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SERI ON-LINE MODELS

NANCY BIRKENHEUER

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Solar Energy Research Institute

1536 Cole Boulevard
Golden, Colorado 80401

A Division of Midwest Research Institute

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DISCLAIMER

NOTICE

SERI ON-LINE MODELS LIBRARY

Nancy Birkenheuer

Abstract

The Solar Energy Research Institute (SERI) Computer Center, operated by the Computer Systems Branch of the Information Systems Division, currently provides large-scale computational capability utilizing a CDC Cyber 70/Model 76, a Cyber 170/Model 720, and two CDC-2551 Communication Processors. This center is available to outside users via a value-added network. To provide additional support to the user community, a system for on-line access to computer models relating to solar applications is being developed. This project is designed to enhance and compliment the capabilities of the Solar Energy Information Data Bank (SEIDB) at SERI. The target user community for the On-Line Models Library includes Regional Solar Energy Centers (RSEC's), affiliated institutions, DOE offices and laboratories, subcontractors, universities, and internal SERI users. Models selected for the library must be complete, operational and well documented. A broad range of applications will be available, including materials research, systems analysis, passive systems, market analysis, sizing, costing, and graphics. After a formal request is approved, the user will receive access to the system through an interactive executor program. This program allows model selection and execution, and processes accounting information. The capability to produce listings and, eventually, graphics at the central site to be mailed to remote users will also be provided.

Introduction

On-line access to analytical models and related calculation tools for use by the nation's solar energy community is being provided through the scientific computational facility at the Solar Energy Research Institute (SERI). The user community is expected to include Solar Energy Information Data Bank (SEIDB) Network participants: the DOE Regional Solar Energy Centers and the National Solar Heating and Cooling Information Center, DOE solar offices, laboratories and contractors, SERI and its subcontractors, and colleges and universities engaged in related energy research.

All models offered through the On-Line Models Project are catalogued and maintained with extensive documentation on content and procedures for execution. Models currently ready, under development, or planned for conversion encompass the solar technologies of passive systems, photovoltaics, wind, solar thermal, biomass, and ocean thermal. A broad range of applications will be available, including materials research, systems design and analysis, sizing, costing, market analysis, and graphics.

The intent of the On-Line Models Project is to augment the capabilities of the SEIDB models data base which contain the descriptions and characteristics of each model. The project will also enhance the Systems Analysis Test and Validation Program Code Center (SATVA) at SERI. Models that meet the necessary criteria will be chosen from the Code Center to reside in the SEIDB Models Library.

Candidate Models

Over three hundred models which have been developed at laboratories and universities around the country, including SERI, are being evaluated for inclusion in the library. Many SERI branches, including the Computer Systems Branch, the Systems Analysis Branch, and the Solar Thermal Conversion Branch are actively acquiring and testing selected models. Members of the Computer Systems Branch are converting and enhancing the capabilities of the more promising models. A partial list of the candidate models being evaluated for inclusion in the on-line models collection is presented below:

Available in Library:

F-CHART	Solar Heating Systems Design
RSVP	Residential Solar Viability Program
SOLCOST	Residential and Commercial Solar Costing & Design

Under Development:

SIM	Simulation of Solar Irradiance Components
SOLTRAN	Solar Beam Intensity Spectrum at Earth's Surface

Other Possibilities:

BLAST	Building Thermal Loads Model
DEROB	Simulation of Passive Solar Systems Design
DOE-2	Building Thermal Loads Model
EASE-2	Economic Analysis of Solar Energy
ECONMAT	Solar System Costing Model
MITAS	General Thermal Analysis
PASOLE	Simulation of Passive Solar Systems Design
PROSYS	Process Heat System Performance Model
SIMWEST	Simulation of Wind Energy Storage Systems
SOLCEL	Simulation of Photovoltaic System Performance
SPURR	National Market Penetration Model
TRNSYS	Simulation of Transient Thermal Performance

A partial list of software to be available in conjunction with the library:

DISSPLA	Graphics Software
SPSS	Statistics Software
TSP	Time Series Software
IMSL	Math Library

Utility programs for data conversion, insolation and angle calculations, return on investment computations, and financial charting will also be available.

Computer Systems and Communications

Access to the On-Line Models Library is being provided through the SERI Computer System. The major components of this system, manufactured by Control Data Corporation, include a Cyber 70/Model 76, a Cyber 170/Model 720, a Gandalf Communication Processor, and two CDC 2551 Communication Processors (Fig.1). The system will be accessible nationwide through the data communications value-added network Tymnet.

Terminals will be connected to the communications processors via concentration devices that will account for line contention and routing, either to the scientific processor or to the remote host for data base processing. Through the use of Tymnet, most users will need only make a local call to access the SERI Computer System. Some users will also have Remote Job Entry access to the system (Fig. 2).

System Access Procedures

After a user's request for access to the Models Library has been approved by SERI, the user will be assigned a unique identification number. When the user logs on and runs the executor program for the library, several procedures will execute automatically. An accounting and a record-keeping program will ask for model selection or return a menu of models or detailed descriptions of the models. Once the model has been selected, another program will then prepare the control language for the model, run the model, and return control to the executor program. Optional data files for modeling applications, such as Typical Meteorological Year (TMY) tapes and SOLMET tapes, eventually will be provided in addition to the existing default data files for each model.

A message and suggestion file is to be provided for user comments. At the conclusion of each session, costs will be tallied and printed. The printed listings as well as the graphics outputs will be mailed to the remote user.

Resource ceilings are maintained for each user identification number to prevent unauthorized or unlimited usage. Resources per session are also limited, unless appropriate authorization is provided. Library copies of the models will be stored with read-only access.

Documentation and Standards

Each model is tested for completeness and operability before being accepted for inclusion in the Models Library. A comprehensive user's manual is also required. All SERI-introduced modifications will be tested and verified against original results. To the extent that it is practical, the program code for all models is self-documenting and has incorporated interactive data input.

Cost

SERI is currently working with DOE to determine a costing policy and rate schedule for users of the Models Library. This information will be announced as soon as it becomes available.

SEIDB Liaison Contacts

Pertinent SEIDB contacts at SERI are listed below. Interested users should feel free to contact these individuals as the need arises. Any contact for general coordination purposes should be through SERI's Network Coordinator, Rafael Ubico, who has overall responsibility for maintaining effective working relationships within the network.

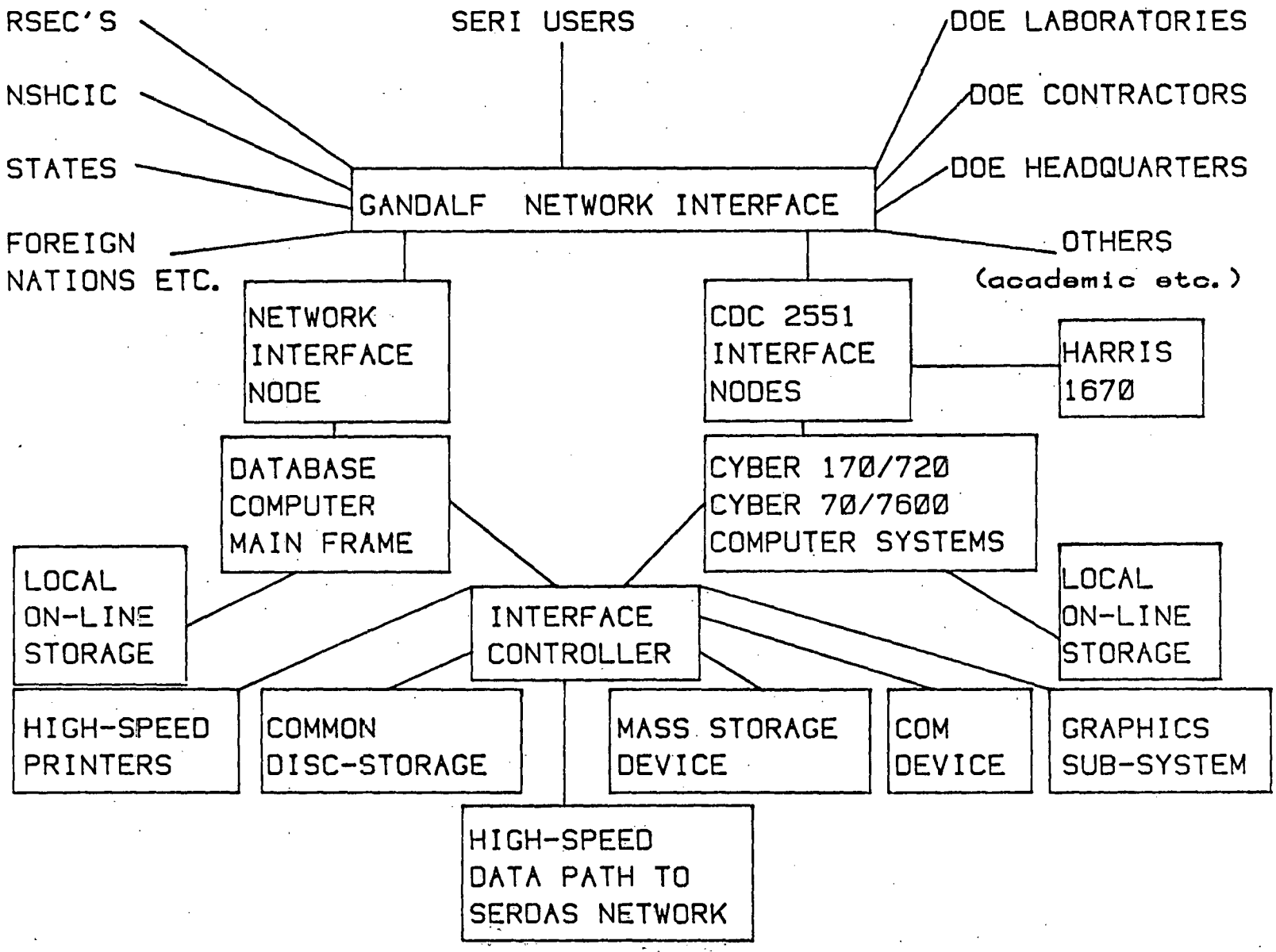
Function	Name	Telephone Ext.
Network Coordinator, SEIDB	Rafael Ubico	(303) 231-1032 or FTS 327-1032
Models Library	Nancy Birkenheuer	(303) 231-1464 or FTS 327-1464
Models Data Base	Kate Kramer	(303) 231-1227 or FTS 327-1227
Document Dissemination	Steve Rubin	(303) 231-1207 or FTS 327-1207
Applications Programming & Technical Support	David Ashton	(303) 231-1251 or FTS 327-1251
Systems Programming & Network Communications	Leroy Lacy	(303) 231-1252 or FTS 327-1252

Schedule

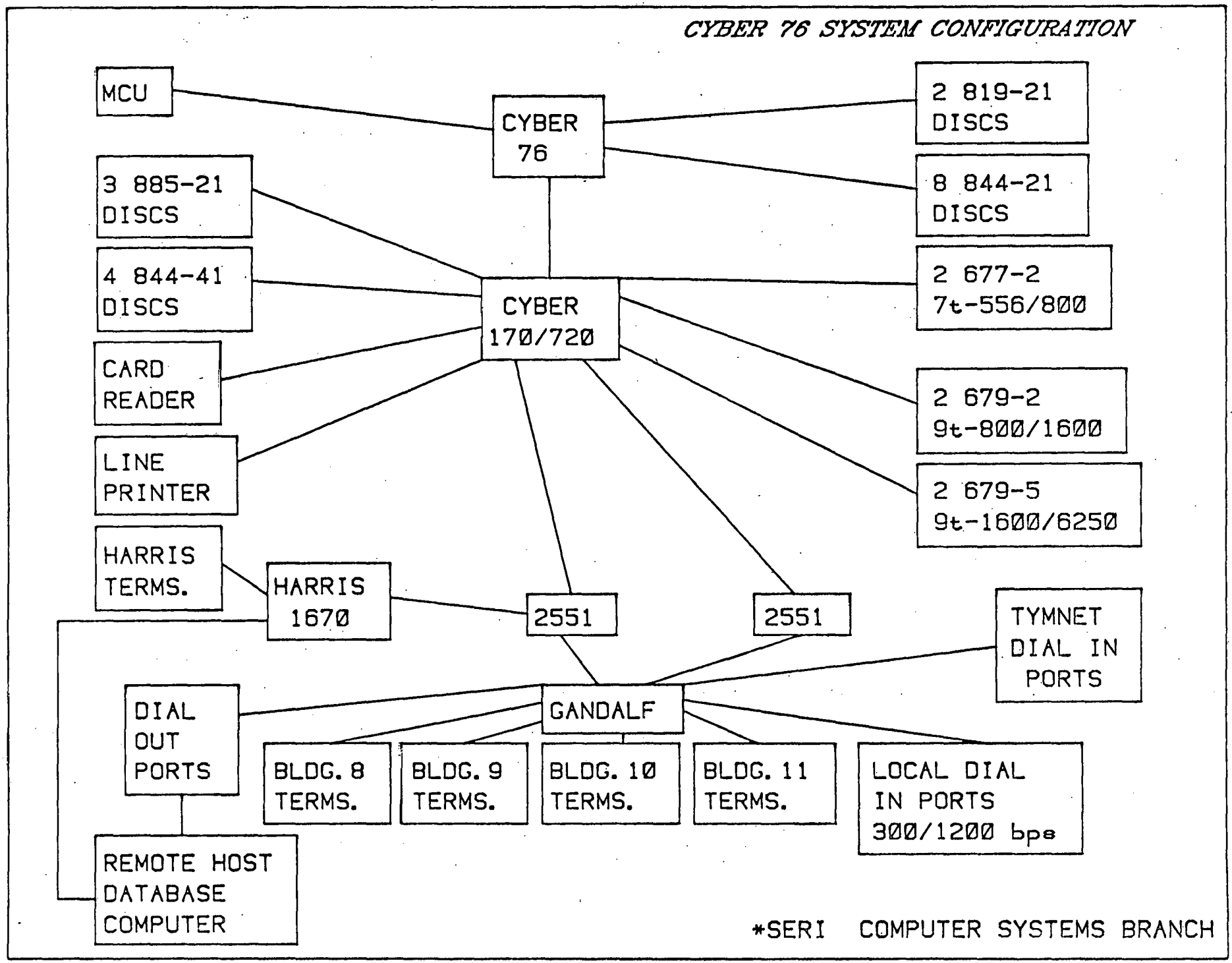
Costing Policy Announcement	May 1980
Availability of Library Message File	Feb. 1, 1980
	Feb. 15, 1980
Additional Model Added to Library	As they become available

SERI'S Permanent Computer Center

(Schematic Conceptualization)



*SERI COMPUTER SYSTEMS BRANCH


CYBER 76 SYSTEM CONFIGURATION
MCU
CYBER 76
2 819-21 DISCS
8 844-21 DISCS
3 885-21 DISCS
4 844-41 DISCS
CYBER 170/720
2 677-2 7t-556/800
CARD READER
LINE PRINTER
2 679-2 9t-800/1600
2 679-5 9t-1600/6250
HARRIS TERMS.
HARRIS 1670
2551
2551
TYMNET DIAL IN PORTS
DIAL OUT PORTS
GANDALF
BLDG. 8 TERMS.
BLDG. 9 TERMS.
BLDG. 10 TERMS.
BLDG. 11 TERMS.
LOCAL DIAL IN PORTS 300/1200 bps
REMOTE HOST DATABASE COMPUTER
*SERI COMPUTER SYSTEMS BRANCH