ATC to Crew: Strategic Language in High Stakes Environments

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ENGL1010: Introduction to College Writing

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Author's Note

In this assignment, I plan to articulate how language conveys intensity, meaning, and can have layered messages depending on how the message is communicated and the verbiage that is used to convey that message. While communication in an industry can be a very broad topic, I have narrowed down my findings to specifically how language in aviation is used primarily for pilots and the different ways they interact with language and literacy.

Discussion Board Post

I think that all three components (visual, media, and information) of literacy are important to formulating a good resource. When I think of literacy, I realte it to how people learn and process information, and not everyone learns everything the same way. I like figures, numbers, and statistics more than I like a wall of text filled with information. Everyone likes to see a PowerPoint with information that can be easily digested and understood. I think that outside of school, i try to be as intentional with my literacy choices as possible - images that support my claim or work, language that conveys feeling, and media literacy as a way of generating sources for the thoughts I plan to share. As an example, I share reporting inside of my office with people up to and including the president. In the process of this class and a recent experience I had, that when you are creating a "one-pager", there has to be a written context to associate the

graphics that are attached. There needs to be graphics to further the meaning of the text, and there needs to be factual information to back it all up.

In my previous DB post, I mentioned that the resources for analyzing literacy levels in aviation are few and far in-between. I was able to find this resource, which is a research paper that was completed in Hong Kong, called Fostering Non-Aviation Student's Aviation Literacy. (https://doi.org/10.1007/s12528-023-09367-0Links to an external site.) Now, because this is a research paper the different ways that information is communicated is going to be a bit different than if it was a magazine or something similar. The paper is about the learning perceptions that students have when challenged with a flight simulator, and how they process the information that they receive in a way that allows them to make informed and safe decisions. Because this site is a link to academic research and published in a medical journal, I do feel that it is a credible source for writing my next paper. The resource also includes supplemental references that can be used to validate the information that they are presenting in this paper.

I know that everyone can only see the abstract of this paper, but do you think that this is enough to use as support for the importance of literacy in aviation? Or do you think that there is more value in getting the sources from this article to synthesize on my own?

Portfolio Planning

I. Introduction

A cheesy “clear for take-off” clearance, full of jargon that then leans into the idea that these words have real meaning that is used to convey complex information at a much faster pace than how someone not in the industry would say it.

Thesis Statement

Language used in aviation is nuanced and requires forethought before committing to anything.

II. Body

1. Written Vs. Spoken. Why some information only done verbally versus sent over apps like Jeppeson/ForeFlight or the FMS.

    a. Low Priority / Non Time sensitive information is shared via apps and FMSs, allowing crew to focus on operation of the aircraft

    b. Mid-Priority – things that will influence operations, can be relayed verbally or written.

    c. High-priority – Things need to happen NOW to continue safe operation.

    d. Both forms of communication have their place in aviation – how does our understanding play into how we communicate with the others around us.

2. Written Communication in Aviation

a. SOPs / checklists -verbiage and jargon (what does it mean?)

b. Maps – Why charts look the way they do and the information they convey with little to no words.

c. Clearance Delivery – how CD reduces the chances of incorrect clearances and where it takes priority.

3. Spoken Communication

a. Importance of proper handoff and establishing clear comms.

b. How words are associated within a pilot's mind and how specific words can trigger FI/FL responses in pilots and controllers.

c. Why do pilots readback information.

III. Conclusion

Language in aviation doesn't just mean the actual language used, or even the words spoken, but comes down to a complex tiered system of understanding, prioritization, and mutual-understanding between both the professionals on the ground and in the air.

Website Evaluation

For my Language Choices Project, I have elected to write about literacy and Language in the Aviation community. This group of individuals is close to my heart as I am a student pilot and spend quite a significant amount of time either in the air, or on the field (the pilot term for an airport in its entirety). While doing some digging into the impact that both language and literacy have on Aviation, I was able to locate a research paper titled "**Language assessment literacy in a workplace environment – an exploratory study from the testing of language proficiency in aviation**" by Neil Bullock with the International Civil Aviation English Association. This paper, originally geared towards the "higher ups" of the community – directors, trainers, and legislatures, can be used to elaborate and support the points I'm trying to make in furtherance of my thesis.

This paper relies on it's writing predominantly, with only a few tables or graphics to help convey complex points. I feel that the mix of the factual information and the tables to both support the assertions but also provide clarity into the surrounding circumstances makes the paper very easy to understand. The writer – Neil Bullock has worked in both Aviation at many organizations, and as an English teacher, with emphasis on the implications in the workspace. His background as well as the number of sources that the paper uses to validate it's claims does make me feel confident that I can rely on the information being presented, and if I need to find further supporting information for the claim that I am trying to make, I have access to several sources already that I know I can use to add another layer of credibility to my writing.

While the writing itself won't carry information about the writer's credentials, I was able to locate Bullock's LinkedIn and some of the bios that are presented at aviation workshops . In the writing – I can see where Bullock's aviation training has come into play – ICAO, or the International Civil Aviation Organization is an agency within the United Nations that assists in governing the standardization of aviation training all over the world – This is in part why a Chinese airline can fly in and land at SFO (San Fransico International Airport) without issue, and understand all of the instructions that are being provided by Tracon, Approach, and Tower. There are other examples where I feel that the author has validated their credentials in international flight operations – like the knowledge of the training and licensure process for pilots at different levels of their career, and understanding the operations as both a civil (General or Delta) aviation airport compared to the operations that happen in Bravo, or commercial airports.

First Draft

Most people spend their travel days getting to the airport hours early, fretting about what they've packed or how heavy their luggage is. The reality is that people often aren't aware of the flurry of activity going that ensures that you get from your home to those beautiful Mexican beaches in one piece while flying. Most of this is thanks to the unique forms of communication that aviation professionals use throughout their duties. I'm not just talking about pilots, but also the maintenance technicians, air traffic control, and even the individuals that work to clean the plane and pump the septic before you get boarded.

With communication being as vital as it is in aviation, how do you think that all these people communicate? Do you think that every situation uses the same verbiage? With the need to often communicate life or death information, the professionals often have shorthanded phrases or tools that allow them to communicate the information they need to get across as quickly as possible. In fact, this portion of training for student pilots often takes the longest to get comfortable with – I mean, can you imagine being in the car, calling Utah Department of Transportation on the phone and telling them everything you plan to do – from the roads you take, the turns, which stoplights you'll use, and where you plan to stop along the way? The way pilots and ground crew all communicate lead to the harmonious system that we know today, but it all hinges upon clear rules and comprehending the information that is being given to you.

When most people picture aviation, the first thing that usually comes to mind is a pilot sitting in an Airbus plane, talking to Air Traffic Control (ATC) via their headset. While

not incorrect, this only paints a very narrow picture of how pilots communicate with all the different people along their routes. Let's walk through a pilot's preflight together. The day starts a few hours before the flight is due to leave. They get dressed for the day, pack their go-bag, and drive to the employee lot of their base airport. By the time that they have passed through the Known Crew Member (KCM) checkpoint, they already have calls and messages from Flight Operations letting them know of an issue on the plane that they will be using for this leg of their trip. Once settled into the Crew Lounge, out comes the iPad. Like many industries, the aviation community used to rely heavily on printed manuals, checklists, logs, and other printouts to help plan their day. Now, they use apps like Jeppesen or ForeFlight to plan their trips.

Figure 1. Foreflight on several different devices, with approach plates open on the right of the iMac (ForeFlight, 2025).

Final Draft

November 629 Tango Juliet Hotel – London Clearance Delivery – Cleared to JFK International via the TALGA departure – LANON, BADSI, LIPGO, KLY, SHANNON VOR, then direct. Maintain 8,000. London Departure frequency 120.52 – squawk 6349. There are going to be two types of people – those that look at that first sentence and can understand most or all of what is being said, and those that have no idea what is going on. In the aviation community, there is a high level of importance placed on the intentionality of words and modality of communication. As such, information in the field can be highly complex and streamlined to deliver the most information in a rapid timeframe as possible. The example I used above is only one of the many ways that aviation professionals communicate – via very-high frequency (VHF) radio, but there many more levels that add to the complexity of the choice of language and modality in aviation.

When people think about aviation their mind usually wanders to one of a few places – they either think about what it would be like to be in the crisp white shirt with four gold bands on the epaulettes and coat sleeves, they think about sitting at the airport and gazing out upon the behemoths that navigate our skies all hours of the day and night, and then there are some that can hear the tinny voices of clearance delivery, tower, or Tracon in their ears – giving them instructions or mitigating disaster. In all of these scenarios across the world there is an understanding among those working in aviation – types of unspoken codes, indicators, actions, and even a language on its own that keeps the world flying.

Looking at the first example in the paragraph above, pilots aren't completely reliant on spoken language and communication to do their jobs in a manner that is safe. Most of the work that goes into planning and routing flights is on maps, charts, and plates. Like driving a car, there are "roads" in the sky that we use to navigate from our departure location to where we are trying to go. Unlike our land-dwelling roads though, the airways are more like navigation waypoints. Picture it: you're the pilot in command of a Boeing 747 on its last flight from London to New York City. You just got to work and now you're looking at the temperature, winds, passenger load, fuel calculations, alternate landing sites, and so much more – how do pilots get all this information so quickly?

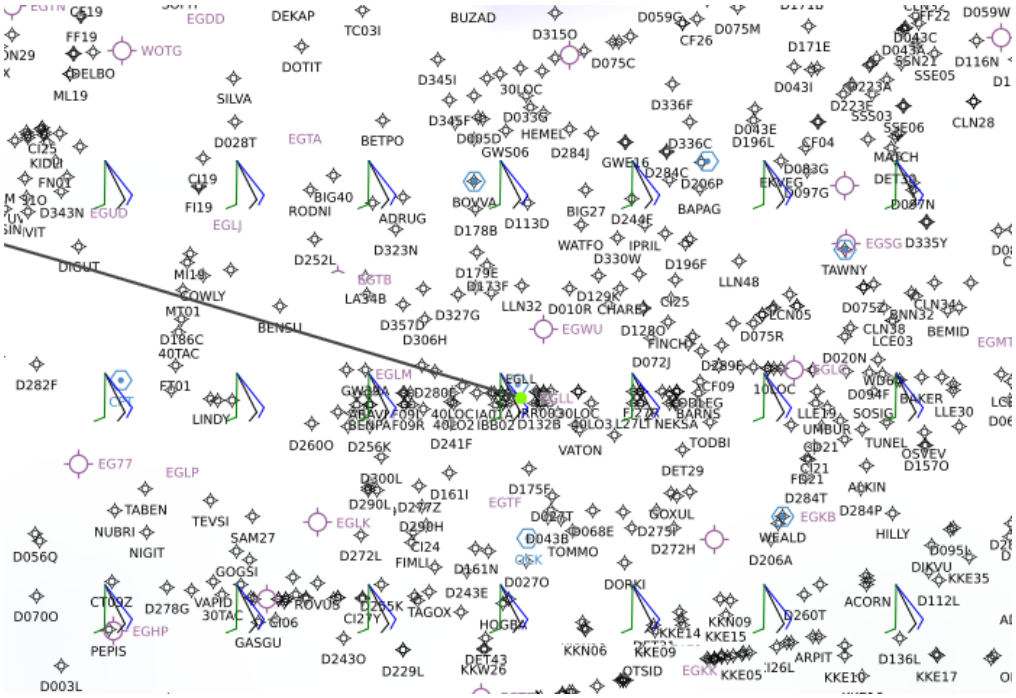
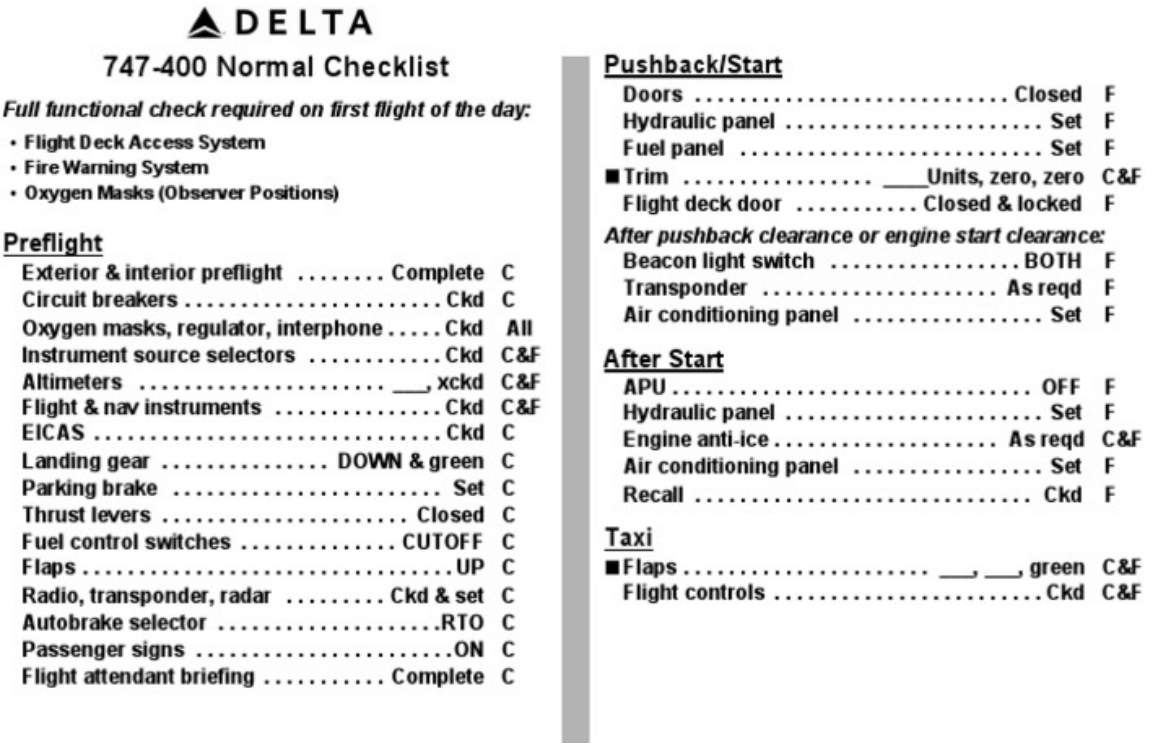


Figure 1: Flight Route Planning Map for EGLL (London Heathrow) to JFK (John F. Kennedy) airport in New York City.

Lower-priority communications in aviation are typically done via "paper", or electronic maps (Figure 1). Information like direction of travel and relevant weather information – like wind, temperature, and cloud cover are all displayed on this map

when a pilot goes to plan their route. Typically, they would access all their paper documentation inside the app provided by their airline – or if they're still starting out like me – they use ForeFlight. These charts will have all the information that one needs to effectively plan and evaluate a potential route of travel. Those blue and green triangles – represent how hard the wind is blowing and in which direction, which will affect the runway used and the fuel needed for the trip. Another example of written language in aviation is the infamous *checklists*. Everyone that works in aviation has at least one checklist that they refer to regularly – for pilots, these are typically pre- and post-flight checklists to verify the safety of the craft and make sure that the equipment is in expected functioning order. While this mode of communication is less glamorous than talking to Air Traffic Control (ATC), it is still an important way for those in operation of these multi-million-dollar machines to communicate about safety and airworthiness to one another.



DELTA

747-400 Normal Checklist

Full functional check required on first flight of the day:

- Flight Deck Access System
- Fire Warning System
- Oxygen Masks (Observer Positions)

Preflight

Exterior & interior preflight	Complete	C
Circuit breakers	Ckd	C
Oxygen masks, regulator, interphone	Ckd	All
Instrument source selectors	Ckd	C&F
Altimeters	___, xckd	C&F
Flight & nav instruments	Ckd	C&F
EICAS	Ckd	C
Landing gear	DOWN & green	C
Parking brake	Set	C
Thrust levers	Closed	C
Fuel control switches	CUTOFF	C
Flaps	UP	C
Radio, transponder, radar	Ckd & set	C
Autobrake selector	RTO	C
Passenger signs	ON	C
Flight attendant briefing	Complete	C

Pushback/Start

Doors	Closed	F
Hydraulic panel	Set	F
Fuel panel	Set	F
■ Trim	____Units, zero, zero	C&F
Flight deck door	Closed & locked	F

After pushback clearance or engine start clearance:

Beacon light switch	BOTH	F
Transponder	As reqd	F
Air conditioning panel	Set	F

After Start

APU	OFF	F
Hydraulic panel	Set	F
Engine anti-ice	As reqd	C&F
Air conditioning panel	Set	F
Recall	Ckd	F

Taxi

■ Flaps	___, ___, green	C&F
Flight controls	Ckd	C&F

Figure 2 – Pre-Flight Checklist for the Boeing 747-400 at Delta Airlines.

The need for these types of communications is two-fold; first, they convey the salient points that need to be reviewed before operating an aircraft. Like checking your tire pressure and getting an oil change before a long drive, these checklists act as a reminder to flight crew to perform regular inspections of the machinery. These checklists also act as a guide when things don't go according to plan. When something goes wrong inside of an aircraft, airport, or regional air traffic control facilities the first thing that everyone does is consult the checklist, standard operating procedure, or manuals. Muñoz-Marrón (2018) goes on to evaluate the efficacy of checklists in aviation; however, they state that the efficacy of the existing checklists is low, as only 1.8% of emergencies reported in aviation have a coordinating checklist that can be used. The importance may not come from the procedure itself, but the psychological impact that having a process in place has on the mind of the crew. With such a large reliance on checklists, the aviation industry is woefully behind the times when it comes to updating policy and procedure to reflect the coming changes in technology, safety, and passenger expectations.

Written communications are not the only way that individuals in aviation communicate though. Language choice in spoken form can also shape interactions while also conveying deeper, more complex information. The primary form of communication that we think of when we talk about language and communication in the industry. Primarily, pilots and other industry professionals will use verbal communication to relay information as it is the fastest way to convey time-sensitive information; however, as mentioned above it's not the only way that these professionals communicate. The use of Very-High Frequency (VHF) communications has been a

staple in aviation since 1918, when military ground stations began using it to communicate with the crews on aircraft to help coordinate war operations in World War I (AVI Aviation Survival, 2022). Before 1918, there was no form of communication from aircraft in the skies to both the ground and other planes in the sky. The introduction of radio communications has shaped how pilots interact with people around the world.

Across the world, aviation uses its own spoken language; well, kind of. No matter where in the world you go, pilots, groundcrew, and everyone involved in the day-to-day operation of aircraft speak English. This is a key detail when we talk about the use of spoken language in industry, as each language or region in the world could have different words that mean something different to someone from across the world. No matter where you go “Mayday, Mayday, Mayday” will always be interpreted as a distress call; but there are other ways of saying the same thing that is less-common and usually less-understood. The phrase I’m referring to would be “Pan-Pan, Pan-Pan, Pan-Pan”. Even with the similar structure of the call, someone who has never been exposed to this type of call is at risk of misunderstanding the verbiage being used and the point it attempts to convey. Majority of the world, for this reason, use the mayday call in place of the pan pan call – except for Asian countries where this is the preferred distress call. Even in more mundane things, like calling for clearance uses specific phrasing in a pattern to make things easily distinguished and provide context and clarity to a situation.

November 629 Tango Juliet Hotel – London Clearance Delivery – Cleared to JFK International via the TALGA departure – LANON, BADSI, LIPGO, KLY,

SHANNON VOR, then direct. Maintain 8,000. London Departure frequency 120.52 – squawk 6349.

At the beginning of this essay, I used an example of a flight from London Heathrow International Airport heading to John F. Kennedy Airport calling for clearance. Every clearance delivery call follows the same pattern of language. First comes the aircraft identifier which usually comes in the form of either a flight name (Delta2290) or the aircraft tail number (N629TJH) spelled out phonetically for clarity. Immediately following we will see the person speaking identify themselves – London clearance delivery in this situation, followed by a sting of information that pertains to how the craft is allowed to move about the airspace. The use of departure paths and navigation waypoints to guide their path out of the controlled airspace, with a set expectation of expected flight level gives the crew a heads up on what to expect when coming out of the pattern while also controlling the chaos that is swarming in the skies above the airport. Finally, in the excerpt above we see the final two pieces of information that every pilot gets when being “handed over” from one division of controllers to the next. This would be the frequency for the next person in line who will communicate with the craft and provide instruction on moving about the apron – or the parts of an airport where planes move that are not the taxiways or runways – in this case London Departures. We also see the squawk code. The squawk code goes into the transponder and allows ATC to track statistics like elevation, direction of travel, distance to other craft, and many more things on radar. The transponder could also be used in an emergency to communicate with controllers to relay problems and also follow a set of

guidelines – like using *squawk 7500* indicates an aircraft hijacking without the need to communicate this verbally (Johnston, 2023). This is especially useful when radio failures unfortunately occur; but often results in the craft getting a large berth in the sky and controllers working to reroute traffic around them.

As we look at the implementation of language in aviation, it is clear to see the importance of intentional phrasing and modality throughout. While we understand that the aviation industry is evolving in response to new technologies, there is still a strong reliance on communication methods that originate over half a century ago. Language in this industry isn't as simple as just the written or spoken words, but also the connections that are made using specific language to elicit specific responses or alert others in the vicinity of evolving situations that might require their attention or intervention. The use of varying modality assists in creating layers of information based on occupational literacy that conveys complex information at a pace that is unseen in other industries. Without access to all different varieties of communication available our airways would be significantly riskier.

References

AVI Aviation Survival. (2022, August 5). *Aviation Communication - History Of Aviation Radios*. Www.aviationsurvival.com. https://www.aviationsurvival.com/The-History-of-Radio-in-Flight-Communications-_b_42.html.

This source analyzes the implementation and use of radio communications in aviation, with particular emphasis on the history of radio and how it affects communications in the aviation industry. The article goes on to include examples of how earlier implementation of two-way communication could have saved lives. I plan to use this source to support the claim that verbal communication in aviation is just as important as written communication and can be used to convey more urgent messages at a much more rapid pace.

Flight Plan Database. (2025, August 6). *EGLL to KJFK*. Flightplandatabase.com. https://flightplandatabase.com/plan/8965169. This website is primarily used for online flight simulator players to plan out the route they plan to fly in software.

The information is accurate when compared to other sectional charts and background information that I know about flying and the tools that are available for route planning. This source's primary purpose is for demonstrative effect rather than informational support.

Johnston, M. (2023, August 18). *A Full Guide to Squawk Codes And What They Mean*. CAU. https://calaero.edu/learn-to-fly/air-traffic/squawk-codes/.

Understanding the difference between squawk codes doesn't only mean regulatory compliance but also opens a secondary line of communication between the pilots in the

air and the air traffic controllers on the ground. The transponder (or squawk) codes are used to convey information that might not be safe to relay verbally. The article goes into detail to explain the differences between the three International Civilian Aviation Organization (ICAO) emergency codes.

Muñoz-Marrón, D., Gil, F., & Lanero, A. (2018). ARE CREWS EMPOWERED WITH ALL THE RESOURCES NEEDED TO SUCCESSFULLY ADDRESS AN INFLIGHT EMERGENCY? CHECKLISTS, A NECESSARY BUT INSUFFICIENT TOOL. *Aviation*, *22*(3), 93–101. https://doi.org/10.3846/aviation.2018.6254.

This source was a research experiment that analyzed the implementation of checklists in emergency settings in the aviation industry. The experiment found that only about 1.5% of emergencies that occur in the air have an appropriate checklist. The article then goes on to add that the ability to document everything is almost impossible but the psychological impact of having a procedural guide adds value and distraction to what can be a tense or stressful situation.

Turner, J. W., & Huntley, M. S., Jr. (1991, April 1). *The Use and Design of Flightcrew Checklists and Manuals* (John A. Volpe National Transportation Systems Center (U.S.), Ed.). ROSA P. https://rosap.ntl.bts.gov/view/dot/8631.

This study, conducted in association with the Department of Transportation, evaluated the use of manuals and checklists and their importance in the aviation industry. The source evaluates whether the checklists and manuals are affecting change throughout the industry, or if crew members are only giving cursory glances to the information inside. The author then goes on to analyze the efficacy of the checklists and manuals

that are in place to evaluate whether they are useful in the environment they are being used in.