

KONINKRIJK BELGIE  
MINISTERIE VAN VERKEER  
EN INFRASTRUCTUUR

Bestuur van de Luchtvaart

## CIRCULAIRE

**CIR/OPS-12**

Datum : **01/89**

Uitgave : **2**

**Betreft :**

Inlichtingen aangaande de voorbereiding en beheer van IFR vluchten.

**Bijlage:**

IFR guidelines.

**Ref. :**

- K.B. van 14 mei 1973 "Vliegverkeersregelen" – art. 4 en art. 7.
- M.B. van 13 februari 1970 "Handelsluchtvervoer" (luchtvaartuigen met een massa van 5700 kg en meer) - § 7.2.
- M.B. van 2 mei 1972 "Handelsluchtvervoer" (luchtvaartuigen met een massa van minder dan 5700 kg) - § 7.2.

De 2<sup>de</sup> uitgave bevat

De Directeur-generaal,

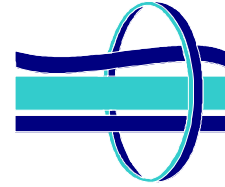
W. VANDERPERREN

22 blz. gedagtekend : **01/89**

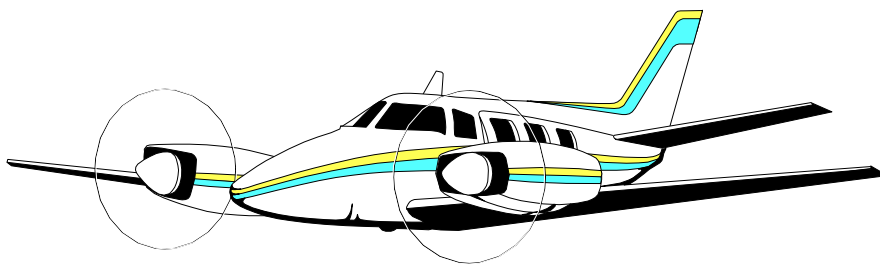
## **Vorbereiding en beheer van IFR vluchten**

Elke IFR vlucht moet op gepaste wijze voorbereid en uitgevoerd worden teneinde het hoogst mogelijke veiligheidsniveau te bereiken.

Tot dit doel stelt deze circulaire, in bijlage, een aanvaardbare methode inzake voorbereiding en beheer van IFR vluchten.



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# IFR FLIGHT

PREPARATION

FOLLOW - UP

# **IFR-FLIGHT**

## **Preparation/Follow-up**

### **CIR/OPS-12**

#### **IFR GUIDELINES**

#### **FLIGHT PREPARATION AND FLIGHT FOLLOW-UP**

#### **CONTENTS**

0. **Introduction.**
  
1. **Generalities** : List of personal equipment as well as useful and mandatory documents.
  
2. **Pre-flight preparation** : A method for selecting appropriate and feasible routing.
  
3. **Operational flight plan preparation** : Fuel computing, aircraft loading - ATC flight plan.
  
4. **Detailed map & chart study** : Suggested method for thorough study of the intended flight.
  
5. **Flight follow-up** : Highlights and advice for task execution during the different phases of flight.

# IFR-FLIGHT

## Preparation/Follow-up

### CIR/OPS-12

#### 0. INTRODUCTION

The purpose of this bulletin is to provide a method to pilots for systematic IFR flight preparation as well as in flight follow-up.

It will be a base to develop the own way of thinking, and cockpit flight organisation of the pilot.

It is not a read and do checklist.

This guide does NOT consider :

- instrument flying technique;
- specific aircraft operating procedures;
- use of de-ice and anti-ice equipment;
- use of weather radar;
- company or school policy;
- traffic rights and over flying permits;
- routing and custom procedures.

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A good flight preparation cannot be performed without thorough knowledge and correct use of :

- air law and ATC regulations;
- meteorology and use of weather maps and messages;
- aircraft and its manuals;
- the navigation maps, departure and approach charts;
- R/T phraseology.

#### ALSO

it is mandatory to be mentally and physically available for the task.

#### CONCLUSION :

Before entering the chapter "flight preparation", be sure to be acquainted with all the theoretical knowledge needed.
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# IFR-FLIGHT

## Preparation/Follow-up

### CIR/OPS-12

#### 1. GENERALITIES

##### 1.1. Personal equipment.

Check availability and validity of :

- licence and qualifications;
- passport and visas;
- international certificate of vaccination;
- identity badge (security documents);
- computer or calculator;
- protractor;
- earphones;
- corrective glasses if required + spare set;
- flash light;
- clip board and sunglasses.

##### 1.2. Aircraft documents.

Before each flight, check for the availability and validity on board of your aircraft of following documents :

the legal aircraft documents :

- registration certificate;
- airworthiness certificate;
- operations manual (if required);
- radio equipment certificate;
- aircraft logbook;
- insurance documents (if required);
- POH - pilots operating handbook;
- trouble report (if required);
- MEL (minimum equipment list) (if required);
- codes for search and rescue (if required);

documents of current use (if required) :

- check lists normal & emergency;
- a complete and updated set of maps and charts;
- the company flight operating manual;
- reserve navigation logs;
- reserve load & trimsheets;
- weight books.

# IFR-FLIGHT

## Preparation/Follow-up

### CIR/OPS-12

## 2. PREFLIGHT PREPARATION

GOOD PREFLIGHT PREPARATION IS THE FOUNDATION OF SAFE FLYING

### 2.1. Optional routing.

Choose the initial routing to destination and alternate.

Taking into account :

- preferential routings;
- topographical details (safety altitudes);
- minimum en route altitudes;
- maximum en route altitudes;
- high and/or low level charts to be used.

Compare routing and airports with your aircraft performances (all engines operational and engine failure).

### 2.2. Notam.

Obtain & study NOTAM :

- departure airport;
- en route (navigation aids & special procedures);
- destination airport;
- alternate airports (T/O - en route - destination).

### 2.3. Weather.

Obtain & study weather information :

- en route :
- eather maps
  - altitude wind maps;

airport TAF & METAR :

- departure airport
- destination airport
- alternate airports (T/O - en route - destination);

special weather condition :

- SNOWTAM
- SIGMET
- runway conditions.

# IFR-FLIGHT

## Preparation/Follow-up

### CIR/OPS-12

**Compare weather conditions with your personal minima.**

#### 2.4. Foreign Destination.

Check for :

- entry requirements;
- airport directory :
  - customs & immigration facilities;
  - opening hours;
  - fuel disponibility;
- special airlaw & regulations;
- emergency data : radio com failure.

#### 2.5. Planned routing.

If necessary alter your optional routing according to the details obtained under : § 2.2., § 2.3., § 2.4.



# IFR-FLIGHT

## Preparation/Follow-up

### CIR/OPS-12

### 3. OPERATIONAL FLIGHT PLAN PREPARATION

3.1. Fill in your navigation log and your T.O. climb data card.

- expected T/O runway;
- SID or intended departure;
- route and minimum safety altitudes;
- STAR or intended arrival;
- routing to alternate.

3.2. Estimated gross weight

Compute your estimated gross weight.

3.3. Minimum required fuel.

Taking into account the estimated gross weight, work out your fuel consumption for :

- trip fuel (taxi fuel included) : -
- total reserve : contingency : -  
alternate : -  
holding : -  
extra (if any) : -

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- minimum required fuel : -  
in accordance with law, school or company policy.

3.4. Payload.

Actualise your gross weight and compare with your :

- MTOW (maximum T/O weight) + type of limitation
- MZFW (maximum zero fuel weight)
- MLW (maximum landing weight).

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Determine your maximum payload.

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Alter your payload according to the details obtained under § 3.2., § 3.3., § 3.4.

(A technical stop may be considered).

# **IFR-FLIGHT**

## **Preparation/Follow-up**

### **CIR/OPS-12**

3.5. Weight & balance :

Finalise.

3.6. ATC flight plan :

File & check for ATFM (Air Traffic-Flow Management).

3.7. T.O. and climb data card :

Fill in for expected runway(s).

3.8. Descent and landing data card :

Prepare for short flight.

3.9. Compute the E.T.P. and the P.N.R. :

If applicable.

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# IFR-FLIGHT

## Preparation/Follow-up

### CIR/OPS-12

#### 4. MAP & CHART

##### DETAILED STUDY

(Based on Jeppesen Airway Manual Terminology)

Depending on pilot's experience, this study can be done at most convenient moment before departure.

MAX. PREPARATION ON GROUND = MIN. PAPERWORK AIRBORNE.

Study in chronological order of use, all charts and maps related to your flight.

Always keeping in mind the sequence :

- ROUTING (plan VIEW)
- PROFILE
- navigation aids.

#### 4.1. Departure airport frequencies :

- Frequency of :
- ATIS
  - Cpt (clearance prior taxi)
  - ramp control
  - TAXI
  - TWR
  - DEP

#### 4.2. Start up & taxi :

Study :

- special start up and taxi procedures;
- parking area lay-out;
- taxi to runway identification of taxiway intersections.

#### 4.3. T/O runway :

Study :

- preferential runway;
- noise abatement procedure;
- displaced threshold;
- available overrun;
- length available in case of intersection T/O;
- runway lighting;
- RVR measuring equipment.

Note : Threshold elevation

# IFR-FLIGHT

## Preparation/Follow-up

### CIR/OPS-12

Mentally prepare your T/O and consider action in case of engine failure during T/O run.

#### 4.4. Departure & climb :

- routing;
- profile :
  - first turn altitude;
  - power reduction altitude;
  - acceleration altitude;
  - check obstacles on the dep. flight path;
  - MSA, AMA, MEA, MORA;
  - specific SID altitudes;
  - transition altitude;
  - speed limit procedure;
  - safety altitudes during climb;
- nav. aids to be used
- air turn back (landing on T/O runway or other runway)

Verify the climb gradient required to comply with the proposed departure.  
Are you able to fly the profile ?  
Prepare engine failure flight path if proposed routing would become unsafe.  
Keep in mind : **FIRST FLY THE AIRCRAFT !**

#### 4.5. En route

Study :

- routing : all maps HI and/or LO to be used;
- safety altitudes - MEA - MORA - grid MORA (when flight outside published route is anticipated);
- optimum altitude;
- maximum altitude (all engines operating);
- maximum altitude (one engine out) and speed;
- navigation aids;
- en route alternates.

#### 4.6. Descent :

Study :

- routing : - chronologically all maps and charts to be used (HI - LO – AREA - STAR - APP CHARTS);
  - speed limit procedures;
  - holdings;
- profile : - safe altitude during descent :

# IFR-FLIGHT

## Preparation/Follow-up

### CIR/OPS-12

- grid MORA - MEA - AMA - MSA;
- transition level;
- min. holding altitude;
- know the topography;
- Nav. aids available and location in relation to the airport of landing;
- % slope needed for descent.

#### 4.7. Approach :

Study :

- all available instrument approach procedures & MINIMA;
- IAF - FAF;
- minimum altitude at IAF;
- minimum altitude at FAF;
- MDA and/or DA;
- all suitable landing runways;
- landing RWY TDZ elevation;
- radio aids for approach
- alignment - offset
- descent slope - %
- MISSED APPROACH PROCEDURE.

#### 4.8. Pull-up :

Study :

- routing;
- altitudes;
- navigation aids.

Contengency flight path in case of engine failure during GO AROUND.
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#### 4.9. Landing :

Study :

- approach lighting available;
- runway lighting available;
- RVR available;
- VASI/PAPI;
- runway length & width and number of suitable RWYs;
- displaced threshold;
- overrun available;
- high speed taxiways;
- arrester gear.

# IFR-FLIGHT

## Preparation/Follow-up

### CIR/OPS-12

#### 4.10. Taxi :

- expected parking;
- taxiways to parking;
- interference of runways with taxiway lay-out;
- ramp control & instruction;
- parking facilities.

#### 4.11. Alternates :

- adequacy for your type of aircraft and operation;
  - same study as your destination aerodrome.
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# IFR-FLIGHT

## Preparation/Follow-up

### CIR/OPS-12

#### 5. FLIGHT FOLLOW UP

AT ALL TIMES :  
EXERCISE THE BEST POSSIBLE LOOK OUT AND MONITORING;  
BE SAFETY ALTITUDE MINDED;  
BE WIND MINDED;  
KNOW WHAT IS IMPORTANT AND WHAT IS SECONDARY.

WHEN RUNNING OUT OF TIME :

- BE SELECTIVE;
- EXECUTE VITAL ACTIONS.

WHEN IN EMERGENCY :

- FLY THE AIRCRAFT FIRST;
- ASK FOR/OR EXECUTE APPROPRIATE CHECK LIST.

#### 5.1. Prior start up :

Check :

- documents - see § 1.2.;
- trouble report & A/C technical status;
- fuel on board;
- loading;
- emergency equipment;

Aircraft external and internal inspection.  
Cockpit set up.

- Special care : - latest weather ATIS;
  - flight instruments;
  - navigation aids initial set up;
  - R/T frequencies;
  - charts available in chronological order;
  - flight log available;

# IFR-FLIGHT

## Preparation/Follow-up

### CIR/OPS-12

Crew briefing : or self briefing :

the briefing should contain :

- determination of pilot flying the aircraft (for crew);
- T/O & climb data;
- action in case of emergency;
- special procedures;
- cabin and passengers safety briefing.

AIRCRAFT CHECKLIST !

5.2. Taxi and/or run up :

Aircraft cockpit set up

- Special care :
- flight instruments check;
  - navigation aids set for departure specified in ATC clearance;
  - changes to : flight preparation;
  - T/O & climb data;
  - crew briefing;
  - cabin & passengers safety check.

AIRCRAFT CHECKLIST !

Mentally review T/O and action in case of engine failure during T/O run and initial climb.

STAY AHEAD OF YOUR AIRCRAFT

5.3. Line up.

AIRCRAFT set up



# IFR-FLIGHT

## Preparation/Follow-up

### CIR/OPS-12

- Special care :
- compare threshold elevation against altimeter indication for:
    - altimeter check
    - QNH check;
    - compass check for runway heading;
    - transponder ON desired code.

#### AIRCRAFT CHECKLIST !

#### 5.4. T/O roll.

#### FLY THE AIRCRAFT

According aircraft operating procedures.

- note or call IAS showing, mention the value in order to cross-check the IAS
- indicator(s);
- check engine(s) parameters;
- note or call T/O speeds.

#### 5.5. Climb out :

#### FLY THE AIRCRAFT !

According aircraft operating procedures.

Keep in mind :

- best angle of climb speed up to the highest of SID - MSA - AMA - MEA - MORA (according to climb distance +/- 100 N.M.);
- en route climb : best R/C speed;
- operational climb speed;
- one engine out climb speed (best angle);
- altitude capability on one engine out & speed;
- engine out escape routing;

Respect - SID & departure procedures;

- R/T vigilance and correct phraseology.

#### AFTER T/O CHECKLIST

BE AWARE OF BEING BELOW YOUR SAFETY ALTITUDES

# IFR-FLIGHT

## Preparation/Follow-up

### CIR/OPS-12

#### 5.6. Cruise :

According aircraft operating procedures :

BE AWARE OF MEA, MORA, grid MORA

- know your altitude capability with one engine out and speed;
- determine type of cruise;
- fill in flight log : frequencies, airway clearances, sigmet and ETA;
- perform weather follow-up (alternates, en route and destinations);
- perform fuel management;
- watch on auxiliary frequency (if any) :
  - company frequency
  - operational frequency
  - emergency frequency (121,5 MHz.);
- actualise the E.T.P. and the P.N.R. (if any).

#### 5.7. Before descent :

According aircraft operating procedures :

- plan top of descent point (T.O.D.), according obstacles a/c performances, wind;
- actualize weather and runway conditions at destination and alternate;
- plan minimum diverting fuel;
- plan holding fuel & maximum holding time;
- review : charts for descent, STAR, speed limit procedures, noise batement procedure, holdings, approach, landing, go around, taxi (see § 4.6. - 4.11)
- minima;
- take option for type of approach to be expected;
- decide on pilot flying (for crew);
- finalize descent and landing data;
- check for emergency routing if go around flight path is unsafe in case of engine failure;
- prepare cabin and cockpit for landing;
- perform crew briefing or self briefing for descent and approach :
  - STAR routing
  - descent profile (MEA, AMA, MSA, grid MORA, transition level)
  - radio aids to be used
  - minima
  - runway exit target taxiway
  - pull-up procedure
  - airport lay-out.

Aircraft cockpit set up

AIRCRAFT CHECKLIST

# IFR-FLIGHT

## Preparation/Follow-up

### CIR/OPS-12

#### 5.8. Approach :

According aircraft operating procedures.

##### 5.8.1. General for all approaches

- set-up radio as soon as possible
  - check all aids;
  - use all equipment available;
  - verify radio aids for correct set up when turning on final course.
- Be wind-minded
  - wind limitations (X wind, tail wind);
  - increment on VREF;
  - patterns & timing correction;
  - rate of descent work out;
  - possible wind shear.
- Be aware of correct altimeter setting
  - X check altimeters;
  - X check your actual QNH setting with different information sources
  - descent clearance, actual weather, forecast.
- Be aware of visibility changes
  - sun position;
  - general vis. & RVR;
  - continuance of approach/approach ban.
- Mentally prepare pull-up
  - aircraft go around procedure;
  - ATC pull up procedure;
  - emergency actions.
- Beware of abnormally steep descent slopes
  - (3° = 5 % is normal).
- Beware of offset final approach courses.
- Beware of abnormal touch down points
  - (300 m inside the runway is normal).
- Be aware of available approach and runway lighting
  - VASI & PAPI;
  - kind of approach lights;
  - TDZ lights;
  - CL.
- Use correct R/T phraseology and maintain listening watch at all times.

#### DO NOT HESITATE TO GO AROUND

If all conditions are not satisfied (profile, heading, speed, A/C configuration power) even below MDA or DA.

A go around does NOT require a clearance

# IFR-FLIGHT

## Preparation/Follow-up

### CIR/OPS-12

AIRCRAFT CHECKLIST
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#### 5.8.2. Precision approach (ILS - PAR)

- See 5.8.1.
- Fly target speeds;
- Use standard call-outs;
- localizer alive;
- glide slope alive;
- OM - read altimeter for X check with published altitude;
- at F.A.F. (OM) ask landing clearance;
- any significant deviation from G/S loc, rate of descent, IAS;
- approaching minima;
- minima;
- when becoming visual :
  - approach lights in sight;
  - runway in sight.

#### 5.8.3. Non precision approach

(Where no electronic glide slope guidance is available).

- See 5.8.1.
- Fly target speeds in order to be able to fly steady rate of descents & to respect precalculated timing.
- Ask for maximum brightness of approach lights if necessary;
- Try to see visual cues as soon as possible.
- Standard call-outs :
  - altitude at published fixes;
  - approaching minima;
  - minima;
  - when becoming visual :
    - ground contact;
    - approach lights in sight;
    - runway in sight (lateral & vertical off-set).
- Be aware that a missed approach or circling, weather conditions permitting, are the only possible actions when having late visual contact approaching missed approach point (MAP).

#### 5.8.4. Circling

- Climb to or maintain circling altitude or higher.
- Stay in aerodrome protected area.
- Keep aerodrome in sight at all times.
- Be aware of pull-up procedure when losing visual contact during circling.
- Do not descent below MDA before intercepting final descent profile.
- A circling approach needs an appropriate ATC clearance.

# IFR-FLIGHT

## Preparation/Follow-up

### CIR/OPS-12

5.9.

#### ADVICE

- Consider all flights as being potentially difficult.
- Be ahead of the in flight presentation.
- When running out of time, be selective. Each phase of flight has its mandatory vital actions to be executed. Know is important and what is secondary.
- Be aware of doubtful clearance or instructions, do not hesitate to request "repetition".
- When a checklist is interrupted or uncompleted, keep it in view.
- "Share your experience" between crew members.
- Make use of T/O, climb, descent and landing data cards. This card should contain pertinent data for aircraft handling and for operational and safety altitudes.

5.10. Good to know (approximate values)

For planning purpose :

$$\text{Slope (\%)} = \frac{1}{60} \cdot \frac{\text{height (ft)}}{\text{distance (n.m.)}}$$

$$1 \% = 60 \text{ ft/n.m.}$$

$$1^\circ : 1,75 \% - 100 \text{ ft/n.m.}$$

To check in flight :

$$\begin{aligned} \text{Vertical speed (ft/min)} &= \text{slope (\%)} \times \text{GS (Kts)} \\ \text{Slope (\%)} &= \frac{\text{Vertical speed (ft/min)}}{\text{G.S.(Kts)}} \end{aligned}$$

Note : - a normal glide slope is  $3^\circ - 5 \% - 300 \text{ ft/n.m.} - 1/20$ ;  
-  $3 \times \frac{\text{FL}}{10} = \text{distance out for a } 5 \% \text{ gradient.}$

5.11. Post flight

AIRCRAFT CHECKLIST  
AFTER LANDING  
&  
SHUTDOWN

# IFR-FLIGHT

## Preparation/Follow-up

### CIR/OPS-12

- Cockpit clean up  
Store flight documentation.
- Secure the aircraft  
If a long stop or adverse weather conditions during stop over are anticipated, protect the aircraft :
  - lock the flight controls;
  - place wheel blocks;
  - install pitot tube protection;
  - install propeller and/or air intake protection.
- File the aircraft log book.
- If required file the following documents :
  - company or school reports;
  - trouble report;
  - technical flight incident report;
  - bird strike report;
  - lightning strike report;
  - near mid-air collision report.
- After landing on an uncontrolled aerodrome don't forget to close your ATC flight plan.