3. Heading, altitude, type of aircraft (make/model/call sign),

4. Type of avionics/receivers in use (e.g., make/model/software series or version),

5. Number of satellites being tracked, if applicable,

6. Description of the position/navigation/timing anomaly observed, and duration of the event,

7. Consequences/operational impact(s) of the NAVAID or GPS anomaly,

8. Actions taken to mitigate the anomaly and/or remedy provided by the ATC facility,

9. Post flight pilot/maintenance actions taken.

e. Pilots operating an aircraft in controlled airspace under IFR shall comply with CFR § 91.187 and promptly report as soon as practical to ATC any malfunctions of navigational equipment occurring in flight; pilots should submit initial reports:

1. Immediately, by radio to the controlling ATC facility or FSS.

2. By telephone to the nearest ATC facility controlling the airspace where the disruption was experienced.

3. Additionally, GPS problems should be reported, post flight, by Internet via the GPS Anomaly Reporting Form at http://www.faa.gov/air_traffic/nas/gps_reports/.

f. To minimize ATC workload, GPS anomalies associated with known testing NOTAMs should NOT be reported in−flight to ATC in detail; EXCEPT when:

1. GPS degradation is experienced outside the NOTAMed area,

2. Pilot observes any unexpected consequences (e.g., equipment failure, suspected spoofing, failure of unexpected aircraft systems, such as TAWS).

1−1−14. LORAN

NOTE−
In accordance with the 2010 DHS Appropriations Act, the U.S. Coast Guard (USCG) terminated the transmission of all U.S. LORAN−C signals on 08 Feb 2010. The USCG also terminated the transmission of the Russian American signals on 01 Aug 2010, and the Canadian LORAN−C signals on 03 Aug 2010. For more information, visit http://www.navcen.uscg.gov. Operators should also note that TSO−C60b, AIRBORNE AREA NAVIGATION EQUIPMENT USING LORAN−C INPUTS, has been canceled by the FAA.

1−1−15. Inertial Reference Unit (IRU), Inertial Navigation System (INS), and Attitude Heading Reference System (AHRS)

a. IRUs are self−contained systems comprised of gyros and accelerometers that provide aircraft attitude (pitch, roll, and heading), position, and velocity information in response to signals resulting from inertial effects on system components. Once aligned with a known position, IRUs continuously calculate position and velocity. IRU position accuracy decays with time. This degradation is known as “drift.”

b. INSs combine the components of an IRU with an internal navigation computer. By programming a series of waypoints, these systems will navigate along a predetermined track.

c. AHRSs are electronic devices that provide attitude information to aircraft systems such as weather radar and autopilot, but do not directly compute position information.

d. Aircraft equipped with slaved compass systems may be susceptible to heading errors caused by exposure to magnetic field disturbances (flux fields) found in materials that are commonly located on the surface or buried under taxiways and ramps. These materials generate a magnetic flux field that can be sensed by the aircraft’s compass system flux detector or “gate,” which can cause the aircraft’s system to align with the material’s magnetic field rather than the earth’s natural magnetic field. The system’s erroneous heading may not