Controller Operations Manual

Schiphol Delivery

Revision history

Table 1 Revision history

Version	Date	Changes
2.0	July 2021	Complete revision of the delivery manual. Special thanks to Thijs Schepman and Olaf Langelaar for their help and feedback.
2.1	July 2021	Added information about odd FLs required for outbound flights through France, Italy, Spain and Portugal. Textual changes.
2.2	August 2021	SID/STAR changes with AIRAC 2108.
2.2.1	August 2021	09 SIDs updated.
2.2.2	May 2022	SID versions update.

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Abbreviations

The list below states all abbreviations used within this document. All abbreviations used in the body text will be written out in full before stating the abbreviated text between brackets.

Table 2 Abbreviations used in this document

DEL	Delivery
FPL	Flight Plan
OPL	Outbound Planner
SID	Standard Instrument Departure
STAR	Standard Terminal Arrival Route
IFR	Instrument Flight Rules
VFR	Visual Flight Rules
SVFR	Special VFR
RT	Radio Telephony
NMOC	Network Manager Operations Center
LT	Local Time

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1. General Introduction

Welcome to the manual for Schiphol Delivery on the VATSIM network! The aim of this manual is to give new and existing controllers basic knowledge for this position, allow new controllers to control on this position without a mentor, while also being able to solve non-standard situations on their own. This manual is a complete rewrite of the old manual, including many more tips, tricks, examples and subjects.

This manual will start with a general introduction on several subjects, such as VATSIM, the Dutch VACC, the mentor program and more. If you have any questions, be sure to ask them primarily on the Dutch VACC Discord server. If there are any questions left, send an email to the Training Department at trainingdepartment@dutchvacc.nl.

1.1 The VATSIM network

The VATSIM (Virtual Air Traffic Simulation) Network is, as the name suggests, an online network which simulates our skies: virtual airplanes flown by (amateur) pilots and online air traffic controllers to guide them safely and efficiently from A to B. By becoming a member, you can fly on the network, and/or join a local facility to control at your favourite airport! While the flight simulator and accessories for flying incur some investment, and controlling will cost you in time, the network is completely free to join for everyone above the age of 13 (following parental approval for members under a certain age).

To optimize ATC coverage, VATSIM utilises the so called 'top-down principle'. If at a given airport only Tower is online, the tower controller also handles delivery and ground duties. If only ACC is online, they cover all controlled airports in their airspace top-down: delivery, ground, tower, approach, of course depending on local facilities.

Because VATSIM is a worldwide network with members from all around the world, the network is divided in a few regions. Americas, Asia Pacific and EMEA (Europe, Middle-East, Africa) are the three regions, which all hold different divisions. The Netherlands is based in the European Division (VatEUD), which is mainly responsible for different VACCs: Virtual Area Control Centers, usually representing a country. The Netherlands is controlled by the Dutch VACC, which consist of a staff to oversee day-to-day operations and members. A global overview of (part of) the VATSIM structure can be found in Figure 1 below.

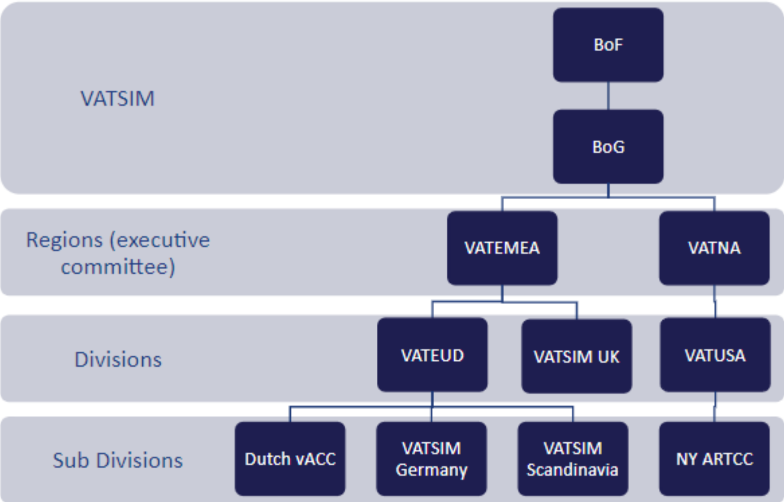


Figure 1 Structure of VATSIM

1.2 Dutch VACC

The Dutch VACC is the local organisation that is responsible for the Dutch airspace, including all underlying airports. The staff oversees the day-to-day operations and make sure that the VACC operates smoothly. The Training Department is responsible for the quality of training now and in the future. The VACC consists of members that join the community, control on Schiphol or other regional airfields in The Netherlands and some dedicate some of their free time to teach other members to control online. This is all done voluntarily, and the Training Department oversees the quality of the training program.

The Dutch VACC organizes on average bi-weekly events, such as the Friday Night Fly-In (realistic Friday evening with a lot of traffic), Runway to Holland (single runway operations), various city pairs and regional airport events. During most events, we exceed real life peak hour capacity. Schiphol as main airport is one of the busiest airports on the VATSIM network in terms of traffic and is known for the high quality and friendly ATC, while efficiently handling a lot of traffic. In 2020, Schiphol on the network has seen over 68.000 movements (arrivals and departures combined), a whopping average of 186 flights a day: number 4 on the entire network. This is around 13% of the real-life traffic movements! So, you could say, a big deal.

1.3 Mentor program

Training for air traffic controller positions is done by a volunteering group of mentors that went through or are in the mentor program themselves. They dedicate their free time to teach other members the skills that are required to staff a position online, on either Schiphol or other regional airfields. They invest a lot of time in training new students and while everyone can join the mentor program (there might be a waiting list as there is limited capacity), please note that the mentor expects a more long-term commitment on both sides.
When training for Schiphol, everyone starts at the delivery position. Here you learn the fundamentals of Euroscope (the program used by controllers in the Dutch VACC), communicate to airplanes and check filed flightplans while the plane is boarding up at the gate. It allows every new student to learn how the airport operates. This is useful, as Schiphol is a very complex airport with quite a few taxiways and runways. Operations on the ground depend on the runways in use for arriving and departing traffic and as mentioned above, the airport can get very busy at times. Challenging, but fun!

When you understand the delivery position and have gained enough experience, you move on to the ground position, where you're responsible for traffic pushing back from the gate, taxiing to the runway or to the gate. You make sure traffic can expeditiously get to the runway without causing a collision at one of the many hot spots. After ground, you move on to tower, where you handle landing and starting traffic and VFR traffic within the CTR. This also includes the police helicopter from Schiphol Oost, coastguard airplane or the ambulance helicopter from the Amsterdam VU hospital. Concluding, very exciting!
Up to now, all positions in real life are done visually from the tower. While this is possible with a tower view, the positions on VATSIM are usually controlled on a radar scope that looks almost identical to the real-life ground radar view. However, as we conclude the tower position, we move on to Schiphol Oost, where we learn the Approach/Arrival and Area Control (ACC) positions, which are controlled on a radar environment which looks exactly like the real-world scope.

Being a (virtual) air traffic controller is a complex task and challenges your problem-solving ability, spatial awareness, patience, stress resistance and multi-tasking skills. Most get a kick out of controlling airplanes in a never-ending puzzle, and this can sometimes be a slightly addicting feeling.

2. Delivery Introduction

Delivery will be the first position you will man as a virtual air traffic controller. This is a perfect position to start with, because you learn a lot about the airfield and its procedures, while also learning the controller client, the VATSIM network and more.

Each flight departing a controlled airfield needs to be cleared for their flight by the delivery controller, whether it is a small two-person aircraft or a 600+ seated Airbus A380 aircraft. It is the delivery controller's responsibility to check their flight plan and clear them on their route or coordinate with the pilot or other controllers to correct the flight plan. A flight plan (FPL) should consist of the departure, arrival and diversion airport, aircraft type, the flown route, height and more. Flights can be flown either (S)VFR ((Special) Visual Flight Rules), which is flown on sight or IFR (Instrument Flight Rules) which is flown on instruments. The different responsibilities of a delivery controller will be outlined in the following chapters.

In real life, flight plans of aircraft departing Schiphol are submitted through the NMOC (Network Manager Operations Center), part of Eurocontrol based in Brussels. This organisation composes standard routes across Europe and gives out slots to improve traffic flow and thus reducing overall delays as much as possible. On VATSIM, there is no such organisation. Usually, everyone is free to fly in or out of an airport whenever they want. During some busy events, an airport might have departure or arrival slots to regulate traffic and to minimize the average delay for those flying.

When a flight is cleared by the delivery controller, they should report fully ready at the outbound planner controller. Outside of events, this position is usually combined with the delivery position. Start-up is only given by the planner controller on taxi-out stands. The flight is handed over to ground when it requests taxi or wants to start their engines combined with a pushback.

Detailed information on all subjects is given in the following chapters, including examples.
If any questions remain, be sure to ask them on the Dutch VACC Discord server. On behalf of the entire Dutch VACC staff, its mentors and all members, we wish you a lot of fun learning the theory and applying this in practice!

3. Instrument Flight Rules (IFR)

A flight can have an Instrument Flight Rules (IFR) flight plan. This means the main means of flying the plane is done through instruments. This should include a route that departs an airport with a Standard Instrument Departure (SID) to a waypoint to join an airway up to a next waypoint. There might be several airways an aircraft will fly along during the flight, mostly depending on the length of the flight. At the end of the route, the aircraft will join a Standard Terminal Arrival Route (STAR), which brings the aircraft, sometimes via a transition, to the runway to join the Instrument Landing System (ILS) or any other approach that is available.

The paragraph above is a general outline of an IFR flight. In this chapter, we will discuss all aspects of an IFR flight that are of interest to a delivery controller. First, we will explain all aspects of a route in further detail in chapter 3.1. Then, in chapter 3.2 the radio telephony (RT) of giving a flight plan clearance is explained. Thereafter, we discuss some aspects of a route: flight levels and rules a delivery controller has to abide by. This is explained in chapter 3.3.
In chapter 3.4 a non-SID departure is discussed: Departure Instructions From Tower (DIFT). In some cases, a flight wants to depart as a local flight, i.e. land at the same airport it will take off from. This is for example a test flight for an airplane that has gotten out of maintenance, or an ILS calibration flight. More information on how to manage this is given in chapter 3.5. We finish with information about start-up control in chapter 3.6.

3.1 Routes

Let's start with an example flight from Amsterdam Schiphol (EHAM) to London Gatwick (EGKK). This is one of the flights you might encounter often as a delivery controller. Our flight **EZY91GT** will fly the route below:

IDRID *L980* **ABNED** *Z344* **AMRIV** *Q63* **ARREK** *Y4* **TEBRA**

This route consists of a few components:
- **IDRID** is the exit point for Schiphol; an SID from a departure runway will end here
- **IDRID**, **ABNED**, **AMRIV**, **ARREK** and **TEBRA** are intersection waypoints
- *L980*, *Z344*, *Q63* and *Y4* are airways to connect the waypoints along the route
- **TEBRA** is the entry point for Gatwick, a STAR to the active landing runway will start here

The flight will first follow the SID to lead it from the departure runway up to the **IDRID** exit point. After **IDRID**, the plane follows the *L980* airway towards **ABNED**. **ABNED** is an intersection waypoint, where the flight can continue on the *L980* airway or join the *Z344* airway. In the above flight plan, the plane follows the latter airway towards **AMRIV**. At **AMRIV**, it joins the *Q63* airway up to **ARREK** and then the *Y4* airway to **TEBRA**, at which it will join the STAR to get to the runway for landing. A visualisation of this route can be found in Figure 2. In this figure you can notice that some waypoints (red circles) have different lines (airways) coming in and out of them.

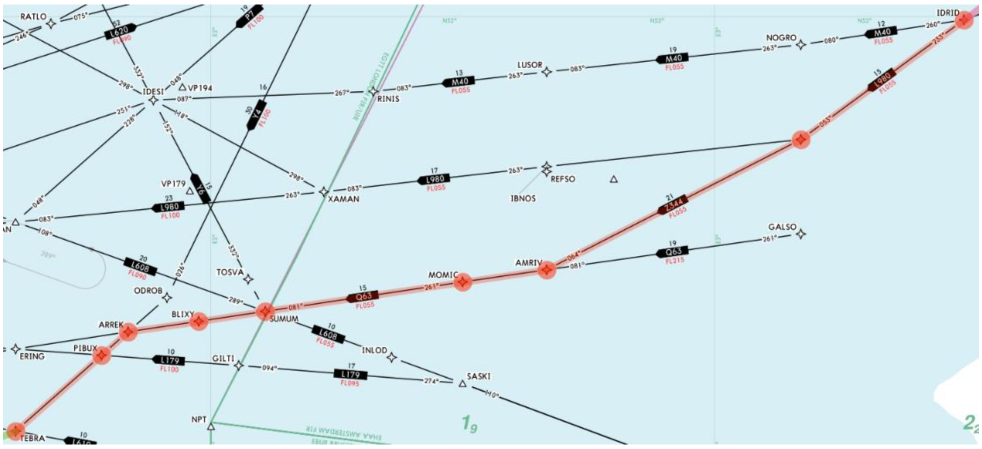


Figure 2 Valid route for a flight from EHAM to EGKK

3.2 Flight plan clearance

When a pilot requests their clearance, it means they want their flight plan checked by the delivery controller and receive a clearance to perform the flight. At Schiphol in real life, this includes the use of a slot time, in which the aircraft is allowed to depart. This is done to prevent overcrowding in an airspace. A correct flight plan consists of the following components:

1. Correct exit point for Schiphol (Figure 3)
2. Route should generally be over airways and not be exclusively directs
3. The filed cruise level should adhere to the rules (listed in chapter 3.3 below)
4. A correct squawk code (listed in chapter 7)

Valid exit points for Schiphol are **ANDIK**, **ARNEM**, **EDUPO**, **LOPIK**, **WOODY**, **IDRID**, **BERGI**.
Note that SIDs may have different names than the exit point, but they will end at one of these exit points.

Table 3 gives an overview of the SIDs from Schiphol from each available departure runway.
An IFR flightplan with a destination other than Schiphol should start at one of these exit points.

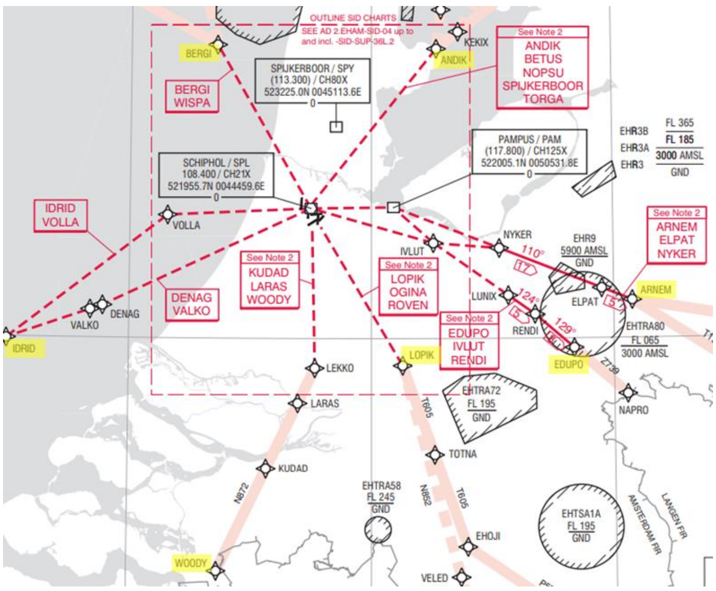


Figure 3 Chart depicting the exit points for Schiphol from AIP Netherlands, these are highlighted in yellow

Table 3 SIDs from Schiphol ordered by exit point and runway

	ANDIK	ARNEM	BERGI	EDUPO	IDRID	LOPIK	WOODY
04	ANDIK 3F	ARNEM 3F	BERGI 2F	RENDI 2F	VOLLA 2F	LOPIK 2F	KUDAD 2F
06	ANDIK 3R[1] ANDIK 2T[2]	ARNEM 3R[1] ARNEM 3T[2]	BERGI 3R	RENDI 2R[1] RENDI 2T[2]	VOLLA 2R	LOPIK 2R	KUDAD 2R[1] KUDAD 2T[2]
09	ANDIK 2N	ARNEM 3N	BERGI 3N	RENDI 2N	IDRID 2N (L) VALKO 5M (R)	LOPIK 2N	KUDAD 2N
18C	TORGA 2X (L) BETUS 5Y (R)	ELPAT 3X	WISPA 3X	EDUPO 3X	DENAG 6X	ROVEN 3X	LARAS 2X
18L	ANDIK 3E	ARNEM 4E	BERGI 4E	RENDI 2E	VALKO 5E	LOPIK 4E	KUDAD 2E
22	ANDIK 3G	ARNEM 4G	BERGI 2G	RENDI 2G	VALKO 3G	LOPIK 2G	KUDAD 2G
24	ANDIK 2S (L) SPY 4K (R)*	ARNEM 3S	BERGI 2S	RENDI 2S	VALKO 3S	LOPIK 3S	KUDAD 3S
27	SPY 2P*	ARNEM 3P	BERGI 2P	RENDI 2P	VOLLA 2P	LOPIK 2P	KUDAD 2P
36C	NOPSU 3W	NYKER 5W	*DIFT 36C*	IVLUT 4W	*DIFT 36C*	OGINA 4W	WOODY 3W
36L	SPY 4V*	ARNEM 2V[1] ARNEM 2Z[2]	BERGI 5V[1] BERGI 2Z[2]	RENDI 2V[1] RENDI 2Z[2]	VOLLA 3V[1] VOLLA 2Z[2]	LOPIK 4V[1] LOPIK 2Z[2]	KUDAD 2V[1] KUDAD 2Z[2]

[1] Between 0630 – 2230 LT
[2] Between 2230 – 0630 LT
* SPY is the Spijkerboor VOR, or Sierra Papa Yankee.

If all the above criteria are met, you can give the pilot their departure clearance. An example is given below:

KLM1009	KLM1009, request clearance to London Heathrow.
DEL	KLM1009, cleared to London Heathrow, VALKO3S departure, runway 24, initial climb flight level 060, squawk 6260.
KLM1009	Cleared to London Heathrow, VALKO3S departure, runway 24, initial climb flight level 060, squawk 6260, KLM1009.
DEL	KLM1009, readback correct, report fully ready.
KLM1009	Will report ready, KLM1009.

In case of a wrong readback:

KLM1009	Cleared to London Heathrow, VALKO3F departure, runway 24, initial climb flight level 60, squawk 6260, KLM1009.
DEL	KLM1009, negative, VALKO3S departure, runway 24.
KLM1009	Apologies, VALKO3S departure, runway 24.
DEL	KLM1009, readback correct, report fully ready.
KLM1009	Will report ready, KLM1009.

As it is not uncommon for pilots to read back something wrong, it is very important that you always keep listening to the readback and if you doubt a readback is correct, double check this with the pilot. It is very important to catch errors at the earliest opportunity!

One tip is to make sure you practice the RT consistently before you go online. It looks simple, but is actually slightly frightening for the first time and you will forget certain stuff. Make sure to <u>not</u> get 'sloppy', such as:

DEL	KLM1009, cleared to London Heathrow *via the* VALKO3S departure *from* runway 24 *with an* initial climb *of* flight level 060 *and* squawk 6260.

It is very difficult to unlearn wrong RT and one of the struggling points for new students when they get assigned a mentor. Be wary of this trap!

Departures to the west (**IDRID** and **BERGI**) from runway 36C don't have a SID available. This is done on purpose; it's an added safety feature so that pilots cannot accidentally fly the wrong SID on departure. As runway 36L might be in maintenance at times, flights to the west might be conducted from runway 36C. There is a standard alternative departure that must be flown by these pilots. The Delivery controller will issue this clearance as following:

KLM1009	KLM1009, request clearance to London Heathrow.
DEL	KLM1009, cleared to London Heathrow, runway 36C, squawk 6260. Report ready to copy initial departure instructions.
KLM1009	Cleared to London Heathrow, runway 36C, squawk 6260, ready to copy, KLM1009.
DEL	KLM1009, after departure turn left to track 341 degrees magnetic, climb to FL60, expect vectors to IDRID, when passing 2000 ft contact Departure on 121.200.
KLM1009	After departure turn left to track 341 degrees magnetic, climb to FL60, expect vectors to IDRID, after passing 2000 ft contact 121.200, KLM1009.
DEL	KLM1009, readback correct, report fully ready.
KLM1009	Will report ready, KLM1009.

Please note that for a flight starting at exit point **BERGI**, the clearance consists of a "expect vectors to BERGI" instead of "expect vectors to IDRID". The rest remains the same.

3.3 Flight levels

One important aspect of a flight is the height at which the flight takes place. Depending on the current height, this is either an altitude or a flight level. The difference between the two aspects is written out in chapter 3.3.1. Rules on cruise levels are to be found in chapter 3.3.2.

3.3.1 Altitudes vs flight levels

While traffic that is on the ground can only move in two directions, airborne traffic can move in three: forward/backward, left/right and up/down. Traffic on the ground can stop to give way to other traffic, but that is not feasible while in the air. If traffic ever needs to cross airborne, this is done by flying at different heights.

Altitudes are read out in feet and flight levels in levels. The latter might sound confusing, but it really is not once you get the hang of it. As an example: 3000ft and flight level 130 (also written as: FL130). Flight level 130 is actually 13.000ft, but there's one difference with an altitude: the air pressure.

Altitudes are always in the local air pressure. This can be written in two formats, inches or hectopascals. The former is mainly used in the United States and the latter can be found across Europe, including Schiphol. The standard air pressure (also called QNE) is 1013,25 hPa (hectopascals), or 29.92 in Hg. The local air pressure can be different from the standard air pressure. The local pressure is called the QNH.

While altitudes are in local air pressure (QNH), flight levels are on standard air pressure. This is done to prevent pilots to constantly have to switch between pressures and to make aviation safer as this is less prone to errors. Flight level 130 might be 13.000ft, but it's on standard pressure (QNE) and not on the local pressure.

To bridge the difference, there is a transition layer. Everything below the layer is 'altitudes in feet', above it is 'flight levels'. In the Netherlands, the transition altitude (at which a plane has to switch from local pressure to standard pressure) is at 3000ft. The transition level (at which a plane switches from standard to local pressure) is depending on the temperature and local air pressure, as to always have a 1000ft difference between the transition altitude and transition level. Sometimes the difference between 3000ft and flight level 40 is 1000ft, but sometimes it's less. In that case, you have a higher transition level, such as flight level 45 (4500ft). Figure 4 clearly shows these principles.

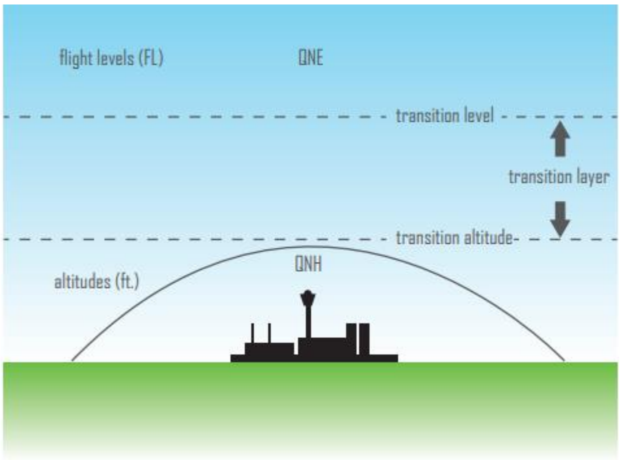


Figure 4 Representation of the differences between altitude and flight levels

3.3.2 Cruise level rules

There are several rules on cruise levels a delivery controller needs to abide by. The controller must know these rules at all times. There are standard rules on flight levels based on the direction of flight, but also rules specific for a city pair. The most common rules you must know as a delivery controller are listed below. This list is not exhaustive and rules might change over time!

First, a cruise level can be even or odd. Generally, flights to the east are to be filed on an odd flight level, while flights to the west are cruising on an even flight level. This is visualized in Figure 5 below. In France, Italy, Spain and Portugal most flights follow a north-south routing. Flights with a routing through France departing on a **WOODY** SID, must file an <u>odd</u> flight level, even though the flight also flies in a slight westerly direction. In short, this means all departures towards **IDRID** and **BERGI** are to be filed on an even flight level, while departures towards **ANDIK**, **EDUPO**, **ARNEM**, **LOPIK** and **WOODY** must file an odd flight level.

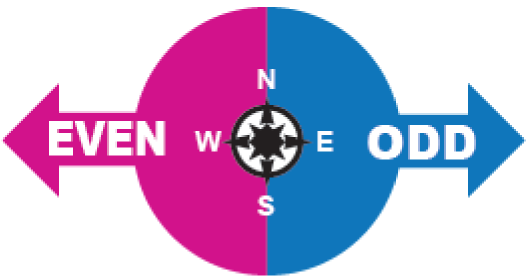


Figure 5 Even-Odd separation

If a pilot files a wrong cruise level, a delivery controller should notify the pilot upon their flight plan clearance request and suggest a suitable, allowed flight level. Usually this is the first allowed flight level below and the first allowed flight level above the filed cruise level. In case of KLM1009 filing flight level 230 to the west:

DEL	KLM1009, flights to the west need to file an even flight level. Would you like flight level 220 or flight level 240? *Or* KLM1009, in your direction of flight you need an even flight level. Can you accept flight level 220 or flight level 240?
KLM1009	We would like flight level 220, KLM1009.
DEL	KLM123, flight level 220, cleared to <…> etc.

In case you need to alter a flight level, make sure to repeat the new cruise level in the flight plan clearance as mentioned above. Thereafter, continue the normal clearance as mentioned in chapter 3.2.

Another important rule is that flight level 250 is not available in certain countries as a cruise level. This is due to the Upper Airspace Control (UAC) sectors of Eurocontrol starting at flight level 245. As a rule of thumb it's prohibited to cruise at flight level 250 in German and Dutch airspace. Flights departing to the east planning on cruising at FL250 are to be modified. As a delivery controller, you should tell the pilot why their cruise level is incorrect ("Flight level 250 is excluded in German airspace") and offer them alternatives. In this case flight level 230 or flight level 270 (odd levels only!). Example RT:

DEL	KLM23B, flight level 250 is excluded in German airspace. Would you prefer flight level 230 or flight level 270?
KLM23B	We would prefer flight level 270, KLM23B.
DEL	KLM23B, flight level 270, cleared to <…> etc.

Also make sure to change the cruise level in their flight plan via the Euroscope flight plan dialog. By doing this, other controllers have an updated flight plan, and it guarantees other controllers and yourself that you have actually altered the cruise level.

Finally, we have city pair caps. These are altitude restriction between pairs of cities to alleviate the workload of (mostly) upper sectors in Europe. These restrictions can change throughout the year based on the amount of traffic flying these routes. Every month, a new table with restrictions is released by Eurocontrol. These so-called RAD restrictions are published on the Dutch VACC website (https://www.dutchvacc.nl/rad-restrictions/).

3.4 Departure Instructions From Tower (DIFT)

Not all flights depart on a SID. Some of the reasons are in real life as well such as a local IFR flight (see chapter 3.5), but on VATSIM it usually is a pilot that is unable to fly a SID for various reasons (old AIRAC, default plane..). Due to the complexity of the airspace, it's generally not possible to give these flights instructions while still at delivery, as situations in the air change every minute. Therefore, these flights receive their departure instructions at the runway from the tower controller, hence the name.

Because these flights don't follow a SID, you cannot clear them for any. In the following example, a DIFT clearance is given for a pilot unable to fly the VOLLA3V departure towards IDRID:

DEL	KLM1009, cleared to London Heathrow, expect departure instructions from tower, runway 36L, squawk 6260.

Departures from runway 36C towards IDRID and BERGI don't have a SID departure available at all. There is a 'standard non-standard' departure available for these, which is given by the delivery controller upon flight plan clearance. Pilots have to fly magnetic track 341 degrees upon departure, up to flight level 60:

DEL	KLM1009, Runway 36C, after departure turn left to track 341 degrees magnetic, climb and maintain flight level 60, expect vectors to IDRID, when passing 2000 ft contact Departure on 121.200, squawk 6260.

3.5 Local IFR flights

Sometimes an aircraft wants to land at the same airport as it has taken off from. This might for example be a test flight that is conducted after scheduled maintenance. This type of flight is called a local IFR flight. Clearances for a local IFR flight are slightly different, as they usually don't fly a route. In this chapter, the 'how-to' for this type of flight is described.

Flights on a local trip can have the following types of flight plans
- An SID, then join the STAR back to the origin airport
- An SID and then vectors back to the airport
- Vectoring around the TMA/airspace

The first two are straight forward and mostly the same as a normal flight plan clearance. Except, instead of the destination, it's a "local flight":

DEL	KLM123, cleared for a local flight, VALKO3S departure, runway 24, initial climb flight level 60, squawk 7050.

The last example needs some more explanation. This flight is vectored around (direction in degrees, height and speed) around the Schiphol TMA (Terminal Manoeuvring Area) or Dutch airspace. For this, you need to issue a DIFT as mentioned above in chapter 3.4. Controllers above you tend to appreciate it if you ask the pilot for their intentions before giving their clearance and relaying the information to them, so they can prepare for this flight as this is a non-standard flight for them.

DEL	KLM123, cleared for a local flight, expect departure instructions from tower, runway 24, squawk 7050.

Note that because the pilot will receive instructions from the tower, you don't specify an initial climb in this call. This is up to the tower controller, usually together with the approach controller to determine at the runway.

3.6 Start-up Control

After the IFR flight has received its IFR flight plan clearance, the aircraft is asked to report back fully ready. The reason that pilots must call back when fully ready is, that the flight plan clearance is available from 30 minutes before the departure time of the aircraft. As noted in chapter 2, in real life procedures the pilot reports fully ready to the OPL controller, which controls when flights get their start-up clearance. Outside of specific events, the OPL controller is not used on the VATSIM network, as the amount of traffic doesn't warrant holding departing traffic at the gate to avoid congestion at the runways. As such, the OPL controller's responsibility is delegated to the delivery controller.

When pilots report that they are fully ready for start-up on the delivery frequency, the delivery controller checks whether the assigned squawk has been set and then hands the flight over to the ground controller. During this handover, the delivery controller also provides the pilots with the current QNH and the active ATIS information. The QNH and ATIS information are only given during the handover to ground, as these might have changed since the time that the flight has received its IFR flight plan clearance. For our flight KLM123 example from paragraph 3.2, this will look as follows:

KLM123	Schiphol delivery, KLM123 we're fully ready.
DEL	KLM123 information A (is current), QNH 1019, contact Schiphol Ground on 121.8
KLM123	QNH 1019, contact ground on 121.8

IFR traffic that departs from a taxi-out gate, notably the B platforms (not the B-pier) and the K-apron, also receive their start-up clearance from the OPL/delivery controller. In the case of a flight departing from the B-platform the RT would be as follows:

KLM123	Schiphol delivery, KLM123 we're fully ready.
DEL	KLM123 information A (is current), QNH 1019, start-up approved, for taxi contact Schiphol Ground on 121.8
KLM123	QNH 1019, start-up approved, for taxi contact ground on 121.8

As the K-apron is not controlled by the ground controller, refer to the VFR section for more details, the RT is slightly different.

KLM123	Schiphol delivery, KLM123 is fully ready.
DEL	Information A (is current), QNH 1019, start-up approved, at GD/GL contact Schiphol Ground on 121.8
KLM123	QNH 1019, start-up approved, for taxi contact ground on 121.8

During busy evenings or during events, it is possible that multiple Schiphol ground controllers are online. In this case, the delivery controller hands the aircraft off to the appropriate ground controller. The default ground splitting is shown in Figure 6.

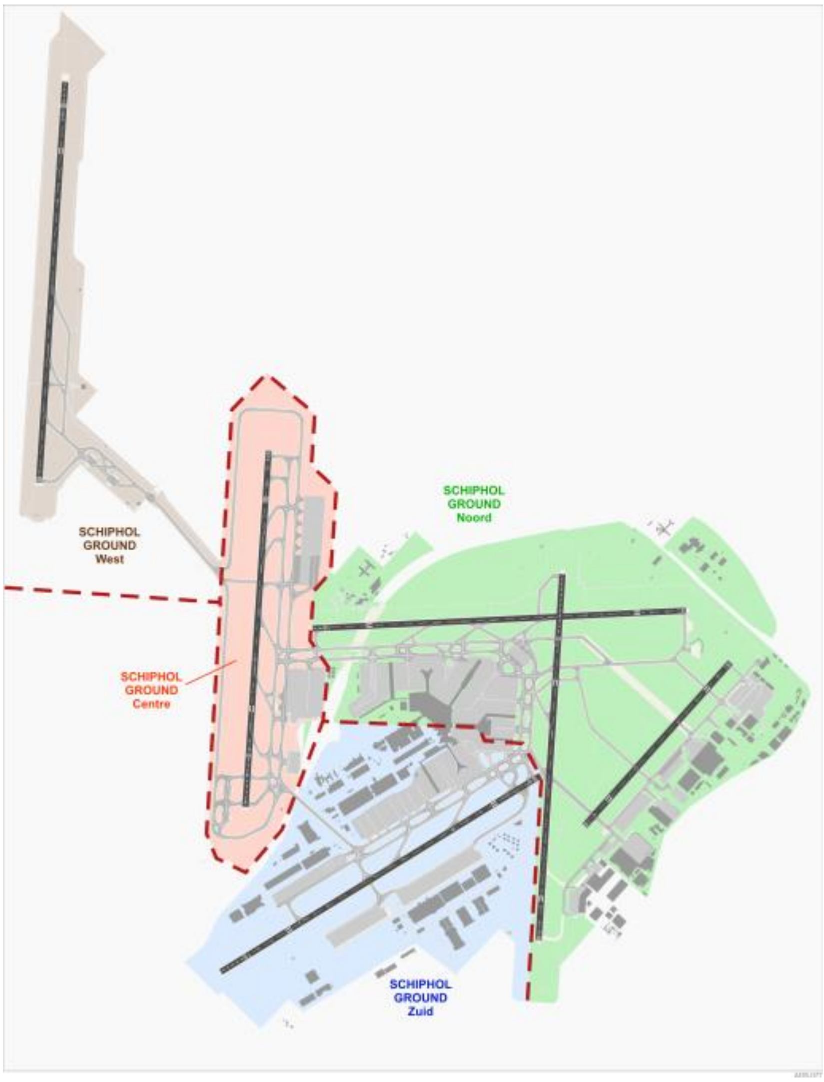


Figure 6 Default ground splitting at Schiphol

Do note that the exact line of the division can be shifted based on the actual traffic load. As such, it is advisable to always confirm with the ground controllers how they have coordinated the division when more than one ground controller is online.

When during events the OPL controller is online, the handoff to the OPL controller is performed right after the readback of the IFR flight plan clearance. The RT for this handoff is as follows.

DEL	KLM123, readback correct, report fully ready to Schiphol planner on 121.650

4. Visual Flight Rules (VFR)

Apart from flying an IFR flight, pilots can also fly VFR: Visual Flight Rules. As the name implies, instead of flying based on the cockpit instruments, pilots fly based on what they can see outside of their airplane. Because these flights navigate based on visual aids, visibility minima exist, which have to be met before they are allowed to fly. For the purpose of controlling at Schiphol, the minima below 3000ft AMSL are explained here. For VFR traffic to be allowed at Schiphol, the following minima apply:

- the flight visibility must be 5 km or greater
- the cloud ceiling must be higher than 450 feet
- VFR flights are only allowed between sunrise and sunset

We do note that the last rule, that VFR flights are only allowed during daylight is not enforced at VATSIM, as many pilots can only fly in the evening. Sometimes when the real-life weather conditions are poor, pilots may opt to use non-real-life weather conditions. In this case pilots can still be allowed to fly VFR. In practice VFR aircraft are never prohibited on the VATSIM network, though in case of poor visibility this might be discussed with the pilots before starting their flight.

VFR traffic at Schiphol will usually do one of four things:

- Fly circuits
- Fly within the CTR
- Depart via the "Victor Departure"
- Depart via a CTR crossing

At Schiphol we require pilots to file a VFR flight plan (class C), as this allows us to see their aircraft type and know their basic intentions. In the route section of the flight plan, pilots may put "VFR Circuits" or "Amsterdam Sector then Zandvoort". This is not necessarily the precise route they will be following, but is a good indication for the controller what they can expect from the pilot. When the workload permits, most VFR requests are accommodated at Schiphol. The main responsibility for VFR aircraft within the Schiphol CTR is with the Tower controller.
Within the airspace close the Schiphol there is a designated area for VFR traffic, the VFR sector (also known as the Victor departure/arrival), a cone shape towards the south east of the airport (Figure 7), free from all the runway approach paths. Through the VFR sector runs the published VFR departure/arrival for traffic from/to Schiphol, the Victor Departure/Arrival. This separation allows VFR traffic to depart/arrive at Schiphol even during high traffic load.

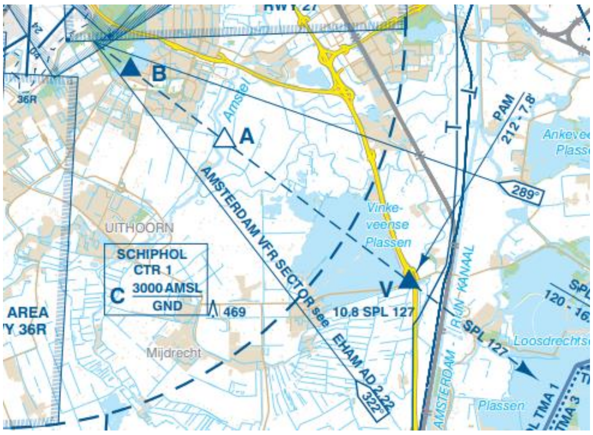


Figure 7 Chart of the Amsterdam VFR sector from AIP Netherlands (AD 2.EHAM-VAC.1)

VFR traffic interacts with the delivery controller when the VFR aircraft requests permission to start-up the engine. In real life all and on VATSIM almost all traffic will call you for start-up at the K-apron. The K-Apron is located at the eastern side of the airport and is dedicated to general aviation aircraft. Important is that the K-apron is not controlled by the ground controller, but in real-life by the KLM jetcenter. On VATSIM we simulate this by having the aircraft taxi on their own discretion to the holding points GD/GL after receiving the clearance and start-up. In the new layout of the K-apron, all traffic leaves the apron via GD, in older sceneries the eastern part of the K-apron leaves the apron via GL.

When VFR aircraft request to start-up the engines, they will usually report the following:

- Aircraft registration
- Aircraft Type
- Location
- ATIS-information
- Flight rules
- Destination (or local)
- Request start-up

The delivery controller will then issue the VFR aircraft its start-up clearance, which contains the following information:

- Startup approved
- Runway in use
- Local QNH
- Squawk
- ATIS-information

VFR traffic within the Schiphol always receives squawk 0060.
An example of the RT related to the above would be:

PHABC	Schiphol Delivery, PHABC, Cessna 172 at the Kilo apron with information A, VFR to Rotterdam, requesting start-up
DEL	PHABC, Start-up approved, runway 22 in use, QNH 1019, squawk 0060, Information A correct
PHABC	Start-up approved, runway 22, QNH 1019, squawk 0060
DEL	PHABC, report ready at GD

At Schiphol there are also a couple of special VFR aircraft, the police helicopters at the “Palace” and the national coastguard. The procedures for the coastguard (callsign: NCG01) is similar to the procedure described above, only instead of assigning squawk 0060, no squawk is assigned in the RT as the coastguard has a standard squawk code of 5177. If the pilot has not already selected 5177 in their transponder, the squawk can still be repeated during the start-up clearance.

For police helicopters there are two possible procedures. First, there are so-called “scramble” flights in which the police helicopter is in a rush to immediately report to its destination. In that case, the police helicopter will contact the Tower controller directly and will forego the usual start-up procedure. If the police helicopter is not on a scramble flight, it will contact Delivery for a start-up clearance. In this case the procedure is similar to the normal procedure, but the police flight gets squawk 6220. Most pilots flying the police helicopters have this squawk already set. If the pilot has not already selected 6220 in their transponder, the squawk can still be repeated during the start-up clearance.

5. Weather

Weather plays an important role in the world of aviation. Wind, temperature, air pressure and other aspects of weather combined results in both possibilities and impossibilities. For example, an airplane must take off and land into the wind. The topic of this chapter is about all the aspects of weather that play a role in aviation and how it affects your tasks as a delivery controller.

First, we start with the basic principles of aspects that affect aviation. This is explained in chapter 5.1. Secondly, the Meteorological Aerodrome Report, or METAR for short, is explained in chapter 5.2. The principle of the Terminal Aerodrome Forecast (TAF) is discussed in chapter 5.3. And finally, the Automatic Terminal Information Service (ATIS) broadcasts information to the pilots and is broadcasted in chapter 5.4.

5.1 Basic principles

In aviation, there are several weather aspects that are of importance, of which wind, temperature and air pressure are the most important for a delivery controller. As a tower controller (or higher), fog also plays a role into capacity and choice of runways. The latter is out of scope for this manual.

5.1.1 Wind

One of the major factors of a runway selection is the wind. Runway selection is explained in greater detail in chapter 6. Basically, airplanes have to depart and land into the wind. Without going into much detail, a controller will select the runway in the direction that is the best into the wind and the preferential runway selection system.
If the wind is 230°, it means the wind is coming out of an angle of 230°, or the south-west (Figure 8).

Figure 8 Windsock depiciting a wind of 230/15 KT

In aviation, winds are usually illustrated as a windsock. You can often find one or more of these at airports and they display the approximate current wind speed and wind direction. Each one of the markings mean a different wind speed. Just the first red marking in a horizontal position means a wind speed of around 3 knots. two markings (red and white) correspond with a wind speed of around 6 knots. Three markings 9 knots, four markings mean a wind speed of 12 knots and all five markings mean a wind speed of 15 knots or greater.

Flying into the wind is called headwind and flying in the same direction is called tailwind. Wind also causes difference in speeds. There are three different kinds of speeds:

1. Indicated airspeed (IAS): This is the speed that is indicated in the cockpit and what pilots use for speed changes. Speed instructions given by air traffic control is given as indicated airspeed.
2. True airspeed (TAS): This is an aircraft's speed relative to the air it's flying through. Because of difference in air pressure when climbing, fewer molecules will enter the pitot tube, resulting in an IAS lower than the TAS.
3. Groundspeed (GS): This indicates the movement of the airplane relative to the ground. This is true airspeed, corrected for wind. For example: 100KT true airspeed with a tailwind of 20KT, the airplane flies a groundspeed of 120KT.

5.1.2 Temperature

Just like cars and trains, airplanes also behave different with different temperatures. The challenges with temperature mostly occur with on average very low and very high temperatures. Air pressure changes with temperature and the temperature changes the higher an airplane climbs into the sky. An airplane's performance decreases when there is an increase of altitude and temperature.

In case of low temperatures, airplanes might need to de-ice. This is the process of removing snow, ice or frost from the surface of an airplane. The same goes for taxiways and runways: these need to be clear of snow and ice as well to maintain a safe environment for aircrafts.

5.1.3 Air pressure

Air pressure, also known as the barometric pressure, is the pressure within the atmosphere of the earth. Just like with temperature, a higher air pressure decreases the performance of aircrafts. Difference in air pressure also creates a different altitude, because of how airplanes calculate their height. In chapter 3.3.1 the difference between altitudes and flight levels is explained. Altitudes are always in local air pressure, while flight levels are in standard air pressure.

During RT, if the air pressure is below 1000 hPa, the controller should mention the unit *hectopascals* to the pilot. This is because of the units of air pressure in the USA. An air pressure of 992 hPa can be confused with 29.92 inHg.

DEL:	KLM123, information A, QNH 1012 contact ground on 121.8.
DEL:	KLM123, information A, QNH 998 hectopascals contact ground on 121.8.

5.2 Meteorological Aerodrome Report (METAR)

The METAR is a regular report of weather conditions around the given airport. METARs are published around the world and get regularly updated. Depending on certain weather conditions such as visibility, certain items might be added or omitted from the METAR text, increasing or decreasing its length.

Below is an example METAR from Schiphol (EHAM) that could have been used.

METAR EHAM 031325Z 19012KTG25 160V200 9999 -RA FEW007 SCT015 BKN022 13/12 Q0989 TEMPO 1500 TSRA

This METAR consists of several parts, which will be explained in Table 4.

Table 4 Breakdown of the example METAR

Item	Explanation
EHAM	This is the ICAO-notation of the airport this METAR is published for.
031325Z	Current day of the month (day 3) and time in Zulu-format (13:25Z).
19012KTG25	Average wind direction and speed at time of report (190°, 12KT). Wind gusts of 25KT have been reported.
160V200	Variable wind direction detected between 160° and 200°.
9999	Visibility in meters. In case of 9999, a visibility of 10+ km has been detected.
-RA	Light rain.
FEW007	Few clouds at 700ft.
SCT015	Scattered clouds at 1500ft.
BKN022	Broken clouds at 2200ft.
13/12	Outside temperature of 13°C, dewpoint of 12°C.
Q0989	Current QNH (air pressure) of 0989 hPa.
TEMPO 1500 TSRA	Trend: it's expected for the visilibity to temporarily drop to 1500 meters with thunderstorms and rain.

Clouds are reported in a few different categories:
- FEW: A maximum of 2/8th of the surface is covered by clouds.
- SCT (scattered): A maximum of 4/8th of the surface is covered by clouds.
- BKN (broken): A maximum of 7/8th of the surface is covered by clouds.
- OVC (overcast): Full cloud coverage of the surface.

A few notes:
- Not all elements are always present in a METAR. In case of calm conditions, the gusting-element of the wind is omitted. The same includes for the variable wind direction.
- The trend at the end of the METAR can contain all the items that might have been used before it, but is used to express expected changes in the weather. In case of no expected change, NOSIG (no significant change) is added to the end instead of TEMPO (temporary).
- A minus means 'light', such as -RA (light rain). A plus means 'heavy', such as +RA (heavy rain).
- If the temperature and/or dewpoint is below 0, an M is added instead of a minus. M05/M04 means an outside temperature of minus 5 degrees and a dewpoint of minus 4 degrees.
- If there are no clouds below 5000ft, a visibility of 10+ km and no significant weather change is expected, the METAR can display CAVOK: Ceiling And Visibility OK.

5.3 Terminal Aerodrome Forecast (TAF)

The Terminal Aerodrome Forecast (TAF) is a format for reporting weather forecast information. TAFs are issued at least four times a day, generally apply to a 24–30-hour period and cover an area of 5 statute miles (8 kilometres) around the aerodrome. TAFs utilise similar encoding as METARs. An example of a TAF report is given below:

TAF COR EHAM 171730Z 1718/1824 30007KT CAVOK

BECMG 1721/1724 03007KT

TEMPO 1801/1806 22015G25KT 4000 SHRA TSRA BKN050CB

PROB30 1806/1810 7000 BKN008

TEMPO 1815/1820 18020G30KT 3000 TSRAGR SHRA SCT030CB

PROB30 TEMPO 1815/1819 18030G40KT 1500 +TSRAGR BKN018CB

BECMG 1818/1821 12010KT

BECMG 1821/1824 20015KT=

The TAF is issued at a certain time and thereafter each line related to either a new period of time or indicate a probable deviation from the most likely predicted weather. The new encoding items as noted in the TAF are shown in Table 5.

Table 5 TAF decoding

Item	Explanation
BECMG	Becoming: Most likely weather forecast
1721/1724	The prediction is valid from the 17th day of the month at the 21th hour, until the 17th at the 24th hour
PROB30	Probability of 30%

5.4 Aerodrome Terminal Information Service (ATIS)

The Aerodrome Terminal Information Service (ATIS) is a weather and general information bulletin which is continuously broadcasted in real life. Within the Dutch VACC, only when a tower controller or higher is online, a voice ATIS will be provided for the airfield. An ATIS consists of following information (Table 6)

Table 6 ATIS information

Message	Explanation
This is Schiphol information Kilo	Indicates the broadcast is for aircraft inbound to/outbound from Schiphol, and the bulletin's identification letter
Main landing runway 18R	Main runway used for landing is 18R
Main departure runway 24	Main runway used for take-off is 24
Transition level 50	When descending below Flight Level 50 (equivalent to 5000ft altitude on a standard barometric setting of 1013 hPa), aircraft should set their altimeter to the prevailing barometric pressure (QNH) of the airfield (given later in the ATIS)
Two zero zero degrees, one one knots	Wind direction from 200 degrees magnetic (south-southwest), average 11 knots
Visibility one zero kilometres	General visibility 10 kilometres or more
Few 1300 feet, scattered 1800 feet, broken 2200 feet	Cloud layers at the indicated altitude above the airport
Temperature one five, dewpoint one three	Temperature and dewpoint in degrees Celsius
QNH niner niner five hectopascal	QNH (barometric pressure adjusted to mean sea level) 995 hectopascal
No significant change	No significant change in weather expected
Contact Approach and Arrival callsign only	When instructed to contact the Approach and Arrival controller, check in with callsign only (for the sake of brevity)
End of information Kilo	End of bulletin, and the bulletin's identification letter again
TEMPO 1500 TSRA	Trend: it’s expected for the visibility to temporarily drop to 1500 meters with thunderstorms and rain.

As a delivery controller, it is important that you know the current ATIS letter when online, as you will provide this to a pilot when handing them off to the ground controller together with the QNH. When there is no tower controller or higher online and as such no voice ATIS is provided, a delivery controller can setup a text ATIS as part of their controller information in Euroscope. For the most up-to-date text, please refer to https://www.dutchvacc.nl/atis-nl/.

6. Runway selection

6.1 Runway overview Schiphol

Schiphol has a complex system of runways, as the runways are aligned in a "tangential" system. This means that some runways are aligned in a 90-degree angle. This makes it possible to always take-off/land without large crosswinds, which is especially favourable with the variable winds in The Netherlands. The downside to this runway alignment is that it makes the airport rather complex for air traffic controllers, as they must anticipate all the potential conflicts of intersecting approaches/take-off paths can create.
Schiphol airport has a total of six runways available, these runways are:

- Polderbaan (18R/36L)
- Kaagbaan (06/24)
- Zwanenburgbaan (18C/36C)
- Aalsmeerbaan (18L/36R)
- Buitenveldertbaan (09/27)
- Oostbaan (04/22)

The layout of the runways is show in Figure 9.

Figure 9 Schiphol runway system

Five of these runways are used for handling commercial aviation, whilst the Oostbaan (04/22) is mostly used to handle General Aviation.

There are some operational limitations to the runways at Schiphol:

- Runways 18L & 36L are not available for landing
- Runways 18R & 36R are not available for take-off

6.2 Runway selection criteria

Runway selection is the responsibility of the tower controller, but as runway selection has an impact on your work as a delivery controller, it is important to understand the theory and practical element of runway selection. When deciding on which runways to use for take-off and landing, a couple of factors are taken into consideration. These factors are:

- Wind condition
- Runway condition
- Visibility
- Noise Abatement
- Other operational factors

In the sections below we explain how each of these factors influence the choice of runway.

6.2.1 Wind condition

The most important and obvious factor when selecting the active runways is the wind condition. In paragraph 5.1.1 we have explained how we describe wind and what impact it has on aircraft performance. As noted there, a pilot always wants to take-off/land into the wind, as this gives the most amount of lift at a certain ground speed. Aircraft manufacturers have also designed and tested their aircraft to be able to safely take-off and land withing certain limits. In general, the following guidelines apply for a **dry** runway:

- Maximum tailwind component of 5 knots
- Maximum crosswind component of 15 knots (including gusts)
- At night (2230-0630 LT) the maximum crosswind component is raised to 25 knots (including gusts)

For a **wet** runway the following conditions apply:

- No tailwind component.
- Maximum crosswind component of 10 knots (including gusts)

6.2.2 Visibility

The visibility conditions at the airport also impact the selection of runways. We will go over the general impact in this section, as specific limitations are outside of the delivery scope. Because Schiphol has runways with intersecting approach/take-off paths, ATC always needs to consider potential conflicts when selecting the runways. When visibility conditions decline, the risk of conflicts increases, as pilots and controllers cannot see other aircraft. Visibility can be reduced by several weather-related factors, such as heavy showers, low cloud ceilings or fog. With low visibility, runway combinations which lead to more potential conflicts are less preferred. For very low visibility conditions, four categories of “Bijzonder Zicht Omstandigheden” (BZO), named A through D. Examples of operational impact are the unavailability of certain runway combinations, restrictions in ground movement, or the prohibition of intersection departures.

6.2.3 Noise abatement

Another large factor for runway selection is noise abatement, as Schiphol has limits on the amount of noise it can produce. Each runway has a different noise sensitive area, due to planes using the runway overflying different towns and cities. For example, the Polderbaan is build all the way to the north west, as there are little noise sensitive areas in its approach path. In order to minimise the amount of noise produced, Schiphol utilizes a preferential runway system. In this system each runway is ranked at a certain preference based on the amount of noise it produces. The preferential runway system is given in Figure 10.

	1	2	3	4	5	6
TAKE OFF:	36L	24	36C	18L	18C	09
LANDING:	06	18R	36R	18C	36C	27

Figure 10 Schiphol preferential runway system

Runways 36L/18R and 24/06 are the most preferred runways and runway 09/27 is the least preferential runway. When selecting a runway at Schiphol, the more preferred runway is selected if weather conditions allow. We also simulate this as much as possible on VATSIM.

6.2.4 Other operational factors

Apart from the other factors mentioned above, there are also other operational factors which may influence the runway selection. One very important operational factor to consider is that during the night (from 22:30 LT to 06:00 LT) a limited number of runways is available. These additional restrictions apply at night:

- Runway 04/22, 09/27, 18L and 36C are not available for take-off.
- Runway 04/22, 09/27, 18C, 24 and 36R are not available for landing.

Most other operational factors are due to the interaction between two runways. For example, when runway 24 is in use for departure, the Oostbaan at Schiphol will always be used as runway 22, even though runway 04 might be slightly more preferential for headwinds. The operation of runways at nearby airports might be included, for example if Schiphol lands on runway 06, Rotterdam airport will also land on 06 if possible. More specific considerations are included in other manuals.

6.3 Runway selection in practice

Now that we have gone over the theoretical aspect of runway selection, we go over the practical consideration on the VATSIM network in this paragraph.

On the network, we normally select an “off-peak scenario”. This means that there is one runway for departures and one runway for landing traffic. As Schiphol is a very busy airport, they will use a “peak scenario” in real life most of the time. In this situation, depending whether the peak consists of landing or departing traffic, a second landing or departure runway will be selected. We will firstly give an example of selecting a runway in an off-peak scenario below before discussing peak scenarios.

An example METAR could look like this:

METAR EHAM 151655Z 33015KT 9999 FEW014 SCT016 BKN040 07/04 Q1018 NOSIG

Based on this METAR, we know the following:
- The wind direction and speed (330 @ 15kt)
- There is no rain (therefore the runway is most likely dry)
- Visibility is over 10km

We then determine which runways are suitable for these weather conditions, which as stated in paragraph 6.2.1 are preferably runway 36L and 36C considering the wind. If we look at the preferential runway table, we can see that runway 36L is the most preferred runway out of the two. As such, we would select runway 36L for departures. For the landing runway, runway 06 is most preferential and useable in the current weather conditions. As such runway 06 would be selected for landing. In practice, there are standard runway combinations that are selected most of the time, some examples are (departure runway/landing runway): 36L/06, 24/18R, 18L/18R, 36L/36R, 24/27, 09/06.

Please note that the Oostbaan (04/22) is always in use for general aviation aircraft and any other aircraft from Schiphol-Oost. GA aircraft receive their clearance for a departure from runway 04/22 instead of the main departure runway in use. Aircraft can decline runway 04/22 if the runway is not operationally suitable, as the runway is the shortest at Schiphol. In this case a clearance from the main departure runway will be issued.

Now that we have discussed the runway selection process during a normal night, below we look closer at some special cases.

6.3.1 Peak scenarios

On a normal night on VATSIM we work in an off-peak scenario as described earlier. During busy events, depending on the flow of traffic that night, it might be necessary to use a peak scenario. In a peak scenario either 2 landing and 1 departure or vice versa are used. During an inbound peak scenario, when 2 landing runways are in use, not much is different for the delivery controller. During an outbound peak, when 2 departure runways are in use, there is a notable difference. With only 1 departure runway, all departures naturally depart from that runway, but with 2 departure runways, this isn't the case. When 2 departure runways are in use, the immediate airspace above Schiphol (the TMA) is split between a west and an east controller. Each controller is responsible for departures towards their areas. In practice the SIDs are split as follows:
- Departures towards **IDRID/BERGI/ANDIK** (western controller)
- Departures towards **ARNEM/EDUPO/LOPIK/WOODY** (eastern controller)

As such, when 2 departing runways are in use, the delivery controller must ensure that each clearance is given to the correct runway and with the correct SID. In most outbound peaks a combination of either runways 36L/36C or 24/18L is in use. In this case, the departures for the western area are cleared for runway 36L or 24 as these runways face most towards the west. Departures to the east are cleared for runway 36C or 18L. In case of an outbound peak-scenario, the exact division of SIDs over the runway will also be confirmed during the briefing.

6.3.2 Multiple SIDs to same route point

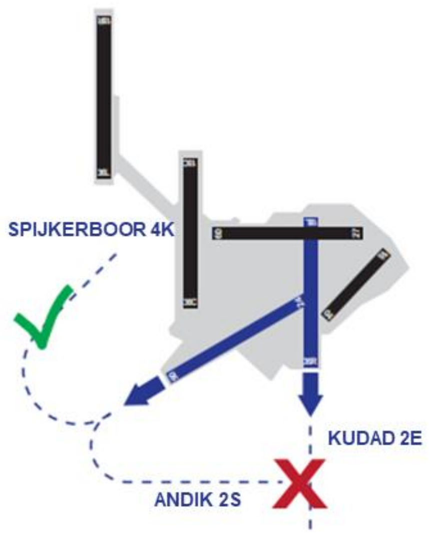
For some runways at Schiphol, there exist more than one SID from the runway to a particular exit point. There are two types of SID's where this is the case, there are the night SIDs from runway 36L and 06 and there are some SIDs where the SID is dependent on the other runway in use.

Firstly the night SIDs, there are available from runway 36L to all exit points except for **ANDIK** (with identified Z) and from runway 06 to **ANDIK**, **ARNEM**, **EDUPO** and **WOODY** (with identified T). These SIDs are assigned to aircraft which are planned to depart between 22:30 LT and 06:00 LT and are designed to minimize noise at the expense of airspace efficiency. The delivery controller will start to assign these night SIDs from 22:15LT onwards to ensure that aircraft that depart after 22:30 LT depart on these SIDs.

The other category of SIDs towards the same exit point from the same runway exist due to the interaction of the SID with other runways in use. This is explained in Table 7 and Figure 11.

Table 7 Alternative SIDs

Runway	Exit point	Standard SID	Condition	Alternative SID
09	IDRID	IDRID 2N	Landing 18C/18R	VALKO 5M
18C	ANDIK	TORGA 2X	Starting 18L	BETUS 5Y
24	ANDIK	ANDIK 2S	Starting 18L	SPY 4K



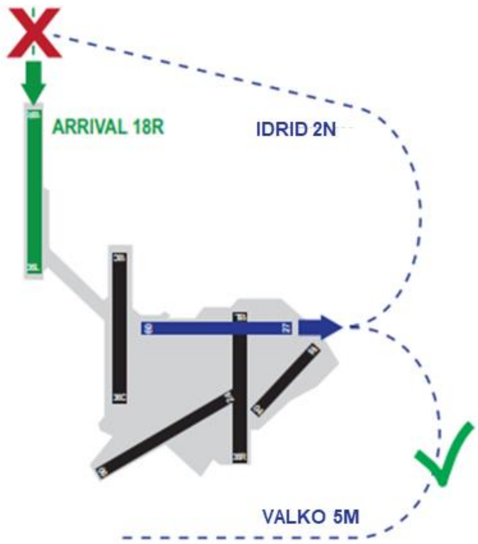


Figure 11 Graphical depiction of alternative SID usage

7. Squawk codes

Every aircraft needs a device on board to identify themselves on a radar screen. This device is called a transponder, as it transmits and responds to a radio signal from the ground. This response is then converted into the indicator or “blip” on the radar screen. The identification of each aircraft is performed by assigning each aircraft a 4-digit code, with each digit ranging from 0 to 7. This 4-digit number is called the “squawk”. As each aircraft within range of a radar station needs to have a unique transponder code to be identified, the total range of possible 4-digit codes is divided into blocks. Each block is assigned to a certain area and neighbouring areas do not use the same codes.

As a delivery controller, it is your task to assign squawk codes to departing aircraft. This happens when the flight requests IFR or VFR clearance. The blocks of transponder codes that are assigned to Dutch air traffic control is further subdivided by the destination of the aircraft in the case of IFR traffic. The following figure shows the range of squawk code available for each destination:

SQUAWK CODES

EG-- EI--	6260 - 6277 7330 - 7347
OTHER DEST.	0140 - 0177 3130 - 3177 1000 *
EH--	0401 - 0437 7001 - 7037
EHAM EHAM	7050 - 7055
VFR CTR	0060
BI-- CY-- EB-- G--- K--- LE-- LFBD LFBO LFPG LFPO LP-- M--- S--- T---	2101 - 2147
POLICE FLIGHT	6220
POLICE ROBBERY	7057
NCGO1	5177
LIFELNx	622X X = 1, 2, 3, 4
VFR	7000

* only selected airports

Figure 12 Squawk code table

VFR traffic within the Schiphol CTR is always assigned squawk 0060. Another exception is the squawk code 1000. This code is used together with squawk mode S, which is an advanced capability of the transponder to identify digitally through the transponder, as well as it allows for the controller to see select information about the flight, e.g., the selected altitude in the auto pilot. As these flights are identified by other means than just the squawk code, multiple aircraft with the 1000 code are no issue. As the code 1000 is only allowed for certain airports, you should not assign 1000 yourself (squawk 1000 availability is checked by a Euroscope plugin).

When you install the correct sector files in Euroscope through Aeronav GNG, the Schiphol Planner Interface (SPI) plugin is automatically installed as well. This plugin allows for automated squawk code assignment in Euroscope, by right clicking the squawk code field in the departure list. This means that you do not have to manually assign squawk codes to aircraft, but it remains important to check whether the automatically assigned squawk code is correct. In some cases, SPI might not automatically assign the correct squawk code and it is the responsibility of the delivery controller to then manually assign a suitable code.