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- [AIR-TO-AIR REFUELLING](#)

AIR-TO-AIR REFUELLING

Air-to-Air Refuelling Operations

This document describes how Copenhagen FIR controllers handle Air-to-Air Refuelling (AAR) operations on published AAR tracks.

The purpose of this procedure is to:

- Give controllers a common procedure for AAR operations.
- Protect the airspace used for the AAR operation.
- Give clear coordination requirements.
- Give standard phraseology examples.
- Reduce the effect of AAR operations on other traffic.

This procedure applies to approved **vSOA operations** on the VATSIM network.

The controller provides ATC service and protects the required airspace.
The flight crew is responsible for close formation, joining, refuelling, and breakaway manoeuvres.

Word Lookup

“**AAR**
Air-to-Air Refuelling

“**ACC**
Area Control Centre

“**FL**
Flight Level

Published Air-to-Air Refuelling Tracks

The following AAR tracks are published for use in Copenhagen FIR.

Track	Published Level Block	Reference Position
RANDI	FL150-240	N57°00.00' E009°00.00'
SARAH	FL150-240	N55°20.00' E008°45.00'
SOFIA	FL180-280	N56°12.00' E005°55.00'
ROBIN	FL180-280	N56°48.00' E005°35.00'
STORK	FL180-280	N55°08.00' E007°18.00'

The published level block defines the vertical limits available for the AAR track.

The tanker can request a base level inside the published level block.

For example:

- RANDI is available between FL150 and FL240.
- A tanker can request FL220 as its base level.
- FL220 does **not** change the published limits of RANDI.

Protect the airspace required for the operation.

Do not protect only the current radar position of the tanker.

Chart

Copenhagen FIR Air-to-Air Refuelling Tracks

Reference: MIL AIP DENMARK ENR 5.3-5.

AAR Operation

An AAR operation consists of the following phases:

1. Request
2. Airspace check
3. Coordination
4. Airspace protection
5. Tanker entry
6. Receiver join
7. Refuelling operation
8. Receiver departure
9. Tanker departure
10. Airspace release

The controller must know the status of the AAR operation during all phases.

Joining the Track

Information from the Tanker

Before the tanker enters an AAR track, obtain:

1. AAR track.
2. Requested base level.
3. Entry time.
4. Expected duration.
5. Receiver callsign or callsigns, if known.

The controller can request missing information.

Example

OAN1:

Request AAR track RANDI.

ACC:

OAN1, confirm AAR track RANDI, base level and duration.

OAN1:

RANDI, base level FL220, duration 15 minutes.

ACC:

OAN1, copied, standby.

Do not approve the AAR operation before the required airspace checks and coordination are complete.

Before Approval

Before approval:

1. Check that the requested track is available.
2. Check that the requested base level is inside the published level block.
3. Check that the required levels are available.
4. Check that no conflicting traffic is inside the protected airspace.
5. Check that crossing traffic can remain clear.
6. Check that climbing and descending traffic can remain clear.
7. Coordinate with all affected ATC sectors.

If the operation cannot start immediately:

ACC:

OAN1, unable AAR operation at this time, expect 10 minutes delay.

If an accurate delay is not available:

ACC:

OAN1, unable AAR operation at this time, standby.

Protect the Airspace

Before the tanker enters the track, protect the required airspace.

The protected airspace must include:

- The complete applicable AAR area.
- The required vertical level block.

Do not use only the tanker position as the protected area.

Protect the published AAR airspace for the complete duration of the operation.

Conflicting Traffic

If traffic conflicts with an active AAR operation, use one of the following methods.

Vertical Separation

Clear the aircraft above or below the protected level block.

Example:

If RANDI is protected from FL150 to FL240, unrelated traffic can be kept:

- Below the protected airspace; or
- Above the protected airspace.

Use the protected AAR level block when you determine if traffic is clear.

Do not use only the tanker base level.

Lateral Separation

Vector or route the aircraft around the protected AAR airspace.

Delay

Delay or hold the aircraft if vertical or lateral separation is not available.

Consider the complete aircraft trajectory.

An aircraft can be clear of the AAR area at its present level but conflict with the area during a climb or descent.

Coordination

Coordinate the AAR operation with all affected ATC sectors before activation.

The coordination must include, as applicable:

- AAR track.
- Protected level block.
- Tanker callsign.
- Expected activation time.
- Expected duration.

Example

RANDI active for OAN1, FL150 to FL240, expected 15 minutes.

The exact coordination method can depend on sector ownership and controller configuration.

All affected controllers must know that the airspace is protected.

Coordination is required before the AAR airspace is activated and when it is released.

Tanker Approval

When the required airspace is protected, approve the tanker operation.

Example

ACC:

OAN1, cleared to operate RANDI, base level FL220.

OAN1:

Cleared to operate RANDI, base level FL220, OAN1.

If an entry point or restriction is required:

ACC:

OAN1, cleared to operate RANDI, base level FL220, enter at [POINT].

Continue to monitor the tanker until it enters the AAR track.

When the tanker enters the track, consider the AAR operation **ACTIVE**.

Receiver Aircraft

Receiver aircraft remain under normal ATC service until the tactical join starts.

Before the join:

1. Identify the receiver.
2. Confirm which tanker the receiver will join.
3. Check the receiver level.
4. Check other traffic.
5. Position the receiver for the join.
6. Give tanker traffic information as necessary.

Example

ACC:

VIPER21, OAN1 twelve o'clock, 15 miles, FL220.

VIPER21:

Traffic in sight, VIPER21.

When the receiver is in a suitable position:

ACC:

VIPER21, join OAN1, maintain own separation.

ATC positions the receiver for the join.

ATC does not control the close formation manoeuvre.

The participating pilots are responsible for separation during close formation and refuelling.

During the AAR Operation

While the AAR operation is active, monitor:

- Tanker position.
- Receiver aircraft.
- Protected airspace.
- Protected level block.
- Crossing traffic.
- Climbing and descending traffic.
- Expected completion time.

Do not clear unrelated traffic into the protected AAR airspace.

Normal ATC operations can continue outside the protected airspace.

Breakaway

A **breakaway** is a tactical manoeuvre between the tanker and receiver.

ATC does not give tactical breakaway instructions.

If an aircraft reports a breakaway:

1. Keep the AAR airspace protected.
2. Keep unrelated traffic clear.
3. Protect the required vertical airspace.
4. Avoid unnecessary ATC instructions.
5. Monitor the aircraft.
6. Wait until the aircraft reports ready for ATC instructions.

BREAKAWAY

Do not assume that an aircraft will remain at its previous level during a breakaway.

Do not issue unnecessary instructions during the immediate manoeuvre.

Example

VIPER21:

BREAKAWAY, BREAKAWAY, BREAKAWAY.

When the aircraft reports ready:

VIPER21:

VIPER21, ready for further clearance.

Normal ATC service can then continue.

Receiver Leaves the Tanker

When refuelling is complete, the receiver leaves the tanker formation.

Before you issue an onward clearance:

1. Identify the receiver.
2. Confirm its level.
3. Confirm its intentions.
4. Check other traffic.
5. Establish the required ATC separation.

Example

VIPER21:

VIPER21, refuelling complete, leaving 0AN1.

ACC:

VIPER21, radar contact, climb FL280, direct [POINT].

Do not release the AAR airspace if the tanker or other receivers continue the operation.

Tanker Leaves the Track

When the tanker reports that the AAR operation is complete, do not immediately release the protected airspace.

First confirm that:

1. All receivers have left the operation.
2. The tanker has left the protected AAR airspace.
3. No breakaway manoeuvre continues.
4. No recovery manoeuvre requires continued protection.

When all AAR aircraft are clear, release the protected airspace.

Coordinate the release with affected ATC sectors.

Example

RANDI released, all levels available.

The airspace can then return to normal use.

Unable or Delayed AAR Operation

ATC can delay an AAR operation when the required airspace is not available.

Possible causes include:

- Traffic complexity.
- Traffic inside the AAR area.
- Traffic that cannot be routed around the area.
- Adjacent sector restrictions.
- Controller workload.

Delay

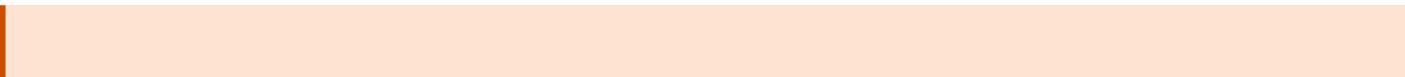
ACC:

OAN1, unable AAR operation, expect 10 minutes delay.

Unable

ACC:

OAN1, unable AAR operation due traffic.



The aircraft must not enter the AAR track until ATC gives approval.

Quick Phraseology

Situation	Phraseology
Request information	[CALLSIGN], confirm AAR track, base level and duration.
Delay	[CALLSIGN], unable AAR operation, expect [TIME] delay.
Standby	[CALLSIGN], unable AAR operation at this time, standby.
Approve tanker	[CALLSIGN], cleared to operate [TRACK], base level [LEVEL].
Tanker information	[RECEIVER], [TANKER] twelve o'clock, [DISTANCE] miles, [LEVEL].
Permit join	[RECEIVER], join [TANKER], maintain own separation.
Receiver returns to ATC	[RECEIVER], radar contact, [CLEARANCE].
Release coordination	[TRACK] released, all levels available.