

OPERATIONAL MANUAL FOR AMATEUR RADIO SERVICE

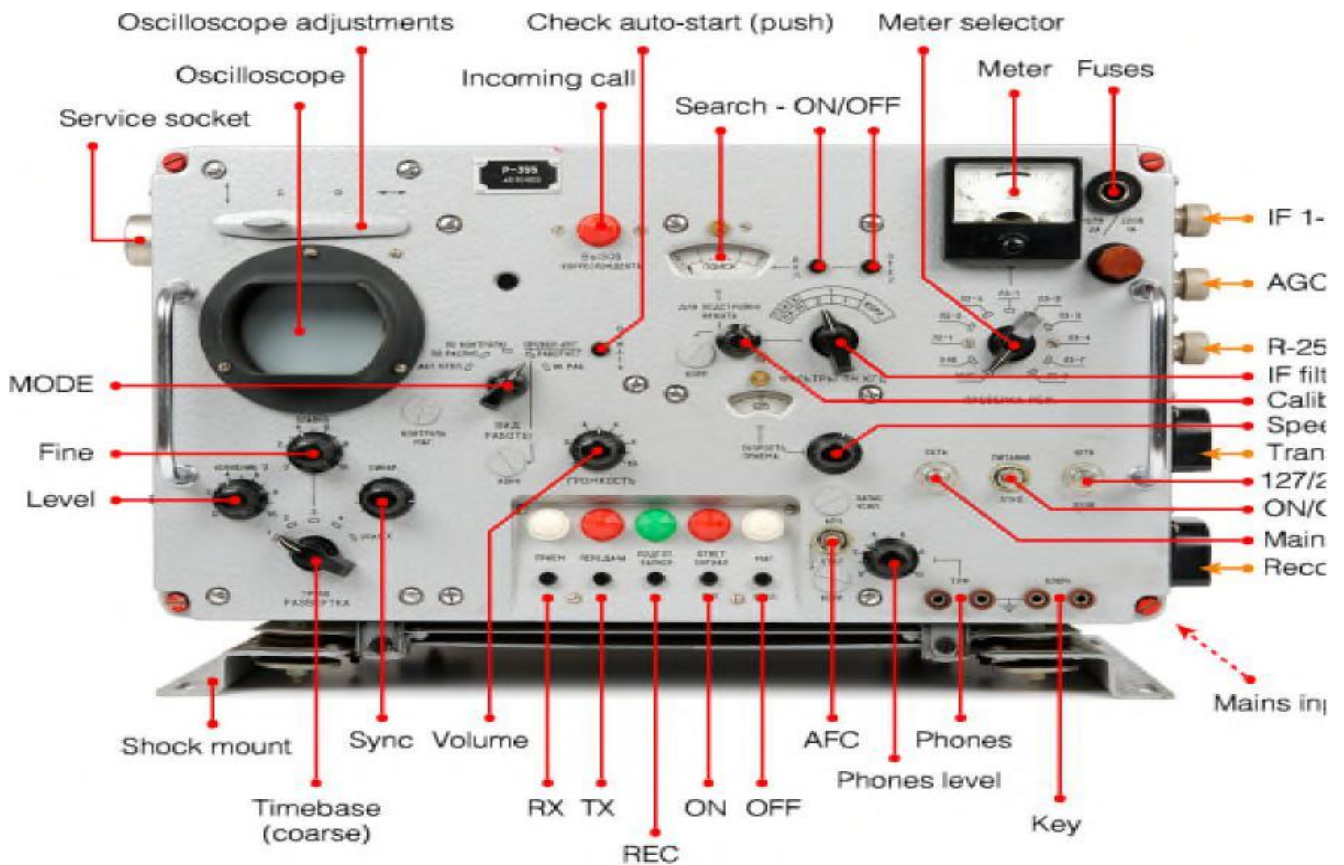
TRANSMISSION PROCEDURE

3rd 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



Parma 2022

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 have 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 enjoys the exact work of the I4CQO friend, it is quite a pleasure. 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 good 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 contribution of the great work of capacity that the author shows with its precious work. Congratulations!

Antonio Zerbini I1ZB INORC 051 (President INORC)

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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, understood 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 autodisciplinarity 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**, 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, initials 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 groups 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 groups 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. To guess: it is well known the meaning of everything that is transmitted, to not degenerate the language of radio amateurs. 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 given 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 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, image 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 radiofrequency away ether in different modes. (3)

Radiotelephony. –

designate an effected radiocommunication to radiofrequency 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 Constitution 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, intercommunication 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 earth 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 reproduction in 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 direction 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 are allotted on international basis and they allow them to individualize the nation of the transmitting station. The nominative are 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 missing 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 are employed for two principal purposes:

1-- to call or communicate with an or more station (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. are expressed with points and lines and come transmitted separately or arranged together. The points, the lines and wavy lines 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 contact. 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 certificate 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 normally operated 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 stations 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 receipt") 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 different countries.

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

Many national amateur radio societies issue certificates or diplomas for contacting 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 regularly 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 "orienteeing" or "rabbit hunting", is a time limited race to demonstrate skills in searching 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 activities are conducted 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 by 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 technical and operational characteristics of systems used in the amateur service and amateur-satellite services for purposes of carrying out sharing studies. The systems and their characteristics described in this Recommendation are considered representative of those operating in the frequency bands available to these 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 demonstration 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 does not require complex equipment and is a robust mode capable 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 Recommendation 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 various data communications modes.

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

DATA COMMUNICATIONS SYSTEMS

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

FACTOR-III – This and other voice-frequency bandwidth data communications systems are gaining increased use in the amateur service. It is a software upgrade for existing

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 keying, 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 developed.

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

IRLP. – The (Internet Radio Linking Project) uses Voice over Internet Protocol (VoIP) 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 double-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 through 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 extension 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 bandwidths

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 research in amateur systems capable of combining data, voice and 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 extended ranges.

D-STAR. – This is a digital voice and data system developed by the Japan Amateur Radio League (JARL) in cooperation with the administration and industry. It is designed for user access at VHF, digitized voice/audio signals and short data messages are supported. Modulation methods supported are: GMSK, QPSK and 4-FSK, at a data 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.

NEW GENERATION DIGITAL SYSTEMS

FT8
JT65
JT9
JT4
QRA64
ISCAT
WSPR
ECHO

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, **I'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 **AS**, that means: wait, or **AS** (number) that means wait (number...minutes).

RECOMMENDATION ITU-R M. 1677-1

INTERNAZIONALE MORSE CODE

Scope

This Recommendation confirms 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) - that it continues to be used in some radiocommunication services including the amateur and amateur-satellite services, and to a diminishing extent in the mobile and fixed services ,.
- c) - that 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 applying to Morse working.

Morse code

Morse code signals

The following are the written characters that may be used and the corresponding 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 understood)	[?] ..--..
Apostrophe.....	[‘] .----.
Hyphen or dsh or subtraction 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	[=] -...-
Understood.....	...-
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 is equal to three dots.

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

The space between two letters is equal to three dots.

The space between two words is equal to seven dots.

Transmission of signs for which there is no corresponding signal 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:

Multiplication sign

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

Percentage 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 appropriate. The signal (**•-•-•-•**) reserved for inverted commas may not be 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 transmitted without spaces between figures and letters.

Ordinal numbers composed of figures and letters, 30me, 25th, etc., shall 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 $1\frac{3}{8}$ transmit **1-3/8**, and not **13/8**

For $\frac{3}{8} 8$: transmit **3/8-8** and not **3/88**

For $363\frac{1}{2} 4 5642$, 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 expressed in four figures preceded by the **L** letter the first two figures is made a report on the degrees, 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 expressed 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 simplify 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 establish 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 outside 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 **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 unable 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 **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 (**.-.-.-**) **AR** and the end of the work with (**...-.-**) **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 a ble omit and use the group of the **QSK q code** that specifies it something. 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 **AS** or **K** with **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 Handbook. 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 established 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 an international for all services, then do not replace that of radio amateurs that know, but are integrated. From the following signals I am broken up that of procedure that are systematized in a list aside from.

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

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 accounts for charges for your station settled?	The accounts for charges of my station are settled by the 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 return to.....
QRG	Will you tell me my exact frequency (or that 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 am 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 you anything for me ?	I have nothing for you.
QRV	Are you ready?	I am ready.
QRW	Shall I inform..... that 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 strength of your signals Or those of.... is: 1 – scarcely 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 mutilated.
QSF*	Have you effected rescue ?	I have effected rescue and am proceeding 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-finding equipment.
QSI		I have been unable to break in on your transmission.
QSJ	What is the charge to be collected to including your internal charge ?	The charge to be collected to including my internal charge is.....francs.
QSK	Can you hear me between your signals and if so may I break in on your transmission ?	I can hear you between my signals; break in on my 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 number.....

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.....MHz or KHz with emissions of class.....?	Send or reply in this frequency or on .....MHz or KHz with emission of class.....
QSV	Shall I send a series of Vs (or signs) for adjustment on this frequency or on.....MHz or KHz ?	Send a series of Vs (or signs) for adjustament on this frequency or on.....MHz or KHz.
QSW	Will you send on this frequency or on..... MHz or KHz (with emission of class.....) ?	I am going to send on this frequency or on.....MHz or KHz (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? What is my TRUE bearing from.....(name or call) What is the TRUE bearing of.....(name or call)from..... (name or call sign) ?	Your TRUE bearing for me is .....degrees at...hours. Your TRUE bearing from.....(name or call) was...deg. hou... The TRUE bearing of.....(name or call) from....(name or call) was.... degrees at ...hours.
QTF	Will you give me my position according to the bearings taken by the direction-finding stations which you control ?	Your position according to the bearings taken by the direction-finding stations which I control was.....latitude, .....longitude (or other indication of position) classe..... at.....hours.
QTG	Will you send two dashes of ten seconds each followed by your call sign (repeated....Time) on .....MHz or KHz Will you request.....(call sign) to send two dashes of ten seconds each followed by his call sign (repeated .....times) on.....MHz or KHz ?	I am going to send two dashes of ten sconds each followed by my call sign (repeated...times) on....MHz or KHz. I have requested (call sign) to send two dashes of ten seconds each followed by his call sign (repeated ...times) on.....MHz or KHz

QTH	What is your position in latitude and longitude (or according to any other indication) ?	My position is.....latitude,.....longitude (or according to any other indication)
QTI*	What 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 surface of the Earth ?	The speed of my aircraft in relation to the surface of the 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 heading 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 Are you airborne ?	I have left dock (or port) . or I am airborne .
QTP	Are you going to enter dock (or port)? or Are you going to alight (or land) ?	I am going to enter dock (or port). or .I am going to alight (or land).
QTQ	Can you communicate with my station by means of the International Code of Signals (INTERCO) ?	I am going to communicate with your station by means of the International Code of Signals (INTERCO).
QTR	What is the current time ?	The current 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	Shall I stand guard for you on the frequency of.....MHz or KHz (from.....to.....hours) ?	Stand guard for me on frequency of. .....MHz or KHz (from.....to.....hours).
QTW*	What is the condition of survivors ?	Survivors are in.....condition and urgently need.....
QTX	Will you keep your station open for further communication with me until further notice (or until.....hours) ?	I will keep my station open for further communication with you until further notice (or until.....hours).
QTY*	Are you proceeding to the position of incident and if so when do you expect to arrive ?	I am proceeding to the position of incident and expect to arrive.....hours (or.....date).
QTZ*	Are you continuing the search ?	I am continuing the search for....(aircraft, ship, survival craft, survivors or wreckage).
QUA	Have you news of.....(name or callsign) ?	Here is news of.....(name or call sign).
QUB*	Can you give me in the following order information concerning: the direction in degrees TRUE and speed of the surface wind; visibility; present weather; and amount, type	Here is the information requested:..... (The units used for speed and distances should be indicated).

	and height of base of cloud above surface elevation at..... (place of observation)	
QUC	What is the number (or other indication) of the last message you received from me (or from .....(name or call sign) ?	The number (or other indication) of the last message I 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....(language), with interpreter if necessary ? if so, on what frequencies ?	I can speak in....(language) on.....MHz or KHz.
QUF	Have you received the distress signal sent by...(call sign) ?	I have received the distress signal sent by.....(call sign) at .....hours.
QUH*	Will you give me the present barometric pressure at sea level ?	The present barometric pressure at sea level is.....
QUM	May I resume normal working ?	Normal working may be resumed
QUN	When directed all stations: Will vessels in my immediate vicinity.....or (in the vicinity of.....latitude,.....longitude) or (in the vicinity of.....) please indicate their position, TRUE course and speed ?	My position, TRUE course and speed are.....
QUO*	Shall I search for..... 1 – aircraft 2 – ship 3 – survival craft in the vicinity .....or.....(lat and long)?	Please search for..... 1 – aircraft 2 – ship 3 – survival craft in the vicinity.....or.....(lat and long)
QUP*	Will you indicate your position by:..... 1 – searchlight 2 – black smoke trail 3 – pyrotechnic lights ?	My position is indicated by.....: 1 – searchlight 2 – black smoke trail 3 – pyrotechnic light.
QUR*	Have survivors..... 1 – received survival equipment 2 – been picked up by rescue vessel 3 – been reached by ground rescue party ?	Survivors..... 1 – are in possession of survival equipment dropped by..... 2 – have been picked up by rescue vessel 3 – have been reached by ground rescue party.
QUS*	Have you sighted survivors or wreckage ? If so, in what	Have sighted.....

	position ?	1 – survivors 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 aircraft 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 in force ?	I have the following navigational warning (s) or gale warning (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 understood 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	WHISKEY
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{AS} signal:

the station that has transmitted \overline{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{AR} ----- *all well? End message*

I4CQO de G5HPE k

G5HPE de I4CQO -.-.- gm **dr john tnx fer rppt** = --- *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{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? 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 AR --- *hope to connect you still, wish you to beautiful behaviour distant connections and send you yours truly, end transmission.*

G5HPE de I4CQO 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 AR -*it my QSL postcard will be sent surely away office, ciao feel still, yours truly. End transmission.*

I4CQO de G5HPE VA - *End traffic.*

OPERATIONS OF EMERGENCY

Role of the amateur service in emergency telecommunications.

Its wide scope of activities and the skills of 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 societies.

Typical 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 operations, amateur stations can reinforce the professional teams by increasing their communication capabilities and reporting observations.

Hospitals and similar establishments 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 establish communications with such institutions.

Amateur networks available for emergency telecommunications.

Short-range networks.

Amateur short-range networks 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 administrative centres outside an affected area, or to headquarters of response providers in neighbouring countries. They also ensure communication with vehicles, vessels and aircraft operating outside the coverage of available VHF or UHF networks. Communication at medium distances 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** (interrompi la trasmissione). 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 ABOUT 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)+(AR)

Quick preamble

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

Number
 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 message 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 $_ \cdot \cdot \cdot _$ PLEASE SEND US INFORMATION
 $_ \cdot \cdot \cdot _$ INFORMATION BUREAU FOR RIVER DISTRICT DISASTER
 $\cdot _ \cdot _ \cdot$

RPT WA PLEASE K

PLEASE SEND K

DE YX1AA QSL 32 $\cdot \cdot \cdot _ \cdot _$

DE XY1ZZ OK $\cdot \cdot \cdot _ \cdot _$

$_ \cdot _ \cdot _$ = message begins

$_ \cdot \cdot \cdot _$ = separation sign

$\cdot _ \cdot _ \cdot$ = message end

$\cdot \cdot \cdot _ \cdot _$ = 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) <input type="checkbox"/> Routine <input type="checkbox"/> Priority <input type="checkbox"/> 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 (QRPPuntil 1W, QRPuntil 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

Prefixes	Country
AAA-ALZ	United States of America
AMA-AOZ	Spain
APA-ASZ	Pakistan (Islamic Republic of)
ATA-AWZ	India (Republic of)
AXA-AXZ	Australia
AYA-AZZ	Argentine Republic
A2A-A2Z	Botswana (Republic of)
A3A-A3Z	Tonga (Kingdom of)
A4A-A4Z	Oman (Sultanate of)
A5A-A5Z	Bhutan (Kingdom of)
A6A-A6Z	United Arab Emirates
A7A-A7Z	Qatar (State of)
A8A-A8Z	Liberia (Republic of)
A9A-A9Z	Bahrain (Kingdom of)
BAA-BZZ	China (People's Republic of)
CAA-CEZ	Chile
CFA-CKZ	Canada
CLA-CMZ	Cuba
CNA-CNZ	Morocco (Kingdom of)
COA-COZ	Cuba
CPA-CPZ	Bolivia (Republic of)
CQA-CUZ	Portugal
CVA-CXZ	Uruguay (Eastern Republic of)
CYA-CZZ	Canada
C2A-C2Z	Nauru (Republic of)
C3A-C3Z	Andorra (Principality of)
C4A-C4Z	Cyprus (Republic of)
C5A-C5Z	Gambia (Republic of the)
C6A-C6Z	Bahamas (Commonwealth of the)
*C7A-C7Z	World Meteorological Organization
C8A-C9Z	Mozambique (Republic of)
DAA-DRZ	Germany (Federal Republic of)
DSA-DTZ	Korea (Republic of)
DUA-DZZ	Philippines (Republic of the)
D2A-D3Z	Angola (Republic of)
D4A-D4Z	Cape Verde (Republic of)
D5A-D5Z	Liberia (Republic of)
D6A-D6Z	Comoros (Union of)
D7A-D9Z	Korea (Republic of)

Prefixes	Country
EAA-EHZ	Spain
EIA-EJZ	Ireland
EKA-EKZ	Armenia (Republic of)
ELA-ELZ	Liberia (Republic of)
EMA-EOZ	Ukraine
EPA-EQZ	Iran (Islamic Republic of)
ERA-ERZ	Moldova (Republic of)
ESA-ESZ	Estonia (Republic of)
ETA-ETZ	Ethiopia (Federal Democratic Republic of)
EUA-EWZ	Belarus (Republic of)
EXA-EXZ	Kyrgyz Republic
EYA-EYZ	Tajikistan (Republic of)
EZA-EZZ	Turkmenistan
E2A-E2Z	Thailand
E3A-E3Z	Eritrea
E4A-E4Z	Palestinian Authority ¹
E5A-E5Z	New Zealand – Cook Islands
E6A-E6Z	New Zealand – Niue ²
E7A-E7Z	Bosnia and Herzegovina
FAA-FZZ	France
GAA-GZZ	United Kingdom of Great Britain and Northern Ireland
HAA-HAZ	Hungary (Republic of)
HBA-HBZ	Switzerland (Confederation of)
HCA-HDZ	Ecuador
HEA-HEZ	Switzerland (Confederation of)
HFA-HFZ	Poland (Republic of)
HGA-HGZ	Hungary (Republic of)
HHA-HHZ	Haiti (Republic of)
HIA-HIZ	Dominican Republic
HJA-HKZ	Colombia (Republic of)
HLA-HLZ	Korea (Republic of)
HMA-HMZ	Democratic People's Republic of Korea
HNA-HNZ	Iraq (Republic of)
HOA-HPZ	Panama (Republic of)
HQA-HRZ	Honduras (Republic of)
HSA-HSZ	Thailand
HTA-HTZ	Nicaragua
HUA-HUZ	El Salvador (Republic of)
HVA-HVZ	Vatican City State
HWA-HYZ	France
HZA-HZZ	Saudi Arabia (Kingdom of)
H2A-H2Z	Cyprus (Republic of)
H3A-H3Z	Panama (Republic of)
H4A-H4Z	Solomon Islands
H6A-H7Z	Nicaragua
H8A-H9Z	Panama (Republic of)
IAA-IZZ	Italy

	Prefixes	Country
3A	JAA-JSZ	Japan
	JTA-JVZ	Mongolia
	JWA-JXZ	Norway
	JYA-JYZ	Jordan (Hashemite Kingdom of)
	JZA-JZZ	Indonesia (Republic of)
	J2A-J2Z	Djibouti (Republic of)
	J3A-J3Z	Grenada
	J4A-J4Z	Greece
	J5A-J5Z	Guinea-Bissau (Republic of)
	J6A-J6Z	Saint Lucia
J7A-J7Z	Dominica (Commonwealth of)	
J8A-J8Z	Saint Vincent and the Grenadines	
	KAA-KZZ	United States of America
3B6-7	LAA-LNZ	Norway
	LOA-LWZ	Argentine Republic
	LXA-LXZ	Luxembourg
	LYA-LYZ	Lithuania (Republic of)
	LZA-LZZ	Bulgaria (Republic of)
	L2A-L9Z	Argentine Republic
	MAA-MZZ	United Kingdom of Great Britain and Northern Ireland
	NAA-NZZ	United States of America
	OAA-OCZ	Peru
	ODA-ODZ	Lebanon
	OEA-OEZ	Austria
	OFA-OJZ	Finland
	OKA-OLZ	Czech Republic
	OMA-OMZ	Slovak Republic
	ONA-OTZ	Belgium
	OUA-OZZ	Denmark
	PAA-PIZ	Netherlands (Kingdom of the)
	PJA-PJZ	Netherlands (Kingdom of the) – Netherlands Antilles
	PKA-POZ	Indonesia (Republic of)
	PPA-PYZ	Brazil (Federative Republic of)
	PZA-PZZ	Suriname (Republic of)
	P2A-P2Z	Papua New Guinea
	P3A-P3Z	Cyprus (Republic of)
	P4A-P4Z	Netherlands (Kingdom of the) – Aruba
	P5A-P9Z	Democratic People’s Republic of Korea
	RAA-RZZ	Russian Federation

.....Agalega **8T ÷ 8Y**India

Prefixes	Country
SAA-SMZ	Sweden
SNA-SRZ	Poland (Republic of)
SSA-SSM	Egypt (Arab Republic of)
SSN-STZ	Sudan (Republic of the)
SUA-SUZ	Egypt (Arab Republic of)
SVA-SZZ	Greece
S2A-S3Z	Bangladesh (People's Republic of)
S5A-S5Z	Slovenia (Republic of)
S6A-S6Z	Singapore (Republic of)
S7A-S7Z	Seychelles (Republic of)
S8A-S8Z	South Africa (Republic of)
S9A-S9Z	Sao Tome and Principe (Democratic Republic of)
TAA-TCZ	Turkey
TDA-TDZ	Guatemala (Republic of)
TEA-TEZ	Costa Rica
TFA-TFZ	Iceland
TGA-TGZ	Guatemala (Republic of)
THA-THZ	France
TIA-TIZ	Costa Rica
TJA-TJZ	Cameroon (Republic of)
TKA-TKZ	France
TLA-TLZ	Central African Republic
TMA-TMZ	France
TNA-TNZ	Congo (Republic of the)
TOA-TQZ	France
TRA-TRZ	Gabonese Republic
TSA-TSZ	Tunisia
TTA-TTZ	Chad (Republic of)
TUA-TUZ	Côte d'Ivoire (Republic of)
TVA-TXZ	France
TYA-TYZ	Benin (Republic of)
TZA-TZZ	Mali (Republic of)
T2A-T2Z	Tuvalu
T3A-T3Z	Kiribati (Republic of)
T4A-T4Z	Cuba
T5A-T5Z	Somali Democratic Republic
T6A-T6Z	Afghanistan
T7A-T7Z	San Marino (Republic of)
T8A-T8Z	Palau (Republic of)
UAA-UIZ	Russian Federation
UJA-UMZ	Uzbekistan (Republic of)
UNA-UQZ	Kazakhstan (Republic of)
URA-UZZ	Ukraine

Prefixes	Country
VAA-VGZ	Canada
VHA-VNZ	Australia
VOA-VOZ	Canada
VPA-VQZ	United Kingdom of Great Britain and Northern Ireland
VRA-VRZ	China (People's Republic of) – Hong Kong
VSA-VSZ	United Kingdom of Great Britain and Northern Ireland
VTA-VWZ	India (Republic of)
VXA-VYZ	Canada
VZA-VZZ	Australia
V2A-V2Z	Antigua and Barbuda
V3A-V3Z	Belize
V4A-V4Z	Saint Kitts and Nevis (Federation of)
V5A-V5Z	Namibia (Republic of)
V6A-V6Z	Micronesia (Federated States of)
V7A-V7Z	Marshall Islands (Republic of the)
V8A-V8Z	Brunei Darussalam
WAA-WZZ	United States of America
XAA-XIZ	Mexico
XJA-XOZ	Canada
XPA-XPZ	Denmark
XQA-XRZ	Chile
XSA-XSZ	China (People's Republic of)
XTA-XTZ	Burkina Faso
XUA-XUZ	Cambodia (Kingdom of)
XVA-XVZ	Viet Nam (Socialist Republic of)
XWA-XWZ	Lao People's Democratic Republic
XXA-XXZ	China (People's Republic of) – Macao
XYA-XZZ	Myanmar (Union of)
YAA-YAZ	Afghanistan
YBA-YHZ	Indonesia (Republic of)
YIA-YIZ	Iraq (Republic of)
YJA-YJZ	Vanuatu (Republic of)
YKA-YKZ	Syrian Arab Republic
YLA-YLZ	Latvia (Republic of)
YMA-YMZ	Turkey
YNA-YNZ	Nicaragua
YOA-YRZ	Romania
YSA-YSZ	El Salvador (Republic of)
YTA-YUZ	Serbia (Republic of)
YVA-YYZ	Venezuela (Bolivarian Republic of)
Y2A-Y9Z	Germany (Federal Republic of)
ZAA-ZAZ	Albania (Republic of)
ZBA-ZJZ	United Kingdom of Great Britain and Northern Ireland
ZKA-ZMZ	New Zealand
ZNA-ZOZ	United Kingdom of Great Britain and Northern Ireland
ZPA-ZPZ	Paraguay (Republic of)

Prefixes	Country
ZQA-ZQZ ZRA-ZUZ ZVA-ZZZ Z2A-Z2Z Z3A-Z3Z Z8A-Z8Z	United Kingdom of Great Britain and Northern Ireland South Africa (Republic of) Brazil (Federative Republic of) Zimbabwe (Republic of) The Former Yugoslav Republic of Macedonia South Sudan (Republic of) ³ ³ Added immediately after RR2012 went to print
2AA-2ZZ	United Kingdom of Great Britain and Northern Ireland
3AA-3AZ 3BA-3BZ 3CA-3CZ 3DA-3DM 3DN-3DZ 3EA-3FZ 3GA-3GZ 3HA-3UZ 3VA-3VZ 3WA-3WZ 3XA-3XZ 3YA-3YZ 3ZA-3ZZ	Monaco (Principality of) Mauritius (Republic of) Equatorial Guinea (Republic of) Swaziland (Kingdom of) Fiji (Republic of) Panama (Republic of) Chile China (People's Republic of) Tunisia Viet Nam (Socialist Republic of) Guinea (Republic of) Norway Poland (Republic of)
4AA-4CZ 4DA-4IZ 4JA-4KZ 4LA-4LZ 4MA-4MZ 4OA-4OZ 4PA-4SZ 4TA-4TZ *4UA-4UZ 4VA-4VZ 4WA-4WZ 4XA-4XZ *4YA-4YZ 4ZA-4ZZ	Mexico Philippines (Republic of the) Azerbaijani Republic Georgia Venezuela (Bolivarian Republic of) Montenegro Sri Lanka (Democratic Socialist Republic of) Peru United Nations Haiti (Republic of) Timor-Leste (Democratic Republic of) Israel (State of) International Civil Aviation Organization Israel (State of)
5AA-5AZ 5BA-5BZ 5CA-5GZ 5HA-5IZ 5JA-5KZ 5LA-5MZ 5NA-5OZ 5PA-5QZ 5RA-5SZ 5TA-5TZ 5UA-5UZ 5VA-5VZ 5WA-5WZ 5XA-5XZ 5YA-5ZZ	Libya Cyprus (Republic of) Morocco (Kingdom of) Tanzania (United Republic of) Colombia (Republic of) Liberia (Republic of) Nigeria (Federal Republic of) Denmark Madagascar (Republic of) Mauritania (Islamic Republic of) Niger (Republic of the) Togolese Republic Samoa (Independent State of) Uganda (Republic of) Kenya (Republic of)

Prefixes	Country
6AA-6BZ	Egypt (Arab Republic of)
6CA-6CZ	Syrian Arab Republic
6DA-6JZ	Mexico
6KA-6NZ	Korea (Republic of)
6OA-6OZ	Somali Democratic Republic
6PA-6SZ	Pakistan (Islamic Republic of)
6TA-6UZ	Sudan (Republic of the)
6VA-6WZ	Senegal (Republic of)
6XA-6XZ	Madagascar (Republic of)
6YA-6YZ	Jamaica
6ZA-6ZZ	Liberia (Republic of)
7AA-7IZ	Indonesia (Republic of)
7JA-7NZ	Japan
7OA-7OZ	Yemen (Republic of)
7PA-7PZ	Lesotho (Kingdom of)
7QA-7QZ	Malawi
7RA-7RZ	Algeria (People's Democratic Republic of)
7SA-7SZ	Sweden
7TA-7YZ	Algeria (People's Democratic Republic of)
7ZA-7ZZ	Saudi Arabia (Kingdom of)
8AA-8IZ	Indonesia (Republic of)
8JA-8NZ	Japan
8OA-8OZ	Botswana (Republic of)
8PA-8PZ	Barbados
8QA-8QZ	Maldives (Republic of)
8RA-8RZ	Guyana
8SA-8SZ	Sweden
8TA-8YZ	India (Republic of)
8ZA-8ZZ	Saudi Arabia (Kingdom of)
9AA-9AZ	Croatia (Republic of)
9BA-9DZ	Iran (Islamic Republic of)
9EA-9FZ	Ethiopia (Federal Democratic Republic of)
9GA-9GZ	Ghana
9HA-9HZ	Malta
9IA-9JZ	Zambia (Republic of)
9KA-9KZ	Kuwait (State of)
9LA-9LZ	Sierra Leone
9MA-9MZ	Malaysia
9NA-9NZ	Nepal (Federal Democratic Republic of)
9OA-9TZ	Democratic Republic of the Congo
9UA-9UZ	Burundi (Republic of)
9VA-9VZ	Singapore (Republic of)
9WA-9WZ	Malaysia
9XA-9XZ	Rwanda (Republic of)
9YA-9ZZ	Trinidad and Tobago

International radio amateurs prefixes

3A	Monaco	8S	Svezia
3B6-7	Agalega	8T ÷ 8Y	India
3B8	Mauritius	8Z	Arabia Saudita
3B9	Is. Rodriguez	9A	Croazia
3C	Guinea Equatoriale	9B/C/D	Iran
3C0	Annobon	9E/F	Etiopia
3D6-3DA0	Swaziland	9G	Ghana
3D2	Fiji	9H	Malta
3E-3F	Panama	9i/j	Zambia
3G	Chile	9K	Kuwait
3H ÷ 3U	China	9L	Sierra Leone
3V	Tunisia	9M0	Spratly
3W	Vietnam	9M2/4	West Malaysia
3X	Guinea	9M6/8	Est Malaysia
3Y0-3Y1-3Y2	Norvegia Antartico	9N	Nepal
3Z	Polonia	9OA-9TZ	Congo
4A/B/C	Messico	9O ÷ 9T	Zaire
4D ÷ 4I	Filippine	9Q1	Kinshasa
4J/K	Azerbaijan	9Q2	Bas Congo
4L	Georgia	9Q3	Bandundu
4M	Venezuela	9Q4	Equador
4O	Montenegro	9Q5	Province Orientali
4P/Q/R/S	Siri Lanka	9Q6	North e South Kivu-Maniema
4T	Perù	9Q7	Katanga
4V	Haiti	9Q8	Oriental Kasai
4W	East Timor	9Q9	Occidental Kasai
4X/Z	Israele	9Q0	Riserva
5A	Libia	9U	Burundi
5B	Cipro	9V	Singapore
5C ÷ 5G	Marocco	9W	West/Est Malaysia
5H/I	Tanzania	9X	Ruanda
5J/K	Columbia	9Y/9Z	Trinidad
5L/M	Liberia	A2	Bedoswana
5N/O	Nigeria	A3	Tonga
5P/Q	Danimarca	A4	Oman
5R/S	Malagasy	A5	Bhutan
5T	Mauritania	A6	United Arab Emirates
5U	Niger	A7	Qatar
5V	Togo	A8	Liberia
5W	Western Samoa	A9	Bahrain
5X	Uganda	AC6	West Carolines
5Y/Z	Kenya	AH0	Is. Maria
6A/B	Egitto	AH1	Baker Howland
6C	Syria	AH2	Guam
6D ÷ 6J	Mexico	AH3	Is. Johnston
6K ÷ 6N	Sud Korea	AH4	Is. Midway
6O	Somalia	AH5	Is. Palmyra
6P ÷ 6S	Pakistan	AH5K	Kingman Reef
6T/U	Sudan	AH6/7	Hawaii
6V/W	Senag	AH7K	Is. Kure
6X	Malagasy	AH8	American Samoa
6Y	Jamaica	AH9	Is. Wake
6Z	Liberia	AL	Alaska
7A ÷ 7I	Indonesia	AM/N/O	Spagna
7J ÷ 7N	Japan	AM6	Is. Baleari
7O	Yemen	AM8	Is. Canarie
7P	Lesotho	AM9	Ceuta-Melilla
7Q	Malawi	AN	Spagna
7R, 7T ÷ 7Y	Algeria	AN6	Is. Baleari
7S	Svezia	AN8	Is. Canari
7Z	Arabia Saudita	AN9	Ceuta Melilla
8A ÷ 8I	Indonesia	AO	Spagna
8J ÷ 8N	Japan	AO6	Is. Baleari
8O	Botswan	AO8	Is. Canarie
8P	Barbados	AO9	Ceuta-Melilla
8Q	Maldiva	AP/Q/R/S	Pakistan
8R	Guayana	AT/U/V/W	India
AT4	Is. Andaman	HM	Nord Kore

AT7	.....Is. Laccadive	HN	.....Iraq
AU	.....India	HO/P	.....Panama
AU4	.....Is. Andaman	HQ/R	.....Honduras
AU7	.....Is. Laccadive	HS	.....Thailandia
AV	.....India	HT	.....Nicaragua
AV4	.....Is. Andaman	HU	.....El Salvador
AV7	.....Is. Laccadive	HV	.....Vaticano
AW	.....India	HW/X/Y	.....Francia
AW4	.....Is. Andaman	HZ	.....Arabia Saudita
AV7	.....Is. Laccadive	I0 ÷ I8, IA ÷ IZ	.....Italia
AX	.....Australia	J2	.....Djibout
AY/Z	.....Argentina	J3	.....Grenada
BA ÷ BL, BP, BR ÷ BU, BW/Y/Z	.....Cina	J4	.....Grecia
BV	.....Taiwan	J5	.....Guinea Bissa
C2	.....Nauru	J6	.....Santa Luci
C3	.....Andorra	J7	.....Dominica
C4	.....Cipro	J8	.....St. Vincent
C5	.....Gambia	JA ÷ JS	.....Giappone
C6	.....Bahamas	JT/U/V	.....Mongolia
C8/9	.....Mozambique	JW/X	.....Norvegia
CA ÷ CE	.....Cile	JY	.....Giordania
CF ÷ CK	.....Canada	JZ	.....Indonesia
CL/M	.....Cuba	KA ÷ KZ	.....USA
CN	.....Marocco	LA ÷ LN	.....Norvegia
CO	.....Cuba	L2A ÷ L9Z	.....Argentina
CP	.....Bolivia	LO ÷ LW	.....Argentina
CQ/R/S/T	.....Portugal	LX	.....Lussemburgo
CV/W/X	.....Uruguay	LY	.....Lituania
CY/Z	.....Canada	LZ	.....Bulgaria
D2/3	.....Angola	MA ÷ MZ	.....Gran Bretagna
D4	.....Capo Verde	N1 ÷ N0, NA ÷ NZ	.....USA
D5	.....Liberia	OA/B/C	.....Perù
D6	.....Comoros	OD	.....Lebanon
D7/8/9	.....Sud Corea	OE	.....Austria
DA ÷ DP	.....Germania	OF ÷ OJ	.....Finlandia
DU ÷ DZ	.....Philippines	OK/L	.....Rep. Ceca
E2	.....Tailandia	OM	.....Rep. Slovacchi
E3	.....Eritrea	ON ÷ OT	.....Belgio
E4	.....Palestina	OU ÷ OZ	.....Danimarca
E7	.....Bosnia Herzegovina	P2	.....Nuova Guinea
EA ÷ EH	.....Spagna	P3A ÷ P3Z	.....Cipro
EL/J	.....Irland	P4	.....Aruba
EK	.....Armenia	P5 ÷ P9	.....Nord Korea
EL	.....Liberia	PA ÷ PI	.....Olanda
EM/N/O	.....Ukraina	PJ	.....Antille Olandesi
EP/Q	.....Iran	PK ÷ PO	.....Indonesia
ER	.....Moldova	PP ÷ PY	.....Brasile
ES	.....Estonia	PZ	.....Surinam
ET	.....Etiopia	R0 ÷ R9, RA ÷ RZ	.....Russia
EU/V/W	.....Belarus	SO	.....Western Sahara
EX	.....Kyrgyzstan	S1A	.....principality of Sealan
EY	.....Tadikistan	S2/3	.....Bangladesh
EZ	.....Turkmenistan	S5	.....Slovenia
F ÷ FZ	.....Francia	S6	.....Singapor
G ÷ GZ	.....Gran Bretagna	S7	.....Seychelles
H2	.....Cipro	S8	.....Sud Africa
H3	.....Panama	S9	.....Sao Tome
H4	.....Is. Solomon	SA ÷ SM	.....Svezia
H6/7	.....Nicaragua	SN ÷ SR	.....Polonia
H8/9	.....Panama	SS	.....Egitto
HA ...HG	.....Ungheria	ST	.....Sudan
HB ...HE	.....Svizzera	SU	.....Egitto
HC/D	.....Ecuador	SV ÷ SZ	.....Grecia
HF	.....Polonia	T2	.....Tuvalu
HH	.....Haiti	T3A ÷ T3Z	.....Kiribati
HI	.....Rep. Dominicana	T4	.....Cuba
HJ/K	.....Columbia	T5	.....Somali
HL	.....Sud Korea	T6	.....Afganistan
T7	.....San Marino	ZA	.....Albania
T88	.....Belau	ZB ÷ Zj	.....Gran Bretagna
T9	.....Bosnia	ZK/L/M	.....Nuova Zelanda

TA	.....Turchia	ZP	.....Paraguay
TD	.....Guatemala	ZR/S/T/U	.....So Africa
TE	.....Costa Rica	ZV ÷ ZZ	.....Brasile
TF	.....Islanda	YT/u	.....Serbia
TG	.....Guatemala	YV÷YY	.....Venezuela
TH	.....Francia	Z2	.....Zimbawe
TI	.....Costa Rica	Z3	.....Macedonia
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		

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 are:

- (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-carriers 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 established 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 designated under 1.2 or 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-established 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 single channel containing quantized or digital information without the use of modulating sub-carrier (this excludes time-division multiplex).
- 2.3 2 A single channel containing quantized or digital information with 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 channels 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 APPLICATIONS

Modes to receipt of the RX AEG Telefunken E1800

- A1A – telegraphy with full main carrier (CW)
- A1B – automatic telegraphy with full main carrier (RTTY or similar)
- A2A – modulated telegraphy (MCW)
- A2B – modulated automatic telegraphy
- A3E – full main carrier, single telephon channel (amplitude modulation)
- R3E – telephony with single side band with reduced main carrier
- H3E – telephony with single side band with full main carrier
- J3E – telephony with single 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 or DSB)
- F1C – Facsimile in frequency modulation with digital signal (weather report papers)
- F3C – Facsimile in frequency modulation (RX. Images)

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.

* 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**

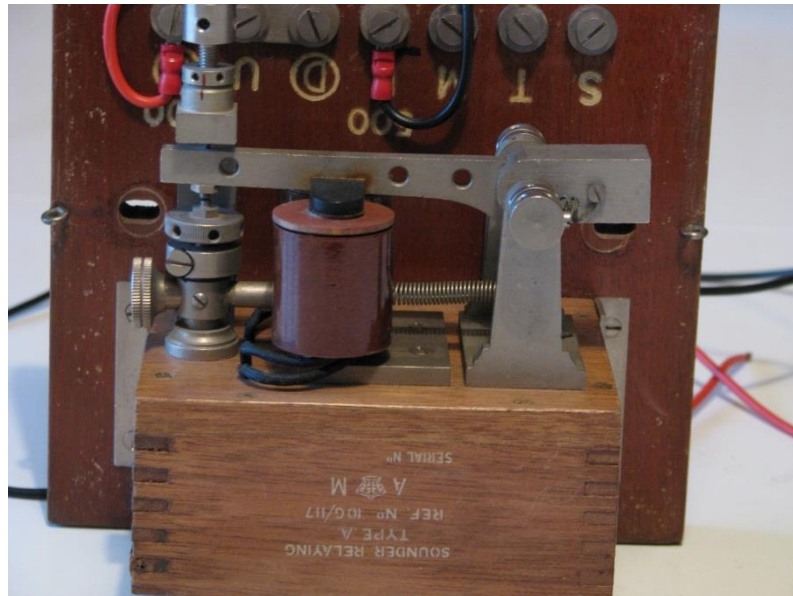


Fig 1

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 IIQOD. **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 groups 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 groups 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-transmitter, 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.

Corrpondences 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	31,5mV	
-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 μV	
-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	1000ηV	
-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	Ila	Cu	CS	4,7PE	0,72CW	66	67,5	75	120	-
11A	-	10,3	Ila	-	Cu	7,25PE	7x0,4CT	66	67,5	75	140	75-7-1
12A	12	10,3	Ila	-	Cu	7,25PE	7X0,4CT	66	67,5	75	253	
34B	-	16	Ila	-	Cu	11,6PE	7X0,63Cu	66	67,5	75	430	75-12-2
35B	24	22,1	Ila	-	Cu	17,3PE	2,65Cu	66	67,5	75	825	
58C	-	4,95	Ila	-	CT	2,95PE	19X0,18CT	66	101	50	40	50-3-1
59B	-	6,15	Ila	-	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	0,64CW	84	42,5	93	84	
122	-	4,05	Ila	-	CT	2,45PE	27X0,13CT	66	101	50	30	
164	-	22,1	Ila	-	Cu	17,3PE	2,65Cu	66	67,5	75	580	75-17-1
212	-	8,4	Ila	CS	CS	4,7PE	1,41CS	66	101	50	125	
213	-	10,3	Ila	-	Cu	7,25PE	7x0,75Cu	66	101	60	160	50-7-1
214	-	10,8	Ila	CS	CS	7,25PE	7X0,75CS	66	101	50	190	50-7-6
215	12	10,3	Ila	-	Cu	7,25PE	7X075Cu	66	101	50	220	
216	-	10,8	Ila	Cu	Cu	7,25PE	7X0,4CT	66	67,5	75	180	75-7-3
217	-	13,8	Ila	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	Ila	-	Cu	17,3PE	4,95Cu	66	101	50	936	
220	-	28,4	Ila	-	Cu	23,1PE	6,60Cu	66	101	50	1100	
221	30,4	28,4	Ila	-	Cu	23,1PE	6,60Cu	66	191	50	1430	
223	.	5,5	Ila	CS	CS	2,95PE	0,89CS	66	101	50	55	50-3-5
224	15,6	13,8	Ila	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

FREQUENCY SEGMENT (kHz)	MAX BANDWIDTH (Hz)	PREFERRED MODE AND USAGE		
135,7 - 137,8	200	CW	CW, QRSS, narrow band digital	
472 - 475	200	CW	CW,	See NOTES
475 - 479	(#)	Narrow band modes	CW, Digimodes	See NOTES
1.8 MHz	1810 - 1838	200	CW	1836 kHz - CW QRP Centre of Activity
	1838 - 1840	500	Narrow band modes	
	1840 - 1843	2700	All modes (1)	Digimodes
	1843 - 2000	2700	All modes (1)	
3.5 MHz	3500 - 3510	200	CW	Priority for intercontinental operation
	3510 - 3560	200	CW	CW contest preferred 3555 kHz - CW QRS Centre of Activity
	3560 - 3570	200	CW	3560 kHz - CW 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 (1)	Digimodes, automatically controlled data stations (unattended)
	3600 - 3650	2700	All modes (1)	SSB contest preferred 3630 kHz - Digital Voice Centre of Activity
	3650 - 3700	2700	All modes	3690 kHz - SSB QRP Centre of Activity SSB contest preferred
	3700 - 3775	2700	All modes	3735 kHz - Image Centre of Activity 3760 kHz - R1 Emergency Centre of Activity
3775 - 3800	2700	All modes	SSB contest preferred, Priority for intercontinental operation	
5 MHz	5351.5 - 5354.0	200	CW, Narrow band modes	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
7 MHz	7000 - 7040	200	CW	7030 kHz - CW, QRP Centre of Activity
	7040 - 7047	500	Narrow band modes	Digimodes
	7047 - 7050	500	Narrow band modes	Digimodes, automatically controlled data stations (unattended)
	7050 - 7053	2700	All modes (1)	Digimodes, automatically controlled data stations (unattended)
	7053 - 7060	2700	All modes	Digimodes
	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 - Region 1 Emergency Centre
	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 Activity	
10 MHz	10100 - 10130	200	CW	10116 kHz - CW QRP Centre of Activity
	10130 - 10150	500	Narrow band modes	Digimodes
14 MHz	14000 - 14060	200	CW	CW contest preferred, 14055 kHz - QRS Centre of Activity
	14060 - 14070	200	CW	14060 kHz CW 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		International Beacon Project	Beacons exclusively
	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 +/- 5 kHz - Priority for DX-peditions 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



IARU Region 1 HF band plan

Effective 01 June 2018

edited by DK4VW

	FREQUENCY SEGMENT (kHz)	MAX BANDWIDTH (Hz)	PREFERRED MODE AND USAGE	
18 MHz	18068 - 18095	200	CW 18086 kHz - CW QRP Centre of Activity	
	18095 - 18105	500	Narrow band modes	Digimodes
	18105 - 18109	500	Narrow band modes	Digimodes, automatically controlled data stations (unattended)
	18109 - 18111		International Beacon Project Beacons exclusively	
	18111 - 18120	2700	All modes	Digimode, 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 - Emergency Centre of Activity

21 MHz	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	Digimodes, automatically controlled data stations (unattended), (not SSB)
	21120 - 21149	500	Narrow band modes	
	21149 - 21151		International Beacon Project Beacons exclusively	
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	

24 MHz	24890 - 24915	200	CW 24906 kHz - CW 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		International Beacon Project Beacons exclusively	
	24931 - 24940	2700	All modes	Digimodes, automatically controlled data stations (unattended)
	24940 - 24990	2700	All modes	24950 kHz - Centre of Activity SSB QRP 24960 kHz - Digital Voice Centre of Activity

28 MHz	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		International Beacon Project Regional time shared beacons, exclusively	
	28199 - 28201		International Beacon Project Worldwide time shared beacons, exclusively	
	28201 - 28225		International Beacon Project Continuous duty beacons, exclusively	
	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 + output)	
29620 - 29700	6000	All modes	FM-Repeater output (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. (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. (LA17_C4_REC_01)

630m band Details shown in the band plan above should be understood as “proposed usage”. (VA14_C4_REC_02)

80m band It is recommended by the IARU Region 1 ARDF Working Group to include in the 3.5 MHz bandplan the new line “3,510 - 3,600 kHz – unmanned ARDF beacons”. (Davos 2005 – DV05_C4_Rec_12)

60m band Details shown in the band plan above should be understood as “proposed usage”. (LA17_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. (LA17_C4_REC_06)

**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
Region 1 HF**

For information about IARU Region 1 beacon policy see the IARU
Manager’s 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 61-01 agreement 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)

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)	
	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	
	5 830-5 850 (secondary) Space-to-earth only	These bands are used for experimental amateur satellites.

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 in 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
60 m	5351,5 – 5366,5 R1	Highest selection setting for USB voice mode on the 5363 KHz band (LA17_C4_REC_01). It should not be used for contests. It is also attributed to the amateur radio service with secondary service status. Amateur radio service stations using this frequency band must not exceed the maximum isotropic power equivalent to 15 W (e.i.r.p) (WRC-15
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 superrefraction (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 it 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 modulation 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 000km.
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

Allocation to services		
Region 1	Region 2	Region 3
kHz		
135.7-137.8 FIXED MARITIMEMOBILE Amateur	135.7-137.8 FIXED MARITIMEMOBILE Amateur	135.7-137.8 FIXED MARITIMEMOBILE RADIONAVIGATION Amateur
472-479 MARITIMEMOBILE Amateur Aeronautical radionavigation		
1 800-1 810 RADIOLOCATION	1 800-1 850 AMATEUR	1 800-2 000 AMATEUR FIXED MOBILE except aeronautical mobile RADIONAVIGATION Radiolocation
1 810-1 850 AMATEUR		
1 850-2 000 FIXED MOBILE except aeronautical mobile	1 850-2 000 AMATEUR FIXED MOBILE except aeronautical mobile RADIOLOCATION RADIONAVIGATION	

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							
	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: right-hand circular polarization

TABLE 2

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

Parameter	Value					
	PSK31 31 Bd	NBDP 50 Bd	PACTOR 2	PACTOR 3	CLOVER 2000	MFSK16
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 2018; various tables of utility; a detailed comment on the manipulation of the straight key and on the international code of signals.

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