

HG2052 Assignment 1
International Civil Aviation Organization (ICAO) Radiotelephony
 Richmond Sng (U1930538D)

Overview

Across the aviation industry, the pilots and air-traffic controllers follow a standardised mean of communication known as the ICAO radiotelephony. The sole purpose is to ensure efficient, clear, concise, and unambiguous communications, throughout the global aviation sector. The radiotelephony phraseology consists of a set of standardised words and phrases approved by ICAO for routine aircraft situations. This paper examines the medium of aviation radiotelephony from a linguistics perspective, and focuses namely on the transmission of letters and numbers, in which the majority of the Aviation English is based on. The examination of the radiotelephony discourse reveals that the phraseology is not a conversational style, but a distinct register of codified, abbreviated, jargon filled language, paired with descriptors to convey crucial information succinctly.

Transmission of Letters

Letter	Word	Pronunciation	Letter	Word	Pronunciation
A	Alpha	<u>AL</u> FAH	N	November	NO <u>VEM</u> BER
B	Bravo	<u>BRAH</u> VOH	O	Oscar	<u>OSS</u> CAR
C	Charlie	<u>CHAR</u> LEE	P	Papa	PAH <u>PAH</u>
D	Delta	<u>DELL</u> TAH	Q	Quebec	KEH <u>BECK</u>
E	Echo	<u>ECK</u> OH	R	Romeo	<u>ROW</u> ME OH
F	Foxtrot	<u>FOKS</u> TROT	S	Sierra	SEE <u>AIR</u> RAH
G	Golf	GOLF	T	Tango	<u>TANG</u> GO
H	Hotel	HOH <u>TELL</u>	U	Uniform	<u>YOU</u> NEE FORM
I	India	<u>IN</u> DEE AH	V	Victor	<u>VIK</u> TAH
J	Juliet	<u>JEW</u> LEE <u>ETT</u>	W	Whiskey	<u>WISS</u> KEY
K	Kilo	<u>KEY</u> LOH	X	X-Ray	<u>ECKS</u> RAY
L	Lima	<u>LEE</u> MAH	Y	Yankee	<u>YANG</u> KEY
M	Mike	MIKE	Z	Zulu	<u>ZOO</u> LOO

Table 1. Radiotelephony Spelling Alphabet (ICAO, Annex 10, Chapter 5)

The table above shows the individual letters of the alphabet and their assigned word based on the ICAO standards of radiotelephony. The underlined syllables in the pronunciation are meant for emphasis when pronounced. So in order to transmit an ‘E’ over the radio, it will be “ECK OH”, with an emphasis on the ‘ECK’.

This style of phonetic code is not exclusive to the aviation industry, and we may have even used some in our everyday lives, such as “E for Egypt” or “T for tree”. However, the non-

standardised form of this phonetic code may introduce errors as some words might sound alike, which is detrimental to safety especially during an aircraft emergency situation. The ICAO standard of phonetic alphabet was designed in such a way that the word pronounced is distinctive to the letter it represents, and most importantly each word sounds nothing like any other. This achieves high levels of brevity and efficiency when transmitting individual letters over the radio.

In order to eliminate wide variations in pronunciations across different speakers, the desired pronunciation and lexical stresses are illustrated as shown in Table 1. It is interesting to note that in the official version of the alphabet, the non-English spelling ‘Alfa’ and ‘Juliett’ are used instead as ‘Alpha’ might not be pronounced properly by native speakers of other languages. This is to distinguish the “ph” to be pronounced as “f”, and ‘Juliett’ is spelled with ‘tt’ for French speakers who may treat the single final ‘t’ as silent.

Transmission of Numbers

Numeral	Pronunciation	Numeral	Pronunciation
0	ZERO	7	SEVEN
1	WUN	8	AIT
2	TOO	9	NINER
3	TREE	Hundred	<u>HUN</u> DRED
4	FOWER	Thousand	<u>TOU</u> SAND
5	FIFE	Decimal	<u>DAY</u> SEE MAL
6	SIX	Point	POINT

Table 2. Radiotelephony Numeral (ICAO, Annex 10, Chapter 5)

The transmission of individual radiotelephony numerals is relatively direct by pronouncing the numeral as per usual. The main difference between radiotelephony and standard pronunciation for numerals will be for ‘4’ and ‘9’, which are pronounced as “FOWER”, and “NINER” respectively.

Number	Pronunciation	Number	Pronunciation
10	WUN ZE-RO	5000	FIFE TOU-SAND
75	SEV-EN FIFE	11000	WUN WUN TOU-SAND
100	WUN HUN-DRED	18900	WUN AIT TOU-SAND NIN-ER HUN-DRED
583	FIFE AIT TREE	25000	TOO FIFE TOU-SAND
2500	TOO TOU-SAND FIFE HUN-DRED	38143	TREE AIT WUN FOW-ER TREE

Table 3. Examples of Pronunciation of Numbers

Numbers are narrated in succession of the next as shown from the example '38143' as "TREE AIT WUN FOW-ER TREE". Numbers involving whole hundreds and whole thousands, are narrated by pronouncing each digit in the number of hundreds or thousands followed by the word 'HUNDRED' or 'THOUSAND' as appropriate. This can be seen from '11000' pronounced as "WUN WUN TOU-SAND". Combinations of thousands and hundreds are transmitted by pronouncing each digit in the number of thousands followed by the word 'THOUSAND', followed by the number of hundreds, followed by the word 'HUNDRED'. This is shown from the example '18900' as "WUN AIT TOU-SAND NIN-ER HUN-DRED".

The transmission of numerals employs operation efficiency rather than linguistic correctness, in which the ultimate criterion for proficiency is evaluated communication. This can be tied to how the Civil Aviation Authority mandates that the 'three' be pronounced as [tri:], and thousand as [tausænd]. The purpose of using [t] at the start of both these words is purely to enhance the intelligibility in the critical domain of aviation communication.

History

Aircrafts in the early 1900s were built with open cockpits and heavy manual controls cruising, which were wholly reliant on visual navigation. Pilots in the vicinity of an airfield, if conditions permitted, rely on the visual signals on airfield for landing. The heavy reliance on visual signals meant that pilots would have to traverse the the distance between the two airfields without any forewarning weather conditions, hazards or en-route support. With the development of radio telephony in the early 20th century, the need of a spelling alphabet arises.

During the First World War, the combination of battlefield conditions and embryonic radio technology meant that messages could be too easily garbled and misunderstood. The British Army and Royal Navy developed their own spelling alphabets to combat the problem, but as global air travel emerged in the 1920s, the need for a level of standardisation became increasingly paramount. The first internationally recognised phonetic alphabet was adopted by 1932 by the International Commission for Air Navigation (ICAN), the predecessor of ICAO, and used in civil aviation until World War II.

Amsterdam Baltimore Casablanca Danemark Edison Florida Gallipoli Havana Italia Jerusalem Kilogramme Liverpool Madagascar New_York Oslo Paris Quebec Roma Santiago Tripoli Upsala Valencia Washington Xanthippe Yokohama Zurich
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Table 4. ICAN Spelling Alphabet

During WWII, the military requirements of joint operations led to the development of a common spelling alphabet for the use of the combined allied service known as the able/baker alphabet.

Able Baker Charlie Dog Easy Fox George How Item Jig King Love Mike Nan Oboe Peter Queen Roger Sugar Tare Uncle Victor William X-ray Yoke Zebra.
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Table 5. Able/Baker Spelling Alphabet

After world war II, ICAO adopted the able/baker alphabet in 1946. However, as many speech sounds of this alphabet were associated only with the English language, it led to confusion in South America where English words were not fully recognised. As such, an alternative alphabet known as ana/brazil was approved by ICAO and introduced for the South American and Caribbean regions.

Ana Brazil Coco Dado Elsa Fiesta Gato Hombre India Julio Kilo Luis Mama Norma Opera Peru
Quebec Rosa Sara Tomas Uruguay Victor Whiskey Equis Yolanda Zeta

Table 6. Ana/Brazil Spelling Alphabet

The coexistence of two spelling alphabets led a first draft by ICAO of a proposed single universal alphabet that had sounds common to English, French, and Spanish. During 1948 and 1949, they enlisted Professor Jean-Paul Vinay, one of the foremost Linguists and Researchers from Canada, to developed a the first ICAO alphabet. The ICAO alphabet was adopted in 1951 as a universal standard for communicating English letters over phone or radio, and came into use for civil aviation in 1952.

Alfa Bravo Coca Delta Echo Foxtrot Golf Hotel India Juliett Kilo Lima Metro Nectar Oscar Papa
Quebec Romeo Sierra Tango Union Victor Whisky Extra Yankee Zulu

Table 7. First ICAO Spelling Alphabet

The ICAO spelling alphabet was based on 3 criteria:

1. A word could only be considered if it was a live word in the three working language and had a similar spelling in English, French, and Spanish;
2. It had to be easily pronounced and recognised by airmen of all languages, clearly transmissible by radio and easy to read;
3. A chosen word could not have any negative meaning or association.

However, confusion among the certain words based on the unintelligibility under poor receiving conditions led to a revised version of the ICAO spelling alphabet. Five words including 'Charlie', 'Mike', 'November', 'Uniform', and 'X-Ray', were replaced in the original alphabet. This revised version was implement by ICAO in 1956, and formally known as the International Radiotelephony Spelling Alphabet.

Features of Speech and Writing

Speech Like	Text Like	Speech Like	Text Like
time bound	space bound	socially interactive	factually communicative
spontaneous*	contrived	immediately revisable	repeatedly revisable
face-to-face	visually decontextualised	prosodically rich*	graphically rich
loosely structured*	elaborately structured		

Table 8. Features of ICAO Radiotelephony based on Crystal (2006)

Time Bound

Communicating through the radiotelephony discourse is usually external when realised in air-to-ground communications (between a pilot and air traffic controller). Should the

communication be within the aircrew in the aircraft, it will be defined as internal. It is also possible when the discourse becomes three-membered. This occurs when pilot is communicating between the air traffic controller and another pilot in another aircraft. For all means of internal and external communication using radiotelephony, it remains dynamic, transient, and time-bound.

Spontaneous*

The radiotelephony discourse is viewed as hierarchically organised speech acts, combined into a dialogue utterance. The specific features of dialogue includes the purposefulness and fast pace delivery of concise information. In combination, the hybrid of organised, compact expression, and immediate production and reception make it hard to draw the line between speech-like and text-like.

Visually Decontextualised

The radiotelephony discourse is considered as a 'code language' since only members of the aviation industry understand the information it provides (Prohozaj, 2011). The 'code language' in radiotelephony refers to the system of signs with certain meaning delivered to a recipient in an encoded form, which requires decoding, through the process of radio exchange. The nature of this exchange would mean no immediate feedback and no deictic expressions, which makes it visually decontextualised.

Loosely Structured*

The structure of radiotelephony is unlike those in standard speech. Aviation English (radiotelephony) have "specialised vocabulary, restricted syntax, and interactional characteristics (Model, 2012)". The "ICAO phraseology is designed to minimise syntax and intonation in order to more accurately pass information between pilots and controllers through the use of specific formula-based phrases (Hinrich, 2008)". Aviation English standard phraseology word order are fixed, and marked by a lack of articles, auxiliary verbs, prepositions, and pronouns (Hinrich, 2008; Moder, 2012; Philips, 1991). On one end radiotelephony is strongly speech like, but on the other, the instillment of fixed structure and unorthodox way of delivering information, makes it somewhat elaborately structured and text-like as well.

Socially Interactive

The basis of radiotelephony revolves around a professional setting in which the discursive activity takes place. The obvious dynamic nature of the the radiotelephony discourse is associated with components of dynamism such as procedurality of activity that is related to interaction, and expressed in real-time. As such, we can view the radiotelephony discourse as a speech behaviour rather than as a result of communication, which makes it socially interactive.

Immediately Revisable

Similar to speech, radiotelephony is dynamic as mentioned earlier. Errors spoken with radiotelephony cannot be withdrawn, and are subjected to interruptions such as outside noise and static. If an error is made while transmission, the word "CORRECTION" can be inserted and the correct information can then be delivered.

Prosodically Rich*

Prosody encompasses a wide range of factors including intonation, rhythm, and speech rate. These elements of prosody are noticeably different in Aviation English and Standard English: "Lack of intonation, rhythm and pauses is typical of rapid aviation radio

communication” (Estival, et al., 2016, p. 48). Based on a research of paper on the “Prosodic Profile of Aviation English”, the Aviation English produced a more restricted pitch range, faster articulation rate, more uniform vowel intervals, and more variable consonant intervals than Standard American English. While it is direct that radiotelephony is auditory decoded, the lack of gestures, intonation (McMillan, 1998; Philips, 1991; Prinzo et al., 2011), and uniform features do also suggest an inclination towards a graphically rich environment as well.

Conclusion

Through examining the radiotelephony, it overall suggests that is not completely a spoken discourse but an independent discourse of its own. Aviation radiotelephony was designed to be without face-to-face contact, in a time-critical environment, yet the messages must be organised and concise with clear and emotionless delivery (Prinzo, Lieberman, & Pickett, 1998). This reflects both aspects of a written discourse as well as the spoken discourse. This specialised register of English has been adopted as a lingua franca by aviation professionals around the world (Estival, Farris, & Molesworth, 2016; Hazrati, 2015; Kim & Elder, 2009).

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