



BECOMING A RADIO AMATEUR

Radio Society of Great Britain

35 Doughty Street · London WC1N 2AE

BECOMING A RADIO AMATEUR

The most fascinating hobby in the world. Certainly this is the opinion of those who hold amateur radio transmitting licences. There are a great many of them spread throughout the world and altogether there are about half a million who are free to transmit to each other whenever they choose. In the United Kingdom there are nearly 20,000 able to enjoy this privilege. What then are the attractions of this hobby? Well, there are probably half a million different answers to that question simply because amateur radio includes an enormously wide range of possible interests compared with most other activities. Each individual can take whatever part that interests him most. Some people are happy just to chat to others using equipment made commercially and installed in their home or in their car, while to others part of the magic of amateur radio is to use equipment that they have designed and built themselves. Some go to the other extreme; designing and building their equipment is the main part of the hobby and using it the icing on the cake. Some people are more interested in the exploratory side of amateur radio, such as the building of communication satellites (of which there have been seven to date) which, when put into orbit, enable transmitters to operate far beyond their normal range. Bouncing signals off the moon and from meteor trails and the aurora borealis, and experimental work at very high frequencies, are activities in which amateurs are still making a significant contribution to the art of radio communication.

Most communication is done by speech although many stations in the United Kingdom are licensed to allow them to transmit television. Modern developments in slow scan television allow pictures to be transmitted all over the world using relatively simple equipment in conjunction with the transmitter and receiver already available for speech communication. Others use teleprinters but even to-day the use of morse is still the most effective way of communicating under difficult conditions. Most operating is relaxed and informal, although competitions between stations (both transmitting and listening) to contact as many stations at as great a distance as possible are very popular and these demand both good equipment and a special kind of operating skill.

It must be emphasized that amateur radio need not be an expensive hobby: one of its advantages is that equipment of the highest quality can be made at home with ordinary domestic facilities.

MAKING A START

Before taking part in a hobby and possibly spending money on it, how does one find out what it is all about? Probably the best way is to visit an amateur radio club, if one is available locally. There you are sure to find as much help and advice as you require. Many clubs operate their own stations, which enables amateur radio to be seen in action. The Radio Society of Great Britain has a list of these clubs which will be sent on request. If there is no local club, the RSGB may be able to put you in touch with a local amateur who will be happy to let you visit his station.

There are a number of magazines available which are involved to a greater or lesser extent with amateur radio, and also numerous books which can provide as much technical information as is needed. A list is given at the end of this booklet.

LEARNING BY LISTENING

Most amateurs start off by being listeners since only a receiver is required and it is not necessary to obtain a licence. Many find listening so interesting that they do not move on to obtain a transmitting licence. Amateur radio stations, like all other radio stations, are allocated bands of frequencies within which they must operate. At the present time UK amateurs are allocated fifteen bands throughout the radio spectrum. The most popular of these and therefore the bands where a listener is more likely to hear amateurs, are as follows:-

1.8MHz (160 metres): This band is shared by amateurs with coastal shipping and coast stations as well as other commercial stations. You can hear mainly semi-local (up to about 50-75 miles) amateur stations during daylight with the range lengthening at night to cover the British Isles and occasional Continental stations. In the winter some long-distance stations, including Americans, can be heard in the early hours.

3.5MHz (80 metres): This band is also shared with commercial stations. Many British and Western European stations can usually be heard, particularly after nightfall.

7MHz (40 metres): Mainly British and European stations, although many long-distance stations will come through in the evening and early mornings, the main drawback to this band is the many very powerful broadcasting stations which transmit in this band, often in breach of international regulations.

14MHz (20 metres): Of all the amateur bands, this one is the most consistently suitable for long distance transmissions. There will be few days when at least some long distance (dx) signals cannot be heard. In addition, many European stations can be heard at very good strength during daylight.

21MHz (15 metres): This is an extremely good daylight dx band except during sunspot minimum years when activity drops sharply. It is often open over North/South paths (eg UK to South Africa or South America) when closed for East/West paths.

28MHz (10 metres): This is rather like 21MHz. In sunspot maximum years it may be very good indeed with loud signals even from low power dx stations; in the sunspot minimum periods few signals may be heard for days on end.

70 and 144MHz (4 and 2 metres): Local and semi-local signals up to about 100 miles can be heard consistently and stations from several hundreds of miles away - including European - can be received when conditions are good. A good location is essential.

Signals from amateurs tend to be relatively weak compared with those from broadcast stations - amateurs are not licensed to use nor could possibly afford the very powerful transmitters employed, so that very sensitive receivers are usually necessary. One therefore is unlikely to hear amateur stations on a normal domestic receiver unless one lives close to an amateur. But if you have a receiver which covers 108-178MHz (as some imported transistor sets do), you may be able to hear local amateurs between 144 and 146MHz.

The special receivers used are known as communication receivers. Some cover continuously a wide range of frequencies which include several amateur bands, while others are designed to cover only amateur bands. Although it is possible for a skilled amateur to build his own receiver, and many do, it is not an easy task and, perhaps surprisingly, often more difficult than building a transmitter. For this reason, it is a good idea initially to buy a receiver, and in doing this it is best to get the advice of an experienced amateur. The cost? Many amateurs have started by using a government surplus receiver costing less than £50 but bargains are not now so easy to find.

AERIALS

Whatever kind of receiver is in use it is always worthwhile putting up a good aerial.

For a single length of wire, the most suitable dimensions for the amateur bands are 33feet, 66feet and 132feet. This may be connected straight into the back of the receiver. Most receivers have inputs for high and low impedance aerials. It is beyond the scope of this leaflet to explain impedance and aerial theory but if you experiment with changing your aerials between each socket you should find the most suitable input for each frequency. Alternatively, you could construct a small tuning unit to tune a random length of wire to the frequency you are listening to. Circuits for these can be found in the various publications of the RSGB.

Another popular aerial is the dipole. Figure 3 shows a simple dipole aerial which will give good reception on all but the very high frequencies. It consists of two lengths of wire, each about 30ft long (the length is not at all critical) connected at the centre point to a length of coaxial cable - the kind that is used with domestic television receivers. One wire of the dipole is connected to the inner conductor of the coaxial cable and the other length to the outer metal braid. (Suitable weather proof connectors can be obtained). Connections at the receiver end of the feeder will depend on the design of the receiver itself, and this connection may be by a coaxial plug or to two terminals marked 'aerial' and 'earth', in which case the outer braid is connected to the 'earth' terminal and the inner conductor to the 'aerial' terminal. The length of the feeder cable is not important. The dipole may be erected in a horizontal or slanting position, but, as far as possible, it should be clear of surrounding objects and as high as possible above the ground.

WHAT WILL BE HEARD?

You are certain to hear very many call signs. Each amateur radio station is allocated its own individual call sign by the administration of the country in which the station is situated. The first letters and numbers identity the country: for example, the call sign of all English stations begin with G, Scottish stations with GM while those of Hong Kong all begin with VS6. Additional letters signify the individual station: for example, G3FKM belongs to a station at present situated in Birmingham. Usually amateurs give their own call signs and that of the station to whom they are talking at the beginning and end of each transmission.

It is also usual to exchange reports on the readability and strength of the signals. This is usually done by using what is called the RST code. This is as follows:-

READABILITY	
R1	Unreadable.
R2	Barely readable, occasional words distinguishable.
R3	Readable with considerable difficulty.
R4	Readable with practically no difficulty.
R5	Perfectly readable.

SIGNAL STRENGTH	
S1	Faint, signals barely perceptible.
S2	Very weak signals.
S3	Weak signals.
S4	Fair signals.
S5	Fairly good signals.
S6	Good signals.
S7	Moderately strong signals.
S8	Strong signals.
S9	Extremely strong signals.

STONE	
T1	Extremely rough hissing note.
T2	Very rough a.c. note, no trace of musicality.
T3	Rough, low-pitched a.c. note, slightly musical.
T4	Rather rough a.c. note, moderately musical.
T5	Musically modulated note.
T6	Modulated note, slight trace of whistle.
T7	Near d.c. note, smooth ripple.
T8	Good d.c. note, just a trace of ripple.
T9	Purest d.c. note.

If the note appears to be crystal-controlled add X after the appropriate number. Where there is chirp add C, drift add D, clicks add K.

These codes, used together, give a very handy way of reporting how a signal is being received. For example, a fairly clear speech signal, medium strength, could be reported as RS47; a weak morse signal of good quality might be reported as RST339.

The remainder of the contact is generally concerned with the exchange of technical information (from which a listener can learn a lot), besides less formal topics such as the local weather and more personal comments. Such contacts may be repeated time and time again, so that two people can become firm friends without necessarily having ever met.

The listener may at first be confused by some of the 'jargon' used in contacts. For example 'QRM' and 'QTH', which originated from abbreviations used to simplify morse transmissions. The advantage of using these terms is that they are understood internationally. The following is a list of some of the more common.

QRG	Will you tell me my exact frequency? Your exact frequency is.....kc/s.
QRH	Does my frequency vary? Your frequency varies.
QRI	What is the tone of my transmission? The tone of your transmission is.....(amateur T1 — T9).
QRK	What is the readability of my signals? The readability of your signals is.....(amateur R1 — R5).
QRL	Are you busy? I am busy. Please do not interfere.
QRM	Are you being interfered with? I am being interfered with.
QRN	Are you troubled by static? I am troubled by static.
QRO	Shall I increase power? Increase power.
QRP	Shall I decrease power? Decrease power.
QRQ	Shall I send faster? Send faster.
QRS	Shall I send more slowly? Send more slowly.
QRT	Shall I stop sending? Stop sending.
QRU	Have you anything for me? I have nothing for you.
QRV	Are you ready? I am ready.
QRX	When will you call me again? I will call you again at.....hours.
QRZ	Who is calling me? You are being called by.....(on kc/s).
QSA	What is the strength of my signals? The strength of your signals is.....(amateur S1 — S9).
QSB	Are my signals fading? Your signals are fading.
QSD	Is my keying defective? Your keying is defective.
QSL	Can you give me acknowledgment of receipt? I give you acknowledgment of receipt.
QSO	Can you communicate with.....direct or by relay? I can communicate with.....direct (or by relay through.....).
QSP	Will you relay to? I will relay to.....
QSV	Shall I send a series of VVVs? Send a series of VVVs.
QSY	Shall I change to another frequency? Change to transmission on another frequency (or on.....kc/s).
QSZ	Shall I send each word more than once? Send each word twice.
QTH	What is your location? My location is.....
QTR	What is the correct time? The correct time is.....hours.

Amateurs frequently confirm contacts by sending so-called QSL cards which give details of the contact and the equipment used. To reduce the cost of sending these around the world the Radio Society of Great Britain operates a QSL Bureau. The cards may be sent in bundles directly to the Bureau, and will then be distributed to the stations for whom they are intended in all parts of the world. Incoming QSL cards are also sent to



Fig 1. A communications receiver



Fig 2. A modern amateur station

THE MORSE CODE AND SOUND EQUIVALENTS

A	di-dah	S	di-di-dit
B	dah-di-di-dit	T	dah
C	dah-di-dah-dit	U	di-di-dah
D	dah-di-dit	V	di-di-di-dah
E	dit	W	di-dah-dah
F	di-di-dah-dit	X	dah-di-di-dah
G	dah-dah-dit	Y	dah-di-dah-dah
H	di-di-di-dit	Z	dah-dah-di-dit
I	di-dit	1	di-dah-dah-dah-dah
J	di-dah-dah-dah	2	di-di-dah-dah-dah
K	dah-di-dah	3	di-di-di-dah-dah
L	di-dah-di-dit	4	di-di-di-di-dah
M	dah-dah	5	di-di-di-di-dit
N	dah-dit	6	dah-di-di-di-dit
O	dah-dah-dah	7	dah-dah-di-di-dit
P	di-dah-dah-dit	8	dah-dah-dah-di-dit
Q	dah-dah-di-dah	9	dah-dah-dah-dah-dit
R	di-dah-dit	0	dah-dah-dah-dah-dah

(0 is sometimes sent as one long dah and 9 as dah dit)

Punctuation

Frequently employed in Amateur Radio

Question Mark	di-di-dah-dah-di-dit
Full Stop	di-dah-di-dah-di-dah
Comma*	dah-dah-di-di-dah-dah

**Often used to indicate exclamation mark.*

Procedure Signals

Stroke	dah-di-di-dah-dit
Break sign (=)	dah-di-di-di-dah
End of Message (+ or AR)	di-dah-di-dah-dit
End of Work (VA)	di-di-di-dah-di-dah
Wait (AS)	di-dah-di-di-dit
Preliminary call (CT)	dah-di-dah-di-dah
Error	di-di-di-di-di-di-di-dit
Invitation to transmit (K)	dah-di-dah

Note also the procedure signal used by many amateur stations inviting a named station only to transmit \overline{KN} dah-di-dah-dah-dit

★ ★ ★

One dah should be equal to three di's (dit's).
 The space between parts of the same letter should be equal to one di (dit).
 The space between two letters should be equal to three di's (dit's).
 The space between two words should be equal to from five to seven di's (dit's).

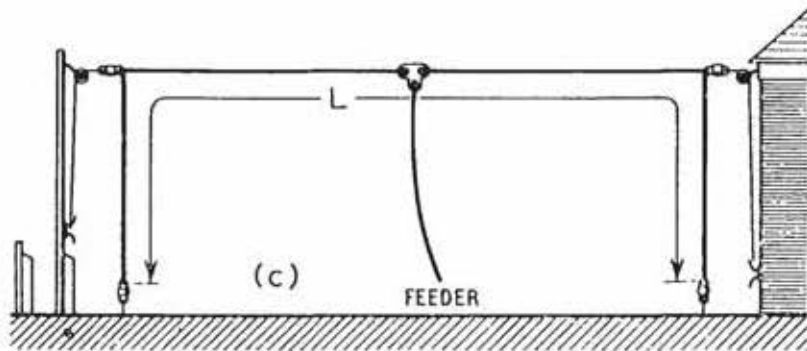
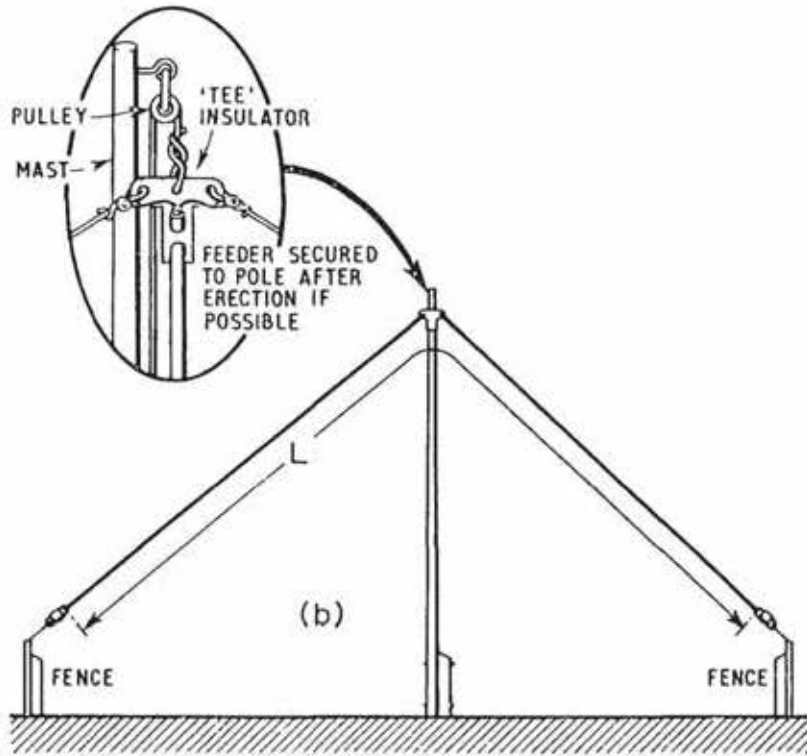
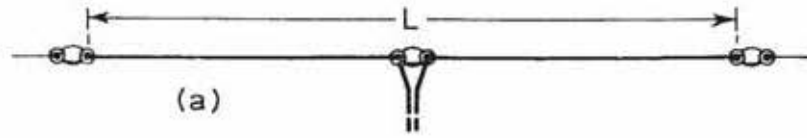


Fig 3. Arrangement of a dipole aerial

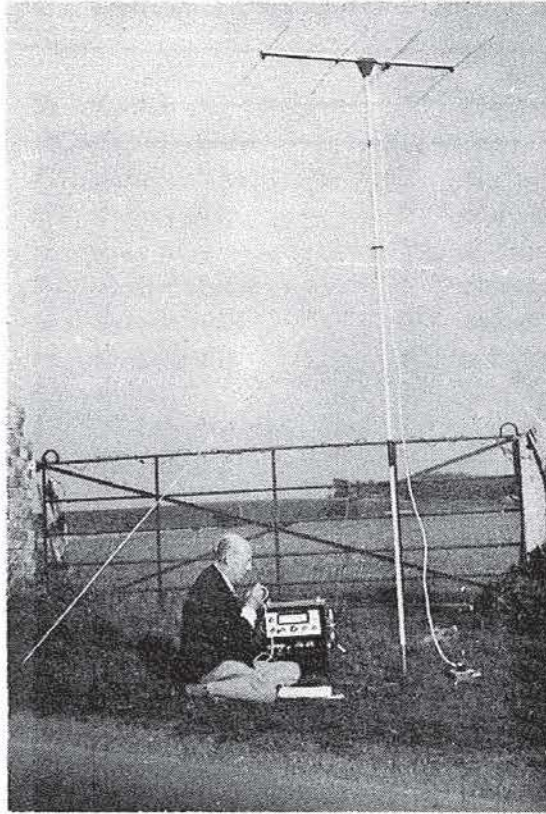


Fig 4.

A low power portable station operated by G2WS

Short Wave Listening Station																				
QSL-BUREAU SSA ENSKEDE 7 SWEDEN	<h1 style="margin: 0;">SM 3-3256</h1>	QSL-BUREAU SSA ENSKEDE 7 SWEDEN																		
<table border="0" style="width: 100%;"> <tr> <td style="width: 30%;">Radio: <i>G2BVN</i></td> <td style="width: 20%;">Hrd you</td> <td style="width: 50%;">Remarks: <i>Hello dear om!</i></td> </tr> <tr> <td>Wkg Calling <i>SM5KV</i></td> <td></td> <td><i>You say that your time</i></td> </tr> <tr> <td>On <i>SSB 14</i> Me. at <i>11:02</i> Gmt</td> <td></td> <td><i>was: STEVE and the</i></td> </tr> <tr> <td><i>UrRS 56/7. February 3th 1975</i></td> <td></td> <td><i>QTH: 50 Km East London.</i></td> </tr> <tr> <td>My Rx: <i>9R-4j</i></td> <td></td> <td><i>Very good signals but</i></td> </tr> <tr> <td>My Ant: <i>Dipole for 21mc!</i></td> <td></td> <td><i>any QSB.</i></td> </tr> </table>			Radio: <i>G2BVN</i>	Hrd you	Remarks: <i>Hello dear om!</i>	Wkg Calling <i>SM5KV</i>		<i>You say that your time</i>	On <i>SSB 14</i> Me. at <i>11:02</i> Gmt		<i>was: STEVE and the</i>	<i>UrRS 56/7. February 3th 1975</i>		<i>QTH: 50 Km East London.</i>	My Rx: <i>9R-4j</i>		<i>Very good signals but</i>	My Ant: <i>Dipole for 21mc!</i>		<i>any QSB.</i>
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TORD GRIP P. O. Box 1403 BOLLNÄS 3 SWEDEN	Please QSL dir or via QSL-Bureau. <div style="font-size: 2em; font-weight: bold; margin-top: 10px;">73's</div>	<i>Tord Grip</i> opr.																		

Fig 5. A listener's QSL card

the Bureau by the QSL Bureaux of other countries. A station wishing to receive incoming cards through the Bureau must send a small number of stamped and addressed envelopes to one of the QSL Bureau Managers and from time to time, as cards arrive, they will be sent on to the stations for whom they are intended.

OBTAINING A TRANSMITTING LICENCE

As has been emphasized earlier, even the relatively low power transmitters that amateurs use can send signals all over the world. A transmitter which develops a fault, or one which is badly operated, can all too easily cause interference with other users of the radio spectrum. This is at least a nuisance, but at worst could interfere with emergency services. For this reason it is necessary for every operator to have sufficient technical knowledge to understand fully all the factors involved. Once he has shown that he has this knowledge, then he will receive a licence to transmit.

Note well: to operate a transmitter without an appropriate licence is illegal and carries heavy penalties.

The certificate of competence is obtained by passing the Radio Amateurs' Examination and the way in which a person sets out to prepare for this will, of course, depend to some extent upon his previous knowledge of the subject. Almost everybody receives a basic training these days in electricity and magnetism, either at school or college, and what is now required is a more exact understanding of the particular techniques used by radio amateurs. There are a great many books in existence for enabling persons to obtain this specialised knowledge, and the RSGB publishes several books designed to help the newcomer to amateur radio. These are listed at the end of this booklet.

But, although it is possible to make considerable progress by individual study, perhaps the best way to ensure passing the examination is through attendance at special classes. Many centres at college throughout the country offer special classes designed for candidates for the Radio Amateurs' Examination. A list of the centres offering such classes may be obtained by writing to the RSGB. Courses are usually held in the evenings, especially during the winter months, and the fees are very moderate.

Attendance for a term or longer will not only give a thorough grounding in the subject but will also enable the candidate to meet others who are preparing to take the examination, which is usually held every six months and consists of a three hour paper. It is not possible in this booklet to explain in greater detail the examination arrangements, but it should be stressed that the examination is not really difficult for anyone who takes the trouble to prepare for it carefully and thoroughly. The age of persons who have been successful in the examination ranges from 14 to 70 years.

Amateur licences in this country are of two kinds, and passing the theoretical examination qualifies one to apply for a Class B licence. A Class B licence is limited to operation on the amateur bands of very high frequency of 144MHz and above. Qualification for the full Class A licence, enabling the holder to work on all the amateur frequencies, involves passing a morse test in addition, and it is necessary for the candidate to learn to send and receive messages in morse at a rate of 12 words a minute. These morse tests are conducted by the Home Office. Slow morse transmissions, organised by the Radio Society of Great Britain, are conducted regularly from amateur stations in various parts of the country and these are a great help to anyone seeking to obtain proficiency in listening to messages in the morse code. To acquaint the reader with the code it is given at the end of this booklet.

OPERATING YOUR OWN STATION

Having passed the examination, and successfully applied to the Home Office for a transmitting licence, you will now have been allocated a call sign and become entitled to operate on the amateur bands. If you have not yet passed the morse test and have received a Class B licence, you will probably wish to start transmitting on the 144-146MHz (2 metre) band. However, if you have passed the morse test as well as the theoretical examination and been given a Class A licence, you will, of course, be empowered to transmit on any of the amateur bands and you may begin by equipping yourself with the necessary apparatus to transmit long distances on the 14, 7, 3.5 or 1.8MHz bands.

Your choice of frequency will, of course, determine the kind of transmitter you use and the type of aerial system you erect. Perhaps the most important decision you will have to make is whether to build your own transmitter or to purchase one. Commercially made transmitters are costly, whereas the home-made transmitter can be quite inexpensive.

For many amateurs, the thrill of designing, building and using a home-made transmitter greatly exceeds the pleasure to be obtained from merely operating a piece of apparatus made by a commercial firm. In fact, for many amateurs, the sense of achievement in building successfully their own radio equipment provides the greatest satisfaction of the hobby. Many amateurs like to build their stations on the unit principle, by which many small pieces of equipment can be linked together in various ways to suit many purposes and to enable operation to be made on many of the amateur bands. A beginning can be made by using a relatively inexpensive receiver and adding units such as preamplifiers and converters to enable the receiver to be used on frequencies additional to those for which it was originally intended.

For detailed guidance on the operation of your own station there are a number of suitable publications available which are obtainable from the RSGB.

In conclusion, the radio amateur should never forget the tremendous number of different types of work he can undertake. Contacts with other stations through satellites and amateur television are just two more examples of the many kinds of amateur activity which can be pursued.

The full enjoyment of amateur radio does not come merely from operating a piece of transmitting equipment; it comes rather from the designing and setting up of a really efficient station and from taking part in experimental work with others which, apart from being a fascinating experience in itself, can make a genuine contribution to the science of amateur radio.

As a newcomer to the hobby, you can be assured of every assistance from other members who have had longer experience than yourself, from members of the Radio Society of Great Britain and from Society headquarters, which will provide information and advice at all times.

WHAT IS THE RADIO SOCIETY OF GREAT BRITAIN?

It is the official organisation which exists to serve British radio amateurs. There are 25,000 members comprising both listeners and transmitting licence holders. The Society was founded in 1913 and its Patron is HRH the Prince Philip, Duke of Edinburgh. Special services are provided by the Society for the benefit of members. There is a bureau for handling QSL cards, the confirmation of radio contacts exchanged between members; the publication of a wide variety of books and pamphlets, with technical and administrative information of interest to members. Moreover, the Radio Society of Great Britain is in constant liaison with the authorities, in order to protect and further the interests of its members, and to retain frequencies for the use of the amateur service. The RSGB is a member society of the International Amateur Radio Union, a world wide organisation of national radio societies. A special subscription rate applies to Associate Members under 18 years of age. The annual subscription includes the supply, by post, of the Society's monthly journal 'Radio Communication'. The RSGB will be pleased to send you, on request, a membership application form.

SOME CALL SIGN PREFIXES

CE	-	Chile	OA	-	Peru
CP	-	Bolivia	OE	-	Austria
CT	-	Portugal	OH	-	Finland
DC,DK,DL	-	Germany (West)	OK,OL	-	Czechoslovakia
EA	-	Spain	ON	-	Belgium
F	-	France	OZ	-	Denmark
G	-	England	PY	-	Brazil
GJ	-	Jersey	SK,SL,SM	-	Sweden
GD	-	Isle of Man	SP	-	Poland
GI	-	Northern Ireland	SV	-	Greece
GM	-	Scotland	TF	-	Iceland
GW	-	Wales	UA	-	USSR
HA,HG	-	Hungary	VE	-	Canada
HB	-	Switzerland	VK	-	Australia
HC	-	Ecuador	VO	-	Newfoundland
HK	-	Colombia	VU	-	India
HR	-	Honduras	W, K	-	USA
HS	-	Thailand	YO	-	Romania
I	-	Italy	YU	-	Yugoslavia
JA,JH,JR	-	Japan	ZE	-	Rhodesia
LA,LG	-	Norway	ZL	-	New Zealand
LU	-	Argentina	ZS	-	South Africa
LX	-	Luxembourg	4X	-	Israel
LZ	-	Bulgaria			

PUBLICATIONS

The following publications of the Radio Society of Great Britain will tell you about amateur radio in greater detail.

'A Guide to Amateur Radio' by Pat Hawker

'The Radio Amateurs' Examination Manual' by G.L. Benbow

'Operating Manual' by R.J. Eckersley

'Morse Code for the Radio Amateur' by M.Mills

'Amateur Radio Techniques' by Pat Hawker

'VHF - UHF Manual' by G.R.Jessop and D.S.Evans

'Radio Communication Handbook' in two volumes

In addition, the RSGB have available a large selection of other publications including maps and log books specifically designed for the radio amateur.

Prepared by G2WS, G2BVN and G3RPE for the RSGB,
35, Doughty Street, London, WC1N 2AE.

Amateur Radio Awards (2nd edn)

This book, now revised and updated, contains details of most of the popular hf awards from all parts of the world, together with details of several swl and vhf certificates.

Country, prefix and zone lists, and maps, are given where appropriate, and many photographs of certificates are included to whet the award hunter's appetite.

80 pages; paperback; 246 by 184mm; 1980

Amateur Radio Operating Manual edited by R. J. Eckersley, G4FTJ

This new book covers the essential operating techniques required for most aspects of amateur radio from 1.8 to 432MHz, and provides a comprehensive set of operating aids.

Chapter titles: *The amateur service; Setting up a station; Operating practices and procedures; DX; Contests; Mobile, portable and repeaters; Amateur satellites; RTTY; Slow-scan television; Special event stations.*

Plus five appendices: *Continental and regional maps; International callsign series holders; Callsign list; Country list; Worldwide legal time.*

"... a really first class publication ... packed with a great deal of very useful, up to date information for both the newcomer and old-timer" — *Short Wave Magazine.*

192 pages; paperback; 246 by 184mm; 1979

Amateur Radio Techniques (7th edn) Pat Hawker, G3VA

Basically an ideas and source book, this ever-popular work brings together a large selection of novel circuits and devices, together with many fault-finding and constructional hints.

Chapter titles: *Semiconductors; Components and construction; Receiver topics; Oscillator topics; Transmitter topics; Audio and modulation; Power supplies; Aerial topics; Fault-finding and test units.*

"An alternative title for this book would be *The Experimenter's Handbook*. It is one of the finest collections of circuits, building blocks, and design ideas, and is invaluable for the inveterate amateur experimenter and constructor" — *Amateur Radio* (Wireless Institute of Australia).

368 pages; paperback; 246 by 184mm; 1980

A Guide to Amateur Radio (18th edn) Pat Hawker, G3VA

Provides the newcomer to amateur radio with basic information on receivers, transmitters and antennas. This book also contains technical information and operating data of interest to all radio amateurs and listeners.

Chapter titles: *This is amateur radio; Getting started; Communication receivers; Transmitters; The antenna; Amateur radio equipment; Workshop practice; The licence examinations; Operating an amateur station; The RSGB and the radio amateur; International amateur radio organizations; Fundamentals of electronics; plus two appendices: Sample RAE questions and Safety pointers.*

144 pages; paperback; 246 by 184mm; 1980