Space Data®
Corporation

Space Data Corporation SkySite System Operators Instructions

Model SKS-900 SkySite
Model GST-900 Ground Station

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1.0 Introduction.

The Space Data Corporation SkySite network is designed to provide wireless paging service to remote areas that are not practically serviced by traditional terrestrial communication towers. This paging coverage is accomplished by mounting the functional equivalent of a communications tower on a high altitude weather balloon thereby overcoming service limitations.

The SkySite Network consists of 5 subsystems listed below.

1. SkySite Platform
2. Launch Facilities
3. Ground Station
4. Network Control Center.
5. SkySite Control Center

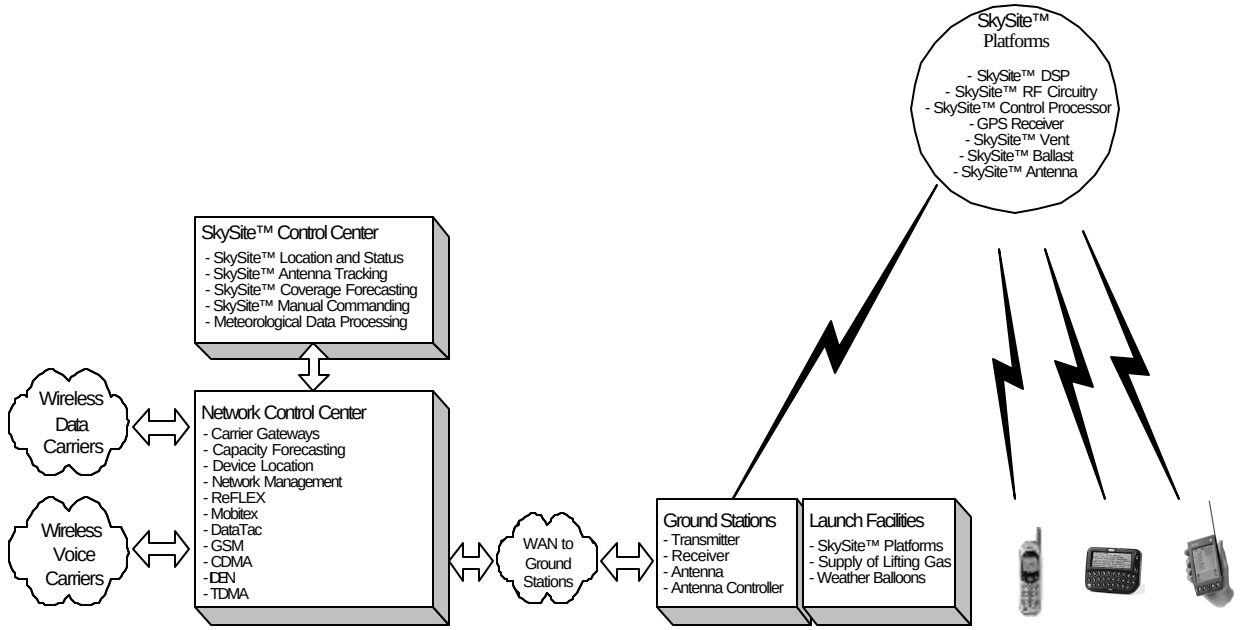

Figure 1.1: The SkySite Network

This document is a summary of the procedures used to deploy and operate the SkySite network. All equipment shown is manufactured, operated and serviced by Space Data Corporation and is therefore meant for internal use only.

2.0 Launch

Control Center operations are managed through the use of several Space Data Corp. proprietary software applications. These client applications run from EPS (Engineering Programming Software) server:

GST (Ground Station). The GST maintains the communication link from the ground to the SkySite. The GST also monitors and controls ground station functions such as antenna auto-tracking, Receive signal strength, TX and RX power levels and frequency correction.

SkySite client. Monitors SkySite performance such as TX and RX power levels, GPS position, battery current and voltage, and AH consumed. Vent ballast controls and accumulated values release command.

Mapping client. This application utilizes the GPS coordinates sent from the SkySite and superimposes it on mapping software. Terrain and population density are easily determined from this screen and is used to plan recovery of the payload.

2.1 Pre-flight client preparation

Start all GST (Ground Station Transceiver) and SKS (SkySite) clients. Both software applications should connect to the EPS (Engineering Programming Software) server.

Determine the type of antenna used by the Ground station in operation. There are only two types of antennas used:

1. Omi-directional antenna (Max. Gain of 3dBi)
2. Yagi antenna (Max. Gain of 10dBi)

Caution:

In order to comply with FCC Part 24 and RF (Radio Frequency) exposure limits of this product the maximum GST ERP (Effective Radiated Power) must not exceed 7 Watts (38.45dBm).

Transmit power levels are shown in the bottom left corner of the GST client in the "TX GLP HPA STATUS" box. This value does not include the directional gain of the antenna. Therefore the maximum permissible power levels into the antenna as are as follows:

1. **Using the Omni-directional antenna the maximum power is 35dBm.**
2. **Using the high gain Yagi antenna the maximum power is 28dBm.**

- Start all GST and SKS clients.
  Ensure that GST clients connect to EPS server.
  On GST Client open the GLP RSSI and GPS screens

- On the SKS Client open the following screens:
  GPS.
  GLP RSSI.
  Altitude vs. heading graphs.
  Altitude vs. Horizontal speed.
  Vertical speed graph.

- Check Antenna Control:
  Disable tracking
  Ensure client is in "remote tracking" mode.
  For each GST client slew antenna in azimuth and elevation.
  Point antenna toward launch site at 0 degrees elevation.

- Start GPS client on mapping PC and ensure it connects to EPS server. The GPS client started must correspond to the GST that will be used to control the payload.

- Start predictor software on mapping PC
- Start Delorme payload and predictor programs on mapping PC.

2.2 Launch procedure:

- Switch GST client to launch frequency
- Watch RSSI level. When Rx Sync has indicator turn green call launch team and give them the OK to release the SkySite.
- When SkySite is picked up by the GST and signal is stable call launch team and have them go to listen mode.
- When you see the RSSI signal level drop on the SkySite enter command mode on GST.
- Confirm auto hover is engaged and set for the correct altitude
- Switch SkySite to operational frequency at high power:
- On configuration screen select an operational frequency, select "non-volatile" and click set.
- On the GST client go to the configuration screen and switch it's frequency to the one that the SkySite is using and re-acquire the SkySite.
- On the SkySite client go to the "configuration" screen and select an output power of 33 dB. Select "non-volatile" and click set.
- Reduce the power of the SkySite to the minimum power required. Ensure that it is a "volatile" change.
- Confirm that ReFLEX is enabled.

3.0 Flight termination

- When the useful life of the SkySite, turn command over to the recovery team and let them know the SkySite will be switching over to a recovery frequency.
- Switch SkySite to a recovery frequency.
- Change the SkySite frequency to a recovery frequency through the "configuration screen click non-volatile and click.
- Change the GST client to the recovery frequency and re-acquire the skysite.
- Set the skysite power level to 33 dBm (max. power) ensures that this is a non-volatile change. This will give the recovery team the best opportunity to acquire the SkySite.
- Switch GST into listen mode. Monitor the SkySite GLP RSSI to ensure that that recovery team successfully takes control.