

CHAPTER 5 • REFERENCE DEPTH

FIRs, Frequencies & Aeronautical Information

Every flight is built on information someone else collected, published and kept current — the elevation of a runway, the frequency of a beacon, the fact that a taxiway is closed tonight. This chapter covers how the airspace is divided, the frequencies you talk and navigate on, and the information system — AIP, AIC, NOTAM — that keeps it all current.

SYLLABUS MAP

Part I (viii) FIRs in India & principal comms/nav facilities • (x) Notices to airmen (NOTAM/AIS)

🎯 Learning objectives — by the end of this chapter you will be able to...

- Define an FIR and the related airspace structures (UIR, CTA, CTR, TMA), and the services provided within them.
- Name India's principal FIRs and decode an ICAO four-letter location indicator.
- Outline the ICAO airspace classes A–G and what each provides.

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- State the principal communication, emergency and navigation frequencies used in India.
- Describe the AIS and the Integrated Aeronautical Information Package (AIP, AIC, NOTAM) and the NOTAM Q-line.
- Explain the AIRAC cycle and the AFTN with its message priorities.

5.1 How airspace is divided

5.2 Indian FIRs & the services

5.3 ICAO location indicators

5.4 Airspace classes A–G

5.5 Principal communication & emergency frequencies

5.6 Principal navigation frequencies

5.7 The AIS & the IAIP

5.8 NOTAM & the Q-line

5.9 AIRAC & AFTN

GHOST AVIATOR



Airspace is divided into blocks so ATC can manage traffic safely and efficiently.

| 5.1 How airspace is divided

i FIRST PRINCIPLES — WHY AIRSPACE IS CARVED UP

Airspace is too vast and varied for one office, one service and one set of rules. So it is divided two ways: **horizontally and vertically** into named blocks, and **by class** according to how much control and service is provided. The largest block is the **Flight Information Region (FIR)**; within it sit smaller, more tightly controlled volumes around the busy parts.

THE AIRSPACE VOLUMES

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FIR — Flight Information Region: a volume within which **Flight Information Service (FIS)** and **Alerting Service** are provided.

UIR — Upper Information Region: the FIR's upper-airspace counterpart.

CTA — Control Area: controlled airspace from a specified lower limit upwards (airways are CTAs).

TMA — Terminal Control Area: a CTA at the confluence of routes near major aerodromes.

CTR — Control Zone: controlled airspace from the **surface** upwards around an aerodrome.

ATZ — Aerodrome Traffic Zone.

DEFINITION — FLIGHT INFORMATION REGION (FIR)

An airspace of defined dimensions within which **Flight Information Service** (useful information for the safe and efficient conduct of flight) and **Alerting Service** (notifying the appropriate organisations of aircraft needing search and rescue, and assisting) are provided. An FIR may extend over the high seas (an **Oceanic** FIR).

5.2 Indian FIRs & the services

INDIA'S PRINCIPAL FIRS

India's airspace is divided into the FIRs of **Delhi, Mumbai, Kolkata and Chennai**, with the **Chennai (Oceanic)** region extending far over the Bay of Bengal and Indian Ocean.

Each is managed by the **Airports Authority of India (AAI)**, which provides ATS, communications, navigation and surveillance within them.

AUTHOR CHECK BEFORE PUBLISHING

Confirm the **complete current list** of Indian FIRs and any sub-FIRs (e.g. Guwahati), their boundaries and exact FIR location indicators from the current AIP.

Boundaries/names change — quote the live AIP.

COCKPIT REALITY — CROSSING AN FIR BOUNDARY

As you cross from one FIR to the next, control is handed from one area control centre to another and you change frequency on instruction. Over the ocean, where there is no radar or VHF, the Chennai Oceanic FIR uses **HF and position reports** (and increasingly CPDLC/ADS) to keep aircraft separated.

5.3 ICAO location indicators

FIRST PRINCIPLES — A UNIQUE ADDRESS FOR EVERY PLACE

Flight plans, NOTAMs and messages must name aerodromes and stations **unambiguously** across the world, so ICAO assigns each a unique **four-letter code**. The letters are structured by region and territory so the code itself tells you roughly where you are.

HOW THE FOUR LETTERS WORK

1st letter = **region**; 2nd letter = **State/territory** within the region; 3rd–4th = the **specific location**. For India the first letter is **V**, and the second splits the country by zone (e.g. **VI**... north, **VA**... west, **VE**... east, **VO**... south). These are **ICAO** codes (4 letters), distinct from the **IATA** 3-letter codes used on tickets and baggage.

Indian 4-Letter Indicators

Airport	ICAO (4-ltr)	IATA (3-ltr)	Zone letter
Delhi	VIDP	DEL	VI — north
Mumbai	VABB	BOM	VA — west
Kolkata	VECC	CCU	VE — east
Chennai	VOMM	MAA	VO — south

MNEMONIC

India starts with **V**. The four metros by zone letter: **VIDP**, **VABB**, **VECC**, **VOMM** — "**I-A-E-O**" for north, west, east, south.



The four primary metro airports defining India's FIR zones: VIDP, VABB, VOMM, and VECC.

5.4 Airspace classes A–G

i IN PLAIN TERMS

ICAO grades airspace from **A** (most controlled) to **G** (uncontrolled). The class decides whether you need a clearance, whether you're separated from other traffic, and what service you receive. You need to recognise the spread, not memorise every cell.

Airspace Classes A–G

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Class	Flights	Separation / service (summary)
A	IFR only	All separated; ATC clearance required
B	IFR & VFR	All separated from all
C	IFR & VFR	IFR separated from IFR & VFR; VFR get traffic info on other VFR
D	IFR & VFR	IFR separated from IFR; traffic info on VFR
E	IFR & VFR	IFR separated from IFR; VFR not separated; controlled for IFR
F	IFR & VFR	Advisory service to IFR (where provided)
G	IFR & VFR	Uncontrolled — flight information service only

MNEMONIC

A is for "All controlled"; G is for "Go as you please" (uncontrolled).

Control and separation steadily decrease from A to G.

AUTHOR CHECK BEFORE PUBLISHING

Confirm which airspace classes India actually uses and their VMC minima from the current AIP/CAR, and insert exact figures if examinable.

5.5 Principal communication & emergency frequencies

IN PLAIN TERMS

Within India you talk to ATC on the VHF aviation band; long-range/oceanic uses HF; and a small set of emergency frequencies is guarded worldwide. The full spectrum is in Chapter 8; these are the ones the examiner expects you to name.

Communication & Emergency Frequencies

Use	Frequency / band
VHF ATC voice	118.0 – 136.975 MHz (AM, line-of-sight)
VHF emergency (international guard)	121.5 MHz

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Use	Frequency / band
UHF military emergency	243.0 MHz (= 2 × 121.5)
ELT — satellite / homing	406 MHz / 121.5 MHz
SAR scene-of-search (aux)	123.1 MHz
Maritime distress (HF/MF)	2182 kHz
HF long-range / oceanic voice	3 – 30 MHz (SSB)

⚠ EXAM TRAP

121.5 MHz is the international VHF emergency (guard) frequency — memorise it exactly. Don't confuse it with the UHF military guard **243.0 MHz**, and note **123.1 MHz** is the SAR auxiliary scene-of-search frequency.

5.6 Principal navigation frequencies

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Navigation Frequencies

Aid	Frequency / band
NDB / ADF	LF/MF $\approx$ 190 – 1750 kHz
VOR / ILS localizer	VHF 108.0 – 117.975 MHz
ILS glide path	UHF 329 – 335 MHz
Marker beacons	75 MHz
DME	UHF 962 – 1213 MHz
SSR transponder	1030 MHz interrogate / 1090 MHz reply

COCKPIT REALITY

These frequencies and the facilities available at each aerodrome — runway, elevation, beacon idents, frequencies — are exactly what you look up in the **AIP** before flying there. Which brings us to the information system itself.

| 5.7 The AIS & the IAIP

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FIRST PRINCIPLES — FLIGHT RUNS ON PUBLISHED INFORMATION

You cannot personally survey every runway or measure every beacon. Someone collects that data, publishes it, and — critically — **keeps it current**. That is the job of the **Aeronautical Information Service (AIS)**, and its output is bundled as the **Integrated Aeronautical Information Package (IAIP)**. Different kinds of information change at different speeds, so the package has different components for permanent, long-temporary, and short-notice data.

THE INTEGRATED AERONAUTICAL INFORMATION PACKAGE

AIP — Aeronautical Information Publication: the permanent reference manual, in three parts — **GEN** (general), **ENR** (en-route) and **AD** (aerodromes).

AIP Amendment — permanent changes to the AIP.

AIP Supplement — temporary changes of **long** duration.

AIC — Aeronautical Information Circular: explanatory/advisory information not meeting NOTAM or AIP criteria.

NOTAM — short-notice, time-critical changes (see 5.8).

Plus pre-flight and post-flight information bulletins.

MNEMONIC — BY HOW FAST IT CHANGES

AIP = permanent · Supplement = long temporary · AIC = advisory · NOTAM = urgent/now. The faster the information changes, the further "down" this list it lives.

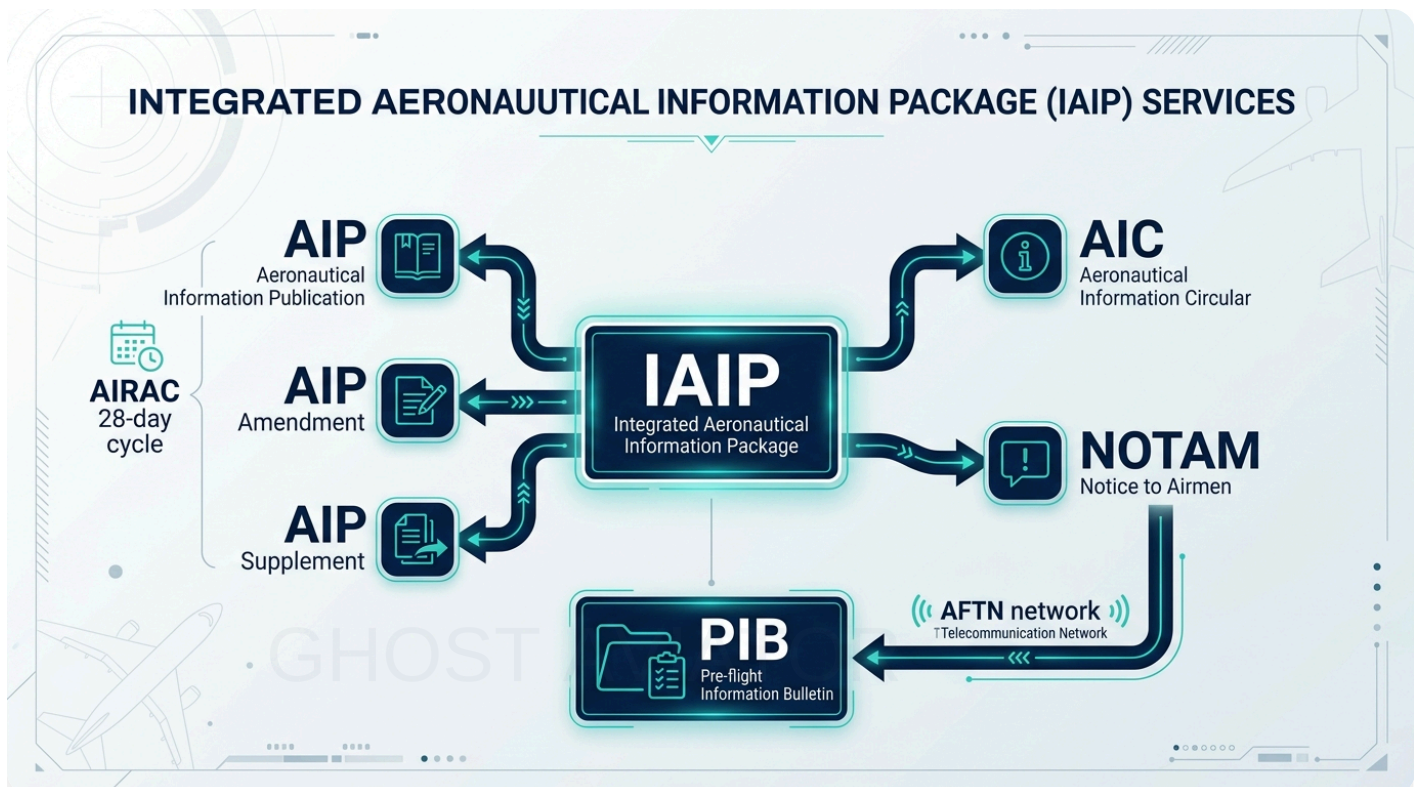


Figure 5.1 — The Integrated Aeronautical Information Package components branching down to time-critical NOTAMs.

5.8 NOTAM & the Q-line

DEFINITION — NOTAM

A **Notice to Airmen** — a notice distributed by telecommunication containing information on the establishment, condition or change in any aeronautical facility, service, procedure or hazard, the timely knowledge of which is essential to personnel concerned with flight operations.

✓ NOTAM TYPES & RELATIVES

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NOTAMN — new · **NOTAMR** — replaces a previous NOTAM · **NOTAMC** — cancels one. Specialised: **SNOWTAM** (runway snow/ice/slush conditions, a special format) and **ASHTAM** (volcanic ash). The summarised set for a route is issued as a **PIB — Pre-flight Information Bulletin**.

THE Q-LINE

Each NOTAM carries a coded **Q-line** that lets computers filter and route it: it encodes the FIR, a **Q-code subject & condition**, the traffic affected (I/V), the purpose, the scope, and the lower/upper limits and a radius. Below the Q-line, items A) to G) give the aerodrome/FIR, start and end times, schedule, and the plain-language text.

WORKED EXAMPLE — READING A NOTAM

A NOTAM reads, in part: "**A) VIDP B) ... C) ... E) RWY 11/29 CLSD DUE WIP.**"

A) = the aerodrome (Delhi, VIDP). B)/C) = valid-from / valid-to times (UTC).

E) = the plain text: **runway 11/29 closed due work in progress.**

So at Delhi, for the period in B)–C), you must plan around runway 11/29 being unavailable. This is exactly the kind of item the PIB surfaces before you fly.

MNEMONIC

N-R-C: New, Replace, Cancel — a NOTAM is freshly issued, takes the place of an old one, or kills one.

| 5.9 AIRAC & AFTN

DEFINITION — AIRAC

Aeronautical Information Regulation And Control — a system delivering operationally significant changes on common **effective dates** at fixed intervals of **28 days**, so that crews, databases and States all update **together** rather than at random.

AFTN — THE NETWORK & ITS MESSAGE PRIORITIES

NOTAMs, flight plans and service messages travel over the **AFTN — Aeronautical Fixed Telecommunication Network**, a worldwide ground network of fixed stations exchanging messages in a standard format with **priority indicators**. In descending priority: **SS** Distress, **DD** Urgency, **FF** Flight safety, **GG** Meteorological, **KK** Flight regularity (and lower categories for administrative/service messages).

MNEMONIC — AFTN PRIORITY ORDER

"**Some Dogs Find Good Kennels**" → **SS** Distress, **DD** Urgency, **FF** Flight-safety, **GG** Met, **KK** Regularity.

| ☆ Numbers to memorise

Essential Facts for Chapter 5

Fact	Value
FIR	Airspace with Flight Information Service + Alerting Service
Indian FIRs	Delhi, Mumbai, Kolkata, Chennai (+ Chennai Oceanic)
Location indicators	VIDP · VABB · VECC · VOMM (India = V, 4 letters)
Airspace classes	A (all controlled) → G (uncontrolled)
VHF ATC band	118.0 – 136.975 MHz
VHF / UHF emergency	121.5 MHz / 243.0 MHz · SAR aux 123.1
IAIP	AIP (GEN/ENR/AD) · Amendment · Supplement · AIC · NOTAM
NOTAM types	NOTAMN (new) · NOTAMR (replace) · NOTAMC (cancel)
AIRAC cycle	28 days
AFTN priorities	SS · DD · FF · GG · KK (distress → regularity)

Question bank

Part A — MCQs (click an option to check)

1. Within an FIR, which services are provided?

Air traffic control only

Flight Information Service and Alerting Service

Customs and immigration

Refuelling and maintenance

Answer: Flight Information Service and Alerting Service.

An FIR is the airspace within which FIS and Alerting Service are provided.

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2. Controlled airspace extending from the surface upwards around an aerodrome is a:

CTA

TMA

CTR (Control Zone)

UIR

Answer: CTR (Control Zone).

A CTR (control zone) is from the surface up; a CTA is from a specified level up.

3. The ICAO location indicator for Mumbai is:

BOM

VABB

VIDP

VOMM

Answer: VABB.

VABB (ICAO, 4 letters). BOM is the IATA 3-letter code.

4. In an ICAO four-letter location indicator, the first letter denotes the:

Specific airport

Region

Runway

Airline

Answer: Region.

1st = region, 2nd = State/territory, 3rd–4th = location.

5. The most controlled ICAO airspace class is:

Class A

Class D

Class F

Class G

Answer: Class A.

Class A is the most controlled (IFR only, all separated); G is uncontrolled.

6. Class G airspace is:

IFR only, fully separated

Uncontrolled, with flight information service only

Reserved for the military

Above FL600 only

Answer: Uncontrolled, with flight information service only.

Class G is uncontrolled — no ATC separation, FIS only.

GHOST AVIATOR

7. The international VHF emergency frequency is:

243.0 MHz

118.0 MHz

121.5 MHz

406 MHz

Answer: 121.5 MHz.

121.5 MHz is the VHF guard; 243.0 MHz is the UHF military guard.

8. The SAR auxiliary scene-of-search frequency is:

121.5 MHz

123.1 MHz

243.0 MHz

2182 kHz

Answer: 123.1 MHz.

123.1 MHz is the auxiliary SAR frequency; 121.5 is the primary guard.

GHOST AVIATOR

9. The VHF aeronautical communication band is:

108.0–117.975 MHz

118.0–136.975 MHz

329–335 MHz

3–30 MHz

Answer: 118.0–136.975 MHz.

118.0–136.975 MHz is the ATC voice band; 108–117.975 is VOR/ILS-LOC.

GHOST AVIATOR

10. The permanent reference manual of a State's aeronautical data is the:

NOTAM

AIC

AIP

SNOWTAM

Answer: AIP.

The AIP (parts GEN/ENR/AD) is the permanent publication.

GHOSH AVIATOR

11. The three parts of the AIP are:

A, B, C

GEN, ENR, AD

N, R, C

SS, DD, FF

Answer: GEN, ENR, AD.

GEN (general), ENR (en-route), AD (aerodromes).

12. A temporary change of long duration to the AIP is published as a/an:

NOTAM

AIP Supplement

AIC

SNOWTAM

Answer: AIP Supplement.

Long-duration temporary changes = AIP Supplement; short-notice = NOTAM.

13. A NOTAM that cancels a previous NOTAM is a:

NOTAMN

NOTAMR

NOTAMC

SNOWTAM

Answer: NOTAMC.

N = new, R = replace, C = cancel.

14. Runway snow, ice and slush conditions are notified by a:

ASHTAM

SNOWTAM

AIC

PIB

Answer: SNOWTAM.

SNOWTAM (special format) for runway contamination; ASHTAM for volcanic ash.

15. The route NOTAM digest provided at briefing is the:

TAF

ATIS

PIB (Pre-flight Information Bulletin)

AIC

Answer: PIB (Pre-flight Information Bulletin).

The PIB gathers the relevant NOTAMs for the route and aerodromes.

16. The AIRAC cycle interval is:

7 days

14 days

28 days

90 days

Answer: 28 days.

AIRAC effective dates recur every 28 days worldwide.

GHOST AVIATOR

17. NOTAMs and flight plans are carried over the:

NFAP

AFTN

VOLMET

SACFA

GHOST AVIATOR

Answer: AFTN.

The Aeronautical Fixed Telecommunication Network carries these messages with priority indicators.

GHOST AVIATOR

18. The highest AFTN message priority is:

FF (Flight safety)

GG (Meteorological)

SS (Distress)

KK (Flight regularity)

Answer: SS (Distress).

Descending priority: SS distress, DD urgency, FF flight-safety, GG met, KK regularity.

Part B — Oral / viva (tap to reveal model answers)

▼ ? What is an FIR and what services are provided in it?

Model Answer:

A Flight Information Region — an airspace of defined dimensions within which Flight Information Service and Alerting Service are provided. India's principal FIRs are Delhi, Mumbai, Kolkata and Chennai, with Chennai Oceanic over the sea.

▼ ? Distinguish a CTA, a CTR and a TMA.

Model Answer:

A CTA (control area) is controlled airspace from a specified lower limit upwards; a CTR

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(control zone) is controlled airspace from the surface upwards around an aerodrome; a TMA is a control area at the confluence of routes near busy aerodromes.

▼ ? **How is an ICAO four-letter location indicator structured?**

Model Answer:

First letter = region, second = State/territory, third and fourth = the specific location. For India the first letter is V, e.g. VIDP for Delhi.

▼ ? **What is the difference between controlled and uncontrolled airspace classes?**

Model Answer:

Classes A–E are controlled, with ATC clearance and varying separation; Classes F and G are largely uncontrolled, with advisory or flight information service only. Control and separation decrease from A to G.

▼ ? **Name the components of the Integrated Aeronautical Information Package.**

Model Answer:

The AIP (with parts GEN, ENR and AD) and its Amendments and Supplements, Aeronautical Information Circulars (AIC), and NOTAMs, together with pre-flight and post-flight information.

▼ ? **What is a NOTAM, and what are its types?**

Model Answer:

A Notice to Airmen distributed by telecommunication giving time-critical information essential to flight operations. Types: NOTAMN (new), NOTAMR (replace), NOTAMC (cancel); plus SNOWTAM and ASHTAM.

▼ ? What is AIRAC?

Model Answer:

Aeronautical Information Regulation And Control — a system of common effective dates at fixed 28-day intervals for publishing operationally significant changes, so everyone updates together.

▼ ? What is the AFTN and how are its messages prioritised?

Model Answer:

The Aeronautical Fixed Telecommunication Network — the worldwide ground message network. Messages carry priority indicators: SS distress, DD urgency, FF flight safety, GG meteorological, KK flight regularity, in descending order.

⚡ 60-SECOND REVISION CARD

FIR = airspace with FIS + Alerting. India: **Delhi, Mumbai, Kolkata, Chennai (+Oceanic)**.

CTA/TMA/CTR nested inside.

ICAO codes (4-ltr, India = V): **VIDP, VABB, VECC, VOMM**. Classes **A (all controlled)** → **G (uncontrolled)**.

VHF ATC **118–136.975**; emergency **121.5/243.0**, SAR aux **123.1**.

IAIP = AIP (GEN/ENR/AD) + Amendment + Supplement + AIC + NOTAM. NOTAM = **N/R/C**, SNOWTAM/ASHTAM.

AIRAC = 28 days; **AFTN** carries messages, priorities **SS·DD·FF·GG·KK**.