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NATO phonetic alphabet

The **(International) Radiotelephony Spelling Alphabet**, commonly known as the **NATO phonetic alphabet**, is the most widely used set of clear code words for communicating the letters of the Roman alphabet, technically a *radiotelephonic spelling alphabet*. It goes by various names, including **NATO spelling alphabet**, **ICAO phonetic alphabet** and **ICAO spelling alphabet**. The **ITU phonetic alphabet and figure code** is a rarely used variant that differs in the code words for digits.

To create the code, a series of international agencies assigned 26 code words acrophonically to the letters of the Roman alphabet, with the intention of the letters and numbers being easily distinguishable from one another over radio and telephone, regardless of language barriers and connection quality. The specific code words varied, as some seemingly distinct words were found to be ineffective in real-life conditions. In 1956, NATO modified the then-current set of code words used by the International Civil Aviation Organization (ICAO); this modification then became the international standard when it was accepted by ICAO that year and by the International Telecommunication Union (ITU) a few years later.[1] The words were chosen to be accessible to speakers of English, French and Spanish.

Although spelling alphabets are commonly called "phonetic alphabets", they should not be confused with phonetic transcription systems such as the International Phonetic Alphabet.

The 26 code words are as follows (ICAO spellings): Alfa, Bravo, Charlie, Delta, Echo, Foxtrot, Golf, Hotel, India, Juliett, Kilo, Lima, Mike, November, Oscar, Papa, Quebec, Romeo, Sierra, Tango, Uniform, Victor, Whiskey, X-ray, Yankee, Zulu. "Alfa" and "Juliett" are intentionally spelled as such to avoid mispronunciations. Numbers are spoken as English digits, but with the pronunciations of *three, four, five, nine*, and *thousand* modified.[2]

The code words are fairly stable. A 1955 NATO memo stated that:

> It is known that [the spelling alphabet] has been prepared only after the most exhaustive tests on a scientific basis by several nations. One of the firmest conclusions reached was that it was not practical to make an isolated change to clear confusion between one pair of letters. To change one word involves reconsideration of the whole alphabet to ensure that the change proposed to clear one confusion does not itself introduce others.[3]

Nonetheless, several regions have changed a single word that is problematic for them. (See variants.)

CHARACTER	MORSE CODE	TELEPHONY	PHONIC (PRONUNCIATION)
A	• —	Alfa	(AL-FAH)
B	— • • •	Bravo	(BRAH-VOH)
C	— • — •	Charlie	(CHAR-LEE) or (SHAR-LEE)
D	— • •	Delta	(DELL-TAH)
E	•	Echo	(ECK-OH)
F	• • — •	Foxtrot	(FOKS-TROT)
G	— — •	Golf	(GOLF)
H	• • • •	Hotel	(HOH-TEL)
I	• •	India	(IN-DEE-AH)
J	• — — —	Juliett	(JEW-LEE-ETT)
K	— • —	Kilo	(KEY-LOH)
L	• — • •	Lima	(LEE-MAH)
M	— —	Mike	(MIKE)
N	— •	November	(NO-VEM-BER)
O	— — —	Oscar	(OSS-CAH)
P	• — — •	Papa	(PAH-PAH)
Q	— — • —	Quebec	(KEH-BECK)
R	• — •	Romeo	(ROW-ME-OH)
S	• • •	Sierra	(SEE-AIR-RAH)
T	—	Tango	(TANG-GO)
U	• • —	Uniform	(YOU-NEE-FORM) or (OO-NEE-FORM)
V	• • • —	Victor	(VIK-TAH)
W	• — —	Whiskey	(WISS-KEY)
X	— • • —	Xray	(ECKS-RAY)
Y	— • — —	Yankee	(YANG-KEY)
Z	— — • •	Zulu	(ZOO-LOO)
1	• — — — —	One	(WUN)
2	• • — — —	Two	(TOO)
3	• • • — —	Three	(TREE)
4	• • • • —	Four	(FOW-ER)
5	• • • • •	Five	(FIFE)
6	— • • • •	Six	(SIX)
7	— — • • •	Seven	(SEV-EN)
8	— — — • •	Eight	(AIT)
9	— — — — •	Nine	(NIN-ER)
0	— — — — —	Zero	(ZEE-RO)

FAA radiotelephony alphabet and Morse code chart

Contents

International adoption

After the code words were developed by ICAO (see history below), they were adopted by other national and international organizations, including the ITU, the International Maritime Organization (IMO), the United States Federal Government as Federal Standard 1037C: Glossary of Telecommunications Terms[4] and its successors ANSI T1.523-2001[5] and ATIS Telecom Glossary (ATIS-0100523.2019)[6] (all three using the spellings "Alpha" and "Juliet"), the United States Department of Defense,[7] the Federal Aviation Administration (FAA) (using the spelling "Xray"), the International Amateur Radio Union (IARU), the American Radio Relay League (ARRL), the Association of Public-Safety Communications Officials-International (APCO), and by many military organizations such as NATO (using the spelling "Xray") and the now-defunct Southeast Asia Treaty Organization (SEATO).

The same alphabetic code words are used by all agencies, but each agency chooses one of two different sets of numeric code words. NATO uses the regular English numeric words (zero, one, two &c., though with some differences in pronunciation), whereas the ITU (beginning on 1 April 1969)[8] and the IMO define compound numeric words (nadazero, unaone, bissotwo &c.). In practice these are used very rarely, as they are not held in common between agencies.

Usage

A spelling alphabet is used to spell parts of a message containing letters and numbers to avoid confusion, because many letters sound similar, for instance "n" and "m" or "f" and "s"; the potential for confusion increases if static or other interference is present. For instance the message "proceed to map grid DH98" could be transmitted as "proceed to map grid Delta-Hotel-Niner-Ait". Using "Delta" instead of "D" avoids confusion between "DH98" and "BH98" or "TH98". The unusual pronunciation of certain numbers was designed to reduce confusion as well.

In addition to the traditional military usage, civilian industry uses the alphabet to avoid similar problems in the transmission of messages by telephone systems. For example, it is often used in the retail industry where customer or site details are spoken by telephone (to authorize a credit agreement or confirm stock codes), although ad-hoc coding is often used in that instance. It has been used often by information technology workers to communicate serial or reference codes (which are often very long) or other specialised information by voice. Most major airlines use the alphabet to communicate passenger name records (PNRs) internally, and in some cases, with customers. It is often used in a medical context as well, to avoid confusion when transmitting information.

Several letter codes and abbreviations using the spelling alphabet have become well-known, such as Bravo Zulu (letter code BZ) for "well done",[9] Checkpoint Charlie (Checkpoint C) in Berlin, and Zulu Time for Greenwich Mean Time or Coordinated Universal Time. During the Vietnam War, the U.S. government referred to the Viet Cong guerrillas and the group itself as VC, or Victor Charlie; the name "Charlie" became synonymous with this force.

Pronunciation of code words

The final choice of code words for the letters of the alphabet and for the digits was made after hundreds of thousands of comprehension tests involving 31 nationalities. The qualifying feature was the likelihood of a code word being understood in the context of others. For example, *Football* has a higher chance of being understood than *Foxtrot* in isolation, but *Foxtrot* is superior in extended communication.[10]

To eliminate wide variations in pronunciation, posters illustrating the pronunciation desired by ICAO are available.[11] However, there are still apparent differences in pronunciation between ICAO and other agencies, and ICAO has conflicting Latin-alphabet and IPA transcriptions.

Pronunciations are somewhat uncertain because the agencies, while ostensibly using the same pronunciations, give different transcriptions, which are often inconsistent from letter to letter. ICAO gives a different pronunciation for IPA transcription and for respelling. The ATIS gives English spellings, but does not give pronunciations or numbers. ICAO, NATO, and FAA use modifications of English numerals, with stress on one syllable, while the ITU and IMO compound pseudo-Latinate numerals with a slightly different set of modified English numerals, and with stress on each syllable. Numbers 10–99 are spelled out (that is, 17 is spoken "one seven" and 60 is spoken "six zero"), while for hundreds and thousands the English words *hundred* and *thousand* are used.[6][12][13][14][15][16]

The pronunciation of the digits 3, 4, 5, and 9 differs from standard English – being pronounced *tree*, *fower*, *fife*, and *niner*. The digit 3 is specified as *tree* so that it is not pronounced *sri*; the long pronunciation of 4 (still found in some English dialects) keeps it somewhat distinct from *for*; 5 is pronounced with a second "f" because the normal pronunciation with a "v" is easily confused with "fire" (a command to shoot); and 9 has an extra syllable to keep it distinct from German *nein* 'no'.[17]

Only ICAO prescribes pronunciation with the IPA, and then only for letters.[11] Both the IPA and respelled pronunciations were developed by ICAO before 1956 with advice from the governments of both the United States and United Kingdom.[18] The ICAO lists both its "International Phonetic Convention" pronunciations and its "Latin alphabet representation" pronunciations under the heading "Approximate pronunciation" and notes: "The pronunciation of the words in the alphabet as well as numbers may vary according to the language habits of the speakers. In order to eliminate wide variations in pronunciation, posters illustrating the desired pronunciation are available from ICAO."[11]

In addition, the ITU and IMO specify a different set of numeral words than does ICAO. The ITU/IMO words are compounds combining the English numeral with either a Spanish or Latin prefix.[19] However, as of 2002, the IMO's GMDSS procedures permit the use of the ICAO numeral pronunciation.[19]

Table

Conflicting pronunciations

Symbol	Code word (ICAO spelling)	ICAO in IPA[11]	ICAO pronunciations[11]	ITU-R 2007 (WRC-07) pronunciations[13]	CCEB 2016 pronunciations[20]	IMO English pronunciations (French)[21]	FAA pronunciations (with stress)[14]	SIA[22] (France aeronautical)	1957 U.S pronuncia
A	**Alfa**	ˈælfa	AL FAH		AL-FAH	**AL** FAH (**AL** FAH)	**AL**FAH	al fah	AL fâh
B	**Bravo**	ˈbrɑːˈvo	BRAH VOH		BRAH-VO	**BRAH** VOH (**BRA** VO)	**BRAH**VOH	bra vo	BRÄH VŌ
C	**Charlie**	ˈtʃɑːli *or* ˈʃɑːli	CHAR LEE or SHAR LEE		CHAR-LEE	**CHAR** LEE (*or* **SHAR** LEE) **TCHAH** LI (*ou* **CHAR** LI)	**CHAR**LEE	tchah li, char li	CHÄR LĒ
D	**Delta**	ˈdeltɑ	DELL TAH		DELL-TAH	**DELL** TAH (**DEL** TAH)	**DELL**TAH	del tah	DĚLL tâh
E	**Echo**	ˈeko	ECK OH		ECK-OH	**ECK** OH (**EK** O)	**ECK**OH	èk o	ĚCK ōh
F	**Foxtrot**	ˈfɔkstrɔt	FOKS TROT		FOKS-TROT	**FOKS** TROT **FOX** TROTT	**FOKS**TROT	fox trott	FŎKS trŏt
G	**Golf**	gʌlf [*sic*]	GOLF		GOLF	GOLF (GOLF)	GOLF	golf	GŎLF
H	**Hotel**	hoːˈtel	HO TELL	HOH TELL	HOH-TELL	HOH **TELL** (HO **TÈLL**)	HOH**TELL**	ho tèll	hōh TĚLL
I	**India**	ˈindi.ɑ	IN DEE AH		IN-DEE-AH	**IN** DEE AH (**IN** DI AH)	**IN**DEE AH	in di ah	ÏN dēē âh
J	**Juliett**	ˈdʒuːliːˈet	JEW LEE ETT		JEW-LEE-ETT	**JEW** LEE **ETT** (**DJOU** LI **ÈTT**)	**JEW**LEE ETT	djou li ètt	JEW lēē Ĕ
K	**Kilo**	ˈkiːlo	KEY LOH		KEY-LOH	**KEY** LOH (**KI** LO)	**KEY**LOH	ki lo	KĒY lōh
L	**Lima**	ˈliːmɑ	LEE MAH		LEE-MAH	**LEE** MAH (**LI** MAH)	**LEE**MAH	li mah	LĒĒ mâh
M	**Mike**	mɑik	MIKE		MIKE	MIKE (**MA** ÏK)	MIKE	maïk	MĪKE
N	**November**	noˈvembə	NO VEM BER		NO-VEM-BER	NO **VEM** BER (NO **VÈMM** BER)	NO**VEM**BER	no vèmm ber	nō VĚM bĕ
O	**Oscar**	ˈɔskɑ	OSS CAH		OSS-CAH	**OSS** CAH (**OSS** KAR)	**OSS**CAH	oss kar	ŎSS câh
P	**Papa**	pəˈpɑ	PAH PAH		PAH-PAH	PAH **PAH** (PAH **PAH**)	PAH**PAH**	pah pah	pâh PÄH
Q	**Quebec**	keˈbek	KEH BECK		KEH-BECK	KEH **BECK** (KÉ **BĚK**)	KEH**BECK**	ké bèk	kēh BĚCK
R	**Romeo**	ˈroːmi.o	ROW ME OH		ROW-ME-OH	**ROW** ME OH (**RO** MI O)	**ROW**ME OH	ro mi o	ROW mē ŏ
S	**Sierra**	siˈerɑ	SEE AIR RAH		SEE-AIR-RAH	SEE **AIR** RAH (SI **ÈR** RAH)	SEE**AIR**AH	si èr rah	sēē ÄIRrâh
T	**Tango**	ˈtængo	TANG GO		TANG-GO	**TANG** GO (**TANG** GO)	**TANG**GO	tang go	TĂNG gō
U	**Uniform**	ˈjuːnifɔːm *or* ˈuːnifɔrm	YOU NEE FORM or OO NEE FORM		YOU-NEE-FORM	**YOU** NEE FORM (*or* **OO** NEE FORM) **YOU** NI FORM (*ou* **OU** NI FORM)	**YOU**NEE FORM (or OO-NEE-FORM)[25]	you ni form, ou ni form	YOU nēē f
V	**Victor**	ˈviktɑ	VIK TAH		VIK-TAH	**VIK** TAH (**VIK** TAR)	**VIK**TAH	vik tar	VĬK tâh
W	**Whiskey**	ˈwiski	WISS KEY		WISS-KEY	**WISS** KEY (**OUISS** KI)	**WISS**KEY	ouiss ki	WĬSS kēy
X	**X-ray**	ˈeksˈrei	ECKS RAY	ECKS RAY	ECKS-RAY	**ECKS** RAY (**ÈKSS RÉ**)	**ECK**SRAY[26]	èkss ré	ĔCKS rāy
Y	**Yankee**	ˈjænki	YANG KEY		YANG-KEY	**YANG** KEY (**YANG** KI)	**YAN**GKEY[26]	yang ki	YĂNG KĒ
Z	**Zulu**	ˈzuːluː	ZOO LOO		ZOO-LOO	**ZOO** LOO (**ZOU** LOU)	**ZOO**LOO	zou lou	ZŌŌ lōō
0	**Zero**, **nadazero**		ZE-RO[27]	NAH-DAH-ZAY-ROH[28]	ZE-RO	NAH-DAH-ZAY-ROH (NA-DA-ZE-RO)[28][29]	ZE-RO / ZEE-RO	zi ro	Zero
1	**One**, **unaone**		WUN	OO-NAH-WUN	WUN	OO-NAH-WUN (OUNA-OUANN)	WUN	ouann	Wun
2	**Two**, **bissotwo**		TOO	BEES-SOH-TOO	TOO	BEES-SOH-TOO (BIS-SO-TOU)	TOO	tou	Too
3	**Three**, **terrathree**		TREE	TAY-RAH-TREE	TREE	TAY-RAH-TREE (TÉ-RA-TRI)	TREE	tri	Thuh-ree
4	**Four**, **kartefour**		FOW-er	KAR-TAY-FOWER	FOW-ER	KAR-TAY-FOWER (KAR-TÉ-FO-EUR)	FOW-ER	fo eur	Fo-wer
5	**Five**, **pantafive**		FIFE	PAN-TAH-FIVE	FIFE	PAN-TAH-FIVE (PANN-TA-FAIF)	FIFE	fa ïf	Fi-yiv
6	**Six**, **soxisix**		SIX	SOK-SEE-SIX	SIX	SOK-SEE-SIX (SO-XI-SICKS)	SIX	siks	Six
7	**Seven**, **setteseven**		SEV-en	SAY-TAY-SEVEN	SEV-EN	SAY-TAY-SEVEN (SÉT-TÉ-SEV'N)	SEV-EN	sèv n	Seven
8	**Eight**, **oktoeight**		AIT	OK-TOH-AIT	AIT	OK-TOH-AIT (OK-TO-EIT)	AIT	eït	Ate
9	**Nine**, **novenine**[31]		NIN-er	NO-VAY-NINER	NINE-ER	NO-VAY-NINER (NO-VÉ-NAI-NEU)	NIN-ER	naï neu	Niner
. (**decimal**	**Decimal**, (FAA) **point**		DAY-SEE-MAL[27]		(decimal)	DAY-SEE-MAL (DÉ-SI-MAL)	(point)	dè si mal	

point)									
00	Hundred		HUN-dred		(zero zero)		(hundred)	hun-dred	Hun-dred
000	Thousand		TOU-SAND[27]		(zero zero zero)		(thousand)	taou zend	Thow-zanc
. (full stop)	Stop			STOP	(full stop)	STOP (STOP)			

CCEB code words for punctuation include:

- hyphen (not 'dash')
/ slant
(brackets on
) brackets off

Others are 'comma', 'colon', 'semi-colon', 'exclamation mark', 'question mark', 'apostrophe', 'quote' and 'unquote'.[20]

History

Prior to World War I and the development and widespread adoption of two-way radio that supported voice, telephone spelling alphabets were developed to improve communication on low-quality and long-distance telephone circuits.

The first non-military internationally recognized spelling alphabet was adopted by the CCIR (predecessor of the ITU) during 1927. The experience gained with that alphabet resulted in several changes being made during 1932 by the ITU. The resulting alphabet was adopted by the International Commission for Air Navigation, the predecessor of the ICAO, and was used for civil aviation until World War II.[18] It continued to be used by the IMO until 1965.

Throughout World War II, many nations used their own versions of a spelling alphabet. The U.S. adopted the Joint Army/Navy radiotelephony alphabet during 1941 to standardize systems among all branches of its armed forces. The U.S. alphabet became known as *Able Baker* after the words for A and B. The Royal Air Force adopted one similar to the United States one during World War II as well. Other British forces adopted the RAF radio alphabet, which is similar to the phonetic alphabet used by the Royal Navy during World War I. At least two of the terms are sometimes still used by UK civilians to spell words over the phone, namely *F for Freddie* and *S for Sugar*.

To enable the U.S., UK, and Australian armed forces to communicate during joint operations, in 1943 the CCB (Combined Communications Board; the combination of US and UK upper military commands) modified the U.S. military's Joint Army/Navy alphabet for use by all three nations, with the result being called the US-UK spelling alphabet. It was defined in one or more of CCBP-1: *Combined Amphibious Communications Instructions*, CCBP3: *Combined Radiotelephone (R/T) Procedure*, and CCBP-7: *Combined Communication Instructions*. The CCB alphabet itself was based on the U.S. Joint Army/Navy spelling alphabet. The CCBP (Combined Communications Board Publications) documents contain material formerly published in U.S. Army Field Manuals in the 24-series. Several of these documents had revisions, and were renamed. For instance, CCBP3-2 was the second edition of CCBP3.

During World War II, the U.S. military conducted significant research into spelling alphabets. Major F. D. Handy, directorate of Communications in the Army Air Force (and a member of the working committee of the Combined Communications Board), enlisted the help of Harvard University's Psycho-Acoustic Laboratory, asking them to determine the most successful word for each letter when using "military interphones in the intense noise encountered in modern warfare.". He included lists from the US, Royal Air Force, Royal Navy, British Army, AT&T, Western Union, RCA Communications, and that of the International Telecommunications Convention. According to a report on the subject:

> The results showed that many of the words in the military lists had a low level of intelligibility, but that most of the deficiencies could be remedied by the judicious selection of words from the commercial codes and those tested by the laboratory. In a few instances where none of the 250 words could be regarded as especially satisfactory, it was believed possible to discover suitable replacements. Other words were tested and the most intelligible ones were compared with the more desirable lists. A final NDRC list was assembled and recommended to the CCB.[32]

After World War II, with many aircraft and ground personnel from the allied armed forces, "Able Baker" was officially adopted for use in international aviation. During the 1946 Second Session of the ICAO Communications Division, the organization adopted the so-called "Able Baker" alphabet[10] that was the 1943 US–UK spelling alphabet. However, many sounds were unique to English, so an alternative "Ana Brazil" alphabet was used in Latin America. In spite of this, International Air Transport Association (IATA), recognizing the need for a single universal alphabet, presented a draft alphabet to the ICAO during 1947 that had sounds common to English, French, Spanish and Portuguese.

From 1948 to 1949, Jean-Paul Vinay, a professor of linguistics at the Université de Montréal worked closely with the ICAO to research and develop a new spelling alphabet.[33][10] The directions of ICAO were that "To be considered, a word must:

1. Be a live word in each of the three working languages.
2. Be easily pronounced and recognized by airmen of all languages.
3. Have good radio transmission and readability characteristics.
4. Have a similar spelling in at least English, French, and Spanish, and the initial letter must be the letter the word identifies.
5. Be free from any association with objectionable meanings."[32]

After further study and modification by each approving body, the revised alphabet was adopted on 1 November 1951, to become effective on 1 April 1952 for civil aviation (but it may not have been adopted by any military).[18]

Problems were soon found with this list. Some users believed that they were so severe that they reverted to the old "Able Baker" alphabet. Confusion among words like *Delta* and *Extra*, and between *Nectar* and *Victor*, or the poor intelligibility of other words during poor receiving conditions were the main problems. Later in 1952, ICAO decided to revisit the alphabet and their research. To identify the deficiencies of the new alphabet, testing was conducted among speakers from 31 nations, principally by the governments of the United Kingdom and the United States. In the United States, the research was conducted by the USAF-directed Operational Applications Laboratory (AFCRC, ARDC), to monitor a project with the Research Foundation of Ohio State University. Among the more interesting of the research findings was that "higher noise levels do not create confusion, but do intensify those confusions already inherent between the words in question".[32]

By early 1956 the ICAO was nearly complete with this research, and published the new official phonetic alphabet in order to account for discrepancies that might arise in communications as a result of multiple alphabet naming systems coexisting in different places and organizations. NATO was in the process of adopting the ICAO spelling alphabet, and apparently felt enough urgency that it adopted the proposed new alphabet with changes based on NATO's own research, to become effective on 1 January 1956,[34] but quickly issued a new directive on 1 March 1956[35] adopting the now official ICAO spelling alphabet, which had changed by one word (November) from NATO's earlier request to ICAO to modify a few words based on U.S. Air Force research.

After all of the above study, only the five words representing the letters C, M, N, U, and X were replaced. The ICAO sent a recording of the new *Radiotelephony Spelling Alphabet* to all member states in November 1955.[10] The final version given in the table above was implemented by the ICAO on 1 March 1956,[18] and the ITU adopted it no later than 1959 when they mandated its usage via their official publication, *Radio Regulations*.[36] Because the ITU governs all international radio communications, it was also adopted by most radio operators, whether military, civilian, or amateur. It was finally adopted by the IMO in 1965.

During 1947 the ITU adopted the compound Latinate prefix-number words (*Nadazero*, *Unaone*, etc.), later adopted by the IMO during 1965.

- Nadazero - from Spanish or Portuguese nada + NATO/ICAO zero
- Unaone - generic Romance una, from Latin ūna + NATO/ICAO one
- Bissotwo - from Latin bis + NATO/ICAO two. (1959 ITU proposals bis and too)[37]
- Terrathree - from Italian terzo + NATO/ICAO three ("tree") (1959 ITU proposals ter and tree)
- Kartefour - from French quatre (Latin quartus) + NATO/ICAO four ("fow-er") (1959 ITU proposals quarto and fow-er)
- Pantafive - from French penta- + NATO/ICAO five ("fife") (From 1959 ITU proposals penta and fife)
- Soxisix - from French soix + NATO/ICAO six (1959 ITU proposals were saxo and six)
- Setteseven - from Italian sette + NATO/ICAO seven (1959 ITU proposals sette and sev-en)
- Oktoeight - generic Romance octo-, from Latin octō + NATO/ICAO eight (1959 ITU proposals octo and ait)
- Novenine - from Italian nove + NATO/ICAO nine ("niner") (1959 ITU proposals were nona and niner)

In the official version of the alphabet,[2] two spellings deviate from the English norm: *Alfa* and *Juliett*. *Alfa* is spelled with an *f* as it is in most European languages because the spelling *Alpha* may not be pronounced properly by native speakers of some languages – who may not know that *ph* should be pronounced as *f*. The spelling *Juliett* is used rather than *Juliet* for the benefit of French speakers, because they may otherwise treat a single final *t* as silent. For similar reasons, *Charlie* and *Uniform* have alternative pronunciations where the *ch* is pronounced "sh" and the *u* is pronounced "oo". Early on, the NATO alliance changed *X-ray* to *Xray* in its version of the alphabet to ensure that it would be pronounced as one word rather than as two,[38] while the global organization ICAO keeps the spelling *X-ray*.

The alphabet is defined by various international conventions on radio, including:

- Universal Electrical Communications Union (UECU), Washington, D.C., December 1920[39]
- International Radiotelegraph Convention, Washington, 1927 (which created the CCIR)[40]
- General Radiocommunication and Additional Regulations (Madrid, 1932)[41]
- Instructions for the International Telephone Service, 1932 (ITU-T E.141; withdrawn in 1993)
- General Radiocommunication Regulations and Additional Radiocommunication Regulations (Cairo, 1938)[42]
- Radio Regulations and Additional Radio Regulations (Atlantic City, 1947),[43] where "it was decided that the International Civil Aviation Organization and other international aeronautical organizations would assume the responsibility for procedures and regulations related to aeronautical communication. However, ITU would continue to maintain general procedures regarding distress signals."
- 1959 Administrative Radio Conference (Geneva, 1959)[44]
- International Telecommunication Union, Radio
- Final Acts of WARC-79 (Geneva, 1979).[45] Here the alphabet was formally named "Phonetic Alphabet and Figure Code".
- International Code of Signals for Visual, Sound, and Radio Communications, United States Edition, 1969 (revised 2003)[46]

Tables

Timeline in development of the ICAO/ITU-R radiotelephony spe

Letter	1920 UECU[39]	1927 (Washington, D.C.) International Radiotelegraph Convention (CCIR)[40]	1932 General Radiocommunication and Additional Regulations (CCIR/ICAN)[47][48]	1938 (Cairo) International Radiocommunication Conference code words[42]	1947 (Atlantic City) International Radio Conference[49]	1947 ICAO (from 1943 US–UK)[50] [51][52]	1947 ICAO alphabet (from ARRL)[53]	1947 ICAO Lat America/Caribbe
A	Argentine	Amsterdam	Amsterdam	Amsterdam	Amsterdam	ABLE	ADAM	ANA
B	Brussels	Baltimore	Baltimore	Baltimore	Baltimore	BAKER	BAKER	BRAZIL
C	Canada	Canada	Casablanca	Casablanca	Casablanca	**CHARLIE**	**CHARLIE**	COCO
D	Damascus	Denmark	Danemark	Danemark	Danemark	DOG	DAVID	DADO
E	Ecuador	Eddystone	Edison	Edison	Edison	EASY	EDWARD	ELSA
F	France	Francisco	Florida	Florida	Florida	***FOX***	FREDDIE	FIESTA
G	Greece	Gibraltar	Gallipoli	Gallipoli	Gallipoli	GEORGE	GEORGE	GATO
H	Hanover	Hanover	Havana	Havana	Havana	HOW	HARRY	HOMBRE
I	Italy	Italy	Italia	Italia	Italia	ITEM	IDA	**INDIA**
J	Japan	Jerusalem	Jérusalem	Jérusalem	Jerusalem	JIG	JOHN	JULIO
K	Khartoum	Kimberley	***Kilogramme***	***Kilogramme***	***Kilogramme***	KING	KING	**KILO**
L	**Lima**	Liverpool	Liverpool	Liverpool	Liverpool	LOVE	LEWIS	LUIS
M	Madrid	Madagascar	Madagascar	Madagascar	Madagascar	**MIKE**	MARY	MAMA
N	Nancy	Neufchatel	New York	New-York	New York	NAN	NANCY	NORMA
O	Ostend	Ontario	Oslo	Oslo	Oslo	OBOE	OTTO	OPERA
P	Paris	Portugal	Paris	Paris	Paris	PETER	PETER	PERU
Q	**Quebec**	**Quebec**	**Québec**	**Québec**	**Quebec**	QUEEN	QUEEN	**QUEBEC**
R	Rome	Rivoli	Roma	Roma	Roma	ROGER	ROBERT	ROSA
S	Sardinia	Santiago	Santiago	Santiago	Santiago	SUGAR	SUSAN	SARA
T	Tokio	Tokio	Tripoli	Tripoli	Tripoli	TARE	THOMAS	TOMAS
U	Uruguay	Uruguay	Upsala	Upsala	Upsala	UNCLE	UNION	URUGUAY
V	***Victoria***	***Victoria***	Valencia	Valencia	Valencia	**VICTOR**	**VICTOR**	**VICTOR**
W	Washington	Washington	Washington	Washington	Washington	WILLIAM	WILLIAM	**WHISKEY**
X	Xaintrie	Xantippe	Xanthippe	Xanthippe	Xanthippe	**XRAY**	**X-RAY**	EQUIS
Y	Yokohama	Yokohama	Yokohama	Yokohama	Yokohama	YOKE	YOUNG	YOLANDA
Z	Zanzibar	***Zululand***	Zürich	Zurich	Zurich	ZEBRA	ZEBRA	ZETA
0				Jérusalem[Note 1]	Jerusalem[Note 1]	Zero		
1				Amsterdam[Note 1]	Amsterdam[Note 1]	Wun		
2				Baltimore[Note 1]	Baltimore[Note 1]	Too		
3				Casablanca[Note 1]	Casablanca[Note 1]	Thuh-ree		
4				Danemark[Note 1]	Danemark[Note 1]	Fo-wer		
5				Edison[Note 1]	Edison[Note 1]	Fi-yiv		
6				Florida[Note 1]	Florida[Note 1]	Six		
7				Gallipoli[Note 1]	Gallipoli[Note 1]	Seven		
8				Havana[Note 1]	Havana[Note 1]	Ate		
9				Italia[Note 1]	Italia[Note 1]	Niner		
. (decimal point)								
Hundred								
Thousand								
,				Kilogramme[Note 1]	Kilogramme[Note 1]			
/ (fraction				Liverpool[Note 1]	Liverpool[Note 1]			

bar)								
(break signal)				Madagascar[Note 1]	Madagascar[Note 1]			
. (punctuation)				New-York[Note 1]	New York[Note 1]			

For the 1938 and 1947 phonetics, each transmission of figures is preceded and followed by the words "as a number" spoken twice.

The ITU adopted the IMO phonetic spelling alphabet in 1959,[54] and in 1969 specified that it be "for application in the maritime mobile service only".[55]

Pronunciation was not defined prior to 1959. For the post-1959 phonetics, the underlined syllable of each letter word should be emphasized, and each syllable of the code words for the post-1969 figures should be equally emphasized.

International aviation

The Radiotelephony Spelling Alphabet is used by the International Civil Aviation Organization for international aircraft communications.[2][11]

Letter	1932 General Radiocommunication and Additional Regulations (CCIR/ICAN)[47][52]	1946 ICAO Second Session of the Communications Division (same as Joint Army/Navy)[32]	1947 ICAO (same as 1943 US-UK)[50] [51][52]	1947 ICAO alphabet (adopted exactly from ARRL[53]	1947 ICAO Latin America/Caribbean[32]	1949 ICAO code words[32]	1951 ICAO code words[33]	1956 – present ICAO code words[11]
A	Amsterdam	Able	ABLE	ADAM	ANA	Alfa	Alfa	Alfa
B	Baltimore	Baker	BAKER	BAKER	BRAZIL	Beta	Bravo	Bravo
C	Casablanca	Charlie	CHARLIE	CHARLIE	COCO	Coca	Coca	Charlie
D	Danemark	Dog	DOG	DAVID	DADO	Delta	Delta	Delta
E	Edison	Easy	EASY	EDWARD	ELSA	Echo	Echo	Echo
F	Florida	Fox	FOX	FREDDIE	FIESTA	Foxtrot	Foxtrot	Foxtrot
G	Gallipoli	George	GEORGE	GEORGE	GATO	Golf	Gold	Golf
H	Havana	How	HOW	HARRY	HOMBRE	Hotel	Hotel	Hotel
I	Italia	Item	ITEM	IDA	INDIA	India	India	India
J	Jérusalem	Jig	JIG	JOHN	JULIO	Julietta	Juliett	Juliett
K	Kilogramme	King	KING	KING	KILO	Kilo	Kilo	Kilo
L	Liverpool	Love	LOVE	LEWIS	LUIS	Lima	Lima	Lima
M	Madagascar	Mike	MIKE	MARY	MAMA	Metro	Metro	Mike
N	New York	Nan (later Nickel)	NAN	NANCY	NORMA	Nectar	Nectar	November
O	Oslo	Oboe	OBOE	OTTO	OPERA	Oscar	Oscar	Oscar
P	Paris	Peter	PETER	PETER	PERU	Polka	Papa	Papa
Q	Québec	Queen	QUEEN	QUEEN	QUEBEC	Quebec	Quebec	Quebec
R	Roma	Roger	ROGER	ROBERT	ROSA	Romeo	Romeo	Romeo
S	Santiago	Sail/Sugar	SUGAR	SUSAN	SARA	Sierra	Sierra	Sierra
T	Tripoli	Tare	TARE	THOMAS	TOMAS	Tango	Tango	Tango
U	Upsala	Uncle	UNCLE	UNION	URUGUAY	Union	Union	Uniform
V	Valencia	Victor	VICTOR	VICTOR	VICTOR	Victor	Victor	Victor
W	Washington	William	WILLIAM	WILLIAM	WHISKEY	Whiskey	Whiskey	Whisky
X	Xanthippe	X-ray	XRAY	X-RAY	EQUIS	X-RAY	eXtra	X-ray
Y	Yokohama	Yoke	YOKE	YOUNG	YOLANDA	Yankey	Yankee	Yankee
Z	Zürich	Zebra	ZEBRA	ZEBRA	ZETA	Zebra	Zulu	Zulu
0		Zero	Zero					Zero
1		One	Wun					One
2		Two	Too					Two
3		Three	Thuh-ree					Three
4		Four	Fo-wer					Four
5		Five	Fi-yiv					Five
6		Six	Six					Six
7		Seven	Seven					Seven
8		Eight	Ate					Eight
9		Nine	Niner					Niner
.								Decimal
100								Hundred
1000								Thousand

International maritime mobile service

The ITU-R Radiotelephony Alphabet is used by the International Maritime Organization for international marine communications.

Letter	1932–1965 IMO code words[56]	1965 – present (WRC-03) IMO code words[57]	1967 WARC code words[58]	2000 – present IMO SMCP pronunciations[57]	1967 WARC pronunciations[58]	2007 – present ITU-R pronunciations[13]
A	Amsterdam	Alfa	Alfa	Alfa	AL FAH	AL FAH
B	Baltimore	Bravo	Bravo	Bravo	BRAH VOH	BRAH VOH
C	Casablanca	Charlie	Charlie	Charlie	CHAR LEE or SHAR LEE	CHAR LEE or SHAR LEE
D	Danemark	Delta	Delta	Delta	DELL TAH	DELL TAH
E	Edison	Echo	Echo	Echo	ECK OH	ECK OH
F	Florida	Foxtrot	Foxtrot	Foxtrot	FOKS TROT	FOKS TROT
G	Gallipoli	Golf	Golf	Golf	GOLF	GOLF
H	Havana	Hotel	Hotel	Hotel	HOH TELL	HOH TELL
I	Italia	India	India	India	IN DEE AH	IN DEE AH
J	Jérusalem	Juliett	Juliett	Juliet	JEW LEE ETT	JEW LEE ETT
K	Kilogramme	Kilo	Kilo	Kilo	KEY LOH	KEY LOH
L	Liverpool	Lima	Lima	Lima	LEE MAH	LEE MAH
M	Madagascar	Mike	Mike	Mike	MIKE	MIKE
N	New-York	November	November	November	NO VEM BER	NO VEM BER
O	Oslo	Oscar	Oscar	Oscar	OSS CAH	OSS CAH
P	Paris	Papa	Papa	Papa	PAH PAH	PAH PAH
Q	Québec	Quebec	Quebec	Quebec	KEH BECK	KEH BECK
R	Roma	Romeo	Romeo	Romeo	ROW ME OH	ROW ME OH
S	Santiago	Sierra	Sierra	Sierra	SEE AIR RAH	SEE AIR RAH
T	Tripoli	Tango	Tango	Tango	TANG GO	TANG GO
U	Upsala	Uniform	Uniform	Uniform	YOU NEE FORM *or* OO NEE FORM	YOU NEE FORM or OO NEE FORM
V	Valencia	Victor	Victor	Victor	VIK TAH	VIK TAH
W	Washington	Whisky	Whisky	Whisky	WISS KEY	WISS KEY
X	Xanthippe	X-ray	X-ray	X-ray	ECKS RAY	ECKS RAY
Y	Yokohama	Yankee	Yankee	Yankee	YANG KEY	YANG KEY
Z	Zurich	Zulu	Zulu	Zulu	ZOO LOO	ZOO LOO
0	Zero	ZEERO	NADAZERO	ZEERO	NAH-DAH-ZAY-ROH	NAH-DAH-ZAY-ROH
1	One	WUN	UNAONE	WUN	OO-NAH-WUN	OO-NAH-WUN
2	Two	TOO	BISSOTWO	TOO	BEES-SOH-TOO	BEES-SOH-TOO
3	Three	**TREE**	TERRATHREE	**TREE**	TAY-RAH-TREE	TAY-RAH-TREE
4	Four	**FOWER**	KARTEFOUR	**FOWER**	KAR-TAY-FOWER	KAR-TAY-FOWER
5	Five	FIFE	PANTAFIVE	FIFE	PAN-TAH-FIVE	PAN-TAH-FIVE
6	Six	SIX	SOXISIX	SIX	SOK-SEE-SIX	SOK-SEE-SIX
7	Seven	SEVEN	SETTESEVEN	SEVEN	SAY-TAY-SEVEN	SAY-TAY-SEVEN
8	Eight	AIT	OKTOEIGHT	AIT	OK-TOH-AIT	OK-TOH-AIT
9	Nine	**NINER**	NOVENINE	**NINER**	NO-VAY-NINER	NO-VAY-NINER
.			DECIMAL		DAY-SEE-MAL	DAY-SEE-MAL
.	Full stop		STOP		STOP	STOP
,	Comma					
	Break signal					
/	Fraction bar					
1000		**TOUSAND**		**TOUSAND**		

Variants

Since 'Nectar' was changed to 'November' in 1956, the code has been mostly stable. However, there is occasional regional substitution of a few code words, such as replacing them with earlier variants, because of local taboos or confusing them with local terminology.

- As of 2013, it was reported that "Delta" was often replaced by "David" or "Dixie" at Atlanta International Airport, where Delta Air Lines is based, because "Delta" is also the airline's callsign.[59] Air traffic control once referred to Taxiway D at the same airport as "Taxiway Dixie", though this practice was officially discontinued in 2020.[60][61]

See also

- International Code of Signals
- Spelling alphabet
- Allied military phonetic spelling alphabets
- APCO radiotelephony spelling alphabet (used by some US police departments)
- Language-specific spelling alphabets
  - Finnish Armed Forces radio alphabet
  - German spelling alphabet
  - Greek spelling alphabet
  - Japanese radiotelephony alphabet
  - Korean spelling alphabet
  - Russian spelling alphabet
  - Swedish Armed Forces radio alphabet
- Radiotelephony procedure
  - Procedure word
  - Brevity code
    - Ten-code
- Q code
- List of military time zones
- PGP word list

Notes

1. Each sequence of figures is both preceded and followed by "as a number" (or, for punctuation only) "as a mark", spoken twice.

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External links

- "The Postal History of ICAO: Annex 10 - Aeronautical Telecommunications" (https://web.archive.org/web/20190212211147/https://www.icao.int/secretariat/PostalHistory/annex_10_aeronautical_telecommunications.htm). ICAO. Archived from the original (https://www.icao.int/secretariat/PostalHistory/annex_10_aeronautical_telecommunications.htm) on 12 February 2019. Retrieved 6 November 2017.
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