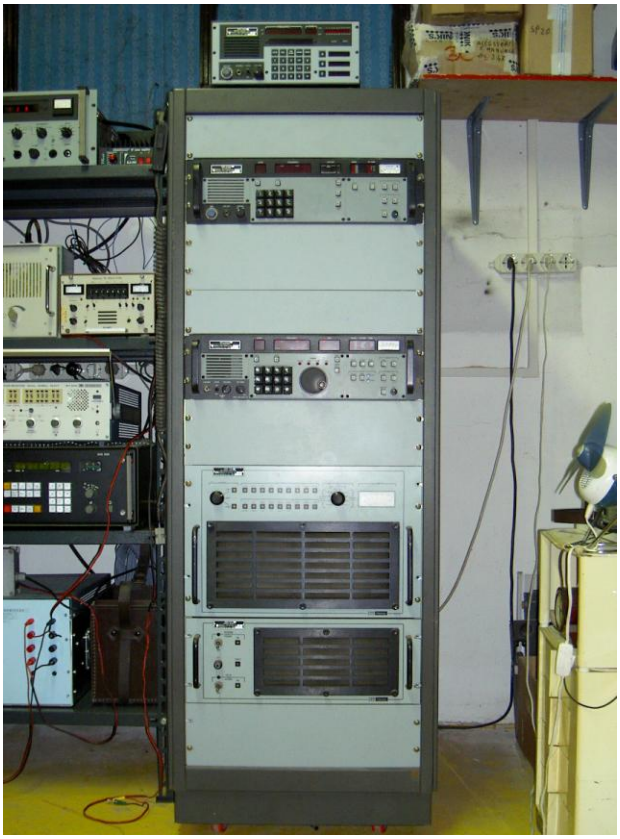
OPERATIONAL MANUAL FOR AMATEUR RADIO SERVICE

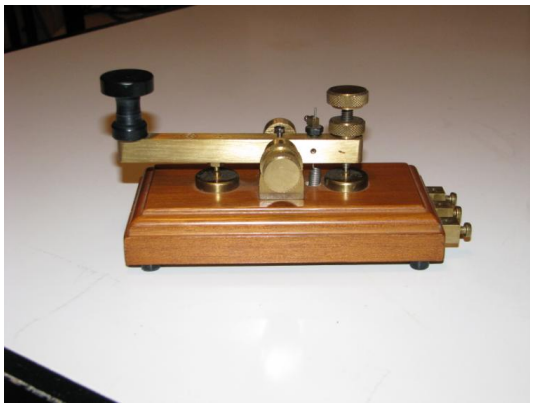
TRANSMISSION PROCEDURE

I 4 C Q O

RULES TO BE OBSERVED IN ACCORDANCE WITH THE CURRENT ITU AND IARU INTERNATIONAL MANUALS.

With a foreword by Antonio Zerbini I 1 Z B





Italian Naval "Old Rhythmers" Club

Foreword

I had known for a long time that my friend Giacomo I4CQO was writing an operational manual for Amateur service radio. However, I never imagined he would be able to condense the contents of the international ITU and IARU manuals into a clear and concise 84 pages.

I have a large affinity with Giacomo dating back to when we both became aficionados of telegraphy at the age of 12. Although we have followed different career paths, we have kept the same passion for telegraphy and subsequently radiotelegraphy. We were classified as radio-telegraphers after graduating from the RT (Navy radio operators) training school in Rome. I4CQO graduating a year before me in 1954. During an INORC meeting, which was, to the best of my knowledge, the first to be held in La Spezia, I met 14CQO. We had worked often with the QSO forty-meter, but it was the presence of the QSO "in Visu" that awoke our common interest and helped us, through differing ways, to become true radio-telegraphers.

I have Giacomo's publication, "Procedures of Transmission", in which it is possible to read the norms and standards that regulate the work of an amateur telegrapher. The manual benefits from the painstaking precision Giacomo incorporated into his work, and it is, even now, a joy to read. This manual is a necessity for every lover of radiotelegraphy who wishes to respect international procedures. It is easy to consult, and contains a precise index that indicates in a professional manner the contents of everything the serious radio operator needs to know.

This then is a presentation of the great, insightful work of my friend Giacomo I4CQO, with only a small contribution from myself to highlight salient points.

Antonio Zerbini I1ZB INORC 051(President INORC)

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INFORMATION REGARDING SERVICES FOR AMATEUR RADIO-TRANSMISSION PROCEDURES AND RELATIVE UPDATES.

Much has been written on the modes of operation for radio amateurs, different authors have filled pages of manuals for amateur radio enthusiasts with laws, decrees, dispositions and so forth, without ever going into depth on transmission procedures. This style omits information that both interests and increases the efficiency of amateur radio. This is the principle reason why radio amateurs dismiss and disregard "Procedures of transmission." Personal research into a host of amateur radio and their knowledge of transmission procedures resulted in answers relating to their incorrect use of procedures ranging from "I do it this way because everyone does" to "I have always done it this way." I have rarely, if ever, received an answer correlating with official procedure. A host of authors, especially those who have written manuals which prepare the radio amateurs for exams, continue to publish misinformation. This causes mistakes to be made or at an extreme, it creates a void of relevant information. Some invent personal rules with the misplaced belief they will improve on age-old and efficient procedure already in place. And while this can be seen as praiseworthy, all languages evolve, there is no necessity to introduce new procedures to replace those that function perfectly and have been put in place by international bodies.

International rules are dictated and updated by **ITU** (**International Telecommunication Union**) - the highest international authority on telecommunication - and **IARU** (**International Amateur Radio Union**), who have put into practice all of the **ITU** regulations for the amateur radio. However, for a long time incorrect behaviour "On Air" has been spoken about. This incorrect behaviour is highlighted in recent international meetings for Region 1 members at Cavtat in Croatia. The incorrect behaviour "On Air" was correlated into two distinct categories 1) Operational Ethics and 2) The lack of respect to procedures of transmission.

In regard to Operational ethics, reference was made to good behaviour. (See operation and amateur ethics while on air described later)

We know that in a specific context the only valid rule is that the QSO must be obtained and then closed in the shortest possible time without respect to transmission procedures. But we cannot do the same in the context of normal traffic - and unfortunately this is not what is happening today - because we would create a fracture in the network and confusion would reign supreme.

Everything that will be said from here on in is not invented or only a personal opinion, but the fruits of years of experience in the operation and study of manuals and information made available by **ITU** and **IARU** along with other publications.

We, as amateur radio, should not follow rigid rules as if we were soldiers, but we must remain conscious of the need to control ourselves and try to operate in a correct manner. The greatest current problem, however, is that the majority of amateur radio operators are operating without regard to procedure. I would ask that these operators do not make personal interpretations of regulations in place, nor do they invent their own. The correct path to take would be to understand all of the regulations and procedures which are already officially accepted and published, including updates, and to put these into practice.

Those who know the regulations of transmission procedures well and listen to the amateur traffic on all frequencies can appreciate the lack of procedural knowledge on show across the airwaves. This can be seen in Operators who call a QRZ instead of CQ, operators in CW that launch on air using only their call sign, QSO exchanging information without transmitting their own call sign and using abbreviations, and transmissions carrier on occupied frequencies and so on.

All of these actions which break with normal procedures are never sanctioned because, as stated previously, we are amateurs and as such we tolerate any behaviour that does not comply with the regulations in place. The only way to counter this phenomenon is to teach ourselves to follow the correct operating procedures, which should be the goal of all aspiring amateur radio.

Often we have heard the argument on the improper use of the **Q code**, both on air and in other forms of transmission. On air the rules impose the requirement that we must speak clearly, in a way that makes us comprehensible for everyone, which means we cannot use abbreviations or other types of signal in the message. We must use common language and not particular codes, initials or abbreviations (an exception is when there is difficulty in finding a common language. Here the rules can be bent to allow coherent exchange of information). However, it is necessary to make a statement as to this situation according to the procedures outlined in ITU or the International Code of Signals. In the Chapter on RADIOTELEPHONY it is specified that when having connection difficulties through language difficulties you are required to observe the principles of Regulation of Radio-communications of the ITU. In the case of the Q code, or other types of abbreviations, they must be pronounced using the **Phonetic Alphabet** and articulated letter for letter.

Obviously we cannot be too rigid in the application of these regulations, but we must remain within the limits of correct etiquette. We as amateur radiographers remain part of the widespread family of telecommunications and we must thus express ourselves with the correct and relative language. In the maritime sphere as well as that of the railroads and aeronautical worlds we are required to use the correct terminology for the professions and not common, everyday language. To specify the action of departure, the sailor will say "Set Sail" whereas a pilot or air-traffic controller will say "Take Off." A sailor, when he finds himself on dry land finds it difficult to say "right" when the word "Starboard" comes much more naturally. Amateur Radio when on air, especially in our mother tongues, often intercalate groups of the **Q code.** This is not meant as a violation of the rules but as an expression of the **telecommunication** language. However, how many times have we heard the misuse of **QSY** in the situation where we want to change frequency or go to another place?

At this stage it is necessary to clarify a most important point. When expressing information in the way indicated above, you need a deep and meaningful understanding of the significance of the abbreviations you are using. Otherwise you risk becoming less an amateur radio and more, as we say in Italy, A Chocolate Maker, which is to say a confusion causing practitioner of your art. An inaccuracy of expression indicates ignorance, and can cause laughter on the airwaves from those more experienced, as well as a modicum of compassion for those ignorant of the rules. How many times do we hear operators perform connections to obtain qualification using a QRZ instead of a CQ? Another example illustrating this misuse is seen in how the group of Q code has been used inappropriately and has almost become indistinguishable from the QRT group. How often do we now say I am performing a QRT? Currently it has almost become an expression of clarifying the intention of the transmission. It must be remembered, however, that this expression was born of an inaccuracy. In the Q code group, QRT specifies "Suspend the Transmission." Therefore it refers directly to another station and not the one which is transmitting. Only when the abbreviation is followed by a question mark, as in "QRT?", does it refer to the station that is tranmitting. QRT?, then, signifies "Should I stop transmitting?" In some manuals the QRT message is given both meanings, which is clearly wrong. If we do not want to twist the meanings of the groups of Q code, do not say "The QRA family". For the QRT group, as we use them, there is an affinity with their true significance. But with

QRA, what significance are we to give them if they are used to refer to the name of a specific station? How can we fit together two different meanings? There are many other improper approaches to transmitting that I hear systematically on air, but I do not have the time to specify these here.

In conclusion, it is better to know the true meaning of everything that is transmitted so as not to degenerate the radio operator's language. For the neophytes it would certainly be advisable not to take as correct procedure everything that you hear on the radio.

Terms and definitions in the world of telecommunications

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

Group. -
designates all the adjoining letters and/or numbers that compose a signal.

Numerical group. –
it is formed by one or more numbers.

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

Hour of origin. –
designates the hour in which the messageis transmitted.

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

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

Signal of procedure. –
designate a signal to facilitate the course of the transmission.

Receiving station. –
designates the station that receives the message.

Transmitting station. –
designates the station that transmits the message.

Telegraphy. –
designates an electric signal in Morse code via wire.

Telecommunications. –
designate any transmission, issue or receipt of signals, which can be: written signals, images or information of any nature by means of wire,, radio, optic or other electromagnetic systems.

Radiotelegraphy. –
Designates emissions of a Morse signal on a radiofrequency in different modes. (3)

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

Morse symbols. –

signals represented by dits an dashes 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 V7.0 Chp. 10.1)

Administration. -

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

Universal Time Coordinated (UTC). -

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

RADIO SERVICE

Radiocommunications. -

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

Radio amateur service. -

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

Radio amateur service-satellite. -

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

RADIO STATIONS AND SYSTEMS

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

Amateur station. – A station in the amateur service.

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

OPERATIONAL TERMS

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

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

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

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

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

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

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

1) The nominative is allotted an international base which allows the individualisation of the transmitting nation. The nominative is assigned to the radio station and not to the individual. An Amateur Radio, waiting to receive their licence, and so in possession of an operator's licence, can transmit provided he or she uses the nominative of the station from which he is operating.

   The nominative expressed in two letters refer directly to the transmission beacon (almost obsolete now due to the emergence of GPS).
   The nominative expressed in three letters refers directly to the terrestrial station.
   The nominative with four letters refers to a movable maritime station (the same nominative followed by a number refers to the means of rescue)
   The nominative with five letters refers to an airborne mobile station.
   The nominatives are employed for two principle reasons. A) To communicate with or call multiple stations (the nominative ID of the transmitting station must **always** be preceded by the signal of **DE** procedure. B) To speak, ask, or through a station.

2) Morse symbols, which represent letters, numbers etc. are expressed with points and lines and come separately or are arranged together. The points, lines and spaces must be made in respect to their specified duration. Their specific values are represented in the following chapter "recommendation-M. 1677R:
3) In cases where you operate the Radiotelegraph or radiotelephone, the operators must respect the Regulations of Telecommunication as et out by the International Telecommunication Union ITU.

(From handbook ITU Ed.2007 chap. 2.3)

AMATEUR SERVICE OPERATIONS AND OPERATOR TRAINING

Typical operations

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

Operating activities

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

Radiosport

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

Contesting

Contesting is a competitive usually involving an attempt to reach a goal, perhaps to make contact with as many amateur stations as possible during a given time period, on certain frequencies and within specified geographical areas. <there are contests throughout the year, particularly on weekends.

An example of contest is the “CQ-M International DX Contest” sponsored by Russian national amateur radio society – Soyuz Radiolyubitelei Rossii (SRR). The stated purpose of this contest is “to unite people in peaceful coexistence, foster mutual understanding, and engage in sportsmanship and cooperation through amateur radio”. It is normal operates on a second full weekend in May of each year on amateur service bands at 1,8 – 3,5 -7 – 14 – and 28 MHz.

Awards programmes

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

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

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

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

DXpedition

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

Amateur radio direction finding

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

High speed telegraphy

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

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

Recommendation ITU-R M.1732

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

TELEGRAPHY SYSTEMS

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

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

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

DATA COMMUNICATIONS SYSTEMS

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

PACTOR-III –This is and other voice-frequency bandwidth data communications system are gaing increased use in the amateur service. It is a software upgrade for exting PACTOR-II modem. Through the use of compression , throughput up to 5200 bit/s are achieved. Its emission symbol is **2K20J2D**

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

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

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

INTERNET WORKING

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

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

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

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

TELEPHONY SYSTEMS

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

DIGITAL VOICE

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

FREQUENCY MODULATED VOICE

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

IMAGE COMMUNICATION SYSTEMS

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

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

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

MULTIMEDIA SYSTEMS

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

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

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

THE INTERNATIONAL CODE OF SIGNALS

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

THE INTERNATIONAL CODE OF SIGNALS.

The international code of signals was created with the purpose of safeguarding lives at sea through respecting the regulations and procedures of transmission as set out by ITU.
The first International code was prepared in 1855 by a committee created by the BOARD OF TRADE (THE BRITISH BOARD OF TRADE), which was published in 1857 and adopted by the majority of maritime countries. This edition was submitted to revision in 1882. Proposals for the revision were controversial among the principal maritime powers at the Washington conference in 1889. The new version was finally completed in 1897 and distributed to all international maritime powers. However, this version failed the test that the First World War provided.
In the international radiotelegraphic conference of 1927, again held in Washington, proposals were examined for a further revision of the code and the draft was prepared in seven languages: French, Japanese, English, Italian, Spanish, German and Norwegian. The new completed version was published in 1930 and adopted in 1932 at the conference in Madrid. At the same conference, a standing committee was created with the task to submit the code to revision when and if required. This committee gathered only once in its lifetime, in 1933, to introduce new signals and changes.
In 1947, The International Telecommunications Union established that the International code would once again become the competence of the Advisory Maritime Intergovernmental Organisation (IMCO). In the first meeting of the IMCO in 1959, it was decided that the organisation would assume all functions and responsibilities of the standing committee of the International code.
In the second meeting in 1961, a project was set in motion for the total revision of the code, with the following important changes: Two new languages added - Russian and Greek. And a proposal was advanced for the compiling of a radiotelephonic code, establishing a relationship with the International code of signals. For this revision a subcommittee was formed included representatives from Argentina, France, Germany, Japan, Great Britain, Greece, Italy, Norway, The United States, and the Soviet Union. Various international government and non-government organisations collaborated on the process of a new code from fields as diverse as atomic energy, civil aviation, telecommunications, meteorology, the merchant navy, labour unions and maritime radio.
The new code was adopted at the fourth IMCO meeting in 1964.
This code was destined to be used principally in situations relating to secure navigation and in particular when difficulty in language arose. Transmissions can be made with the full range of communication methods including radiotelegraphy, with every signal having a meaning and therefore the old system of transmitting every message word for word was abandoned.
Before describing the International Code of Signals, I would like to make obvious the following point to illustrate the structure and work of the code:
Attached to the circular Number 33469 from 16 - 01 - 1969 and written by the Marine Minister, a point was made in reference to point 10, - The regulations of radio-communication, and so the Q codes and the list of abbreviations remain in force until the 30th March 1969. From the 1st of April, a series of modifications will be brought

forward, all of which were decided upon at the Conference for administration in the world of Radio-communication held in Geneva in 1967. (These changes did not affect the activity of the amateur radio enthusiast.)
The Q code was contained in appendix 13 (currently it is contained in appendix 14 of the ITU RADIO REGULATIONS ART.52). When it is necessary to make a connection using the new code, so as not to create problems and incorrect interpretations, it is necessary to transmit the group QTQ or the word INTERCO.
In the new code some changes have been made in relation to the procedure for signals of which, given the origin being ITU, must be followed in every form of transmission. Luckily there were few of these changes. The procedure signals remained unchanged with the addition of the CS which specifies the nominative of your station, and the RQ group which are to be used instead of a question mark (when spoken). Another change is the phonetic issue of numbers, which you will find in the corresponding table.
The new International code has been created to establish the method of transmission or signal whereby every emission has a significance represented in a group of letters. The groups can consist of one, two or three letters. The groups of one or two letters include also the groups for procedures. Only one group of procedures is made up of three letters, RPT, which signifies please repeat or I repeat. The majority of groups consist of two letters and are represented in such a way as to be subdivided by type of operation in such a way as to facilitate consultation. All of the groups which contain three letters are refer directly to the medical section.
The procedure signals are groups of one or more letters that have an international significance for the correct carrying out of radio traffic in all types of transmission. The groups with a small bar above the letters have to be transmitted in telegraphy united as if a single letter. E.g. $\overline{AS}$, means WAIT. $\overline{AS}$(number) means WAIT for (number minutes).

RECOMMENDATION ITU-R M. 1677

INTERNATIONAL MORSE CODE

The ITU Radiocommunication Assembly:

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

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

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

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

Annex 1

Operational provisions appllying to Morse working.

Morse code

Morse code signals

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

Letters

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

-

Figures

1	.----	**6**	-....
2	..---	**7**	--...
3	...--	**8**	---..
4	....-	**9**	----.
5	.....	**0**	-----

Punctuation marks and miscellaneous signs

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

Spacing and length of the signals

A dash is equal to three dots.

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

The space between two tetters is equal to three dots.

The space between two words is equal to seven dots.

On the Wheatstone instrument, where perforators are used, the space between two letters shall be equal to one *centre hole* perforation and the space between two words shall be equal to three *centre holes*.

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

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

Mmultiplication sign

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

Percentange or per thousand sign

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

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

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

For **4½‰** transmit **4-1/2-0/00**

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

Inverted commas (quotation marks)

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

Minute and second signs

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

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

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

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

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

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

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

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

LATITUDE AND LONGITUDE

To indicate a point of position or a QTH where it is necessary to communicate the latitude and longitude, you take the following steps:

LATITUDE

Latitude is expressed by four figures preceded by the letter L. The first two figures refer to the degrees, while the second pair refers to the minutes followed by a letter N (NORTH) or S (SOUTH). To simplify, the combination is transmitted in a unified whole.

E.g. **L3740S means Latitude 37 degrees and 40' South**.

Longitude.

Longitude is expressed with four figures and if necessary five figures preceded with the letter G. The first two or three numbers refer to the degrees while the second set of numbers refers to the minutes followed by E (EAST) or W (WEST). To simplify the transmission the letters and figures are united for transmission.

E.g. **G13925E means Longitude 139 degrees and 25' East**.

Indication of the time.

The time must be indicated with four figures of which the first two indicate the hour (from 00 - midnight - to 23.) The following two numbers indicate the minutes (from 00 to 59). The figures are preceded by the letter T to indicate local time, or the letter Z to indicate Greenwich meantime (GMT)

E.g. **T1045 (the local time is 10:45)**

Z2217 (GMT is 22:17

GENERAL RULES OF TRANSMISSION

ETHICS (GOOD BEHAVIOUR)

In amateur traffic, the first thing to respect is ethics and thus good behaviour.
In chapter 7.4 (operation and ethics of an amateur on the netweork) of the HF MANAGERS HANDBOOK 5 points of reference are described:

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

To what has already been said I would add the usual, but never wasted, recommendations.

a) Respect International transmission procedures.
b) Transmit at a frequency that does not create interference with occupied close frequencies.
c) During QSO, always leave a space between exchanges (white) to give others the possibility to enter in QSO.
d) At the end of an exchange, repeat the nominative both for the receiver and sender. Do the same at intervals when the exchange is long.
e) When the QSO is made through numerous radio amateurs, it is good etiquette to not provide long passages of information as this can come across as disrespectful to the other operators within the circle.
f) Be respectful of amateur language and telecommunications in general. For example never say "SIGLA" when making reference to a nominative and never say "ROGER" to acknowledge receipt.
g) Before entering in a multiple QSO, it is a good standard of etiquette to listen to the complete circle of participants so as to become familiar with their all.
h) If you have to send a tuning signal on a frequency that is already occupied to insert yourself in a QSO do it as quickly as possible and if possible at low power so as not to create a disturbance.
i) Try as much as possible not to transmit information that is not applicable to our service and to use other forms of communication for this purpose.
j) In CW try to separate the individual letters and words and try to respond at the same speed as the person who has answered your call.
k) In relation to the type of transmission, the frequency and the type of service you wish to perform, if you have any doubts consult the Bad Plan.

TRANSMISSION PROCEDURES.

In the telecommunication field, traffic occurs following the rules contained in the **ITU,** which are also recorded in the **International code of Signals**. These rules must be known and respected by everyone who wishes. Every branch of telecommunications (defence, police, commercial, radio amateurs etc.) adopt a particular procedure suited to their needs. All, however, must operate in respect to the above-mentioned codes. Radio amateurs must also respect the **IARU** procedures which are contained in the **HF Managers Handbook**. These codes are important enough for every radio station to be in possession of a copy. In our field, however, not only do we not find this information in the ARI, but the overwhelming majority radio amateurs ignores its existence. Luckily, among the radio amateurs there are operators who have come from a background in telecommunications and these without doubt are aware of the new and unofficial manipulation of the procedures of transmission. In the history of radio amateurs we can find cases of collaboration and in particular instances where radio amateurs have been of great assistance when intercepting stations outside of our service and have been able to play a major role in emergency situations. If today a similar emergency scenario were to occur, it would be almost impossible for the radio amateur to be of assistance if they were unaware of the specified procedures for emergency situations. This is because we are seeing a separation between our operators and those within International telecommunications along the lines of regulated procedures. (Later I will describe the procedure for emergency scenarios.)

It seems to me that in our service as radio amateurs, there exist immense gaps in Transmission procedures. For as much as I have searched, I have yet to find an official source of procedures for amateur radio enthusiasts, which certainly to my mind should be by the **IARU** which itself has drawn from the **ITU**. But nobody knows if this is the case with any certainty. The first procedural rules I have been able to track down were found in an old volume of Radio Engineering by the founder of the ARI, Ernest Montu and in the handbook ARRL. In other manuals currently available, regulations, procedures and required behaviour to which amateur radio must adhere are described. But in these manuals the descriptions are represented as set knowledge without being referenced to a source of official regulations. They are represented by the authors as information they know, and therefore what you should do. Now, I believe it is time to update these unofficial regulations and that people concerned with a lack of specific official procedures for the amateur radio should lobby IARU so that this situation can be rectified and an official version of Transmission procedures for amateur radio can be set down. In effect, as I recently read the **HF managers Handbook**, I noticed that they reference Abbreviated International signals, on which I will comment shortly. The list of abbreviations is updated to February 2009, and I must say that many OM operators to whom I have spoken know and use one group, the TU, which means "Thanks", instead of TKS-TNX specified in the list of abbreviated amateur signals. To this I can say only one thing, there should not exist the spread of popularised and unofficial abbreviations beyond those already specified in official accounts. Already, then, a new abbreviation has come into popular use, and while this creates a vibrant and evolving language it causes without official recognition, a perplexing sub-language, or slang, on the airwaves at an international level. Naturally occurring updates to radio amateur language of this kind need to be recognized and placed into official lists of abbreviations with respect to the old rules and updates which will naturally occur in the future.

GENERAL INDICATIONS

All connections between two stations begin with a call sign.
To call, you transmit the nominative of station called not more than twice, followed by the **DE** procedure signal with the nominative of the calling station and the **K** procedure signal (The invite to transmit)
If the called staion is unable to respond immediately it is obliged to transit the signal for the waiting procedure **$\overline{\text{AS}}$**(**.-...**) If the wait will go beyond ten minutes, they need to provide a reason.
You will see later the procedure to follow after the AS signal.
If the station called does not respond you may repeat the call at timed intervals.
If you want to connect to a random station, you must send a general call starting with the **CQ** transmission procedure signal, which is repeated three times, the DE signal followed by the nominative and finish with the **K** (**-.-**) procedure signal (Invited to transmit)
If you want to connect to an unspecified station in a specific country, at the end of the CQ signal you add the letter or number that indicates the country (every nominative is constructed in such a way that the first letter indicates the country or the locality of origin.)
If you want to connect to a station far from your own, you add the initials **DX** to the **CQ** signal.
During the course of the connection to a station far from your own, if we are speaking of a normal QSO, you must give all of the relevant information necessary for a radio amateur, which is **RST**, **QTH**, the name of the operator, working conditions, weather conditions and so on. It is recommended to use the sign for double line separation (**_...._**) at every change of argument. At the beginning of each message you transmit the signal (**-.-.-)**, and at the end of every exchange you transmit **$\overline{\text{AR}}$.-.-.** and you repeat the nominative of the two stations involved separated with the signal **DE** and finish with **K**. When the exchange finishes with **KN,** it means that you want to communicate only with the station connected.
If, on the other hand, this is a transmission of a telegram type message, you must adopt all relative rules to the composition of telegrams.

In all cases the message is indicated with (**.-.-.**)**$\overline{\text{AR}}$** and the end of the work with (**...-.-**) **$\overline{\text{VA}}$**.
When the exchange between the two stations is brief in nature, it is not necessary to transmit the nominative of the station that is listening but simply use **DE** (the nominative of the transmitter). If the exchange is even more brief, you can finish with **BK**, which means return to you) without transmitting the nominative.

However, the BK signal can be used for three indications.

1) In the international abbreviations BK means BREAK (interruption of transmission)
2) In the abbreviation for radio amateurs BK means operation in BREAK IN.
3) In the manual ARRL BK mean BACK TO YOU.

Considerations:
In the first use, with the exception of specific cases this is not used by radio amateurs because it is considered too intrusive.
In the second use, it is possible to avoid the use an instead use the group QSK from the Q code, which has the same significance.
The third use is that which is generally used by the radio amateur when the exchange between two stations is brief.

The importance of the DE procedure signal.
The exact definition is **"FROM" and is used to precede the name or other identification of the station that transmits**. That is to say, any nominative of a transmitting station must **always** be preceded with **DE.**
Without this prefix it becomes impossible to ascertain if the nominative expressed on air is that of the transmitter or the nominative for who that operator is searching. This can cause confusion as for example in the case where I need to connect to an operating station which is busy with a QSO as a matter of urgency and I have no idea if that station is able to hear me I would, in the pauses, transmit only that station's nominative. If they can hear me they could respond with an **AS** or **K**. With the **AS** I would wait for their availability, while with **K** I would answer **DE** plus my nominative and follow the connection. Obviously if after the transmission of their nominative I receive no reply it means that they cannot hear me.
For a long time we have been able to hear nominatives without the DE signal on air, and the cases are increasing steadily. However, they are radio amateurs that are looking to connect and by expressing their nominative without the **DE**, and without following the general directive of a **CQ.**
This type of behaviour is spreading without anyone making provision for its eradication; in fact this type of behaviour is supported by information in do-it-yourself manuals, which adds to the confusion on air.

From IARU HF Manager Hanbook. chapter 7.2

DX CALLING PROCEDURE

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

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

Signals of international abbreviation

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

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

TR Used by a land station to request the position and next port of call of a mobile station; used also as a prefix to the reply.
TU Thank you.
TXT Text *[used after a question mark in radiotelegraphy or after RQ in radiotephony (in case of language difficulties) or after RPT, to request a repetition*].
W WEST (cardinal point)
WD Word/s or Group/s
WX Weater report (or Weater report follows).
XQ Prefix used to indicate the transmission of a service note.
YZ The words which follow are in plain language.

Signals of procedure (from the international code of signals)

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

AMATEUR RADIOABBREVIATIONS

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

THE Q CODE

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

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

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

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

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

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

The Q code in use by radio amateurs

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

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

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

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

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

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

NOTE - In a number of manuals the signal QRT is given the meaning: Suspend the transmission or I am suspending the transmission. The correct meaning of this signal is: SUSPEND TRANSMISSIONS (without any other invented additions)
Never transmit QRZ? In the place of CQ. The meaning of QRZ is: Who is calling me? Which is to be used when you do not understand which station has called you.
DO not use "QRZ?" when you want to know the nominative of the station. Instead you must use "CS."

Phonetic International Code of the letters

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

Phonetic international code of numbers

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

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

PROCEDURES FOR AMATEUR RADIO TRAFFIC.

Examples of connections among amateur radio stations.

1) General call.

The first thing to do is to be sure that the frequency is free, so you need to transmit the QRL? Group from the Q code. If the frequency is occupied, you could hear a number of responses. C, yes, C QSY, and so on. However, none of these answers respects the current rules. The only correct answer in this situation is **QRL** which means "I am busy (with . . .) please do not interfere.
Obviously you must change frequency and repeat until you find a free frequency on which to transmit the call. To make a general call (to whichever station) you repeat the **CQ** signal three times followed by the procedure signal **DE** followed by the nominative repeated twice, and you finish with the procedure signal (in CW or RTTY) **K** (invite to transmit) e.g.

CQ CQ CQ de 14CQO 14CQO K

When spoken you use the phonetic alphabet to articulate every letter and/or number with the exception of **DE** that becomes **FROM** or **THIS IS** and **K** becomes **KEY,** or **OVER** or **STAND BY**. (in International commercial procedure, DE is transmitted as DELTA ECHO.)

2) To connect to another station you must repeat the nominative of that station twice followed by the procedure signal **DE** which is in turn followed by the nominative of the station making the call.

   e.g. 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 with any station in Scotland.

   CQ CQ CQ DX de I4CQO I4 CQO K

   The I4CQO station wants to connect with a distant station.

   IZ4CZJ IZ4CZJ IK4WLO IK4WLO de I4CQO I4 CQO K

   The 14CQO station is calling two stations. The stations answer in the same order as they are called.

   When a call or various exchanges are closed with the **KN** code, it means that you want to communicate only with the station connected or called.

Examples of the application of procedures.

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

The station that has transmitted the **$\overline{\text{AS}}$** performs, after the pause, performs de I4CQO QRV? K (are you ready to receive?)

The station that answers replies: de IK4WLO QRV K (I am ready to receive)

When a connection is made in **CW,** given the need to shorten the communication, you must make use of all the abbreviations allowed in the International code, either ITU or IARU.

Example of a QSO in CW between radio Amateur stations.

G5HPE G5HPE de I4CQO I4CQO K (it should be noted that between each argument there should be a separation signal **-...-** (double hyphen =).

I4CQO de G5HPE -.-.- gm tnx fer call = --start of transmission, *Good morning, thank you for answering my call. =*

Ur RST 599 599 fb = ---- Your RST signal quality is 599 and excellent =

QTH london london = ---- my QTH is London.

name john john = ----- my name is John =

OK? $\overline{\text{AR}}$ ------- Is everything OK? End message.

I4CQO de G5HPE K

G5HPE de I4CQO -.-.- gm dr john tnx fer rprt = ---- start of transmission. Good Morning dear John, thank you for relaying my signal

Ur RST 589 589 = your RST signal quality is 589

QTH parma parma = my QTH is PARMA

name jim jim = my name is Jim

hr rig rtx yaesu ft 920 abt 100 w out = working conditions here are ft920 with about 100w out power.

Ant vertical multiband butternet = vertical antenna multi band butternet

Hr wx sunny temp 22C = here the weather is sunny with a temperature of 22 degrees.

OK? $\overline{\text{AR}}$ = All is 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 my working conditions are knw transceiver with 100 watts out of power and dipole antenna.

hr wx cloudy 12C temp = here the weather is cloudy with a temperature of 12 degrees centigrade.

Dr jim QRU? $\overline{\text{AR}}$ = dear jim do you have other information for me? End transmission.

I4CQO de G5HPE k

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

nw QRU tnx fer nice QSO = have nothing more to communicate, thank you for the nice connection.

dr john pse ur QSL my qsl sure via buro = dear john please send me your QSL card, mine I will definitely send you through official channels (ARI)

hpe cuagn best dx 73 $\overline{\text{AR}}$ = I hope to connect with you again, best of luck with long distance connections, best regards. End transmission.

G5HPE de I4CQO $\overline{\text{VA}}$ = end of traffic.

14CQO de G5HPE -.-.- dr jim tnx fer nice QSO = dear Jim thank you for the connection.

my QSL sure via buro gb cuagn 73 AR = my QSL card will definitely be sent through official channels, bye and speak to you again, best regards. End transmission.

I4CQO de G5HPE $\overline{\text{VA}}$ = end of traffic.

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

OPERATIONS OF EMERGENCY

Role of the amateur service in emergency telecommunications.

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

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

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

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

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

Amateur networks available for emergency telecommunications.

Short-range networks.

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

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

Medium-range networks

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

Long-range networks

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

Communication networks have to be created in these countries where they do not currently exist, or where they are required.

It is necessary to instruct and train 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. The operator that transmits, in the feel the dots, interrupts the transmission by passing in listening. The operator that receives transmits the first letter of the last received word well. The operator that transmits, it take back the transmission from the indicated word. In this way it ends the message with the certainty of has received the whole error - free message and facilitating so the final control by accelerating the **received thing.**

Example:

Preamble

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

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

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

X - Emergency
P - Priority
R - Routine

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

Example:

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

RED CROSS LAKE CITY (destination)

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

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

Quick preamble

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

Namber
Station of origin
Filing time

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

Example:

Nr 4 XY1ZZ 1832 (number – station of origin – time)=

OSPITAL LAKE CITY=

TWO MORE AMBULANCES NEEDED AT HARBOUR STREET ==

Operation Example Phone

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

Operation example CW

YX1AA de XY1ZZ QTC K

De YX1AA QRV K

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

RED CROSS LAKE CITY **_ ... _**

PLEASE SEND US INFORMATION **_..._**

INFORMATION BUREAU FOR RIVER DISTRICT DISASTER **. _ . _.**

RPT WA PLEASE K

PLEASE SEND K

DE YX1AA QSL 32 ••• _ • _

DE XY1ZZ OK ••• _ • _

_ • _ • _ = message begins

_ ••• _ = separation sign

• _ • _ • = message end

••• _ • _ = transmission end

Phonetic alphabet

To avoid confusion use only the international phonetic alphabet..

Special cw/rtty abbreviations for emergency traffic

QOD can you communicate with me in ...

I can communicate with you in....

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

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

QTX Will you keep your station open for further communication with me - until further notice (or until ... hrs)?
I will keep my station open for further communication with you until - further notice (or until.... hrs)

QUA Have you news of ...?
Here is news of ...

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

QUM May I resume normal working?
You may resume normal working.

QRR Are you ready for automatic operation?
I am ready for automatic operation.

What to do afterwards

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

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

Activity centers global service band

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

Activity centers band for region service 1

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

EXAMPLE OF FORM FOR MESSAGES TRANSCRIPT

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

To: (BLOCK LETTERS):

From: (BLOCK LETTERS):

For radio operator use only:

RECEIVED FROM	DATE	TIME

SENT TO	DATE	TIME

INDICATION OF CENTER-TRAFFIC ON THE FREQUENCIES

CW QRS

3.555 – 14.055 – 21.055 – 28.055

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

CW

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

SSB

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

EMERGENCY

Global activity

21.360 – 18.160 – 14.300

Activity Region 1

7.110 – 3.760

DIGITAL ACTIVITY

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

SEGMENTIS OF BANDS
FAVOURITES FOR CONTESTS
From 3.510 to 3.560 CW

From 7.000 to 7.025 CW

From 14.000 to 14.060 CW

From 3.600 to 3.650 and from 3.700 to 3.800 SSB

From 7.060 to 7100 and from 7.130 to 7200 SSB

From 14.125 to 14.300 SSB

INTERNATIONAL PREFIXES

AAA ÷ ALZ	USA
AMA ÷ AOZ	SPAIN
APA ASZ	PAKISTAN
ATA AWZ	INDIA
AXA AXZ	AUSTRALIA
AYA AZZ	ARGENTINA
A2A A2Z	BOTSWANA
A3A A3Z	TONGA
A4A A4Z	OMAN
A5A A5Z	BHUTAN
A6A A6Z	UNITED ARAB EMIRATES
A7A A7Z	QATAR
A8A A8Z	LIBERIA
A9A A9Z	BAHARAIN
BAA BZZ	CHINA
CAA CEZ	CHILE
CFA CKZ	CANADA
CLA CMZ	CUBA
CNA CNZ	MOROCCO
COA COZ	CUBA
CPA CPZ	BOLIVIA
COA CUZ	PORTUGAL
CVA CXZ	URUGUAI
CYA CZZ	CANADA
C2A C2Z	NAURU
C3A C3Z	ANDORRA
C4A C4Z	CYPRUS
C5A C5Z	THE GAMBIA
C6A C6Z	BAHAMAS
C7A C7Z	W.M.O.
C8A C9Z	MONZAMBIQUE
DAA DRZ	GERMANY
DSA DTZ	REP.OF KOREA
DUA DZZ	PHILIPPINES
D2A D3Z	ANGOLA
D4A D4Z	CAPE VERDE
D5A D5Z	COMOROS
D7A D9Z	REP OF KOREA
EAA EHZ	SPAIN
EIA EJZ	IRELAND
EKA EKZ	ARMENIA
ELA ELZ	LIBERIA
EMA EOZ	UKRAINE
EPA EQZ	IRAN
ERA ERZ	MOLDOVA
ESA ESZ	ETHIOPIA
EUA EWZ	BELARUS
EXA EXZ	KIRGHIZ
EYA EYZ	TAJIKISTAN
EZA EZZ	TURKMENISTAN
E2A E2Z	THAILAND
E3A E3Z	ERITREA
E4A E4Z	PALESTINE
E5A E5Z	NEW ZELAND-COOK ISLADS
E7A E7Z	BOSNIA HERZEGOVINA
FAA FZZ	FRANCE
GAA GZZ	UNITED KINGDOM
HAA HAZ	HUNGARY
HBA HBZ	SWITZERLAND
HCA HDZ	ECUADOR
HEA HEZ	SWITZERLAND
HFA HFZ	POLAND
HGA HGZ	HUNGARY
HHA HHZ	HAITI
HIA HIZ	DOMENICAM REP.
HJA HKZ	COLUMBIA
HLA HLZ	REP. OF KOREA
HMA HMZ	REP. DEM. OF KOREA
HNA HNZ	IRAQ
HOA HPZ	PANAMA
HQA HRZ	HONDURAS
HAS HSZ	THAILAND
HTA HTZ	NICARAGUA
HUA HUZ	EL SALVADOR
HVA NVZ	VATICAN CITY
HWA HYZ	FRANCE
HZA HZZ	SAUDI ARABIA
H2A H2Z	CYPRUS
H3A H3Z	PANAMA
H4A H4Z	SOLOMON ISLANDS
H6A H7Z	NICARAGUA
H8A H9Z	PANAMA
IAA IZZ	ITALY
JAA JSZ	JAPAN
JTA JVZ	MONGOLIA
JWA JXZ	NORWAY
JYA JYZ	JORDAN
JZA JZZ	INDONESIA
J2A J2Z	DJIBOUTI
J3A J3Z	GRENADA
J4A J4Z	GREECE

J5A J5Z	GUINEA-BISSAU
J6A J6Z	SAINT LUCIA
J7A J7Z	DOMINICA
J8A J8Z	ST. VINCENT
KAA KZZ	USA
LAA LNZ	NORWAY
LOA LWZ	ARGENTINA
LXA LXZ	LUXEMBOURG
LYA LYZ	LITHUANIA
LZA LZZ	BULGARIA
L2A L9Z	ARGENTINA
MAA MZZ	UNITED KINGDOM
NAA NZZ	USA
OAA OCZ	PERU
ODA ODZ	LEBANON
OEA OEZ	AUSTRIA
OFA OJZ	FINLAND
OKA OLZ	CZECH REP.
OMA OMZ	SLOVAK REP.
ONA OTZ	BELGIUM
OUA OZZ	DENMARK
PAA PIZ	NETHERLANDS
PJA PJZ	NETHERLANDS ANTILLES
PKA POZ	INDONESIA
PPA PYZ	BRAZIL
PZA PZZ	SURINAME
P2A P2Z	PAPUA NEW GUINEA
P3A PRZ	CYPRUS
P4A P4Z	ARUBA
P5A P9Z	DEM. REP. OF KOREA
QAA QZZ	SERVICE ABBR.
RAA RZZ	RUSSIA
SAA SMZ	SWEDEN
SNA SRZ	POLAND
SSA SSM	EGYPT
SSN SSZ	SUDAN
STA STZ	SUDAN
SUA SUZ	EGYPT
SVA SZZ	GREECE
S2A S3Z	BANGLADESH
S5A S5Z	SLOVENIA
S6A S6Z	SINGAPORE
S7A S7Z	SEYCHELLES
S8A S8Z	SOUTH AFRICA
S9A S9Z	SAO THOME PRINCIPE
TAA TCZ	TURKEY
TDA TDZ	GUATEMALA
TEA TEZ	COSTA RICA
TFA TFZ	ICELAND
TGA TGZ	GUATEMALA
THA THZ	FRANCE
TIA TIZ	COSTA RICA
TJA TJZ	CAMEROON
TKA TKZ	FRANCE
TLA TLZ	CENTR. AFRICAN REP.
TMA TMZ	FRANCE
TNA TNZ	CONGO
TOA TQZ	FRANCE
TRA TRZ	GABON
TSA TSZ	TUNISIA
TTA TTZ	CHAD
TUA TUZ	IVORY COAST
TVA TXZ	FRANCE
TYA TYZ	BENIN
TZA TZZ	MALI
T2A T2Z	TUVALU
T3A T3Z	KIRIBATI
T4A T4Z	CUBA
T5A T5Z	SOMALIA
T6A T6Z	AFGANISTAN
T7A T7Z	SAN MARINO
T8A T8Z	PALAU
UAA UIZ	RUSSIA
UJA UMZ	UZBEKISTAN
UNA UQZ	KAZAKHSTAN
URA UZZ	UKRAINE
VAA VGZ	CANADA
VHA VNZ	AUSTRALIA
VOA VOZ	CANADA
VPA VQZ	UNITED KINGDOM
VRA VRZ	CHINA
VSA VSZ	UNITED KINGDOM
VTA VWZ	INDIA
VXA VYZ	CANADA
VZA VZZ	AUSTRALIA
V2A V2Z	ANTIGUA AND BARBUDA
V3A V3Z	BELIZE
V4A V4Z	SAINT KITTS AND NEVIS
V5A V5Z	NAMIBIA

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

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

INTERNATIONAL PREFIXES FOR RADIOAMATEURS

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

AT4 ……Is. Andaman
AT7 ……Is. Laccadive
AU ……..India
AU4 ……Is. Andaman
AU7 ……Is. Laccadive
AV ……India
AV4 ……Is. Andaman
AV7 ……Is. Laccadive
AW ……India
AW4 ……Is Andaman
AV7 ……..Is Laccadive
AX ……Australia
AY/Z ……..Argentina
BA ÷ BL, BP, BR ÷ BU, BW/Y/Z ……Cina
BV ……Taiwan
C2 ……Nauru
C3 ……..Andorra
C4 ……Cipro
C5 ……Gambia
C6 ……..Bahamas
C8/9 ……..Mozambique
CA ÷ CE ……Cile
CF ÷ CK ……Canada
CL/M ……..Cuba
CN ……Marocco
CO ……..Cuba
CP ……Bolivia
CQ/R/S/T ……..Portugal
CV/W/X ……Uruguai
CY/Z ……Canada
D2/3 ……Angola
D4 ……Capo Verde
D5 ……..Liberia
D6 ……Comoros
D7/8/9 ……Sud Corea
DA ÷ DP ……Germania
DU ÷ DZ ……Philippines
E2 ……..Tailandia
E3 ……..Eritrea
E4 ……..Palestina
E7 ……Bosnia Herzegovina
EA ÷ EH ……Spagna
EL/J ……Ireland
EK ……Armenia
EL ……Liberia
EM/N/O ----------Ukraine
EP/Q ……..Iran
ER ……..Moldova
ES ……Estonia
ET ……Ethiopia
EU/V/W ……Belarus
EX ……..Kyrgyzstan
EY ……Tadijkistan
EZ ……Turkmenistan
F ÷ FZ ……Francia
G ÷ GZ ……..Gran Bretagna
H2 ……..Cipro
H3 ……Panama
H4 ……Is. Solomon
H6/7 ……Nicaragua
H8/9 ……Panama
HA …HG……..Ungheria
HB …HE……Svizzera
HC/D ……Ecuador
HF ……Polonia
HH ……Haiti
HI ……-Rep. Dominicana
HJ/K ……Columbia
HL ……Sud Korea
HM ……..Nord Kore
HN ……Iraq
HO/P ……Panama
HQ/R……Honduras
HS ……..Thailandia
HT ……Nicaragua
HU ……El Salvador
HV ……..Vaticano
HW/X/Y ……..Francia
HZ ……....Arabia Saudita
I0 ÷ I8, IA ÷ IZ ……Italia
J2 ……..Djibout
J3 ……Grenada
J4 ……Grecia
J5 ……Guinea Bissa
J6 ……..Santa Luci
J7 ……Dominica
J8 ……St. Vincent
JA ÷ JS ……Giappone
JT/U/V ……Mongolia
JW/X ……Norvegia
JY ……Giordania
JZ ……Indonesia
KA ÷ KZ ……..USA
LA ÷ LN ……..Norvegia
L2A ÷L9Z ……..Argentin
LO ÷ LW ……Argentina
LX ……Lussemburgo
LY ……Lituania
LZ ……..Bulgaria
MA ÷ MZ ……Gran Bretagna
N1 ÷N0, NA ÷ NZ ……USA
OA/B/C ……Perù
OD ……..Lebanon
OE ……Austria
OF ÷ OJ ……..Finlandia
OK/L ……Rep. Ceca
OM ……Rep. Slovacchi
ON ÷ OT ……Belgio
OU ÷ OZ ……Danimarca
P2 ……..Nuova Guinea
P3A ÷ P3Z ……Cipro
P4 ……Aruba
P5 ÷ P9 ……Nord Korea
PA ÷ PI ……Olanda
PJ ……Antille Olandesi
PK ÷ PO ……Indonesia
PP ÷ PY …….. Brasile
PZ ……..Surinam
R0 ÷ R9, RA ÷ RZ ……..Russia
SO ……..Western Sahara
S1A ……principality of Sealan
S2/3 ……Bangladesh
S5 ……Slovenia
S6 ……Singapor
S7 ……Seychelles
S8 ……Sud Africa
S9 ……..Sao Tome
SA ÷ SM ……..Svezia
SN ÷ SR ……Polonia
SS ……..Egitto
ST ……..Sudan
SU ……Egitto
SV ÷ SZ ……Grecia
T2 ……Tuvalu
T3A ÷ T3Z ……Kiribati
T4 ……..Cuba
T5 ……Somali
T6 ……Afganistan

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

From HF Manager Handbook IARU REG.1 EDZ. V7 (feb 2009)
Cap. 10.2
CLASSIFICATIONS

SYMBOLS OF EMISSIONS FOR CHARACTERISTICS OF BASE

Symbols of characteristics of base am:

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

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

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

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

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

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

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

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

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

EXAMPLES OF APPLICATIONS

Modes to receipt of the RX AEG Tlelefunken E1800

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

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

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

COMMENTS ON THE USE OF A STRAIGHT KEY.

We should remember that telegraphy was created before radiotelegraphy (patent: Morse 1840) therefore communication in Morse code, before the advent of radio, occurred without the emission of any sound. A small machine printed onto strips of paper, characters (dots and dashes) to represent the output from a remote operator. The only thing we could hear were the noises made by the lever, which was operated by a relay (corresponding to the noise of typing on a keyboard), that hit the strips of paper leaving the sign of dots and dashes behind. These coded messages were then read and translated into normal written language.

Very soon, however, operators learnt to translate the Morse signals directly from the noise of the relay, without the need to look at the characters inserted into the ribbon. This obviously saved considerable time, and created the system of sounder receipt, whereby the noise of the relay was amplified for the operator to hear the code clearly and no ribbon representation of the Morse code was created.**See Fig. 1**

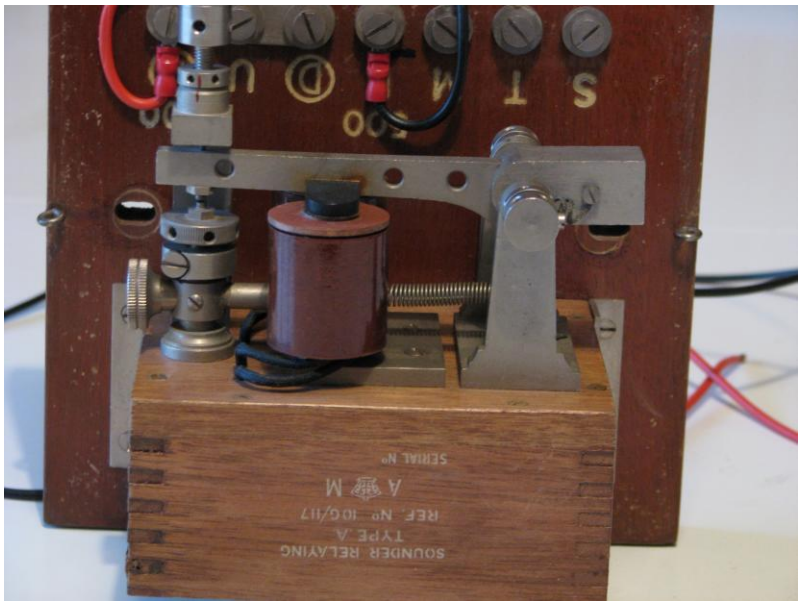


Fig 1

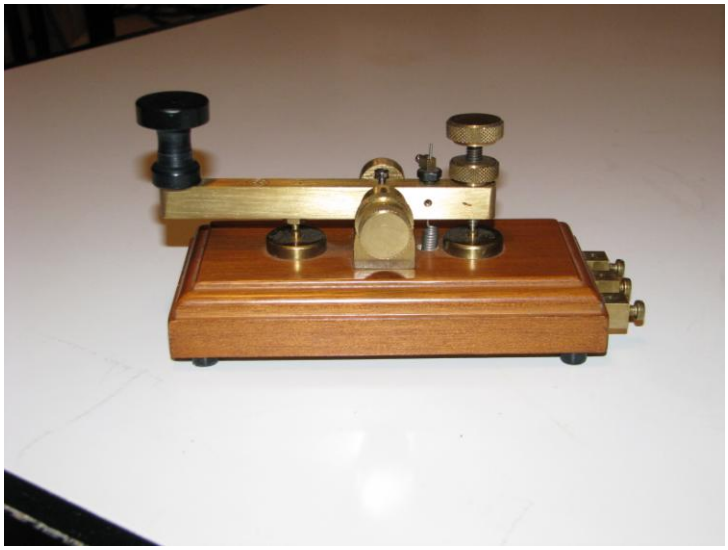
I have already prepared a DVD that shows everything I am going to describe - you can see this on the site **morsegroup.org** by clicking on the FILMED VIDEO link and then accessing USE OF THE STRAIGHT KEY. The spur for me to make to take this step

has been my observation of other videos on the web which demonstrate that even on an international level there is a lack of knowledge on how to operate a straight key correctly. Among all of the recordings I have seen (more than 40) from different nationalities, the correct manipulation of the straight key is never represented. The motive for this is easily identified. Radio amateurs, who wish to operate in CW, participate on courses to pass the CW exam. However, these courses concentrate on the receipt of Morse and not its sending. In fact it is enough to procure an electronic key to facilitate transmission.

Many object to the use of the straight key as it causes the operator to tire quickly. However, I would argue that this tiredness occurs exactly because of the incorrect manipulation of the key as mentioned before. It seems inconceivable that the straight key can provoke such exhaustion now when upon its introduction operators worked without interruption through long shifts.

With this description I do not intend to provide lessons on the correct use of the straight key, especially not to members of INORC who are almost without exception expert operators. Instead I hope to illustrate better technique to those of us who are passionate about the straight key but who would like to improve their fluidity and technique.

It is pertinent to start with the characteristics of the straight key. The best key in terms of comfort and size is the old man telegraphic **See Fig. 2.**



Fig, 2

The distance from the summit of the hilt and the surface of the table is roughly eight centimeters. The peg is grasped according to personal preference - I prefer to use four fingers, excluding the little finger, and holding the thumb and ring finger on the

underlying diskette. The way of holding the instrument holds minor importance, it must however feel comfortable. What is of the utmost importance is the movement of the wrist. The wrist moves with an action that pushes the fingers down forcing pressure on the lower part of the key. Fingers must not be moved. It is this movement that causes the excessive tiring of the wrist. The correct position of the arm is with the forearm extended and supported along its entire length up to the elbow. The position of the key must be such that it allows the full extension of the forearm. During transmission the forearm must remain supported at all times with movement restricted to the wrist. In this way, it is possible to transmit for long periods of time without causing weariness. Regulating at intervals the run and tension of the spring, with good training, you can easily exceed the speed of 120 characters a minute. Obviously this refers to basic station. In a basic station it is impossible to find a straight key with low pegs or with the key set at the near edge of a table because this would inhibit comfortable use of the key.

Fig 3 shows various straight keys at a basic station.

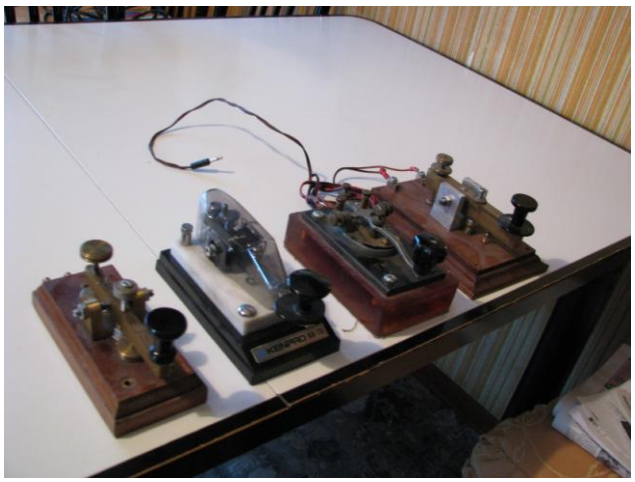


Fig 3

The use of a straight keys without a support for the arm is permitted only in specified situations e.g. field stations and in emergency. **Fig. 4** represents deriving keys from military surplus.

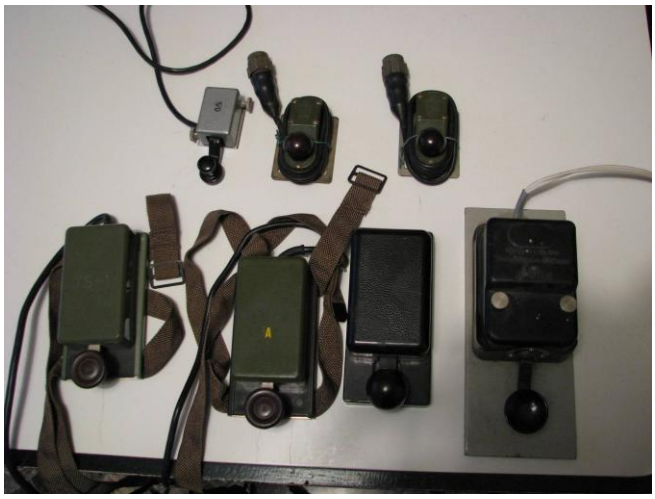


Fig. 4

With the advent of radio the straight keys evolved. After the straight key was the horizontal semi-automatic key, then came the electronic BUG, and finally even to devices with a keyboard that automatically transmit the typed letters. These new methods of transmission have given the possibility to transmit with greater clarity, greater speed and mainly to reduce the weariness of the operator.

The choice of key is made in accordance with the predisposition of the operator and the service that needs to be performed. For example, a radio amateur participating in a contest, and the need to speed up communication, will opt for the device with which he is able to support his goals.

A consideration, however, is that apart from the straight key, all the other devices are more or less automatic and thus impersonal as they transmit signals automatically both the proportion of dots and dashes and the spaces between are not controlled by the operator.

I, in all cases, prefer the use of the straight key. Obviously I am unable to transmit with the perfect timing of an automatic machine. But every good operator has their imperfection and it is this that characterizes the truly personal way of communicating. The use of the straight key can be compared to the use of handwriting. Each person has a distinct calligraphy just as every straight key operator has their own distinct style.

When I served in the RT in the Navy I was able to identify the individual operator solely from the rhythm and feel of their communication.

The straight key itself has also evolved. There exist today straight keys which allow a fluid manipulation as the telegraphic key has been modified. The horizontal pivot has been eliminated and replaced with one which rotates on ball-bearings. Also there is the

Swedish straight key which has eliminated the horizontal pivot and replaced it with a steel-foil that functions also as a spring. Here contact is not made by in a from-up-to-down movement on the peg of the hilt as in traditional keys, but from low-to-high to high movement on the extremity opposite the hilt. The Great British Navy used this type of key. In commerce you can acquire one of these keys through military surplus. I obtained one from England which was delivered to me in Italy. See Fig. 5.

See Fig. 5.

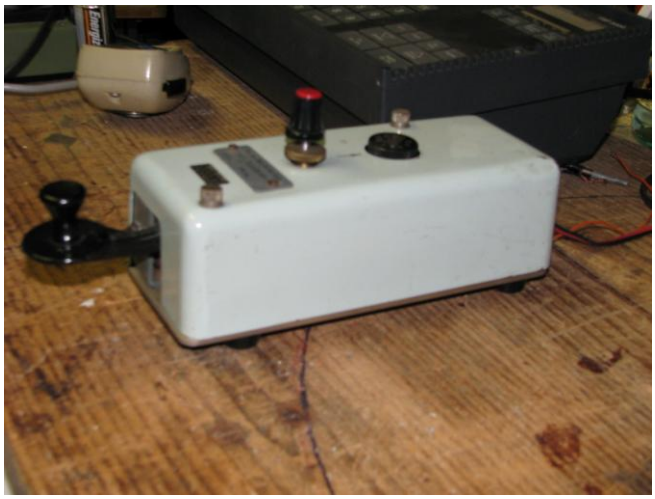


Fig. 5

However, the most beautiful straight key that I use with pride was built by my friend and colleague **INORC I1QOD see Fig.6.**

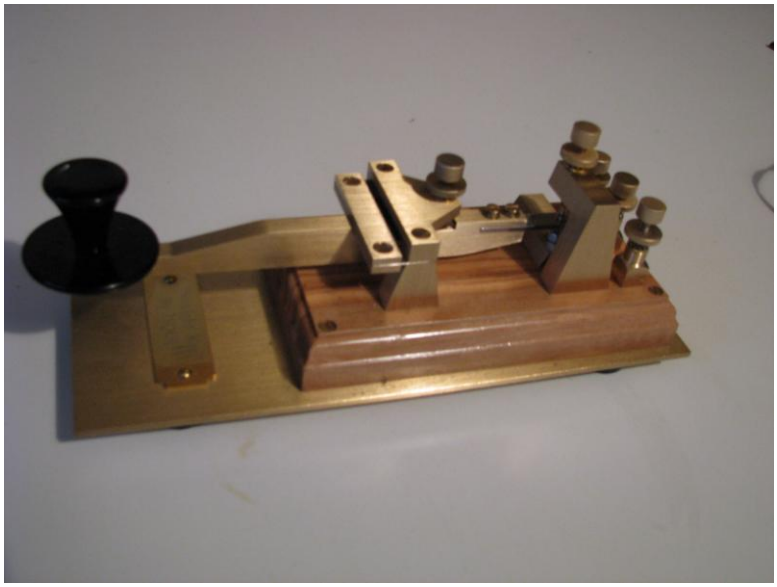


Fig.6

ADVICE TO IMPROVE THE ABILITY OF THE OPERATOR.

Transmission.

To improve the cadence of the transmission, it is recommended that you follow the following exercise. From an automatic transmission device (The same that is used to exercise receipt) transmit groups of 3,4 or 5 letters or numbers. Every group you repeat ten or fifteen times and, with the key disconnected (you need to only hear the sound of the key) you need to manipulate the group you receive pretending to transmit that to which you are listening. When you have the same cadence, you change group. Obviously when you have reached the desired results, you change speed.

Receipt

For exercises in reception there are many computer programs that allow many types of exercise. I will not describe them as to try to do so would leave me tangled in the scope of these programs.
I have always used, especially when teaching, the tools that I will now describe to you.
The RFT MG80M (origin, Military surplus EX DDR)

See Fig. 7.

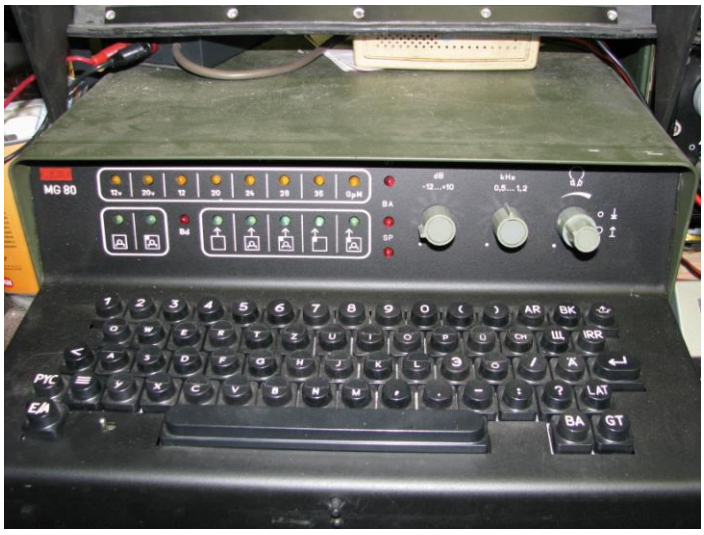


Fig. 7

When this machine, which provides the possibility to change the speed of transmission, you can transmit more than 3000 texts of 50 groups composed of 3, 4 or 5 letters, numbers or a mixture of the two. It has a vast memory that can be used in more fanciful conditions and a multitude of other uses as a microprocessor manages all the functions of the machine. The MG80M is commercialized by different German suppliers and is available with all its accessories for around 80 Euro. For this machine I have prepared a detailed manual of use.

Another machine which can be used together with the MG80M is the RFT FP12 PRACITRONIC (also this is EX DDR military surplus)**See Fig.8.**

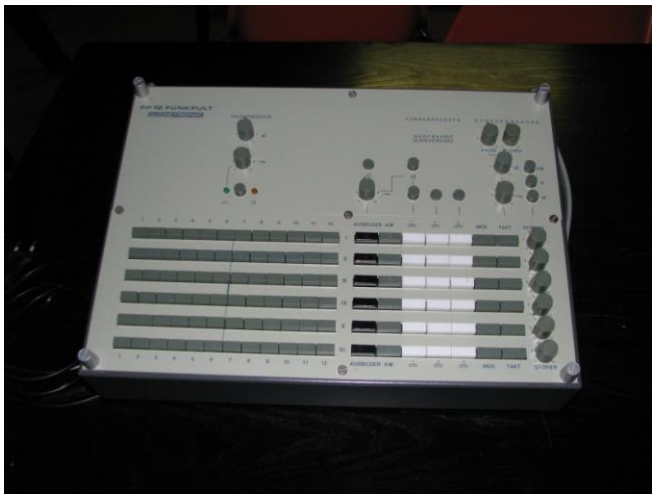


Fig. 8

This Item was conceived for the purpose of reception exercises for an indefinite number of operators, while for reception-transmission it is predisposed for a maximum of 12 operators. The entire machine consists of 13 keys, 13 headphones, two recorders, a speaker and many other accessories. With regards to reception, other than generating its own signal, it can elaborate on any signal received from outside e.g. from MG80M. It can mix the signal with local disturbances like rustles and whistles of varying strength and it can mix incoming signals with those we really can hear on the radio. With this type of exercise, students are placed in real world examples of reception problems that occur in general radio traffic. With regard to the reception-transmitter, the twelve students can communicate with each other as well as the instructor, while some can be placed in a position of precarious reception. This apparatus is also predisposed to be used in field situations.

Corripondences table amog dbm V W e S-Meter

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

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

dbm	mV	R **S** T
-53	0,50	9+20
-54	0,45	
-55	0,4	
-56	0,35	
-57	0,32	
-58	0,286	
-59	0,251	
-60	0,225	
-61	0,2	
-62	0,18	
-63	0,16	9+10
-64	0,141	
-65	128 **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	1000**ηV**	
-108	900	
-109	800	3
-110	710	
-111	640	
-112	580	
-113	500	
-114	450	
-115	400	2
-116	355	
-117	325	
-118	286	
-119	251	
-120	225	
-121	200	1
-122	180	
-123	160	
-124	141	
-125	126	
-126	117	
-127	100	
-128	90	
-129	80	
-130	71	
-131	61	
-132	58	
-133	50	
-134	45	
-135	40	
-136	35	
-137	33	
-138	29	
-139	25	
-140	23	

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

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

1 = INITIALS OF THE CABLE

-

2 = EXTERNAL DIAMETER ARMOR

3 = EXTERNAL DIAMETER SCABBARD

4 = TYPE OF SCABBARD

I = PVC black (-40° to 80° +)

IIa = PVC black (-40° to 90° +)

IIIa = PE black (-55° to 85° +)

5 = MATERIAL STOCKINGS

Cu = COPPER

CT = STAGNATED COPPER

CS = COPPER SILVERY

6 = EXTERNAL DIAMETER AND DIELECTRIC TYPE

PE = POLYETHYLENE

PSA = POLYETHYLENE AND AIR

7 = DIAM. AND MATERIAL - CONDUCTOR-- CENTRAL

Cu = COPPER

CT = STAGNATED COPPER

CS = SILVERY COPPER

CW = (copper plated steel) COPPERWELD

8 = PROPAGATION SPEED

9 = CAPACITY IN PF for METER

10 = IMPEDANCE

11 = PESO IN km for kg

12 = TYPE ANSWERABLE TO STANDARDS IEC

IARU REGION 1 HF BAND PLAN – Effective 29th March 2009

Frequency (KHz)	Max bandwidth /(Hz)	Preferred mode and usage
135,7 ÷ 137,8	**200**	CW QRS and narrow digital modes……

Stations in the amateur service using frequencies in the band **135,7 ÷137,8** KHz shall not exceed a maximum radiated power of **1W** (e.i.r.p.) and shall not cause harmful interference to stations of the radionavigation service operating in countries listed in N° **5.67 (WRC-07)**

The use of the band **137,5 ÷ 137,8** KHz in Algeria, Egypt, Iran, Iraq, Libyan Arab Jamahirya, Lebanon, Siryan Arab Republic, Sudan and Tunisia, is luimited to the fixed and maritime mobile services. The amateur service shall non be used in the above mentioned countries in the band 135.7 – 137.8 KHz, and this should be taken into account by the contries authorising such use.

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

3500 ÷ 3510	**200**	CW, Priority for intercontinental operation **……**- --
3519 ÷ 3560	**200**	CW contest prefered, 3555 KHz - QRS centre activity…….. .----
3560 ÷ 3580	**200**	**C**W, 3560 QRP centre activity……
3580 ÷ 3590	**500**	Narrow band modes . Digimodes ……
3590 ÷ 3600	**500**	Narrow band modes– digimodes, automaically……..….
-		controlled data stations (unattended)----------…----------
3600 ÷ 3620	**2700**	All modes, digimodes, automatically controlled data……..….
-		station (unattended) (*)… ……..…...
3600 ÷ 3650	**2700**	All modes, 3630 digital voice centre of activity……
3650 ÷ 3700	**2700**	All modes, 3690 QRP SSB center of activity. **…….**
3700 ÷ 3800	**2700**	All modes, SSB contest preferred……..…
3775 ÷ 3800	**2700**	All modes, Priority for intercontinental operation ……..……

7000 ÷ 7025	**200**	CW, contest preferred----------
7025 ÷7040	**200**	CW, 7030 KHz QRP centre 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, digimodes, automatically controlled data stations (unattend
7053 ÷ 7060	**2700**	All modes, digimodes----------
-7060 ÷ 7100	**2700**	All modes, SSB contest prefered, 7070 digital voice centre of activity
		7090 QRP SSB centre activity.----------
7100 ÷ 7130	**2700**	All modes, 7110 Emergency center activity Reg. 1----------
7130 ÷ 7200	**2700**	All modes, SSB contest prefered, 7165 Image centre activity

7175 ÷ 7200	**2700**	All modes, priority for intercontinental operation .----------
10100 ÷ 10140	**200**	CW, 10116 QRP centre of activity ----------
10140 ÷ 10150	**500**	Narrow band modes, digimodes .----------

SSb may be use during emergencies involing the immediate safety of life and property and only by stations actually involved in the handling of emergency traffic.

14000 ÷ 14060	**\200**	CW, contest prefered, 14055 QRS centre of activity ---------
14060 ÷ 14070	**200**	CW, 14060 QRP-centre of activity----------
14070 ÷ 14089	**500**	Narrow band modes , digimodes----------
14089 ÷ 14099	**500**	Narrow band modes, automatically controlled data stations
14099 ÷ 14101		IBP, exclusively for beacons.----------
14101 ÷ 14112	**2700**	All modes, digimodes, automatcally controlled data stations s ----------(unattended)----------
13112 ÷ 14125	**2700**	All modes----------
14125 ÷ 14300	**2700**	All modes, SSB contest preferred ----------
		14130 digital voice centre of activity ----------
		14195 ± 5 KHz priority for DXpedicions----------
		14230 image centre of activity ----------
		14285 QRPcentre of activity ----------
14300 ÷ 14350	**2700**	All modes, 14300 global emergency centre of activity--------

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18068 ÷ 18095	**200**	CW, 21055 QRS centre of activity, 21060 QRP centre of----
---------- activity-------		
18095 ÷ 18105	**500**	Narrow band modes , digimodes----------
18105 ÷ 18109	**500**	Narrow banda modes , digimodes automatically----------
---------- controlled data stations (unattemded----------)-		
18109 ÷ 18111		IBP exclusively for beacons----------
18111÷ 18120	**2700**	All modes- digimodes, automatically controlled data statons-- ----------(unattended)----------
18120 ÷ 18168	**2700**	All modes, 18130 SSB QRP centre of activity.----------
		18150 digital voice centre of activity----------
		18160 Global emergency centre of activity----------
21000 ÷ 21070	**200**	CW, 21055 QRS centre of activity ----------
		21060 QRP centre of activity----------
21070 ÷ 21090	**500**	Narrow band modes – digimodes----------
21090 ÷ 21110	**500**	Narrow band modes – digimodes, automatically -----
		controlled data stations (unattended)------
21110 ÷ 21120	**2700**	All modes, (excluding SSB) – digimodes, ----------
		automatically controlled data stations (unattended)
21120 ÷ 21149	**500**	Narrow band modes----------
21140 ÷ 21151		IBP, exclusively for ----------
21151 ÷ 21450	**2700**	All miodes, 21180 digital voice centre of activity----
		21285 SSB QRP centre of activity----------
		21340 image centre of activity----------
		21360 global emergency centre of activity-------y---

24890 ÷ 24915	**200**	CW, 24906 QRP centre of activity----------
24915 ÷ 24925	**500**	Narrow band modes, digimodes ----------
24925 ÷ 24929	**500**	Narrow band modes, modi digimodes automatically ---------- controlled data stations. (unattended.)----------
24929 ÷ 24931		IBP exclusively beacons----------
24931 ÷ 24940	**2700**	All modes,digimodes, automatically controlled data stations (----------(unattended)----------
24940 ÷ 24990	**2700**	All modes, 24960 digital voice centre of activity----------

28000 ÷ 28070	**200**	CW, 28055 QRScentre activity , 28060 QRP centre activity -
28070 ÷ 28 120	**500**	Narrow band modes, digimodes----------
28120 ÷ 28150	**500**	Narrow band modes, digimodes, automatcally controlled. ---------- data stations (unattended----------)
28150 ÷ 28190	**500**	Narrow band modes----------
28190 ÷ 28199		IBP, regional time shared beacons----------
28199 ÷ 28201		IBP, worldwide time shared beacons----------
28201 ÷ 28225		IBP, continuous duty beacons ----------
28225 ÷ 28300	**2700**	All modes, beacons----------
28300 ÷ 28320	**2700**	All modes, digimodes automatically controlled data stations-- ----------(unattended)----------
28320 ÷ 29200	**2700**	All band modes---------- 28330 digital voice centre of activity---------- 28360 QRP SSB centre of activity---------- 28680 Image centre of activity----------
29200 ÷ 29300	**6000**	All modes, digimodes automatically controlled data stations - ----------(unattended)----
29300 ÷ 29510	**6000**	Satellite- down link----------
29510 ÷ 29520		Guard-channel----------
20520 ÷ 29550	**6000**	All modes. FM simplex- 10 KHz channels----------
29560 ÷ 29590	**6000**	All modes, repeater FM input (RH1-RH4)----------
29600		All modes, calling FM channels----------
29610 ÷ 29650	**6000**	All modes, FM simplex 10 KHz channels----------
29660 ÷ 29700	**6000**	All modes, FM repeater outputs (RH1 – RH4)----------

Member societies should advise operators not to transmit on frequencies between 29.3 and 29.51 MHz to avoid interference to amateur satellite downlinks.

Prefered NBFM operating frequencies on each 10 KHz from 29.210 to 29.290 MHz inclusive should be used.
A deviation of ±2.5 KHz being used with 2.5 KHz as maximum modulation frequency.

DEFINITIONS

All modes - CW, SSB, and those modes listed as Centre 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 badwidth, including CW, RTTY, PSK etc.

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

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

Appliations 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 Artcle 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.

λ mt	Frequency band (KHz) (R=Region)	APPLICATIONS
160	1810÷1850 R1 1800λ2000 R2,R3	Its propagation characteristics allow short-range communications during daytime hours, and medium and long-range communications during night-time hours. This band is particulary useful during sunspot minima, when the maximum usable frequency (MUF) is below 3500 KHz.
80	3500÷3800 R1 3500÷4000 R2 3500÷3900 R3	This band is used for contacts over distances of up to 500 Km during the day, and for distances of 2000 Km ad more at night. It is heavily used during communications emergencies.
40	7000÷7200 R1, R2 7000÷7300 R3	The 7 MHz band is heavily used 24 hours each day. During daylight hours, the dand carries the builk of amateur sky wave communication over distances of less than 1300 Km.
30	10100÷10150 All regions in secondary	This band is in use 24 hours each day, as a bridge between the 7 MHz and 14 MHz bands.
20	14000÷14350	This is the most popular band for intercontinental communications.
17	18068÷10168	The band is used as an alternative to 14 MHz which is iften congested with traffic.
15	21000÷21450	These bands are used particularly during the daytime and when susspot activity is high.
12	24800÷24990	
10	28000÷29700	

λ mt	Frequency band MHz (R=Region)	APPLICATIONS
6	50÷52 o 50÷54 R1 50÷54 R2, R3	This band is used for local communication at all times, including telecommand of objects such as models. Sky wave, tropospheric satter and meteor burst propagation are used for distances up to 2000 Km.
2	144÷146 R1 144÷148 R2, R3	This band is heavily used throughout the word for short-range communications including the use of repeaters.
1,25	220÷225 R2	Where allocated, this band serves as alternative to the 144 MHz band short-range communications.

λ	Frequency band MHz (R=Regiun)	APPLICATIONS
70 cm	**430÷440 R all Secondary**	This band is used for short-range communications including amateur analogue and digital television. Amateur use of this band is generally secondary to radiodetermination.
	430÷450 440÷450 certain countries (secondary)	
33 cm	**902÷928 R2 Secondary**	The 902 MHz band is allocated to the amateur service only Region 2, where it is also used for industrial, scientific and medical applications, and low-power devices.
23 cm	**1240÷1300 Secondary**	These bands are used for short-range communications and for experimentation.
13 cm	**2300÷2450 Secondary**	
9 cm	**3300÷3500 R2, R3 Secondary**	
5 cm	**5650÷5850 R1, R3 5650÷5925 R2**	
λ	**Frequency band GHz**	
3 cm	**10÷10,5 Secondary**	
1,2 cm	**24÷24,05 Primary**	
6 mm	**47÷47,2**	
4 mm	**76÷77,5 Secondary**	
	77,5÷78 Primary	
	78÷81 Secondary	
2,5 mm	**122,25÷123 Secondary**	
2 mm	**134÷136 Primary**	
	136÷141 Secondary	
1 mm	**241÷248 Secondary**	
	248÷250 Primary	

TABLE 1

Characteristics of amateur systems for Morse on-off keying

Parameter	Value							
Mode of operation	CW Morse 10 - 50 baud				CW Morse < 20 baud (Eart-moon-Eart)			Slow Morse ≤1 baud CW
Frequency band (MHz) (1)	1.8 - 7.3	10.1 - 29.7	50 - 450	902 -47200	144	432	1296	0.136
Necessary bandwitdh and class of emission (emission designator)	150HA1A 150HJ2A	150HA1A 150HJ2A	150HA1A 150HJ2A	150HA1A 150HJ2A	50H0A1A 50H0J2A	50H0A1A 50H0J2A	50H0A1A 50H0J2A	1H00A1B 1H00J2B
Transmitter power (dB W) (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
Transmitter antenna gain (dB)	-20 to 15	-10 to 21	0 - 26	10 - 40	20 - 26	20 - 26	25 - 40	-22
Tipical e.i.r.p. (dB W)	-17.2 to 46.5	-7.3 to 52.4	2 - 55	1 - 45	38 - 55	38 - 55	68	1
Antenna polarization	Horizzontal Vertical	Horizzontal Vertical	Horizzontal	Horizzontal Vertical	Horizzontal	Horizzontal Vertical LHCP RHCP	Horizzontal Vertical LHCP RHCP	Vertical
Receiver IF bandwitdh (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	O.5 - 2	1 - 7	1	1	1	13

(1) With the exception of the band around 0.136 MHz, the amateur bands within the frequency ranges shown conform to RR Aerticle 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 2

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

Parameter	Value					
Mode of operation (1)	PSK31	NBDP	PACTOR 2	PACTOR 3	CLOVER 2000	MFSK 18
	31 BAUD	50 BAUD				
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 bandwitdh and class of emission (emission designator)	60H0J2B	250HF1B	375HJ2B	2K20JED	2K00J2D 2K00JEB	316HJ2D 316HJ2B
transmitter power (dB W) (3)	3÷1,7	3÷1,7	3÷1,7	3÷1,7	3÷1,7	3÷1,7
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÷21	-20÷21	-20÷21	-20÷21	-20÷21	-20÷21
Typical e.i.r.p (dB W)	-17,2÷52,5	-17,2÷52,5	-17,2÷52,5	-17,2÷52,5	-17,2÷52,5	-17,2÷52,5
Antenna polarizzation	Horizontal vertical	Horizontal vertical	Horizontal vertical	Horizontal vertical	Horizontal vertical	Horizontal vertical
ReceiverFI bandwitdh (KHz)	0,5	0,5	0,5	2,7	2,4	0,5
Recevier noise figure (dB) (4)	7÷13	7÷13	7÷13	7÷13	7÷13	7÷13

(1) PSK 31 is data system using PSK at 31.1 bauds. PACTOR 2 is a data system using DPSK modulation with rates varyng according to cvonditions. 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. MFSK 16 is data system using 16-tone FSK and forward error corretion.

(2) Amateur bands within the frequency ranges shows conform to RR Article 5.

(3) Maximum powers are determinated 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	Valori					
Mode of operation		SSB voice			FM voice	
Frequency band (MHz) (1)	1,8÷7,5	10,1÷29,7	50÷450	902÷47200	50÷450	90247200
Necessary bandwitdh and class of emission (emission designator)	2K70J3E	2K70J3E	2K70J3E	2K70J3E	11K0F3E 16K0F3E 20K0F3E	11K0F3E 16K0F3E 20K0F3E
Transmitter power (dB W) (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÷15	-10÷21	0÷23	0÷40	0÷26	0÷40
Typical e.i.r.p (dB W)	16,8÷46,5	-7,3÷52,4	2÷53,7	1÷45	2÷55	1÷45
Antenna polarizzation	Horizontal vertical	Horizontal vertical	Horizontal vertical	Horizontal vertical	Horizontal vertical	Horizontal vertical
Receiver IF bandwitdh (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 eithin the frequency ranges shown conform to RR Artcle 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 bans (MHz) (1)	1.8 - 7.3	10.1 - 29.7	50 - 450	1240 - 1300	5650 -10500
Necessary bandwitdh and class of emission (emission designator)	2K70J2E	2K70J2E	2K70J2E 5K76G1E 8K10F1E	2K70GID 6K00F7D 16K0D1D 150KF1W	2K70G1D 6K00F7D 16K0D1D 150KF1W 10M5F7W
Transmitter power (dB W) (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. (dB W)	-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 bandwitdh (KHz)	2.7	2.7	2.7, 5.76, 8.1	2.7, 6, 16, 130	2.7, 6, 16, 130, 10500
Receiver noise figure (dB) (3)	13	7 - 13	1	2	2

(1) Amateur bands within the frequency rangers shown conform to RR Artcle 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 system in the Eart-to-space dirction

Mode of operation	**CW Morse 10 ÷ 50 baud**			**SSB voice, digital voice, FM voice, Data** -		
Frequency band (MHz) (1)	28	144÷5670	10450÷24050	28	144÷5670	10450÷24050
Necessary bandwitdh and class of emission (emission designator)	150HA1A 150HJ2A	150HA1A 150HJ2A	159HA1A 159HJ2A	2K70J3E 2K70J2E 16K0F3E	2K70I3E 16K0F3E 44K2F1D	2K70J3E 16K0F3E 44K2F1D
					88K3F1D	88K3F1D
Transmitter power (dB W) (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÷10	-2÷27	-2÷31	-2÷10	-2÷27	-2÷31
TYpical e.i.r.p (dB W)	10÷29	10÷45	10÷42	10÷29	10÷45	10÷42
Antenna polarization	Horizontal vertical RHCO-LHCP	Horizontal vertical RHCO-LHCP	Horizzontal vertical RHCO-LHCP	Horizzontal vertical RHCO-LHCP	Horizontal vertical RHCO-LHCP	Horizontal vertical RHCO-LHCP
Receiver FI bandwitdh (KHz)	0,4	0,4	0,4	2,7 - 10	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 baud			SSB voice, digital voice, FM voice, data		
Frequrecy band (MHz) (1)	28	144 -5850	10450 - 24050	28	144 - 5850	10450 - 24050
Necessary bandwitdh 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 (dB W) (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	O - 6	0 - 6	0	0	0 - 6
Typical e.i.r.p. (dB W)	9	9 - 15	9 - 15	9	9 - 15	set-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 bandwitdh (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 Artcle 5.

(2) While total transmitter power of 20 dB is assumed, 10 dB W is used as power is shared amog signals in passband.

(3) Recever noise figures for bands above 50 MHz assume the use of low-noise preampèlifiers.

At the age of twelve, Giacomo Comis was already operating a straight key. He attended courses in telegraphy and went on to study at professional seafaring and nautical institutes finally becoming a fully qualified naval engineer who developed his skills further in the capacity of wireless operator in the Italian Navy. At the end of his course at "La Storta, Roma" in 1954 he graduated as first in his class and was thus able to choose his place of work. As he is a native of Catania in Sicilly, he chose to serve at the radio station of Messina where he operated until completion of his service in 1956, at which point he had become deputy chief and classed as expert. When the Obligatory national service in the Navy was reduced to fourteen months there was no longer enough time to incorporate a six-month course into the schedule so the navy introduced pre-enlistment courses which he was enlisted to run, therefore he was responsible for training the future RT operators of the Italian Navy. He has been a radio amateur since 1970 and is currently in charge of the ARI of Parma and a member of INORC with the number 112.

This manual, the only one of its kind, has been written with the purpose to eliminate any doubt on procedures of transmission.

Recently, many writings have appeared that confuse the idea about the procedure of transmission for radio amateurs. The authors of these works, even if they are established international experts, have introduced some procedures that are clearly in contrast to the international norms published by ITU and IARU. It is unknown if they have acted based on their own beliefs and tried to introduce new rules or because they are unaware the existing norms already in force.

Today there is the need to regulate the manner in which we operate, given the always increasing confusion that you are able to hear on air. And the best way to achieve this is by following the international rules which are already in place.

Radio amateurs are exactly that, amateurs, and are able to operate without fear of sanctions. If we use procedures which are not officially correct we break no law, only cause confusion. But this is in part due to the lack of popularization of the official norms in our field of interest. Every serious radio amateur should strive to understand and use the norms set out to facilitate communication, and not try to find a colloquial method, or short hand system to provide information in a way that already has its specific method presented in the manuals supplied by ITU.

Contents of this manual.

The present manual besides containing all the standards regarding procedures of transmission for normal traffic (excluding contest, pile-up etc.) contains indications for all the services and activities of the radio amateur.

Emergency procedure as reported by IARU HF International Emergency Operating Procedure.
International abbreviations for the radio amateur and their use in transmission.
International prefixes for the radio amateur.
The band-plan region 1 updated as of March 2009.
Various useful tables.
A detailed comment on the manipulation of the straight Key and on the International code of signals.

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