



COMMUNICATION IN AVIATION

Gp Capt Sameera Lankathilake

MSc in Mgt, MSc in Def & Strat Stu, MSc in Def Stu (BAN),
PGDM (Kelaniya), BSc (Def Stu) Elec & Eltc Eng, AMIE (SL), psc

LEARNING OBJECTIVES

- To ascertain the knowledge on Aviation Communication
- To appreciate a situation with better knowledge of technical limitations
- To take strategic decisions on employment of airpower as a mean to reach the End State

SEQUENCE

- Definition
- Importance
- History
- Types of Aviation Communication
- Components of Aviation Communication
- Operating Frequencies
- Cockpit Voice Recorders

DEFINITION

- Aviation communication is the means by which aircraft crews connect with other aircraft and people on the ground to relay information



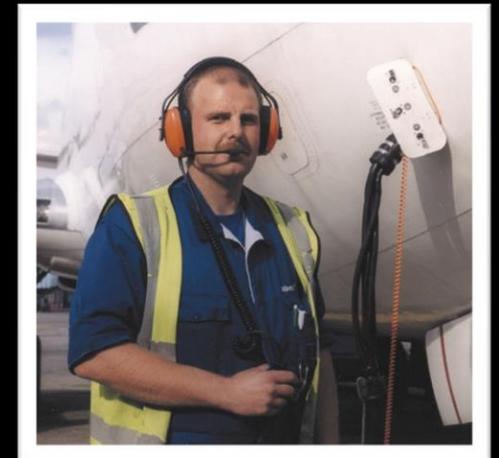
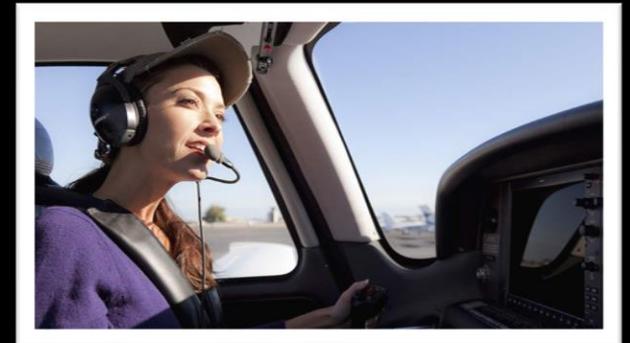
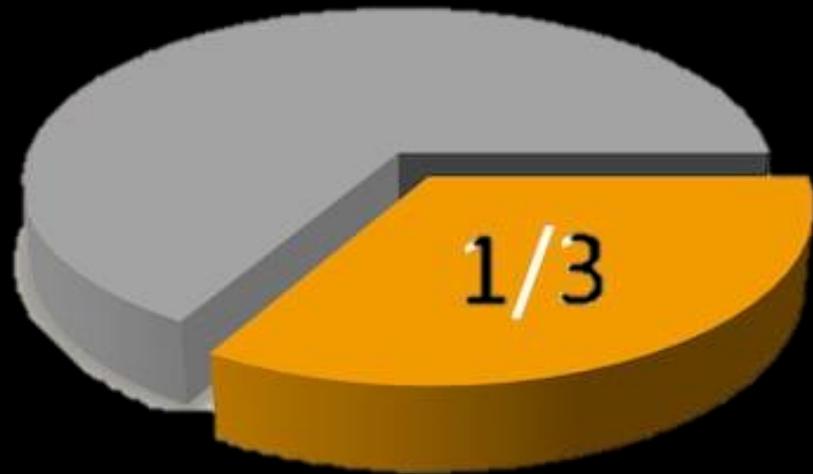
IMPORTANCE

- Aviation communication is a crucial component used for the successful functionality of aircraft movement both on ground and in air



IMPORTANCE

- One third of all aviation accidents are a result of some form of communication failure



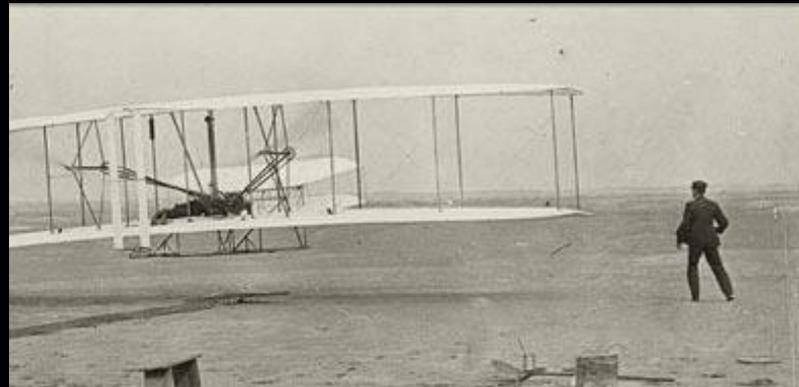
IMPORTANCE

- Increased communication reduces the risk of accidents



HISTORY

- Wright Brothers' invented aircraft in 1903



HISTORY

➤ Ground crews initially used coloured paddles, signal flares, hand signs, and other visual aids to communicate with incoming and outgoing aircraft



HISTORY

- Only had one way communication (Ground to air)



HISTORY

➤ Morse cords are being used during the first decade of the twentieth century

A a	• —	J j	• — — —	S s	• • •
B b	— • • •	K k	— • —	T t	—
C c	— • • — •	L l	• — • •	U u	• • —
D d	— • •	M m	— —	V v	• • • —
E e	•	N n	— •	W w	• — —
F f	• • — •	O o	— — —	X x	— • • —
G g	— — •	P p	• — — •	Y y	— • — —
H h	• • • •	Q q	— — • —	Z z	— — • •
I i	• •	R r	• — •		



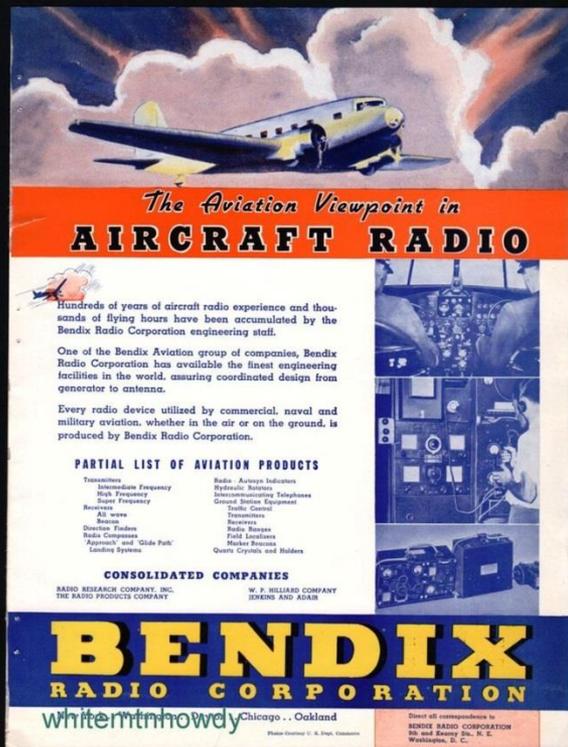
HISTORY

➤ In June 1915, the world's first air-to-ground voice transmission took place at Brooklands, England which was led by two way communication in July 1915



HISTORY

➤ During the WW2 requirement of developing aircraft radio communication and navigation systems were arise to cater the air operations conduct by both Axis and Allied parties



The Aviation Viewpoint in
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HISTORY

➤ As a result VHF and HF aviation communication equipment were developed



R 1155 TX/Rx used by RAF



TR1143 in Spitfire used by RAF



S phone for ground air com by RAF

TYPES OF AVIATION COMM'N

- Ground to Air Communication
- Air to Ground Communication
- Inter Communication



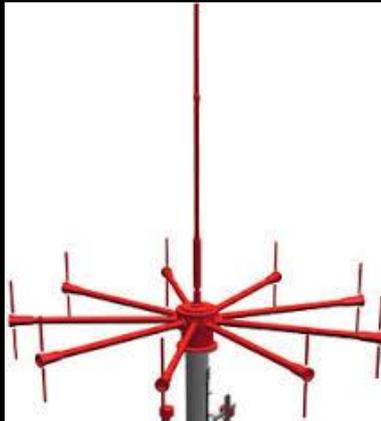
COMPONENTS

- Transducers are devices which convert energy from one form to another
- Basic radio communication systems require two audio transducers
 - **Microphone** to convert audio signal to electrical signal to be transmitted from the transmitter
 - **Speakers** to convert electrical signal from the receiver back into audio signal

G - A COMPONENTS

- PTT (Push To Talk) Switch
- Speaker Microphone
- Radio Transceiver
- Antennae

G - A COMPONENTS



A - G COMPONENTS

- PTT (Push To Talk) Switch
- Microphone
- Audio Distribution Box / Audio Amplifier
- Radio Transceiver
- Antennae

INTERCOM COMPONENTS

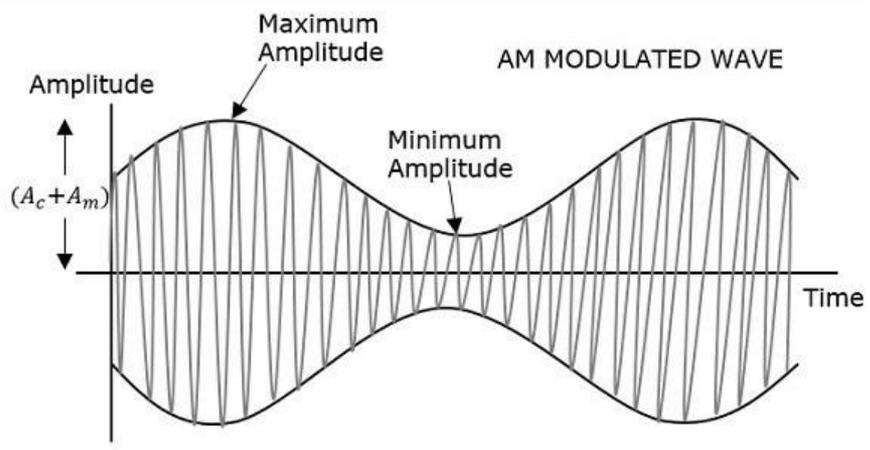
- Microphone
- Audio Distribution Box / Audio Amplifier
- Head Seat

INTERCOM COMPONENTS



OPERATING FREQUENCIES

- Use Radio signals with Amplitude Modulation
- Aviation communication use Radio Signal in the range of – HF, VHF and UHF



0.003 MHz	Very Low Frequency (VLF)
0.03 MHz	Low Frequency (LF)
0.3 MHz	Medium Frequency (MF)
3 MHz	High Frequency (HF)
30 MHz	Very High Frequency (VHF)
300 MHz	Ultra High Frequency (UHF)
3 000 MHz	Super High Frequency (SHF)
30 000 MHz	Extra High Frequency (EHF)
300 000 MHz	

OPERATING FREQUENCIES

HF

- High Frequency (3– 30 MHz)
- Basic band for long-range communications
- **Disadvantages:** All kinds of electrical interference caused by ionosphere disturbances provides the typical radio noise

OPERATING FREQUENCIES

HF



OPERATING FREQUENCIES

VHF

- Very High Frequency (30– 300 MHz)
- 117MHz to 137MHz are used for ATC communications
- The range is about 180 nautical miles

OPERATING FREQUENCIES

VHF

118-121.4 MHz	Air Traffic Control
121.5 MHz	Emergency (ELT)
121.6 – 121.9 MHz	Airport Ground control
123.1 MHz	Search And Rescue
123.675-128.8 MHz	Air Traffic Control
128.825-132.0 MHz	En Route
132.05-135.975 MHz	Air Traffic Control

OPERATING FREQUENCIES

VHF



Park Air 5000 VHF AM



Park Air 1250 VHF AM



Park Air T6TR VHF AM

OPERATING FREQUENCIES

VHF



KTR 908 VHF AM



KFS 598 A Control Unit



VHF Antenna



Orlan 85CT

OPERATING FREQUENCIES

UHF

- Ultra High Frequency (300MHz– 3GHz)
- Restricted mainly for military aviation use



COCKPIT VOICE RECORDER (CVR)



COCKPIT VOICE RECORDER (CVR)

- Electronic recording device placed in an aircraft for the purpose of facilitating the investigation of aviation accidents and incidents
- Generally known as “Black Box”
- Can withstand an impact of 3400 g and temperatures of over 1,000 °C (1,830 °F)

Thank
You

