

Assignment 1: Familiarization with Aviation Data Sources and Aircraft Classifications

Date Due: September 5, 2025

Professor: Dr. Trani

Problem 1

Download the latest version of the FAA Advisory Circular 150/5300-13B with Change 1 (see the link on our home page). Read carefully Sections 1.1 to 1.2.3 and 1.6 of the advisory circular before answering the following questions.

Also, download the FAA Aircraft Characteristics Database at: https://www.faa.gov/airports/engineering/aircraft_char_database (second item in the home page).

ICAO_Code	FAA_Designator	Manufacturer	Model_FAA	Model_BADA	Physical_Class
A10	A10	FAIRCHILD	Fairchild A10	Fairchild A-10A	Jet
A124	A124	ANTONOV	Antonov AN-124 Ruslan	Antonov AN-124-100	Jet
A19N	A19N	AIRBUS	Airbus A319 Neo	Airbus A319 Neo	Jet
A20N	A20N	AIRBUS	Airbus A320 Neo	Airbus A320-271N	Jet
A21N	A21N	AIRBUS	Airbus A321 Neo	Airbus A321-251N	Jet
A306	A306	AIRBUS	Airbus A300 B4-600	Airbus A300B4-622	Jet
A30B	A30B	AIRBUS	Airbus A300-B2	Airbus A300B4-203	Jet
A310	A310	AIRBUS	Airbus A310	Airbus A310-204	Jet
A318	A318	AIRBUS	Airbus A318	Airbus A318-112	Jet
A319	A319	AIRBUS	Airbus A319	Airbus A319-131	Jet
A320	A320	AIRBUS	Airbus A320	Airbus A320-231	Jet

Aircraft Characteristics Database.

- Briefly explain the differences between standards, recommended practice and requirements used in airport design.
- How many Aircraft Approach Categories are used in airport design?
- Why would approach speed be important in airport design?
- Define the two parameters that dictate the Taxiway Design Group in airport design.
- A new commercial airport has a 10,300-foot long runway. The Airbus A350-1000 (see Figure 1) is expected to be the critical aircraft. Find the ADG, AAC and TDG code for the airport.
- If the airport is located in Asia, find the ICAO design codes (codes 1 and 2). Are there any differences in the FAA and ICAO standards?



Figure 1. Virgin Atlantic Airbus A350-1000. Source: A. Trani.

- Find the airport ADG, AAC and TDG codes allowing an airline to conduct operations with Boeing 787-9 aircraft (see Figure 2). Assume the visibility minima is 1,200 feet. State the ICAO Aerodrome Reference Code (Element 2) for the Boeing 787-9.



Figure 2. Japan Airlines Boeing 787-9 Dreamliner at Chicago O'Hare Airport (ORD). Source: A. Trani.

- h) A new airport project identifies the Embraer 190 (see Figure 3) as the critical aircraft for the future facility. Find the ADG, AAC and taxiway design groups to design the airport.



Figure 3. Aeromexico Connect Embraer 190 in tow at Atlanta Hartsfield Airport (ATL). Source: A. Trani.

- i) A small reliever airport is upgrading its airside facility to accommodate Bombardier Challenger 650-class aircraft (see Figure 4) as the critical aircraft for the future facility. Find the ADG, AAC and taxiway design group to design the airport.



Figure 4. Netjets Bombardier Challenger 650 at Teterboro Airport (TEB). Source: A. Trani.

Problem 2

Aircraft Consolidated Wake Classification

- a) A Boeing 747-400 (ICAO Code is B744) lands ahead of a Bombardier Challenger 650 (ICAO Code is CL60) on runway 24R at Los Angeles International Airport (LAX). Find the minimum separation between the Challenger 650 trailing the Boeing 747-400 according to the Consolidated Wake Turbulence Reclassification (see course notes on aircraft classifications starting on pages 53-54 of aircraft classification the class notes). Figure 5 shows both aircraft.
- b) If the Challenger 650 in part (a) travels at 132 knots on the final approach, find the time between successful arrivals (in seconds) between the arrival of the Boeing 747-400 and the Challenger to the runway threshold (see example in the notes).







Figure 5. Boeing 747-400 (top) and Bombardier Challenger 650 (bottom). Source: A. Trani.






Problem 3

Identify the commercial aircraft presented in Table 1. State the FAA Aircraft Design Group (ADG), Taxiway Design Group (TDG) and Aircraft Approach Class (AAC). Here is a list of possible choices (more choices than pictures to add a little challenge): Cirrus SR-22 (SR22), Embraer Phenom 300 (E55P), Boeing 777-200 (B772), Boeing 737-900 (B739), Boeing 717-200 (B712), Beechcraft King Air B350, Cessna 172 (C172), Embraer 175 (E175), Airbus A320-200 (A320), and Airbus A321 (A321). Use the FAA Aircraft Characteristics Database to get information on ADG, TDG, AAC.

To help you identify the aircraft use my web site which contains similar pictures with annotations (<https://photos.app.goo.gl/8bdSvdwPQU7IHIDi2>). Other good sites to help identify aircraft are Airliners.net <http://www.airliners.net> and Jet Photos <http://www.jetphotos.net>.

Table 1. Aircraft for Problem 2.

Picture	Aircraft Name	ADG	TDG	AAC
	Airbus A320-200	III	3	C
				
				
				

Picture	Aircraft Name	ADG	TDG	AAC
				
				
				
				
				

Problem 4**True or false section.**

Question	True / False
The Douglas DC-3 was the first successful commercial aircraft.	
In the late 1920s, Pan-American Airlines introduces passenger service to Cuba.	
The Boeing 707-320 required a runway length of 6,000 feet.	
Runway length requirements for piston and turboprop aircraft doubled between 1936 and 1959.	
President Reagan fired 11,000 air traffic controllers in 1978.	
The NAS is made up of 10,000 landing facilities.	
ADS-technology is used to track aircraft in real-time today.	
Radar technology is still in use today to track aircraft.	
The Airbus A321neo offers 11% improved fuel economy over the aircraft it replaced (e.g., Airbus A321)	
There are about 3300 airports in the US that can receive federal funds.	