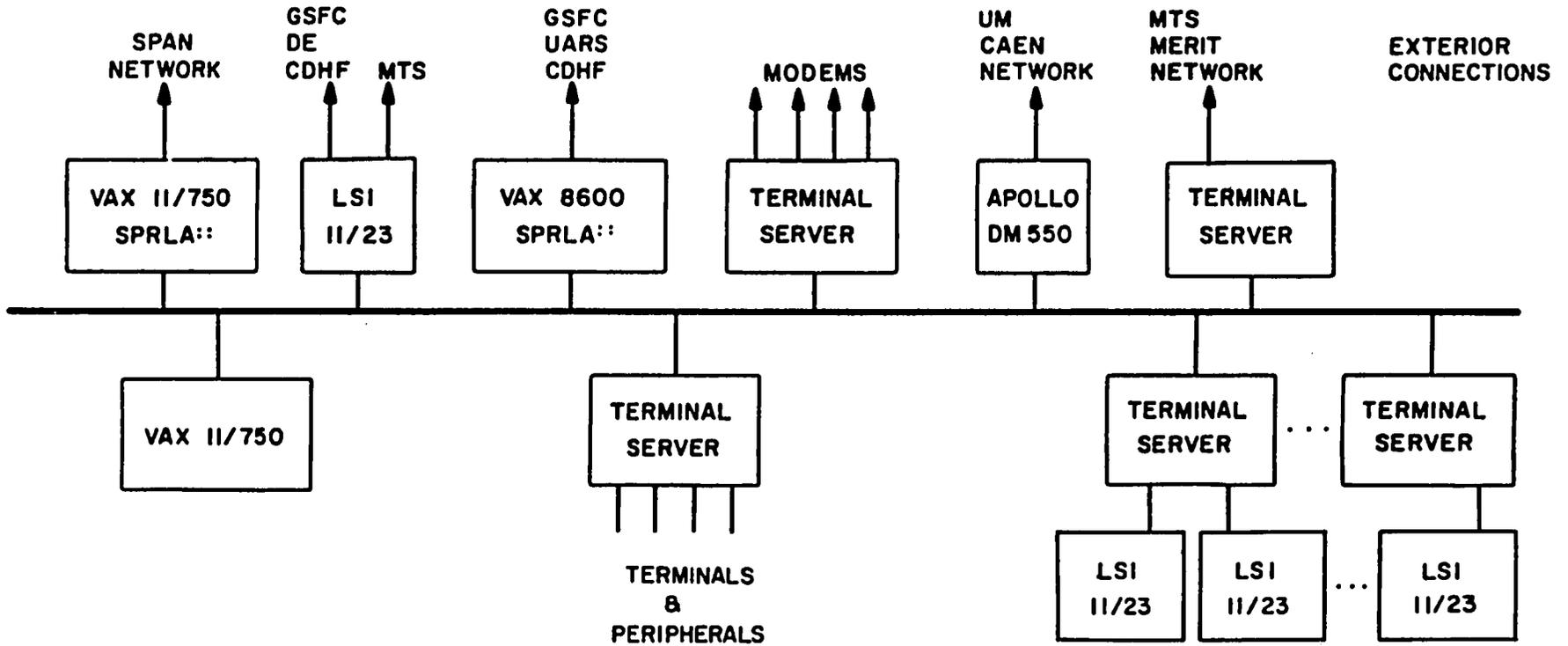# PCDS AS A TOOL IN TEACHING AND RESEARCH
AT THE UNIVERSITY OF MICHIGAN

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The Space Physics Research Laboratory (SPRL) has a long history of involvement in the development of satellite instrumentation and data analysis. A few years ago, it became evident to the members of the SPRL that success as a research and teaching institution was very much linked to their capability to effectively use data bases available in the community. For this purpose, a computer center was established to provide the hardware and software necessary to fully utilize existing data bases for research and teaching purposes. A schematic of the SPRL network is shown in Figure 1. The core of the system consists of two VAX 11/750s and a VAX 8600, networked through ETHERNET to several LSI 11/23 microprocessors. As indicated in the schematic, much of the system is used for external communications with major networks and data centers. A VAX 11/750 provides DECNET services through the SPAN network to the PCDS. Figure 2 is a functional diagram of PCDS usage. As indicated in the figure, the browsing capabilities of the PCDS are used to generate data files, which are later transferred to the SPRL center for further data manipulation and display. This mode of operation for classroom instruction will be used to effectively use terminals and to simplify usage of the data base. The Atmosphere Explorer data base has been used successfully in a similar manner in courses related to the thermosphere and ionosphere.

The main motivation to access the PCDS was to complement research efforts related to the High Resolution Doppler Imager (HRDI), to be flown on the Upper Atmosphere Research Satellite (UARS). The HRDI will measure wind velocities in the stratosphere and mesosphere during the day and the mesosphere and thermosphere at night, with an accuracy of 5 m/sec. HRDI will determine winds by measuring Doppler shifts of atmospheric absorption and emission features. The PCDS has been used to provide input parameters to a forward model that simulates the measurement. Parameters of interest are temperature, ozone density, aerosol optical thickness, and water vapor content.
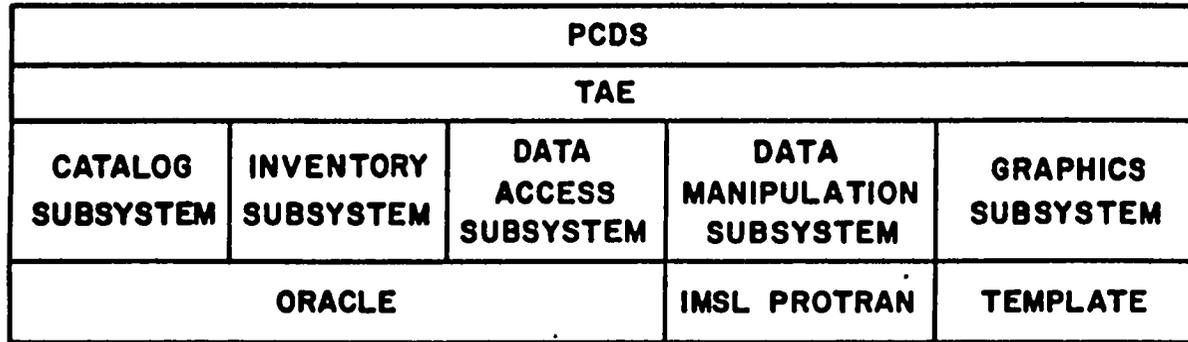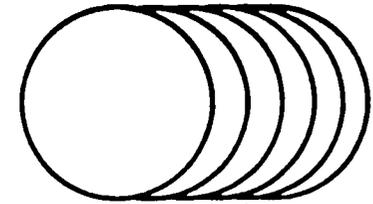
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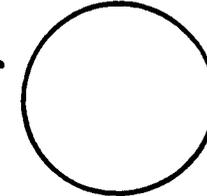
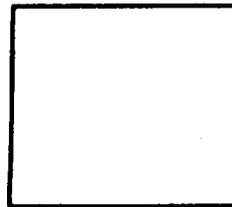SPRL NETWORK
SCHEMATIC

Figure 1.

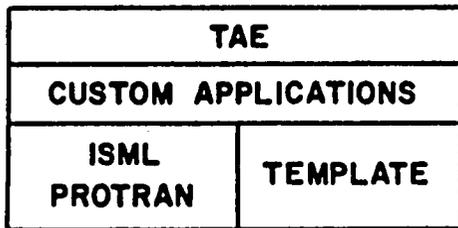**ARCHIVE DATA**

NSDDC

PCDS				
TAE				
CATALOG SUBSYSTEM	INVENTORY SUBSYSTEM	DATA ACCESS SUBSYSTEM	DATA MANIPULATION SUBSYSTEM	GRAPHICS SUBSYSTEM
ORACLE			IMSL PROTRAN	TEMPLATE

CLIMATE DATA FILE

SPRL

TAE	
CUSTOM APPLICATIONS	
ISML PROTRAN	TEMPLATE

GRAPHICS
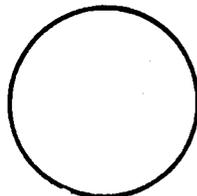
TRANSFORMED DATA

PCDS FUNCTIONAL DIAGRAM

Figure 2.