DATA COLLECTION WITH THE
ACTS PROPAGATION TERMINAL

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ACTS MINI-WORKSHOP
PASADENA, CA

June 14, 1993
Figure 13.2-1. Block diagram of DACS hardware.

Chapter 13
**APT Data Collection Computer**

- **UPS**
  - Tripp Lite 1350 Watt Battery Backup

- **Power**
  - Lpt1
  - 2 Mb RAM

- **Com1**
  - VGA Display Card
  - WWV Card
  - Bus Mouse Card

- **Modem**
  - 2400 Baud Modem (COM2)

- **Bus Mouse Card**

- **HD/FD Controller Card**

- **80 Mb Hard Drive**

- **Colorado 120**
  - 120 Mb Cartridge Tape Unit

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**Figure 13.2-2.** Configuration of the data collection computer hardware.
APT Software Downloading

Digital Receiver and DACS executable code can be (re)loaded from the collection computer hard disk either under operator command or automatically at power up/reset.

Figure 13.4-1. Block diagram of the downloading process.
<table>
<thead>
<tr>
<th>Configuration of Terminal Strip for The Receiver Enclosure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tipping bucket rain gauge sensor</td>
</tr>
<tr>
<td>Outside air temperature sensor</td>
</tr>
<tr>
<td>Wind direction sensor</td>
</tr>
<tr>
<td>Wind speed sensor</td>
</tr>
<tr>
<td>Barometric pressure sensor</td>
</tr>
<tr>
<td>Relative humidity sensor</td>
</tr>
<tr>
<td>Capacitive rain gauge sensor</td>
</tr>
<tr>
<td>Optical rain gauge sensor</td>
</tr>
<tr>
<td>Test align output</td>
</tr>
<tr>
<td>Wind direction, +15 V</td>
</tr>
<tr>
<td>Barometric pressure, +15 V</td>
</tr>
<tr>
<td>Relative humidity, +15 V</td>
</tr>
<tr>
<td>Capacitive rain gauge, +15 V</td>
</tr>
<tr>
<td>Optical rain gauge, +15 V</td>
</tr>
</tbody>
</table>
DATA STORAGE FOR APT

- 27 GHz Beacon (1 Hz, 16 Bits)
- 20 GHz Beacon (1 Hz, 16 Bits)
- 27 GHz Radiometer (1 Hz, 16 Bits)
- 20 GHz Radiometer (1 Hz, 16 Bits)
- Environmental
- Status

Control Functions

PC
HD
44 Mb/Month

PC
Preprocessing
and
Analysis

Data file (one second data rate):

<table>
<thead>
<tr>
<th>Field</th>
<th>(# of Bytes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time (4)</td>
<td>20 GHz Beacon (2)</td>
</tr>
</tbody>
</table>

Beacon data are signal power in 0.01 dB;
Radiometer data are voltage in 0.001 V.

Storage Requirements:

\[
\left( \frac{16 \text{ Bytes}}{\text{Sec}} \right) \left( \frac{60 \text{ Sec}}{\text{Min}} \right) \left( \frac{60 \text{ Min}}{\text{Hr}} \right) \left( \frac{24 \text{ Hours}}{\text{Day}} \right) = 1.32 \text{ Mb/Day}
\]

Figure 13.8-1. Data storage format.
Raw data  
60 Mb Cassette  
(1 month data)  

Preprocessing  
Conversion of signals to attenuation  
Conversion of radiometer output to sky temperature  
Conversion of radiometer sky temperature to attenuation (ARD)  
Removal of spacecraft diurnal fluctuations from beacon data  

Preprocessed data with separate diurnal removal file  
60 Mb cassette  

Input to analysis  

To Data Center  
Backup tape to Data Center