error" voltage is fed back to VC02 in such a sense as to reduce the phase error between the two 5 MHz signals. As these signals are thus locked in phase, it follows that any frequency change (*i.e.*, modulation) of VC01 must be exactly matched by the 5 MHz difference-frequency and, therefore, must appear in VCO2 at the carrier frequency. Once again, of course, VFO operation is possible by tuning VCO1.

A very satisfactory type of frequency modulator is shown in Fig. 11, and is known as a frequency locked loop. As in the phase-lock loop, a 5 MHz (for example) difference-frequency is produced, but in this case it is fed into a frequency discriminator tuned to 5 MHz. As we shall see in the next section of this article, this is a device giving an output voltage proportional to the frequency of the input signal. In the present case, an input of exactly 5 MHz produces zero voltage output, so no change is made in the VCO frequency: it happens to be "spot-on". However, if the VCO drifts HF slightly, the 5 MHz signal increases in frequency and the discriminator output becomes positive. The VCO is designed such that a positive input voltage *lowers* its frequency and, providing that the discriminator is sufficiently sensitive, the VCO is returned to the correct frequency. If the drift is in the other direction, the correction voltage goes negative, and again pulls the VCO back on frequency. So much for keeping the VCO on frequency—and this in itself is a very useful feature as tuning the discriminator gives VFO operation—but what about our FM? We can see that, if we connect a battery in series with the control wire, a frequency error will be introduced for two reasons: (1) The VCO input voltage will change; (2) To correct, or partially correct, for the battery voltage, the discriminator output, and hence the VFO frequency, must change.

These two effects work together, and in the same way that negative feedback reduced distortion in amplifiers, produces a frequency shift which follows the battery voltage very precisely. All we have to do then, is to introduce our AF signal into the VCO input voltage and we have very low distortion FM. The author has been using this system (or an adaptation of it) with great success as an FM VFO on two metres. It is capable of extremely high quality transmissions.

(To be continued)

RADIO COMMUNICATION HANDBOOK

Price of the new printing of the RSGB's *Radio Communication Handbook*—one of the standard guides to the whole subject of Amateur Radio—is £4.10, including postage and secure packing. It can be obtained to order from our Publications Dept., Short Wave Magazine, Ltd., 55 Victoria Street, London, SW1H-0HF.

VHF BANDS

A. H. DORMER, G3DAH

BRIEF mention was made in the *Stop Press* item last month of the arrival of the first good two-metre aurora this year The date was June 18 and it was effective right down into the North of France which is unusual. From reports received, it would appear that both 4m. and 2m. exhibited auroral symptoms between about 3 p.m. and 6.30 p.m. with the second phase appearing between 8-9 p.m., possibly later in some parts of the country.

G3OHH (Staffs.) found conditions better on 4m. than on 2m. but this does not seem to have been the experience of operators South and further North. G5DF in Reading, Berks, for example, heard nothing on the lower frequency, although on 2m. he logged PAØLSC, G3YJG, GM3ZBE, GI3HCG, G3LQR, GW2HIY, GW3NNF, GM3ZVL and GWGWX, finishing up with EI4AL at just after 6 p.m. Beam heading for these contacts was, as usual, just East of North.

GM8FFX (Aberdeen) noticed the start of the aurora while he was out working portable on SSB and went straight round to GM3EOJ and GM3ZBE who both had CW. Apart from several G stations, they contacted SM, PAØ, DL, ON, OZ, GW and F. At 5.30 p.m., GB3VHF, GB3ANG, GB3GI, GB3DM, DLØPR and SM4MPI were all *Ar* auroral signals and G3BA, GM8BKE, GW3NNF and G8DNK were heard *via* the aurora using SSB. Graham kindly sent along a tape of these signals, and one only wishes it were possible to play it in this Column to give the newcomers an idea of the rather special operating techniques required under these circumstances.

GD2HDZ missed out on the aurora completely. That'll larn him to go gallivanting off with GD3FOC on 80m. mobile!

G3COJ rendered valuable and welcome service in alerting several operators by phone. Tks., Brian.

IARU Region I Conference

Now that the report on the IARU Region I Conference at Scheveningen in May this year has been made public, it must be obvious to all of us that the decisions will have far-reaching effects on VHF/UHF communication in this country. The 2m. and 70 cm. band plans will need extensive changes to accommodate the new proposals for repeaters and beacons; Contest arrangements will need modification and some minor rearrangement of the UHF bands will also be required.

Of particular importance is the allocation of frequencies between 145·0 MHz and 145·25 MHz for repeater input channels, and between 145·5 MHz and 145·85 MHz for repeater output channels and FM simplex working. This arrangement will probably necessitate the abandonment of the admirable, geographical band plan we have at present, and the adoption of a "free for all" zone between 144·15 and 145·0 MHz. There may be some compensation for this loss in that the rancour which has sprung up between the FM and non-FM users of the band should disappear if all FM simplex is located above 145·5 MHz and the arbitrary monopolisation of out-of-Zone frequencies by various groups ceases. The limited "free for all" zone also brings some advantages in that it obviates the chore of tuning over the whole band for DX contacts, and it seems unlikely, with present occupancy and predicted growth, that QRM is going to become a serious problem.

There will have to be some serious re-thinking by A/TV operators to accommodate systems in what is left to them of the 70 cm. band—625-line colour without the audio channel falling in the communication section of the band presents quite a challenge!

The introduction of repeaters on 70 cm. will not have the same impact as it will have on 2m. but it must still be regarded as possible, if not probable, that we shall have to abandon the idea of a geographical band plan on these frequencies also—an action which will be regarded by many as merely legitimising current usage!

Considerable discussion will be required to ensure that any long term plan produced for the U.K. shall meet the needs of all users into the foreseeable future.

It is too early, therefore, to comment in greater detail on these proposals, but meanwhile, readers' ideas on the broad outline would be welcome.

Beacons & Repeaters

GB3CTC is back in business on 144·13 MHz. GB3LDN is now reported on 1297·886 MHz with ± 100Hz drift, although the nominal frequency is 1297·95 MHz. G8ARM says that this discrepancy will be corrected after an initial running-in period. F3THF is off the air.

As a result of the IARU Region I Conference, it has been proposed that GB3GEC should go to 432·0 MHz, GB3SC to 432·025 MHz and GB3DN to 432·05 MHz, while the 2m. beacons should go to the top end of the band—all this subject to MPT approval.

A beacon with the call ZC4CY is being installed 15 miles West of Limassol in Cyprus and should be operational on *50·5 MHz* at any time now since ZC4TE, the beacon keeper, has finally obtained the go-ahead from the local authorities. (ZC4's are not permitted to use 4m. or 6m., and the beacon was treated as a special case). G3WCI, who teaches physics at Huntingdon School, has a monitor and pen recorder on the frequency so he may be in a position to confirm reception during periods of Sporadic-E propagation. ZB2VHF, the Gibraltar 4m. beacon, will be switched on "soon" for the Sporadic-E season. If you can listen on 50 MHz, it is reported that SVØAB is now licensed for that band. He must be one of the few EU operators to have that privilege.

We have been asked by MPT to

point out that the Cambridge repeater, reported last month as being on test, is not yet licensed.

A late report on reception via the *Anjou 1* repeater (*see* p.237, June) comes from G8CFZ (St. Leonards-on-Sea) who first heard the beacon transmitter at 0917z and by 0941z traffic was at S6 to S7. Between 1000z and 1030z, it was like 80m. on a Sunday morning! He is one of the few British stations to have got through on the translator. He was heard by locals in Sussex, was called by F8OD (QTH Locator ZH63), and has received a French SWL report from Dept. 17 (QTH Locator ZF). Reports of contacts via *Anjou 1* are still being collated, but it is known that the equipment has been recovered in good condition and that one of the best QSO's was that between F1FG near Bordeaux and F1SA (Strasbourg). The gear was to have been launched again (as *Anjou 2*) between July 15 and 30th, too late for most of us to do anything about it, but the frequencies are the same, so if you hear, or have heard, anything strange during the latter half of the month, this might be the explanation—but as the launch was to take place in the South-West of France, it looks as if it will be beyond our range, even though it be planned to use balloons capable of getting up to 40 km.

We are indebted to Bernard Stroh (a keen French SWL follower of this piece) for information on "Sonde N5" to be launched on Sunday, September 17 at 1400z. The translater will accept all transmission modes between 432·1 and 432·4 MHz and will respond between 145·6 MHz and 145·9 MHz, which puts it beyond the tuning range of some operators. There will be beacon transmissions on 146·0 MHz. F8BSE will be operating between 3·75 and 3·78 MHz with the latest information on the flight, and will answer queries about it over the air. Prior information, on receipt of s.a.e. and one IRC from, and reports to, F1NK, Georges Guinard, 15, Route de Villers, 54, Laxou-Nancy.

DX-Peditions

G8CZE and G8AYD are organising an expedition to the Benelux countries between August 12-26. They will have 50 watts on AM on 145·75 MHz, but can QSY to 145·94, 145·68 or 145·53 MHz if QRM so dictates. Operation between 0730-0830 BST and 2100-2400 BST and skeds can be arranged by s.a.e. to G8AYD, *QTHR*.

Members of the RAF ARS are venturing on to Dartmoor (Devon) and operating on 144·24 MHz between 1900z on September 21 and 2330z on the 23rd. Callsign will be G3RAF/P and skeds can be arranged via G4ACK, *QTHR*.

GM8DTM will be operational at 3,000ft. on Wester Ross in Banffshire on 145·66 MHz on August 5/6. Gear is fully transistorised and can be carried in a rucksack together with a tent and the "necessary survival gear"! Including the corkscrew?

Further information on the G8AGU/GM3JFG trip to the Isle of Arran, Buteshire: They will oe on 2m. between 7 p.m. and 11 p.m. on September 8, 9, 11 and 12th. Modes are: SSB first 15 minutes, CW second 15 minutes and AM for the remainder of each hour. QRG is 145·4 MHz for SSB and 145·5 MHz for AM and CW. They will also have 4m. on Sunday, September 10, between 10 a.m. and 1 p.m. and will particularly welcome skeds for this band. Contact G8AGU, *QTHR*, with s.a.e.

GM8FFZ and GM3ZBE will be operating from the Isle of Man during August 18-25 and from the Kilsyth Hills in Stirlingshire on the night of August 26 on their way home. They will have 400 watts of SSB and will operate around 145·5 MHz. The 70cm frequency is 433·35 MHz with 90 watts of NBFM to a Parabeam, and this station will be activated by request on 2m. Callsigns will alternate daily—GD8FFX one day and GD3ZBE the next. Note that the dates cover the 2m. SSB contest on August 20. Skeds via GM3ZBE, *QTHR*.

It is learned that there is to be an expedition to Mont Blanc (4,807 metres a.s.l.) on September 2/3. Frequencies are 145·0 MHz (main) and 145·8 MHz (alternative if QRM on main channel) and 433·62 MHz—transmit NBFM but receive all modes. A beacon on 1296 MHz will also be carried and this will be up between H and H+15 only. No calls will be answered between H and H+15 as special transmissions will be made during that time to assist in propagation studies. Callsigns are F5LS/P, F1ARL/P or F1BBE/P. Just in case you are wondering how they are going to get up 15,500 feet, a similar expedition last year was serviced by helicopter!

QSL cards will be sent after the expedition has returned but, please do *not* try to work all three callsigns —they will be busy enough!

Contests

Two Metre Contest: Conditions for the 2m. contest over the weekend of July 1/2 were variable. Opinions generally suggest that propagation was good on the Saturday night, tailed off during the late morning and early afternoon of Sunday, and picked up again during the last two or three hours of the event. Several reports mention the welcome increase in CW operation, and the idea of using SSB at the start of each hour seems to have caught on well. That conditions were good during the Sunday afternoon is confirmed by the the reception of GD2HDZ and several GM portable stations in the South. Of these, GM3XHY/P seems to have been the most widely received. This is the call used by the South of Scotland VHF/UHF Contest Group operating from Green Lowther with gear belonging, in the main, to GM8DMZ, who puts out a remarkably good signal from his home QTH in Patna, Ayrshire. GM8CHR/P was copied down into the Midlands, but seemed to be having some trouble with his equipment. GB2UM/P, the group from the University of Manchester, who were at Islay, in Argyllshire, are not reported as heard in the South, which may have been due to the change of site which had to be made at the last moment. GM8FFX/P and GM3ZBE/P were operating from Cairn o' Mounth with about 100 watts of SSB and a 10-ele beam but report conditions not too good, although they managed 120 contacts including nine GW, GD and a mass of stations in the Midlands.

Inevitably, the Welsh portables on their hilltops were good signals over most of the country, particularly the party reported to have had the gear air-lifted by helicopter to the contest site! Consistently strong signals were received from

GW4AYK/P (Brecon), GW3OXD/P (New Radnor), GW3FEC/P (near Snowdon) and GW4ABR/P (Radnor). GW3NNF in Angelsey was well received in the South during the Sunday afternoon.

Further confirmation of the good propagation was the appearance of stations in the Channel Islands (GC2FZC in Guernsey and GC3ZXR/P in Alderney) and several French and Dutch stations. DL was heard on the East Coast, but weakly.

Best U.K. score heard towards the end of the contest was from G8BHH/P in Herefordshire with 265 contacts, although GW8AYK/P, G4AJC/P and GW3FEC/P must be up among the leaders. The last contact of the contest made by your scribe produced a startled reaction—F9FT/A passed 559*344*!

Whether chaps are learning good operating techniques or whether the prospect of disqualification for bad signals has made its mark, it was noticeable that few criticisms were offered about the usual contest malpractices. There still seems to be some tendency to gabble the call-signs, and a couple of stations were heard passing a QTH Locator which did not correspond with their QTH as given but, by and large, discipline was good.

Contest Comments: *By G3BW:*—I was excited to work my first Frenchman, but also frustrated as, although I could hear PAØ and GC, the band was clobbered by the GM portables and I couldn't work them. . . . *By G3NHE:*— On counting up after the contest, I found that I had worked 48 counties and 8 countries after all that scratching about for 56+9 since the start of the year; 32 of my 141 contacts were on CW. . . . *By GD2HDZ:*—The contest was quite rewarding. During 20 hours of operating, I worked 168 stations and nearly lost my voice into the bargain. The day after the contest I received a QSL for a QSO at 2 p.m. on the Sunday. Some people *are* enthusiastic! QSB was very troublesome. *Future Events:* August 13 is the date for the 70 MHz contest and August 20 for the 2m. SSB event, with VHF/NFD and the concurrent IARU Region I affair over the weekend of September 2/3.

An International A/TV contest has been arranged for September 23/24 and September 30 to October 1. Times are 1700-2200 BST on the Saturday and 0900-1200 BST on the Sunday. Frequencies to be used are 2m. for sound only, and 70 cm. and 23 cm. for both sound and vision. This has been organised by BATC in this country, by ATA in Belgium and by AGAF in Germany. BATC are running a national contest concurrently, details of which may be obtained from the secretary of the Club or from Malcolm Sparrow, G8ACB, *QTHR.*

GM3DAH/M/P set up for Two on the Mull of Kintyre.

VHFCC Awards

G8ERF (Aylesbury) receives Award No. 155, for two metres. Les Pimm has been licensed for just over a year and runs an HW-30 at 5 watts input to a 4/4 in the loft. With the exception of the HRO Rx, most of the gear, including a wide range of test equipment, is home-built. He aims to go portable quite a bit in the near future and most of the apparatus is already assembled. He designs and prints his own QSL cards, and attractive they are, too.

Bill Capstick, G3JYP, Appleby, Westmorland, has been the target of the DX chasers for many years, but his claim to Award No. 156 is interesting in that it lists contacts on 2m. with *GM stations only.* He runs a QQV06-40A with 90 watts input to a 10-ele beam at 45ft. The QTH is 550ft. a.s.l., but how he ever gets out is something of a mystery. Your scribe had the opportunity of visiting him recently, and to stand in the garden of

"Condensergapp" (as his house is called) and look out on the fells rising all around, up to 2,000ft. at 3 miles in one direction, offers no easy solution to the enigma. The Nuvistor converter feeds a Drake 2B. Bill expects to be on 70 cm. shortly and has a cavity for the 4CX250B well on the way.

From Norwich comes Peter Le Fevre, G8AWZ, with a claim for 2m. Award No. 157. The two-metre station is QRV on AM, NBFM and SSB. The AM/FM Tx is a converted Ekco CE91 and runs 75 watts to a QQV06-40A. The frequency is VXO controlled with xtals to cover the whole of the band. Both the NBFM and the main tuning are varactor operated. The associated RX is a home-built, solid state job with an FET converter. Digital readout has recently been added giving a six-figure read to 1 kHz. The SSB side of the business uses an HW-32A as the prime mover on 14 MHz and feeds a conventional transverter with 100 watts p.e.p. output. A separate 2m. Rx is also in use which incorporates a panoramic display covering the whole of the band, and Peter finds this invaluable during openings to pick out a call easily amid the band-wide QRM. For 70 cm., he runs a BC-525 with a QQVO3-20A tripler/PA and a DL9ZR type converter with an IF of 144 MHz. Antennae are 10/10 for 2m. and a Multibeam for 70 cm.—all J-Beam. At one time operations were almost entirely from a /A QTH on the East Coast, but after coming home one day having just worked an OE2 from there and then being called by him at the home location with much the same signal report, the alternative site was abandoned! Of the 100 QSL cards submitted for the claim, only 16 were for contacts with G stations, the remainder being a choice selection of DL, OZ, OE, PAØ, F and SM. Very nice going!

Three-Band Annual Tables

More newcomers to the Annual Tables again this month. Particularly welcome are those who, while up among the leaders, have still taken the trouble to send in scores which are of interest for regional, and personal, comparison purposes.

For those who are sending in claims for the *first* time, please include a list of the counties and countries worked on the particular bands, with callsigns and dates. Thereafter, such details are only required for the *additions* to the scores. For those who already figure in the Tables, when amending your scores would you please also give new total claimed per band. This will avoid possible errors of omission and also the confusion which arises when two letters arrive in one month simply requesting that x + y be added to the total, and one cannot be certain whether the greater includes the lesser or not!

This month we show, for the second this time year, the breakdown by bands. The poor propagation conditions since the start of the year have kept the scores down woefully. Among the leaders on 2m. only GD2HDZ has improved substantially over his score for August last year—this probably due not so much to more operating time this year as to the fact that Arthur now has SSB. The 70 cm. scores are, without exception, considerably lower, and on 4m. only G3DAH shows some improvement—from 18 + 2 to 21 + 2—this due to improved equipment as much as anything else.

News Items

GW3ITZ, the RAF Sealand Club, are to be heard on the bands during most contests. They are now operating rather more frequently from their Club QTH which is 4ft. *below* sea level. However, they have a 100ft. tower with 4 elements on 4m. and eight on 2m. which helps quite a bit. They also have gear for 70 cm. and 23 cm. Operators are usually GW3LAI, G3NTI or G3YJK.

G3RVA and G3XEV/P of Wolverhampton seem to have escaped the TVI bogey on 4m. They were heard working on that band recently and commenting that, although they have TV sets on either side of them, they are UHF models and not Band 1 Ch. 4 BBC1 jobs. A sign of the times, since there is usually a loud amount of silence to be heard on 4m. from the Midlands during evening TV hours!

G4ALN is now receiving on 23 cm. with a hybrid ring mixer and untuned coupling into the 2m. converter. The antenna is a 4ft. dish and the tripler is almost ready. GW8FTQ (Newport, Mon.) has made over 80 contacts on 2m. since he was licensed in February this year, and that with but 480 mW measured RF output to a 5-ele. beam. Nice going, but then he served his apprenticeship under Justin Cooper of "SWL"!

Just deserts for the pirate who has been using Alan Dailey's call G3UMH. He has been caught and is being prosecuted, so next time you hear that call on 2m. it should be coming from the top floor of Bradford University where Alan works.

A new record in *non*-receipt of QSL cards may have been set up by G8FNI. He has worked 180 2m. stations since he was first licensed in October 1971, has sent out 170+ QSL cards via the Bureau—so far, he

GB2UM, the Manchester University team on their recent foray into Scotland.

THREE BAND ANNUAL VHF TABLE
January to December 1972

TWO METRES

Station	Counties	Countries	Total
GD2HDZ	67	7	74
G3NHE	56	9	65
G5DF	55	7	62
G8CIW	52	9	61
G3BW	53	7	60
G8CUT	50	9	59
G3DAH	46	7	52
G8DWT	44	4	48
G8BXX	43	4	47
G8FAG	41	4	45
G8FIH	41	4	45
G3FIJ	38	6	44
G4AVX	37	4	41
G4AJE	34	6	40
G3YRH	33	5	38
G3DAO	32	6	38
G8EMS	34	3	37
G8DYK	30	7	37
G8CBU	34	3	37
G8BKR	31	5	36
G4ALN	31	5	36
G8FUI	33	3	36
G8COG	31	3	34
G3PQF	28	6	34
G2AXI	27	4	31
GM8BDX	25	4	29
G8BMD	23	4	27
G3OHH	23	3	26
G8AGL	25	1	26
G8FKL	24	2	26
GW3CBY	19	5	24
G8ERM	21	2	23
G8FNH	20	2	22
GM3ZVB	16	3	19
G3EKP	16	2	18
G3MEW	14	3	17
G8GBH	14	2	16
GW8FTQ	13	2	15
G4AZK	10	2	12
F6BQH	7	3	10
G8DBX	6	2	8
G8FVI	7	1	8
G8FSO	4	2	6

FOUR METRES

Station	Counties	Countries	Tota
G3OHH	36	4	40
G5DF	33	2	35
G2AXI	23	2	25
G3DAH	21	2	23
G3EKP	13	6	19
GD2HDZ	12	3	15
G3FIJ	10	2	12
GW3CBY	1	1	2

SEVENTY CENTIMETRES

G8BXX	25	2	27
G5DF	24	2	26
G3DAH	21	3	24
G3NHE	22	2	24
G8CUT	20	2	22
G4ALN	14	1	15
G3YRH	10	4	14
G8FUI	12	2	14
GD2HDZ	11	2	13
G3OHH	11	2	13
G3FIJ	9	3	12
G8BKR	8	2	10
G8CBU	8	1	9
G2AXI	6	1	7
GW3CBY	3	2	5
GM8BDX	2	2	4
G3EKP	1	1	2

has received *two* back! Something has gone adrift there. Incidentally, he passed the R.A.E. 23 years ago and has only just got around to getting the ticket!

SWL reports on his portable working in Hampshire and Berkshire would be welcomed by G3MEW, *QTHR*. The only one he has had so far was delivered personally by a listener who drove out specially from Andover to Inkpen Hill to deliver it! He is beginning to wonder if there *are* any VHF SWL's! (The answer is "not many" but those we do have are good and keen).

A plea from G8COG to /P's to check that they are using the correct QTH Locator; he notes that one portable with a GW prefix was in fact in Shropshire if the Locator he was passing was correct.

G4AZK is now QRV on 2m. and expects to be on 70 cm. shortly. A recent investment in an HF bands transceiver is delaying the building programme somewhat.

It is with regret that we must announce the death on June 19 of Shane McManee, EI2A of Navan, Co. Meath. He will be remembered by many an old timer for his activities on VHF.

Several correspondents have commented recently on the abuse of the 2m. mobile calling channel by non-mobile stations, and indeed your scribe became only too well aware of the problem during a recent trip to GM and back. The frequency 145·0 MHz has been adopted internationally as the Mobile *Calling* channel, and we really should use it as such. This means that a Mobile may *call* on that QRG, and indeed may be answered on it, but once contact has been established, both operators should vacate it to leave it open for other mobiles in the vicinity. It certainly should *not* be used for local chit-chat by high power, wide band FM, fixed-station operators, as frequently happens at present. This is not intended to be a sermon, but feelings are running quite high in some quarters, and anything which can be done to relieve the tension should be done, if only to make life just that bit more tolerable for the rest of us.

Having mentioned the trip to GM above, it may be added that a J-Beam Portable mast was taken along and this proved ideal for operating from out-of-the-way spots. Two of the three guy wires provided can be fastened to the bumpers of the car and the third tied to any suitable adjacent object or pegged into the ground, the whole operation taking only a few minutes to complete. Another piece of gear which has proved its worth when operating with the mobile equipment is the 2m. pre-amp made and marketed by G3PRX, *QTHR*. This is quiet and has a reasonable amount of gain, ideal for this type of operation.

Tailpiece

Perceptive readers will have observed the use of the expression "QTH Locator" rather than the more familiar "QRA Locator" in these notes. This follows a decision taken at the IARU Region I Convention that the former, more nearly correct, title should replace the latter. It is to be hoped that the VHF Contests Committee will not allow themselves to be put in the position of calling for both QTH and QTH Locator—a *reductio ad absurdum* if ever there was one! (See p.232 of the June 1972 issue).

Deadline

Deadline for next time is **August 4.** The address for news, views, claims and comment remains: "VHF Bands," SHORT WAVE MAGAZINE, BUCKINGHAM. Cheers for now and *73 de G3DAH.*

Stop Press: A high-pressure system (of the order of 1030 mB) centred on the U.K. between July 13-16 produced excellent VHF/UHF tropo. conditions, resulting in the first major EU/DX opening this year. Best direction appeared to be to the East. Few southern French stations were heard but PAØ, ON and DL could be worked easily on both two metres and 70 centimetres during the opening.

Sunday evening, 16th, was the most productive of long-haul contacts, with GM, SM, LA and OZ available at good strength on Two.

Four metres showed promise which was never fully realised—no doubt due to lack of activity?

It is of interest to add that after the 27-day interval there was no return of the Aurora manifestation of June 18.

Valete: It is with deepest regret that we have to record—of heart failure, on July 13—the passing of John Curnow, G6CW, a distinguished old timer very well known on the VHF air. Of him, it can truly be said that he will be missed and not forgotten.

COURSES FOR THE R.A.E.

We commence this month our customary listing of classes to be held giving instruction in the Radio Amateurs' Examination (R.A.E., Subject No. 55 in the syllabus of the City & Guilds of London Institute).

In most cases, course lecturers are themselves active amateurs and also qualified as teachers. In any populous area where there is a strong interest in Amateur Radio, a course can usually be arranged on application to the Principal of the local Technical College, Evening Institute or Adult Education centre (address in Telephone Book). A certain minimum number, normally not less than about 12, is stipulated before a class can be formed. Under these conditions, fees are nominal because the course can be conducted under the local Education Authority regulations.

Where no class exists, the possibility of getting one going can be taken up with the Education Authority by the local radio club. Classes are held on week-day evenings, once or twice a week, and over the years certain of the regular courses have acquired a considerable reputation for getting their students through.

Finally, will those concerned please note that *we* have no information regarding courses other than those listed here. Enquiries should be made through the local office of the Education Authority (or Principal of the Evening Institute) and *not* direct to us. All enquiries should quote Subject No. 55, C. & G.

Course organisers who have not already notified their arrangements should let us know them as soon as possible (not later than August 4) for appearance in the September issue (due out on August 25). Details should be set out in the form shown here and not as "narrative" because we have no space for long insertions. Address to: R.A.E., SHORT WAVE MAGAZINE, BUCKINGHAM, on a piece of paper quite separate from anything else that may be sent in at the same time.

FIRST R.A.E. COURSE LIST

Birmingham: At Holte Adult Education Centre, Wheeler Street, Lozells, B'ham 19, to start on Sept. 20, enrolment evenings Sept. 11-12. Enquiries to Head of Centre, address as given, or to G4ABV, *QTHR.*

Borehamwood, Herts: At the College of Further Education, Elstree Way, on Wednesdays 7.0-9.15 p.m., starting on Sept. 27. Enrolment 10.0 a.m.-1.0 p.m. and 4.0-8.0 p.m., Monday/Tuesday, Sept. 11-12. Course Lecturer G. L. Benbow, G3HB.

Boston, Lincs: At the College of Further Education, Rowley Road, details from D. Byrne, G3KPO, Quadring Watergate, Spalding, Lincs. (*Tel. Gosberth 485*).

Corby, Northants: At the Technical College, for the third successive year, with D. J. Wilson, G3VCQ, as instructor. Course will be one evening a week, starting in September, enrolment during the first week of the new term. Information at the College, or ring *Corby 3252.*

Cove, Hants: Commencing at the Further Education Centre, Cove County Secondary School, St. Johns Road, Farnborough, on Sept. 28 at 7.30 p.m., with J. Hardy, G3KND, as Course Tutor. Details and enrolment form from the Principal, address as given.

Gosforth, Northumberland: At the Evening Institute, Gosforth Secondary School, Regent Avenue, commencing in September. Enquiries to the Principal of the Institute, or to the Course Lecturer, D. R. Loveday, G3FPE, 5 Carlton Road, Benton, Newcastle-on-Tyne, 12 (*Tel. 668439*).

Harlow, Essex: At the Technical College, College Gate, The High, on Friday evenings, 7.0-9.30 p.m., starting in September. Details from E. P. Essery, G3KFE, 17 Ascot Close, Parsonage Lane, Bishops Stortford (*2501*), Herts.

Ilkley, Yorks.: At Ilkley Grammar School, to cover the district of the Pudsey College of Further Education. Details from D. B. Appleby, G8FUW, Hillcrest, Bingley Road, Menston, Nr. Ilkley, Yorkshire.

London (Chingford): At the Community Centre, Friday Hill House, Simmons Lane, starting on Sept. 25, 7.30-9.30 p.m. on Mondays. Fees £2·65 and £1·25 for juniors, enrolment at the Centre, Sept. 18-20. Further information from the Course Tutor, E. Johnson, G2HR, 35A Woodland Road, Chingford, E.4. (*Tel. 01-529 2932*).

London (Ilford): At the Evening Institute, Cranbrook Road, opening on Sept. 27, enrolment Sept. 7-10, 7.0-8.30 p.m. at the Institute. Fees from £3·00 to £1·50 for juniors. This Course was started 25 years ago and has a long record of success in R.A.E.— W. G. Hall, G8JM, 48 Hawkdene, North Chingford, London, E4 7PF.

London (Penge): At the Adult Education Centre, 28 Beckenham Road, Beckenham, starting on Sept. 19 at 7.0 p.m. Applications for enrolment can be made by post to the Area Office, 244 Croydon Road, Beckenham, Kent, BR3 4DA, from Aug. 29, or personally at the Centre. The Lecturer will be R. E. Piper, G3MEH.

London (Western & Purley): At the Technical College Annexe, Tamworth Road, Croydon, on Thursday evenings. Enrolment Sept. 16, 9.0 a.m.-3.0 p.m. and Sept. 18, 7.0-9.0 p.m. Course Tutor will be P. L. Burton, G3ZPB.

Oxford: At the College of Further Education, Cowley Road, details from the Principal, at the College.

Slough: Offering at the College of Technology, Wellington Street, Fridays 6.30-8.0 p.m. (Morse) 8.0-9.30 p.m. (R.A.E. Theory), enrolment Sept. 13-15. There is also an interesting Advance Class, for those already licensed and wanting to learn more. The College operates G3XPL as a fully-equipped amateur-band station. Further details from: E. C. Palmer, G3FVC, Dept. of General Studies, Dept. of Technology, Wellington Street, Slough, SL1 1YG, Bucks.

Further R.A.E. Course details will be given in the September issue of SHORT WAVE MAGAZINE, provided information is received by *August 4.*

NEW PREFIX LIST

We have just published another revise of our *Prefix List*, giving countries and prefixes alphabetically both ways, and also the Zone area appropriate to each country/prefix. This is a much more extensive and informative list than any other available in print—for one thing, it sorts out the Russian prefix system in some detail, and also includes a tabulation of the international numerical prefixes, held by the I.T.U. for future use.

Since the last *Prefix List* appeared, about two years ago, there have been something like 180-200 changes of one sort or another, all taken into this new edition. As well as telling you things like YA being for Afghanistan in Zone 21, we have even got in the new name for British Honduras ("Belize") when it "gains its independence," as the saying is, later in the year.

Cost of the new *Prefix List*, corrected to January 1972, is 20p. However, as always, we include it as a free loose supplement with our *DX Zone Map* (which has likewise had the Zone area panels at the sides of the Map brought right up-to-date) and at 85p post free the *Zone Map* and the *Prefix List* together are extremely good value for money—the one is a useful, practical and decorative addition to the station and the other an indispensable reference for any operator seriously interested in DX. Orders (*Prefix List* only 20p, *Zone Map* with the prefix list, 85p) with remittance, to: Publications Dept., Short Wave Magazine, Ltd., 55 Victoria Street, London, SW1H-OHF.

SPECIALLY ON THE AIR

As the summer season starts to run out, there are fewer stations to be listed under this heading—though, if we do get a "St. Luke's Summer," which is entirely possible after the appalling weather we have been having, there could be more stations coming on.

We have represented to the Ministry that, in future, all special-activity stations should be given a prefix-callsign *not* involving the personal call letters of any amateur already licensed, *i.e.*, that the prefix should be GB7, or whatever, this then constituting a separate c/s sequency. It happens too often that the holders of active callsigns find their call letters being used to fit some fête or other public occasion, differentiated only by the GB prefix. But the I.T.U. regulations make it quite clear that the prefix is to indicate nationality only and that the suffix identifies the holder of the callsign personally.

By using a prefix like GB7 for special-activity stations, with the suffix letters to suit the occasion, there would be no misunderstanding about the status of the station nor, perhaps more importantly, about the QSL procedure. It would be known that all GB7's were to be QSL'd under the conditions applying to Special Activity stations. This would eliminate much of the present confusion and mis-direction of QSL cards—we understand that many 100's of exotic DX cards cannot be delivered because the GB stations involved not only have never lodged envelopes but are unknown to QSL bureaux managers.

We are glad to say that the Ministry now appreciates the point and that the special prefix is being considered as future procedure.

G3OHB/A, July 29: The Cornish Club's exhibition station at the Mawnan-Smith Festival, Falmouth, to cover all bands as practicable, also an SWL station for visitors.—P. King, G3WKP, Nirvana, Compriney Hill, Truro, Cornwall.

LA1SS, August 3-9: From the Norwegian Scout Camp near Oslo, operating all amateur bands, with a special QSL card to confirm contacts.—V. Segalstad, LA4LN, Heggeliviein 44, Oslo, 3, Norway.

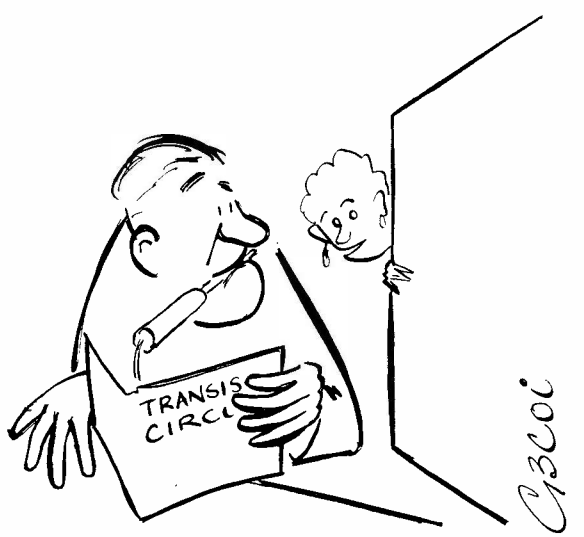
GB3ISJ, till August 5: Operated by the Torbay Amateur Radio Society for the International Scout Jamboree at Torquay.—L. H. Webber, G3GDW, 43 Lime Tree Walk, Newton Abbot, South Devon.

GB3BIC, August 5-12: Located at the Berkshire International Scout Camp in Windsor Great Park, running full-scale activity over 10 to 80 metres and Two, with a special card for all QSO's.—L. R. Mitchell, G3BHK, 28 Darwall Drive, Ascot, Berks.

G3CAR, September 2: For the annual Wycombe Show, organised by the Chiltern Amateur Radio Society, operating on all bands 10-80m., AM/CW/SSB. Contacts will be confirmed by special QSL card, and visitors welcomed for the occasion.—A. C. Butcher, G3FSN, 70 Hughenden Avenue, High Wycombe (*24835*).

GB3PP, September 4-9: By Preston Amateur Radio Society for Preston Guild Week, working HF bands 10-80m.—G. W. Earnshaw, 12 Withy Parade, Fulwood, Preston, Lancs. PR2 4JN.

GB3SAF, October 7: Put on as a demonstration station for the 62nd Leicester Scouts annual Autumn Fair. It is hoped that operation will be on 160-80-20-2m. simultaneously, with SSB. Special QSL cards are being produced.—D. Pick, G3YXM, 9A Long Lane, Billesdon, Leicester.



" . . . I think Baby's swallowed your VFO . . . "

THE MONTH WITH THE CLUBS

By *"Club Secretary"*

(Deadline for September issue: August 4)

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

GRIPES all around this month, to be mentioned—it must have something to do with the weather!

Nina G8ENX, puts in a lot of work, to report the programme details each month, and she was somewhat incensed at overhearing, while attending the Chiltern Rally, the statement that "Burnham Beeches meet twice a month at the pub and never do anything!"

Reader P. L. Newman, of Thame, writes to say he made a thirty-mile journey to attend his first club meeting; at the venue were five others, none of whom were officials, and after ¾-hour they "gave it best," and retired to the local, less reader Newman who went home to his receiver. One can understand his feeling of no-enthusiasm, but it was perhaps somewhat hasty; the club your old scribe belongs to has been known at this time of year to have a very low attendance at a meeting, so if for any reason the lecturer and the officers could not turn up, they would just remain in the bar. The same club would show an attendance of up to thirty people a couple of months later in the season. It is a pity SWL Newman did not name the club he tried to join, so that the group concerned could have an opportunity to defend itself.

Nationals

And here we must make a mention of the British Amateur Radio Teleprinter Group, better known as **BARTG.** Their current *Newsletter* contains the second part of an article discussing the coded information used by the weather stations, and what information can be extracted. In a separate letter, hon. sec. G3VZV says that it has come to notice that some people who want to join are not sure of the address to contact—no more problem, just use the name, address, and telephone number shown in the relevant part of our Panel of Hon. Secretaries (p.368).

British Amateur Television Club needs no introduction to those devotees of the /T art; but if there is anyone with a yearning to learn about A/TV, then the *BATC Newsletter* is the thing for you. The 1972 BATC Covention is to be held on September 15, at the ITA Hq., 70 Brompton Road, Knightsbridge—further data from the Hon. Sec.—*see* Panel.

R.A.I.B.C. nets are on a frequency around 3650 to 3700 kHz, depending on the QRM, on Tuesdays at 1000, and 1400 on Wednesdays; and they always mention in their magazine the Cheshire Homes Net on the same frequency, at 1400 on Thursdays.

The **Nigerian** crowd seem to be more numerous in U.K. than Nigeria, judging by the latest *Newsletter*! Whether this is so or not, they find that their "mentions" in this piece have helped several people to make contact.

The mobile interest is catered for by **A.R.M.S.,** mainly through their admirable *Mobile News* each month.

Our last entry in this section is devoted to **WAMRAC** an organisation catering in the main for radio types who are also Methodists, anywhere in the world, contact being maintained by way of the *Newsletter*, and various nets on different bands around of the world.

South and East

And in this section we must first mention a new Club formation, covering the area around **Ely** in Cambridgeshire; they meet at Ely Adult Education Centre, St. Mary's Street, Ely, on alternate Thursdays, at a starting time of 7.30 p.m. Incidentally, already they have obtained a membership of about 25, the majority licensed.

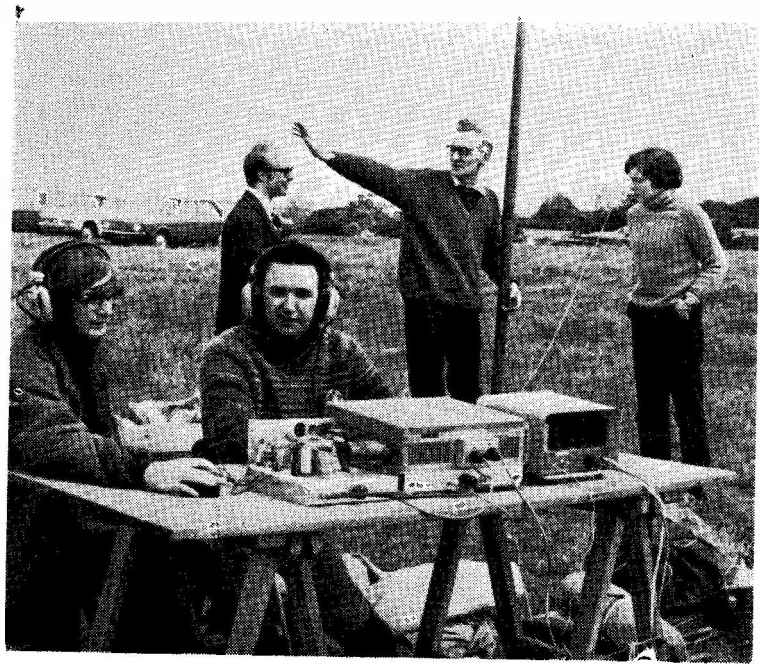
For **Bishops Stortford** members, August is a slack month; they have no formal talk laid on, as so many of the gang are on holiday, but, instead, they open the Hq. up for a good old gas. The venue is the British Legion Club, Wind Hill, Bishops Stortford, and the date August 21, starting at 2000 clock.

August 10, a Thursday, is the one, as far as the lads of the **Southgate** group are concerned, at the Civil Defence Hut in Bowes Road; the matter in hand will be the VHF NFD arrangements, and what is left will be given over to nattering. The Hq., incidentally, for those who do not know their North London, is right opposite Arnos Grove Tube station on the Piccadilly Line.

Nothing formal is booked at **Mid-Sussex,** their normal home at Marle Place, Leylands Road, Burgess Hill, being closed. However, we understand a series of shack visits are filling up the temporary gap, so a line to G3RXJ seems indicated, by way of the address in the Panel on p.368.

For August, on the 15th, the **Surrey** crowd and their ladies have a treat in store, when G2YL does yet another of her slide-show travelogues, as anyone who has ever seen one will agree. The venue is the Swan and Sugarloaf in South Croydon.

There are two sessions of the **Burnham Beeches** group, at Hedgerly Scout Hut, on August 3, for a tape lecture, and August 17 for a session on VHF NFD planning. In addition, they are having a mobile picnic in Windsor Great Park, this event being booked for Sunday August 13—we will keep our fingers crossed



Before they got the tent up—the Bury & Rossendale Radio Society were signing G3BRS for Field Day, this picture having been taken at about 1.30 p.m. on June 3. The gear included a Heathkit HW-101 and in the picture (seated) are G4ATK and G3RSM; behind are G8EAP, G2GA (evidently directing operations!) and SWL Taylor.
picture courtesy "Bury Times"

for some good weather!

Another new formation is that for **Kent Coast.** They are for the moment meeting in alternate months, with the next one on August 1. However, the question of a venue is, at the time of writing, still open, so for that, and any other information, we must refer you to G4ADS, as Panel.

Now a change of Hq. to be announced; at **Bracknell** the group is moving to Cooper's Hill CommunityCentre, in Bracknell, where the meetings will be fortnightly, the dates we are given extrapolating to August 7 and 21. There is an entrance fee to the building of 10p, which goes to the local authority running the hall.

We have already made it known that a change was pending at **Edgware;** in the event, it has meant also a change of date. Normally, it will be the second and fourth Thursdays, at Watling Community Centre, 145 Orange Hill Road, Edgware, but, for August, there will only be one meeting, *on the 21st,* to discuss VHF Field Day arrangements.

Over to **North Kent** now, at the Congregational Church Hall, Chapel Road, Bexleyheath. August 10 sees G8CIU expound on RTTY techniques, and on the 24th G3GJW talks on Raynet activity. An "extra" occurs on August 28, when the club have a station at the Erith Show, at the Avenue Road Sportsground.

Dunstable Downs are a very active lot, VHF-wise, not to mention Amateur TV, and other such delights; they can be found at Chews House, 77 High Street South, Dunstable, on Fridays, with August 4 and 18 as "between weeks," meaning the Bring-and-Buy Sale on the 11th, and G8ASP's talk on August 25.

An early *Newsletter* brings **Crystal Palace** in phase with our dates; and from it we find that on August 19 G3FZL and G8AMG will be explaining the ins-and-outs of VHF Repeaters, and Mobile Equipment.

At the moment it is wide open whether the **Chiltern** chaps have a lecture in August, dependent on the number away on holiday; however, the Club will be operational on August 8 and August 23, as usual, at the Ernest Turner works, in Totteridge Avenue, High Wycombe.

A sked has been arranged for August 15, between the assembly at **Acton, Brentford and Chiswick** Hq. and FØUT, who is member G3CCD in disguise. Hq., incidentally, is Chiswick Trades and Social Club, 66 High Road.

Unfortunately, we have been a little out of sync. with the **Echelford** Newsletter of late, and so it is not, at this writing, possible to tell you what is on for August. This being the case, it is suggested those interested should contact G3WVJ at the address in the Panel, p.368.

No meetings in August, saving August 31, is the message from **Shefford;** the August 31 date is set up for final planning details of their VHF NFD entry, with a Junk Sale in what time remains. Shefford meet at the Church Hall, Ampthill Road.

Another group reducing their August activity is that at **Basingstoke,** where Chineham House, Popley, is booked only for August 19, for everyone to discuss and plan for the VHF Field Day event. Incidentally, by the autumn, it is hoped that Basingstoke's Club station will be on the air, on the HF Bands and Two Metres, using entirely club-owned equipment.

(over

M C C THIS YEAR

Fixed for November 4-5, rules and procedure in full in the October issue, due out on Sept. 25.

Westerlies

Sadly, the letter and copy of **IRTS** *News* advertising their meeting to prepare for the Dalkey Island expedition missed our previous deadline; and if all goes well they should by the time this reaches print be either well on the way or already back home, dependent on the date finally chosen. However, we notice their Region One Hq. is at 91 Lower Baggot Street, Dublin, and the Secretary's address appears in the Panel.

Another club which has been forced to make a move is at **Bristol,** and it is a pleasure to be able to say that they now have a new Hq.—24 Bright Street, Barton Hill, Bristol 4,—which is no more than the aerial's length from the old place. Meetings weekly on Tuesdays; and details of the current arrangements can be obtained from G3TKF, as Panel below.

Cornish have made a good move, in the current issue of the *Cornish Link*, in putting, immediately under the detailed information on the coming meeting, notes on the next three main meetings—how we wish some other clubs would do the same! From this advance information we get it that G3HFS will, on August 3, give a talk and demonstration of Colour TV, to be followed after the break by a Question-and-Answer session. This will be, as usual, at the SWEB Clubroom, Pool, Camborne; and a p.s. indicates that the Newquay sub-group have decided to go into hibernation for the summer months.

Now to **Hereford,** who are at the moment recovering from the Cider Festival in which they participated; they can be found, on any Friday evening, at the County Control, Civil Defence Headquarters, Gaol Street, in Hereford.

It is quite a time since we heard from **North Devon,** a group for which your old scribe has rather a soft spot, having tasted for himself the flavour of their welcome to a stranger in the area. For August they have only one date booked, namely August 23, for a Ragchew, the August 9 date being deleted.

Midlands Northward

Here our first port of call is **Cheltenham RSGB** group —one of several clubs in the area, so we must take care of titles!—who have a Natter Night on August 3 at the Royal Crescent Hotel, Clarence Street.

Nottingham use a room at Sherwood Community Centre, Mansfield Road, making a prompt start at

Names and Addresses of Club Secretaries Reporting in this issue:

ACTON, BRENTFORD & CHISWICK: W. G. Dyer, G3GEH, 188 Gunnersbury Avenue, Acton, London, W.3.
A.R.M.S.: N. A. S. Fitch, G3FPK, 40 Eskdale Gardens, Purley, Surrey, CR2-1EZ.
BARRY COLLEGE: D. H. Adams, GW3VBP, 49 Colcot Road, Barry, Glam.
BASINGSTOKE: P. Sterry, G3CBU, Ashley, Orchard Road, Salisbury Gardens, Basingstoke.
BEDFORD: J. Bennett, G3FWA, 47 Ibbett Close, Kempston (*2427*). Bedford.
BISHOPS STORTFORD: E. P. Essery, G3KFE, 17 Ascot Close, Parsonage Lane, Bishops Stortford (*2501*).
BRACKNELL: S. Jewell, G8EMY, 3-10th Avenue, Garstons Park, City Road, Tilehurst, Reading.
BRISTOL: R. W. Thompson, G3TKF, Stapledown, Hill Drive, Fairland, Bristol.
B.A.R.T.G.: G. P. Shirville, G3VZV, 2 Bradford Way, Toddington (*2470*), Dunstable, Beds.
B.A.T.C.: D. S. Reid, 58 Weald Road, Brentwood, Essex.
BURNHAM BEECHES: Miss N. Appleby, G8ENX, 42 Sutton Avenue, Slough, Bucks.
BURY: F. S. Burnett, 13 Rhiwlas Drive, Bury (*061-764 7554*).
CHAD: G. Benson, G8FBL, 2 Saxon Walk, Lichfield, Staffs., WS13-8AJ.
CHELTENHAM RSGB: E. Janes, G2FWA, Hillside, Bushcombe Road, Woodmancote, Cheltenham. (*Bishops Cleeve 2229.*)
CHILTERN: P. J. Perkins, G3OUV, Loakes House, Loakes Park, High Wycombe.
CORNISH: P. King, Nirvana, Comprigney Hill, Truro (*4788*), Cornwall.
COVENTRY: C. Jaynes, 20 Belgrave Road, Wyken, Coventry, CV2-5AY.
CRAY VALLEY: P. F. Vella, G3WVP, 78 Hurst Road, Sidcup, Kent.
CRYSTAL PALACE: G. M. C. Stone, G3FZL, 11 Liphook Crescent, London, SE23-3BN (*01-699 6940*).
DERBY: F. C. Ward, G2CVV, 5 Upland Avenue, Littleover, Derby (*21931*), DE3-7GE.
DUNSTABLE DOWNS: C. G. Powell, G8BPK, 1 Wenwell Close, Buckland Wharf, Aston Clinton (*600*), Aylesbury, Bucks.
ECHELFORD: V. W. Higgs, G3WVJ, 205 Commercial Road, Staines (*57021*), Middx., TW18-2Q T.
EDGWARE: A. J. Masson, G3PSP, 62 Coldharbour Lane, Bushey, Herts. (*01-950 6827*).
ELY: P. R. Brown, 59 Fieldside, Ely, Cambs.
HARROW: R. H. Medcraft, G3JVM, 134 Dulverton Road, Ruislip Manor, Ruislip (*38726*), HA4-9AG.
HEREFORD: S. Jesson, 181 Kings Acre Road, Hereford (*3237*).
IRTS REGION I: M. McNamara, 125 Coaley Road, Dublin (*502275*), 12.
KENT COAST: J. Chisman, G4ADS, 5 Shirley Avenue, Ramsgate, Kent. (*Thanet 55317.*)
LOUGHBOROUGH: M. Roberts, G8FER, 27 Lansdowne Drive, Loughborough (*65355*), Leics.
MELTON MOWBRAY: R. Winters, G3NVK, 32 Redwood Avenue, Melton Mowbray (*3369*).
MID-SUSSEX: E. J. Letts, G3RXJ, 87 Meadow Lane, Burgess Hill (*3552*), Sussex.
NIGERIAN: E. A. Lomax, 5N2ABG, P.O. Box 68, Kaduna, Nigeria.
NORTH DEVON: H. G. Hughes, G4CG, Crinnis, High Wall, Sticklepath, Barnstaple, Devon.
NORTH KENT: M. Lee, G4BAL, 46 Harman Drive, Sidcup.
NORTH STAFFS: D. Maxfield, G3ZRQ, 40 Fegg Hayes Road, Stoke-on-Trent, ST6-6RA.
NOTTINGHAM: S. F. Claringburn, 49 Fernleigh Avenue, Westdale Lane, Nottingham, NG3-6FN.
PLYMOUTH: A. G. B. Helm, G4BCX, 94 Cotehele Avenue, Keyham, Plymouth.
R.A.I.B.C.: Mrs. F. Woolley, G3LWY, Woodclose, Penselwood, Wincanton, Somerset.
RUGBY: J. L. Wood, G3YQC, 54 Elkington Road, Yelvertoft, Nr. Rugby, Warks.
SHEFFORD: A. Sullivan, G2DGF, 12 Glebe Road, Letchworth.
SLADE: J. E. Drakeley, 186 Conway Road, Chelmsley Wood, Birmingham, 37.
SOLIHULL: A. W. Bagley, G3XPY, 266 Warwick Road, Olton, Solihull, Warwickshire (*021-706 3688*).
SOUTHGATE: J. Batchelor, G3XMV, 22 Faversham Avenue, Bush Hill Park, Enfield, Middx.
SOUTH MANCHESTER: D. Holland, G3WFT, 7 Alcester Road, Sale, Cheshire, M33-3GW.
STOKE-ON-TRENT: R. Procter, G8CRS, 8 Birch Road, Bignall End, Stoke-on-Trent, ST7-8LB.
SURREY: S. A. Morley, G3FWR, 22 Old Farleigh Road, Selsdon, South Croydon, CR2-8PB (*01-657 3258*).
SUTTON & CHEAM: J. Korndorffer, G2DMR, 19 Park Road, Banstead.
TORBAY: Mrs. G. L. Western, G3NQD, 10 Truro Avenue, Hele, Torquay.
VERULAM: H. Young, G3YHY, 93 Leaford Crescent, Watford, Herts., WD2-5JQ.
W.A.M.R.A.C.: Rev. A. W. Shepherd, G3NGF, The Manse, Kendal Road, Tebay, Penrith, Cumberland. (*Orton 275.*)
WIRRAL: A. Fisher, G3WSD, 34 Glenmore Road, Oxton, Birkenhead, Cheshire.
WOLVERHAMPTON: J. P. H. Burden, G3UBX, 28 Coalway Road, Wolverhampton, WV3-7LX.
YEOVIL: D. L. McLean, G3NOF, 9 Cedar Grove, Yeovil, Somerset.

7.30 p.m. August 3 is a ragchew/discussion session, and the 10th an Activity Night with the Club station on the air. August 17 is a talk by G3YUT on Printed Circuit Techniques; in this second talk he will be dealing with the photographic methods. August 24 is a Sale of Equipment, and on August 31, they are going out to Ratcliffe-on-Soar Power station, although the clubroom will be open to visitors and those members not on the trip.

Still another new formation comes up for mention, this one being the **Chad** club of Lichfield, who ran GB3CRC during June for a fortnight, making 300 contacts all of which will be QSL'ed. Details of the Club can be had from G8FBL, as Panel opposite.

Derby can always be relied on to present a full month for members' entertainment and edification; for instance, the August list shows, on the 2nd, a Junk Sale; preparations for the Rally on the 9th, this being at the Rally venue, Rykneld School; and a Ladies Evening on August 16, when the Quiz will be organised by Miss Ann Woollerton of "Radio Nottingham". Then comes a Technical Film Show on August 23, the topic being aerials. The month is nicely rounded out by a D/F Practice. Boiling it all down, it means a weekly meeting at 119 Green Lane, Derby every Wednesday, plus extra treats in between.

The hon. Secretary at **Stoke-on-Trent** made sure we got the essentials by putting them as a heading to his letter, thus making things a bit easier for your conductor —Thanks! Thursdays it is, at 2A Racecourse Road, and we understand things have been left open for August, not just because of holidays but also so that the Hq. may be improved by the installation of separate workshop facilities.

In the same area is **North Staffs,** whose home is at the Harold Clowes Community Centre, off Dawlish Drive, Bentilee, Stoke. At the moment, they are mainly "on the air" with their TS-510 transceiver, and they would be glad to see visitors on any Monday evening.

At **Loughborough,** the hon. sec. has sent in three months' programme in advance—we hope he doesn't want us to keep his letter on file that long; there just isn't enough room in the shack as it is for your "Club Secretary's" papers, himself *and* the rig! Anyhow, to look at the August doings, on the 4th there is a D/F session on *Two*, and on the 11th they will spend the evening dropping, overhauling and re-erecting the 144 MHz aerials. Then on August 18 there is a visit, destination as yet not fully settled, followed by a lecture on the 25th. The Hq. is at Bleach Yard, Wards End, Loughborough.

For **Wolverhampton** there is a weekly get-together, on Monday evenings at Neachells Cottage, Stockwell Road, Tettenhall, plus, over August 28/29, an exhibition station set up at the Walsall Show, in the extension of the Walsall Arboretum.

It rather looks as though the **Melton Mowbray** crowd are missing August completely, the earliest date we are advised of being September 17, for the all-important AGM, at the St. John Ambulance Hall, Asfordby Hill.

A change of address is recorded for the **Rugby** lads who have now got a private room at the Lawrence Sheriff public-house in Rugby, where they assemble on the last Tuesday of each month, for an informal evening, with refreshments—naturally—being available.

SHORT CLUB NOTICES

CLUB NAME	HEADQUARTERS LOCATION	MEETING DAY MONTHLY
Bedford	"The Dolphin," Broadway	Wednesdays
Bury	*not given*	August 8
Coventry	121 St. Nicholas Street, Radford Road	Fridays
Cray Valley	Congregational Hall, Court Road, London, S.E.9	August 3, 17
Harrow	Harrow County School, Sheepcote Road	*None till September* 15
Plymouth	Virginia House, Bretonside	August 8, 22
Slade	Church House, High Street, Erdington	August 11, 25
Solihull	Malt Shovel, High Street Manor House, High Street	August 1 August 15
South Manchester	Sale Moor Community Centre, Norris Road, Sale	Fridays
Sutton and Cheam	"The Harrow," Cheam	*None till September* 19
Torbay	Bath Lane, Belgrave Road, Torquay	August 26
Verulam	St. Albans Town Hall	*Refer to Hon. Sec.*
Wirral	Drill Hall, Birkenhead	August 2, 16
Yeovil	Youth Centre, 31 Park Lodge, The Park	Thursdays

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

Philately

Stamp-collecting readers may be interested in the **Barry College of Further Education** idea of arranging for a special envelope, franked by the Flatholm Island postmark and stamped with the 7½p Marconi stamp, to be available for 20p as a "first-day cover." All the details may be obtained from the club's hon. sec.—*see* Panel.

Last Nail In

With that, we wind up another "Month with The Clubs", the mail (and the reports) beginning to show the effects of the holiday season.

For our next appearance, on August 25 (*Sept. issue*), the closing date is **August 4,** first post for certain—and please note that with our very tight production schedule we can *not* write in reports received late (whatever may be the date on the letter! There is too often a wide discrepancy between letter and postmark dates!).

Send your Club gen. to "Club Secretary," SHORT WAVE MAGAZINE, BUCKINGHAM—which is full and sufficient. And don't forget about MCC, coming up the first week-end in November.

MAKE IT OR BUY IT?

SOME THOUGHTS IN THE CONTEXT OF THE TIMES

N. C. HENDERSON (GM3LYI)

IN many branches of industry it is often necessary to consider the *pros* and *cons* of making or buying equipment or component parts and the final decision is made after due consideration has been given to the two main factors involved which are (1) Can we make it? and (2) Would it be cheaper to buy it?

Today a growing number of radio amateurs face exactly the same problem, largely due to the complexity of modern radio equipment and the expense involved in obtaining the necessary bits and pieces which, in most instances, can no longer be picked up at the local radio store.

The amateur, however, has another difficulty, which is somewhat akin to losing face among his fellows—because if he doesn't create and operate home-built gear, he can be scathingly dubbed an "appliance operator".

'Way back in the days of breadboard rigs and simple receivers it was comparatively easy to be an all-round exponent of the art of Amateur Radio and, as the years went by, many were still capable of keeping abreast of modern designs and techniques but, nevertheless, the ranks were thinning because of the changing patterns of the modern age.

How many hours per week does the average amateur have available to indulge his practical interest in radio?

Apart from the ever-present menace of TVI and the need to keep friendly with the neighbours (so *your* Tx is free from harmonics!) the domestic situation has undergone a radical change with the advent of that facet of "Women's Lib.", the working XYL! The days when the OM could disappear into the shack for hours on end is largely a thing of the past as, by the time he has washed the dishes, and put the baby to bed there's little of the evening left for anything else but the making of the supper and getting between the sheets. (Unless of course he is one of the *rara avis*—a night owl!)

Under these circumstances how much time is available for constructional work and how many tired and fractious XYL's would be willing to have the kitchen table littered with bits and pieces and the OM filling the room with the sweet smell of solder? Lucky is he who is still a bachelor—or the possessor of a workshop or shack at the bottom of the garden!

Of course, there are lots of folk still building their own gear but, if the current Amateur Radio literature is anything to go by, the majority of constructors are VHF enthusiasts caught up in transistory, with very few tackling the more complex task of building an all-band SSB rig or some such man-size piece of equipment for the HF bands.

So be charitable towards the "appliance operator" who has many problems to overcome but, at least, he helps to keep the bands occupied and the Amateur Radio ball rolling.

It follows, then, that a large number of amateurs nowadays—if they want to be able to communicate (which, after all is surely the prime object of the exercise)—must end up by buying a rig to put themselves on the air.

So, by taking a more liberal view, it is evident that there is no harm done in acquiring a tailor-made as opposed to a roll-your-own piece of gear and, anyway, it isn't essential to be technically brilliant to enjoy and to contribute to the world of Amateur Radio. An increasing proportion of active amateurs are doing just that.

"THE OTHER MAN's STATION"

We would be glad to have more offerings for this feature, which has appeared off and on in SHORT WAVE MAGAZINE ever since 1938, though not so often during the last year or so. The first requirement is a good, clear black-and-white photograph, preferably about post-card size, with details of the gear in view, the operator's personal history as a radio amateur, current on-the-air achievements and interests and any other such information permissible for publication. We write the story from the details given and payment is made at page-rate immediately on publication. Material for "Other Man's Station" should be sent to: Editor, SHORT WAVE MAGAZINE, BUCKINGHAM.

RTTY CLUB MEMBERSHIP

Present strength of the British Amateur Radio Teleprinter Group is about 270, of whom 80+ are SWL's, in 14 countries. The hon. secretary B.A.R.T.G. is G. P. Shirville, G3VZV, 2 Bradford Way, Toddington, Dunstable, Beds. We would like to hear much more in the way of RTTY operating results, with what and who are being worked on the various bands. After all it was the articles by Brennan, G3CQE in SHORT WAVE MAGAZINE ("RTTY Topics," April '61 to October '66) that got amateur radio-teleprinter working off the ground, not only in the U.K. but in many other countries. The forthcoming BARTG manual, *Radio Teleprinter Handbook*, will incorporate much of this material.

ECHO FROM THE PAST

Many years ago, meaning about 1923, a callsign to be heard on the old 440-metre band (at that time open to amateurs as a medium-wave allocation when the BBC was off the air—at that period U.K. broadcasting only happened between about 5.0 p.m. and 11.0 p.m.) was 2CH, operated from Oundle School, Northants., then as now one of England's leading public schools. At that time, Edgar Wagner, G3BID, was one of the senior boys behind the Oundle School Science Society, as it was then called.

The years have gone on and once again 2CH, now with the G prefix, is back on the air with the c/s re-issued, to the Oundle School Amateur Radio Society, with G4AOF as one of the leading lights.

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.

G3BDT, A. L. Searle, Mayditte, Chard Junction, Chard, Somerset (*Tel. South Chard 462*) (*re-issue.*)

G3XWK, W. J. C. Pinnell, 6 Priory Road, Hastings, Sussex.

G4APH, J. Lambert, 2 Hargrove Avenue, Padiham, Burnley, Lancs., BB12 8NU.

G4BBY, R. W. Edwards, 68 Dosthill Road, Twogates, Tamworth, Staffs.

G4BCP, L. A. Graves (*ex-VP8KO*), 5 Grasmere Place, Gosforth, Newcastle-upon-Tyne, NE3 2JA. (*Tel. 0632- 855067.*)

G4BEE, R. Banister (*ex-G8EBK*), Lyngrove, 215 Chorley Old Road, Whittle - le - Woods, Chorley, Lancs., PR6 7NP. (*Tel. Chorley 6202.*)

G4BEM, c/o D. Maxfield, Harold Clowes Community Centre, Dawlish Drive, Bentilee, Stoke-on-Trent, Staffs.

GM4BFX, A. B. Milne (*ex-GM8EVV*), 11 Hammerfield Avenue, Aberdeen, AB1 6LL. (*Tel. Aberdeen 33533.*)

G4BGI, J. Butler, 4 Church Street, Bridgnorth, Shropshire.

G4BGT, M. A. Staton, 65 Campbell Road, Eastleigh, Hants., SO5 5AA.

G4BGX, D. B. Jones, 5 Tupsley Road, Coley-Park, Reading, Berks.

G4BGY, J. Fogg, 6 Linden Leas, West Wickham, Kent, BR4 OSE.

G5KD, Dr. F. M. Smith, 62 Hartington Road, Chiswick, London, W4 3TU (*re-issue*). (*Tel. 01-994 3902.*)

G8FNI, D. Ormston, The Paddock, Wyton, Bilton, Hull, Yorkshire, HU11 4DJ. (*Tel. Hull 811386.*)

G8FQA, B. Dunn, 17 Duke Street, Clayton-le-Moors, Accrington, Lancs.

G8FUW, D. B. Appleby, Hillcrest, Bingley Road, Menston, Nr. Ilkley, Yorkshire.

G8GBH, S. Hannah, 443 Chesterfield Road, Pleasley Hill, Mansfield, Notts.

G8GFL, A. K. Milner, 38 Lime Grove, Grantham, Lincs.

CHANGE OF ADDRESS

G2CVO, F. H. Osborn, Mount Echo, 54 Firs Chase, West Mersea, Colchester, Essex.

G3CEU, N. F. Wilshire, 29 Trenethick Parc, Helston, Cornwall.

GM3EZQ, S. A. H. White, Dorran Cottage, Druimneil, Port Appin, Appin, Argyll.

G3HCM, D. Dumbleton, 14 Compton Court, Long Compton, Warks. (*Tel. Long Compton 669.*)

G3ISP, P. Cairns, 13 Garden Drive, Hebburn, Co. Durham. (*Tel. 0632-834162.*)

G3LEX, R. J. V. Reed, 13 The Casemates, H.M. Tower of London, E.C.1.

G3LMO, N. G. Cooper (*ex-VS1GC/DL5XD/PA9JI*), 40 Helston Drive, Emsworth, Hants.

G3LSL, D. I. Lunn, 18 Cordon Crescent, Earls Barton, Northants. NN6 OPW.

G3NJQ, J. D. Simpson, 2 Neville Street, Norwich, Norfolk.

G3PRK, A. Yilmaz, 100 Chase Way, London, N.14.

G3OHP, M. J. Winter, The Chimes, 9 Higham Road, Cliffe, Rochester, Kent.

GM3POK, E. J. Kelly, 7 Hazeldean Avenue, Bo'ness, West Lothian.

G3PTZ, A. Bensley, 7 Keeble Drive, Washingborough, Lincoln.

G3TJQ, D. J. Bean, 87 Stanford Road, Norbury, London, S.W.16. (*Tel. 01-679 1089.*)

G3TWG, Lt./Cdr. P. J. Patrick, R.N., 35 Sylvana Close, Vine Lane, Hillingdon, Middlesex.

G3WPP, D. C. H. Minett, 50 Timberdine Avenue, Worcester, Worcs., WR5 2BD.

GM3WSR, V. G. Clark, 3 Concorde Way, Spencerfield, Inverkeithing, Fife. (*Tel. Inverkeithing 4466.*)

GD3XJR, M. S. Dickinson, Borrane, The Promenade, Port St. Mary, I.o.M. (*Tel. 0624-72 2479.*)

G3XYJ, R. N. Walker, 27 Archer Close, Kings Langley, Herts.

GM3YHJ, The Caravan, Drimvore, Lochgilphed, Argyll.

GM8EUS, J. N. Douglas, 49 Barcaldine Avenue, Chryston, Glasgow, G69 9PB.

DO USE IT!

When you see "Short Wave Magazine, Buckingham" given as the Editorial address—either for our regular news features, Club reports, or whatever—please use it! This simple QTH is a full and sufficient address from anywhere in the world (with the addition of "England" for non-G countries). While anything affecting the editorial content of the *Magazine*—meaning what goes between the advertising sections—sent to our registered-office address at 55 Victoria Street, London, SW1H-0HF will naturally reach the Editorial Dept. in due course, it should be realised there can be a "post-officing delay" (particularly with weekend mail) because the Editorial Dept. is operated from Buckingham, and not from London. On the other hand, everything to do with subscriptions, advertising and book orders should go to Victoria Street for immediate action in these particular categories. Though in fact 95% of our mail *is* being correctly routed, and has been for years now, there is a certain small proportion that has to be re-directed every week.

For this month's Small Advertisements, see pp.376-381

SMALL ADVERTISEMENTS

("SITUATIONS" AND "TRADE")

5p per word, minimum charge £1.00. No series discount. All charges payable with order. Insertions of radio interest only accepted. Add 50% for Bold Face (Heavy Type). Box Numbers 12½p extra. No responsibility accepted for transcription errors. Replies to Box Numbers should be addressed to The Short Wave Magazine, 55 Victoria Street, London, SW1H OHF.

TRADE

GOVERNMENT Surplus Wireless Equipment Handbook; Contains circuits, data, illustrations and valuable information for British & USA receivers, transmitters and trans/receivers. Includes modifications to sets and test equipment; price £2·85, post/packing 15p. **WANTED:** All types of communication receivers and test equipment; top prices paid. What Have You—**Gerald Myers (SW), 18 Shaftesbury Street, Leeds, LS12-3BT, Yorkshire.**

QSL Cards for Tx and SWL. Send s.a.e. for samples stating which type required.—**Beaumont, G5YV, 8 Ashfield Avenue, Morley, Leeds, LS27-0QD.**

SEPTEMBER Issue: Due out August 25. Single-copy orders 25p, post free, to reach us by Wednesday, August 23, for posting on August 24.—Circulation Dept., Short Wave Magazine Ltd., 55 Victoria Street, London, SW1H-0HF.

YORK PHOTO-AUDIO CENTRE. Yaesu FT-200, FT-101, FT-400DX, YC-305, etc., all available ex-stock. **Trio** TS-515 Transceiver, £235 (new models), TR.2200 two-metre portable transceiver, £69·95. TR.7100 two-metre car transceiver, £99·50, and all existing models available from stock. **Codar** A.T.5 Mk. II, £22·50; PSU, £11·50; CR-70A Mk. II receiver, £27·50. **Hamgear:** The full range of Calibrators, Converters and Preselectors ex-stock. **Credit terms** are available on all equipment of value £25 or over, with little or no deposit and up to 24 months to pay. We are prepared to consider your Camera Equipment in **Part Exchange** and we will accept good quality Communications Gear in exchange for Cameras or Hi-Fi apparatus. We stock Nikon, Pentax, Rollei, Minolta, Zenith, Olympus, etc., etc. and in our Hi-Fi Dept. we have B. & O., Trio, Sanyo, Yamaha, Koss, Sinclair, etc., etc.—**51 Fossgate, York, Y01-2TF, Tel: 56176,** or York 25798 after hours.

QSL CARDS and G.P.O. approved Logs (hard back), prompt delivery. Send 4p stamp for samples.—**Atkinson Bros., Printers, Looe, Cornwall, PL13-1LA.**

QSL Cards: for Tx, G8 or SWL. One to four-colour designs; large s.a.e. for samples; good selection. —**Red Rose Publicity (Pennington), 34 Aqueduct Street, Preston, Lancs.**

WANTED: Crystals, 2 to 3 kHz spacing, range 430 to 480 kHz; qty. 50-100 at any frequency in this range required, also one-third quantity 2 to 3 kHz lower in frequency. Please quote details and price.—**G3LLL, Holdings, 39/41 Mincing Lane, Blackburn, BB2-2AF, Lancs.**

READERS ADVERTISEMENTS

2½p per word, minimum charge 50p payable with order. Add 25% for Bold Face (Heavy Type). Please write clearly, using full punctuation and recognised abbreviations. No responsibility accepted for transcription errors. Box Numbers 12½p extra. Replies to Box Numbers should be addressed to The Short Wave Magazine, 55 Victoria Street, London, SW1H OHF.

READERS

SELLING: RC.411/R professional receiver, having digital frequency indication, phase-locked loop, full synthesising, tuning 15 kHz to 31·0999 MHz (no gaps) in 32 bands, each covered in steps of 1 kHz and 100 Hz, with vernier tuning 0-100 cycles plus 10 kHz and 100 kHz controls (any spot frequency in range set in seconds), stability better than one part in 100 million per day drift, sensitivity better than 0·5 microvolt in A1, A3A, A3J modes, with four positions of crystal selectivity, three settings of AGC, RF and AF level metering, audio output of one watt and 10 mW, on plug-in PC boards, all solid state, incorporating over 540 semiconductors and 18 integrated circuits. Best offer over £450.—Box no. 5094, Short Wave Magazine, Ltd., 55 Victoria Street, London, SW1H-0HF.

BARGAIN: New Sony Global Receiver Type CRF-150, coverage LW, MW, ten SW bands and VHF, double-superhet circuit, uses 19 transistors and 12 diodes, with built-in speaker, telescopic aerial and external terminals, cost £126·50, a bargain at £85.—Leighton, Tangley Cottage, Wonersh, Guildford, Surrey.

RECEIVERS: Eddystone 940, EA-12; Hallicrafters VHF BC-348, £12·50. BC-221, £10. Collins P.T.O., £5. Bandpass filter 2·6 kHz; large UK navigation map. Meters: 20 micro-amp, 54mV; Headphones; £1 each. Please send s.a.e.—Wright, 249 Sandy Lane, Hindley, Wigan (55948), Lancs.

REQUESTING any unwanted radio books or magazines, by keen reader now serving in N. Ireland. —Fus. Edwards, Medical Centre, 1st Bn. Royal Welch Fusiliers, Eblington Barracks, B.F.P.O. 801, Northern Ireland.

SELLING: Mosley TA-32Jr, £14·50 prefer collected. Hamgear PM Mk. I preselector, £3·50. Eddystone speaker, £1. Joymatch Type 4RF, £2·50. Post/packing extra. WANTED: Codar RQ-10X Q-multiplier with PSU, top price paid for FB model with instructions; also instruction sheet for Marconi VTVM TF-428B/1, No. 1497592.—Watson, 19 Frances Road, Basingstoke, Hants.

INTERESTED listener wishes to borrow recordings of any pirate radio stations or any information on such stations. All letters answered.—Gibson, 3 Suffolk Road, Middlesbrough, Teeside.

EXCHANGE or SELL: HW-17A and DC/PSU, immaculate, used twice only, £60 or EXCHANGE for good general coverage Rx or RTTY gear. Minimitter 8-band converter, £5.—Ring Bradbury, 0782 21164 (Stoke-on-Trent), evenings.

SALE: BC-221 frequency meter, good condition, original manual and charts.—Bell, Watch Tower House, The Ridgeway, London N.W.7. (Tel: 01-959 6773).

WANTED: Pye "Cambridge" radio-telephones, any band, working or not, or pieces.—Westlake, West Park, Clawton, Holsworthy, Devon.

SALE: Pye Vanguard, £30; Pye Cambridge, £25; both fully converted for two metres. "G2DAF" Mk. II Rx, with 898 dial, Electroniques coils, Kokusai filter, £30. Buyer collects.—Tompkins, G3SUU, QTHR.

FOR SALE: Lafayette HA-600 Rx, new, unused, boxed and guaranteed. First offer nearest to £35. —Ring Hely, 711 538 (Olney, Bucks).

SELLING: Heathkit RA-1 amateur band receiver, £20. Heathkit DX-40U with VF-1U, £20. (Both factory-built). Codar PR30X preselector, £4. Four-metre J-beam, 4-element, new, £3. Fernesh all-transistor TV camera, complete with f1.8 Schneider lens, with spare Vidicon, £30. All items are in perfect working order, all "or near offer."—Ring Quinn, Plymouth 51502.

WANTED: By VK3BEQ. TTL II or ST6/5 demodulator, Racal RA-217 or RA-17 receiver. Price by airmail, please.—McCulloch, VK3BEQ, P.O. Box 14, Riddells Creek 3431, Victoria, Australia.

FOR SALE: JXK two-metre converter, 28-30 MHz IF, in perfect condition, £10.—Struthers, GM8CVN, QTHR. (Tel: Hawick 2806).

SELLING: RCA AR88LF receiver, very good condition, £30. WANTED: HRO table model for rebuilding, BC-348 or BC-342. Would collect 50 miles, s.a.e. please.—Cox, 8A Parker Street, Chorley, Lancs.

SALE: KW-2000, excellent condition, G-line cabinet, new R.C.A. 6146B in final, £100 no offers.—Davies, G3YJD, ring Watford 31369 (Herts).

FOR SALE: Heathkit RA-1 receiver with crystal calibrator, excellent condition, £30. Prefer buyer collects.—Griffiths, G8EJR, or ring Sheffield 306427.

SALE: R.C.A. AR88D receiver, very good condition, with set of spare valves, bargain at £35.—Taylor, Hurdley Moor Farm, Middlemarsh, Sherborne, Dorset. (Tel: Holnest 235).

SELLING: Trio JR-500SE fitted with Top Band, cascode front end, Clevite filter, a good receiver, £42. AR88D Rx, rack mounting, modified for SSB, spare valves and headset, good working order, £25. Deliver 50 miles.—Handy, 105 Humber Avenue, Coventry (22201).

SELLING: Large quantity of components, transformers, valves, FET's, transistors, R.1155, CR-100, DX-40U, 70cm. converter, Multimeter, Class-D wavemeter, etc., etc.—Lewis, 1 Western Road, Pontardawe, Swansea, Glam. Ring 21221 (work), 862297 (home).

WANTED: Wharfedale W15/W10/Super-3, preferably in well-constructed 9 cu. ft. SFB cabinet to Wharfedale design.—Sandall, G3LGK, QTHR.

SALE: Codar CR-70A receiver, additional IF, as new condition, £15. PR-30 and RQ-10, £4 each. The Lot for £20. Can deliver.—Thornewell, 24 Leigh Sinton Road, Malvern, Worcs.

FOR SALE: Eddystone EC-10 Mk. I general coverage receiver, just been factory overhauled, £50 or near offer? Wharfedale W3 loudspeaker, £10.—Herring, 34 Woodands Road, Romford (47998), Essex.

SELLING: Hammarlund HQ-170A with clock, £75. K. W. Vanguard, £25. Both units in store last four years; checked over and in excellent order.—Crossan, 8a Beckenham Road, West Wickham, Kent. (Tel: 01-777 6645).

SALE: Trio TS-510D with PSU, Tx never used, mint, £145 or near offer. Codar CR-70A, PR-30 and speaker cabinet, all brand new, £31. Baby expected in December, so must sell.—Ring Capper, Takeley 517 (Herts).

SALE: Grundig Satellite-210 amateur band communications receiver, covering VHF/LW/MW/Marine/49m. plus 160-10m., full bandspread, wide/narrow IF bandwidth, AM and CW/SSB product detectors, twin speakers, battery/mains operation, little used, mint, about 24 months old, £85 carriage paid or EXCHANGE professional tape deck or Ferrograph/Revox.—Sandall, G3LGK, QTHR.

SELLING: Heathkit HW-12A 80m. Transceiver with HP-23A PSU and HRA 10-1 Calibrator, price £55 or near offer.—Passdore, G3UCF, Tel: 021-475 7710.

WANTED: Aerial rotator, suitable for two-metre beam.—Cage, G8GBV, 25 Petersham Drive, Alvaston, Derby (71875), DE2-OJU.

SALE: KW-2000 with AC/PSU, in good condition, price £110 or near offer (carriage paid).—Edwards, G3RJB, 41 Winston Road, Hereford (Tel: 0432 66869).

SELLING: National HRO-M receiver, with PSU and three coil packs covering 600 kHz to 14 MHz, £12. B.40 Rx, 650 kHz to 30 MHz, also £12. Both these receivers in clean and working condition. Bateman, 6 Oxford Drive, Whitehills, Kippax, near Leeds, Yorkshire. (Tel: Garforth 4214, after 6.0 p.m.).

FOR SALE: KW-2000B with external VFO, two transformer PSU, zeners in place of OA2's, mint condition, top performance, price £175. Yaesu FL-DX400 transmitter, two months old, hardly used, a real punchy job, at £110. SWL's: Apart from the gimmicks, this is better than a R-4B—Drake 2C triple conversion Rx, realigned and with new valves, mint condition, £80.—Manning, G3XOM, 60 North Cray Road, Bexley, Kent, CY 22612.

SELLING: American UHF Rx, coverage 450-470 MHz, AC operated, £15. CRT unit Type 2, £6·50. Calibrator unit, AC/PSU, £3·50. CRT AC/PSU, £5·50. American CRT D/F unit, £8. CRT unit Type 100, £5. VHF Rx, 20-100 MHz, AC operated, £15. AC/PSU Type 234, £5. Eleven UHF valves, £5. Carriage extra, s.a.e. with enquiries please.—Hayward, Sunnyfields, Lighthouse Road, St. Margaret's Bay, Dover, Kent.

FOR SALE: K.W. Atlanta, separate VFO, with Vox and built-in fan, 16 months old, £160 or will split. —Ring Thomas, G3ZLN, Ipswich 55200.

SALE: Heath Apache TX-1, excellent condition, £50 or near offer. Heath HW-32 20m. transceiver, requires attention, £20 or near offer.—Menzies, Eastwood High School, Capelrig Road, Newton Mearns, Glasgow.

WANTED: TR-2200 2m. hand transceiver. Also Joystick aerial with VFA tuning unit. State condition and price.—Selman, 25 Hereford, 370 Fulham Road, London S.W.10.

SELLING: S.27 Rx, £15. Heath RA-1 receiver, £25. SP.600 in cabinet, £85. Pye base station, hi-band, coverage 144-146 MHz, £25. Vanguard hi-band, with control gear, £17·50. R.1155, with internal power supply, £10. Transceiver for 20-40-80m., with commercial power supply, £85.—Ring Earl, G3OXV, Daventry 2265.

SALE: KW-201 receiver, mint, includes crystal calibrator and speaker, coverage 160-10m., £60 or near offer?—Buckley, G3VLX, 17 The Weald, Chislehurst, Kent. (Tel: 01-467 8093).

FOR SALE: Lafayette HA-600 AM/CW/SSB communications Rx, coverage 150 kHz to 30 MHz, bandspread 80-10m., complete with 'phones and instruction book, good condition and approx. 18 months old, £25. Buyer collects, s.a.e. please.—Bunyan, 20 Gayhurst Drive, Sittingbourne, Kent.

WANTED: R.C.A. AR88D in good condition.—Knight, Blossomfield, East Street, Great Bookham, Surrey. (Tel: Bookham 3500 after 6 p.m.).

SELLING: American UHF Rx, coverage 75-1000 MHz in two bands, AC operated, £120. American panoramic receiver, AC operated, £25. Eight-waveband transistor communications receiver, 150 kHz-22 MHz, £14. Carriage extra, s.a.e. with enquiries.—Hayward, Sunnyfields, Lighthouse Road, St. Margaret's Bay, Dover, Kent.

SELLING: Eddystone EB-36 receiver, immaculate condition, with BFO, ANL, AGC on/off, RF gain, battery/mains internal PSU and manual, in maker's original packing. Offers?—Lockwood, G3XLL, 29 Coppice Avenue, Hellesdon, Norwich (48685), Norfolk.

SALE: Trio 9R-59DE Rx, fitted stabiliser, original packing, as new, £35.—Coles, Fox Lane, Westcott Barton, Oxon OX5 4BS. (Tel: Steeple Aston 609).

FOR SALE: Lafayette HA-63 receiver, coverage 550 kHz-30 MHz in 4 bands, with bandspread, BFO, Ant. trim, ANL, S-meter and phone socket. Codar PR-40 preselector and Joymatch aerial tuner Type SM. All in excellent condition; ideal beginner's, or stand-by, station, £30 The Lot. Post/packing extra. Sale due to owner moving.—Williams, 6 Heol-Llwynon, Caewern, Neath, Glam. SA10 7SN. (Tel: Neath 4391 after 5 p.m.).

FOR DISPOSAL: Trio TS-510D transceiver with PS-510 PSU, less than a year old and never used, because advertiser's ticket quest has been unsuccessful! An absolute gift at £110. Also R.1155 Rx, with mains PSU and speaker, Joystick tuner Type 4RF (unused), the pair for £7—or The Lot as one package deal, £115. (Leeds area).—Box No. 5096, Short Wave Magazine, Ltd., 55 Victoria Street, London, SW1H-0HF.

OFFERING: A good R.C.A. AR88LF, with speaker, headphones and handbook, in very clean condition and a good performer. WANTED: HW-32A or similar.—Ring Machtin, G4BHE, Bracknell (Berks.) 3111, ext. 219.

WANTED: K.W. E-Zee Match. Codar 12 M/S and 12 R/C Units. Also PSU for National HRO.—Sweeney, G3TFS, 58 Grosvenor Road, Epsom Downs, Surrey (Tel: Ashtead 72689).

SELLING: AR22 rotator with control. Quad for 10-15m. comprising 20ft. pole, two end cross-pieces, all alloy, plus 8 fibre-glass rods, £25. Also Pye PSU, fully enclosed, fused and relay controlled, outputs 500v. 500 mA, 300v. 250 mA, neg. 50v. for bias, neg. 50v. for relay and 6·3v. 5A, £7.—Ring Vann, GM3TVB, Glasgow 427 1337.

FOR SALE: Eddystone EC-10 Mk. I receiver, £35. Eddystone S.640, £12. Labgear Top Band Tx, £12. —Mathews, G3APB, 16 Great Parks, Holt, Trowbridge, Wilts.

SALE: Hallicrafters SX-100 receiver, with full coverage and bandspread, suitable AM/CW/SSB, in mint condition, including speaker and headphones, £70.—Ring Lance 021-706 0557 (Birmingham).

SELLING: Receiver CR-100/B.28, with noise limiter, working but needs slight attention, £10, carriage extra.—Brett, 33 Eastfield Road, Keyingham, Hull, HU12 9TP.

SEPTEMBER Issue Short Wave Magazine due out on Friday, August 25. Single copies at 25p post free can be supplied to orders reaching us by Wednesday, 23rd, for despatch on Thursday 24th, the day before publication. These copies go out flat in an envelope. Orders with remittance to:—Circulation Dept., Short Wave Magazine, Ltd., 55 Victoria Street, London, SW1H-0HF.

OFFERING: G2DAF-type Mk. II SSB Tx, in excellent condition, with mechanical filter, coverage 10 to 160m., £50 or offer.—Savage, G3SCU, QTHR.

EXCHANGE or SELL: Codar CR-70A receiver for Hallicrafters Rx covering 27 to 200 MHz, or thereabouts.—Forrest, 8/3 Calder Grove, Edinburgh, 11, Scotland.

For some recommended titles, taken from our main list of publications in "Short Wave Magazine" every month and briefly described when space allows, see May '72, pages 136 & 184.

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