IVAO-HK

General Knowledge of Aerodrome Controller

Version 0.1

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1.1 Login onto the network

Callsign prefix & suffix

Callsign prefixes for tower, clearance delivery and ground positions are based on the aerodrome's four-letter ICAO code. For example, the ICAO code for HKIA is VHHH.

Callsign suffixes follow the IVAO global format of three letters to indicate the type of position being operated:
- Tower is abbreviated to TWR;
- Ground is abbreviated to GND;
- Clearance Delivery is abbreviated to DEL.

The callsign prefix and suffix are joined by an underscore (_). For example:
VHHH_N_TWR (ICAO_ZONE_POS)
VHHH_N_GND
VHHH_DEL

Selecting the appropriate facility type

The network connection dialogue box in your controller client will ask you to set your facility type. You must select the facility that corresponds to the position you are operating (ie. tower facility for a tower position). This setting affects your visibility to pilots on the network. In other words, it is a hard-coded setting that specifies how far away pilots can see you.

Using your real name

In accordance with the IVAO Code of Conduct, you must use your real, full name as registered with IVAO at all times when connected to the network.

Setting an appropriate visual range

Setting the visual range in your controller client will affect how far away you can see pilots. It does not change the distance at which pilots can see you. The larger your visibility range, the more network bandwidth is consumed, therefore it is important to set this to as low as possible without compromising your ability to provide a service to pilots.

1.2 Configure Voice and Communication

Setting an A-G frequency

All IVAO-HK ATC positions have published frequencies that must be used at all times. To determine the correct frequency you can, in the first instance, refer to the sector file you are using. Opening the sector file in a text editor such as NotePad will display the sector file header, which specifies the frequencies for use within HKFIR airspace. Alternatively, for aerodrome frequencies you can consult the relevant entry in ERSA.

Text-based pilots

From time to time you will encounter pilots who do not have voice capability. It is important to remember that they should not be penalised for using text only. They must receive equal priority to voice-equipped pilots.

Guard frequency

The guard frequency - 121.5 MHz - is the real life emergency frequency used by emergency locator beacons and aircraft in distress when there is no other suitable communication frequency available. Guard is monitored by all military and international aircraft, and usually by domestic airliners

Clearance Delivery

The clearance delivery controller (callsign "DELIVERY") is responsible for verifying the submitted flight plan and issuing an appropriate clearance.

Delivery checks that the pilot has planned via the correct route and at a level that conforms to the table of cruising levels (more about this later).

Then, Delivery will assign a:

- temporary "MAINTAIN" level for departure (initial climb)
- departure procedure, such as a SID or Visual departure
- transponder/squawk code; and
- departure frequency

This information, together with the authorized route, forms the airways clearance that is issued to the pilot.

The content of a clearance will be covered in more detail as part of the 'Clearance Delivery' competencies.

It is important to note that:

- Delivery does not control the movement of aircraft at any time; and
- Aircraft should change from the delivery frequency to ground without prompting by the controller, but online some pilots may require guidance.

2.2 Ground Control

As the name implies, the ground controller (callsign "GROUND") is responsible for preventing collisions between aircraft on the ground. This is achieved by issuing taxi clearances to regulate and control the movement of aircraft.

ATC responsibility (split between Ground and Tower) covers the parts of the aerodrome used for the take-off, landing and taxiing of aircraft, excluding aprons and parking areas. This is know as the manoeuvring area.

ATC is not responsible for aircraft operations on aprons, parking areas or any other area that is outside the manoeuvring area. Therefore, an ATC clearance is not required to operate on these areas.

Responsibility for the avoidance of collisions between aircraft on the ground is as follows:

1. On the manoeuvring area, it is a joint pilot-controller responsibility.
2. Beyond the manoeuvring area (such as aprons & parking areas), it is the responsibility of the pilot and assisting ground personnel. ATC helps by providing traffic information about other aircraft entering or leaving the same apron or parking area.This is especially important online as pilots of large aircraft do not have the luxury of ground crew to guide their pushback.

2.3 Tower

The tower controller (callsign "TOWER") is responsible for all runway operations. This includes:

- takeoffs
- landings
- runway crossings
- taxiing via a runway

This does not preclude Ground from coordinating with Tower in order to clear an aircraft to cross a runway. However, Tower is responsible even if the aircraft crossing remains on Ground frequency.

Tower applies runway separation standards to all arriving and departing aircraft, as well as wake turbulence separation to departing aircraft.

Tower is also responsible for maintaining the aerodrome ATIS, which provides weather and operational information to pilots. At some aerodromes the tower owns a portion of airspace and is responsible for managing and separating the traffic within that airspace.

One of the skills of a good tower controller is being able to move traffic efficiently. That is, picking the gaps in the arrival stream to get departures away and considering the departure sequence to minimize delays to following traffic.

For example, consider the scenario of a Cessna 172 and a B747 both ready to depart. On one hand it might seem obvious to depart the B747 first, as it's much faster. However, if the B747 departs first, the C172 has to wait several minutes for wake turbulence. Conversely, if the C172 departs first it will hold up the B747. One option is to depart the C172 first with an early turn away from the departure track of the B747. That way, both aircraft are airborne relatively quickly.

Efficient tower controlling requires quick thinking and the ability to project ahead and anticipate where aircraft will be in the next few seconds or minutes in order to process traffic with minimal delay.

2.4 Service delivery awareness

When pilots plan a flight and lodge a plan, they must specify the flight rules to which they will adhere. Pilots can choose to fly under Instrument Flight Rules (IFR) or Visual Flight Rules (VFR). Each category has specific rules regarding navigation, cruising levels, arrival and departure procedures, visibility conditions, lowest safe altitudes and ATC communication requirements.

VFR:

When outside controlled airspace, VFR aircraft have no requirement to report to ATC or broadcast their position. These aircraft operate on a see and avoid basis with other aircraft outside controlled airspace. VFR aircraft need only contact ATC if they wish to obtain a clearance to enter controlled airspace .(an optional service provided by Hong Kong Zone Control).

Due to the requirement to remain visual, VFR flights can be easily impacted by adverse weather conditions, so most charter flights and all regular public transport (RPT - eg. airliners) aircraft will fly under the instrument flight rules, which allows greater flexibility for their operations.

IFR aircraft are required to be in continuous two-way communications with ATC, even outside controlled airspace. The ATC service provided to IFR aircraft is based on the assumption that the aircraft is operating in cloud or poor visibility, unless the pilot specifically advises "visual". For this reason, standard arrival and departure procedures have been developed that provide terrain clearance to IFR aircraft.

Summary of key differences

	VFR	IFR
Navigation	Mainly heads-up, visual reference to ground or water	Mainly heads-down, relies on cockpit instruments
Communication with ATC	Only when operating within controlled airspace	At all times
Procedures	Visual departure & approaches only	Instrument departures (SIDs), instrument approaches. Can also accept visual procedures in suitable conditions

2.5 Altimetry

To monitor the altitude of an aircraft, pilots use an instrument called an altimeter. The altimeter compares current air pressure to a specific pressure set on the altimeter in order to determine altitude. The specific pressure setting depends on the height of the aircraft and will be set to either standard, local or area **QNH**. QNH is the current sea level air pressure and is measured in hectapascals (HPA).

Local vs Area QNH
Local QNH is specific to a controlled aerodrome and is found in the aerodrome METAR. It is used by ATC and quoted in the ATIS.

Area QNH is issued as part of an Area Forecast, which provides meteorological information for a defined area of operation (often hundreds of square miles). It is an average QNH over the area covered. Area QNHs are not available online with IVAO, and is therefore necessary to use the nearest local QNH as a reference point for issuing an Area QNH.

Transition altitude
The transition altitude is 9000ft in Hong Kong (it varies in other countries). This must be specified in your controller client for aircraft altitude to appear correctly. For operations up to and including this altitude, the altimeter is set to current *area or local QNH*. When set correctly the altimeter will give an accurate indication of the aircraft's height above sea level; this is known as an **altitude**.

Transition level
The transition level is FL110(For QNH979 hPa or below : FL120). At and above this level, aircraft use a *standard QNH* setting of 1013.25 HPA, regardless of the current sea level air pressure. Height at or above the transition level is referred to as a **Flight Level**, measured in hundreds of feet. For example, FL150 approximates to 15,000ft.

Transition layer
The transition layer is the bit of airspace between the transition level and transition altitude. This is where aircraft on climb transition from altitude to flight levels and aircraft on descent transition from flight levels to altitude. The layer provides a buffer for separation between aircraft operation at the transition altitude (9000FT) and the transition level (FL110) and therefore **cruising in the transition layer is not permitted**. Note: the transition level sometimes changes (rises) when the QNH drops, but this will be discussed in the Approach rating.

2.6 Decode a METAR

Weather is an important consideration for aviation operations. It influences many aspects of flying, from the selection of takeoff and landing runways, the planned route from departure to destination, deviations off-track due to storm activity and optimal levels to capture or avoid strong winds. This module will outline some very basic concepts of aviation meteorology that are particularly relevant to ATC.

Aerodrome Weather Reports

Aerodrome weather reports are known as METARs and contain observations of the weather at an aerodrome at a particular time. The reports are made by approved observers, or automatic weather stations.

Online, METARs are sourced from real world reports and are generally accurate to current real-world weather. However, there is usually a slight delay between the real world METARs and those available on IVAO (due to the data feed). It is important to remember that the IVAO METAR must take precedence over any real world METAR you refer to, as this is the main source for flight simulator winds & other weather.

METARs provide basic weather observations including wind speed and direction, visibility, cloud, temperature, dew point and QNH. As they are actual observations, *they do not provide a prediction of weather in the future*. There are other met products that do this, however they are not available through IVAO.

METAR composition

METARs use a standard format with codes to indicate the observed weather. The follow a standard format which is:

[LOCATION][DATE & TIME][WIND][VISIBILITY][CLOUD][TEMPERATURE & DEWPOINT][QNH][REMARKS]

Using the following example for Melbourne, we will examine this format and some of the common codes.

VHHH 110730Z 10022KT 7000 FEW012 SCT040 17/13 Q1016 WS R07R NOSIG=

ELEMENT	MEANING	PHRASEOLOGY
VHHH	ICAO location code	Hong Kong
110730Z	Date/time stamp. This is the 6-figure format that gives the day of the month followed by the time in UTC.	ZERO SEVEN THREE ZERO
10022KT	First three digits are wind direction, degrees true and last two digits are speed	WIND ONE ZERO ZERO DEGREES TWO TWO KNOTS
7000	Visibility in metres. Pronounced as metres if at or below 5000M and kilometres if greater than 5000M.	VISIBILITY SEVEN KILOMETRES
FEW012 SCT040	Cloud descriptor (three letters) and altitude (in hundreds of feet ie. 4000ft)	CLOUD FEW ONE THOUSAND TWO HUNDRED FEET SCATTERED FOUR THOUSAND FEET
17/13	Temperature and dewpoint	TEMPERATURE ONE SEVEN , DEWPOINT ONE THREE
Q1016	QNH	QNH ONE ZERO ONE SIX
WS R07R NOSIG=	This is a remark (RMK) that indicates there is windshear reported at RWY 07R. And there won't be any significant change in 2hrs.	WINDSHEAR REPORTED at RUNWAY ZERO SEVEN RIGHT

If any elements are unavailable, they will be replaced with a / for each character eg. //// for visibility.

Cloud

There are five abbreviations used to describe the amount of cloud.

FEW = Few

SCT = Scattered

BKN = Broken

OVC = Overcast

SKC = Sky clear

CAVOK

CAVOK (pronounced CAV-OH-KAY) is an abbreviation for 'Ceiling And Visibility OK', which appears in METARs during periods of good weather. It is included when the

following conditions occur:

- Visibility of 10KM or more;
- No cloud below 5000ft;
- No significant weather.

3.1 Matches Data

As a controller, you will receive information about an aircraft from different sources. These are usually:

1. The flight strip
2. The datatag (radar paint)
3. Voice communication from the aircraft

"Hong Kong Tower North, CATHAY 056 at Gate Charlie 12, request airways clearance, IFR to Narita"

You must be able to match the various sources of information in order to form a complete picture of who you are talking to, where they are, and what they are doing.

For example, when a pilot calls, you should look for the flight strip that corresponds to the aircraft. You may also need to identify the actual location of the aircraft in your controller client (eg. holding short of the runway, parked at the terminal).

You must be completely sure about <u>who</u> you are talking to and <u>where</u> they are, before issuing any instructions to them.

3.2 Decode a flight strip

As a tower controller you will have a lot of interaction with flight strips. When an aircraft calls for clearance, you must review the strip carefully to ensure you are familiar with the details of the planned flight.

Ask yourself these questions when looking at a flight strip:

- where is the aircraft going?

- is it flying IFR or VFR?

- is it a jet or a prop?

- is the planned route correct?

To answer these questions, you must be familiar with the different parts of a flight strip. The controller client manuals explain these in detail.

3.3 Update Flight Data

As you saw earlier in 'Matches data', there are numerous sources of information about a given aircraft and it is essential that the information is updated to accurately reflect the current situation. For this reason, IVAO-HK has outlined a number of standard operating procedures that apply to ALL controllers at ALL times. You will be assessed on your ability to update the various sources of data (flight plan, datatag) during your practical assessment.

4.1 Uses correct phraseology

Phraseology

The airwaves are often very busy, so simple standard words and phrases are used. In this way the communication is much more brief, yet still fully understood. Try to be clear and concise.

If you don't know the standard words and phrases, then speak slowly and clearly in plain English, but be brief, otherwise you jam up the radio channel.

Official phraseology can be found in AIP GEN

Typical phrases for Tower controllers may include:

Phraseology	Example
[callsign], TAXI TO HOLDING POINT [identifier], RUNWAY [number] via [TWY]	**CPA015** TAXI TO HOLDING POINT **K1** of, RUNWAY **07R** via taxiway **L1** and **K**.
[callsign], CLEARED FOR TAKEOFF	**HDA702** CLEARED FOR TAKEOFF
[callsign], CLEARED TO LAND	**BAW10**, CLEARED TO LAND
[callsign], CROSS RUNWAY [number]	**QFA451**, CROSS RUNWAY **07R**
[callsign], PUSHBACK APPROVED	**MAS370**, PUSHBACK APPROVED

Acknowledgment

Each pilot or ATC communication requires acknowledgment so that the sender knows that the message has been received. A pilot must acknowledge ATC communications, and ATC must acknowledge a pilot's communication.

The sequence for any particular exchange between pilot and ATC is like a verbal ping-pong rally between the two until fully complete, after which the controller is free to talk to another aircraft.

Terminology

The term '**over**' is redundant since standard phrases are used, and additionally the aircraft callsign is used to signify the end of a transmission. The term '**roger**' means the message is received and understood, but 'roger' can **never** be used where a readback or a Yes/No response is required, since in those instances it would be ambiguous. An Australian controller **does not** respond to a read back with the term "*readback correct*", instead responding with simply the aircraft callsign.

Radio Terminology	Explanation
Advise	Let me know what you want
Affirm	Yes
Confirm	Is this so
Expect	Plan ahead for this
Negative	No
Report	Let me know when this occurs
Standby	Wait and I will call you
Wilco	I will comply

The terms '**heading**', '**degrees**', '**knots**', '**feet**', '**squawk**', '**code**', etc, are only used when required to avoid confusion. Distances in miles are assumed to be nautical miles, and runway lengths are expressed in metres.

Runway numbers are used when there is more than one active runway, or the operation is on a runway other than the active. The standard format for runways is two-digit; eg Runway 05L = zero five left.

Numbers have been presented here in their written form, and should be said in the proper spoken form. eg 1500 = one thousand five hundred. Avoid using 'to' next to a numeral. eg. Do not say "Turn left to one zero zero"; instead use "Turn left, heading one zero zero".

4.2 Determine priority

Arriving aircraft are in a critical phase of flight. They should be afforded priority over other aircraft requesting, for example, an airways or taxi clearance. Additionally, pilot workload is very high on final approach, so ensure you issue a timely landing clearance or at least advise the pilot to expect late landing clearance. Otherwise the pilot may opt to go around and will have to be resequenced for arrival.

Arriving aircraft also have priority for use of the runway over departing aircraft. If you have an aircraft on final and one ready to depart, ensure that the arriving aircraft is not inconvenienced by the departure - if necessary delay the departure at the holding point until the arrival has landed.

5.1 **Clearance Delivery**

Coordination

Coordination is another word for communication between air traffic controllers. As you read in the communcations section, clear & concise communication is essential for the safe operation of the air traffic system. Additionally, each controller handling a given flight must be aware of a number of factors, such as:

- who it is (callsign)

- where it's going (destination)

- how it's getting there (route)

- what level it's flying at (or climbing/descending to)

A lot of this information is passed electronically in the aircraft datatags or flight strips. There are also standard operating procedures in place to reduce the amount of manual coordination between controllers. For example, all jet departures from Sydney are issued with "maintain 5000 [feet]" with their clearance, so the departures controller knows that all jets will be climbing initially to 5000ft.

From time to time you will get aircraft whose planned flight will not be covered by standard procedures; this requires manual coordination with the other controllers handling the flight. For example, an aircraft requesting a non-duty runway must be coordinated with TWR.

Never approve an aircraft for operations in another controller's airspace (or area on the ground) without first checking with that controller!

The preferred method of communication between controllers is the 'Override' line, also known as a hot line. When you override another controller, their microphone is considered 'hot' and you will hear everything they say, regardless of whether they press their push-to-talk button. Ensure you wait a moment or two before talking, in case the other controller is communicating with another aircraft.

If override communciations are not practical for a particular reason, then you may try:

- ATC chat channel

Note: the ATC chat channel is for operational communication only. It should only be used as a last resort or where your message is intended for more than one controller.

5.2 Airways Clearence and Departure Clearence (PART I)

As you saw in the Flight Data section, you must be completely sure about <u>who</u> you are talking to and <u>where</u> they are, before issuing any instructions to them. When an aircraft contacts you for clearance, you should ask yourself the following questions:

1. Where is the aircraft physically located? Your instructions may vary depending on the position of the aircraft.

2. Does the flight plan or strip that I am looking at match the callsign of the aircraft who requested clearance? If you have been looking through a number of flight plans it is possible you may have another aircraft's plan open.

3. Is the flight planned IFR or VFR? This will affect the clearance you issue to the aircraft.

Checking the planned route

In the real world, pilots must plan via published ATS routes. Ideally, this should also happen online, but remember that there is a varying degree of skill & understanding among those who fly online. You will inevitably come across pilots who have planned the wrong way down a one-way route, or simply planned direct from departure to destination.

So, how should you manage this?

Ask the pilot if they can accept an amended route and explain the reason why. If they can, then provide them with the correct route details and update their flight plan. If they are new and don't understand your question, or cannot accept a different route, then - subject to other traffic - try to accommodate them.

Checking the planned cruising level

Check the pilot has planned the correct cruise level. Cruising levels depend on the direction of flight and vary for IFR and VFR operations.

The general rule of thumb is that EASTBOUND aircraft fly at ODD levels, and WESTBOUND aircraft fly at EVEN levels. For VFR aircraft, always below 4000 or otherwise stated or approved by Hong Kong Zone Control / Hong Kong TMA/Radar.

Issuing a transponder code

You need to assign a transponder, or squawk, code to aircraft so they 'tag up', or display their callsign & aircraft information, on departure. Squawk codes must be allocated using the appropriate key in your controller client (F9 for VRC & ASRC). Ensure you have the HK POF file installed, otherwise you may end up assigning duplicate codes.

Initial 'maintain' level

Hong Kong Standard Initial Climb Altitude is 5000ft for normal operations and 7000ft for Kai Tak Airport.

5.3 Airways clearance and Departure instructions (PART II)

Departure procedures

Departure procedures provide tracking guidance from the runway to the first point of the aircraft's planned route. There are three categories of departure procedures and your selection of the appropriate one will depend on the following factors:

- aircraft flight rules (IFR or VFR)

- weather (visual or instrument conditions)

The three categories of departure procedures are:

Standard Instrument Departures (SIDs).

These are IFR procedures only and must never be issued to VFR aircraft. SIDs are designed to provide tracking and altitude guidance to:

- enable an IFR aircraft to depart from an aerodrome and join its planned route
- keep aircraft clear of terrain or obstacles in the area
- meet noise abatement requirements
- provide separation with arrival routes (STARs - covered in APP rating)

These are IFR procedures only and must never be issued to VFR aircraft. SIDs are available for all radar towers and some procedural towers. There are two types - procedural and radar(but radar departure doesn't suitable for Hong Kong FIR's airport).

Issuing the clearance - phraseology

The airways clearance authorises the pilot to proceed along the route specified by ATC. It is delivered in a standard format to avoid ambiguity and contains several mandatory elements:

1. Aircraft callsign

2. Destination, or area of operation

3. Route (this must specify the first point of the route, followed by the phrase 'planned route', or an amended route provided by the controller)

4. Maintain level

5. Departure procedure (IFR aircraft only)

6. Transponder (squawk) code

Radar towers must also specify the departure unit frequency, so pilots are prepared for the instruction to 'CONTACT DEPARTURES'.

You may elect to include the runway as part of the clearance - this is not essential as the departure runway is specified in the ATIS, however some pilots may not be aware of this and ask you for a runway.

In narrative form, an **IFR clearance** reads as follows:

[callsign] CLEARED TO [destination] as filed, INITIAL CLIMB [level], [departure procedure/trans], SQUAWK [squawk code], DEPARTURES FREQUENCY [freq]

"CPA015, you are cleared to Narita as filed, OCEAN 2 A departure, V3 transition to ENVAR, initial climb 5000ft, squawk 5301, Departure frequency 123.800"

In narrative form, a **VFR clearance** reads as follows:

[callsign] CLEARED LOCAL VFR TO [destination](optional), MAINTAIN [level] or BLW, SQUAWK [squawk code].

"HKG001, you are cleared local VFR, maintain 4000ft or below, squawk 5241"

Note: the pilot must readback all elements of the airways clearance

Ensure you follow the above phraseology carefully, particularly when issuing the departures frequency. A common error is to say 'after departure contact [freq]', which is a subtly different instruction to simply advising the frequency for the departures unit.

Don't forget to update your flight data as you assign levels, SIDs and if you amend routes!

6.1 Ground Controls - Coordination

As a ground controller, you will need to work closely with Tower to coordinate your aircraft movements. At most aerodromes you will find crossing runways, or taxiways that cross runways. It is critical that both you and the tower controller are completely clear about who has responsibility for the various taxiways and runways.

Generally speaking:

- Tower owns all runways, both active and non-active.

- Non-active runways may be released to Ground to facilitate aircraft movements. See the 'Coordinate runway crossings' competency for more information.

- Ground owns all taxiways and is responsible for aircraft operating on the manoeuvring area (between the apron & the taxiways).

- Aircraft pushback is a join pilot-ATC responsibility, because at some aerodromes the view of the apron from the tower is obscured. This is why the phrase "PUSHBACK APPROVED" is used, rather than "CLEARED FOR PUSHBACK".

Remember that the preferred medium for coordination is override.

6.2 Taxi Instructions

Taxi routes

You should issue a taxi route that provides the simplest and most direct route to the runway holding point unless:

- other traffic precludes the use of the most direct taxiway

- specific taxiways are designated as one-way taxiways, eg 'Northbound only' (See the aerodrome specific entry in ERSA for details)

Taxi instructions

Unless absolutely necessary, keep your taxi instructions simple and try to avoid overloading pilots with complex taxiway instructions.

Use the phrase "TAXI TO HOLDING POINT [identifier] of RUNWAY [runway number] via [TWYs]"

"CPA015, taxi to holding point K1 of runway 07R via taxiway L1, K, K1"

Hold short & crossing runway instructions

If a taxiway crosses a runway, you <u>MUST</u> issue a clearance to cross that runway, regardless of whether or not it is active. If you cannot issue a clearance to cross the runway then you must specify "HOLD SHORT RUNWAY [runway number]".

The correct phraseology for issuing a runway crossing instruction is:

[callsign] CROSS RUNWAY [runway number]

You should not say "cleared to cross"; it is an instruction, not a clearance, that imparts an obligation to the pilot to comply *immediately*.

See 'Coordinate runway crossings' competency for more information.

Transfer to Tower

The ground controller must issue a frequency transfer instruction to the pilot. E.G. CATHAY 015, Contact Tower South, 118.4, good day.

7.1 Tower Control - ATIS

Updating your ATIS

When should your ATIS be updated? Use these guidelines:

- the requirement for, or type of, instrument approach is changed

- the take-off or landing runway is changed

- reported wind changes by more than 10 degrees or KT

- QNH changes by 1 HPA

- Cloud base below 500ft AGL changes by 200ft or amount changes from one descriptor to another (eg. FEW -> BKN)

- Visibility between 1500M & 10KM changes by more than 1KM, and below 1500M as required

Don't forget to change your ATIS identifier when you update your ATIS!

Runway Notification

When specifying the runway or runways in the ATIS you can apply the following;

- When one runway is in use - Simply enter 'RWY##' in the ATIS line. (There is no need to add 'ARRS AND DEPS'.)
- When two runways are in use - Use 'ARRS and DEPS' as required.

7.2 Takeoff Clearence

Runway separation standards - departures

Do not clear an aircraft for takeoff until the preceding departure is airborne and has:

- passed the upwind threshold of the runway; or

- commenced a turn; or

- reached a point at least 1800M (6000FT) along the runway (which must be at least 1800M long)

Takeoff behind a previous arrival
Do not clear an aircraft for takeoff until the preceding arrival has vacated the runway

Intersecting runway operations
Do not clear an aircraft to takeoff or land until a departing aircraft on the crossing runway has crossed the intersection, or an arriving aircraft has either crossed the intersection or landed and stopped short of the intersection.

Wake turbulence separation (departing aircraft)

As a Tower controller you are required to apply wake turbulence separation to departing aircraft (Approach is responsible for wake turbulence separation for arriving aircraft). The required separation depends on the wake turbulence category of the aircraft and may be applied either as a distance observed on radar (NM) or time (minutes).

Lead aircraft	Following aircraft	Distance (NM)	Time (minutes)
HEAVY	HEAVY	4	2
	MEDIUM	5	2
	LIGHT	6	2
MEDIUM	HEAVY	-	-
	MEDIUM	-	-
	LIGHT	5	2

To clear an aircraft for takeoff, use the phrase: "[callsign] CLEARED FOR TAKEOFF RUNWAY [RWY]".

You may use the phrase "[callsign] LINE UP AND WAIT RUNWAY[RWY]" to instruct an aircraft to enter the runway and wait for a takeoff clearance.

7.3 Landing Clearence

Landing clearance

Before issuing a landing clearance, ensure the runway is clear and, if necessary, you have an appropriate runway separation standard. You do not need to provide the wind unless it differs significantly from the wind specified on the ATIS.

Frequency change

In the real world, aircraft automatically change to the ground frequency once they have vacated the active runway. However, this may not always happen online, so be prepared to issue a frequency change to the ground controller.

'GO AROUND' instruction

The GO AROUND instruction commands an aircraft to abort its approach, climb to a level & take up a heading as instructed by the tower controller. It is used as a last resort when runway separation standards would be infringed by allowing the aircraft to continue its approach and land, and is issued as follows:

'CPA111, go around, contact Hong Kong Approach 119.100.'

Do not be afraid to use this instruction if runway separation will be compromised, but do try to plan ahead so that you don't back yourself into a corner with no other option but to issue a go around. For example, you shouldn't clear an aircraft for takeoff when an arrival is only a mile or two from touchdown. When you first start out, play it safe and allow a greater margin for error as you build up your judgement and experience of arrival speeds and the amount of time it takes for an aircraft to commence its takeoff roll.

7.4 Missed Approach

As a controller, when you instruct a pilot to go around you should either specify tracking & level instructions (eg. fly runway heading, climb to 3000), or instruct the aircraft to follow the missed approach procedure (keeping in mind that the missed approach is an IFR procedure and not applicable to VFR aircraft).

Although giving instructions such as "ABC, go around, fly runway heading, and climb to 3000" is entirely valid, the controller must be mindful of the surrounding geography and the rationale for the missed approach design.   Giving this instruction to an aircraft conducting the ILS/LOC RWY 15 at Cairns (pictured above) would put the aircraft at risk of contact with terrain.

If you need to issue tracking instructions use the following format:

[callsign], PROCEED ON MISSED APPROACH PROCEDURE, CONTACT Hong Kong Approach 119.100.

Once you have issued the go around, you must immediately inform APP of the go around and advise the instructions you have issued to the aircraft. Once you have coordinated with APP, transfer the aircraft to them for resequencing and landing.