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Structure and Importance of an International Airborne Language

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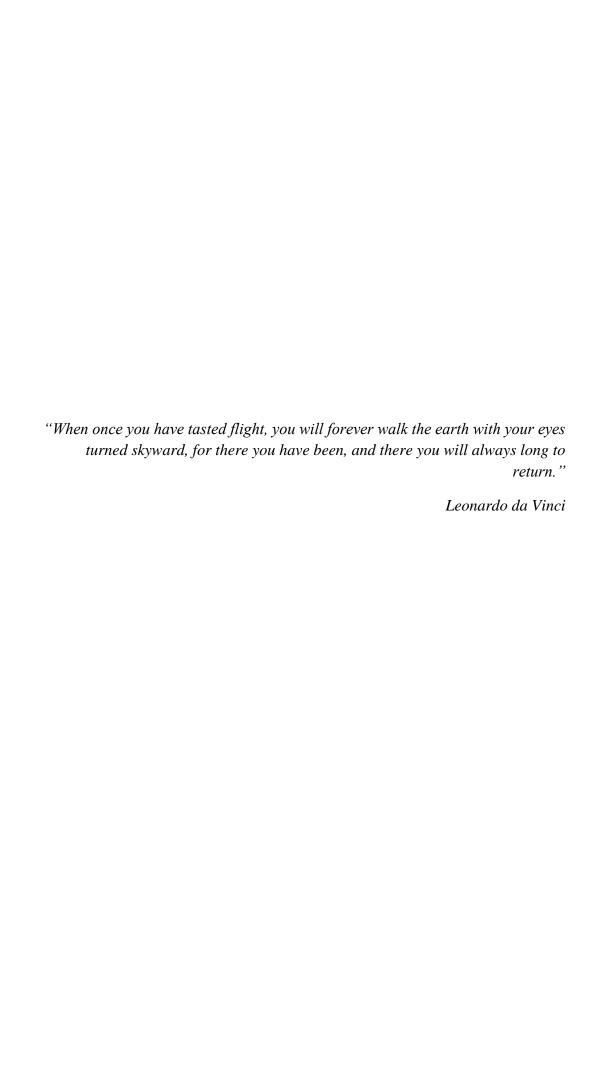

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Primo Appello

"When once you have tasted flight, you will forever walk the earth with your eyes turned skyward, for there you have been, and there you will always long to return."

Leonardo da Vinci

TABLE OF CONTENTS

Introduction

In today's globalized world, air travel is one of the fastest growing markets. Millions of aircrafts take off and then touch down all around the world each day. This well-synchronized symphony, however, is much more complex than it seems, and communication – language - plays a crucial role during a plane's journey. Misunderstandings and miscommunications can have disastrous effects, so the adoption of a standard phraseology to be used during flight is a means to overcome language barriers, avoid ambiguous expressions and guarantee a safe and effective operation of an aircraft.

Little is known about the interaction that goes on between pilots and air traffic controllers (ATCOs), and even though the language of aviation is English, cockpit communication can be hard to understand for people who are not familiar with this specific language. The scope of this thesis is to examine the origins of this uncommon language, the characteristics and peculiarities of air communication and to shed a little light on this mystery called Aviation English.

In the first part of this thesis, the historical settings in which English was appointed as the language of air travel will be presented.

In the second part, we will see the characteristics of Aviation English, such as the alphabet, the digits and their pronunciation, while explaining – from a linguistic point of view - how this type of English differs from Standard English and why some of these changes were necessary to implement. We will then proceed to analyze the assessment method of this language for ATCOs and pilots alike in accordance with the International Civil Aviation Organization (ICAO) standards. Lastly, we will see two of the less fortunate events that have resulted from (among other factors) the use of incorrect phraseology: the Tenerife accident in 1977 and the Linate airport accident in 2001.

The third and final part of this thesis is dedicated to interviews held with an air traffic controller and an air force pilot to have an insight on Aviation English.

1. English as a Lingua Franca

Not only is English a first language or a widely used national language in approximately sixty countries, it has also reached a status of an important second language worldwide. In fact, there are more speakers of English as a second or foreign language than as a first language, and most of the communication contexts occur among speakers of English as a second or foreign language. Non-native users of English outnumbered native users at the start of the 21st century by approximately 3 to 1 (Graddol, 1997; Graddol, 2006). Yet, it is also true that very few speakers achieve a so called "native-like" pronunciation. This has led to the emergence of English as an international language (EIL) or lingua franca, with its own standards to ensure mutual understanding between its users.

This evolution is especially relevant for language proficiency requirements in aeronautical radiotelephony communications. EIL research (Jenkins, 2000) states that "native-like" pronunciation is not only unlikely but also unnecessary. However, there are certain features of the pronunciation of English that are pivotal to intelligibility for international users. These features include:

1. distinctions between the long and short length of vowels (e.g. bit/beat);
2. the correct positioning of main stress (e.g. location);
3. tone boundary markings (i.e. important changes in voice pitch or intonation); and
4. the non-simplification and non-reduction of consonant clusters (e.g. the cluster "st fl" found in "test flight" must be pronounced to avoid saying "tes' flight").

Since speakers in an English-as-a-second-language context often do not share the same background knowledge, pronunciation becomes even more important during a communication involving non-native speakers. A pronunciation that is mutually comprehensible in the context of aviation communication is not only desirable, but necessary.

2. The International Civil Aviation Organization

The International Civil Aviation Organization (ICAO) is a United Nations specialized agency that was established in 1944 during the Chicago Convention on International Civil Aviation.

As of March 2016, ICAO has 191 members, consisting of 190 of the 193 UN members (except Dominica, Liechtenstein, and Tuvalu), plus the Cook Islands. The Organization's main task is

> to reach consensus on international civil aviation Standards and Recommended Practices (SARPs) and policies in support of a safe, efficient, secure, economically sustainable and environmentally responsible civil aviation sector.

ICAO also states that Member States must conform to these norms in order to guarantee

> more than 100,000 daily flights in aviation's global network to operate safely and reliably in every region of the world.

In addition to its main framework, ICAO also assists States with aviation development regarding safety and air navigation, and oversees the air transport sector.

2.1 English Language Proficiency Requirements for Pilots and Air Traffic Controllers

English, though it has not been specifically stated in the Chicago Convention, is the official language of aviation. As mentioned above, today there are more non-native speakers of English than native speakers, and this is also true among flight crews and ATCOs.

Effective communication between these two parties is of critical importance, the lack of which may lead to communication issues that can affect flight safety. Historically, insufficient English language proficiency on the part of the flight crew or the controller has contributed to a number of accidents and incidents.

ICAO has therefore implemented a standard phraseology along with language proficiency requirements for ATCOs and pilots in order to improve the level of language proficiency and reduce the possibility and frequency of communication errors.

The ICAO Language Proficiency requirements are applicable to both native and non-native English speakers. ICAO Doc 9835 states: "Native speakers of English, too, have a fundamentally important role to play in the international efforts to increase communication safety."

Chapter IV of the Chicago Convention (1944), Article 28 on *Air navigation facilities and standard systems* states that:

> Each contracting State undertakes, so far as it may find practicable, to:
>
> (b) Adopt and put into operation the appropriate standard systems of communications procedure, codes, markings, signals, lighting and other operational practices and rules[1]

While Chapter VI, Article 37 on *International standards and recommended practices* states that every State involved must collaborate in respecting and guaranteeing conformity in regulations, standards, procedures and organization as far as the aircraft, personnel, airways and auxiliary services are concerned for best results in air navigation. For this purpose, the International Civil Aviation Organization implements and adjusts international standards and recommends the procedures

> (a) Communications systems and air navigation aids, including ground marking;
> (b) Characteristics of airports and landing areas;
> (c) Rules of the air and air traffic control practices[2];

In 2003, ICAO set a deadline, March 2008, for English language proficiency at Level 4 and above for all pilots flying international routes and air traffic controllers serving international airports and routes. For States which were not

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[1] which may be recommended or established from time to time, pursuant to this Convention.
[2] For full list, see Appendix A

able to meet the March 2008 deadline, a second deadline for full implementation was set for March 2011.

2.2 ICAO Language Proficiency Rating Scale[3]

  The ICAO Rating Scale delineates six levels of language proficiency in spoken language ranging from Pre-elementary (Level 1) to Expert (Level 6) in six linguistic skill areas: pronunciation, structure, vocabulary, fluency, comprehension and interactions. Its main focus is the correct use of strategic competences, including intelligibility, in case of unexpected events or emergencies.

Level 4 is the minimum operational standard, and it does not target the correct use of grammar and native-like pronunciation. However, it should be noted that the descriptors for Expert Level 6 exceed the demands of aeronautical radiotelephony communications, and therefore Level 6 is mostly attained by first-language speakers with native or native-like proficiency and second- or foreign-language speakers with a high level of proficiency. Reaching Level 6 is considered an unrealistic expectation of most second- or foreign-language learners, and it is therefore not a requirement for a successful aeronautical communication. The final rating is not the average of the each part's rating, but the lowest of these six ratings. It is important to note that the Rating Scale does not refer to native or native-like proficiency, which results from a decision that native speech should not be privileged in a global context. All participants in aeronautical radiotelephony communications must conform to the ICAO proficiency requirements.

It is important to add, though, that ICAO does not obligate member states to use English, but only recommends it, and it has become common practice. As any situation may arise during flight, a high proficiency in English is indispensable, and this necessity is also recognized in the ICAO Standard Phraseology Quick Reference Guide:

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[3] Manual on the Implementation of ICAO Language Proficiency Requirements, International Civil Aviation Organization, Second edition (2010)

Phraseology has evolved over time and has been carefully developed to provide maximum clarity and brevity in communications while ensuring the phrases are unambiguous.

This works well and is applied in routine situations, but

while standard phraseology is available to cover most routine situations, not every conceivable scenario will be catered for and RTF[4] users should be prepared to use plain language when necessary following the principle of keeping phrases clear and concise. (EUROCONTROL 2007: 2)

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[4] Radiotelephony

3. Aviation Language

The term "aviation language" does not only refer to the use of English between a pilot and a controller. It also covers a series of professions within the aviation domain, including flight crews, commercial staff, engineers, and so on. However, the sole object of ICAO's language proficiency requirements is radiotelephony communication, a subcategory of aviation language[5]. It includes standardized words and phrases, as well as the correct pronunciation of letters of the alphabet and time.

3.1 Letters

A code word is assigned to each letter of the English alphabet, so that combinations of letters and numbers can be pronounced and understood by those who exchange voice messages without the possibility of misunderstanding. During radiotelephony communication, the International Radiotelephony Spelling Alphabet, also known as the NATO Phonetic Alphabet or the ICAO radiotelephonic or spelling alphabet is used.

Letter	Word	Pronunciation
A	Alpha	AL-FAH
B	Bravo	BRAH-VO
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

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[5] Manual on the Implementation of ICAO Language Proficiency Requirements, International Civil Aviation Organization, Second edition (2010)

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-NE-FORM
V	Victor	VIK-TAH
W	Whiskey	WISS-KEY
X	X-ray	ECKS-RAY
Y	Yankee	YANG-KEY
Z	Zulu	ZOO-LOO

Juliett is spelled with *tt* for French speakers, because in French, a single final *t* would be silent.

An airplane's registration is its identification made up of five letters. Civil planes that are not operated by airlines use their registration as their call signs. In this case, all letters should be pronounced. For example:

YRTGM: Yankee Romeo Tango Golf Mike

An interesting fact: "Delta" is replaced by "Data", "Dixie" or "David" at airports that have a majority of Delta Air Lines flights in the U.S. so as to avoid confusion, because "Delta" is also the airline's call sign[6].

3.2 Digits

Digits are pronounced according to the chart below.

Digits	Word	Pronunciation
0	Zero	ZE-RO or ZEE-RO
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

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[6] https://en.wikipedia.org/wiki/NATO_phonetic_alphabet#Digits

9	Nine	NIN-ER
.	Decimal	DAY-SEE-MAL
00	Hundred	HUND-DRED
000	Thousand	TOU-SAND

The pronunciation of the digits 3, 4, 5 and 9 differs from Standard English. This is to avoid the number 3 and thousands being pronounced as *sri* and *sousands* respectively (the pronunciation of dental fricatives, [θ, ð], is often difficult for non-native speakers of English), the number 4 being confused with *for,* and to distinguish between the somewhat homonym numbers 5 and 9 (9 has an extra "r" sound also to keep it distinct from the German *nein* meaning "no".)

Numbers from 10 to 99 are spelled out, for example 27 is pronounced as *two-seven* and 99 as *niner-niner.* Round numbers such as 300, 3000 and 3400 are pronounced *tree-hun-dred*, *tree-tou-sand* and *tree-tou-sand-fo-wer-hun-dred* respectively.

Numbers contained in callsigns, transponder codes, flight levels should always be pronounced digit by digit, even if they contain round hundreds or round thousands.

For example:

Callsign: ALITALIA 300 = ALITALIA *three zero zero*
Transponder code: 1200 = Squawk[7] *one two zero zero*
Flight level: 400 = Flight level *four zero zero*

3.3 Transmission of Time

When referencing events that take place at the time of the communication, only the minutes of the hour should normally be transmitted, and each digit should be

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[7] ATCOs use the term "squawk" when they are assigning an aircraft a transponder code. The word comes from the system's origin in the World War II identification, friend or foe (IFF) system. Source: https://en.wikipedia.org/wiki/Transponder_(aeronautics)

pronounced separately. When referencing future or past events, the hour as well as the minute need to be expressed, and all numbers are pronounced.

For example:

0839 (08:39 am) : three niner (or zero eight three niner)
1345 (01:45 pm) : four five (or one three four five)

3.4 Basic Expressions

The following chart contains all the basic expressions that guarantee a safe and effective communication between pilots and ATCOs. These are standard expressions and may not be replaced by synonyms or other words or expressions.

Word / Expression	Meaning[8]
Able	To be able to do something
Acknowledge	Let me know that what's been said is received and understood
Advise	To tell, advise, inform
Affirm	Yes
Approved	Permission granted
Available	Accessible, useable, ready
Break	Indicates separation between different portions of the message (to be used when there is no clear distinction between the different portions of the message)
Break break	Indicates the separation between messages transmitted to different aircraft
Cancel	Previously given command, permission or information annulled
Check	Check a system, setting or procedure
Cleared	An aircraft is authorized to proceed under specified conditions
Clearance	Authorization to an aircraft to proceed under specified conditions

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[8] The second column (Meaning) was translated from Hungarian into English based on *Farkas Vulkán, Menráth Gábor – Rádiótávbeszélő kifejezések*, 2012: 9

Climb to	Start climbing to a given height or flight level
Confirm	I have understood / Have you understood?
Contact	Establish radio connection with …
Continue	Continue taxiing, flight in given direction, climb/descent, approaching, turning, or flight with own navigation
Correct	Exact, accurate
Correction	There has been a mistake in the message. The correct version is…
Cross	Fly over something or cross something on the ground
Descend to	Start descending to a given height or flight level
Disregard	Ignore previous message
Follow	Taxi after, fly after or comply with command
Maintain	Keep on given height or flight level
Monitor	Listen to a message on another frequency
Negative	No, not authorized, not correct
Pass	Fly over given flight level
Recleared	There has been a change in the last message and this new permission replaces the previous permission or part of it
Report	Give or report information
Request	I want to know, or I am asking for something
Roger	I have received all of last transmission. *Never to be used in reply to questions requiring read back, or a direct response in the affirmative ("Affirm") or negative ("Negative")*
Stand-by	Wait, I will call you back
Wilco	Abbreviation for "Will comply". I understood the message and I will comply.
Unable	I cannot comply with your request, instruction
Words twice	As a request: Communication is difficult, give each word or group of words twice As information: Communication is difficult, I will give each word or group of words twice

The expression "Go ahead" is no longer in use, since its meaning could be easily understood as a permission to continue flight. In fact, the United Kingdom has preferred the expression "Pass your message" for a long time before the above mentioned expression was removed.

3.5 A Case of Non-Verbal Communication: Military Interception Signaling

Military interceptions are a security measure that involves fighter jets moving up to another – usually civilian – aircraft that has entered national airspace without a submitted flight plan, has failed to establish radio connection with the local ATC center, is unidentifiable or is in a prohibited or restricted airspace. ICAO has standard procedures that must be adhered to in this case, which involve identifying the intercepted aircraft, trying to establish radio connection with it, and using visual signals, each of which has a specific meaning, to communicate. These standards are listed in Annex 2 to the Convention on International civil aviation, *Rules of the air*, and are repeated in the Aeronautical information publication (AIP) for each country in section ENR 1.12, *Interception of civilian aircraft*[9].

The following chart lists the standard visual signals that serve communication purposes between an intercepting and an intercepted aircraft.

Intercepting aircraft	Meaning	Intercepted aircraft
Approaches pilot-side of aircraft and matches speed and heading. (Nighttime) Will also flash navigation lights.	You have been intercepted.	(Daytime) Rock wings to acknowledge. (Nighttime) Rock wings and flash navigation lights to acknowledge

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[9] *National differences may exist. For full list, see Appendix B*

Initiates a slow, level turn.	Follow me. Fly this way.	Match heading and follow. Continue on heading in direction of fighter.
Initiates abrupt turn across nose; may dispense flares.	Warning! Turn now in direction of fighter.	Immediately match heading and follow.
Performs the breakaway maneuver.	Fighter understands intercepted aircraft's intentions.	If cannot comply, switch on and off all available lights at regular intervals. If in distress, switch on and off all available lights at irregular intervals.

4. Miscommunications in Aeronautical Radiotelephony

In everyday life, miscommunication usually appears without any serious consequences. In aeronautical communication, however, neither of the participants have a complete view of what's happening, and therefore they heavily rely on the use of devices and verbal communication. For this reason, language plays a pivotal role, and errors may have disastrous consequences. In these operating conditions, it is of crucial importance that the pilot and the air traffic controller share not only the same language, but also the same context. Difficulty in communication – breakdowns – may appear for a number of reasons, for example because of:

- two words sounding the same (homonyms);
- differences in pronunciation, even among native speakers (accents);
- a message being too indirect so that the intent is missed;
- expectations that lead the listener to hear what the listener expected to hear instead of what the speaker has actually said;
- code switching (switching from standard phraseology to normal spoken English); and
- inadequate knowledge of the language

In this chapter, two major accidents that were caused by – among other factors – communication mishaps will now be presented.

4.1 The Tenerife Accident

The Tenerife airport disaster was a runway accident that occurred on 27 March 1977. It involved two Boeing 747s, one belonging to KLM and the other to Pan Am. The crash killed 583 people, making it the deadliest accident in aviation history. This unfortunate event still serves as an example for preventing future accidents of the sort. During the investigation several factors were identified as

the causes of the disaster, but in this chapter, only the linguistic one will be analyzed in depth.

The two Boeing planes involved in the crash were preparing for takeoff. The KLM pilot started to move forward, but his co-pilot reminded him that ATC clearance had not yet been given. To this, the captain replied "I know that. Go ahead, ask." The co-pilot then radioed the tower that they were "ready for takeoff" and "waiting for our ATC clearance". The instructions that the KLM crew received contained the word "takeoff", but did not include an explicit statement that they were cleared for takeoff. The co-pilot then read the flight clearance back to the controller, completing with the statement: "We are now at takeoff".

The captain interrupted the co-pilot's read-back with the comment "We're going". The controller, who could not see the runway due to the fog, first responded with "OK" (a nonstandard terminology), which reinforced the KLM captain's misinterpretation that they had clearance for takeoff. It is probable that the controller misinterpreted the "now at takeoff" message as a reference to the plane's position, not the process of takeoff. The controller then immediately added "stand by for takeoff, I will call you", indicating that he had not intended the message to be interpreted as a takeoff clearance.

Simultaneously, the Pan Am crew – who were taxiing down the runway – initiated a radio call to the tower, which caused interference on the radio frequency. This was heard in the KLM cockpit as a few-second-long whistling sound. Due to this interference, the KLM crew missed the crucial part of the tower's response as well as the Pan Am crew's transmission that was "We're still taxiing down the runway, the Clipper 1736". Since the KLM crew did not hear any of these messages, they continued their takeoff on the runway where Pan Am flight was taxiing. Due to the fog, neither crew could see the other plane ahead, and neither plane was visible from the tower (the airport was not equipped with ground radar at the time). By the time the KLM pilot spotted the plane in front of them, they were already travelling too fast to stop. In an attempt of avoiding a head-on collision, the pilots rotated the aircraft and tried to climb, but the collision could not be avoided.

The investigation that followed concluded that, among other factors such as bad weather conditions and radio interference, the fundamental cause of the accident was that the KLM captain had started takeoff without proper clearance. The use of nonstandard phraseology was also considered, and after this unfortunate event, aviation authorities have pushed for and introduced major changes in standard phraseology. Today, ATCOs' instructions should always be acknowledged with a read back of the instruction to show mutual understanding. Additionally, the phrase "takeoff" is spoken only when the actual takeoff clearance is given or when that same clearance is cancelled ("cleared for take-off" or "cancel take-off clearance"). Up until that point, the phrase "departure" is used in its place, e.g. "ready for departure". Cockpit procedures were also changed: hierarchical relations among crew members were played down and more emphasis was placed on team decision-making.

4.2 The Linate Airport Accident

This accident occurred at the Linate Airport in Milan, Italy, on 8 October 2001, when a plane belonging to Scandinavian Airlines (SAS) collided with a Cessna business jet on the ground. This accident, in which 118 people died, remains the deadliest in Italian aviation history, and is the second most serious ground accident of air traffic after the Tenerife accident. Again, it was a number of factors that played a role in the catastrophe. On top of that, visibility was less than 200 meters due to thick fog. The smaller Cessna plane took the wrong runway, and collided with the SAS airplane that was taking off.

The investigation that followed was carried out by the Italian *Agenzia Nazionale per la Sicurezza del Volo* (ANSV, "National Agency for the Safety of Flight"), which identified several factors as causes for the accident: low visibility, non-compliance with the standards for guidance signs, the lack of operating ground radar, and a number of other deficiencies of airport procedures. Human error and communicational mismatch were the widely-accepted causes of the accident

(Garzone, Archibald: Discourse, Identities and Roles in Specialized Communication, 2010).

4.3 Organizational Factors in Accidents

Accidents are always the consequence of a series of malfunctions, of so called organizational factors (Weick 1990; Vaughan 1996; Turner/Pidgeon, 1997; Reason 1997; Perrow 1999).

It was Barry Turner's groundbreaking "Man-made Disasters" model (Turner, 1978; Turner and Pidgeon, 1997) that described how despite the best intentions of all involved, the objective of safely operating technological systems could be subverted by some very familiar and "normal" processes of organizational life (Pidgeon, O'Leary 2010). This period, in which a series of malfunctions or errors build up and result in an unfortunate event, is described by Turner as the *disaster incubation period*. He notes that:

> (...) a disaster or cultural collapse occurs because (…) there is an accumulation over a period of time of a number of events (...) Within this "incubation period" a chain of discrepant event, or several chains of discrepant events, develop and accumulate unnoticed. (Turner and Pidgeon, 1997, p. 72)

Research has shown that communication errors are among the major factors that contribute to accidents in air travel. They are usually classified as "human errors" and are usually caused by a difficulty in interaction, either in the cockpit or during air-ground communication. In his research, Tomkins (1991) indicates that over 60% of incident reports include some communication errors, while according to Billings and Cheaney (1981) 73% of incident data contain some kind of information transfer problem (Garzone, Archibald: Discourse, Identities and Roles in Specialized Communication, 2010). According to Cushing (1989), the real reason for miscommunication is

the complexity and flexibility of language (…), because of the confusion and misunderstandings that can result as a result of ambiguity, unclear reference, intonation peculiarities, implicit inference and presupposition.

It is in order to overcome these problems posed by the language itself that the linguistic resources used in air travel communication have been restricted and standardized.

5. Interviews

5.1 Interview #1

The first interview was conducted in January 2016 with an air traffic controller, who is also an air control personnel trainer at the HungaroControl center in Budapest, Hungary. HungaroControl provides air navigation services in the Hungarian airspace and (on a NATO assignment) the upper airspace over Kosovo, trains air control personnel and conducts air navigation research and development.

What is the admission test to an air traffic controller training like?

The FEAST test (First European Air Traffic Controller Selection Test) consists of a set of cognitive tests and an English language test, some ATC work sample tests, and the FEAST Personality Questionnaire. After that there's an interview held in English.

What is the language training like for future ATCOs? Is there anything to which special attention is dedicated?

After a candidate is accepted, he or she will undergo an intensive training, where special attention is dedicated to pronunciation, vocabulary and the expressions used in aviation. During this language course, aspiring ATCOs face different situations each day. A power point presentation that introduces the situation is shown at the beginning of each class, and students are then expected to deal with these events. The course lasts 9 months, after which there is a 2-month break. Candidates have to take the ICAO language test, and the minimum required level is Level 4. For the rest of the training, candidates learn of the characteristics of the Hungarian airspace (these lessons are held in Hungarian).

What is the language examination like for ATCOs?

It concentrates on the candidate's ability to communicate using standard phraseology. During the exam, the candidate must correctly give and receive

information, communicate call signs and flight levels, and deal with any given situation.

Does this language test have to be renewed?

Yes, but the time interval depends on the level. A Level 4 (of the ICAO), which is the level requested for ATCOs, have to be renewed every 3 years. In addition, there's an obligatory, 5-day-long training each year, during which ATCOs are faced with different situations each day.

Is the knowledge of the English language a prerequisite? If so, what level is needed?

Yes, prior intermediary knowledge of English is required.

What challenges are there in the English language communication for an ATCO?

Fortunately, due to the standardized phraseology there aren't really any expressions that can be misunderstood. We don't use the conditional (for example, we never say "You may climb to FL 200"), and different accents can be difficult at first, so these take some getting used to. The hardest one to understand in my opinion is Chinese, and the French say that they, on the other hand, have difficulties understanding us Hungarians. US pilots rarely say "Hi" or "Good morning" when establishing connection. I once greeted the pilot of an American flight with a "good morning", and he actually said "What?" This is strange for European ATCOs, but this is because radiofrequencies in the States are so busy that pilots have no time for these formalities.

Is a specific English accent preferred during training?

There are some instructors who prefer American or British English in terms of accents, but in radiotelephony communication, no priority is given to any accent. The important thing is for the communication between the pilot and the ATCO to be effective.

Is the familiarity with the radiotelephony communication standards enough when working in such a high-profile environment?

Yes and no. In some cases, especially in emergencies, when the situation cannot be described using standard phraseology alone, it is a must to be able to speak English. For example, if someone gets sick aboard a plane, and the pilot requests an ambulance, it is essential that both the pilot and the ATCO can describe and understand the situation – even using non-standard expression -, so that the ATCO can contact medical services for example.

Can a pilot or an ATCO use their mother tongue? If so, when, in what situations?

They are allowed to use their mother tongue only on the pilot's request or in case of emergency, but only if the plane is in that airspace where that language is spoken. For example, a Hungarian pilot would be allowed to talk in Hungarian with the Hungarian ATCOs when he's flying through Hungarian airspace, but only if it's absolutely necessary. We almost never use our mother tongues, and that's also for security reasons: this way, every pilot flying through our airspace can understand what's going on.

* An exception is made when a pilot greets the tower upon their arrival in Hungarian airspace: they often use the Hungarian greeting "Jó reggelt" (good morning) when greeting ATCOs upon entering and "Viszlát" (see you) when saying goodbye before leaving the airspace.

While at the HungaroControl tower, the candidate of this thesis had the opportunity to listen to live conversations between ATCOs and pilots. At their last check-in before leaving the Hungarian airspace, pilots almost always used Hungarian to say goodbye, and ATCOs in return used the language of the pilot.

An example[10]:

ATCO: Alitalia AZ436 contact 125.9. Have a nice flight, *arrivederci.*
Alitalia pilot: Contact 125.9. Thank you, *viszlát.*

Using the language of the ATCOs and the pilots when greeting each other is a formality, and in no way does it influence the comprehensibility of the communication between the parties, since important information and commands are always pronounced in English and in accordance with standard phraseology.

Air traffic controllers of two bordering countries may have to occasionally contact one another. Although they still use English, their communication is much more informal than that between an ATCO and a pilot. ATCOs contacting each other have a bigger freedom at expressing themselves, because there are no instructions addressed at one another. Sentences are longer and may contain informal speech such as "OK" or "Yeah".

5.2 Interview #2

The second interview was conducted in February 2016 with a Hungarian Air Force pilot, who has trained in Canada.

How are pilots trained for the use of English during flight?

Today, it's a prerequisite that aspiring pilots speak English at an intermediate level. This knowledge is then verified, of course. After this, training begins in English, where we learn everything from aircraft mechanics to radiotelephony communication.

Is there anything specific in your training (abbreviations, synonyms, etc.)?
Yes, there are plenty of abbreviations and specific terms, so we never stop learning. The list of abbreviations is endless, there will always be a new word or

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[10] *The flight number and radio frequency in this conversation have been changed by the candidate of this thesis.*

22

code word. Radiotelephony communication that uses code words is based on the English language, but it's like learning a whole other – although easier – language, one without grammatical rules.

What language training do pilots have to go through, where and how long does it take?

The training for radiotelephony communication is 1-2 months long, and there is an exam at the end of the course. If someone wants to fly "civil", they need the so called ICAO language exam to be able to do so. This exam has three levels: Levels 4, 5 and 6. A Level 6 language exam does not have to be renewed. Then comes the longer part of the training: aircraft mechanics, theory of flight, aviation law, meteorology, navigation. These are all topics that require the use of specific expressions, words and abbreviations, and is therefore completely different from "standard English". Some of the expressions originate from Latin, some from German or French. This part of the training is much longer, since not only do we have to learn the specific terminology, but we also have to learn everything that's behind it, and this can take years.

What is the language exam like for pilots?

The first exam consists of an oral and a written part, and it's around intermediate level. During the second exam, the "radiotelephony exam", special attention is dedicated to radiotelephony communication and comprehension in emergencies or when communication through radio is difficult, and to different accents. We are given a drawing or we hear someone describe an event, and we need to retell it from memory. There is also a part of the exam when a radio communication is simulated: we have to communicate with an instructor on the phone. Exams regarding the other subjects mentioned above are all held in English, and they consist of multiple choice questions. There is a time limit, because a pilot never has much time to react in real life.

Does this language exam need to be renewed for pilots?

Not in the Air Force. This is because we coordinate, communicate and fly a lot, so we actively use the language.

What challenges does a pilot have to face when communicating in English?

A bad radio connection is always disturbing, which can be due to bad weather conditions, or many other factors. There is a five-level scale on which we rate comprehensibility: 1 – unreadable; 2 – readable now and then; 3 – readable but with difficulty; 4 – readable; 5 – perfectly readable. The expression we use to check the quality of the radio connection is "I read you" and then the number. For example, "I read you 5 by 5" means intelligibility and volume are perfect. If volume is only a 3 on a scale of 5, then we say "I read you 5 by 3". Different accents can sometimes be difficult to understand. During my training in Canada, I came into contact with a lot of them, and after a while we get used to them, but they can still cause problems. Each accent, be it French, Singaporean, German or Russian…each one has their own curiosity. I personally found the Singaporean accent the most difficult to understand. A real event: during an air combat simulation, my Singaporean instructor kept shouting "Pu mo". Then when we were back on the ground, I found out he meant to say "Pull more". Or the case of the Irish colleague: he kept saying "Look ait", which meant "Look out". These are the language barriers we hear so much about, but after a while we get used to them, and the aim of radiotelephony is to get rid of these differences in pronunciation. The number nine is pronounced as niner in order to distinguish from the German "nein" because unfortunately there had been problems due to pilots misunderstanding it.

Is there any difference between the use of radiotelephony English in Canada during the training and flights and its use in Hungary?

Not really. This aviation language is meant to substitute non-standard radio communication, but there are some cultural and geographical obstacles to this. For example, at the airport in Canada where we trained (Moose Jaw), permission for takeoff had to be asked for saying "Ready for takeoff!" This expression prohibited everywhere else, because the expression "Take off" can be used only if the ATCO gives permission ("Cleared for takeoff"), and only after this has been said by the ATCO can a pilot say it too, in fact, reread is mandatory. Instead of "ready for takeoff", we use "ready for departure". One of the factors in the Tenerife accident in 1977 was actually the incorrect use of the word "takeoff", which was taken as a clearance for takeoff by one of the pilots, while another plane was still on the runway.

Conclusion

This thesis introduced the structure of the linguistic aspects of air travel communication and its importance. We have seen how language and its use play a critical role in the safe operation of an aircraft. Although this side of aviation is often overlooked by the "outsider", it is important to recognize the significance of such an international language.

In the first part of this thesis, the history of the birth of Aviation English and the International Civil Aviation Organization was presented. Since effective communication between the operators of an aircraft and the ground personnel is of critical importance, ICAO's main task was to implement a standard phraseology that can and must be used in order to improve flight safety. The ICAO Rating Scale was also presented, which measures the assessment of the users of this type of English language.

In the second part of this thesis, the linguistic elements and aspects of this specific language were presented, such as the alphabet, numbers, pronunciation and the importance of standardized phraseology to be used during flight by both the pilots and the ATCOs. A case of non-verbal communication phenomenon, the so called military interception signaling was also described.

The final part was dedicated to interviews with a pilot and an ATCO, with the help of which more insight was given into their everyday job.

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"It is a pity to lose the romantic side of flying and simply to accept it as a common means of transport."

Amy Johnson

Appendix A

Chapter VI, *Article 37* on *International standards and recommended practices* states that:

> Each contracting State undertakes to collaborate in securing the highest practicable degree of uniformity in regulations, standards, procedures, and organization in relation to aircraft, personnel, airways and auxiliary services in all matters in which such uniformity will facilitate and improve air navigation.
>
> To this end the International Civil Aviation Organization shall adopt and amend from time to time, as may be necessary, international standards and recommended practices and procedures dealing with:
>
> (a) Communications systems and air navigation aids, including ground marking;
>
> (b) Characteristics of airports and landing areas;
>
> (c) Rules of the air and air traffic control practices;
>
> (d) Licensing of operating and mechanical personnel;
>
> (e) Airworthiness of aircraft;
>
> (f) Registration and identification of aircraft;
>
> (g) Collection and exchange of meteorological Information;
>
> (h) Log books;
>
> (i) Aeronautical maps and charts;
>
> (j) Customs and immigration procedures;
>
> (k) Aircraft in distress and investigation of accidents;
>
> and such other matters concerned with the safety, regularity, and efficiency of air navigation as may from time to time appear appropriate.

Appendix B

Annex 2 to the Convention on International civil aviation, *Rules of the air*

An interception may occur in the event that military, customs or police authorities of a State:

    a) are unable to secure positive identification of an aircraft observed in or entering the sovereign airspace of the State by means other than visual

inspection, i.e. by co-ordination with air traffic services units and/or by secondary surveillance radar;

b) observe that an aircraft without proper authorization is about to enter, or has entered, an area in its territory in which civil flights are restricted or prohibited;

c) observe that an aircraft within its airspace deviates from a designated air traffic services (ATS) route, or a flight plan route outside the ATS route network, without a known or apparent valid reason for the deviation; or d) suspect that an aircraft is engaged in illegal flight and/or transportation of illicit goods or persons, inconsistent with the aims of the Chicago Convention and contrary to the laws of said State. (Manual concerning Interception of Civil Aircraft, 1990: 6)

Interception of civil aircraft may also take place if an aircraft:

a) enters the sovereign airspace of a State without proper permission and fails to comply with instructions to land or to leave the airspace;

b) enters the sovereign airspace of a State through different positions or routes from those stated in the overflight permission; or

c) constitutes a hazard to other aircraft. (Manual concerning Interception of Civil Aircraft, 1990: 7)

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