
VHF BANDS

By E. J. WILLIAMS, B.Sc. (G2XC)

*The Five-Metre Story—
Summary of Results on Five—
Two-Metre Activity—
Another Record on 70 Centimetres*

TO summarise the results obtained on Five Metres since the band was first operated, and the experience it has given all VHF workers in this country, is not the easiest of tasks—apart from which, we are all bidding farewell to an old friend. Operations on Five Metres find a unique and lasting place in the history of Amateur Radio in this country. In the amateur field, they made possible some remarkable developments in VHF technique; every VHF operator, known or unknown, has benefited directly from the collective progress made by British amateurs on Five Metres; and most operators cut their VHF teeth on the problems (which seem so easy now) posed by the Five-Metre Band.

It will probably be agreed that the story of Five Metres divides itself into two well-marked periods. The first, the years up to about 1936, when self-excited transmitters and super-regenerative receivers were the order of the day; and the second, from 1938 onwards, when crystal control and either straight or superhet receivers became the standard equipment. The years between were a transition period when the need for stabilised apparatus was becoming generally recognised, with the DX possibilities of the band gradually assuming a greater importance.

Pre-War Era

For those who did not know the pre-crystal control period, we should like to paint a picture of five metres as it was then. The experience of your conductor started in 1933, but others knew the band long before that. That long distances might be covered on rare occasions had been proved by one or two reports of 100-mile reception several years before, but in general, anything over 10 miles was considered DX and worth reporting. Transmitters were often of the push-pull tuned

anode resonant grid type, feeding into long wire aerials.

Such was the transmitter at, for instance, G6NZ in Southsea. In common with other local enthusiasts, we built a super-regenerative receiver, but being on the opposite side of a 300-ft. hill from G6NZ, we failed to hear anything but ignition QRM. Nothing daunted, we persuaded a neighbour to spend Sunday mornings taking us round the district in his car, so that we could log G6NZ's signals in more favourable locations.

Other groups up and down the country were doing the same sort of thing. Portable work became the great thing. One Sunday in each month was set apart in the South of England as a 5-metre field day. Transceivers, each smaller than the last, were built by everyone and provided much fun, even if they did not add much to the sum total of radio knowledge. We remember a contact between G2XC and G6NZ while the latter was on a moving bus, and other similar novel contacts were made elsewhere.

In 1934, G6QB took his five-metre gear to the top of the Crystal Palace, while G5CV went aloft in an aircraft and obtained air-to-ground ranges of 130 miles. G5BY went to the top of Snowdon, a venture repeated by G5CV, G6YQ, GW6AA and others later. Signals from Snowdon were heard as far away as Essex.

But by 1936, many of us were realising that so far we had only been playing at 5 metres and that if the full possibilities of the band were to be explored, both transmitters and receivers must be improved considerably. CW reception should be made possible, and that meant frequency stability at both Tx and Rx ends. Really good valves for use on 60 mc were still scarce and expensive, and in spite of the general acceptance that CC transmitters and straight or superhet receivers were desirable, progress was slow. Gradually, however, stabilised transmissions increased in number as news spread of the possibility of European DX; commercial harmonics had been logged during the summer of 1936 and G2FA worked F8NW across the Channel, while G5BY (then at Croydon) was reported heard at W2HXD.

But the first European QSO was delayed until July 2, 1938, when G5MQ worked I1IRA. About this same time, inter-G contacts over distances up to 100 miles or so were becoming commonplace, as a result of the improved Tx, Rx and aerials in use. In fact, we find A. J. Devon saying in the *Short Wave Magazine* for October, 1938, "56 mc contacts are of little value as news items when the distances involved are less than 50 miles." In the latter half of the same year, G5BY-G6FO obtained regular schedule contacts over the

126-mile path between Croydon and Newport, Mon., for the first reliable ground-to-ground GDX, and G6FO also logged G6DH at 180 miles. The G5BY-G6FO contacts stood for many months as the GDX record.

Early 1939 found G6DH striving to work ON4DJ across 85 miles of sea. And so came the summer, when in 8 days of June, G6CW made 13 contacts over 100 miles. Contacts between G and I were made on June 1, 13, 24 and 25, and G2ZV and G6CW set up a new inter-G record of 150 miles. The Snowdon tests of that same summer were, however, not so successful as a result of a severe gale which reduced all the expectations of GW6AA and his helpers to nothing. In spite of that 25 stations were worked, including G6CW at 137 miles. In August, 1939, the GDX record advanced another stage, when the late G2OD (Worthing) contacted G8KD (Sheffield) over a 190-mile path, while G2AO (Eastbourne) worked PAØPN. When, on the outbreak of war, activity ceased on September 3, 1939, not only had the GDX record been brought to a figure which would have been considered incredible only a few years previously, but contacts had been made between G and EI, F, I and PA.

Post-War Results

And so to 1946, when with the return of amateur licences the Five-Metre Band was one of the two bands made available, but shorn now of its LF end. With better and cheaper valves, and a general trend towards beams in place of long wires and simple dipoles, GDX was soon being worked. By June, A. J. Devon, in his feature "Five Metres" in the *Magazine*, was beginning to run out of superlatives! G5BY made the first inter-European contact on May 19, working IIFA. About the same time G5MQ and G6VX were maintaining a 184-mile schedule for 15 evenings in succession, while G5BY worked G5MQ on May 13 over a 215-mile path. As A.J.D. said that month, "Inter-G working up to 200 miles is passing from the very uncommon and exciting". During June, the band opened to Europe on six occasions, G2XC, 5BD, 5BY, 5LL, 5MP and 6CW being there to take advantage of it. G5BY and G6LK started a regular schedule over 156 miles with remarkably consistent results. The GDX record passed to G5BY/G8UZ. July 23, 1946, was an outstanding evening for inter-G work, while August 22 provided the best European evening of the year with the first HB contacts being made. Early October brought a fortnight of excellent conditions for GDX working, the evening of October 11 surpassing anything previously experienced. Complaints were coming in of congestion at the LF end of the band, and of

FIVE-METRE COUNTIES WORKED LIST

Starting Figure, 14
From Fixed QTH only

Worked	Station
43	G3APY (225)
42	G3BLP (254)
41	G5WP
40	G5BD (234), G6CW
39	G2ADZ, G2AJ (341), G2OI, G5JU
38	G2MR, G5MA, G3ABA (189)
37	G2CIW (219), G3DCV, G5YV (191)
36	G5MQ, G6OS (186), G8UZ
35	G5BM, G6MN (150)
34	G2NH (270), G2RI (167), G5VB, G6LK, G6VX
33	G5BY, G5GX (147), G5RP, G6XM (319), G8WV
32	G2IQ, G2XC (320), G3IS (143), G3WW, G4LU, G5BJ (114), G6OH, G8KL (151)
31	G2AXG, G5PP
30	G2KI (177), G3BK, G5PY (251)
29	G2KG (164), G4AP
28	G3CGQ (146), G6HD (181)
27	G2BMZ, G3BOB (130), G3KX/A, G4IG, G8UR
26	G4MR (154), G5HN, G5LC (144), G6NF (170), G8SM (159)
25	G2AOK/A, G4RO (164), G5LQ (200)
24	G6UH (226), G6VC (137), G8GX, G8KZ (198), G8WC
23	G2NM, G5LQ, G8PX
22	G2ADR, G2AOL (100), G2HLF (134), G3CWW (194), G5IG, G6KB (170), G6LC, G8QX
21	G2AUA, G2KF (121), G6SM (115), G8LY
20	G3BW, G5CP, G5MR (119), G6TF
19	G2LC (136) G5UM (150) G6ZQ
18	G2HDY (135), G6FO, G6UW,
17	G3YH, G3COJ
16	GWSSA
15	G3EHY, G6CB, G8IC, G8TS (170)
14	G3BTC (108), G8JO

Note: Figures in brackets after call are number of different stations worked. Starting figure, 100.

weak, unidentifiable 'phones who failed to sign on CW.

In November came the first *Short Wave Magazine* Five-Metre Contest, lasting a fortnight. From the point of view of GDX, the event was a failure, conditions being far below normal, but all participants enjoyed it and activity was outstanding. G6VX (Hayes) was the easy winner of this Contest, with G5MA his runner up. There was a total entry of 44, and A. J. Devon estimated that about 300 G's were active on the band during the period.

Aurora Openings

March 8, 1947, was the date of the first major Aurora opening on 58 mc, GDX signals being received from the North irrespective of great-circle directions and with fuzzy notes. During a further auroral display on April 17, G5MA (Ashstead) was logged by GM3BDA (Airdrie). In April, 1947, A.J.D., in the *Magazine*, launched "Counties Worked" as a method of assessing collective progress, commenting that there was known to be activity in 30 G counties. G5MA became first leader in the table with 22 counties worked. The EDX season opened on May 14 with the GM's receiving I's, while at G2XC we worked 21 counties in a month! The table of Five-Metre Firsts was growing rapidly, and by the end of the summer 11 different European countries had been worked from the U.K. W5BSY/MM added to the excitement of that summer of 1947 by operating on 5 metres from the Mediterranean area, and a new GDX record was set up on June 1, 1947, over 285 miles between G5BY and G5GX.

Personality Note

In November, 1947, your present conductor took over from A. J. Devon, who for years had contributed this feature. As many may have guessed, it might now be disclosed that A.J.D. was the pseudonym of the Editor of the *Short Wave Magazine*.

Five-metre news was temporarily eclipsed by the DX openings on 6 metres. A second Five-Metre Contest in January, 1948, attracted a good entry, although again we were unlucky with conditions. G6VX and G5MA repeated their former success and, as in the previous contest, occupied the first two places. The idea of the "Fiveband Club" was born on February 21, and was immediately well supported by VHF enthusiasts.

Rise—

Activity Week-Ends provided a valuable incentive during the summer of 1948. By a remarkable coincidence, all these week-ends produced unusually fine weather, and we were inundated with requests to make every week-

FIVE-METRE COUNTRIES WORKED LIST Starting Figure, 3

Worked	Station
17	G6LK (D, F, FA, G, GI, GM, GW, HB, I, LA, OE, OK, ON, OZ, PA, SM, ZB1)
15	G5BY (D, F, FA, G, GW, HB, I, LA, OE, OK, OZ, PA, SM, ZB1, ZB2) G5YV (D, F, FA, G, GI, GM, GW, HB, I, OE, OK, ON, OZ, PA, SM)
13	G5WP
12	G2XC, G5BD, G5MA, G5MQ
11	G2AJ, G3KX/A, G5CP, G6XM
10	G2ADZ, G2AOK/A, G2MR, G2OI, G3APY, G3BW, G3DCV, G5BM, G5GX, G5VB
9	G2BMZ, G2CIW, G2NH, G3IS
8	G2ADR, G2HML, G3COJ, G3YH, G15SJ, G6CW, G6DH, G6LC, G8GX, G8TS, G8UZ
7	G2KG, G2QY, G3ABA, G3BLP, G4AP, G4LU, G6MN, G8SM, G8UR
6	GM2DI, GM4JO, G4MR, G4RO, G6TF, GM6XI, G8IC, G8KL, G8KZ, G8WV
5	G2BDQ, G2KF, G2RI, GM3BDA, G3BXE, G3WW, G4IG, G4LX, G5BJ, G5IG, G5LC, G5PY, GM5VG, G16VU, G8LY
4	G2DBF, GM3AXO, G3CWW, GM3NH, GM3OL, G3TP, G5MR, G6OH, G8WC
3	G2HLF, G2KI, G3CGQ, G3CYY, G5LQ, G6HD, G8FO, G8VN

end an "activity" one! GM3OL and the Newcastle group broke through to the Midlands in May, and several new counties, notably Dorset, Somerset and Suffolk, appeared on the 5-metre map.

The Counties table now showed several stations at the 31 level. Excitement grew as in June GM3OL and G3BW were heard in the London area, and on June 13 a new GDX record was achieved by G3BLP and GM3OL, the distance being 296 miles. On June 9 a tropospheric contact between G2XC and PAØWL, 370 miles, also set a new record. In fact, some 19 contacts during June of over 200 miles *via* the troposphere were recorded in our columns. June 4 saw an excellent Euro-

pean opening, as many as *eight different countries* being heard.

With greatly increased activity in GI and GM the stage was well set for August 7, when an amazing spell of "aurora conditions" opened the band for working between Southern G and GM's and GI's. Record contact was that by G5MA and GM2DAU, a distance of 363 miles. A further outcome of this occurrence was a rapid rise in the counties worked, G5WP reaching 41, and G6LK making his total 16 countries.

—And Fall

On September 1, 1948, the two-metre band became available for amateur use and from that date five-metre activity started on a steady decline. A contest organised by the R.E.F. on October 23-24 produced a brief burst of activity and enabled G3HW/A and G3CQC to make 460-mile contacts with F8YZ, thus raising the tropospheric record to an even higher figure. A second break in the general lull came as a result of our own *Magazine* VHF Contest in mid-November. This time conditions were excellent and numerous over-200-mile contacts were made, G5BY and G3HW/A being the outstanding stations.

To round it all off, we reproduce herewith the last set of Five-Metre Achievement Tables, based upon all the available information. Some of the figures are interesting: No less than 43 countries worked, 42 of them by a station in the South London area; nearly 100 stations figuring in the Counties Worked list, for which the qualifying standard is 14 countries; 17 European countries worked by one station, followed by two operators with 15 countries each; a total of 88 stations shown in the Counties Worked list; 11 European countries worked first time on 58 mc post-war, three of them—North Africa, Switzerland and Czechoslovakia—by the same operator; an estimated total of not less than 600 G stations which have appeared on the band; and some distance records which will stand as a monument to the operators who made them.

The detail of all this achievement, over a period of years, is contained in the pages of the *Short Wave Magazine*, which from the beginning has devoted much space, time and energy to the VHF bands. No other record can be so complete nor so accurate. It is with pride that we look upon their results in the VHF field and the vast accumulation of technical knowledge and experience gained by so many of our readers for still further VHF exploration. But unless they had taken the time and the trouble, not only to record their results but also to report them to us, this all-too-brief Summary would not have been

possible, and much of the history of VHF achievement would have been lost.

And so we come to the close of the story. Among the thoughts which pass through one's mind is the remarkably persistent attraction the band was held for so many operators. Many of the calls that were in the five-metre news in 1933 still hit the headlines in 1948. Among its regular habitués existed a unique spirit of friendly rivalry, an amazing willingness to help the other man, even to break one's own records.

From the technical point of view the Five-Metre Band laid the foundations of British VHF technique and provided a grand opportunity to investigate sporadic-E propagation; the Summaries of European Activity and EDX contacts which we prepared from readers' reports have been acknowledged by research laboratories in several countries as a valuable contribution to the study of VHF propagation problems.

Most of the well-known 5-metre call-signs can now be heard on two metres—or if not there, then on 70 cms. The experience of Five-Metre operation enabled excellent two-metre records to be set up within a few months. On

FIVE-METRE FIRSTS

France	G2FA/F8NW March 29, 1936
Italy :	G5MQ/IIIRA July 2, 1938
Holland :	G2AO/PAØPN August 17, 1939
North Africa :	G5BY/FA8B June 24, 1946
Switzerland :	G5BY/HB9CD August 22, 1946
Sweden :	G5TH/SM5FS May 24, 1947
Denmark :	GM8MJ/OZ7G May 24, 1947
Belgium :	G6DH/ON4KN May 25, 1947
Czechoslovakia :	G5BY/OK2MV June 22, 1947
Malta :	G6LK/ZB1AB June 30, 1947
Gibraltar :	G2XC/ZB2A July 22, 1947
Norway :	G2BJS/LA1V June 26, 1948
Austria :	G5GX/OE1CD July 2, 1948
Germany :	G5BM/D7RB July 2, 1948

70 cm. technique is somewhat different, but we have no doubt that the persistence and endeavour which brought success on "five" will prevail on 70 cm. as well and that in due course a story of great achievements will be written for this new band. Five has gone! Here's to Two and Seventy!

THE 145 AND 420 MC BANDS

In spite of generally poor conditions on the VHF bands, the large number of reports we have received this month indicates that interest is well maintained. On the other hand, we do feel that if *all* those who wrote to us complaining of lack of signals were to be as active as they wish others to be, the liveliness of the bands would be something at which to marvel!

New 70 Cm. Record

On March 19, G3AHB/A-G2WS/P made it on 420 mc over the 24-mile path Hayes-Oxted, Surrey, where G2WS was operating portable. The contact was held for an hour, with signals reported R5,S8 both ways—our congratulations to the operators concerned, who are working hard on 70 cm. It will only be a matter of time and opportunity before this distance is increased still further.

On 420 mc the number of active stations is on the upgrade. On the South Coast G3BEX and G3BNR are on daily in Southwick, Sussex, at 0715 and 2200. Their home QTH's are badly screened to the north by the South Downs, but they hope to be out portable very soon. At present they are running a pair of RL18's (EC53) into a 24-element beam consisting of 12 radiators and 12 reflectors. A higher-powered Tx is likely before long. The Rx is an RAF 1359 superhet. Over their 2½-mile path S9 signals are received. G3LV (Southsea) is also on 70 cm. with an 18-element beam, while in the South Birmingham area G3EMY, G3LN, G5JU and G8JI are there on most evenings at 2000. G3APU and G3BUR should be ready shortly. Anyone interested in VHF work in that area is asked to contact G8JI. G3APY (Kirkby, Notts) has a much modified BTH P58 Rx with a CC BFO; CW can readily be taken and held. There are switchable band widths from 30 kc to 1 mc. An aircraft altimeter transmission was recently heard and the time from when it was S9 *plus* until it faded out was 70 minutes, which indicates a remarkable range. Others active on the 70 cm. band include G2HKU and G2VA in Sheerness.

Two Metres

We are grateful to G3BHD (Peterborough) for some news of activity in Germany. DL4XS will be on 144 mc (exactly) shortly with

130 watts to HK24's in push-pull. A 32-element beam will be in use, with an RME152 converter feeding into an AR88. DL4DZ will be on 144.45 mc with 40 watts to an 815 and a BC629 for Rx. On April 2, 3 and 4, D4LDD was to be active on the top of the highest point in the Bavarian Alps, beamed on G in an attempt to beat the 660-mile world record. Perhaps by the time you read this someone may have worked him! G3BHD himself has an SCR522 ready, but wants some information on multi-element beams.

In Scotland, GM5VG is regularly active in Glasgow, while GM2DI and GM3EDQ (Wishaw), GM6KH (Hamilton), GM3BDA (Airdrie) are also heard frequently. GM6LS, 500 feet up in Edinburgh, has been heard at S7 in Glasgow, while GM3BDA has worked GM3OL (Dumfries) and has been received by G3BW (Whitehaven). This follows on the first 2m. G/GM QSO reported last month between G3BW and GM3OL. Schedules with northern G's are requested by the GM's.

South of the Border, G4LX (Newcastle) has worked the South Shields group G8AO, G8JO and G8IF at 10 miles, and G3CYY at 1 mile. He comments that the signals he receives from G8AO on two metres are louder than on any other band. So far no signals from the South have been logged; schedules will be welcomed in any direction.

Another centre of 2 m. activity in the North is Catterick, Yorks, where G2HNL, G3CIO, G3CVO/A, G3DMK and G4RB are on the band. A regular net on 145.26 mc is maintained daily at 2000 and they look North and South at 2030 for DX. G8IC is active near Doncaster, while G2OI (Manchester) is on every evening at 2100 hoping for a break! He is of the opinion that the 2 m. beams are so efficient that unless some arrangement be made for times of North and South transmissions many possible DX contacts will be missed. Perhaps northern beams have better front-to-back ratios than the southern types, but we must mention that we can get most of the South London stations when they are beamed North, and we have worked Devon with our own beam NE! Over a year ago it was prophesied in this column that there would be more "dead" spells on two than on five metres, working on the fact that much of our

British VHF Records

- | | | | |
|--------|-------------------|--------------|------------|
| 58 mc | GDX (Tropo), | G3BLP/GM3OL, | 296 miles. |
| | GDX (Aurora), | G5MA/GM2DAU, | 363 miles. |
| | Tropo (European), | G3CQC/F8YZ, | 460 miles. |
| 145 mc | European, | G5BY/PAØZQ, | 390 miles. |



Another VHF Dinner group. In the front row, l. to r., are G2AJ, G6VX, G2XC, G2NH, G3BLP, G2WS and G16TK. The ladies in the back row are G2YL (left) and G8LY.

five-metre GDX was probably due to reflection, a mechanism which would be much less effective on 2 m. So we feel that it is just a case of patiently waiting for that settled summer weather and a nice duct.

G2ADZ (Oswestry) called six London stations one evening without success and asks for a receiver check-up down South! He says G4OS is active in Chester and G3AUS in Stoke.

In Wolverhampton, G3CNY, G3EEZ and G8KL are all on 2 metres. The last-named is anticipating building a 16-element array and asks for information on feeding it from 50-ohm coax. His Rx is a modified SCR522 with 9003 local oscillator and 12 mc IF. Active stations in Coventry are G3ABA, G3BGG, G4NB, G4RK, G5PP and G6YU, while G2R1 is ready in Leicester.

G2XS and G5UD (King's Lynn) are hoping to put Norfolk on the 2 m. map and the former worked G5MA (Ashstead), during one of the few good spells of the past month.

G8QX (Malvern) has hopes of erecting a stacked array, while G5BM (Cheltenham) heard or worked GDX on 14 days during the month. G8DM (Shrivenham, Berks) has shifted QTH and as a result will be inactive for a while. The new QTH is about 1 mile from the old. He enquires for 145 mc activity between 1700 and 1800, especially on the South Coast or in GC. G3CCP, also at Shrivenham, hopes to be on VHF soon. G4AP keeps the flag flying at nearby Swindon.

In the South-West, G3YH and G5YK keep Bristol in the 2 m. picture. The former has an R1132A with EF54-EF54-EC52 at the front end. He has been heard by G3EHY and G5BH, and is active daily at 1930 and 2230. G3EHY (Banwell) has an RK34 PD on 145 mc and will beam ESE nightly at 1930, 2030 and 2200, while G4RX (Bridgwater) hopes to be active soon. G5QA (Exeter) is finding 145 mc very lonely. He has worked G6WT but nought else, using a G2AJ type Tx (*Short Wave Magazine*, November 1948) a 4-element beam, and a CC converter with a 2 RF stages. Active hours are 1900-2000 and 2200-2230. He wants information on aerial change-over relays.

News from the South-East includes a shift of QTH by G2CIW (Brentford) to a somewhat lower position on the same hill. (We apologise for identifying G3BLP as G2CIW in the picture last month!) G3BLP (Croydon) has worked G2IQ for DX. G5UM (Knebworth) uses a TRF Rx, EF54-EC52-EF50, which gives excellent results on CW. He will keep any schedule at any time (except Wednesdays) for anyone requiring Herts. Others active on two metres include G2AKM (Guildford), G2KG (Chelmsford), G2WJ (Dunmow), G5PB (New Milton)—1830 daily, G6VC (Northfleet) and G8SM (Molesey).

Finally, our apologies if we have had to condense your report this time, but the Five-Metre story in these pages has taken much of our quota of space this month. But we hope

to be able to do ample justice to the 2 m. and 70 cm. news in the May issue.

Activity Week-End

The first Two-Metre Activity Week-End was not blessed with outstanding conditions, but reports from up and down the country show that there was plenty doing enough, at least, to encourage us to suggest a second such Week-End for May 7-8. The idea is to be on the band as much as possible between 1800 on the Saturday and midnight on Sunday. Might we suggest a N-S effort from 1900 to 1930 and 2215 to 2300, and E-W 2000 to 2030 and 2300 to 2330, both days.

Late News

SM5VL is reported to be on 144.24 mc daily with an 18-element beam directed at G ; times are 0640 and 2000 GMT, for 15 minutes.

His input is 150 watts and he has a triple super-het Rx. Others known to be interested include SM7BE, OH2NV, 2NJ and 2OK. In addition, the SM's are still licensed for 50 mc.

We also understand that the OZ's are holding a 2 m. field day on May 14-15, from 2000 to 2300 on the Saturday, and 0900 to 1700 on Sunday.

GC2AWT is on 145 mc in Jersey, and has heard a few (mostly unreadable) signals, but G3DUP was logged in November. He hopes to operate portable soon.

In Conclusion

Please let us have your reports for next month by April 14 latest. The address is, as usual, E. J. Williams, G2XC, *Short Wave Magazine*, 49 Victoria Street, London, S.W.1. CU on May 4.