Contract (ADS-C) in Europe and some oceanic regions) in two ways. First, ADS-B systems broadcast SV and other data to be received by any suitable receiver and ADS-A uses an air-ground point-to-point communications system. Second, the ADS-A update rate is controlled by either the pilot or the ground while the ADS-B update rate is generally not so controlled. ADS-A is presently used in lieu of verbal position updates in areas without radar coverage, and the ADS-A data is used exclusively by Air Traffic Controllers and Airlines Operations Centers on the ground.

ADS-B is considered to be a key enabling technology to enhance safety and efficiency in airspace operations. RTCA Special Committee SC-186 has documented a wide range of applications of ADS-B focused on those goals in RTCA/DO-242A. These include basic applications, such as the use of ADS-B to enhance the pilot's visual acquisition of other nearby aircraft, as well as more advanced applications, such as enabling enhanced closely-spaced parallel approach operations. Other applications involving airport surface operations, improved surveillance in non-radar airspace, and advanced conflict management are also described.

Some applications of ADS-B are focused on airport surface operations and suggest that it is appropriate for certain surface vehicles also to be equipped with ADS-B and to share their SV information with aircraft on the surface, or in-flight near the airport. Such vehicles might include, for example, snow removal equipment, crash/fire/rescue vehicles, or construction equipment near runways or taxiways. For simplicity in this document, the term "aircraft" will be used to refer, collectively, to aircraft and vehicles, as any necessary distinction can be readily established by context. Occasionally the term aircraft/vehicle (A/V) may also be used.

1.3 UAT System Overview

The UAT is a wideband multi-purpose data link intended to operate globally on a single channel with a channel signaling rate of just over 1Mbps. By design, UAT supports multiple broadcast services including FIS-B and TIS-B in addition to ADS-B. This is accomplished using a hybrid medium access approach that incorporates both time-slotted and random unslotted access. By virtue of its waveform, signaling rate, precise time reference, and message-starting discipline, UAT can also support independent measurement of range to most other participants in the medium.

There are two basic types of broadcast transmissions - or *messages* - on the UAT channel: the ADS-B Message, and the Ground Uplink Message. The ADS-B Message is broadcast by an aircraft to convey its SV and other information. The Ground Uplink Message is used by ground stations to uplink flight information such as text and graphical weather data, advisories, and other aeronautical information, to any aircraft that may be in the service volume of the ground station (see, for example RTCA/DO-267). The allocation of Ground Uplink capacity to particular types of broadcast information will be made by the appropriate regulatory authority. Regardless of type, each message has two fundamental components: the message *payload* that contains user information, and message *overhead*, principally consisting of forward error correction code parity, that supports the transfer of the data.

1.3.1 UAT Medium Access for ADS-B and Ground Uplink Segments

UAT Message transmissions are governed by a combination of time-slotted and random-access techniques. Figure 1-1 illustrates the basic UAT Message timing structure called a UAT *frame*. A frame is one second long and begins at the start of each UTC second.