Uplink Preamble Discussion

Initial draft KB5MU, KA9Q, W5NYV

The Phase 4 FDMA uplink channel is currently assumed to be 10MHz wide, consisting of one hundred 100kHz channels.

There are certain things we want the uplink signal to be or do. We want a constant envelope signal. We want reliable signal acquisition at the satellite. We want to reduce adjacent channel interference. We do not want to spend more power than necessary.

We believe that reliable signal acquisition at the satellite can be enabled with a preamble on uplink transmissions. The purpose of the preamble is for the satellite to identify a Phase 4 signal from the earth, obtain symbol timing, then obtain frame timing.

Since a user terminal can hear itself on the downlink, it will not have to resynchronize as long as its own signal is being received. If it loses its own signal, then the preamble is resent. For cases where there are uplink-only stations, such as emergency operations, automated operations, or equipment failure, another mechanism must be constructed that forces resynchronization.

Below are the major components of the preamble in time order.

A fixed-sized header is sent at the lowest modulation rate. This header describes the packet. The contents of the header are as follows.