STANDARD OPERATING PROCEDURE (SOP)
DOCUMENT NUMBER: HKVACC-SOP005-R6
DATE ISSUED: 05 OCT 2024
REVISION: 6

SUBJECT: Hong Kong En-route Control Standard Operating Procedures

EFFECTIVE DATE: 05 OCT 2024

SCOPE: Outlines standard techniques for online ATC service provided by controllers staffing Area Radar positions within Hong Kong FIR.

1. PURPOSE

1.1 This Standard Operating Procedure (SOP) sets forth the procedures for all controllers providing en-route air traffic control service within the Hong Kong FIR to improve communication, techniques, and to distinguish procedures that are specific to the online environment.

2. ROLES AND RESPONSIBILITIES

2.1 The Office of Primary Responsibility (OPR) for this SOP is the team under the supervision of the Facilities Director. This SOP shall be maintained, revised, updated or cancelled by the Facilities Director. Any suggestions for modification / amendment to this SOP should be sent to the Facilities Director for review.

3. DISTRIBUTION

3.1 This SOP is intended for controllers staffing Area Radar positions within Hong Kong FIR, as well as other controllers who interface with Area Radar controllers.

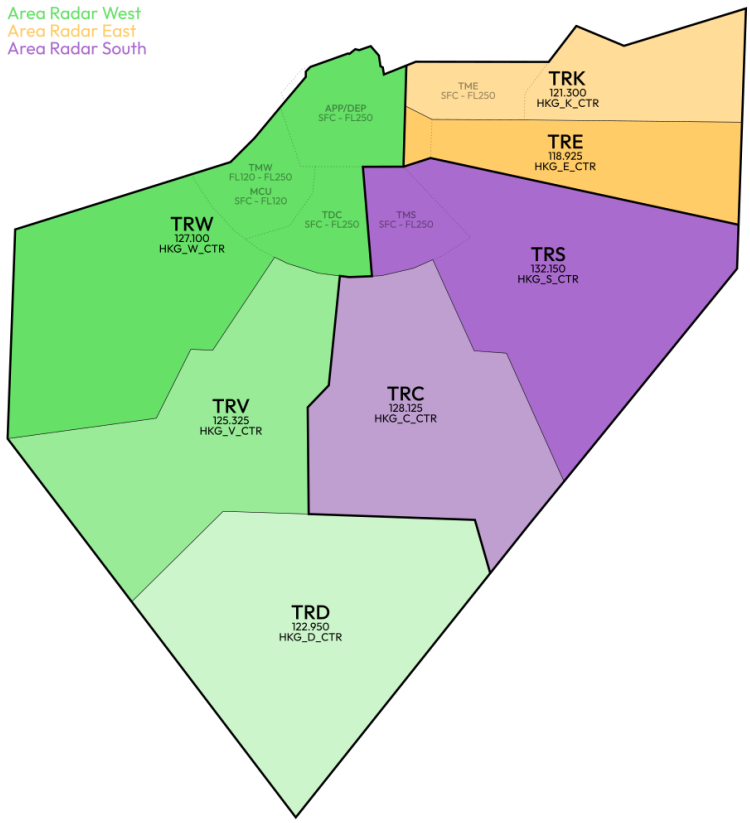
4. BACKGROUND

4.1 Over time, it has been observed that a written standard procedure is helpful to Hong Kong Area Radar controllers due to the vast knowledge required to control within this complex airspace. Due to operational differences between this online environment on VATSIM and that in the real world, it is also necessary to define procedures that are specific to the online environment.

5. AIRSPACE

5.1. AIRSPACE SECTORISATION

5.1.1. Hong Kong Area Radar Airspace Sectorisation



5.1.2. When Area Radar East is the only Area Radar East sector online, it covers both Area Radar East and Area Radar East Arrivals.

5.1.3. When Area Radar South is the only Area Radar South sector online, it covers both Area Radar South and Area Radar Central.

5.1.4. When Area Radar West is the only Area Radar West sector online, it covers Area Radar West, Area Radar West Departures and Area Radar West DULOP.

5.1.4.1. When Area Radar West Departures is online but Area Radar West DULOP is offline, it covers Area Radar West Departures and Area Radar West DULOP.

5.1.5. Controllers shall refer to SOP005 Annex I for specific details on Area Radar airspace sectorisation within Hong Kong FIR.

5.1.6. Hong Kong Approach (VHHH_APP) must be open before another Area Radar sector may be opened.

5.2. FREQUENCIES

5.2.1. The following frequencies, text call sign and voice call sign shall be used at all times. Frequencies other than listed may not be used. *(Refer to AIP ENR 2.1)*

POSITION	TEXT CALL SIGN	VOICE CALL SIGN	FREQUENCY	CODE	CJS
Area Radar East Arrivals	HKG_K_CTR	"Hong Kong Radar"	121.300	TRK	EK
Area Radar East	HKG_E_CTR	"Hong Kong Radar"	118.925	TRE	EE
Area Radar South	HKG_S_CTR	"Hong Kong Radar"	132.150	TRS	ES
Area Radar Central	HKG_C_CTR	"Hong Kong Radar"	128.125	TRC	EC
Area Radar West	HKG_W_CTR	"Hong Kong Radar"	127.100	TRW	EW
Area Radar West	HKG_V_CTR	"Hong Kong Radar"	125.325	TRV	EV
Area Radar West	HKG_D_CTR	"Hong Kong Radar"	122.950	TRD	ED
Area Radar Upper (note)	HKG_U_CTR	"Hong Kong Radar"	135.325	TRU	EU

Note: This position may only be opened during major events or high departure traffic volume. Prior approval is required from the Training Director and/or Director of Hong Kong vACC.

5.2.2. Controllers shall note that the sector identifier in EuroScope and the sector code as seen in SOPs are different, as per real world practices.

5.2.3. When only one Area Radar controller is online, such controller shall use **HKG_W_CTR and frequency 127.100** to log in. Coverage will be the entire Area Radar airspace.

5.3. VERTICAL LIMITS

5.3.1. For areas above Terminal Radar sectors, the vertical limit for Area Radar sectors is **FL250 – Unlimited**. For other areas, the vertical limit is **SFC – Unlimited**. (AIP **ENR 3.1** Section 4.2)

5.3.2. When an Area Radar controller is providing coverage for Terminal Radar positions as per Section 5.3.2 of Terminal Airspace SOP (SOP004), the lower vertical limit may be extended below FL250. Controllers shall refer to SOP004 document for the vertical limits of Terminal Radar positions.

5.3.3. The vertical limit for Area Radar Upper is **FL365 – Unlimited**. Therefore, when this sector is online, the upper vertical limit for all other Area Radar Sectors become **FL365**. The lower vertical limit remains unchanged. The lateral limit for Area Radar Upper shall be the entire Area Radar airspace.

5.4. SECTORISATION

5.4.1. When two or more controllers covering the Area Radar airspace are online, depending on the current and upcoming traffic flow, the controllers shall coordinate and decide on the sectorisation of the airspace. It is possible that one controller controls more than one sector at the same time.

5.4.2. Other sectorisation methods are possible and shall be arranged through prior coordination.

5.5. TOP-DOWN COVERAGE

5.5.1. If there is no controller online for Terminal Radar airspace, the Area Radar controllers shall provide coverage to Terminal Radar airspace, and, if applicable, aerodrome control service.

5.5.2. Pursuant to 5.5.1, if there is no aerodrome ATC available for airfields within Hong Kong FIR, Area Radar controllers shall also provide aerodrome ATC service to all airfields with an overlying ATZ owned by the Area Radar controller, except Shek Kong Airfield (VHSK).

6. GENERAL INFORMATION

6.1. PRIOR TO CONNECTION

6.1.1. Prior to connecting, Area Radar controllers shall check the weather information at each aerodrome and, if coverage for aerodrome positions is necessary, determine the runway(s)-in-use at the relevant aerodromes.

6.1.2. Hong Kong Area Radar controllers shall make use of the Hong Kong vACC Discord voice channels and/or private text messages to coordinate with aerodrome controller(s), other Area Radar controller(s) and Terminal Radar controller(s) if they are also online. If other Area Radar controllers are already online, then arrangement of sectorisation shall be made prior to connecting.

6.1.3. To coordinate with Area Radar controllers in neighbouring FIRs, Area Radar controllers within Hong Kong FIR may either use VATSEA Discord, the ATC text channel or private text messages.

6.1.4. Area Radar controllers shall be familiar with all SIDs, STARs and IAPs into the three major aerodromes (VHHH, VMMC and VHHX) prior to connecting. In particular, it is the responsibility of the Area Radar controllers to issue arrival clearance and initiate descent for aircraft at cruising altitude. If needed, they should have all the SID/STAR guides ready prior to connecting.

6.1.5. Area Radar contollers shall also be familiar with **all handoff procedures** specified within all published Letters of Agreement (LoA) with neighbouring Flight Information Regions (FIR). Controllers may refer to SOP005-ANNEX-I for details on handoff procedures.

6.2. UNDERSTANDING SEPARATION

6.2.1. Area Radar controllers shall maintain a safe and sound separation between aircraft at all times. They shall understand that airspace is three-dimensional (3D), hence in many cases both vertical and lateral separation shall be fully used. Area Radar controllers shall provide separation between all flights in Class A and Class C airspace (ICAO Doc. 4444 Section 5.2.1.1).

6.2.2. VERTICAL SEPARATION

6.2.2.1. RVSM vertical separation scheme shall be used within Hong Kong FIR. As such, the following separation shall be applied:
- 1000 feet vertical separation at or below FL410, and;
- 2000 feet vertical separation above FL410

6.2.2.2. According to Section 5.3.3.6 of ICAO Doc 4444, “cruising levels of aircraft flying to the same destination shall be assigned in a manner that will be correct for an approach sequence at the destination.”

6.2.2.3. According to Section 5.3.4.1 of ICAO Doc 4444, “An aircraft may be cleared to a level previously occupied by another aircraft after the latter has reported vacating it, except when:
- severe turbulence is known to exist;
- the higher aircraft is effecting a cruise climb; or
- the difference in aircraft performance is such that less than the applicable separation minimum may result;

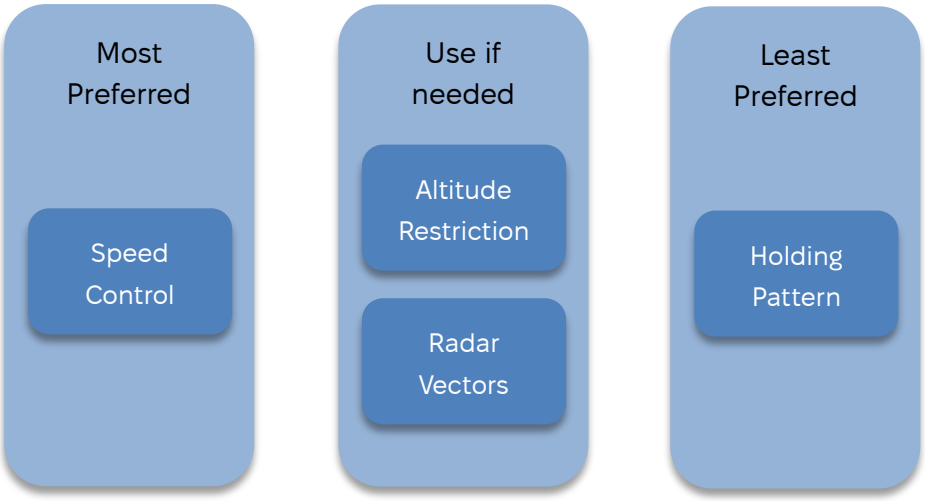
in which case such clearance shall be withheld until the aircraft vacating the level has reported at or passing another level separated by the required minimum.”

6.2.3. LATERAL SEPARATION

6.2.3.1. The method of longitudinal separation based on distance using Distance Measuring Equipment (DME) and/or GNSS shall be used in Hong Kong FIR whenever possible as distances between aircraft are always readily available on the screen.

6.2.3.2. For aircraft on the same cruising level and on the same track, **20 nm minimum longitudinal separation** shall be provided. Except when the preceding aircraft maintains a true airspeed of **20 knots or more** faster than the succeeding aircraft, then **10 nm minimum longitudinal separation** may be applied. (Section 5.4.2.3 of ICAO Doc 4444)

6.2.4. Area Radar controllers shall attempt to use **speed control** for separation before deciding to use radar vectors or holding patterns. The priority shall be set as follows:



6.3. GENERAL KNOWLEDGE FOR HANDOFFS

6.3.1. As per Section 5.3.3.1 of ICAO Doc 4444, Area Radar controllers may only assign one cruising altitude beyond the control area. No climbs or descents shall take place during a handoff unless agreement has been established with the accepting controller prior to the handoff. The aircraft may request further climb or descent after contacting the accepting controller.

6.3.2. Area Radar controllers shall not clear an aircraft to a waypoint beyond their area of control. If deviation from flight plan route is necessary during a handoff, the controller shall notify the accepting controller prior to initiating the handoff.

6.3.3. Unless prior coordination is made with the en-route controller(s) of the neighbouring FIR, handoff procedures with the respective LoAs shall always be observed.

7. DEPARTURE PROCEDURES

7.1. Area Radar controllers shall expect to receive handoffs from the Departure / Terminal Radar controllers (or the Approach controller acting as the Departure / Terminal Radar controller if only Approach is available) as the departing aircraft approaches the ceiling of the terminal airspace or the boundary of the airspace, whichever is sooner. The Area Radar controller shall **clear the aircraft to the requested cruising altitude** within the flight plan as soon as possible in a safe and sound manner. If assigning an intermediate altitude is required due to traffic or weather, the Area Radar controller shall explain the reason to the pilot.

7.2. When the requested cruising altitude is a metric altitude, the aircraft shall initially be cleared to an empirical level. The instruction to climb to the metric level shall be given prior to the point as per AIP **ENR 1.5** Section 3.6.1. This is also listed on the respective **Reaching Cruising Level** field within the Hong Kong vACC Cue Card. Controllers shall note the use of the following phraseology for climbing traffic to metric levels:

> Phraseology:
> **Climbing to Metric Levels:**
> Area Radar Controller: (Callsign) **CLIMB TO** (altitude / flight level) **METRES.**
>
> Examples:
> HKG_E_CTR: CATHAY 420, CLIMB TO FLIGHT LEVEL 7500 METRES.

7.3. Occasionally, the cruising altitude requested within the flight plan may be incorrect due to errors by previous controllers. In this case, the Area Radar controller shall confirm with the pilot the closest correct altitude may be accepted before assigning a new altitude.

7.4. As the majority of departure flights from aerodromes within Hong Kong FIR will cross the boundary of Hong Kong FIR, Area Radar controllers shall ensure that a **proper cruising altitude** is assigned to the aircraft when it crosses the Transfer of Control Point (TCP) between Hong Kong FIR and a neighbouring FIR. These altitudes are listed in the respective Letters of Agreements (LoA).

8. ARRIVAL PROCEDURES

8.1. ISSUING ARRIVAL CLEARANCES

8.1.1. On first contact with an arriving aircraft, Area Radar controllers shall assign an appropriate arrival to aircraft arriving at aerodromes within Hong Kong FIR. The controller shall coordinate with Hong Kong Approach (VHHH_APP) and/or the Tower controller at the arrival aerodrome for the runway(s)-in-use and assign a STAR based on that information. Specific information on STARs may be found within the Hong Kong vACC Cue Card.

8.1.2. Once the arrival clearance has been issued, Area Radar controllers shall ensure that aircraft are handed off at appropriate levels to the Terminal Radar controller. When there is not a separate controller responsible for the Terminal Radar sector, the Area Radar controller shall endeavour to assign appropriate levels to aircraft as if the Terminal Radar controller is online. More information about these handoff levels are available within SOP005-ANNEX-I.

8.2. INITIATING DESCENT FOR ARRIVAL AIRCRAFT

8.2.1. There are two ways to calculate the Top of Descent (TOD) distance from the arriving aerodrome:

8.2.1.1. The explicit way:

Step 1: Time to descent can be calculated by dividing the difference between cruising altitude and descent altitude (the altitude the aircraft needs to reach) by the rate of descent.

Step 2: Multiply the time to descent by the ground speed in cruise. Then, divide the result by 60. (dividing by 60 converts the unit of time from minutes to hours)

Example:
Cruising altitude – FL380
Needs to reach FL260 by ENPET
Average rate of descent – 1500ft / min
Ground speed at cruise – 490 kts

$\frac{38000ft - 26000ft}{1500ft/min}$ = 8 mins

$\frac{8\ mins}{60min/hour} \times 490nm/hour$ = 65nm

Therefore, the descent should start about 65nm from ENPET. Controllers shall note that this assumes the aircraft does not slow down from cruise. The distance needed should be less if speed reduction is taken into consideration.

8.2.1.2. The simplified way: (derived from the above formula)

Step 1: Determine the vertical distance needed to travel by subtracting the desired altitude from the aircraft's current altitude.

Step 2: Drop the thousands in the altitude.

Step 3: Multiply the result by a number between 4 and 5. (4 is a bit more ambitious, 4.5 moderate; 5 gives a longer descent distance)

Example:
Cruising altitude – FL380
Needs to reach FL260 by ENPET

$\frac{38000ft-26000ft}{1000}$ = 12

12 x 4 = 48nm (Multiplying by 4)
12 x 5 = 60nm (Multiplying by 5)

Therefore, the aircraft will have to start descent between 48nm and 60nm from ENPET. Controllers shall note that these numbers are less than the result from Example 1. The multiplying factor has taken speed reduction into consideration.

8.2.1. When assigning descent altitude, controllers shall **only assign an altitude within their sector**.

8.3. PHRASEOLOGIES FOR INITIATING DESCENT

Phraseology:
Initiating descent:
When assigning a lower altitude with a waypoint reference,
Area Radar Controller: (Callsign) **DESCEND TO REACH** (altitude / flight level) **BY** (waypoint), or;
(Callsign) **DESCEND TO** (altitude / flight level), **REACH BY** (waypoint).

When assigning a lower altitude without a waypoint reference:
Area Radar Controller: (Callsign) **DESCEND TO** (altitude / flight level).

Examples:
HKG_K_CTR: CATHAY 420, DESCEND TO REACH FL260 BY ENPET.
HKG_K_CTR: CATHAY 420, DESCEND TO FL300.

8.4. HANDING OFF TO TERMINAL RADAR CONTROLLERS

8.4.1. Area Radar controllers shall begin the handoff process as soon as an aircraft approaches the handoff level as detailed in SOP005-ANNEX-I. Controllers shall be aware of the vertical and lateral limits of the airspace.

Example: An aircraft that is flying at a level above FL250 above the Terminal Radar airspace is not in the Terminal Radar airspace, even though it may appear to have crossed the boundary of the Terminal Radar sector.

9. TRANSIT PROCEDURES

9.1. Many aircraft transit through the airspace of Hong Kong FIR without landing or departing from any of the aerodromes within Hong Kong FIR. This is considered **Transit Traffic**. Transit aircraft from VATSIM shall comply with all airway restrictions as published in the Hong Kong AIP, all LoA documents and all SOP documents.

9.2. Pursuant to Section 9.2, transit aircraft accepted from VATPRC ATC shall thus be flying at empirical levels once entering Hong Kong FIR. If the aircraft has not already been assigned an empirical level and is still flying at metric levels, the Area Radar controller shall assign the nearest empirical level when traffic permits.

9.3. Area Radar controllers shall be reminded that transit aircraft landing at an aerodrome near the boundary of Hong Kong FIR after exiting Hong Kong FIR may be required to cross the Transfer of Control Point (TCP) below the cruising altitude of the aircraft. These altitudes are usually listed in the respective Letter of Agreement (LoA), and SOP005-ANNEX-I. Examples of these aerodromes include: ZGOW, ZSAM, ZGGG, ZGSZ, ZGSD, ZJSY and ZJHK.

9.4. AREA RADAR UPPER PROCEDURES

9.4.1. When Area Radar Upper is online, aircraft requesting a climb to FL370 or above requires the approval of the Area Radar Upper controller. The Area Radar controller currently managing said traffic shall first coordinate with the Area Radar Upper controller, and when traffic permits the Area Radar Upper controller shall approve the request. Once the request has been approved, the Area Radar controller managing the traffic shall climb the aircraft to FL360. Once the aircraft approaches FL360, the aicraft may be transferred to Area Radar Upper.

9.4.2. Aircraft requesting descent to FL360 or below requires the approval of the respective lower Area Radar controller. The Area Radar Upper controller shall first coordinate with the lower Area Radar controller, and when traffic permits the lower Area Radar controller shall approve the request. Once the request has been approved, the Area Radar Upper controller shall descend the aircraft to FL370. Once the aircraft

approaches FL370, the traffic may be transferred to the lower Area Radar controller.

9.4.3. Controllers shall maintain vigilance when climbing / descending aircraft to / from FL360 and FL370 due to the possibility of conflicting with traffic in the Area Radar Upper sector.

9.4.4. When Area Radar Upper is online, the Area Radar Upper controller shall coordinate with en-route controllers in the neighbouring FIRs such that traffic at or above FL370 should contact Area Radar Upper (voice callsign Hong Kong Radar) on 135.325 MHz.

10. DONGSHA AIRPORT PROCEDURES

10.1. Dongsha Airport (ICAO: RCLM) is an airport located in the South China Sea within Hong Kong FIR and is controlled by the Taipei Civil Aeronautics Administration in the real world. Due to the military nature of this airport, it is also located within Restricted Area VHR7, between **SFC – 5000FT**.

10.2. On VATSIM, this airport is considered uncontrolled and Area Radar controllers shall not provide aerodrome control service to the airport. Flights to Dongsha Airport shall be instructed to leave controlled airspace at an appropriate level / point and transferred to UNICOM 122.800 MHz, and flights originating from Dongsha Airport entering controlled airspace within Hong Kong FIR shall be issued an IFR clearance once in the air and on first contact with Area Radar.

11. CONTROLLER-PILOT DATA LINK COMMUNICATIONS (CPDLC)

11.1. Controller-pilot data link communications (CPDLC) is a method by which air traffic controllers can communicate with pilots over a data link system. On VATSIM, this system is available through the Hoppie network as part of the functionality offered by the TopSky plugin. Area Radar controllers are encouraged to provide a CPDLC service to pilots through said network. **Controllers shall note that CPDLC service is only available to pilots above FL245.**

11.2. All Area Radar positions within Hong Kong FIR are CPDLC-equipped and controllers shall connect to the Hoppie network using the pre-defined station codes within the Hong Kong vACC Sector Package. A list is provided below for reference:

- Area Radar East Arrivals – VHHK
- Area Radar East – VHHE
- Area Radar South – VHHS
- Area Radar Central – VHHC
- Area Radar West – VHHW
- Area Radar West Departures – VHHV
- Area Radar West DULOP – VHHD
- Area Radar Upper - VHHU

11.3. Controllers should note that CPDLC service is not intended as a complete replacement for voice communications, rather it is intended to prevent the frequency from becoming overloaded. There is a short latency (about 30 seconds – 1 minute) in this form of communication, therefore controllers shall revert to utilising the frequency where a time-critical instruction needs to be issued.

11.4. Due to the extensive nature of the TopSky CPDLC system, controllers should refer to the TopSky plugin manual found within the Hong Kong vACC Sector Package for procedures pertaining to operating the CPDLC system.

RECORD OF REVISION

DATE	REV.	REVISION CONTENT	APPROVAL
31 JUL 2018	1	Changes in Content	B. BROWN
19 JUN 2020	2	Updated new sector splits and frequency list	B. BROWN
24 JUN 2020	3	Updated section 5.3.2	J. CHENG
29 FEB 2024	4	Updated text call signs for all positions Added Area Radar Upper sector (event-only) Updated Section 5.2.2 (Primary Area Radar sector) Updated Section 6.1.2 and 6.1.3 (Coordination requirements) Added Section 7.2 (Climbing to Metric Levels) Added Section 8.1 (Issuing Arrival Clearances) Added Section 9.4 (Area Radar Upper Procedures) Added Section 10 (Dongsha Airport Procedures) Added Section 11 (CPDLC) Split Sector Identifiers and Sector Codes	T. SIU
23 APR 2024	5	Updated Section 5.5.2 Added Section 5.1.6	T. SIU
05 OCT 2024	6	Updated Airspace Diagram	T. SIU