OPERATIONAL MANUAL FOR AMATEUR RADIO SERVICE

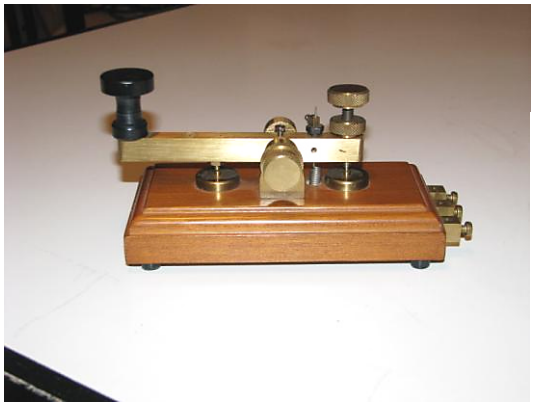
TRANSMISSION PROCEDURE

2nd edition

I 4 C Q O

RULES TO BE OBSERVED BY ITU AND IARU INTERNATIONAL MANUAL IN FORCE

With a foreword by Antonio Zerbini I 1 Z B



I.N.O.R.C.

Italian Naval "Old Rhythmers" Club

Foreword

I knew long ago that his friend James I4CQO, was working on an operating manual for service amateur radio. But never imagined he could return with clarity in content and manuals by the international **ITU** and **IARU** with only 84 pages.

I have many affinity with James, in first, of is me approached to the telegraphy age of 12 years. We have covered road different, but with the same passion for the first telegraphy and the radiotelegraphy after. Are classified remove radiotelegraphy after having frequented the school of formation of the RT "radio operators" Navy in Rome Radio Transmitter St. Rosa. I4CQO in the course 1954, the writer in the course 1955.

During an INORC meeting, if I remember well the first that is held to the La Spezia, I met I4CQO in vertical, then QSO in 40 meters had performer quite a lot, but it was the QSO of presence to disclose our common roads that periods different haves covered to arrive to the coveted destination of remove telegraphist.

I have the work of James "Procedures of Transmission" read the most elementary standard that regulate the service of radio amateur, it enjoies the exact work of the I4CQO frend, it is quite a pleausure. This manual must not miss to none of the radio amateurs and respectful of the International procedures.

Easy by consult, with an exact index, that look through fast, indicating in professional manner the contents of everything that must know a goog operative radio.

I conclude this telegraphic presentation of the work of the James friend, affirming that when over by myself writing is only a little contibution of the great work of capacity that the author shows with its precious work. Congratulations!

Antonio Zerbini I1ZB INORC 051 (President INORC)

INDEX

Pag.

NEWSES ON THE SERVICE OF THE RADIO AMATEURS – TRANSMISSION OF PROCEDURES AND RELATIVE UPDATINGS

Much has written on the opportunity to operate, different authors have filled the manuals of pages regarding the service of the radio amateurs, law student, decree, dispositions, ecc. without never deepen the procedures of transmission and without do know all newses that really interest the efficacy of radio amateurs. This is one of the motives for which the majority of the radio amateurs, disowns it "**procedures of transmission**". From a sort search personally, on a host of radio amateurs, on the knowledge of procedures of transmission, the more current answers have been the following thing: I do so because all do so; I have done always so; they say all so. Have found any answer on the knowledge of the organ that gives disposition on the procedures of transmission. Rather a lot of authors, especially what write manual that prepare to the examinations the new radio amateurs, certain times write inaccuracies giving news make a mistake or deficient. Some invent personal rules with the purpose to improve the interpretations of procedures. All this is praiseworthy, however not would be need of new rules if knew their existence and the impossibility to modify it, because exhaled by international and highly authoritarian organs.

International rules am dictated and updated by **ITU (International Telecommunication Union)** maximum international authority on the telecommunications and **IARU (International Amateur remove Union)** that puts into practice all ITU dispositions in breast to the radio amateurs service. Already more times and for a long time has spoken of the bad behaviour that generally himself feel in "air". This matter has been faced in a recent meeting of nations belonging to the region 1 to Cavatat in Croatia. When it speaks of bad behaviour intends: **a)** operational ethics; **b)** lacked respect of procedures of transmission.

With regard to the ethics, reference is done to the good behaviour, to the education civilian. see: operation and ethical of a collector in net, described later.

We know that in the contests the only valid rule is that to get the QSO and close it in the briefest possible time, without respect the procedures of transmission. Not are able not it do same does, when perform normal traffic (is what is happening today), because a clean fracture is would create in the manner of operate and the confusion would reign sovereign. Everything that will say here at a stretch, am not invented things or in accordance with my opinion personnel. I am yield far - reaching experience and of in-depth studies on manuals and dispositions imparted by **ITU, IARU** and from other authoritative publications.

We radio amateurs are dilettantes, must not follow rigid rules as that soldiers, but it is paid necessary autoregolarsi looking for to operate in the correctness. The greater trouble that there is now is what the majority of the radio amateurs, as I said first, ignores what are the correct rules that there are in being with regard to procedures of transmission. Invite, then all the operators not to force to create or interpret new rules. The thing more near is that to know everything that is in being, understanded the updatings and put them in practice.

Who knows well the rules of procedures of transmission and listens the of a collector traffic on all frequencies, can appraise the level of incorrectnesses to which are arrived. Operators to graduate that call with QRZ rather than CQ; operators in CW that launch in "air" only the nominative thing; QSO in dries doing exchange without transmit the

nominative and using abbreviations; transmissions of carrying on frequency occupied; ecc. etc.
All these incorrectnesses does not never go sanction, because, as I said first, being dilettantes, himself you bear any behaviour that is not consistent with the in being rules. The only thing from behaviour is autodisciplinarsi to reenter in the correct efficacy that it must be the index of every good radio amateur.

We have often feel of polemics on the improper mode of the use of the **Q Code,** is in it dries that in other types of issues. In drying the regulation impose to speak clearly, to be comprehensible in all, then is not can make use of any type of signal or group that shortens the meaning of the message. Does one need to use the tongue that in that moment needs to the connection, but is not possible to use particular codes, initialses or abbreviations (only provided that difficulty of tongue, himself can use, as specified at a stretch).

Be necessary however do a precise statement in worth. in the procedures contained in **International Telecommunication Union (ITU) or International Code of the signals,** to which we Radio amateur must also do reference, in the chapter relating to the **radiotelephony** , himself specifies that: when in a connection difficulty is verified of tongue, himself you must observe the principles of the **Regulation of Radiocommunications of the ITU** current. In the case use the **Q Code**, or other types of abbreviations, they go judgments using the **phonetic alphabet**, articulating letter for letter.

Certainly not are able not be many rigid in the apply this regulates, too remaining in the correctness of expressions. We radio amateurs do part of the great family of the telecommunications and then express with the relative language. the maritime, the railroaders, the aeronautical ecc. in the dispatch their work use an appropriate language that is not that usual one. When find out of from their work, feel them express with terms that recall their activity. To say: we go away; the sailor will say: " set sail. The aeronaut will say: " take off. The sailor, when is found to the ground, hardly will say: right; but "starboard". The rope will call it "top" and the like. We radio amateurs in the course of the connections, especially in mother tongue, often intercalate croups of the **Q code**. This go understood as violation of the regulation, but as expression of the language of **Telecommunications**. How many times have feel say and said: I do **QSY**; when want to do understand that want to change frequency or that want to go from an other part.

At this stage it be necessary clarify a very important thing: when are expressed in the above-mentioned mode, you must be wary of accepting lifts really to knowledge of the meaning of the group of abbreviation that is transmitted, otherwise it threatens to behaviour the figure of the " chocolate manufacturer. An inaccuracy of expression denotes ignorance. Not it is the first time that in frequency himself you feel things that move to laughter and to the compassion at the same time. How many times feel say from the operators that perform connections for the attainment of graduates (by now am on the agenda) **QRZ** in place of the **CQ**. Another example about how a group of the **Q Code**, second-hand improperly, it is by now become for all a current expression is the **QRT** group. How many times say: I do **QRT**. By now, as mentioned first, it is an expression that clarifies the intention of who the pronunciation. Remember however that this expression has been born by an inaccuracy. The group of the **Q Code, QRT**: specification **"Stop sending"**, then it is reported to other station and not to what transmits. Only if following by the question mark, it refers to the station that transmits: **QRT?** Specification: **" Shall I stop sending?"**in some manual they gives to **QRT** both meanings. Quite a boner. If is not want to twist the meanings of croups of the **Q Code**,

say: the and **QRA** family. For the **QRT** group, as well as the use, there is affinity with the true meaning; but to the **QRA**, that interpretation give if its truth meant it refers to the name of the station? How to can fit two like that meanings different? There are many other improper approaches that are feel systematically in "air" and I think that is not the case to specify them at the moment. Tto guess: it is well know the meaning of everything that is transmitted, to not do degenerate the of radio amateurs language. For the neophytes, it would certainly be advisable to do not take for good everything that himself feel in radio.

Terms and definitions in the world of telecommunications

Addressee. –
designate the authority to which the message is addressed.

Group. -
It designates all the more letters and/or number adjoining that compose a signal.

Numerical group. –
it is fully grown by one or more numbers.

Sender. –
designate the authority that orders the dispatch of the message.

Hour of origin. –
designate the hour when comes orderly to transmit a message.

Procedure. –
It designates all the the standards for the behavior of transmissions.

Nominative or indicative. –
designate the group to letters and of figures assigned to each station from the really administration. (1)

Signal of procedure. –
designate a signal destined for facilitate the behavior of the transmission.

Receiving station. –
designate the station that indeed receives the message.

Transmitting station. –
designate the station that indeed transmits the message.

Telegraphy. –
designate an emanation of electric signal Morse code away clear off.

Telecommunications. –
designate any transmission, issue or receipt of signals, that they can be: writings signals, imagine and ring or information of any nature by means of clear off, remove, optic or other electromagnetic systems.

Radiotelegraphy. –
designate an emanation of Morse signal to radiofrequenza away ether in different modes. (3)

Radiotelephony. –
designate an effected radiocommunication to radiofrequenza modulated to audio frequency. (3)

Morse symbols. –

I am those signals represented on the button and/or lines that symbolize internationally all letters of the alphabet, the numbers, the signals of punctuation and some signals of procedure. (2)

(From HF Manager handbook IARU V8.1 Chp. 9.1)

Administration. -

Designates any governmental department or service responsible for discharging the obligations undertaken in the Costutution of the International Telecommunication Union, in the Convention of the International Telecommunication Union and in the Administrative Regulations.

Universal Time Coordinated (UTC). -

Universal time signature.
to the practical ends, related to the normative radio, UTC is answerable to the solar middle time of the first meridian (0° longitude), already expressed in GMT.

RADIO SERVICE

Radiocommunications. -

It designates a service as defined in this Section involving the transmission, emission and/or reception of radio waves for specific Telecommunication purposes. In these Regulations, unless otherwise stated, any radiocommunication service relates to terrestrial radiocommunication.

Radio amateur service. -

Announce a service of radiocommunication for the purpose of self-training, intercommunuication and technical investigations carried out by amateurs, that is, by duly authorized persons interested in radio technique solely with a personal aim and without pecuniary interest.

Radio amateur service-satellite. -

It defines a service of radiocommunication that it uses space station on eart satellites for the same purposes as those of the amateur service.

RADIO STATIONS AND SYSTEMS

Station. - One or more transmitters or receivers or combination of transmitters and receivers, including the accessory equipment, necessary at one location for carrying on a radiocommunication service, or the radio astronomy service.

Amateur station. – A station in the amateur service.

Adaptive system. –A radiocommunication system which varies its radio characteristics according with to canne quality.

OPERATIONAL TERMS

Frequency-shift telegraphy. –Telegraphy by frequency modulation in which the telegraph signal shifts the frequency of the carrier between predetermined values.

Facsimile. – A form of telegraphy for the transmission of fixed image, with or without half-tones, with a view to their reprodutionin permanent form.

Telephony. – A form of Telecommunication primarily intended for the Exchange of information in the form of speech.

Simplex operation.- Operating method in which transmission is made possible alternately in each direction of a Telecommunication channel, for example by means of manual control. .

Duplex operation. – Operating method in which transmission is possible simultaneously in both derection of a Telecommunication channel.

Semi-duplex operation. – A method which is simplex operation at one end of the circuit and duplex operation at the other.

In general, duplex operation and semi-duplex operation require two frequencies in radiocommunication; simplex operation may use either one or two.

1) The nominative am allotted on international base and they allow then to individualize the nation of the transmitting station. the nominative go assigned to the radio stations and not to persons. A radio amateur, in waiting for receive the license, and then in the possession of license of operator, can transmit provided use the nominative thing of the station when is going to be operated.
The nominative with two letters make a report on the beacons (by now, in harbor, through and through missinged after the GPS birth).
The nominative with three letters make a report on the terrestrial stations.
The nominative with four letters is made a report on maritime movable stations (just the same nominative following by a number it refers to his half of rescue).
The nominative with five letters is made a report on aerial movable stations.
The nominative go emploied for two principal purposes:
1-- to call or communicate with an or more stand (the nominative thing of the transmitting station must be **always** preceded by the signal of **DE procedure**).
2 -- to speak, ask or through of a station.

(2) the Morse symbols, that represent letters, number, ecc. am express with points and lines and come transmitted separately or arranged together. the points, the lines and wander it mediate debbonoes be effected to respect, in their last, the specified values later, in the chapter relating to the ITU recommendation-M. 1677-1 R:

(3) In the cases when is used the Radiotelegraphy or Radiotelephony, the operators must respect the regulation of Telecommunication of - - **International Telecommunication Union (ITU)** in force.

(From handbook ITU Ed.2014 chap. 2.3)

AMATEUR SERVICE OPERATIONS AND OPERATOR TRAINING

Typical operations

Typical operations withing the amateur service consist of contacts between two, or among more, amateur stations as stated in RR N° 1.56, that is "for the purpose of self training, intercommunication and technical investigations carried out by amateurs".
Normal operations include dialogue between operators on a variety of subjects including technical discussions. There is also an axchange of formal and informal massages now normally transmitted via data communications modes. A number of contests are carried out to demonstrate the level of proficiency, to challenge and raise the level of operator skills, demonstrate amateur station capabilities and commemorate special events.

Operating activities

Radio amateurs use their stations in a wide variety of operating modes. Many amateurs spend much of their time listening to other amateur stations making a two-way contact (known as a "QSO" – a Q code meaning "I can communicate with..."). They may join the contact and contribute to the ongoing conversation. The contacts may be lengthy lasting as much as an hour but are often very brief, simply the exchange of call signs, signal reports, names and locations. Brief contacts are common for amateur stations operating from locations (countries and call sign prefixes which are rarely on the air.
Another operating mode is to call CQ (meaning "General call to all stations") to invite any other station to make cantact. If more than twoo stations are involved in a contact, it may be called a "roundtable". A group cantact made regulary (same day of the week, same time and frequency) is called a "net". Nets exist for different purposes, such as exchange of messages related to emergencies, health and welfare information, weater condition and others.

Radiosport

Radiosport is the term for a variety of amateur radio competitive activities. Some are sponsored by the **IARU,** others by amateur radio national societies or amateur radio magazines, and a few have their origins in state-sponsored sport programmes. These activities have formal rules published by the sponsors, have measures of performance or achievement, and normally involve publication of results and issuance of a certficate or diploma.

Contesting

Contesting is a competitive usually involving an attempt to reach a goal, perhaps to make contact with as many amateur stations as possible during a given time period, on certain frequencies and within specified geographical areas. <there are contests throughout the year, particularly on weekends.
An example of contest is the "CQ-M International DX Contest" sponsored by Russian national amateur radio society – Soyuz Radiolyubitelei Rossii (SRR). The stated purpose of this contest is "to unite people in peaceful coexistence, foster mutual

understanding, and engage in sportsmanship and cooperation through amateur radio". It is normal operates on a second full weekend in May of each year on amateur service bands at 1,8 – 3,5 -7 – 14 – and 28 MHz.

Awards programmes

In recognition of international two-way amateur radio communication, the IARU issues Worked-All-Continents (WAC) certificates to amateur radio statios of the world. Qualification for the WAC award is based on an examination by the International Secretariat , or a member-society, of the IARU of QSL ("I am acknowledging recept") cards that the applicant has received from other amateur stations in each of the six continents.

DXCC is an award issued by the American Radio Relay League (ARRL) for proof of a station contacting stations in at least 100 dofferent cuntries.

Islands on the Air (IOTA), sponsored by Radio Society of Great Britain (RSGB), is inteded to encourage contacts with amateur stations on islands throughout the world.

Many national amateur radio societies issue certificates or diplomas for cantacting a certain number of amateur stations in their territories under specified conditions.

DXpedition

DX (meaning "long distance") expeditions, "DXpeditions", are organized to put rare locations (countries or remote places with few or no regulary operated amateur stations) on the air for limited times. They provide amateur stations the opportunity to make contact with these rare locations and exchange QSL cards as proof of contact.

Amateur radio direction finding

Amateur radio direction finding (ARDF), sometimes called "orienteering" or "rabbit hunting", is a time limited race to demostrate skills in serching for radio transmitters. Amateur service bands at 3,5 MHz and 144 MHz are normally used.. ARDF began in Northern and Eastern Europe but has spread world wide, particularly the Northern Hemisphere. Annual ARDF activies are conduced in a number of countries operating under IARU rules. IARU sponsors World Championship.

High speed telegraphy

High speed telegraphy (HST) challenges operators to correctly Morse code at the highest possible speeds. International world championships are sponsored the IARU.

CHARACTERISTICS OF SYSTEMS OPERATING IN THE AMATEUR AND AMATEUR-SATELLITE SERVICE FOR USE IN SHARING STUDIES

Recommendation ITU-R M.1732-1

This Recommendation documents the tecnical and operational characteristics of systems used in the amateur service and amateur-satellite services for purposes af carryng out sharing studies. The systems and their characteristics described in this Recommendation are considered representative of those operating in the frequency bands available to thes services ranging from 135,7 KHz through 47,2 GHz.

TELEGRAPHY SYSTEMS

MORSE CODE - International Morse code in accordance with Recommendation ITU-R M.1677 continues to be used in the amateur service despite the removal of the mandatory requirement for demostration of Morse proficiency from RR Article 25 at WRC-03. Some administrations have discontinued Morse testing while others have maintained an examination at 5 words per minute for certain classes of amateur licences. Morse code telegraphy is does not require complex equipment and is a robust mode caoable of operation with weak signals during poor conditions.

RADIOTELETYPE – Known as RTTY in the amateur service, this mode involves teleprinters at each end of the radio circuit. there continues to be 45 Bd, start-stop, frequency-shift RTTY operation and narrow-band direct-printing (NBDP) using a variant of Recommandation ITU-R M.476 (known as AMTOR) in the amateur service HF bands. The trend is toward replacing these modes with narrow-band PSK systems such as PSK31 and varius data communications modes.

PSK31 - PSK31 is a digital communications mode intended for interactive keyboard operation between personal computers and an amateur sigle-sideband (SSB) transceiver. Its data rate is 31,5 Bd (abaut 30 words per minute) and its emission symbol is **60H0J2B**. It is implemented using software written for personal computer sound cards.

DATA COMMUNICATIONS SYSTEMS

PACTOR-II – PACTOR-II is an adaptive data communications system using defferent modulation and encoding methods depending on channel quality. It uses two-tone differential phase-shift keing (DPSK) modulation. With data compression, its effective throughput is 1200 bit/s. Its emission symbol is **375HJ2D.**

PACTOR-III –This is and other voice-frequency bandwidth data communications system are gaing increased use in the amateur service. It is a software upgrade for exting

PACTOR-II modem. Through the use of compression , throughput up to 5200 bit/s are achieved. Its emission symbol is **2K20J2D**

CLOVER 2000 – Data compression permits throughputs up 5200 bit/s. Its emission symbol is: **2K00J2D**

MFSK16 – This is a data communications system using 16-tone frequency-shift keing, affording a data rate of 3000 bit/s. Its emission symbol is: **316HJ2D.**

APRS. - An Automatic Position Reporting System (APRS) is in operation in the amateur service. Individual mobile units derive their locations from global positioning satellites, and report tracking, mapping and related data to amateur stations via HF or VHF amateur packed radio

INTERNETWORKING

The internet is used as an interconnection between amateur service networks. Several methods have been developped.

WINLINK 2000. – This method permits automatic trasfer of messages between the internet and remote amateur stations.

IRLP. – The (Internet Radio Linking Project) usesVoice over Internet Protocol (VolP) for interconnection of amateur stations by means of the internet.

ECOLINK. – This system links a personal computer to an amateur station via the internet.

TELEPHONY SYSTEMS

SSB . – Amateur single sideband suppressed carrier telephony has virtually replaced douple-sideband amplitude-modulated telephony in the amateur service. The emission symbol is **2K70J3E**, although there is some use of narrower and wider bandwidths, SSB is used on frequencies from 1,8 MHz trough 47,2 GHz.

DIGITAL VOICE

Digital voice has been used in the amateur service since the year 2000. Two orthogonal frequency division multiplexing (OFDM) technologies have been used, one based on the AMBE encoder-decoder and the other a variant of Digital Radio Mondiale (DRM) modified to fit inside a 2,7 KHz bandwidth. Early applications have been on HF including transatlantic tests. Use in VHF/UHF/microwave bands is expected to increase.

FREQUENCY MODULATED VOICE

FM voice, emission symbols **11K0F3E** and **16K0F3E,** are in use from 29 MHz to 47,2 GHz. The use of FM repeaters for exstension of range is common.

IMAGE COMMUNICATION SYSTEMS

SSTV. – Amateurs use slow-scan television SSTV systems currently employing cameras and personal computer with special software for slow transmissions of colour images in voice-frequency badwidths

FSTV. – Most amateur fast-scan television, using NTSC or PAL systems, involves the use of repeaters for extension of ranges. FSTV systems operate on frequencies above 420 MHz.

DATV. – Radio amateurs have developed full-motion digital television using digital compression techniques in bandwidths of 1,5 Mbit/s to 2 Mbit/s in frequencies above 420 MHz.

MULTIMEDIA SYSTEMS

There is continuing researc in amateur systems capable of combining data. voice ad image communications. There is some use of wireless-standard equipment in the band 2400 – 2450 MHz, in accordance with limitations of domestic amateur licences, to achieve extemded ranges.

D-STAR. – This is a digital voice andata system developed by the Japan Amateur Radio League (JARL) in cooperation with the administation and industry. It is designed for user access at VHF, Digized voice/audio signals ad short data messages are supported. Modulation methods supported are: GMSK, QPSK and 4-FSK, at a date rate of 4,8 Kbit/s. Voice encoding method is AMBE (2020) at 2,4 Kbit/s within 6 KHz bandwidth. for data, the transmission rate is 128 Kbit/s within a bandwidth of 150 KHz.

Backbone communication between repeaters containing multiplexed digitized voice/audio, user data, and link control data signals at 10 Mbit/s within a bandwidth of 10,5 MHz.

THE INTERNATIONAL CODE OF SIGNALS

The knowledge of the international code of signals is necessary because brings all rules of international procedures of transmissions, deriving by ***ITU,*** *in all the the opportunity to issue. We radio amateurs act out of self-interest because can be essential for the collaboration provided that help. The birth of signals of procedure and their breakup from the general group of abbreviations is sanctioned in the international code of signals.*

The international code of signals is born with the purpose to safeguard the life into the sea, respecting the regulations and the procedures of transmission for the activity of telecommunications announced by **ITU**.

The first international code was prepared in 1855 from a committee instituted by the and**Board of Trade**" (British Board of Trade), published in the 1857 and adopted by the majority of the maritime countries. Such edition was submitted to revision in 1882. Proposals for the revision were controversial among the principal maritime powers to the Washington conference in 1889. It new version was completed in 1897 and distributed to all maritime powers. However, it new version did not bear it proof of the First World War.

In the radiotelegraphic international conference of Washington of the 1927, examined any proposals for a further revision of the code and is decided that were prepared in seven tongues: French; Japanese; English; Italian; Spaniard; German; Norwegian: It new version was completed in 1930 and was adopted in 1932 (international conference of Madrid). in the same conference, it is instituted a standing committee with the task to submit the code to revision when necessary. Such committee reunited a just once, in 1933 to introduce new signals and changes.

In 1947, **l'International Telecommunication Union**, it established that the international code, reentered in the competence of the advisory maritime intergovernmental organization (**IMCO**). in the first meeting of the IMCO, of the 1959 , himself decided that the organization assumed all functions then attributed to the standing committee of the international code.

In the second meeting of the 1961 adopted a project of total revision of the code with the following important changes: to tongues added the Russian and the Greek; were advanced proposed for the compilation of a radiotelephonic code, establishing the relationships with the international code of signals. For such revision it was fully grown a constituted sottocomitato by representatives of: Sweater; France; Germany; Giappone; Great Britain; Greece; Italia; Norway; United States; Soviet union. to the revision of the code they have collaborated the various governmental and non-governmental international organizations: atomic energy; civil aviation; work; telecommunications; meteorology; health; merchant navy; labor unions; maritime radio.

The new code was adopted by the fourth the IMCO meeting in 1964.

This is destined to be second-hand mainly in situations relating to the safety of the navigation and, in particular, in cases when is presented difficulty of tongue. The transmission can be done full - scale of communication, there inclusive the radiotelephony and the radiotelegraphy. The new code is based on the principle that

every signal has a complete meaning and therefore abandons the method of transmission word for word, adopted by the old code.

Before the summary description of the international code of the signals, desire lead to noscenza co the following: in the illustrative note on the structure and on the opportunity to employment of the code, attached to the Nr 33469 circular of the 16-01-1969 of the office of the harbor, brings to the point 10, paragraph 1-- the regulation of the radiocommunications, and then the q code and the list of the so drawn up abbreviations, they remain in being until 30 March of the 1969. from the 1° April, it comes into force a siege of changes, decided in the administrative world conference of tenutasi radiocommunications to Ginevra in the fall of the 1967 (this change does not interest the of radio amateurs activity).

The Q code were contained in the annex 13 (now in Annex 1 – Section 1 of Recommendation ITU-R M.1172). When needs connection behaviour using the new code, not to create false interpretations, does one need to transmit the **QTQ** group or the **INTERCO** word.

In the new code notice some changes in signals of procedure to which, given the origin (**ITU**), all must be kept, in every form of transmission. For fortune am not many. signals of procedure remain unchanged, adds the **CS** group that specifies: Which is the nominative thing of your station? And the **RQ** group that is used in place of the question mark (in voice). Another change is the phonetic issue of numbers. You will find further on the corresponding tables.

The new international code is so composed: establishes that am the the opportunity to transmission or signaling; assign to issue every kind of the meanings of croups of letters. Croups can be composed of a, after two and after three letters. Croups of an or two letters understand also the croups of procedure. An only group of procedure is composed of three letters: **RPT**, that means repeat or I repeat. The majority of croups am in two letters and am exhibited in such way to be divided for type of operation to facilitate the consultation. All croups of three letters make a report on the medical section.

Signals of procedure are those croups of an or more letters that have meant (international) for the correct carrying out of the traffic remove, in all the types of transmission. Croups with the bar over, it is must transmit, in telegraphy, united as though were an only letter. For instance $\overline{\text{AS}}$, that means: wait, or $\overline{\text{AS}}$ (number) that means wait (number…minutes).

RECOMMENDATION ITU-R M. 1677-1

INTERNAZIONAL MORSE CODE

Scope
This Reccommendation confirm the international Morse code characters and the operational provisions applying to their use in radiocommunication services.

The ITU Recommendation Assembly:

a) - the versions of the Morse code have been in use since 1844;

b) - thet is continues to be used in some radiocommunication services including the amateur and amateur-satellite services, and to a diminishing extend in the mobile and fixed services ,.

c) - thet the code needs to be updated from time-to-time the needs of the radiocommunication services.

The annex 1 should be used to define the Morse code characters and their application in the radiocommunication services.

Annex 1

Operational provisions appllying to Morse working.

Morse code

Morse code signals

The following are the written characters that may be used and the corrisponding Morse code signals:

Letters

A	·−	**N**	−·	accented
B	−···	**O**	−−−	.à ·−−·− *
C	−·−·	**P**	·−−·	è ··−··
D	−··	**Q**	−−·−	ò −−−· *
E	·	**R**	·−·	ù ··−− *
F	··−·	**S**	···	* =(not ricognized in internazionale circle)
G	−−·	**T**	−	
H	····	**U**	··−	
I	··	**V**	···−	
J	·−−−	**W**	·−−	
K	−·−	**X**	−··−	
L	·−··	**Y**	−·−−	
M	−−	**Z**	−−··	

-

Figures

1	·−−−−	**6**	−····
2	··−−−	**7**	−−···
3	···−−	**8**	−−−··
4	····−	**9**	−−−−·
5	·····	**0**	−−−−−

Punctuation marks and miscellaneous signs

Full stop (period).....……	**[.]**	**.-.-.-**
Comma……..	**[,]**	**--..--**
Colon or division sign.....……	**[:]**	**---...**
Question mark (interrogation or repetition of transmission not unterstood**)**	**[?]**	**..--..**
Apostrophe…….	**[‘]**	**.----.**
Hyphen or dsh or substraction sign…….	**[-]**	**-....-**
Fraction bar or division sign..... ……	**[/]**	**-..-.**
Left-hand bracket (parenthesis) ……	**[( ]**	**-.--.**
Right-hand bracket (parenthesis)…….	**[ )]**	**-.--.-**
Inverted commas (quotation marks) (before and after the words) **.....**	**[“]**	**.-..-.**
Double hyphen ……....……	**[=]**	**-...-**
Unterstood…….		**...-.**
Error (eight dots) ……		**........**
Cross or addition sign……	**[+]**	**.-.-.**
Invitation to transmit ……..		**-.-**
Wait …….		**.-...**
End of work …….		**...-.-**
Starting signal (to precede every transmission) ……..		**-.-.-**
Multiplication sign..... ……	**[x]**	**-..-**
Symbol used in e-mail addresses .....……	**[@]**	**.--.-.**

Spacing and length of the signals

A dash il equal to three dots.

The space between the signals forming the same letter is equal to one dot. .

The space between two tetters is equal to three dots.

The space between two words is equal to seven dots.

Transmission of signs for which there is no corresponding signsl in the Morse code.

Signs that have no corresponding signal in the Morse code, but that are acceptable in the writing of telegrams, shall be sent as follows:

Mmultiplication sign

For the multiplication sign, the signal corresponding to the letter X shall be transmitted.

Percentange or per thousand sign

To indicate the signal % or ‰, the figure **0,** the fraction bar and the figure **0** or **00** shall be transmitted successively (**0/0, 0/00).**

A whole number, a fractional number, or a fraction, followed by a % or ‰ sign, shall be transmitted by joining up the whole number, the fraction number, or fraction to the % or ‰ by a single hyphen.

Examples: For **2%**, transmit **2-0/0,** and not **20/0**

For **4½‰** transmit **4-1/2-0/00**

. and not **41/20/00**

Inverted commas (quotation marks)

The special signal for inverted commas shall be transmitted before and after the word or words. However, where code converters are used, the apostrophe may be transmitted twice before and twice after the word or words to signal inverted commas (quotation marks).

Minute and second signs

To transmit the minute (‘) or second (“) signs,. when such signs follow figures – for example 1’ 15” – the apostrophe signal (**.----.**) must be used once or twice as appropiate. The signal (**.-..-.**) reserved for inverted commas may not used for the second sign.

Transmission of groups of figures and letters, of ordinal numbers or of fractions

A group consisting of figures and letters shall be transmittted without spaces between figures and letters.

Ordinal numbers composed of figures and letters, 30me, 25th, etc., shal be transmitted in the form **30ME, 25TH,** etc.

A number that includes a fraction shall be transmitted with the fraction linked to the whole number by a single hyphen

Example: for 1⅜ transmit **1-3/8,** and not **13/8**

For ⅜ 8:transmitt **3/8-8** and not **3/88**

For 363½ 4 5642, transmit **363-1/2 4 5642** and not **3631/2 4 5642.**

Latitude and Longitude

To indicate a point of position or a QTH where needs communicate the latitude and longitude, it is performed in the following manner:

Latitude

Is espress in four figures preceded by the **L** letter the first two figures is made a report on the degreers, other such two the first minutes followed **N** letter are made a report on (North) or **S** (Sud). To simplify transmit all united . Example:

L3740S. means **Latitude 37° and 40' Sud.**

Longitude

It is espress with four figure what if necessary with five figures preceded by the **G.** Letter The first one or two figures is made a report on the degrees, other such two is made a report on the first minutes segute from **E** (Est) or **W** (West). To semplify Transmettonoes all united. For example:

G13925E means **Longitude 139° and 25' East**

INDICATION OF THE HOUR

The hour must be suitable with four figures of the what the first two indicans the hours. [from 00 (midnight) to 23], the latests two indicans the minutes (from 00 to 59). Figures are preceded by the **T** letter to indicate the local time or the **Z** letter to indicate the Greenwich middle hour (GMT).

Examples:

T1045 (hours local time 10 and minutes 45)

Z2217 (hours GMT 22 and minutes 17)

GENERAL RULES OF TRANSMISSION

ETHICS (GOOD BEHAVIOUR)

In the of a collector traffic, the first thing to respect is the ethics and then the good behaviour. Not spend never enough words in the recall such respect.
In the chapter 7.4 (operation and ethical of a collector in net) of the HF MANAGERS HANDBOOK (ed.V8.1) are described 5 points of reference:

1. No net or single operator has the exclusive right to a specific frequency unless carrying emergency traffic, as defined in the "HF Emergency Operation Procedure
2. In the event that a QSO is in progress on a so-called net frequency the net must either wait until the QSO is terminated or alternatively estabilish the net elsewhere.
3. The net controller is responsible for ensuring that the net is conducted in an orderly manner with courtesy and consideration and does not disturb other traffic.
4. .On no account other than when carrying emergency traffic, as defined in the "HF Emergency Operating Procedure", may a net hold a frequency when there is no traffic to be passed.
5. All National Societies are again requested to direct their efforts to a return on the bands to the Amateur Radio Operator's Code.

To when said, add it usual, but never useless, recommendations.

a) Respecting the international procedures of transmission.
b) Transmit in frequencies that do not create interferences with the neighbours frequencies occupied.
c) During the QSO, in the passages leave always a space (white), to give possibility to other of goes into QSO.
a) At the end of the passage you repeat the nominative it is of who receives that of who transmits. Fairies it same thing on and off when the passage is done long.
b) When the QSO it makes among different operators, is good rule not passages behaviour long the like are disrespectful vis-à-vis the other operators of the wheel.
c) Are respectful in the of a collector language and telecommunications generally. For instance: say never "SIGLA" in the reference behaviour to the "nominative" and say "Roger" to accuse received.
d) Before goes into a QSO multiple, it is good first standard listen that has closed the wheel to become familiar with all components of the QSO.
e) If you must send a signal of tuning on the already busied frequency, to insert you in a QSO, do it you in the more fast possible mode and possibly to low power, not to create disturb.
f) Quick looks, in the limit I shall do it to the best of my ability, to not QSO behaviour, transmitting newses that am not relating to our service and that would require other the opportunity to traditional communication.
g) In CW quick looks to separate well the letters and the words and quick looks to transmit to the same speed of who has answered to your call.
h) In relation to the opportunity to transmission, to the frequency and to the sort of service that you prepared to perform, if have some doubt, consult the Bad Plan in being.

PROCEDURES OF TRANSMISSION

In the field of the telecommunications, the traffic develops following the contained rules nell'**ITU**, and brought also in the international **code of signals**. Such rules must be known and respected by all. Every branch of telecommunications (defended, police, commercial, radio amateurs, etc.), adopt a particular procedure, suited to the really purpose; all however must operate in the respect of above-mentioned codes. We radio amateurs also must respect the **dell'IARU procedures** , contained in the **HF Managers Handbook**. Such codes am so important for telecommunications that in every radio station if must find a copy. In our field, not only is not neither in the ARI sections, but straight the overwhelming majority of the radio amateurs ignore the existence. For fortune, among the operators there are operating that are or they come from activity of telecommunications and these is surely that it is verified in the field of the procedures of transmission. in the history of the radio amateurs we find cases of collaboration and in particular mode the radio amateurs have been of great help intercepting other stations to the of outtside the our service and have been able to give all the necessary supply to resolve cases of emergency. If today himself you must verify some similar case, the task of the radio amateur would be nearly impossible, it being more to knowledge of the new procedures of help. This because a too clean separation is been verifying among the world of our efficacy and that of international telecommunications (later will describe the procedure on cases of emergency).

It seems to me that in our service- " radio amateurs- exists an immense gap on the " procedure of transmission. So far as has lavished me, have not still invention the official source of the " procedure of radio amateurs, what certainly must be **l'IARU**, drawing from the international organ **ITU** but that any knows with certainty. The first rules of the of a collector procedure have track down it in the old volume of radio engineering of the founder of the ARI, (Ernest Montù) and in the Handbook ARRL. In other manuals today in commerce they are described the regulations, the procedures, the behaviour to which must be kept the radio amateurs. In these manuals the descriptions are done in the capacity of knowledge, as though said: this know and this say you, without do any reference to sources or official publications. I think that by now is time of updatings: persons preceded must lobby with **IARU** to do the point of the situation of the " procedures of transmission. In fact, reading recently **HF Mangers Handbook**, have noticed that also brings the signals of international abbreviations and that will comment later on. The listing of abbreviations is up-to-date in the " February 2009, and must say that many by myself questioned operators know and they use an only group: **TU** that means " thanks, in place of **TKS-TNX** of radio amateurs abbreviations. This wants to say an only thing: **do not exist divulgation**. Already are joined to a stung hard to deal with judging from the marasmus that is in action also to world - class in the various frequencies. The updating it is necessary to to look for to put order, recalling the respect of the old rules and the following updatings.

General indications

All among two stations begin with the call signal.
For calling, the calling station shall transmit the call sign (no more than twice) of the station required, the word **DE** followed by its own call sign and the signal -.- **K** procedure **(invite to transmit)** unless there are special rules peculiar to the type of apparatus used. The call shall always be made at hand speed.
The station called must reply immediately by transmitting the call sign of the calling station, the word **DE** followed by its own call sign and the signal -.- **K.**
If the call station is uneable to answer must transmit the signal of procedure of **AS wait (.-...).** If the celestial wait the 10 minutes, be necessary give the motivation.
It sees later, the procedure to follow after the **AS** signal.
If the call station does not answer, the call to intervals is can repeat of time.
If it is wants to connect an any station, does the general call beginning with the transmission of the signal of **CQ** procedure repeated three times, the **DE signal** following by the really nominative and end with the signal of **K** procedure (**-.-**) (**invite to transmit**)
If himself you want to connect an any station of a specific nation, at the end of the **CQ** signals adds the letter or number that announces the nation (every nominative is composed in order that the first letters announce the nation or the place of affiliation).
If himself you want to connect a distant station, it is added to **CQ** signals initials it **DX.**
In the course of the connection, in the case of a **QSO** normal, all newses are must give attached to the of radio amateurs activities, that is: the **RST**, the **QTH,** the name of the operator, the working conditions, the atmospheric weather conditions etc. It begs to use the in being abbreviations and to have a clearer picture and order, to use the sign of double line of separation (**-...-**) to every change of matter. To every beginning of message transmits the signal **-.-.-**. To every end in passing transmits $\overline{\text{AR}}$ **.-.-.** and repeats the nominative thing of the two separated stations by the **DE** signal and end with **K.** When the passage ends with **KN**, wants to say that it wants to communicate with the only connected station.
If instead this is to the transmission of a telegram type message, himself you must adopt all relative rules to the composition of telegrams.

In all the modes the end of the message announces with (**.-.-.**) $\overline{\text{AR}}$ and the end of the work with (**...-.-**) $\overline{\text{VA}}$**.**
When the passages among the two stations am short, not it is necessary to transmit the nominative thing of the station that listens but simply **DE** (nominative of the transmitting station) if the passage is still more short, it can end with **BK** (that means: return to you) without transmit the nominative.

In fact, the **BK find** it in three different indications:
1) - in the international abbreviations BK is going **BREAK (interruption of a transmission):**
2) - in the of radio amateurs abbreviations BK is going **operation in BREAK-IN**:
3) - in the manual ARRL BK is going **Back sensed you (return to you).**
Considerations:
In the first case, but particular situations, is not second-hand among OM because reserved too intrusive.
In the second cases, is you are able omit and use the group of the **QSK q code** that specifies it same thing.
The third cases and what generally use, when among two stations there are short passages.

The importance of the signal of DE procedure

The exact definition is: **" FROM…." (used to precede the name or other identification of the station that transmits)**

This important definition is to indicate that any nominative of transmitting station must be **ALWAYS** preceded by the signal of **DE** procedure. Never do not listen bad examples and out of use just the same method of the contest or other type of traffic when operate upon someone in that normal one.

If a person shouts its name, who listens will think that that guy is calling some that it has that name. It seems me a logical thing.

It same thing is can think, when in "air" is feel only the nominative (given that is not preceded by **DE**), all the less so there is a routine of call, as for instance: I have impelling necessity (is not normal routine) to connect a station that is working and hocked in a **QSO** and as does not know if feel me, among the pauses will transmit only its nominative. If it listen me is able answer me $\overline{\text{AS}}$ or **K** with $\overline{\text{AS}}$ would wait its availability, with **K** would answer **DE** (nominative) and would follow the connection. Obviously if to the transmission of its nominative do not receive any answer wants to say that does not listen me.

Already for a long time is feel nominative single in air, and I am always of more. I am the OM that look for to connect without do the usual **CQ CQ**.

Perhaps to imitate the opportunity to do the contest or to imitate the nominative individuals that answer to calls in split. This type of behaviour is spreading without that none of the responsible takes a provision, on the contrary invite the radio amateurs to operate as described in some manual "do-it-yourself" increasing the confusion that is feel in “air”.

From IARU HF Manager Hanbook. V8.1 chapter 6.2

DX CALLING PROCEDURE

It is recommended that the following guidelines be observed when calling **DX:**

a) Do not tune up on the DX station’s frequency.
b) Listen carefully for DX station’s
c) Send you own callsign a few times only, and then do not transmit again until after the DX is heard. Repeated calling introduces large gaps between QSO’s and mat cause the DX operator to QSY or QRT.
d) If the DX is calling a specific station or area only make a call if you fall within the group he is listening for. Good DX operators do not answer those who call out of turn.
e) Use ITU phonetics on SSB. On CW send not faster than the speed of the DX station.
f) If the DX station is working split, call on the specified frequency to minimise QRM to other band users.
g) Once contact is estabished pass only as much information as is passed to you, and when it is known that other stations have called and are waiting for a contact do not request a QSY or for DX station to listen for a friend or a list.

Signals of international abbreviation

Groups of signals that follow am international for all services, then do not replace that of radio amateurs that know, but am integrated. From the following signals I am broken up that of procedure that are systematized in a list aside from.

ADS Addres [*used after a question mark in in radiotelegraphy or RQ il radiotelephony (in case of lauguage difficulties) or after RPT, to request a repetition*]
BK Signal used to interrupt a transmission in progress.
BQ A reply to an RQ.
CFM Confirm (or I cnfirm).
CL Iam closing my station.
COL Collate or (I collate)..
CORRECTION Cancel my last word or group (used in radiotelephony).
DF Your bearing at .... hours was ..... degrees, in the doubtful sector of this station, with a passible error of ..... degrees.
DO Bearing doubtful. Ask for another bearing later (or at ... hours).
DSC Digital selective calling.
E EAST (cardinal point).
ETA Estimated time if arrival.
INTERCO International Code of Signals groups follow (used in radiotelephony)
KTS Nautical miles per hour (knots).
MIN Minute (or Minutes).
MSG Prefix indicating a message to or from the master of ship concerning its operation or navigation.
MSI Maritime safey information.
N North (cardinal point).
NBDP Narraw-band direct-printing telegraphy.
NIL I have nothing to send you.
NW Now.
NX Notice to Mariners (or Notice to mariners follows).
OL Ocean letter.
P Prefix indicating a private radiotelegram.
PBL Preamble [*used after a question mark in radiotelegraphy or RQ in radiotelephony (in case of language difficulties) or after RPT, to request a repetition*].
PSE Please.
RCC Rescue ciiodination centre.
REF Reference to .... (or refer to)..
S SOUTH (cardinal point).
SAR Search and Rescue.
SIG Signature [*used after a question mark in radiotelegraphy or after RQ in radiotelephony (in case of language difficulties) or after RPT, to request a repetition].*
SLT Radiomaritime letter.
SVC Prefix indicating a service telegram.
SYS Refer to your service telegram.
TFC Traffic.
TR Used by a land station to request the position and next port of call of a mobile station; used also as a prefix to the reply.
TU Thank you.

TXT Text *[used after a question mark in radiotelegraphy or after RQ in radiotephony (in case of language difficulties) or after RPT, to request a repetition*].
W WEST (cardinal point)
WD Word/s or Group/s
WX Weater report (or Weater report follows).
XQ Prefix used to indicate the transmission of a service note.
YZ The words which follow are in plain language.

Signals of procedure (from the international code of signals)

AA All after...." word or group or signal (used after the RPT signal).
AB All first…." word or group or signal (used after the RPT signal)
$\overline{\text{AR}}$ Fine communication (**transmitted united as only letter**.)
$\overline{\text{AS}}$ Signal of wait (**transmitted united as only letter**.)
BN All among…" group word or signal " and.." group word or signal (after RPT)
$\overline{\text{BT}}$ Signal to mark the separation among different parts of the same transmission (**transmitted united as only letter**)
C Affirmative
CP General call for two or more specific stations (see ITU- recommendation r M.1170).
CQ General call of all stations
CS Which is the nominative thing of your station? (it is transmitted without question mark).
FROM Deriving by…..(used before the nominative thing of the station that transmits)
K Invitation to transmit.
$\overline{\text{KA}}$ Signal of beginning (transmits united as only letter **)**
NO No negative.
OK Are well and good (or this is correct).
R Received.
RPT Signal of repetition, I repeat or repeat.
RQ Question, or: the group or word that precedes is understood in interrogative sense (in Rtelephony)
$\overline{\text{VA}}$ End transmission (**transmitted united as only letter**).
WA Word or group after……" word, group or signal (after RPT).
WB Word or first group……" word, group or signal (after RPT)

OF RADIO AMATEURS ABBREVIATION

ABT - abaut
AC - current alternate
ADR - address
AF - audio frequence
AGN - again
AM - ampletude modulation
ANT - antenna
BCNU - to hear again
BZC - to cause of ……
BD - bad
BI - to half of …….
BK - duplex
BN - has been, have been
BT - low tension
BTR - better
BU - separator stadium, buffer
BUG - semiautomatic key
B4 - first of
C - yes
CALL - call, nominative
CL - close
CLD - called
CFM - confirm
CN - can, you can
CNT - am not able, are not able
CNDX - the conditions of propagation
CONGRATS - congratulations
CQ - general call
CRD - QSL, postcard
CU - will find you
CUAGN - will find you still, goodbye
CUL - to upon thet
CW - radiotelegraphy (A1)
DC - current continues
DR - dear
DX - distance record
ECO - oscillator, electric coupling
ES - and
FB - many good
FM - modulation of frequency
FER - for
FD - duplicator of frequency
FONE - phony
GA - good afterrnoon
GBA - give me a better address
GE - good evening
GM - good morning
GUD - good
GB - goodbye
GD - ground
GLD - glad
GN - good night
HAM - radio amateur
Hi - laughter
HR - here
HT - hi tension
HVY - strongly, heavy, much
HF - hi frequency
HPE - hope
HRD - heartfelt (have feel)
HV - have, you have
I - I
HW - as? how to can you hear me?
INPT - input power
KEY - key
MY - my
MO - oscillator pilots
MIKE - microphone
MNI - much
MN - minut
MSG - message
ND - nothing (forbidden conditions)
NICE - beatiful, good, well-turned
N - no
NW - now
NEW - new
NIL - have nothing for you
NM - have not more nothing
NR - number, near to…….
OB - old friend
OC - old friend
OK - all well
OM - old friend
ON - "in ariae"
OP - operator
OT - old radio amateur
PA - amplifier of power
PPA - amplificatore di potenza in controfasce
PSE - please
PWR - power supply
R - received
RAC - corrent alternate (bad filtration)
RIG - radiostation , equipment
RF - radiofrequency
RX - receiver
RPRT - report
SED - said
SINE - nickname
SL - greet
SN - early
SA - say
SIGS - segnals
SKED - appointmrnt
SLD - integrally
SRI - sorry
TX - transmitter
TMW - tomorrow
TRUB - spoil, difficulty
TEST - test
TNX-TKS - thanks
VF - VFO
UR-URS - yours
VFO - oscillator pilots to varing freq.
VY - much
WUD - future (of any verb)
XMT - transmitter
XS - atmospheric
YL - girl
WL - well, want you, must
WX - state atmospheric
XTAL - cristal
2NITE - this night
YF-XYL - wife
73 - your truly
88 - affectionate regards, kiss
INFO - information

THE Q CODE

Certain abbreviations of the **Q** code can have affirmative or negative sense, transmitting following the abbreviation respectively **YES or NO.**

The meanings assigned to **Q** code abbreviations may be amplified or completed by the addition of appropriate other groups, call signs, place names, numbers, etc. It is optional to fill in the blanks shown in parentheses. Any data which are filled in where blanks appear shall be sent in the same order as shown in the next of the following tables.

Q code abbreviations are given the form of a question, when following by a question mark in radiotelegraphy and **RQ** (ROMEO QUEBEC) in radiotelephony. When an abbreviation is used as a question and is followed by additional or complementary information, the question mark (or **RQ**) should follow this information.

Q code abbreviations with numbered alternative significations shall be followed by the appropriate figure to indicate the exact meaning intended. This figure shall be sent immediately following the abbreviation.

All times shall be given in Coordinated Universal Time (**UTC**) unless otherwise indicated in question or reply.

An asterisk * following code abbreviation means that this signal has a meaning similar to e signal appearing in the International Code of Signals.

The Q code in use by radio amateurs

	Q CODE	
	QUESTION	**ANSWER or COMMUNICATION**
QRA	What is the name of your vessel (or station)?	The name of my vessel (or station) is …….
QRB	How far approximately are you from my station?	The approximate distance between our station is(Km or mil)
QRC	By what private enterprise (or state administration) are the	The accounts for charges of my station are settled by the
	accounts for charges for your station settled?	private enterprise (or state administration)……
QRD	Where are you bound for and where are you from?	I am bound for……. from ……
QRE	What is your estimated time of arrival at……?	My estimated time of arrival at……. hours …….
QRF	Are you returning to ……?	I am returning to ……or retun to.....
QRG	Will you tell me my exact frequency (or thet of.....)?	Your exact frequency (or that of...) is..……KHz or MHZ
QRH	Does my frequency vary?	Your frequency varies.
QRI	How is the tone of my transmission?	The tone of your transmission is:
		1 – good
		2 – variable
		3 – bad
QRJ	How many radiotelephone calls have you book?	I have…….radiotelephone calls book.
QRK	What is the intelligibility of my signals (or those of.....)?	The intelligibility of your signals (or those of…....) is
		1 – bad
		2 – poor
		3 – fair
		4 – good
		5 – excellent
QRL	Are you busy?	I am busy, (with……..) please do not interfere.
QRM	Is my transmission being interfered with?	Your tranmission is being interfered with....
		1- nil
		2 - slightly
		3 - moderately
		4 - severely
		5 - extremely
QRN	Are you troubled by statc?	I am troubled by static
		1 – nil
		2 – slightly
		3 – moderstrly
		4 - severely
		5 - extremely

QRO	Shall I increase transmitter power?	Increase transmitter power
QRP	Shall I decrease transmitter power?	Decrease transmitter power
QRQ	Shall I send faster?	Send faster (.....word per minute)
QRR	Are you ready for automatic operation?	I ame ready for automatic operation. Send at .... words per minute
QRS	Shall I send more slowly?	Send more slowly (...words per minute)
QRT	Shall I stop sending?	Stop sending.
QRU	Have yoy anything for me ?	I have nothing for you.
QRV	Are you ready?	I am ready.
QRW	Shall I inform…... thet you are calling him on .....MHz o KHz?	Please inform….. that I am calling him on……..MHz o KHz.
QRX	When will you call me again?	I will call you again at ……hours on…….MHz o KHz
QRY	What is my turn? (to communication) ?	Your turn is number(or according relates to communication)
QSA	What is the strength of my signals (or Those of...)?	The strengh of your signals Or those of.... is:
		1 – scarcel perceptible
		2 – weak
		3 – fairly good
		4 – good
		5 – very good
QRZ	Who is calling me ?	You are being called by……. on …….MHz or KHz
QSB	Are my signals fading ?	Your signals are fading.
QSC	Are you a low traffic ship station ?	I am a low traffic ship station.
QSD	Are my signals mutilated ?	Your signals are mutilayed.
QSF*	Have you effected rescue ?	I have effected rescue and am proceding to……base
QSG	Shall I send ……..(Nr) telegrams at a time ?	Send ……(Nr) telegrams at a time.
QSH	Are you able to home with your direction-finding equipment ?	I am able to home with my direction-findind equipment.
QSI		Ihave been unable to break in on your trnsmission.
QSJ	What is the charge to be collected to …. including your	The charge to be collected to …. including my internal
	internal charge ?	charge is.....francs.
QSK	Can you hear me between your signals and if so may I break	I can hear you between my signals; break in on my
	in on your transmission ?	transmission.
QSL	Can you acknowledge receipt ?	I am acknowledging receipt.

QSM	Shall I repeat the last telegram which I send you ?	Repeat the last telegram which you sent me. Or namber.....
QSN	Did you hear me or….(call sign) on MHz……or KHz……?	I did hear you or...(call sign) on MHz….or KHz…….
QSO	Can you communicate with……. direct (or by relay?	I can communicate with….. direct (or by relay through)……..
QSP	Will you relay to.....(call sign) free of charge ?	I will relay to.....(call sign) free of charge.
QSQ	Have you a doctor ……..(or name of person) on board ?	I have a doctor …….. (or name of person) on board
QSR	Shall I repeat the call on the calling frequency ?	Repeat your call on the calling frequency; did not hear you.
QSS	What working frequency will you use?	I will use the working frequency……MHz o KHz
QSU	Shall I send or reply on this frequency or on	Send or reply in this frequency or on …….MHz or KHz
	……..MHz or KHz with emissions of class……..?	with emission of class……
QSV	Shall I send a series of Vs (or signs) for adjustment on this	Send a series of Vs (or signs) for adjustament on this
	frequency or on……MHz or KHz ?	frequency or on…….MHz or KHz.
QSW	Will you send on this frequency or on..... MHz or KHz	I am going to send on this frequency or on…..MHz or KHz
	(with emission of class.....) ?	(with emission of class....).
QSX	Will you listen to……(call sign) on ……MHz or KHz ?	I am listening to…….(call sign). on ……..MHz or KHz.
QSY	Shall I change to transmission on another frequency ?	Change to transmission on another frequency….MHz or KHz
QSZ	Shall I send each word or group more than once ?	Send each word or group twice (or...times).
QTA	Shall cancel telegram (or message) number……?	Cancel telegram (or message) number…….
QTB	Do you agree with my counting of word?	I do not agree with your counting of words. I will repeat the
		first letter or digit of each word or group.
QTC	How many telegrams have you to send ?	I have…….telegrams for you or for .....(name or call sign).
QTD*	What has the rescue vessel or rescue aircraft recovered ?	……(identification) has riicovered 1…….n° survivors
		2 wreckage
		3…….n° bodies
QTE	What is my TRUE bearing from you?	Your TRUE bearing for me is ……degrees at…hours.
	What is my TRUE bearing from.....(name or call)	Your TRUE bearing from.....(name or call) was...deg. hou...
	What is the TRUE bearing of.....(name or call))from.....	The TRUE bearing of.....(name or call) from....(name or
	(name or call sign) ?	call) was.... degrees at ...hours.
QTF	Will you give me my position according to the bearings	Your position according to the bearings taken by the
	taken by the direction-finding stations which you	direction-finding stations which I control was.....latitude,
	control ?	.....longitude (or other indication of position) classe.....
		at…….hours.
QTG	Will you send two dashes of ten seconds each followed	I am going to send two dashes of ten sconds each followed
	by your call sign (repeated....Time) on .....MHZ or KHz	by my call sign (repeated...times) on….MHz or KHz.
	Will you request.....(call sign) to send two dashes of ten	I have requested (call sign) to send two dashes of ten

	seconds each followed by his call sign (repeated ……times)	seconds each followed by his call sign (repeated…times) on
	on.....MHz or KHz ?	.....MHz or KHz
QTH	What is your position in latitude and longitude	My posityion is……latitude,.....longitude
	(or according to any other indication) ?	(or according to any other indication)
QTI*	Wihat is your TRUE course ?	My TRUE course is……degrees.
QTJ*	What is your speed ?	My speed is..... knots (or Km) per hour.
QTK*	What is the speed of your aircraft in relation to the	The speed of my aircraft in relation to the surface of the
	surface of the Earth ?	Earth is ....knots (or Km) per hour.
QTL*	What is your TRUE heading ?	My TRUE heading is …….degrees.
QTM*	What is your MAGNETIC heading ?	My MAGNETIC headind is …… degrees.
QTN	At what time did you depart from ……(place) ?	I departed from…….(place)at …….hours.
QTO	Have you left dock (or port) ? or	I have left dock (or port) . or
	Are you airborne ?	I am airborne.
QTP	Are you going to enter dock (or port)? or	I am going to enter dock (or port). or
	Are you going to alight (or land) ?	.I am going to alight (or land).
QTQ	Can you communicate with my station by means of the	I am going to communicate with your station by means
	International Code of Signals (INTERCO) ?	of the International Code of Signals (INTERCO).
QTR	What is the corrent time ?	The corrent time is…….hours
QTS	Will you send your call sign (and/or name) for..... seconds?	I will send my call sign (and/or name) for.....seconds.
QTT		The identification signal which follows is superimposed on
		another transmission.
QTU	What are the hours during which your station is open ?	My station is open from.....to.....Hours.
QTV	Shalll stand guard for you on the frequency of	Stand guard for me on frequency of.
	.....MHz or KHz (from.....to.....hours) ?	.....MHz or KHz (from.....to.....hours).
QTW*	What is the condition of survoivars ?	Survoivars are in.....condition and urgently nee.....
QTX	Will you keep your station open for further communication	I will keep my station open for further communication
	with me util further notice (or until.....hours) ?	with you until further notice (or until.....hours).
QTY*	Are you proceding to the position of incident and if	I am priceding to the position of incident and wxpect
	so when do you expect to arrive ?	to arrive……..hours (or.....date).
QTZ*	Are continuing the search ?	I am continung the search for....(aicraft, ship,survival craft,
		survivos or wreckage).
QUA	Have you new of……(name or callsign) ?	Nere is news of……(name or call sign).
QUB*	Can you give me in the following order information	Here is the information requested:.....

	concerning: the ditrection in degrees TRUE and speed of the	(The units used for speed and distances should be
	surface wind; visibility; present weather; and amount, type	indicaded).
	and height of base of cloud above sruface elevation at.....	
	(place of observation)	
QUC	What is the namber (or other indication) of the last message	The number (or other indication) of the last message I
	you received from me (or from …….(name or call sign) ?	received from you (or from…….(name or call sign).
QUD	Have you received the urgency signal sent by .....(call sign) ?	I have received the urgency signal sent by …….(call sign) at
		.....hours.
QUE	Can you speak in....(linguage), with interpreter if necessary ?	I can speak in…..(linguage) on……MHz or KHz.
	if so, on what frequencies ?	
QUF	Have you received the distress signal sent by…(call sign) ?	I have received the distress signal sent by……(cll sign) at
		.....hours.
QUH*	Will you give me the presente barometric pressure at sea	The present barometric pressure at sea level is.....
	level ?	
QUM	May I resume normal working ?	Normal working may be resumed
QUN	When directed all stations: Will vessels in my immediate	My position, TRUE course and speed are.....
	vicinity.....or	
	(in the vicinity of.....latitude,.....longitude) or	
	(in the vicinity of.....) please indicate their position, TRUE	
	course and speed ?	
QUO*	Shall I search for.....	Please search for.....
	1 – aircraft	1 – airceaft
	2 – ship	2 – ship
	3 – survaval craft in the vicinity …..or.....(lat and long)?	3 – survival craft in the vicinity……or .....(lat and long)
QUP*	Will you indicate your position by:.....	My position is indicated by.....:
	1 – searchlight	1 – searchlight
	2 – black smoke trail	2 – black smoke trail
	3 – pyrotechnic lights ?	3 – pyrotechnic light.
QUR*	Have survivors.....	Survivors.....
	1 – reveived survival equipment	1 – are in possession of sruvival equipment dropped by.....
	2 – been piched up by rescue vessel	2 – have been picked up by rescue vessel
	3 – been reached by ground rescue party ?	3 – have been reached by ground rescue party.

QUS*	Have you sighted survivors or wreckage ? If so, in what	Have sighted.....
	position ?	1 – suvivors in water
		2 – survivors on rafts
		3 – wreckage In .....latitude.....longitude
QUT*	Is position of incident marked ?	Position of incident is marked by....
		1 – flam or smoke float
		2 – sea marker
		3 – sea marker dye (specify other marking)
QUU*	Shall I home ship or airxcraft to my position ?	Home ship or aorcraft.....(name and/or call sign)
		1- to your position by sending your call sign and long dashes
		on ..... MHz or KHz
		2 – by sending on .....MHz or KHz TRUE track reach you.
QUW*	Are you in the search area designated as.....Lat.....long....?	I am in the.....(designation) search are.
QUX	Do you have any navigational warnings or gale warnings	I have the following navigational warning (s) or gale warning
	in force ?	(s) in force:.....
QUY*	Is position of survival craft marked ?	Position of survival craft was marked at ....hours by .....
		1- flame or smoke float
		2 – sea marker
		3 – sea marker dye 4 – (specify other marking)
QUZ	May I resume restricted working ?	Distress phase still in force; restricted working may be resumed.

Notes-- exact that in some manuals to the QRT signal give the meaning of: *suspend the transmissions or I suspend the transmissions.*
The correct meaning is: SUSPEND THE TRANSMISSIONS (*without other added fanciful).*
Transmit never QRZ? in place of CQ. (the meaning is: Who is calling me?), then himself uses, when has not understanded the call sign thing of the station that has called you.
Out of use QRZ? When you want to know the call sign thing of a station. They use instead the signal of procedure "CS".

Phonetic International Code of the letters

A	**ALFA**
B	**BRAVO**
C	**CHARLIE**
D	**DELTA**
E	**ECHO**
F	**FOXTROT**
G	**GOLF**
H	**HOTEL**
I	**INDIA**
J	**JULIETT**
K	**KILO**
L	**LIMA**
M	**MIKE**
N	**NOVEMBER**
O	**OSCAR**
P	**PAPA**
Q	**QUEBEC**
R	**ROMEO**
S	**SIERRA**
T	**TANGO**
U	**UNIFORM**
V	**VICTOR**
W	**WHISKEI**
X	**X-RAY**
Y	**YANKEE**
Z	**ZULU**

Phonetic international code of numbers

The following code, too being in being for some years still is not gone into the use of the amateur language, but given that is suitable by **ITU**, feel me in to do it must know.

0	**NADAZERO**
1	**UNAONE**
2	**BISSOTWO**
3	**TERRATHREE**
4	**KARTEFOUR**
5	**PANTAFIVE**
6	**SOXISIX**
7	**SETTESEVEN**
8	**OKTOEIGHT**
9	**NOVENINE**
Comma	**DECIMAL**
End	**STOP**

PROCEDURES OF THE RADIO AMATEUR TRAFFIC

Examples of connections among of radio amateur stations

1) General call

The first thing from behaviour is make sure that the frequency is free, then transmits the group **QRL?** of the Q code. If the frequency is busy, can feel many types of answers: **C; Yes; QSY C;** etc. All these answers do not respect the application of in being rules. The only and only correct answer is **QRL** that specifies: **am busy (with…..) it begs to not interfering.**

Obviously is must change frequency and repeat when said, until when verify you that the frequency is free and then transmit the call. To do a general call (turned to any station) it is repeated for three times the signal of **CQ** procedure following by signal of **DE** procedure and following by the really call sign repeated two times, and it ends with the signal (in CW or RTTY) of **K** (invite to transmit).

CQ CQ CQ de I4CQO I4CQO k

In dries the phonetic alphabet is used to articulate every letter and/or number but the **DE** that becomes **FROM** or **THIS IS** and the **K** that becomes **KEY,** or **OVER** or **STAND BY** (in the commercial international procedures, also the DE transmits " DELTA ECO).

2) To take an oath connection with an other station, it is repeated for two times the call sign thing of the station called following by the signal of **DE** procedure followed for two times from the call sign thing of the station that transmits or calls. Example:

G5HPE G5HPE de I4CQO I4CQO k

3) Various types of call:

CQ CQ CQ GM de I4CQO I4CQO k

The I4CQO station wants to connect a station any of Scotland.

CQ CQ CQ DX de I4CQO I4CQO k

The I4CQO station wants to connect a distant station.

IZ4CZJ IZ4CZJ IK4WLO IK4WLO de I4CQO I4CQO k

The I4CQO station calls two stations. They stand it calls will answer with just the same order of call.

When in the calls or in the various passages, it closes with **KN,** means that is wants to communicate with the only connected station or call.

Examples of applications of procedures.

Example of procedure after a $\overline{\text{AS}}$ signal**:**

the station that has transmitted $\overline{\text{AS}}$, in the take back the transmission after the pause, performs: **de I4CQO QRV? k** (are you ready to receive?).

The station that receives answers; **de IK4WLO QRV k** (I am ready to receive).

When it is done connections in **CW,** given the need to shorten the communications, is made use of all allowed abbreviations by international codes **ITU and IARU.**

Example of a **QSO** in **CW** among stations of radio amateurs:

G5HPE G5HPE de I4CQO I4CQO k (to noticing to every change of matter is put a signal of separation **-...-** double hyden **=**

I4CQO de G5HPE -.-.- gm tnx fer call =-- begin transmission, *good morning, thanks of has answered to my call =*

ur RST 599 599 fb = ----- *the quality of your RST signal is 599 very well =*

QTH london london= *----- my QTH is london =*

name john john = ----- *my name is john =*

OK? $\overline{\text{AR}}$ **----------** *all well? End message*

I4CQO de G5HPE k

G5HPE de I4CQO -.-.- gm dr john tnx fer rprt = --- *begin transmission, good morning dear john, thanks for the relationship of my segnale=*

ur RST 589 589 =--- *the quality of your RST signal is 589 =*

QTH parma parma= --- *my QTH is Parma =*

name jim jim = --- *my name is Jim=*

hr rig rtx yaesu ft 920 abts 100 w out =-- *here it my working conditions are ft920 yaesu rtx with about 100W of power in exit =*

ant vertical multiband butternut = *vertical antenna multi bands butternut =*

hr wx sunny temp 22C = ------- *here the atmospheric time is sunny with temperature of 22 centigrade degrees=*

OK? $\overline{\text{AR}}$ ----- *all well? End message.*

G5HPE de I4CQO k

I4CQO de G5HPE -.-.- dr jim tnx fer info = *begin transmission*, *dear jim thank you for the information =*

hr rig transceiver knw f125 100W out and ant dipole =-- *here it my working conditions are of transceiver knw with 100 watts of exit and dipole antenna =*

hr wx cloudy 12C temp = *here the atmospheric time is cloudy with temperature of 12 centigrade degrees =*

dr jim QRU? $\overline{\text{AR}}$ = ---- *dear jm have of the other from communicates me? End Transmission=*

I4CQO de G5HPE k

G5HPE de I4CQO -.-.- dr john tnx fer info = *-begin transmission, dear john thank for the information =*

nw QRU tnx fer nice QSO =-- *have not now more nothing to communicate you and thank you for the beautiful connection =*

dr john pse ur QSL my qsl sure via buro =-- *dear john praies you of sends me your postcard QSL, my will send it you surely away office (ARI) =*

hpe cuagn best dx 73 $\overline{\text{AR}}$ --- *hope to connect you still, wish you to beautiful behaviour distant connections and send you yours truly, end transmission.*

G5HPE de I4CQO $\overline{\text{VA}}$ --- *end traffic.*

I4CQO de G5HPE -.-.- dr jim tnx fer nice QSO =-- *dear jim thank you for the beautiful connection =*

my QSL sure via buro gb cuagn 73 $\overline{\text{AR}}$ -*it my QSL postcard will be sent surely away office, ciao feel still, yours truly. End transmission.*

I4CQO de G5HPE $\overline{\text{VA}}$ - End traffic.

From **ITU handbook** Amateur and amateur-satellite services - Chapter 2.4

OPERATIONS OF EMERGENCY

Role of the amateur service in emergency telecommunications.

Its wide scope of activies and the skills af amateur radio operators make the amateur service a valuable asset in emergency telecommunications. It has a large number of operational amateur stations in almost all countries of the world, providing a robust network independent from any other. In many cases, it has provided the first, and sometimes the only, link outside the area affected by disaster. The amateur service has training programmes and emergency simulation exercises developed by some of the national amateur radio sacieties.
Tpical situations for which the amateur service can supplement emergency communications include:

Initial emergency alerts may originate from individual amateur stations to bring an incident to the attention of competent institutional emergency services.

In search and rescue operatins, amateur stations can reinforce the professional teams by increasing their communication capabilities and reporting observation.

Hospitals and similar estabilishments might in the aftermath of a disaster be without communications. Local amateur radio emergency groups prepare in advance for such assistance.

Hazardous materials (HAZMAT) and other incidents may require the evacuation of residents, and coordination between the disaster site and the evacuation sites or shelters. Amateur emergency stations may be asked to estabilish communications with such institutions.

Amateur networks available for emergency telecommunications.

Short-range networks.

Amateur short-range network provide operational or tactical communications at the site of a disaster and with the surrounding areas. They can include fixed, mobile and nomadic equipment typically using frequencies in the band 50 – 54 MHz, 144 – 148 MHz and 420 – 450 MHz, noting that there are regional and national differences in these frequency ranges.

Repeater stations are used to extend the communication range of VHF and UHF stations. Positioned in elevated locations, they allow communication between fixed or mobile amateur stations separated by obstructions such as mountains or tall buildings when operating in an urban environment. A repeater station receives on one channel and transmits on a different frequency, usually within the same frequency band.

Medium-range networks

Amateur medium-range networks typically provide communication from the disaster site to organizational and administartive centres outside an affected area, or to headquarters of response providers in neighbouring countries. They also ensure communication with veicles, vessels and aircraft operating outside the coverage of available VHF or UHF networks. Communication at medium distnces of to 500 km may be accomplished by near-vertical-incidence sky-wave (NVIS) propagation at lower MF/HF in bands 1800 – 2000 KHz, 3500 – 4000 KHz and 7000 – 7300 KHz, noting that there are regional and national differences in these bands. In addition, several national administrations have designated specific frequencies (channels) for amateur radio emergency traffic and related training.

Long-range networks

Amateur long-range networks provide communication with headquarters of international emergency and disaster response providers. They serve as backup connections between offices of such institutions in different countries or on different continents. Amateur stations routinely communicate over long distances typically beyond 500 km, using oblique-incidence sky-wave propagation in bands 3500 KHz through 29,7 MHz.

Nets of communications must be fully grown in those countries where not there are, or where am in demand.

It is necessary to the education and the formation of operators for the management of messages.

General information

The radio amateur is one of the services of radio communications constituted by the **International Telecommunication Union.** In all the services of emergency, the traffic has absolute priority in comparison with the normal operations.

Operations of emergency require an effective transmission of the traffic. The efficiency of the communication is not obvious in the radio-amateur, then every operator must think about as react on emergency situation to get the maximum possible preparation.

OPERATIONAL PROCEDURES IN EMERGENCY SITUATION

From "IARU HF INTERNATIONAL EMERGENCY OPERATING PROCEDURE"

If you hear the word "**emergency", "welfare-traffic**" or the abbreviation **QUF** - stop transmitting and listen.

- if you receive such traffic - stand by, observe it and write down all you hear.
- don't leave the frequency before you are sure that you cannot help and somebody is helping.

- don't transmit before you are sure that you can help.

- Follow the instructions the traffic controlling station (if there is one) is giving you.The traffic is controlled by the station in emergency or the station appointed by the station in emergency.

- keep messages short - don't transmit useless information.

- in case of interference by other stations, the traffic controlling station or other stations appointed by it should transmit the word "emergency", "welfare-traffic","stop sending" or the abbreviation QUF to the interfering station.

Gather information by following system

When? (date, time, frequency)
Where? (emergency place)
What? (what happened, what is to be done)
How? (how can be helped)
Who? (who is able to help)

Confine to communication

Amateur radio is perhaps the last communication possibility in case of emergency. Confine to it. Leave advice and planning of aid to persons and institutions in charge of emergency relief.

In the traffic of emergency, if it presents the need to send messages, necessarily must be composed in the following manner: they must contain the address of the recipient and the sender and at the end of the text, the signature. To clarify better, does one need to use the form of telegrams.

The telegram is composed of: **preamble, text and signs**.

Operators must follow the procedures of in being transmission. In particular must give the **received (Nr. Telegr.)** of the message after having checked the number of words of the text and the comprehensibility. In the case of discordances, it is must use the signals of procedure and the procedures for the corrections or repetitions.

When is there the need to transmit messages, at the end of the message, when it is verified errors of receipt creditable to disturb or to other, repetitions through the croups of abbreviations are can ask of procedure that are:

RPT = repeat or I repeat
AA = all after (……word or group)
AB = all first (……word or group)
BN = all among (……..word or group and……. word or group)
WA = word or group after (…….word or group)
WB = word or first group (…….word or group)

Obviously among repetitions and confirmations, passes of the time valuable to the urgent transmission of the message. In CW it would certainly be advisable to use in the connections the traffic in break-in to accelerate notably the communications. The procedure is the following thing: the operator that receives, to the first interference that does it lose the meaning of some word, transmits a siege of dots or the seg. **BK** (interrempi la trasnissione). The operator that transmits, in the feel the dots or **BK,** interrupts the transmission by passing in listening. The operator that receives transmits the first letter of the last received word well. The operator that transmits, it take back the transmission from the indicated word. In this way it ends the message with the certainty of has received the whole error - free message and facilitating so the final control by accelerating the **received thing.**

Example:

Preamble

Stations that send messages in the net of radio amateurs compose the preamble.
The preamble contains the following information in the following order:

a) number
b) precedence
c) station of origin
d) check (number of words in text)
e) place of origin
f) filing time (UTC)
g) filing date

a) The number is a serial number assigned to the message.
b) The precedence may be

X - Emergency
P - Priority
R - Routine

c) Station of origin is the call of the station which first sent the message over the air.
d) Number words of the taxt
e) Place of origin in the place (city, town, village, ship) from where the originator sends his message.
f) Filing time and filing date **(g)** is the time when the message was originated in UTC.

Example:

Nr 32 **(a)** P **(b**) XY1ZZ **(c)** 27 **(d)** POOL-TOWN **(e)** 2215 **(f)** JAN 14 **(g**)=

RED CROSS LAKE CITY (destination)

PLEASE SEND US INFORMATION ABAUT FOLLOWING PERSONS STOP WALTER SMITH HARBOUR STREET 4 STOP ADAM BROWN AN FAMILY WATER AVENUE 16 STOP EVA BLACK RAIN WAY 28= (text – 27 words)

INFORMATION BUREAU FOR RIVER DISTRICT DISASTER .(firma)+($\overline{\mathbf{AR}}$)

Quick preamble

For traffic in VHF-FM nets where communication is easier you may use a shorter type of preamble:

Namber
Station of origin
Filing time

The number is a serial number assigned to the message.
Station of origin is the call of the station which first sent the massage over the air.
Filing time is the time when the message is originated (UTC).

Example:

Nr 4 XY1ZZ 1832 (numero – stazione origine – ora)=

OSPITAL LAKE CITY=

TWO MORE AMBULANCES NEEDED AT HARBOUR STREET ==

Operation Example Phone

YX1AA this is XY1ZZ, I have a message over
this is YX1AA, I am ready, over –
message begins,
number kartefour
x-ray yankee unaone zulu zulu
unaone oktoeight terrathree bissotwo,
address - HOSPITAL LAKE CITY –
text,
TWO MORE AMBULANCES NEEDED AT HARBOUR STREET,
message ends, over
- repeat word after more, over
- more ambulances over
- received number kartefour YX1AA out
- ok XY1AA out

Operation example CW

YX1AA de XY1ZZ QTC K

De YX1AA QRV K

_ . _ . _ Nr 32 P XY1AA 24 POOR TOWN 2215 JAN 14 _ ... _

RED CROSS LAKE CITY _ ... _

PLEASE SEND US INFORMATION _..._

INFORMATION BUREAU FOR RIVER DISTRICT DISASTER . _ . _.

RPT WA PLEASE K

PLEASE SEND K

DE YX1AA QSL 32 ... _ . _

DE XY1ZZ OK ... _ . _

_ . _ . _	=	message begins
_ ... _	=	separation sign
. _ . _ .	=	message end
... _ . _	=	transmission end

Phonetic alphabet

To avoid confusion use only the international phonetic alphabet..

Special cw/rtty abbreviations for emergency traffic

QOD can you communicate with me in ...

I can communicate with you in....

0 Dutch	5 Italian
1 English	6 Japanese
2 French	7 Norwegian
3 German	8 Russian
4 Greek	9 Spanish

QTV Shall I stand guard for you on the frequency ... kHz (from ... to ... hrs)?

Stand guard for me on the frequency ... kHz (from ... to... hrs)

QTX Will you keep your station open for further communication with me

- until further notice (or until ... hrs)?

I will keep my station open for further communication with you until further -

- notice (or until.... hrs)

QUA Have you news of ...?

Here is news of ...

QUF Have you received the distress (emergemncy) signal sent by ...?

I have received the distress (emergency) signal sent by ....

QUM May I resume normal working?

You may resume normal working.

QRR Are you ready for automatic operation?

I am ready for automatic operation.

What to do afterwards

Do not forget to inform your national society about your emergency - or welfare traffic handling.

Here at a stretch I am suitable the frequencies of center activity in the traffic of emergency.

Activity centers global service band

15m	**21.360 KHz**
17m	**18.160 KHZ**
20m	**14.300 KHZ**

Activity centers band for region service 1

40m	**7.110 KHZ**
80m	**3.760 KHz.**

EXAMPLE OF FORM FOR MESSAGES TRANSCRIPT

NUMBER	PRECEDENCE (tick one) ☐ Routine ☐ Priority ☐ Emergency	STATION OF ORIGIN	WORD COUNT (CHECK)	PLACE OF ORIGIN	FILING TIME	FILING DATE

To: (BLOCK LETTERS):

From: (BLOCK LETTERS):

For radio operator use only:

RECEIVED FROM	DATE	TIME

SENT TO	DATE	TIME

INDICATION OF CENTER-TRAFFIC ON THE FREQUENCIES

CW QRS

3.555 – 14.055 – 21.055 – 28.055

QRP o QRPP (QRPP until 1W, QRP until 5W)

CW

1.836 - 3.560 – 7.030 –10116- 14.060 – 18.086 -21060-24906-28060

SSB

3690-7090-14285-18130-21285- 24.950-28360

EMERGENCY

Global activity

21.360 – 18.160 – 14.300

Activity Region 1

7.110 – 3.760

DIGITAL VOICE ACTIVITY

3.630 - 7.070 - 14.130 - 18.150 - 21.180 - 24.960- 28330

IMAGE

3735 – 7165 – 14230 – 21340 - 28680

DX SPEDITIONS

14195 + - 5 KHz

INTERNATIONAL PREFIXES

AAA ÷ ALZ	USA
AMA ÷ AOZ	SPAIN
APA ASZ	PAKISTAN
ATA AWZ	INDIA
AXA AXZ	AUSTRALIA
AYA AZZ	ARGENTINA
A2A A2Z	BOTSWANA
A3A A3Z	TONGA
A4A A4Z	OMAN
A5A A5Z	BHUTAN
A6A A6Z	UNITED ARAB EMIRATES
A7A A7Z	QATAR
A8A A8Z	LIBERIA
A9A A9Z	BAHARAIN
BAA BZZ	CHINA
CAA CEZ	CHILE
CFA CKZ	CANADA
CLA CMZ	CUBA
CNA CNZ	MOROCCO
COA COZ	CUBA
CPA CPZ	BOLIVIA
COA CUZ	PORTUGAL
CVA CXZ	URUGUAI
CYA CZZ	CANADA
C2A C2Z	NAURU
C3A C3Z	ANDORRA
C4A C4Z	CYPRUS
C5A C5Z	THE GAMBIA
C6A C6Z	BAHAMAS
C7A C7Z	W.M.O.
C8A C9Z	MONZAMBIQUE
DAA DRZ	GERMANY
DSA DTZ	REP.OF KOREA
DUA DZZ	PHILIPPINES
D2A D3Z	ANGOLA
D4A D4Z	CAPE VERDE
D5A D5Z	COMOROS
D7A D9Z	REP OF KOREA
EAA EHZ	SPAIN
EIA EJZ	IRELAND
EKA EKZ	ARMENIA
ELA ELZ	LIBERIA
EMA EOZ	UKRAINE
EPA EQZ	IRAN
ERA ERZ	MOLDOVA
ESA ESZ	ETHIOPIA
EUA EWZ	BELARUS
EXA EXZ	KIRGHIZ
EYA EYZ	TAJIKISTAN
EZA EZZ	TURKMENISTAN
E2A E2Z	THAILAND
E3A E3Z	ERITREA
E4A E4Z	PALESTINE
E5A E5Z	NEW ZELAND-COOK ISLADS
E7A E7Z	BOSNIA HERZEGOVINA
FAA FZZ	FRANCE
GAA GZZ	UNITED KINGDOM
HAA HAZ	HUNGARY
HBA HBZ	SWITZERLAND
HCA HDZ	ECUADOR
HEA HEZ	SWITZERLAND
HFA HFZ	POLAND
HGA HGZ	HUNGARY
HHA HHZ	HAITI
HIA HIZ	DOMENICAM REP.
HJA HKZ	COLUMBIA
HLA HLZ	REP. OF KOREA
HMA HMZ	REP. DEM. OF KOREA
HNA HNZ	IRAQ
HOA HPZ	PANAMA
HQA HRZ	HONDURAS
HAS HSZ	THAILAND
HTA HTZ	NICARAGUA
HUA HUZ	EL SALVADOR
HVA NVZ	VATICAN CITY
HWA HYZ	FRANCE
HZA HZZ	SAUDI ARABIA
H2A H2Z	CYPRUS
H3A H3Z	PANAMA
H4A H4Z	SOLOMON ISLANDS
H6A H7Z	NICARAGUA
H8A H9Z	PANAMA
IAA IZZ	ITALY
JAA JSZ	JAPAN
JTA JVZ	MONGOLIA
JWA JXZ	NORWAY
JYA JYZ	JORDAN
JZA JZZ	INDONESIA
J2A J2Z	DJIBOUTI

J3A J3Z	GRENADA
J4A J4Z	GREECE
J6A J6Z	SAINT LUCIA
J7A J7Z	DOMINICA
J8A J8Z	ST. VINCENT
KAA KZZ	USA
LAA LNZ	NORWAY
LOA LWZ	ARGENTINA
LXA LXZ	LUXEMBOURG
LYA LYZ	LITHUANIA
LZA LZZ	BULGARIA
L2A L9Z	ARGENTINA
MAA MZZ	UNITED KINGDOM
NAA NZZ	USA
OAA OCZ	PERU
ODA ODZ	LEBANON
OEA OEZ	AUSTRIA
OFA OJZ	FINLAND
OKA OLZ	CZECH REP.
OMA OMZ	SLOVAK REP.
ONA OTZ	BELGIUM
OUA OZZ	DENMARK
PAA PIZ	NETHERLANDS
PJA PJZ	NETHERLANDS ANTILLES
PKA POZ	INDONESIA
PPA PYZ	BRAZIL
PZA PZZ	SURINAME
P2A P2Z	PAPUA NEW GUINEA
P3A PRZ	CYPRUS
P4A P4Z	ARUBA
P5A P9Z	DEM. REP. OF KOREA
QAA QZZ	SERVICE ABBR.
RAA RZZ	RUSSIA
SAA SMZ	SWEDEN
SNA SRZ	POLAND
SSA SSM	EGYPT
SSN SSZ	SUDAN
STA STZ	SUDAN
SUA SUZ	EGYPT
SVA SZZ	GREECE
S2A S3Z	BANGLADESH
S5A S5Z	SLOVENIA
S6A S6Z	SINGAPORE
J5A J5Z	GUINEA-BISSAU
S7A S7Z	SEYCHELLES
S8A S8Z	SOUTH AFRICA
S9A S9Z	SAO THOME PRINCIPE
TAA TCZ	TURKEY
TDA TDZ	GUATEMALA
TEA TEZ	COSTA RICA
TFA TFZ	ICELAND
TGA TGZ	GUATEMALA
THA THZ	FRANCE
TIA TIZ	COSTA RICA
TJA TJZ	CAMEROON
TKA TKZ	FRANCE
TLA TLZ	CENTR. AFRICAN REP.
TMA TMZ	FRANCE
TNA TNZ	CONGO
TOA TQZ	FRANCE
TRA TRZ	GABON
TSA TSZ	TUNISIA
TTA TTZ	CHAD
TUA TUZ	IVORY COAST
TVA TXZ	FRANCE
TYA TYZ	BENIN
TZA TZZ	MALI
T2A T2Z	TUVALU
T3A T3Z	KIRIBATI
T4A T4Z	CUBA
T5A T5Z	SOMALIA
T6A T6Z	AFGANISTAN
T7A T7Z	SAN MARINO
T8A T8Z	PALAU
UAA UIZ	RUSSIA
UJA UMZ	UZBEKISTAN
UNA UQZ	KAZAKHSTAN
URA UZZ	UKRAINE
VAA VGZ	CANADA
VHA VNZ	AUSTRALIA
VOA VOZ	CANADA
VPA VQZ	UNITED KINGDOM
VRA VRZ	CHINA
VSA VSZ	UNITED KINGDOM
VTA VWZ	INDIA
VXA VYZ	CANADA
VZA VZZ	AUSTRALIA
V2A V2Z	ANTIGUA AND BARBUDA
V3A V3Z	BELIZE

V4A V4Z	SAINT KITTS AND NEVIS
V5A V5Z	NAMIBIA
V6A V6Z	MICRONESIA
V7A V7Z	MARSHALL ISL.
V8A V8Z	BRUNEL
WAA WZZ	USA
XAA XIZ	MEXICO
XJA XQZ	CANADA
XPA XPZ	DENMARK
XQA XRZ	CHILE
XSA XSZ	CHINA
XTA XTZ	BURKINA FASO
XUA XUZ	CAMBODIA
XVA XVZ	VET NAM
XWA XWZ	LAOS
XXA XXZ	CHINA-MACAU
XYA XZZ	MYANMAR
YAA YAZ	AFGHANISTAN
YBA YHZ	INDONESIA
YIA YIZ	IRAQ
YJA YJZ	VANUATU
YKA YKZ	SYRIA
YLA YLZ	LATVIA
YMA YMZ	TURKEY
YNA YNZ	NICARAGUA
YOA YRZ	ROMANIA
YSA YSZ	LATVIA
YTA YUZ	SERBIA
YVA YYZ	VENEZUELA
YZA YZZ	SERBIA
Y2A Y9Z	GERMANY
ZAA ZAZ	ALBANIA
ZBA ZJZ	UNITED KINGDOM
ZKA ZMZ	NEW ZEALAND
ZNA ZOZ	UNITED KINGDOM
ZPA ZPZ	PARAGUAY
ZQA ZQZ	UNITED KINGDOM
ZRA ZUZ	SOUTH AFRICA
ZVA ZZZ	BRAZIL
2AA 2ZZ	UNITED KINGDOM
3AA 3AZ	MONACO
3BA 3BZ	MAURITIUS
3CA 3CZ	Equadorial guinea
3DA 3DM	SWAZILAND
3DN 3DZ	FIJI
3EA 3FZ	PANAMA
3GA 3GZ	CHILE
3HA 3UZ	CHINA
3VA 3VZ	TUNUSIA
3WA 3WZ	VIET NAM
3XA 3XZ	GUINEA
3YA 3YZ	NARWAY
3ZA 3ZZ	POLAND
4AA 4CZ	MEXICO
4DA 4IZ	PHILIPPINES
4JA 4KZ	AZERBAIJGIAN
4LA 4LZ	GEORGIA
4MA 4MZ	VENEZUELA
4NA 4NZ	YUGOSLAVIA
4OA 4OZ	MONTENEGRO
4PA 4SZ	SRI LANKA
4TA 4TZ	PERU
4UA 4UZ	UNITED NATIONS
4VA 4VZ	HAITI
4XA 4XZ	ISRAEL
4WA 4WZ	TIMOR LESTE
4YA 4YZ	ICAO
4ZA 4ZZ	ISRAEL
5AA 5AZ	LIBYA
5BA 5BZ	CYPRUS
5CA 5GZ	MOROCCO
5HA 5IZ	TANZANIA
5JA 5KZ	COLOMBIA
5LA 5MZ	LIBERIA
5NA 5OZ	NIGERIA
5PA 5QZ	DENMARK
5RA 5SZ	MADACASCAR
5TA 5TZ	MAURITANIA

5UA 5UZ	NIGER
5VA 5VZ	TOGO
5WA 5WZ	WESTERN SAMOA
5XA 5XZ	UGANDA
5YA 5ZZ	KENYA
6AA 6BZ	EGYPT
6CA 6CZ	SYRIA
6DA 6JZ	MEXICO
6KA 6NZ	KOREA
6OA 6OZ	SOMALIA
6PA 6SZ	PAKISTAN
6TA 6UZ	SUDAN
6VA 6WZ	SENEGAL
6XA 6XZ	MADAGASCAR
6YA 6YZ	JAMAICA
8ZA 6ZZ	LIBERIA
7AA 7IZ	INDONESIA
7JA 7NZ	JAPAN
7OA 7OZ	YEMEN
7PA 7PZ	LESOTHO
7QA 7QZ	MALAWI
TRA 7RZ	ALGERIA
7SA 7SZ	SWEDEN
7TA 7YZ	ALGERIA
TZA TZZ	SAUDI ARABIA
8AA 8IZ	INDONESIA
8JA 8NZ	JAPAN
8OA 8OZ	BOTSWANA
8PA 8PZ	BARBADOS
8QA 8QZ	MALDIVES
8RA 8RZ	GUAYANA
8SA 8SZ	SWEDEN
8TA 8YZ	INDIA
8ZA 8ZZ	SAUDI ARABIA
9AA 9AZ	CROATIA
9BA 9DZ	IRAN
9EA 9FZ	ETHIOPIA
9GA 9GZ	GHANA
9HA 9HZ	MALTA
9IA 9JZ	ZAMBIA
9KA 9KZ	KUWAIT
9LA 9LZ	SIERRA LEONE
9MA 9MZ	MALAYSIA
9NA 9NZ	NEPAL
9OA 97Z	CONGO
9UA 9UZ	BURUNDI
9VA 9VZ	SINGAPORE
9WA 9WZ	MALAYSIA
9XA 9XZ	RWANDA
9YA 9ZZ	TRINITAD AND TOBAGO

INTERNATIONAL PREFIXES FOR RADIOAMATEURS

3A .....Monaco
3B6-7 ……Agalega
3B8 ……Mauritius
3B9 ……Is. Rodiguez
3C ……Guinea Equatoriale
3C0 …… Annobon
3D6-3DA0 ……..Swaziland
3D2 ……Fiji
3E-3F ……...Panama
3G ……Chile
3H ÷ 3U ……China
3V ……Tunisia
3W ……Vietnam
3X ……..Guinea
3Y0-3Y1-3Y2……Norvegia Antartico
3Z ……Polonia
4A/B/C ……Messico
4D ÷ 4I ……Filippine
4J/K ……Azerbaijan
4L ……Georgia
4M ……..Venezuela
4O ……...Montenegro
4P/Q/R/S ……Siri Lanka
4T ……Perù
4V ……Haiti
4W ……East Timor
4X/Z ……Israele
5A …… Libia
5B …….. Cipro
5C ÷ 5G ……..Marocco
5H/I …… Tanzania
5J/K …… Columbia
5L/M ……Liberia
5N/O …… Nigeria
5P/Q ……Danimarca
5R/S ……Malagasy
5T ……..Mauritania
5U ……Niger
5V ……Togo
5W ……..Western Samoa
5X …… Uganda
5Y/Z ……Kenya
6A/B ……Egitto
6C ……Syria
6D ÷ 6J …… Mexico
6K ÷ 6N …… Sud Korea
6O …….. ..Somalia
6P ÷ 6S ……Pakistan
6T/U ……...Sudan
6V/W ……..Senag
6X ……..Malagasy
6Y ……..Jamaica
6Z ……Liberia
7A ÷ 7I ……Indonesia
7J ÷ 7N …… Japan
7O ……Yemen
7P ……..Lesotho
7Q ……..Malawi
7R, 7T ÷ 7Y ……..Algeria
7S ……..Svezia
7Z ……Arabia Saudita
8A ÷ 8I……Indonesia
8J ÷ 8N ……Japan
8O ……..Botswan
8P ……Barbados
8Q ……Maldive
8S ……..Svezia
8T ÷ 8Y ……..India
8Z ……Arabia Saudita
9A ……..Croazia
9B/C/D ……Iran
9E/F ……Etiopia
9G ……Ghana
9H……...Malta
9i/j ……..Zambia
9K ……..Kuwait
9L ……Sierra Leone
9M0 …… …Spratly
9M2/4 ……West Malaysia
9M6/8 ……Est Malaysia
9N ……..Nepal
9OA –9TZ.……Congo
9O ÷ 9T ……Zaire
9Q1 ……Kinshasa
9Q2 ……Bas Congo
9Q3 ……..Bandundu
9Q4 ……Equador
9Q5 ……..Province Orientali
9Q6 ……..North e South Kivu-Maniema
9Q7 ……..,,……Katanga
9Q8 ……..Oriental Kasai
9Q9 ……..Occidental Kasai
9Q0 ---……..--Riserva
9U ……Burundi
9V ……Singapore
9W ……West/Est Malaysia
9X ……..Ruanda
9Y/9Z ……Trinidad
A2 ……Bedoswana
A3 ……Tonga
A4 ……Oman
A5 ……Bhutan
A6 ……..United Arab Emirates
A7 ……..Qatar
A8 ……Liberia
A9 ……Bahrain
AC6 ……..West Carolines
AH0 ……Is. Maria
AH1 ……..Baker Howland
AH2 ……..Guam
AH3 ……Is. Johnston
AH4 ……Is. Midway
AH5 …… Is. Palmyra
AH5K ……Kingman Reef
AH6/7 ……Hawaii
AH7K ……Is. Kure
AH8 ……..American Samoa
AH9 ……Is. Wake
AL ……Alaska
AM/N/O ……Spagna
AM6 ……Is. Baleari
AM8 ……..Is. Canarie
AM9 ……Ceuta-Melilla
AN ……..Spagna
AN6 ……..Is. Baleari
AN8 ……Is. Canari
AN9 ……Ceuta Melill
AO ……Spagna
AO6 ……Is. Baleari
AO8 ……Is. Canarie
AO9 ……Ceuta-Melilla
AP/Q/R/S ……Pakistan

8R …….Guayana
AT4 ……Is. Andaman
AT7 ……Is. Laccadive
AU ……..India
AU4 ……Is. Andaman
AU7 ……Is. Laccadive
AV ……India
AV4 ……Is. Andaman
AV7 ……Is. Laccadive
AW ……India
AW4 ……Is Andaman
AV7 ……..Is Laccadive
AX ……Australia
AY/Z ……..Argentina
BA ÷ BL, BP, BR ÷ BU, BW/Y/Z ……Cina
BV ……Taiwan
C2 ……Nauru
C3 ……..Andorra
C4 ……Cipro
C5 ……Gambia
C6 ……..Bahamas
C8/9 ……..Mozambique
CA ÷ CE ……Cile
CF ÷ CK ……Canada
CL/M ……..Cuba
CN ……Marocco
CO ……..Cuba
CP ……Bolivia
CQ/R/S/T ……..Portugal
CV/W/X ……Uruguai
CY/Z ……Canada
D2/3 ……Angola
D4 ……Capo Verde
D5 ……..Liberia
D6 ……Comoros
D7/8/9 ……Sud Corea
DA ÷ DP ……Germania
DU ÷ DZ ……Philippines
E2 ……..Tailandia
E3 ……..Eritrea
E4 ……..Palestina
E7 ……Bosnia Herzegovina
EA ÷ EH ……Spagna
EL/J ……Ireland
EK ……Armenia
EL ……Liberia
EM/N/O ----------Ukraine
EP/Q ……..Iran
ER ……..Moldova
ES ……Estonia
ET ……Ethiopia
EU/V/W ……Belarus
EX ……..Kyrgyzstan
EY ……Tadijkistan
EZ ……Turkmenistan
F ÷ FZ ……Francia
G ÷ GZ ……..Gran Bretagna
H2 ……..Cipro
H3 ……Panama
H4 ……Is. Solomon
H6/7 ……Nicaragua
H8/9 ……Panama
HA …HG……..Ungheria
HB …HE……Svizzera
HC/D ……Ecuador
HF ……Polonia
HH ……Haiti
HI ……-Rep. Dominicana
HJ/K ……Columbia
AT/U/V/W……..India
HM ……..Nord Kore
HN ……Iraq
HO/P ……Panama
HQ/R……Honduras
HS ……..Thailandia
HT ……Nicaragua
HU ……El Salvador
HV ……..Vaticano
HW/X/Y ……..Francia
HZ ……....Arabia Saudita
I0 ÷ I8, IA ÷ IZ ……Italia
J2 ……..Djibout
J3 ……Grenada
J4 ……Grecia
J5 ……Guinea Bissa
J6 ……..Santa Luci
J7 ……Dominica
J8 ……St. Vincent
JA ÷ JS ……Giappone
JT/U/V ……Mongolia
JW/X ……Norvegia
JY ……Giordania
JZ ……Indonesia
KA ÷ KZ ……..USA
LA ÷ LN ……..Norvegia
L2A ÷L9Z ……..Argentin
LO ÷ LW ……Argentina
LX ……Lussemburgo
LY ……Lituania
LZ ……..Bulgaria
MA ÷ MZ ……Gran Bretagna
N1 ÷N0, NA ÷ NZ ……..USA
OA/B/C ……Perù
OD ……..Lebanon
OE ……Austria
OF ÷ OJ ……..Finlandia
OK/L ……Rep. Ceca
OM ……Rep. Slovacchi
ON ÷ OT ……Belgio
OU ÷ OZ ……Danimarca
P2 ……..Nuova Guinea
P3A ÷ P3Z ……Cipro
P4 ……Aruba
P5 ÷ P9 ……..Nord Korea
PA ÷ PI ……Olanda
PJ ……..Antille Olandesi
PK ÷ PO ……Indonesia
PP ÷ PY …….. Brasile
PZ ……..Surinam
R0 ÷ R9, RA ÷ RZ ……..Russia
SO ……..Western Sahara
S1A ……principality of Sealan
S2/3 ……Bangladesh
S5 ……Slovenia
S6 ……Singapor
S7 ……Seychelles
S8 ……Sud Africa
S9 ……..Sao Tome
SA ÷ SM ……..Svezia
SN ÷ SR ……Polonia
SS ……..Egitto
ST ……..Sudan
SU ……Egitto
SV ÷ SZ ……Grecia
T2 ……Tuvalu
T3A ÷ T3Z ……Kiribati
T4 ……..Cuba
T5 ……Somali

HL ……..Sud Korea
T7 ……..San Marino
T88 ……Belau
T9 ……..…Bosnia
TA ……Turchia
TD ……Guatemala
TE ……Costa Rica
TF ……Islanda
TG ……..Guatemala
TH ……Francia
TI ……Costa Rica
TJ ……Cameroon
TK ……..Corsica
TL ……Rep. Africa Centrale
TM ……Francia
TN ……..Congo
TO/P/Q ……Francia
TR ……..Gabon
TS ……Tunisia
TT ……..Chad
TU ……Ivory Coast
TV/W/X ……Francia
TY ……..Benin
TZ ……Mali
U0 ÷ U9, UA ÷UI ……Russia
UJ ÷ UM ……Uzbekistan
UN ÷ UQ ……Kazakistan
UR ÷ UZ ……Ukraina
V2 ……Antigua
V3 ……Belize
V4 ……St. Kitts
V5 ……Namidia
V6 ……Fed Micronesia
V7 ……..Is, Marshall
V85 ……Brunei
VA ÷ VG ……Canada
VH ÷ VN ……..Australia
VP/Q ……Gran Bretagna
VR ……Cina
VS ……..Gran Bretagna
VT ÷ VW ……India
VX/Y ……Canada
VZ ……Australia
W1 ÷ W0, WA ÷ WZ ……USA
XA ÷ XI ……Messico
XJ ÷ XO ……Canada
XP ……Danimarca
XQ/R ……Cile
XS ……Cina
XT ……Burkina Faso
XU ……Kampuchea
XV ……..Vietnam
XW ……..Laos
XX ……..Macao
XY/Z ……Burma
YA ……Afganistan
YB ÷ YH ……Indonesia
YI ……Iraq
YJ ……..Vanuatu
YK ……..Siria
YL ……Latvia
YM ……..Turchia
YN ……Nicaragua
YO ÷ YR …….. Romania
YS ……..El Salvador
YT/U ……Serbia
YV ÷ YY ……Venezuela
Z2 ……Zimbawe
T6 ……Afganistan
ZA ……..Albania
ZB ÷ Zj ……Gran Bretagna
ZK/L/M ……..Nuova Zelanda
ZP ……Paraguay
ZR/S/T/U ……So Africa
ZV ÷ ZZ ……Brasile
Z3……Macedonia

For updates: www.ac6v.com/prefixes.htm

From HF Manager Handbook IARU REG.1 EDZ. V8.1
Cap. 9.2
CLASSIFICATIONS

SYMBOLS OF EMISSIONS FOR CHARACTERISTICS OF BASE

Symbols of characteristics of base am:

(1) – First symbol – type of modulation of the main carrier.
(2) – Second symbol – nature of signal(s) modulating the main carrier.
(3) – Third symbol – type of information to be transmitted.

Modulation used for short periods and for incidental purposes (such as, in many cases, for identification or calling) may be ignored provided that the necessary bandwidth is not thereby increased.

FIRST SYMBOL:
1. – first symbol – type of modulation of the main carrier.

1.1 N Emission of unmodulated carrier.
1.2 Emission in which the main carrier is amplitude-modulated (including cases where sub-carrieres are angle-modulated):
1.2.1 A Double sideband
1.2.2 H Single sideband. full carrier.
1.2.3 R Single sideband, reduced or variable level carrier.
1.2.4. J Single sideband, suppressed carrier.
1.2.5 B Independent sidebands.
1.2.6 C Vestigial sideband
1.3 Emission in which the main carrier is angle modulated.
1.3.1 F Frequency modulation .
1.3.2 G Phase modulation.
1.4 D Emission in which the main carrier is amplitude and angle modulated either simultaneously or in a pre estabilished sequence.
1.5 Emission of pulses [emissions where the main carrier is directly modulated by a signal which has been coded into quantized form (e.g. pulse code modulation) should be besignated under 1.2 o 1.3].
1.5.1 P Sequence of unmodulated pulses.
1.5.2 A sequence of pulses
1.5.2.1 K Modulated in amplitude
1.5.2.2 L Modulated in width/duration
1.5.2.3 M Modulated in position/phase
1.5.2.4 Q In which the carrier is angle-modulated during the angle-period of the pulse.
1.5.2.5 V Which is a combination of the foregoing or is provided by other means.
1.6 W Cases non covered above, in which an emission consists of the main carrier modulated, either simultaneously or in a pre-estabilished sequence, in a combination of two or more of the following modes: amplitude, angle, pulse.
1.7 X Cases not otherwise covered.

2. - Second symbol – nature of signal modulating the main carrier..

2.1 0 No modulating signal.
2.2 1 A sigle channel containing quantized or digital information without the use of modulating sub-carrier (this excludes time-division multiplex).
2.3 2 A single channel conaining quantized or digital information whit the use of a modulating sub-carrier (this excludes time-division multiplex).
2.4 3 A single channel containing analogue information .
2.5 7 Two or more channels containing quantized or digital information.
2.6 8 Two or more channels containing analogue information.
2.7 9 Composite system with one or more channel containing quantized or digital information, together with one or more channels containing analogue information.
2.8 X Cases not otherwise covered..

3. - Third symbol – type of information to be transmitted.

(In this context the word "information" does not include information of a constant, unvarying nature such as is provided by standard frequency emissions, continuous wave and pulse radars, ecc.)

3.1 N No information transmitted.
3.2 A Telegraphy for aural reception.
3.3 B Telegraphy for automatic reception.
3.4 C Facsimile.
3.5 D Data transmission, telemetry, telecommand.
3.6 E Telephony (including sound broadcasting)
3.7 F Television (video)..
3.8 W Combination of the above..
3.9 X Cases not otherwise covered.

EXAMPLES OF OPPLICATIONS

Modes to receipt of the RX AEG Tlelefunken E1800

A1A – telegraphy with full main carrier (CW)
AIB – automatic telegraphy with full main carrier (RTTY or similar)
A2A – modulated telefraphy (MCW)
A2B – modulated automatic telegraphy
A3E – full main carrier, sigle telephon channel (amplitude modulation)
R3E – telephony with sigle side band with reduced main carrier
H3E – telephony with singleside band with full main carrier
J3E – telephony wlth sigle side band and suppressed main carrier
J7B – automatic telegraphy with single side band and suppressed main carrier (RTTY or similar)

Modes to receipt of the RX Teletron TE704C-F/FS

A1A – Telegraphy with full main carrier
A2A – Modulated telegraphy (MCW)
A3E – Full main carrier, single telephon channel (AM o DSB)
F1C – Facsimile in frequency modulation with digital signal (weater report papers)
F3C – Facsimile in frequency modulation (RX. Imagines)
F1B – Automatic telegraphy in frequency modulation (RTTY or similar)

RECOMMENDATION ITU-R M.1041-2*
Future amateur radio systems

Scope

This Recommendation provides the design objectives and characteristics that should be taken into account when developing future systems in the amateur and amateur-satellite services. It includes general, technical and operational considerations.

Considering

a) Question ITU-R 48/8;

b) that different future systems are under study;

c) that system compatibility is necessary for international operation;

d) the need for flexible systems capable of adapting to new developments and natural disasters;

e) that the amateur and amateur-satellite bands below 5 GHz are heavily used, and there is a need to reduce interference within these services;

f) that the bands above 5 GHz will be subject to increasing use;

g) that to communicate at distances beyond line of sight, propagation characteristics of the bands above 144 MHz usually require use of terrestrial or satellite radio-relays;

h) that there is increasing need for high-speed digital communications;

j) that commonality of hardware, software and protocols is desirable in order to achieve economies of scale and reduce the cost of systems,

Recommends

that future systems in the amateur and amateur-satellite services should incorporate the following objectives and characteristics, and take into account the following frequency band considerations:

Objectives

General objectives for future systems in the amateur and amateur-satellite services should:

General

Promote design of robust systems capable of providing communication during natural disasters.

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* Radiocommunication Study Group 5 made editorial amendments to this Recommendation in 2008 in accordance with Resolution ITU-R 44.

Accommodate the needs of amateur operators in urban, rural and remote areas, including those in developing countries.

- Make systems widely available to amateur operators at an acceptable cost, recognizing that amateur operators fund their own stations.

- Develop compatible and interoperable terrestrial and satellite systems.

- Provide a flexible architecture that will facilitate introduction of technology advancements.

- Minimize radiated power.

Technical

- Promote increased spectrum efficiency, e.g. through use of automatic power control, automatic link establishment, adaptive antennas, diversity reception, digital signal processing, software defined radio and access techniques such as time division multiple access (TDMA) and code division multiple access (CDMA).

- Ensure information integrity through error control techniques.

- Encourage the development of common interfaces for the interconnection of equipment.

Operational

- Provide for operational flexibility and self-organization.

- Support international roaming within the amateur services.

- Permit amateur stations to gain access to particular capabilities made possible by advances in technology, e.g. automatic language translation, databases, etc.

Methods of radiocommunication

Support, among others, the following:

- Morse code

In accordance with ITU-T Recommendation F.1, Division B.

- Narrow-band direct-printing

International Telegraph Alphabet No. 2, as defined in ITU-T Recommendation F.1, Division C, and Recommendation ITU-R M.625 except for modified station identification.

- Telephony

Telephony of commercial quality.

- Facsimile

In accordance with appropriate ITU-T Recommendations, subject to radio environments.

- Data transmission

Synchronous and asynchronous in accordance with appropriate ITU-T Recommendations, consistent with bandwidth limitations and propagation at MF/HF and higher frequencies.

Television

Slow and fast scan television using appropriate regional standards, including digital techniques.

-New transmission modes

Experimentation and development of new modes of transmission in order to advance the state of the art.

Technical characteristics

Amateur and amateur-satellite systems should have technical characteristics that provide worldwide interoperability, and allow origination, relay and termination of communications independent of other radio services. Design emphasis should be placed on reliability, robustness and flexibility of reconfiguration for efficient emergency communications. Multiple access techniques (FDMA, TDMA and CDMA) should be selected for optimum spectrum efficiency and frequency reuse. The selection of modulation techniques should take into account resistance to interference and immunity to adverse propagation conditions

Operational characteristics

Systems should be capable of operation in urban, residential and rural areas, and should be suitable for use in fixed and/or mobile applications. Mobile systems should include personal pocket terminals and systems suitable for operation in vehicles. Small, inexpensive systems capable of being upgraded should be available for new users and those in developing countries. Satellite systems should be designed to serve both industrialized and developing countries. Systems should facilitate education of operators and technicians.

Frequency band considerations

-Spectrum requirements

Worldwide common frequency bands to facilitate international working, international roaming and commonality of equipment.

-Spectrum utilization

Frequency bands as associated with future amateur radio systems should be chosen for operations to carry out the desired communication with minimum power, maximum frequency reuse and sharing, minimum interference to other services, in accordance with the Radio Regulations, and spectrum efficiency. More consideration should be given to using bands above 5 GHz.

COMMENTS ON THE MANIPULATION WITH THE STRIGHT KEY

Remember that the telegraphy is native before the radiotelegraphy (patent bit 1840) then the communications in Morse code, before the advent of you mustn't leave the radio, happened without emanation of any sound. A machine did appear on a little strip of paper the characters in dits and dashes transmitted by a remote operator. The only thing that were feel were the noise of the lever, operated by a relay (answerable to the noise of the key), that beat on the organs of movement the like operated the device of writing of dots and dashes on the strip of paper. So received characters were translated and then writings manually completing the message.

Subsequently, the operators had learned to translate directly the Morse signals from the noise of the relay, without need to look the incised characters on the ribbon. It were born so a new mode of receipt of the Morse signals, doing saves one's time. The new method of receipt calls " Sounder receipt. Be built devices (SOUNDER RELAYING) that amplified the noise of the manipulation to allow to the operators a better receipt. **See Fig. 1**

Fig 1

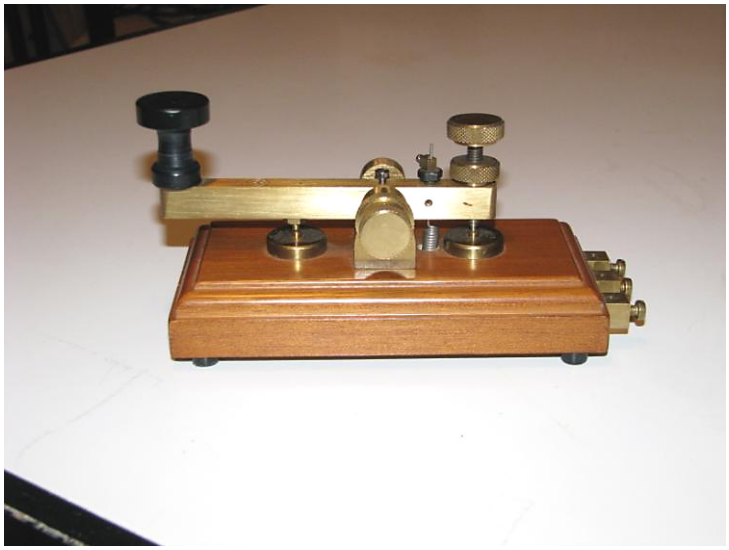
I have already prepared a DVD that shows everything that am going describe. It can see overleaf the site **morsegroup.eu** on the *filmed video* au gratin title *use of the straight key.* The spur that me has pushed to do this step have had to it any seen registrations on Internet, where I have ascertained that, also to world - class, not the

correct type is known of manipulation with the straight key. Among all registrations that I have seen (more of 40) and of different nationality, neither a presented the correct manipulation. The motive it is easier said than done: who as radio amateurs prepared or it prepares to operate in CW, participated or participates to a course of learning which, first served to pass the examination of CW, while now they serve to satisfy the pleasure to learn to operate with the old Morse code. Instructors have always interested mostly to the receipt, giving a marginal importance to the transmission. In fact, is enough get a electronic key to facilitate the transmission.

Some object that the manipulation with the straight key tires notably. In accordance with what have been able to ascertain must side with this affirmation because I interpret their thought that it refers to the sort of incorrect manipulation to which did first reference. I don't know what to do about it then the old telegraphists to transmit for the whole period of the really turn of work?

With this writing I do not intend to give a lesson to any, especially to Naval members that are the best part of experienced operators. I hope instead, of behaviour does appreciated to when are, as me, lover of the stright key and that then are able verify the correctness of the my observations.

We begin with the characteristic of the key: the ideal key for conformation and sizing is the old man feel telegraphic. **See Fig. 2.**



Fig, 2

The distance from the summit of the hilt and the plan of the table is of about eight centimetres. The peg is grasped in accordance with personal preference (I prefer grasp using four fingers, excluding only the little finger, holding the thumb and the ring

finger on the underlying diskette). The opportunity to grasp has not many importance. What it has instead many importance is the movement of the wrist. The wrist moves with an impulse that pushes the fingers in down effecting so the pressure toward the lower part on the key. The movement of fingers must not never be carried out by the tall thing. It is this, in fact, that provokes an excessive weariness of the articulation of the wrist. The correct position of the arms is with the extended forearm and supported for all its length until the elbow. The position of the key must be such by allowing the relaxation of the forearm. During the manipulation the forearm will remain always supported doing enliven coming and going only with the wrist. With this position, it is possible to manipulate for the present, without any weariness. Regulating opportunely it run and the tension of the, with good training, it is can well overcome the speed of 120 characters the minute. Obviously, it refers to plants of basic stations. In a basic station it is not possible to find vertical keys with the low peg or with the key set to the limit of the table because this is presupposed of a bad manipulation, in when is can manipulate only with brace free that is without support.

The **Fig 3** shows various vertical keys by basic station.

Fig 3

The manipulation with brace free is admitted only with feel lower keys or in miniature destined for field stations or of emergency. **The Fig 4** presents deriving keys by military surplus

Fig. 4

With the advent of you mustn't leave the radio, the types of manipulators have evolved. From the stroght key has spent to the horizontal semiautomatic key, to the electronic BUG, and even to devices with keyboard that transmit automatically the beaten letters. It are all manipulators applicable to the transmission of messages. These new methods of manipulation are been born to has the possibility of transmit with greater clarity, greater speed and mainly to reduce the weariness of the operator.

The choice on mode of manipulation is done in accordance with the predisposition of the operator and in accordance with the sort of service that it prepares to perform. For instance: an radio amateur that will participate to a contest, given the need to speed up the more possible the communications, it will use the sort of manipulation that will satisfy such necessity.

A consideration however is rightful to do it: aside from the straight key, all the other manipulators, more or less automatic, am impersonal because transmit the signals in automatic way. Is the proportion of the dots and of dashes that the spaces among they, are created in automatic way.

I, in all the cases, I prefer the manipulation with the straight key. With the straight key not it can transmit with a perfect lilt of an automatic device. Also the more good operators have always some imperfection and it is this that characterizes the really personal mode to manipulate. The manipulation with the vertical key can be compared to the handwriting of who writes. All has the really calligraphy as every operator has it really manipulation with the straight key.

I remember me, when I did service from RT in Navy that, from the opportunity to manipulate, I individualized the operator with whom horse in communication.

Also the straight key has had its evolution. Today exist keys that allow a fluid manipulation, the telegraphic key has been modified: it has been eliminated the attrition of the horizontal pivot doing the rotate on ball bearings. Has been invented the vertical key Swedish type where has been eliminated the horizontal pivot (eliminating then its attrition) replacing the with a foil of steel that acts also from. The contact does not happen with enliven from on high it's on the top and next to the peg of the hilt, like in the traditional keys, but from the low in tall and to the extremity antipathetic to the hilt. The Great Britain Navy harbor used this type of key. In commerce find these deriving keys by military surplus. I have acquired a deriving by the England. **See Fig. 5.**

Fig. 5

The more beautifull and the use with pride, has built it the friend and connects INORC I1QOD. **See Fig. 6.**

Fig.6

ADVICES TO IMPROVE IT CAPABILITY OF OPERATOR

Transmission.

To improve the lilt of transmission, be necessary behaviour the following exercise: from a device of automatic transmission (the same that are used to practise in receipt) is done transmit un croups of 3.4 or 5 letters or number. Every group it is done to repeat for ten or fifteen times and, with the key disconnected (does one need to feel only the noise of the key) does one need to manipulate the group that is received doing feint to transmit what are listening, when it is reached it same lilt, himself you change group. Obviously as the exercise it reaches the desired purpose, himself you change speed.

Receipt.

For the exercise of receipt they exist many programs for computer that can allow many types of exercises. I am not to them describe because be like that many that would lose me in the tangle of these programs.

I have always used, especially for teaching, the tools that here at a stretch describe you. The RFT MG80M machine (surplus origin military EX DDR).

See Fig. 7.

Fig. 7

With this item, with possibility to change speed of transmission, they can transmit more of 3000 texts of 50 croups compact of 3.4 or 5 letters, number or mixed.

It has un wide memories that they can be used in the more fanciful conditions and an a multitude of other functions. A microprocessor governs all functions of the machine. The MG80M is commercialized by different German surplus, is sold news with all the accessories to about 80 €. For this machine I have prepared a detailed manual of use.

Another apparatus that can work together with the MG80M is the RFT FP12 PRÄCITRONIC (also this deriving one from the EX DDR). **See Fig.8.**

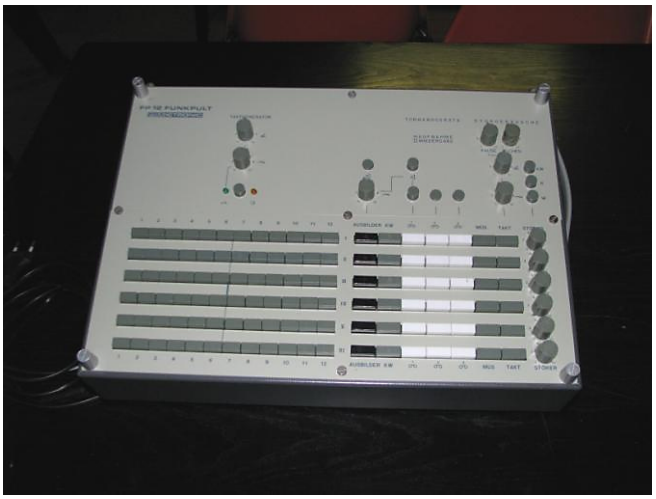


Fig. 8

This item has been conceived with the purpose of exercise behaviour of receipt for an indefinite number of operators, while for the receipt-transmitter, is predisposed for 12 operators. All the complex understands: 13 keys, 13 head-phones, two recorders a speaker and rather a lot of other accessories. With regard to the receipt, besides produce a signal one's own, can elaborate any signal knee-high from the outside (for instance from the MG80M) can mix the signal with of the local troubles, like rustles and revenues of varying strength and can mix the signals in entry with what are feel really in radio. With this type of exercise, it is put the students in the true conditions of the traffic remove. With regard to the receipt-trasmitter, the twelve students can communicate among them, among them and the instructor. Some can be excluded or put in condition of precarious receipt. This apparatus is predisposed to be mounted also in field situation.

Corripondences table amog dbm V W e S-Meter

dbm	V	W
+53	100,0	200
+50	70,7	100
+49	64	80
+48	58	64
+47	50	50
+46	44,5	40
+45	40	32
+44	32,5	25
+43	32	20
+42	28	16
+41	26,2	12,5
+40	22,5	10
+39	20	8
+38	18	6
+37	16	5
+36	14,1	4
+35	12,5	3,2
+34	11,5	2,5
+33	10	2
+32	9	1,6
+31	8	1,25
+30	7,1	1
+29	6,4	800 **mW**
+28	5,8	640
+27	5	500
+26	4,45	400
+25	4	320
+24	3,55	250
+23	3,2	200
+22	2,8	160
+21	2,52	125
+20	2,25	100
+19	2	80
+18	1,8	64
+17	1,6	50
+16	1,41	40
+15	1,25	32
+14	1,15	25
+13	1	20
+12	0,9	16
+11	0,8	12,5
+10	0,71	10
+9	0,64	8
+8	0,56	6,4
+7	0,5	5
+6	0,445	4
+5	0,4	3,2
+4	0,365	2,5
+3	0,32	2
+2	0,28	1,6
+1	0,252	1,25
0	0,225	1

dbm	V	R **S** T
-1	0,200	
-2	0,180	
-3	0,160	
-4	0,141	
-5	0,125	
-6	0,115	
-7	0,100	
-8	0,090	
-9	0,080	
-10	0,071	
-11	0,064	
-12	0,058	
-13	0,050	
-14	0,045	
-15	0,040	
-16	0,0355	
-17	31,5**mV**	
-18	28,5	
-19	25,1	
-20	22,5	
-21	20	
-22	17,9	
-23	15,9	
-24	14,1	
-25	12,8	
-26	11,5	
-27	10	
-28	8,9	
-29	8	
-30	7,1	
-31	6,25	
-32	5,8	
-33	5	9+40
-34	4,5	
-35	4	
-36	3,5	
-37	3,2	
-38	2,85	
-39	2,5	
-40	2,25	
-41	2	
-42	1,8	
-43	1,6	9+30
-44	1,4	
-45	1,25	
-46	1,18	
-47	1	
-48	0,9	
-49	0,8	
-50	0,71	
-51	0,64	
-52	0,57	

dbm	mV	R **S** T
-53	0,50	9+20
-54	0,45	
-55	0,4	
-56	0,35	
-57	0,32	
-58	0,286	
-59	0,251	
-60	0,225	
-61	0,2	
-62	0,18	
-63	0,16	9+10
-64	0,141	
-65	128 µ**V**	
-66	115	
-67	100	
-68	90	
-69	80	
-70	71	
-71	65	
-72	56	
-73	50	9
-74	45	
-75	40	
-76	35	
-77	32	
-78	29	
-79	25	8
-80	22,5	
-81	20	
-82	18	
-83	16	
-84	11,1	
-85	12,9	7
-86	11,5	
-87	10	
-88	9	
-89	8	
-90	7,1	
-91	8,1	6
-92	5,75	
-93	5	
-94	4,5	
-95	4	
-96	3,51	
-97	3,2	5
-98	2,9	
-99	2,51	
-100	2,25	
-101	2	
-102	1,8	
-103	1,6	4
-104	1,41	

dbm	µV	R **S** T
-105	1,27	
-106	1,18	
-107	1000**ηV**	
-108	900	
-109	800	3
-110	710	
-111	640	
-112	580	
-113	500	
-114	450	
-115	400	2
-116	355	
-117	325	
-118	286	
-119	251	
-120	225	
-121	200	1
-122	180	
-123	160	
-124	141	
-125	126	
-126	117	
-127	100	
-128	90	
-129	80	
-130	71	
-131	61	
-132	58	
-133	50	
-134	45	
-135	40	
-136	35	
-137	33	
-138	29	
-139	25	
-140	23	

CHARACTERISTICS OF THE COAXIAL CABLE-- STANDARDS MIL.-C-17-E

1 RG/U	2	3	4	5		6	7	8	9	10	11	12
				2°	1°							
6A	-	8,4	IIa	Cu	CS	4,7PE	0,72CW	66	67,5	75	120	-
11A	-	10.3	IIa	-	Cu	7,25PE	7x0,4CT	66	67,5	75	140	75-7-1
12A	12	10,3	IIa	-	Cu	7,25PE	7X0,4CT	66	67,5	75	253	
34B	-	16	IIa	-	Cu	11,6PE	7XO,63Cu	66	67,5	75	430	75-12-2
35B	24	22,1	IIa	-	Cu	17,3PE	2,65Cu	66	67,5	75	825	
58C	-	4,95	IIa	-	CT	2,95PE	19XO,18CT	66	101	50	40	50-3-1
59B	-	6,15	IIa	-	Cu	3,70PE	0,58CW	66	67,5	78	55	
62A	-	6,15	I	-	Cu	3,7PSA	0,64CW	84	42,5	93	56	
71B	-	6,35	IIIa	CT	CT	3,7PSA	O,64CW	84	42,5	93	84	
122	-	4,05	IIa	-	CT	2,45PE	27XO,13CT	66	101	50	30	
164	-	22,1	IIa	-	Cu	17,3PE	2,65Cu	66	67,5	75	580	75-17-1
212	-	8,4	IIa	CS	CS	4,7PE	1,41CS	66	101	50	125	
213	-	10,3	IIa	-	Cu	7,25PE	7x0,75Cu	66	101	60	160	50-7-1
214	-	10,8	IIa	CS	CS	7,25PE	7X0,75CS	66	101	50	190	50-7-6
215	12	10,3	IIa	-	Cu	7,25PE	7X075Cu	66	101	50	220	
216	-	10,8	IIa	Cu	Cu	7,25PE	7X0,4CT	66	67,5	75	180	75-7-3
217	-	13,8	IIa	Cu	Cu	9,4PE	2,7Cu	66	101	50	300	
218	-	22,1	iiA	-	Cu	17,3PE	4,95Cu	66	101	50	690	50-17-1
219	24	22,1	IIa	-	Cu	17,3PE	4,95Cu	66	101	50	936	
220	-	28,4	IIa	-	Cu	23,1PE	6,60Cu	66	101	50	1100	
221	30,4	28,4	IIa	-	Cu	23,1PE	6,60Cu	66	191	50	1430	
223	.	5,5	IIa	CS	CS	2,95PE	0,89CS	66	101	50	55	50-3-5
224	15,6	13,8	IIa	Cu	Cu	9,4PE	2,7Cu	66	101	50	463	

1 = INITIALS OF THE CABLE

-

2 = EXTERNAL DIAMETER ARMOR

3 = EXTERNAL DIAMETER SCABBARD

4 = TYPE OF SCABBARD

- **I = PVC black (-40° to 80° +)**
- **IIa = PVC black (-40° to 90° +)**
- **IIIa = PE black (-55° to 85° +)**

5 = MATERIAL STOCKINGS

- **Cu = COPPER**
- **CT = STAGNATED COPPER**
- **CS = COPPER SILVERY**

6 = EXTERNAL DIAMETER AND DIELECTRIC TYPE

- **PE = POLYETHYLENE**
- **PSA = POLYETHYLENE AND AIR**

7 = DIAM. AND MATERIAL - CONDUCTOR-- CENTRAL

- **Cu = COPPER**
- **CT = STAGNATED COPPER**
- **CS = SILVERY COPPER**
- **CW = (copper plated steel) COPPERWELD**

8 = PROPAGATION SPEED

9 = CAPACITY IN PF for METER

10 = IMPEDANCE

11 = PESO IN km for kg

12 = TYPE ANSWERABLE TO STANDARDS IEC

IARU REGION 1 HF BAND PLAN

A recommendation for all radio amateurs how to use the bands, as revised at the Interim Meeting Vienna 2016, effective 01 June 2016.

FREQUENCY (kHz)	MAX. BANDWIDTH (Hz)	PREFERRED MODE AND USAGE

2200m Band:

135.7 – 137.8	200	CW, QRSS and narrow band digital modes	

630m Band:

472 – 475 **	200	CW	See NOTES
475 – 479 **	(#)	CW, digimodes	See NOTES

(**) If a frequency is to be selected, particular attention must be paid to still existing Non Directional Beacons (NDB) of the radionavigaton service! (#) max. bandwidth not specified, 500 Hz suggested.

160m Band:

1810 - 1838	200	CW,	1836 kHz – QRP Centre of Activity
1838 - 1840	500	Narrow band modes	
1840 - 1843	2700	All modes – digimodes, (*)	
1843 - 2000	2700	All modes, (*)	

Radio Amateurs in countries that have a **SSB allocation ONLY** below 1840 kHz, may continue to use it, but the National Societies in those countries are requested to take all necessary steps with their licence administrations to adjust the phone allocations in accordance with the Region 1 Bandplan. (Davos 2005)

80m Band:

3500 - 3510	200	CW, priority for intercontinental operation	
3510 - 3560	200	CW, contest preferred,	3555 kHz – QRS Centre of Activity
3560 - 3570	200	CW,	3560 kHz – QRP Centre of Activity
3570 - 3580	200	Narrow band modes – digimodes	
3580 - 3590	500	Narrow band modes – digimodes	
3590 - 3600	500	Narrow band modes – digimodes, automatically controlled data stations (unattended)	
3600 - 3620	2700	All modes - digimodes, automatically controlled data station (unattended), (*)	
3600 - 3650	2700	All modes, SSB contest preferred, 3630 kHz – Digital Voice Centre of Activity, (*)	
3650 - 3700	2700	All modes,	3690 kHz – SSB QRP Centre of Activity
3700 - 3775	2700	All modes, SSB contest preferred	
			3735 kHz – Image Centre of Activity
			3760 kHz – Reg.1 Emergency Centre of Activity
3775 - 3800	2700	All modes, SSB contest preferred, priority for intercontinental operation	

60m Band:

5351.5 – 5354.0	200	CW, Narrow band modes – digimodes	See NOTES
5354.0 – 5366.0	2700	All modes, USB recommended for voice operation (##)	See NOTES
5366.0 – 5366.5	20 (!)	Weak signal narrow band modes	See NOTES

It is strongly recommended that frequencies within the WRC-15 allocation only be used if there are no other frequencies available at 5 MHz under domestic (ITU-R article 4.4) permissions.

Local nets and long rag chew QSOs should not use the WRC-15 allocation at 5 MHz but should instead make use of the 3.5 MHz, 5 MHz domestic, or 7 MHz bands where there is more spectrum available.

40m Band:

7000 - 7040	200	CW,	7030 kHz – QRP Centre of Activity
7040 - 7047	500	Narrow band modes – digimodes	
7047 - 7050	500	Narrow band modes – digimodes, automatically controlled data stations	
7050 - 7053	2700	All modes – digimodes, automatically controlled data stations (unattended) (*)	
7060 - 7100	2700	All modes, SSB contest preferred	
			7070 kHz – Digital Voice Centre of Activity
			7090 kHz – SSB QRP Centre of Activity
7100 - 7130	2700	All modes,	7110 kHz – Reg.1 Emergency Centre of Activity
7130 - 7175	2700	All modes, SSB contest preferred,	7165 kHz – Image Centre of Activity
7175 - 7200	2700	All modes, SSB contest preferred, priority for intercontinental operation	

30m Band:

10100 - 10130	200	CW,	10116 kHz – QRP Centre of Activity
10130 - 10150	500	Narrow band modes – digimodes	

SSB may be used during emergencies involving the immediate safety of life and property and only by stations actually involved in the handling of emergency traffic.

The band segment 10120 kHz to 10140 kHz may be used for SSB transmissions in the area of Africa south of the equator during local daylight hours. News bulletins on any mode should not be transmitted on the 10 MHz band.

20m Band:

14000 - 14060	200	CW, contest preferred,	14055 kHz – QRS Centre of Activity
14060 - 14070	200	CW,	14060 kHz – QRP Centre of Activity
14070 - 14089	500	Narrow band modes – digimodes	
14089 - 14099	500	Narrow band modes - digimodes automatically controlled data stations (unattended)	
14099 - 14101		IBP, exclusively for beacons	
14101 - 14112	2700	All modes – digimodes, automatically controlled data stations (unattended)	
14112 - 14125	2700	All modes	
14125 - 14300	2700	All modes, SSB contest preferred	
			14130 kHz – Digital Voice Centre of Activity
			14195 kHz ± 5 kHz - Priority for Dxpeditions
			14230 kHz – Image Centre of Activity
			14285 kHz – SSB QRP Centre of Activity
14300 - 14350	2700	All modes,	14300 kHz – Global Emergency centre of activity

17m Band:

18068 - 18095	200	CW,	18086 kHz – QRP Centre of Activity
18095 - 18105	500	Narrow band modes – digimodes	
18105 - 18109	500	Narrow band modes – digimodes, automatically controlled data stations	
18109 - 18111		IBP, exclusively for beacons	
18111 - 18120	2700	All modes – digimodes, automatically controlled data stations (unattended)	
18120 - 18168	2700	All modes,	18130 kHz – SSB QRP Centre of Activity
			18150 kHz – Digital Voice Centre of Activity
			18160 kHz – Global Emergency Centre of Activity

15m Band:

21000 - 21070	200	CW,	21055 kHz – QRS Centre of Activity 21060 kHz – QRP Centre of Activity
21070 - 21090	500	Narrow band modes, digimodes	
21090 - 21110	500	Narrow band modes, digimodes, automatically controlled data stations (unattended)	
21110 - 21120	2700	All modes (excluding SSB), digimodes, automatically controlled data stations (unattended)	
21120 - 21149	500	Narrow band modes	
21149 - 21151		IBP, exclusively for beacons	
21151 - 21450	2700	All modes,	21180 kHz – Digital Voice Centre of Activity 21285 kHz – SSB QRP Centre of Activity 21340 kHz – Image Centre of Activity 21360 kHz – Global Emergency Centre of Activity

12m Band:

24890 - 24915	200	CW,	24906 kHz – QRP centre of activity
24915 - 24925	500	Narrow band modes – digimodes	
24925 - 24929	500	Narrow band modes – digimodes, automatically controlled data stations (unattended)	
24929 - 24931		IBP, exclusively for beacons	
24391 - 24940	2700	All modes – digimodes, automatically controlled data stations (unattended)	
24940 - 24990	2700	All modes,	24950 kHz – SSB QRP Centre of Activity 24960 kHz – Digital Voice Centre of Activity

10m Band:

28000 - 28070	200	CW,	28055 kHz – QRS Centre of Activity 28060 kHz – QRP Centre of Activity
28070 - 28120	500	Narrow band modes – digimodes	
28120 - 28150	500	Narrow band modes – digimodes, automatically controlled data stations (unattended)	
28150 - 28190	500	Narrow band modes	
28190 - 28199		IBP, regional time shared beacons	
28199 - 28201		IBP, worldwide time shared beacons	
28201 - 28225		IBP, continuous duty beacons	
28225 - 28300	2700	All modes – beacons	
28300 - 28320	2700	All modes – digimodes, automatically controlled data stations (unattended)	
28320 - 29000	2700	All modes,	28330 kHz – Digital Voice Centre of Activity 28360 kHz – SSB QRP Centre of Activity 28680 kHz – Image Centre of Activity
29000 - 29100	6000	All modes	
29100 - 29200	6000	All modes – FM simplex – 10 kHz channels	
29200 - 29300	6000	All modes – digimodes, automatically controlled data stations (unattended)	
29300 - 29510	6000	Satellite Links	
29510 - 29520		Guard channel	
29520 - 29590	6000	All modes – FM repeater input (RH1 – RH8)	
29600	6000	All modes – FM calling channel	
29610	6000	All modes – FM simplex repeater (parrot - input and output)	
29620 - 29700	6000	All modes – FM repeater outputs (RH1 – RH8)	

DEFINITIONS

All modes CW, SSB and those modes listed as Centres of Activity, plus AM (Consideration should be given to adjacent channel users).

Image modes Any analogue or digital image modes within the appropriate bandwidth, for example SSTV and FAX.

Narrow band modes All modes using up to 500 Hz bandwidth, including CW, RTTY, PSK etc.

Digimodes Any digital mode used within the appropriate bandwidth, for example RTTY, PSK, MT63 etc.

NOTES

The frequencies in the band plan are understood as "transmitted frequencies"
(not those of the suppressed carrier!)

To prevent any out of band transmission the maximum dial setting for USB Voice mode should be 3 kHz below upper band edge on bands 20m to 10m.

(*) Lowest dial setting for LSB Voice mode: 1843, 3603 and 7053 kHz

(##) Highest dial setting for USB Voice mode on the 60m band: 5363 kHz

CW QSOs are accepted across all bands, except within beacon segments. (Recommendation DV05_C4_Rec_13)

Amplitude modulation (AM) may be used in the telephony sub-bands providing consideration is given to adjacent channel users. (NRRL Davos 05).

Sideband Usage

Below 10MHz lower sideband (LSB) is recommended, and above 10 MHz use upper sideband (USB). The exception to this is on the 5 MHz band where USB is recommended.

630m band:
Details shown in the band plan above should be understood as "proposed usage". (VA14_C4_Rec_02)

60m band:
Details shown in the band plan above should be understood as "proposed usage". (VIE14_C4_Rec_02)

Contests

Where no DX traffic is involved, the contest segments should not include 3500-3510 kHz or 3775-3800 kHz.

Non-contesting radio amateurs are recommended to use the contest-free HF bands (30, 17 and 12m) during the largest international contests. (DV05_C4_Rec_07)

Contests should be restricted to 160, 80, 40, 20, 15 and 10m. That is 60, 30, 17, and 12m bands shall not be used for contests. (VIE16_C4_Rec_06 *)
(* to be ratified at General Conference 2017)

For more recommendations about contest segments see the IARU Region 1 HF Manager Handbook.

Unmanned transmitting stations:

The term "automatically controlled data stations" includes Store and Forward stations.

IARU member societies are requested to limit this activity on the HF bands.

It is recommended that any unmanned transmitting stations on HF shall only be activated under operator control except for beacons agreed with the IARU Region 1 beacon coordinator, or specially licensed experimental stations.

Member Societies are reminded of the recommendation in the IARU Region 1 HF Band Plan 'that any unmanned transmitting stations on HF shall only be activated under operator control, except for beacons agreed with the IARU Region 1 Beacon Coordinator'.

Unmanned transmitting stations, and operation involving unmanned transmitting stations, must adhere to the frequency and bandwidth limits of the band plan.

The operator connecting to an automatically controlled unmanned transmitting station is responsible for not causing interference. This is particularly important in the 30 meter band where the amateur service only has secondary status.

Amateur radio operators may transmit messages via unmanned transmitting stations during coordinated emergency, and disaster preparedness exercises, limited to the duration of such exercises, using a bandwidth not exceeding 2 700 Hz.

Such communication should be announced regularly on the frequency, and radio amateurs not participating in the communication should cooperate by not transmitting on the frequency. (VA14_C4_Rec_06).

Beacons

For information about IARU Region 1 beacon policy see the IARU Region 1 HF Manager Handbook.

Remote controlled operation on HF

Remote controlled operation is defined to mean operation where a licensed operator controls an amateur radio station from a remote control terminal.

Where a station is operated remotely, the following conditions shall apply:
Remote operation must be permitted, or not objected to, by the Regulatory Authority of the country where the station is located.

1. The call sign to be used should be the call sign issued by the Regulatory Authority of the country in which the station is located. This applies irrespective of the location of the operator.

2. It should be noted that the CEPT T/R 61-01agreement only applies to people using their own call sign, with the appropriate country prefix, when the operator is actually visiting that country, not for remote operation.

3. Any further requirements regarding the participation of remotely controlled stations in contests or award programs are a matter for the various contest or award program organisers.

(SC11_C4_REC_07) , (VA14_C4_REC_04)

History

2005 Davos — Introduction of band plan by bandwidth. — Effective 1 January 2006

2008 Cavtat — Several modifications. — Effective 29 March 2009

CW segment extended from 7000 - 7035 kHz to 7000 -7040 kHz.

Narrow band modes, digimodes segment moved and extended from 7035 -7038 kHz to 7040 -7047 kHz.

Narrow band modes, digimodes, segment for automatically controlled stations (unattended) moved and extended from 7038 - 7040 kHz to 7047-7050 kHz.

All modes, digimodes, segment for automatically controlled stations (unattended) moved from 7040-7043 kHz to 7050-7053kHz.

Introduction of SSB preferred contest segments 7060 -7100 kHz and 7130 -

7200 kHz Introduction of Digital Voice Activity Centres.

2011 Sun City — Several modifications. — Effective 17 August 2011

CW contest preferred segment 7000-7025 kHz withdrawn.

Segment 29100 - 29200 kHz changed from max. bandwidth of 2700 Hz to max. 6000 Hz.
Introduction of new segment 29100 - 29200 kHz for FM simplex operation (10 kHz channels).
Removal of FM simplex channels 29520 - 29550 kHz and 29610 - 29650 kHz.
Number of FM Repeater channels increased to eight, former FM simplex channels became new repeater input, respectively repeater output channels.

FM repeater channels renumbered, RH1 = 29520 / 29620 kHz, RH8 = 29590 / 29690 kHz

Introduction of FM Simplex Repeater 29610 kHz (parrot, input + output)

2014 Varna — Several modifications. — Effective 26 September 2014

Segment 29000 - 29100 kHz: Change from max. bandwidth of 2700 Hz to max. 6000 Hz. Satellite segment 29300 - 29510 kHz: Removal of downlink restriction

2016 Vienna — Several modifications *. — Effective 01 June 2016
(* to be ratified by General Conference 2017)

Introduction of narrow bandwidth segment with max. bandwidth of 200 Hz from 3570 kHz to 3580 kHz

Narrow bandwidth mode segment with max. bandwidth of 500 Hz extended by 10 kHz now from 10130 kHz to 10150 kHz.

AMATEUR-SATELLITE SERVICE
Applications of bands allocated to the amateur-satellite service

The following table describes typical applications of frequency bands available to the amateur-satellite service. Refer to RR Article 5 for the specific allocation status of each band.

Wavelength	Frequency band (MHz) (R = Region)	Applications
40 m	7 000-7 100 (primary)	These bands are identified only for limited satellite application, such as ionospheric research, because of potential interference to and from terrestrial users. For example It is planned that South African Cubesat ZACube-1 will operate at 14 MHz to support auroral research
20 m	14 000-14 250 (primary)	
17 m	18 068-18 168 (conditions of co-primary	
15 m	21 000-21 450 (primary)	
12 m	24 890-24 990 (primary)	
10 m	28 000-29 700 (primary)	This band is used primarily in conjunction with an input or output in the 144 MHz band.
	Frequency band (MHz)	
2 m	144-146 (primary)	These bands are in heavy use by numerous amateur satellites for inputs and outputs.
70 cm	435-438 (secondary)	

Wavelength	Frequency band (MHz) (R = Region)	Applications
23 cm	1 260-1 270 (secondary) Earth-to-space only	These bands are used as alternatives to the 144 MHz and 435 MHz bands because of congestion.
13 cm	2 400-2 450 (secondary) RR No. **5.282**	
9 cm	3 400-3 410 (secondary) Regions 2 and 3 only	
5 cm	5 650-5 670 (Secondary) Earth-to-space only	These bands are used for experimental amateur satellites.
	5 830-5 850 (secondary) Space-to-earth only	

Wavelength	Frequency band (MHz) (R = Region)	Applications
3 cm	10.45-10.5 (secondary)	These bands are used for experimental amateur satellite communications.
1.2 cm	24-24.05 (primary)	
6 mm	47-47.2 (primary)	These bands are used for experimental amateur satellites.
4 mm	76-77.5 (secondary)	
	77.5-78 (primary)	
	78-81 (secondary)	
2 mm	134-136 (primary)	
2 mm	136-141 (secondary)	
1 mm	241-248 (secondary)	
1 mm	248-250 (primary)	

Background

The amateur-satellite programme began in 1961 with the design and launch of OSCAR (the first satellite using the acronym Orbiting Satellite Carrying Amateur Radio). The original Project OSCAR group was responsible for the first 4 amateur satellites. In 1969 the Radio Amateur Satellite Corporation (AMSAT) was formed in the USA. This was followed by the establishment of organizations in other countries including Argentina, Australia, Brazil, Chile, Denmark, Germany, Italy, India, Japan, Republic of Korea, Malaysia, New Zealand, Portugal, the Russian Republic (and the former Soviet Union), the Republic of South Africa, Spain, Sweden, Turkey and the United Kingdom. With some exceptions, these satellites were built by licensed radio amateurs, including university students. Recent developments in nano and pico-satellites (such as Cubesats) have led to a considerable increase in university and other groups developing and launching amateur satellites in addition to the original AMSAT groups.

Most satellites have been of the low-Earth-orbiting (LEO) type. Some have been designed for highly elliptical orbits (HEOs). Owing to cost, there have been no geostationary satellite orbit (GSO) satellites in the amateur-satellite service. Technology developed in the amateur-satellite service has been applied directly to commercial LEO satellite systems, and the amateur-satellite service has served as a training ground for design engineers.

Operational amateur satellites

The following table is for illustrative purpose only and does not include every amateur service nano/pico-satellite. Note that there is no requirement for an OSCAR number to be assigned to a satellite in order for it to be legitimately recognized and used in the amateur satellite service.

Satellite	Launch	Observations
AMSAT-OSCAR 7	1974	Linear transponder, beacons (sunlight hours)
UoSat-OSCAR 11	1984	Telemetry beacon
AMRAD-OSCAR 27	1993	FM voice repeater, packet telemetry
Fuji-OSCAR 29	1996	9 600-Bd store-and forward, linear transponder, beacon, “digitalker”
Gurwin-OSCAR 32	1998	9 600-Bd packet bulletin board
SEDSat-OSCAR 33	1998	9 600-Bd packet repeater
Navy-OSCAR 44	2001	1 200-Bd store-and-forward digital repeater
Saudi-OSCAR 50	2002	FM repeater and several experiments
RS-22	2003	Telemetry beacon
VUSat-OSCAR 52	2005	Linear transponder and Morse CW beacon
CubeSat-OSCAR 55	2003	Telemetry beacons
CubeSat-OSCAR 57	2003	Beacon and telemetry
CubeSat-OSCAR 58	2005	Beacon and telemetry
GeneSat-1	2006	1 200-Bd telemetry beacon
Delfi-OSCAR 64	2008	1 200-Bd telemetry beacon
Cubesat OSCAR 65	2008	1 200-Bd telemetry beacon, 9 600-Bd digipeater
Cubesat OSCAR 66	2008	Morse CW beacon, FM packet repeater, digitalker
COMPASS-1	2008	Morse CW beacon
RS-30	2008	Morse CW beacon
PRISM	2009	Morse CW beacon, 1 200-Bd and 9 600-Bd telemetry beacons
KKS-1	2009	Morse CW beacon, digital down link
STARS	2009	Morse CW beacon, 1 200-Bd packet down link
SwissCube	2009	Morse CW beacon, 1 200-Bd telemetry beacon
ITUpSAT1	2009	Morse CW beacon, 19 200-Bd telemetry beacon
UWE-2	2009	9 600-Bd telemetry beacon
BEESAT	2009	Morse CW beacon, 4 800-Bd and 9 600-Bd telemetry beacons
Hope OSCAR 68	2009	Morse CW beacon
Fastrac OSCAR 69	2010	1 200-Bd telemetry beacon
Fastrac OSCAR 70	2010	1 200-Bd telemetry beacon
O/OREOS	2010	1 200-Bd telemetry beacon
SRMSAT	2011	Morse CW beacon
JUNGU	2011	Morse CW beacon
SRMSAT	2011	Morse CW beacon
Explorer 1 Prime Unit 2	2011	1 200-Bd telemetry beacon
MCubed	2011	9 600-Bd telemetry beacon
RAX-2	2011	9 600-Bd telemetry beacon
AO-71	2011	Morse CW beacon
PW-Sat	2012	Morse CW beacon
MO-72	2012	625-Bd and 1 250-Bd telemetry beacons
ARISS	Ongoing	Amateur Radio on the International Space Station (ARISS) includes voice communications, packet radio, digital television and several experiments.

NOTE – Additional information is available at http://www.amsat.org.

Applications of bands allocated to the amateur service

The following table describes typical applications of frequency bands available to the amateur service. Refer to Article 5 of the Radio Regulations (RR) for the specific allocation status of each band. Refer to national regulations for specific allocations, as they may vary by country.

Wavelength	Frequency band (kHz) (R = Region)	Application
2 200 m	135.7-137.8 (secondary) Geographical constraints are given is RR Nos. **5.67A** and **5.67B**	Propagation in this band permits short-range communications during daytime hours and longer range communications via ionospheric refraction at night, when D layer absorption weakens. Power output is limited to 1 W e.i.r.p. which is sufficient for transcontinental and transoceanic transmissions at night.
630 m	472-479 (secondary) Geographical and technical constraints are given in RR Nos. **5.82**, **5.80A** and **5.80B**	Propagation in this band permits short-range communications during daytime hours and longer range communications via ionospheric refraction at night, when D layer absorption weakens. Power output is limited either 1 W or 5 W e.i.r.p., depending stations location (see RR Nos. **5.80A** and **5.80B**)
160 m	1 810-1 850 R1 (co-primary use with other services) RR Nos. **5.98**, **5.99**, **5.100**, **5.101** and 5.**103**)	Its propagation characteristics allow short-range communications during daytime hours, and medium and long-range communications during night-time hours. This band is particularly useful during sunspot minima, when the maximum usable frequency (MUF) is below 3 500 kHz.
	1 800-1 850 R2	
	1 800-2 000 R2, R3 (co-primary use with other services) RR No. **5.102**	

Wavelength	Frequency band (kHz) (R = Region)	Application
80 m	3 500-3 800 R1 (co-primary use with other services)	This band is used for contacts over distances of up to 500 km during the day, and for distances of 2 000 km and more at night. It is heavily used during communications emergencies.
80 m	3 500-3 750 R2 (primary)	
	3 500-3 900 R3 (co-primary use with other services)	
	3 750-4 000 R2 (co-primary use with other services)	
40 m	7 000-7 200 R1, R3 (primary)	The 7 MHz band is heavily used 24 hours each day. During daylight hours, the band carries the bulk of amateur sky wave communication over distances of less than 1 300 km.
	7 000-7 300 R2 (primary)	
30 m	10 100-10 150 (secondary)	This band is in use 24 hours each day, as a bridge between the 7 MHz and 14 MHz bands.
20 m	14 000-14 250 (primary)	This is the most popular band for international communications.
	14 250-14 350 (Conditions of co-primary	
17 m	18 068-18 168 (conditions of co-primary	The band is used as an alternative to 14 MHz which is often congested with traffic.
15 m	21 000-21 450 (primary)	These bands are used particularly during the daytime and when sunspot activity is high.
12 m	24 890-24 990 (primary)	
10 m	28 000-29 700 (primary)	

Wavelength	Frequency band (kHz) (R = Region)	Application
6 m	50-54 R1 (Only allocated in 11 countries of the African Region where the allocation is primary).	This band is used for local communication at all times including via repeaters. Use of this band may also include telecommand of objects such as models by radio amateurs. The band may also be used on occasion for communication for distances up to 2 000 km by sky wave, tropospheric scatter, earth-moon-earth (EME), sporadic reflection from the E layer of the ionosphere (Es) and scattering by the ionized trails of meteors (MS).
	50-54 R2, R3 (geographical constraints are given in	
2 m	144-146 R1 (primary)	This band is heavily used throughout the world for short-range communications, including the use of repeaters. This band is actively used for Earth-Moon-Earth (EME) communications using analog and digital modulation techniques, for different types of radio waves propagation – tropospheric scattering and superrefaction (TROPO), scattering by irregularities in the lower ionosphere (FAI), scattering by the ionized trails of meteors (MS) as well as ionospheric scattering in the circumpolar regions during polar storms (AURORA) making it possible to contact, using analog and digital modulation techniques, over distances of up to 2 000-3 000 km. This band is actively used for local communications in times of disasters. It is also used for contacts with the use of repeaters on board amateur satellites.
	144-148 R2, R3 (conditions of co-primary use with other services in a number of countries are given in RR	
1.25 m	220-225 R2	Where allocated, this band serves as an alternative to the 144 MHz band for short-range communications.
70 cm	430-440 (R1 co-primary use with other services)	This band is used for short-range communications including repeaters and amateur analogue and digital television. It is also used for Earth-Moon-Earth (EME) communications using analogue and digital modulation techniques. Tropospheric scattering and superrefraction (TROPO) makes it possible to contact over distances of up to 1 000 km. It is also used for contacts with the repeaters on board amateur satellites.
	420-430 and 440-450 in several countries. R2, R3 on a secondary basis	
	430-440 R2, R3 (secondary)	
33 cm	902-928 R2 (secondary)	This band is allocated to the amateur service only in Region 2.

Wavelength	Frequency band (kHz) (R = Region)	Application
23 cm	1 240-1 300 (secondary)	This band is used for communications using analog and digital modulation techniques, as well as for digital television and repeater networks. Tropospheric scattering and superrefraction (TROPO) makes is possible to contact over distances of over 1 000 km. This band is the most popular for Earth-Moon-Earth (EME) communications using analog and digital modulation techniques. Also this band is used for contacts on board amateur satellites.
13 cm	2 300-2 450 (secondary)	This band is used for narrowband, data and television communications and for experimentation. It is also used for Earth-Moon-Earth (EME) communications and for contacts with the use of repeaters on board amateur satellites (mainly space-Earth
9 cm	3 300-3 500 R2, (R3 secondary)	This band is used for narrowband communications, data links and for Earth-Moon-Earth (EME) communications using analog and digital modulation techniques.
5 cm	5 650-5 850 R1, R3 5 650-5 925 R2 (secondary in all three regions)	This band is used for narrowband communications, data links and for Earth-Moon-Earth communications using analog and digital modulations techniques.
	Frequency band (GHz)	
3 cm	10-10.5 (secondary)	This band is used for narrowband communications, short range wideband communications, television (including repeaters), and for Earth-Moon-Earth (EME) communications using analog and digital modulation techniques. It is the most popular band above 1.3GHz. Certain propagation conditions such as TROPO or RAINSCATTER can result in communications ranges in excess of 1 000 km.
1.2 cm	24-24.05 (primary)	These bands (at 24 GHz, 47 GHz and 76 GHz) are largely used for narrowband communications and for experimentation, and also for Earth-Moon-Earth (EME) communications.
	24.05-24.25 (secondary) RR 5.150	
6 mm	47-47.2 (primary)	
4 mm	76-77.5 (secondary) 77.5-78 (primary) 78-81.5 (secondary)	
2.5 mm	122.25-123 (secondary)	
2 mm	134-136 (primary)	
1 mm	136-141 (secondary)	Bands at 122 GHz and above are largely used for narrowband communications and experimentation
	241-248 (secondary)	
	248-250 (primary)	

NOTE – Some administrations permit amateur experimentation at frequencies above 275 GHz, consistent with RR No. 5.565 (WRC-12).

Table of Frequency Allocations

<table>
<tr><th colspan="3">Allocation to services</th></tr>
<tr><th>Region 1</th><th>Region 2</th><th>Region 3</th></tr>
<tr><th colspan="3">kHz</th></tr>
<tr><td>135.7-137.8
FIXED
MARITIME MOBILE
Amateur</td><td>135.7-137.8
FIXED
MARITIME MOBILE
Amateur</td><td>135.7-137.8
FIXED
MARITIME MOBILE
RADIONAVIGATION
Amateur</td></tr>
<tr><td colspan="3">472-479
MARITIME MOBILE
Amateur
Aeronautical radionavigation</td></tr>
<tr><td>1 800-1 810
RADIOLOCATION</td><td rowspan="2">1 800-1 850
AMATEUR</td><td rowspan="3">1 800-2 000
AMATEUR
FIXED
MOBILE except aeronautical mobile
RADIONAVIGATION
Radiolocation</td></tr>
<tr><td>1 810-1 850
AMATEUR</td></tr>
<tr><td>1 850-2 000
FIXED
MOBILE except aeronautical mobile</td><td>1 850-2 000
AMATEUR
FIXED
MOBILE except aeronautical mobile
RADIOLOCATION
RADIONAVIGATION</td></tr>
</table>

News on 500 KHz frequency

The study ITU-R made a report on the current situation in the frequency range 415 ÷ 526.5 KHz, which shows the division of bandwidth between the amateur radio services and civil services, and analyzes the compatibility of the spaces of the range reserved.

The report reminds us of the following studies and recommendations that somehow relate to the activities on the aforementioned frequency range:

Recommendation ITU-R M.1732 - Characteristics of operating systems in the amateur and amateur-satellite services for use in sharing studies

Recommendation ITU-R P.525-2 - Calculation of free space attenuation

Recommendation ITU-R BS.560 - Radio-frequency protection ratios of LF, MF and HF broadcasting

Recommendation ITU-R P.368-9 - Earth-wave propagation curves for frequencies between 10 kHz and 30 MHz

Recommendation ITU-R P.372-10 - Radio noise

Recommendation ITU-R P.832-2 - World Atlas of the conductivity of the Earth

Recommendation ITU-R P.1147-4 - Prediction sky wave field strength at frequencies between about 150 and 1700 kHz

ITU-R SG 3 Handbook - Ionosphere and its effects on Radiowave Propagation Handbook, 1998 Edition

Recommendation ITU-R F.1610 - Planning, design and implementation of wireless systems Fixed Service HF

Recommendation ITU-R M.476 - direct printing telegraph equipment in the maritime mobile service

Recommendation ITU-R M.625-3 - direct printing telegraph equipment using automatic identification in the maritime mobile service

Report ITU-R M.2200 - Characteristics of amateur radio stations in the range from 415 to 526.5 kHz for sharing studies

Report ITU-R M.2201 - Use of the band 495-505 kHz by the maritime mobile service for the digital transmission of safety and security related information from shore to ship

Report ITU-R M.910-1 - Sharing between the maritime mobile service and the aeronautical radionavigation service in the band 415 526.5 kHz.

The employment situation of the frequency range

In the three regions of the ITU, the band 415 to 526.5 kHz includes allocations to mobile marine navigation and aircraft. Maritime Safety Information (MSI) systems operating on 424 kHz, 490 kHz and 518 kHz above (NAVTEX), and there is a common endowment primary mobile service in the three Regions in the band 495-505 kHz.

The ITU highlights studies and the results of the experiments of amateur radio to make the most of the portions of bandwidth used by radio amateurs to not interfere with other civil services and gives explanations of the types of permissions to be requested by the various administrations.

All this is contained in these three REPORT ITU:

REPORT ITU - R M.2200 (2010)

REPORT ITU - R M.2203 (2010)

REPORT ITU - R M.2226 (2010)

In fact there are not many states that have been authorized to operate in the band 500 KHz.

List of Administrations which have obtained authorization in relation to the type of operations:

Permissions for secondary service:

Belgium	501 ÷ 504 KHz
Norway	493 ÷ 510 KHz
New Zealand	505 ÷ 515 KHz
Great Britain	501 ÷ 504 KHz

Trial license:

Ireland	501 ÷ 504 KHz

Experimental licenses

Croatia	493 ÷ 510 KHz
Iceland	493 ÷ 510 KHz
Denmark	501 ÷ 504 KHz
Holland	501 ÷ 504 KHz
Sweden	501 ÷ 507 KHz
Canada	504 ÷ 509 KHz
United States	461 ÷ 478 495 ÷ 510 KHz

License scientific

Australia	505 ÷ 515 KHz

Beacons

Czechoslovakia	505.06 KHz -	Germany	505.1 KHz

TABLE 1

Characteristics of amateur systems for Morse on-off keying

Parameter	**Value**							
Mode of operation	Continuous wave (CW) Morse 10-50 Bd				Continuous wave (CW) Morse < 20 Bd (Earth-moon-Earth)			Slow Morse ≤ 1 Bd CW
Frequency band (MHz)[1]	1.8-7.3	10.1-29.7	50-450	902-81 500	144	432	1 296	0.136
Necessary bandwidth and class of emission (emission designator)	150HA1A 150HJ2A	150HA1A 150HJ2A	150HA1A 150HJ2A	150HA1A 150HJ2A	50H0A1A 50H0J2A	50H0A1A 50H0J2A	50H0A1A 50H0J2A	1H00A1B 1H00J2B
Transmitter power (dBW)[2]	3-31.7	3-31.7	3-31.7	3-31.7	3-31.7	3-31.7	17-31.7	23
Transmitter line loss (dB)	0.2	0.3-0.9	1-2	0-10	1-2	1-2	1-4	0.0
Transmitting antenna gain (dBi)	–20 to 15	–10 to 21	0-26	10-42	20-26	20-26	25-40	–22
Typical e.i.r.p. (dBW)	–17.2 to 46.5	–7.3 to 52.4	2-55	1-45	38-55	38-55	68	1
Antenna polarization	Horizontal, vertical	Horizontal, vertical	Horizontal	Horizontal, vertical	Horizontal	Horizontal, vertical, LHCP, RHCP	Horizontal, vertical, LHCP, RHCP	Vertical
Receiver IF bandwidth (kHz)	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Receiver noise figure (dB)[3]	13	7-13	0.5-2	1-7	0.5	0.5	0.5	13

[1] With the exception of the band around 0.136 MHz, the amateur bands within the frequency ranges shown conform to RR Article 5.

[2] Maximum powers are determined by each administration.

[3] Receiver noise figures for bands above 50 MHz assume the use of low-noise preamplifiers.

LHCP: left-hand circular polarization

RHCP:r ight-hand circular polarization

TABLE 2

Characteristics of amateur systems for narrow-band direct printing telegraphy and data

Parameter	Value					
Mode of operation[1]	PSK31 31 Bd	NBDP 50 Bd	PACTOR 2	PACTOR 3	CLOVER 2000	MFSK16
Frequency band (MHz)[2]	1.8-29.7	1.8-29.7	1.8-29.7	1.8-29.7	1.8-29.7	1.8-29.7
Necessary bandwidth and class of emission (emission designator)	60H0J2B	250HF1B	375HJ2D	2K20J2D	2K00J2D 2K00J2B	316HJ2D 316HJ2B
Transmitter power (dBW)[3]	3-31.7	3-31.7	3-31.7	3-31.7	3-31.7	3-31.7
Feeder loss (dB)	0.2-0.9	0.2-0.9	0.2-0.9	0.2-0.9	0.2-0.9	0.2-0.9
Transmitting antenna gain (dBi)	–20 to 21	–20 to 21	–20 to 21	–20 to 21	–20 to 21	–20 to 21
Typical e.i.r.p. (dBW)	–17.2 to 52.5	–17.2 to 52.5	–17.2 to 52.5	–17.2 to 52.5	–17.2 to 52.5	–17.2 to 52.5
Antenna polarization	Horizontal, vertical	Horizontal, vertical	Horizontal, vertical	Horizontal, vertical	Horizontal, vertical	Horizontal, vertical
Receiver IF bandwidth (kHz)	0.5	0.5	0.5	2.7	2.4	0.5
Receiver noise figure (dB)[4]	7-13	7-13	7-13	7-13	7-13	7-13

[1] PSK31 is a data system using phase shift keying (PSK) at 31.1 bauds. PACTOR 2 is a data system using differential PSK (DPSK) modulation with rates varying according to conditions. PACTOR 3 is a data system with a potential throughput of up to 5.2 kbit/s. CLOVER 200 is a digital data system capable of rates up to 5.2 kbit/s. MFSK16 is a data system using 16-tone frequency shift keying (FSK) and forward error correction (FEC).

Further information about these modes of operation can be obtained from the ARRL HF Digital Handbook (4th Ed.), American Radio Relay League, ISBN: 0-87259-103-4, published 2008.

[2] Amateur bands within the frequency ranges shown conform to RR Article 5.

[3] Maximum powers are determined by each administration.

[4] Receiver noise figures for bands above 50 MHz assume the use of low-noise preamplifiers.

TABLE 3

Characteristics of amateur analogue voice systems

Parameter	**Value**					
Mode of operation	Single side-band (SSB) voice				FM voice	
Frequency band (MHz)[1]	1.8-7.3	10.1-29.7	50-450	902-81 500	50-450	902-81 500
Necessary bandwidth and class of emission (emission designator)	2K70J3E	2K70J3E	2K70J3E	2K70J3E	11K0F3E 16K0F3E 20K0F3E	11K0F3E 16K0F3E 20K0F3E
Transmitter power (dBW)[2]	3-31.7	3-31.7	3-31.7	3-31.7	3-31.7	3-31.7
Feeder loss (dB)	0.2	0.3-0.9	1-2	0-10	1-2	0-10
Transmitting antenna gain (dBi)	–20 to 15	–10 to 21	0-23	0-42	0-26	0-42
Typical e.i.r.p. (dBW)	–16.8 to 46.5	–7.3 to 52.4	2-53.7	1-45	2-55	1-45
Antenna polarization	Horizontal, vertical	Horizontal, vertical	Horizontal, vertical	Horizontal, vertical	Horizontal, vertical	Horizontal, vertical
Receiver IF bandwidth (kHz)	2.7	2.7	2.7	2.7	9 15	9 15
Receiver noise figure (dB)[3]	13	7-13	0.5-2	1-7	0.5-2	1-7

[1] Amateur bands within the frequency ranges shown conform to RR Article 5.

[2] Maximum powers are determined by each administration.

[3] Receiver noise figures for bands above 50 MHz assume the use of low-noise preamplifiers.

TABLE 4

Characteristics of amateur digital voice and multimedia systems

Parameter	**Value**				
Mode of operation	Digital voice			Digital voice and multimedia	
Frequency band (MHz)[1]	1.8-7.3	10.1-29.7	50-450	1 240-1 300	5 650-10 500
Necessary bandwidth and class of emission (emission designator)	2K70J2E	2K70J2E	2K70J2E 5k76G1E 8K10F1E	2K70G1D 6K00F7D 16K0D1D 150KF1W	2K70G1D 6K00F7D 16K0D1D 150KF1W 10M5F7W
Transmitter power (dBW)[2]	3-31.7	3-31.7	3-31.7	1-10	3
Feeder loss (dB)	0.2	0.3-0.9	1-2	1-3	1-6
Transmitting antenna gain (dBi)	–20 to 15	–10 to 21	0-26	30	36
Typical e.i.r.p. (dBW)	–16.8 to 46.5	–7.3 to 52.4	2-55	39	38
Antenna polarization	Horizontal, vertical	Horizontal, vertical	Horizontal	Horizontal, vertical	Horizontal, vertical
Receiver IF bandwidth (kHz)	2.7	2.7	2.7 5.76 8.1	2.7, 6, 16, 130	2.7, 6, 16, 130, 10 500
Receiver noise figure (dB)[3]	13	7-13	1	2	2

[1] Amateur bands within the frequency ranges shown conform to RR Article 5.

[2] Maximum powers are determined by each administration.

[3] Receiver noise figures for bands above 50 MHz assume the use of low-noise preamplifiers.

TABLE 5

Characteristics of amateur-satellite systems in the Earth-to-space direction

Mode of operation	**CW Morse, 10-50 Bd**			**SSB voice, digital voice, FM voice, data**		
Frequency band (MHz)[1]	28	144-5 670	10 450-24 050	28	144-5 670	10 450-24 050
Necessary bandwidth and class of emission (emission designator)	150HA1A 150HJ2A	150HA1A 150HJ2A	150HA1A 150HJ2A	2K70J3E 2K70J2E 16K0F3E	2K70J3E 16K0F3E 44K2F1D 88K3F1D	2K70J3E 16K0F3E 44K2F1D 88K3F1D
Transmitter power (dBW)[2]	0-20	0-20	0-13	0-20	0-20	0-13
Feeder loss (dB)	0.2-1.5	0.2-3	0.2-3	0.2-1.5	0.2-3	0.2-3
Transmitting antenna gain (dBi)	–2 to 10	–2 to 27	–2 to 31	–2 to 10	–2 to 27	–2 to 31
Typical e.i.r.p. (dBW)	10-29	10-45	10-42	10-29	10-45	10-42
Antenna polarization	Horizontal, vertical, RHCP, LHCP	Horizontal, vertical, RHCP, LHCP	Horizontal, vertical, RHCP, LHCP	Horizontal, vertical, RHCP, LHCP	Horizontal, vertical, RHCP, LHCP	Horizontal, vertical, RHCP, LHCP
Receiver IF bandwidth (kHz)	0.4	0.4	0.4	2.7 16	2.7, 16, 50, 100	2. 7, 16, 50, 100
Receiver noise figure (dB)[3]	3-10	1-3	1-7	3-10	1-3	1-7

[1] Amateur bands within the frequency ranges shown conform to RR Article 5.

[2] Maximum powers are determined by each administration.

[3] Receiver noise figures for bands above 50 MHz assume the use of low-noise preamplifiers.

TABLE 6

Characteristics of amateur-satellite systems in the space-to-Earth direction

Mode of operation	**CW Morse, 10-50 Bd**			**SSB voice, digital voice, FM voice, data**		
Frequency band (MHz)[1]	28	144-5 850	10 450-24 050	28	144-5 850	10 450-24 050
Necessary bandwidth and class of emission (emission designator)	150HA1A 150HJ2A	150HA1A 150HJ2A	150HA1A 150HJ2A	2K70J3E 2K70J2E 16K0F3E	2K70J3E 16K0F3E 44K2F1D 88K3F1D	2K70J3E 16K0F3E 44K2F1D 88K3F1D
Transmitter power (dBW)[2]	10	10	10	10	10	0-10
Feeder loss (dB)	0.2-1	0.2-1	0.2-1	0.2-1	0.2-1	0.2-1
Transmitting antenna gain (dBi)	0	0-6	0-6	0	0	0-6
Typical e.i.r.p. (dBW)	9	9-15	9-15	9	9-15	9-15
Antenna polarization	Horizontal, vertical, RHCP, LHCP	Horizontal, vertical, RHCP, LHCP	Horizontal, vertical, RHCP, LHCP	Horizontal, vertical, RHCP, LHCP	Horizontal, vertical, RHCP, LHCP	Horizontal, vertical, RHCP, LHCP
Receiver IF bandwidth (kHz)	0.4	0.4	0.4	2.7, 16	2.7, 16, 50, 100	2.7, 16, 50, 100
Receiver noise figure (dB)[3]	3-10	1-3	1-7	3-10	1-3	1-7

[1] Amateur bands within the frequency ranges shown conform to RR Article 5.

[2] While total transmitter power of 20 dB is assumed, 10 dBW is used as power is shared among signals in passband.

[3] Receiver noise figures for bands above 50 MHz assume the use of low-noise preamplifiers.

Comis James to 12 years were already with the key in hand, it took part in all courses of telegraphy that is developed in the professional seafaring institutes and nautical institutes. Qualified naval engineer. It developed the military service in Navy in the capacity of wireless operator. Course 1954 to La Storta Roma. Resulting first to fine run to equal worth of other two fellow soldiers. As reward for the result main point was given it the possibility to choose the destination where operate upon someone. Being native of Catania, it chose the radio station of Messina where it operate upon someone until completion of the service, it were the 29 february of the 1956. It reached the degree of deputy chief and the nomination of expert. When the service in Navy was brought in 14 monthes, not being more the time to perform the course that lasted 6 monthes, the Navy organized the pro-enlistment courses and it is so that it had the job of behaviour the instructor of the future operators of the Navy. Radio amateur after 1970 currently in load to the ARI section of Parma and member INORC with N° 112.

The manual, only present in its kind, has been written with the purpose to eliminate any doubt on procedures of transmission.
Of recent are appeared some writings that confuse the ideas on procedures of transmission of radio amateurs. Authors of these writings, even if I am un established champions in brings into relief international, have indicated any procedures that are clearly in contrast to the international issued standards by **ITU** and **IARU.** It is not known if they have acted under the influence of their notoriety, looking for to create new rules, or because ignored the existence of already in being standards.
Today have the need to give a correction in the manner of operate, given the confusion, always on the upgrade, that is feel in "air" and the better mode is that to himself keep to rules exhale by international organs cited.
We radio amateurs are of the dilettantes, and operate without any fear of is sanctioned if we commit some incorrectness in the use the procedures of transmission and this is the motive of many “disorder”, must also to the lack of the popularization of in being standards. Every serious operator it must document to embank the lacks described. The manual present is the source of the exactness on procedures of transmission and every Humpty - Dumpty prepares to write or comment some rule on procedures must first consult the present manual and the manual and **Amateur and amateur-satellite service** compiled by **ITU,** not to commit errors and for the possible updatings.

Contents of the manual:
The present manual besides containing all standards regarding procedures of transmission of the normal traffic (excluding contest, pile-up etc.), it contains the indications of all ill-treats and radio amateur activity; the emergency procedure, as well as brought by **IARU HF International Emergency Operating procedures;** the international abbreviations and of the radio amateurs and their use in procedures of transmission; international prefixes of radio amateurs; the Band-Plan region 1 updated to the June 2016; various tables of utility; a detailed comment on the manipulation of the straight key and on the international code of signals.

Giacomo Comis E-mail giacomocomis@yahoo.it