16.72 Basic Procedures

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Basic Concepts/Terms

- **IFR** = Instrument Flight Rules
- **VFR** = Visual Flight Rules
- **IMC** = Instrument Meteorological Conditions
- **VMC** = Visual Meteorological Conditions
- **FAR Part 91** - General Operating Rules
US Airspace Classes

From: http://www.asy.faa.gov/safety_products/airspacecard.html
### Service Characteristics of Airspace Classes

<table>
<thead>
<tr>
<th>Airspace Classes</th>
<th>Communications</th>
<th>Entry Requirements</th>
<th>Separation</th>
<th>Special VFR in Surface Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Required</td>
<td>ATC clearance</td>
<td>All</td>
<td>N/A</td>
</tr>
<tr>
<td>B</td>
<td>Required</td>
<td>ATC clearance</td>
<td>All</td>
<td>Yes</td>
</tr>
<tr>
<td>C</td>
<td>Required</td>
<td>Two-way communications prior to entry</td>
<td>VFR/IFR</td>
<td>Yes</td>
</tr>
<tr>
<td>D</td>
<td>Required</td>
<td>Two-way communication prior to entry</td>
<td>Runway operations</td>
<td>Yes</td>
</tr>
<tr>
<td>E</td>
<td>Not required for VFR</td>
<td>None for VFR</td>
<td>None for VFR</td>
<td>Yes</td>
</tr>
<tr>
<td>G</td>
<td>Not required</td>
<td>None</td>
<td>None</td>
<td>N/A</td>
</tr>
</tbody>
</table>

From: http://www.asy.faa.gov/safety_products/airspacecard.html
### Airspace Class Characteristics

**An Easy-to-Read Chart for VFR Flight**

<table>
<thead>
<tr>
<th>Airspace Features</th>
<th>Class A</th>
<th>Class B</th>
<th>Class C</th>
<th>Class D</th>
<th>Class E</th>
<th>Class G</th>
</tr>
</thead>
<tbody>
<tr>
<td>Entry Requirements</td>
<td>ATC Clearance</td>
<td>ATC Clearance</td>
<td>Prior two-way communications</td>
<td>Prior two-way communications</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Minimum Pilot Qualifications</td>
<td>Instrument rating</td>
<td>Private or student certificate location dependent</td>
<td>Student certificate</td>
<td>Student certificate</td>
<td>Student certificate</td>
<td>Student certificate</td>
</tr>
<tr>
<td>Two-way Radio Communications</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Not required</td>
<td>Not required</td>
</tr>
<tr>
<td>Special VFR Allowed*</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>N/A</td>
</tr>
<tr>
<td>VFR Visibility Minimum</td>
<td>N/A</td>
<td>3 Statute miles**</td>
<td>3 Statute miles**</td>
<td>3 Statute miles**</td>
<td>3 Statute miles**</td>
<td>1 Statute mile**</td>
</tr>
<tr>
<td>VFR Minimum Distance from Clouds</td>
<td>N/A</td>
<td>Clear of clouds</td>
<td>500 feet below, 1,000 feet above, 2,000 feet horizontally**</td>
<td>500 feet below, 1,000 feet above, 2,000 feet horizontally**</td>
<td>500 feet below, 1,000 feet above, 2,000 feet horizontally**</td>
<td>Clear of clouds**</td>
</tr>
<tr>
<td>VFR Aircraft Separation</td>
<td>N/A</td>
<td>All</td>
<td>IFR</td>
<td>Runway operations</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Traffic Advisories</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Workload Permitting</td>
<td>Workload Permitting</td>
<td>Workload Permitting</td>
</tr>
<tr>
<td>Former Airspace Equivalent</td>
<td>Positive control area (PCA)</td>
<td>Terminal control area (TCA)</td>
<td>Airport radar service area (ARSA)</td>
<td>Airport traffic area and control zone</td>
<td>General controlled airspace</td>
<td>Uncontrolled airspace</td>
</tr>
</tbody>
</table>

From: http://www.asy.faa.gov/safety_products/airspaceclass.htm
Current Control Structure

- **Surface Control**
  - “Ground”

- **Local Control**
  - “Tower”

- **Terminal Area Control (TRACON)**
  - “Approach and “Departure”

- **Enroute Control (ARTCC)**
  - “Center”

- **Oceanic Control (FIR)**
  - “Oceanic”

- **Flow Control (ATCSCC)**
  - “Central Flow”

![Map of U.S. Airspace](image)
Example Flight

- Logan KBOS > Washington Dulles KIAD
Flight Plan Form

<table>
<thead>
<tr>
<th>1. TYPE</th>
<th>2. AIRCRAFT IDENTIFICATION</th>
<th>3. AIRCRAFT TYPE/SPECIAL EQUIPMENT</th>
<th>4. TRUE AIRSPEED</th>
<th>5. DEPARTURE POINT</th>
<th>6. DEPARTURE TIME</th>
<th>7. CRUISING ALTITUDE</th>
</tr>
</thead>
<tbody>
<tr>
<td>VFR</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IFR</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DVFR</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

8. ROUTE OF FLIGHT

9. DESTINATION (Name of airport and city)

10. EST. TIME ENROUTE
    
    HOURS  MINUTES

11. REMARKS

12. FUEL ON BOARD
    
    HOURS  MINUTES

13. ALTERNATE AIRPORT(S)
    
    HOURS  MINUTES

14. PILOT'S NAME, ADDRESS & TELEPHONE NUMBER & AIRCRAFT HOME BASE

15. NUMBER ABOARD

16. COLOR OF AIRCRAFT

CIVIL AIRCRAFT PILOTS, FAR 91 requires you file an IFR flight plan to operate under instrument flight rules in controlled airspace. Failure to file could result in a civil penalty not to exceed $1,000 for each violation (Section 901 of the Federal Aviation Act of 1958, as amended). Filing of a VFR flight plan is recommended as a good operating practice. See also Part 99 for requirements concerning DVFR flight plans.

FAA Form 7233-1 (8-82)  
CLOSE VFR FLIGHT PLAN WITH _______________ FSS ON ARRIVAL
Direct User Access Terminal (DUAT) Flight Plan

From: KBOS -- Boston MA (General Edward Lawrence Logan Intl
To: IAD -- Washington DC (Washington Dulles International
Alt.: FL240  Profile: LR-35
Time: Tue Sep 19 14:00 (UTC)

Routing options selected: Automatic low altitude airway.
Flight plan route:
   PVD V475 LGA V433 ARD V210 V3 MXE

<table>
<thead>
<tr>
<th>Ident</th>
<th>Type/Morse Code</th>
<th>Name or Fix/radial/dist</th>
<th>Latitude Longitude Alt.</th>
<th>Route Mag KTS Fuel</th>
<th>Dist</th>
</tr>
</thead>
<tbody>
<tr>
<td>KBOS</td>
<td>Apt.</td>
<td>Temp Hdg GS Dist</td>
<td>42:21:51 71:00:18 0</td>
<td>Direct</td>
<td>15.0</td>
</tr>
<tr>
<td>1.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PVD</td>
<td>.--. ...- -.</td>
<td>+7 C</td>
<td>223 229 43</td>
<td>15.0</td>
<td>15.0</td>
</tr>
<tr>
<td>2.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ORW</td>
<td>--- -.</td>
<td>-3 C</td>
<td>258 233 28</td>
<td>24.4</td>
<td>15.0</td>
</tr>
<tr>
<td>3.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
DUAT Flight Plan

(Preferred routes:
  1 (H) GLYDE BAF J077 SAX J006 LRP V143 MULRR AML
Effectives Time(s): 1100–0300

1 Type of flight plan: IFR
2 Aircraft tail number: N123LR
3 Acft type/special equip: LJ35/K
4 True airspeed: 130
5 Departure point: BOS
6 Departure time: (UTC) Tue Sep 19 14:00
7 Altitude: 240
8 Route of flight: PVD V475 LGA V433 ARD V210 V3 MXE
9 Destination: IAD
10 Estimated time enroute: 0123
11 Remarks:
12 Fuel on board: 0300
13 Alternate destination(s):
14 Pilot's name: ROBERT J HANSMAN
   Address: MIT CAMBRIDGE MA 02139
   Phone no.:
   Aircraft home base: BED
15 Number aboard: 3
16 Color of aircraft: W/R/GY
17 Dest contact name: Phone no.:

Flight plan accepted by DynCorp IS DUAT service and will be filed
Flight Progress Strip

- **Call Sign**: Northwest 196
- **Departure Point**: San Diego
- **Altitude**: 37,000 feet
- **Destination**: Minneapolis
Clearance: PDC or Cl Del, “Lear 123LR is cleared to IAD via Logan 5 Departure to PVD then as filed, climb and maintain 5000 expect FL 240 10 min after departure, squawk 3417. Contact Ground Control on 121.9 and advise ready to push”
US Air Route Traffic Control Center (ATRCC) Airspace - 20 Centers

ZSE, ZMP, ZLC, ZAU, ZBW, ZOB, ZDV, ZNY, ZOA, ZKC, ZID, ZDC, ZLA, ZME, ZAB, ZFW, ZTL, ZJX, ZHU, ZMA
Example Procedures

- **Altitude for Direction**
  - IFR, Even Thoustands Wesbbound, Odd Eastbound (0-179 Magnetic)
  - VFR +500
  - DRVSM above FL29

- **Radar Contact**

- **Transponders**
  - Codes
  - Mode C altitude verification

- **Hand Offs**
  - BOS, NY Transition LOAs

- **Lost Communication**

- **Holding Patterns**
Example Procedures

- **Weather and Flow Interruptions**
  - Traffic Flow Management
  - Collaborative Decision Making
  - Traffic Flow Management

- **Standard Flows**

- **Military and Restricted Airspace**
  - MOA, Restricted, Prohibited

- **Remote Sites**
  - Radar
  - Communication

- **Seperation Standards**
  - Enroute 5 Miles, 1000 ft
  - Terminal 3 miles, 1000 ft
  - Wake Vortex
San Francisco

- Special use airspace provides additional constraints

Special Use Airspace

Route Flown

Flight Plan

- June 11, 2001 4
SEPARATION ASSURANCE CONSIDERATIONS

- PERSONAL SAFETY BUFFER
- MINIMUM SEPARATION STANDARD
- PROCEDURAL SAFETY BUFFER
- SURVEILLANCE UNCERTAINTY
- HAZARD ZONE
<table>
<thead>
<tr>
<th>Flight Phase</th>
<th>Separation Minima</th>
<th>Selected Requirements</th>
<th>Reference</th>
<th>Controlling Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>OCEANIC</td>
<td>LATERAL: 60-120 NM</td>
<td>Depends on speed and route (North Atlantic and Caribbean)</td>
<td>¶8-7-4, ¶8-8-4</td>
<td>Navigation accuracy, no radar</td>
</tr>
<tr>
<td></td>
<td>or VERTICAL: 2000 ft</td>
<td>Above FL290 (non-RVSM)</td>
<td>¶8-7-2, ¶8-8-2</td>
<td>Altimetry accuracy</td>
</tr>
<tr>
<td></td>
<td>1000 ft</td>
<td>Above FL290 (RVSM) or at or below FL290</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>or LONGITUDINAL: 10-60 minutes at track entry</td>
<td>Depends on speed and distance flown</td>
<td>¶8-3-3.e.</td>
<td>Navigation accuracy, no radar</td>
</tr>
<tr>
<td>EN ROUTE within the U.S.</td>
<td>LATERAL: 5 NM</td>
<td>Below FL 600, if multiple radar sensors (mosaic mode) radar or either aircraft more than 40 NM from antenna, and 60 NM for Mode S surveillance³</td>
<td>¶5-5-4</td>
<td>Radar resolution and update rate</td>
</tr>
</tbody>
</table>
Separation Requirements for Arrival (Same Runway)

- **Wake Turbulence Requirement**
  - Radar Separation requirements

<table>
<thead>
<tr>
<th>Leading Aircraft</th>
<th>Trailing Aircraft</th>
<th>Heavy</th>
<th>Large</th>
<th>Small</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heavy</td>
<td>Heavy</td>
<td>4</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>B757</td>
<td>Heavy</td>
<td>4</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Large</td>
<td>Large</td>
<td>3(2.5)</td>
<td>3(2.5)</td>
<td>4</td>
</tr>
<tr>
<td>Small</td>
<td>Small</td>
<td>3(2.5)</td>
<td>3(2.5)</td>
<td>3(2.5)</td>
</tr>
</tbody>
</table>

- **Visual Separation requirements**
  - Pilots Discretion

- **Preceding arrival must be clear of runway at touchdown**
  - Runway Occupancy time