VFR & IFR Communications

Edition 1.1

Definitions & General Operating Procedures

DEFINITIONS

ROGUE DEFINITIONS

- **HX –** No Specific Working Hours
- **HS –** Service Available During Scheduled Operational Hours
- **HR –** Hours
- **HN –** Sunset to Sunrise (*'Nuit'*)
- **HJ –** Sunrise to Sunset (*'Jour'*)
- **HO –** During Operating Hours
- **H24 –** Continuous Day and Night Service
- **ATIS –** Automatic Terminal Information Service
- **ACARS –** Aircraft Communication Addressing and Reporting System
- **SAR –** Search and Rescue
- **CTR –** Control Zone
- **STAR –** Standard Instrument Arrival
- **APV –** Approach Procedures with Vertical Guidance
- **Instrument Approach –** From Initial Approach Fix (IAF) or Defined Arrival Route to a Point where a landing may be completed (and missed approach)
- **Aeronautical Station –** A land station in the aeronautical mobile service (or in some cases a ship or platform at sea
- **Duplex –** 2-way communication can be established simultaneously (*Air/Ground Comms are considered 2-way duplex in Austro*)
- **Simplex –** 2-way communication takes place in one direction at a time

GENERAL OPERATING PROCEDURES

STANDARDS

- Standard language is **English**
- Standard abbreviations should be used
- Wait **10 seconds** if no reply

PRONUNCIATION

- Uses NATO phonetic alphabet and numbers
- Numbers always as **separate digits**, except **Altitudes**, **cloud heights**, **visibility's** and **RVRs** may use the **whole number**
  - For numbers **>9,999**, the **number of thousands** should be said
  - *e.g 12,000ft* = "One Two Thousand"
- Decimal points transmitted as '**day-se-mal**'
  - Always used when giving a frequency
- **All 6 digits** of a frequency should be used
- If last **2 digits** are **0**, these may be omitted
- Times should use the **24-hour clock** with **4 digits** in **UTC**
- Minutes only if ***no confusion*** about the hour
- Time checks are to the nearest half minute
  - e.g "Time Check Two Three Three Zero"

GROUND CALLSIGNS

- ATC without Radar -

- **Control –** Area Control Service
- **Approach –** Arrival and Departure Control Service

- ATC with Radar -

- **Radar –** ATC Service
- **Departure –** Departure Control Service
- **Arrival –** Arrival Control Service
- **Director –** Control Service on Final Approach
- **Precision –** Control Service on Final Approach with Precision Radar

- ATS Services at an Airport -

- **Tower –** Aerodrome Control Service
- **Ground –** ATC on the Manoeuvring Area
- **Delivery –** Pre-Departure Clearances
- **Information –** Flight Information Service (FIS)

- Other Services -

- **Apron –** Aircraft Guidance by the Airport
- **Dispatch –** From the Operator
- Callsigns shortened by removing location/suffix after first call if there will be no confusion

AIRCRAFT CALLSIGNS

- Registration Number -

- **Full –** "HB-XYJ"
- **Abbreviated –** "H-YJ" (***first*** *and* ***last 2 letters***)
- **Type**/**Manufacturer** of aircraft may be used instead of first letter – "Citation BXYJ"
- If this is the case, **abbreviation** is just the **last 2 letters** – "Citation XJ"

- Operator + Registration Number -

- **Full –** "FlyKeys PVMA"
- **Abbreviated –** "FlyKeys MA"

- Operator + Code (i.e Flight Number) -

- **Full –** "Jersey 1234"
- This may **NOT be abbreviated**
- **Full callsigns** used until **addressed by ATC** in **abbreviated** form
- ATC may **temporarily** change callsign
- "**Heavy**" used if in heavy wake turbulence category (**>136,000kg**) on **first call** – "Speedbird 123 Heavy"

Aeronautical Comms Service & General Comms Procedure

AERONAUTICAL COMMS SERVICE

AERONAUTICAL MOBILE SERVICE

- Categories include:
  - **Air Traffic Control Service** (**ATC**)
  - **Aerodrome Flight Information Service** (**AFIS**)
  - **Aerodrome Air/Ground Comms** (**A/G**)
- **AFIS** is provided to give information for **safe** and **efficient** **conduct** in the ATZ
  - Provided by **Flight Information Service Officers** (**qualified**)
  - Can give **instructions** on the **ground** (including helicopters)
- **A/G** is provided by **AGCS operators**
  - May only give information
  - Use the suffix '**Radio**'

MESSAGE CATEGORIES

1. **Distress – "MAYDAY" -** In **imminent & serious danger** & **requires immediate assistance**
2. **Urgency – "PAN PAN" –** Safety of aircraft threatened but does **not require immediate assistance**
3. **Direction Finding –** Q codes for directions
4. **Flight Safety –** Of immediate concern to safety of aircraft (**normal ATC messages**, including PIREPs)
5. **Meteorological –** Reports, forecasts or warnings of weather (METARs etc.)
6. **Flight Regularity –** Changes to schedules, **servicing** and operations

Prioritized in this order

AIR TO GROUND COMMUNICATIONS

- **First call -** "Station callsign, your (full) callsign"
- **New information** – "Aircraft callsign then request"
- **Reply –** "Information then callsign"

READBACKS

Required for the following information:

- **Level**, **Heading** and **Speed** Instructions, **Clearances**, **Runway in Use**, **VDF** info, **Frequency Changes** (*only the frequency*), **SSR**, **Radar Service** and **Altimetry**
- ***Anything with numbers involved***

TEST TRANSMISSIONS

- Include **station**, **callsign**, "**radio check**" and **frequency in use**
- **Replies** will **not** include the **frequency**
- **<10 seconds** long
- *"1, 2, 3, 4, Station"* is a test call

Radio Check Readability Categories

1	Unreadable
2	Readable Now and Then
3	Readable with Difficulty
4	Readable
5	Perfectly Readable

PRACTICAL COMMS

- "**TO**" is allowed if preceding an **altitude**, **height** or **FL**
- *This is only for EASA!*

GENERAL COMMS PROCEDURES

AIRCRAFT CALLSIGNS

- **QFE –** Airfield Pressure
  - **Height** is referred to using QFE
- **QNH –** Airfield Pressure adjusted to MSL using ISA
  - **Altitude** is referred to using QNH
- **QDM – Magnetic** Track **TO** the Station
- **QDR – Magnetic** Bearing **FROM** the Station
- **QTE – True** Bearing **FROM** the Station
- **QUJ – True** Track **TO** the Station

POSITION REPORTS

1. **Aircraft Identification**
2. **Position**
3. **Time**
4. **Level**
5. **Next Position** and **ETA**
6. **Ensuing Significant Point**

- ***OLE***

IN-FLIGHT FLIGHT PLANS

- **FIS frequency** should be used

Format is:

- **Aircraft Identification** and **Type**
- **Position** and **Heading**
- **Level** and **Flight Conditions**
- **Departure Aerodrome**
- **Estimated Time** at **Entry Point**
- **Route** and **Point of First Intended Landing**
- **TAS**
- **Requested Level** on **Airway/Advisory Route**

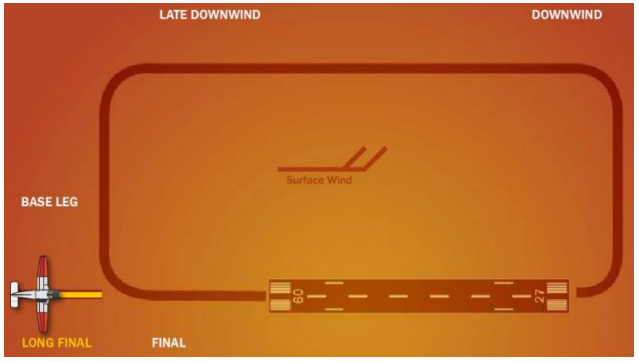
5/6/7 Aerodrome Control of Aircraft, Radar Phraseology & Approach Control

AERODROME CONTROL OF AIRCRAFT

TAKE-OFF

- Aircraft should not be spoken to whilst taking off/landing unless in an **emergency**
- "Cleared for **immediate** takeoff" means:
  - Taxi **straight** onto the runway
  - **Do not stop**, just take-off
- The pilot should NEVER use the word **take-off** unless they have been cleared for take-off
- Instead use "**Ready for Departure**"

CIRCUIT PATTERN



- **Long** Final - **4-8nm** away
- **Short** Final - **<2nm** away

OVERHEAD JOIN

- **2000ft AAL** to **view the Signal Square**
- Descend on **deadside** to 1000ft AAL
- Report "**Deadside descending**"
- Join **downwind** and continue circuit

MISSED APPROACH

- **IFR -** Follow **Missed Approach Procedure**
- **VFR -** Continue the **Traffic Pattern**

RADAR PHRASEOLOGY

RADAR ADVISORY SERVICE

- a.k.a **Procedural Service**
- Should be told of conflicting traffics relative bearing, range, direction, height and relative speed
- Turns may be issued for avoidance

RADAR INFORMATION SERVICE

- a.k.a **Traffic Service**
- Pilot is responsible for separation

RADAR PHRASEOLOGY

- **RADAR CONTACT –** Radar identity established
- **UNDER RADAR CONTROL –** Must obey ATC
- **RADAR SERVICE TERMINATED –** No longer receive radar control
- Termination or loss of identification may be acknowledged with "**Roger**"

SSR INSTRUCTIONS

- **STOP SQUAWK CHARLIE –** Turn off Mode C
- **RECYCLE SQUAWK –** Reset current squawk
- **RESET SQUAWK–** Reselect current squawk and mode
- **VERIFY YOUR LEVEL –** Done to check Mode C accuracy
- **SQUAWK IDENT –** Operate '**Special Position Identification**' feature
- **CONFIRM SQUAWK –** Readback current squawk
- **SQUAWK STANDBY –** Set transponder to standby

APPROACH CONTROL

STANDARD INSTRUMENT DEPARTURES

On first contact with departure/approach, say...

- **Callsign**
- **SID designator** (e.g SANTA2V)
- **Current/passing altitude**
- **Cleared altitude**

HOLDING PROCEDURES

Information will be given in this order:

- **Fix**
- **Level**
- **Inbound Track**
- **Right** or **Left Turns**
- **Time** of Leg
  - Substituted by **distance** if **DME** used
- ***FLIRT***

EXPECTED APPROACH TIME (EAT)

- **Time** you can **leave the hold** to **begin approach** after delay
- Given if **delay >10 minutes**
- Revised if **changes by >5 minutes**

Meteorological Information

METEOROLOGY

- In the air, **ATC**, **ATIS** and **VOLMET** may give weather information
- Broadcast on **VHF** and **UHF**

ROUTINE REPORTS

- **Position Information -** Callsign, Position, Time, Altitude, Next Position
- **Operational Information -** ETA, Endurance
- **Meteorological Information -** Temperature, Wind, Turbulence, Icing and Supplementary Information
- **Exempt** if **not datalink equipped** (unless requested)

SPECIAL REPORTS

- Include Callsign, Position, Time, Altitude and the Observed Conditions
- Required in severe turbulence, icing, mountain waves, **embedded CBs**, thunderstorms, heavy sand/dust storms, volcanic ash or eruption

METARs

- **Visibility** in **km >5000m**
- **4 digits** in **m**
- **Wind** in **° True** and **m/s** or **kts**
- "***Hear it magnetic, see it it's true***"
- Temperature in °C
- Updated when wind direction changes **>60°** or speed increases **>10kts**
- Also updated with **MET REPORT SPECIALs**

WINDSHEAR

- **WS ALLRWY –** On All Runways
- **WS RWY27L –** On Runway 27L

RVR

- Reported when prevailing vis **<1500m**
- e.g R27R/1500U
- **Trend value** after number:
  - **U –** Increasing RVR
  - **N –** Neutral
  - **D –** Decreasing RVR

TIME

- Format is Location and then Date and Time of Issue (**DDHHMM**)
- e.g LEJR 032330Z....

CLOUDS

- **CAVOK –** Ceiling and Visibility OK
  - Visibility **10km+**
  - No cloud below **5000ft** or **MSA**
  - No **CB**s/**TCU** reported
  - No **Significant Weather**

Oktas	Description
1-2	FEW
3-4	SCATTERED
5-7	BROKEN
8 (100%)	OVERCAST

VOLMET

- Gives weather for ***multiple airports*** in flight
- Includes **TAF**s, **SIGMET**s and **METAR**s

ATIS

- Provides **routine information** as **repetitive broadcast**
- Broadcast on **discrete VHF** and/or **VOR**
- Usually updated every **30 minutes**
- **D-ATIS –** Datalink Automatic Terminal Information Service

BRAKING ACTION

Coefficient	Braking Action	Code
>0.4	**Good**	5
0.39 to 0.36	**Medium to Good**	4
0.35 to 0.30	**Medium**	3
0.29 to 0.26	**Medium to Poor**	2
<0.25	**Poor**	1
-	**Unreliable** (Slush)	9

EMERGENCIES

- First call on the **frequency in use**
- **121.5 MHz –** International Distress Frequency

SSR CODES

- **7500 –** Hijack
- **7600 –** Radio Failure
- **7700 –** General Emergency (Distress)
- ***"75 taken alive, 76 radios shit, 77 going to heaven"***

DISTRESS PROCEDURES

- 'Threatened by **serious/imminent danger** and requiring **immediate assistance**'
- "**MAYDAY MAYDAY MAYDAY**"
- Includes station addressed (unless **circumstances permit** it to be **omitted**), callsign, type of aircraft, nature of emergency, intentions, position, altitude and heading
- **ATC** should **acknowledge** the message
- **Relayed** Maydays should be **acknowledged**, then take control of comms and pass all necessary information to the ATS unit, Aircraft Operating Agency and warn other stations
- **Radio silence** until the distress is over (unless giving assistance or given permission)
- May be imposed by aircraft in distress or ATC

DISTRESS TERMINOLOGY

- "**STOP TRANSMITTING, MAYDAY**" **–** Imposes silence after a MAYDAY call
- "**CANCEL DISTRESS**" **–** From the aircraft when emergency is over
- "**DISTRESS TRAFFIC ENDED**" **–** From ATC when emergency is over

URGENCY PROCEDURES

- 'Safety of **aircraft/person on-board** or **nearby** threatened **not requiring immediate assistance**'
- "**PAN PAN, PAN PAN, PAN PAN**"
- Includes station addressed, aircraft callsign, nature of urgency condition, intentions, position, level and heading
- When heard, pilots should **monitor** the frequency

PAN MEDICAL

- Callsign will be "**PAN PAN MEDICAL**"
- Used for **protected medical transport**
- Includes callsign, position, number and type of transports, ETE/ETD/ETA and any other information
- Does **not** apply for an **onboard medical emergency**
- Established by **1949 Geneva Convention**

COMMS FAILURE

- VMC -

- Land at the **nearest airport** and **report ASAP** to ATCU

- IMC -

- Maintain last assigned **speed** and **level** for:
  - **ATC** has **no radar – 20 minutes** following failure to report at CRP
  - **ATC** has **radar – 7 minutes** following either the last assigned level being reached, squawking 7600 or not reporting at a CRP, (**latest**)
- Then fly the **Current Flight Plan**
- **Land** within **±30 minutes of EAT/ETA**
- Transmitting blind = Transmit twice
- Transmit reports at **scheduled** times
- Should advise **time** of **next intended transmission**
- "**TRANSMITTING BLIND DUE TO RECEIVER FAILURE**"

	In Flight	On Ground
Steady Green	Cleared to Land	Cleared for T/O
Flashing Green	Return to Land	Cleared for Taxi
Steady Red	Give Way/Circle	Stop
Flashing Red	Do Not Land/Aerodrome Unsafe	Taxi Clear of Landing Area
Flashing White	Land and Proceed to Apron	Return to Starting Point
Red Pyrotechnic	Do Not Land	

TRANSPONDER FAILURE

- **Before** departure – Depart only to get **repaired**
- **After** departure – ATC **notified** who will try and get you to destination following **FPL**

FREQUENCY ALLOCATION

- Aeronautical Comms uses 117.955-137 MHz
- **Amplitude Modulated VHF**
- Available Channels are **118-136.975 MHz**
- Spacing is **8.33 kHz** with **25 kHz** as backup
- "**NEGATIVE EIGHT POINT THREE THREE**" – Not equipped
- **HF** uses **2.85MHz – 22 MHz**

FREQUENCY BANDS

Band	Frequencies
VLF (Very Low)	3-30 kHz
LF (Low)	30-300 kHz
MF (Medium	300-3000 kHz
HF (High)	3-30 MHz
VHF (Very High)	30-300 MHz
UHF (Ultra High)	300-3000 MHz
SHF (Super High)	3-30 GHz

- Higher frequencies have:
  - Lower range
  - Higher quality
  - Lower wavelengths
- **3×10^8 = Frequency x Wavelength**

ATTENUATION

- **Weakening** of **radiated waves**
- **Increased** with **high frequencies** and **high densities**
- **Fading** will occur if the **same signal** arrives at **different times**

VHF PROPOGATION

- **Range = $1.23\sqrt{\text{Transmitter + Receiver}}$**
  - *Heights in feet, Range in nm*
- **Super refraction** may extend range
- **Range $\propto$ Transmitter Power^2**
- Affected by **obstacles** as waves travel **basically straight** ("**Direct Waves**")
- Two aircraft at altitude will have the best reception