

NETWORK ACCESS TO PCDS (SPAN, ESN, SESNET, ARPANET)

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One of the major goals of the National Space Science Data Center is to increase access to NASA data systems by enhancing networking activities. The activities are centered around three basic networking systems: the Space Physics Analysis Network (SPAN); the Earth Science Network (ESN); and the NASA Packet Switched System (NPSS). In this presentation, each system was described, linkages among systems were explained, and future plans were announced. The inclusion of several new climate nodes on SPAN or ESN was also mentioned. Presently, the Pilot Climate Data System is accessible through SPAN and will be accessible through NPSS by summer and ESN by the end of 1986.

Ambitious plans for implementation are underway. The implementation of these plans will represent a major advance in the utilization and accessibility of data worldwide. The interdisciplinary opportunities afforded for correlative studies will further expand the nature and scope of future research using NASA data.

Copies of the SPAN technical memorandum, TM-86499, and of the "First Earth Science Pilot Coordination Meeting" minutes are available on request from NSSDC.

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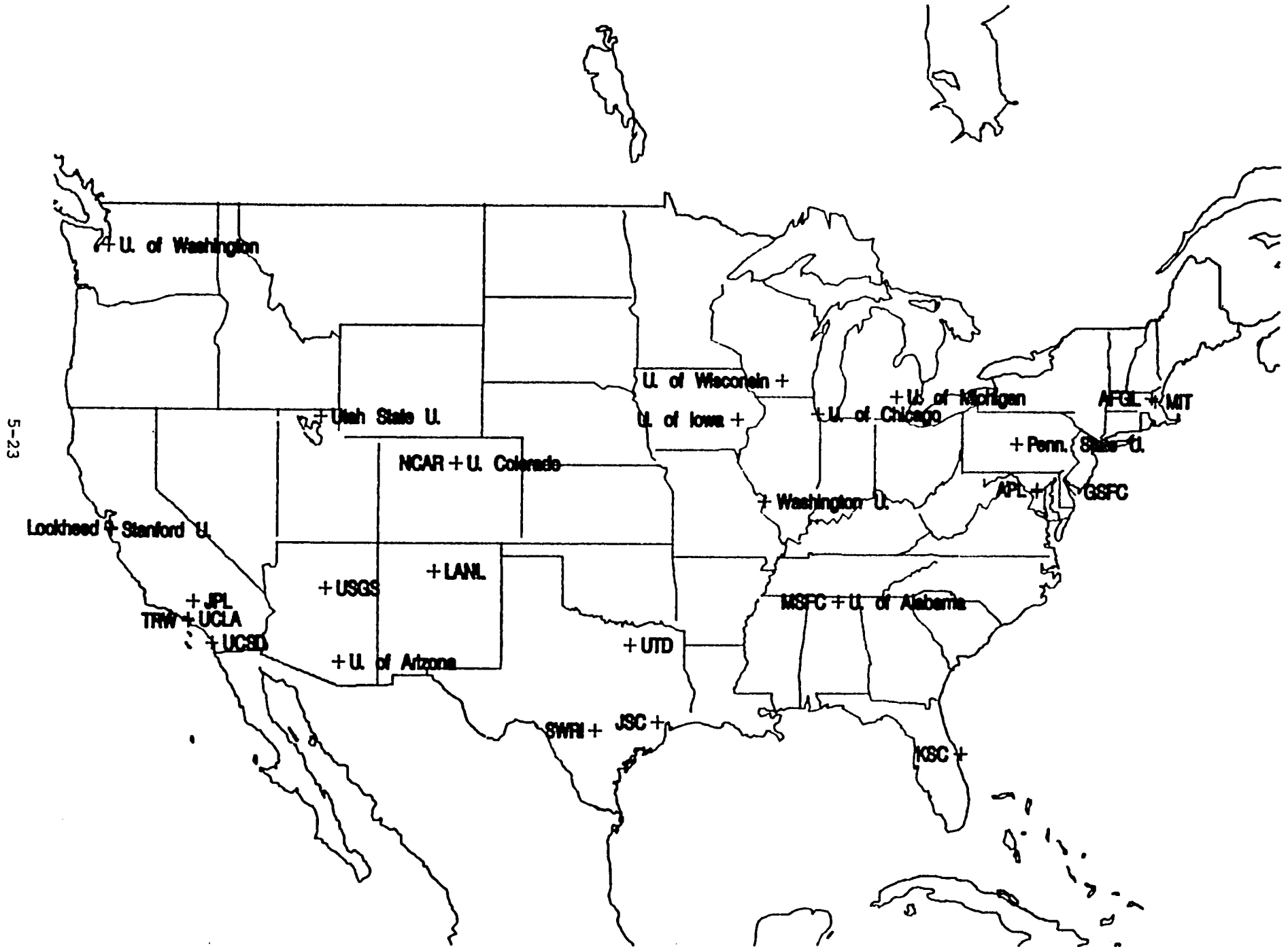
NSSDC NETWORK INVOLVEMENT

- o SPACE PHYSICS ANALYSIS NETWORK (SPAN)
 - OPERATIONAL (120 COMPUTER NODES)
 - MAJOR REDESIGN UNDERWAY
 - COMBINES SPACE PHYSICS, ATMOSPHERIC, PLANETARY, AND OCEANS (FUTURE) NODES
 - GSFC, PENN STATE, U OF MICHIGAN, MIT & NCAR
- o EARTH SCIENCE NETWORK (ESN)
 - MAJOR DEVELOPMENT UNDERWAY
 - EXPECT PARTIAL OPERATIONS BY SEPTEMBER
 - FULL OPERATION BY DECEMBER 86
- o NASA PACKET SWITCHED SYSTEM (NPSS)
 - EXCELLENT TELENET CONNECTION
 - HAS SPAN GATEWAY AT MSFC
 - EXPECT NSSDC GATEWAY BY JULY
 - PRIMARY TERMINAL TRAFFIC
 - NPSS PART OF NASA'S PROGRAM SUPPORT COMMUNICATION (PSC) HIGHWAY
- o NEED TO IDENTIFY MAJOR CLIMATE NETWORK NODES FOR SPAN OR ESN

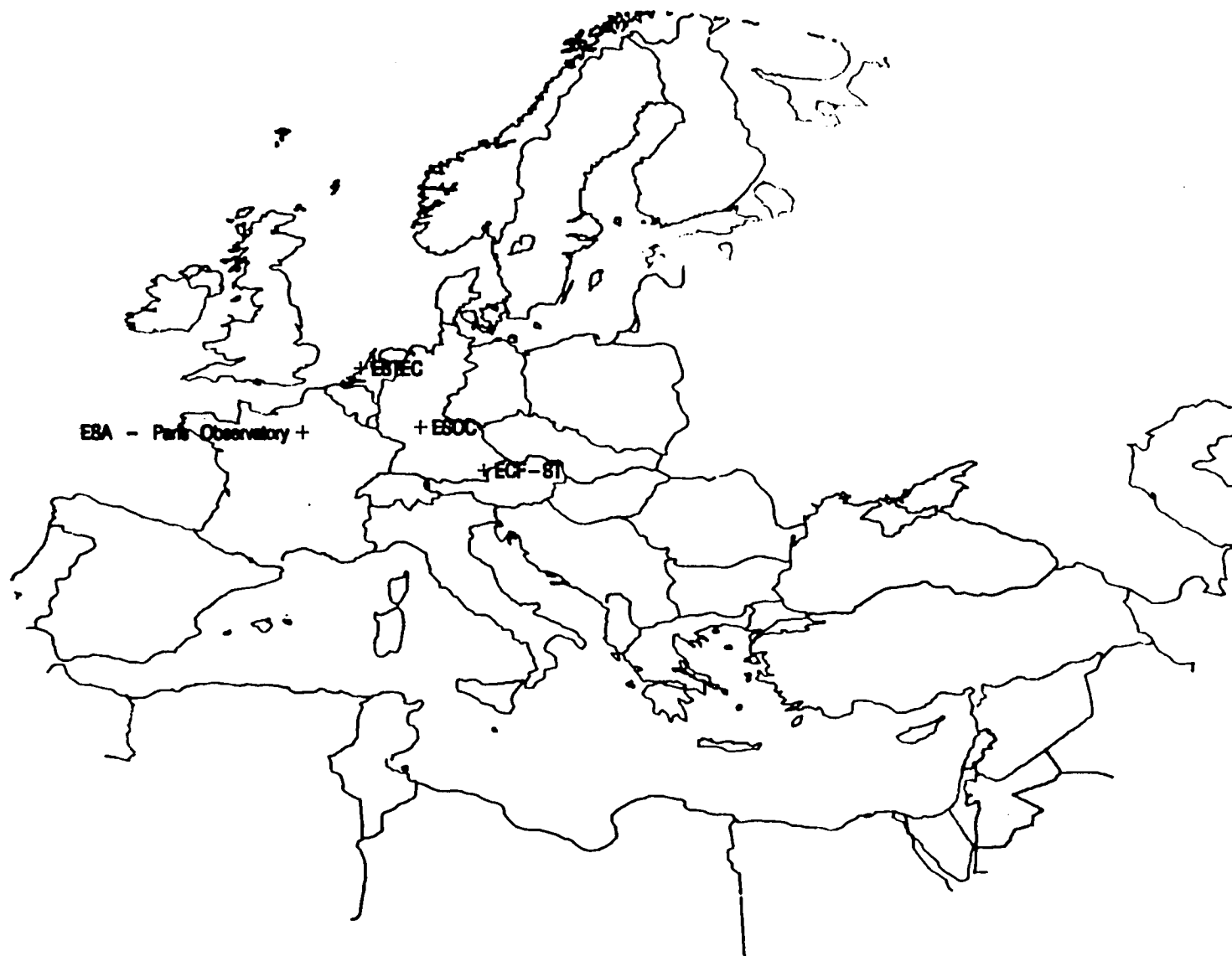
WHAT IS THE SPACE PHYSICS ANALYSIS NETWORK (SPAN)

- o SPAN DESIGN STARTED IN 1980; SPAN OPERATION STARTED IN 1981
- o SPAN IS A MULTI-MISSION, CORRELATIVE DATA COMPARISON NETWORK
- o SPAN IS "RUN" BY THE USERS (DATA SYSTEMS USERS WORKING GROUP)
- o SPAN IS A COMPUTER-TO-COMPUTER COMMUNICATION SYSTEM (DECNET)
- o SPAN UTILIZES MUCH OF THE ALREADY PAID FOR NASA EQUIPMENT
- o NSSDC HAS BEEN A SPAN NODE SINCE OCTOBER 1984

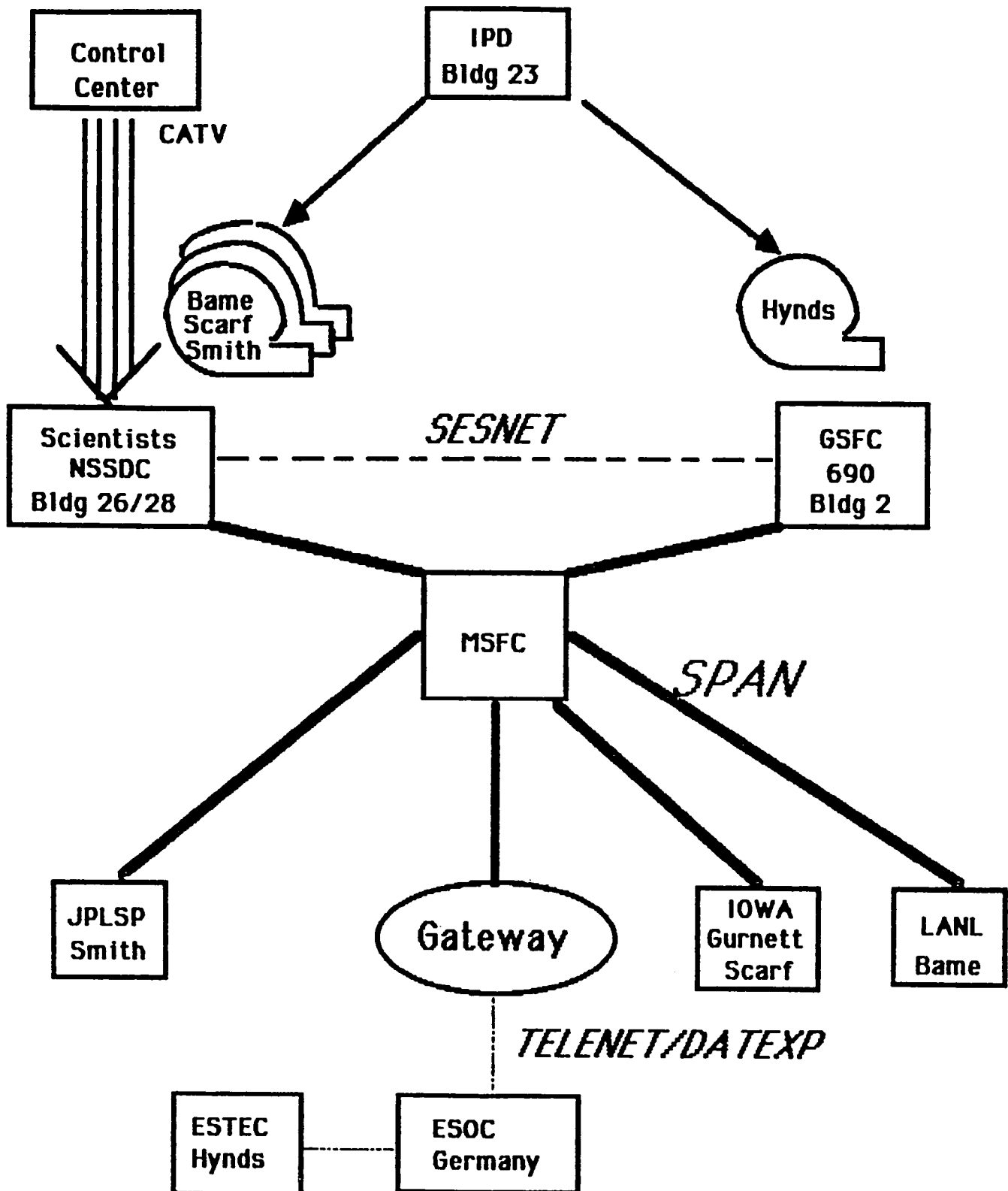
SPAN Nodes as of January 1986



European Nodes Connected to SPAN



ICE Communication Support



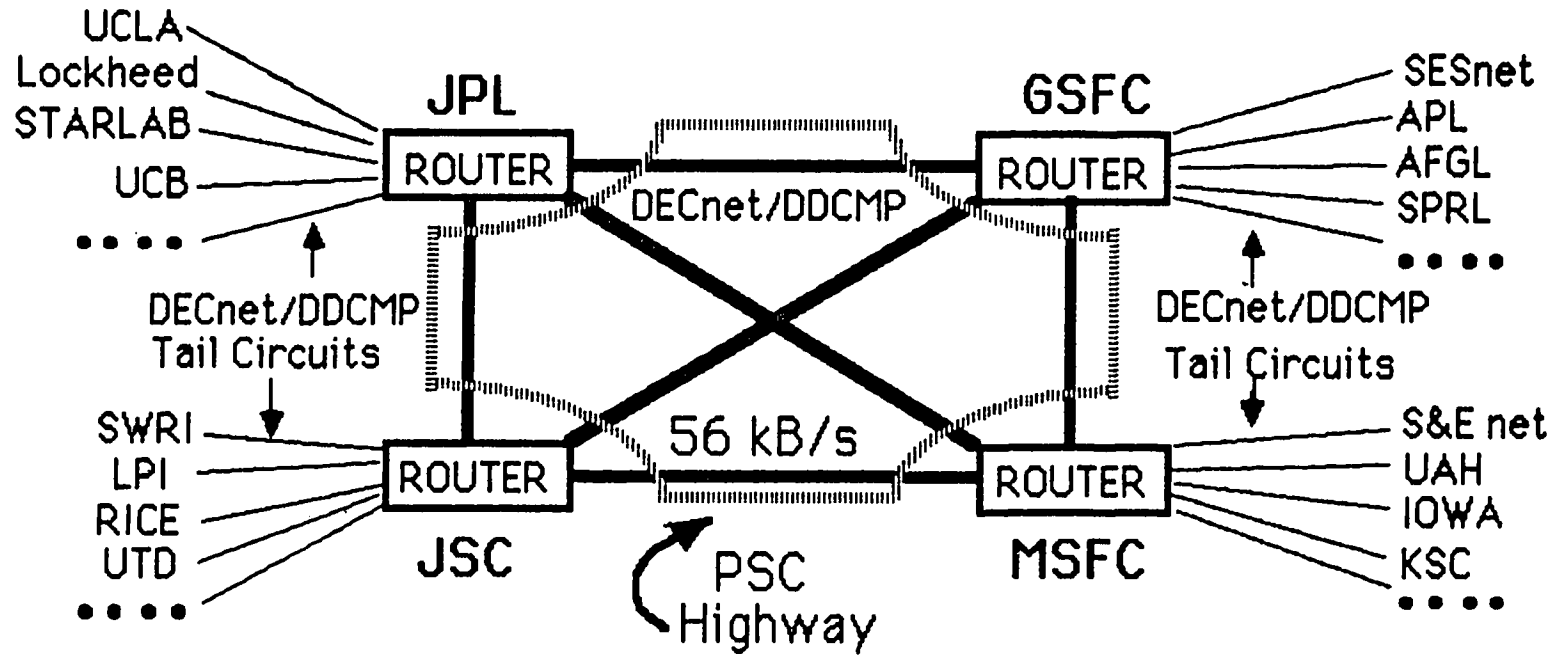
NSSDC

SEPT 12/85

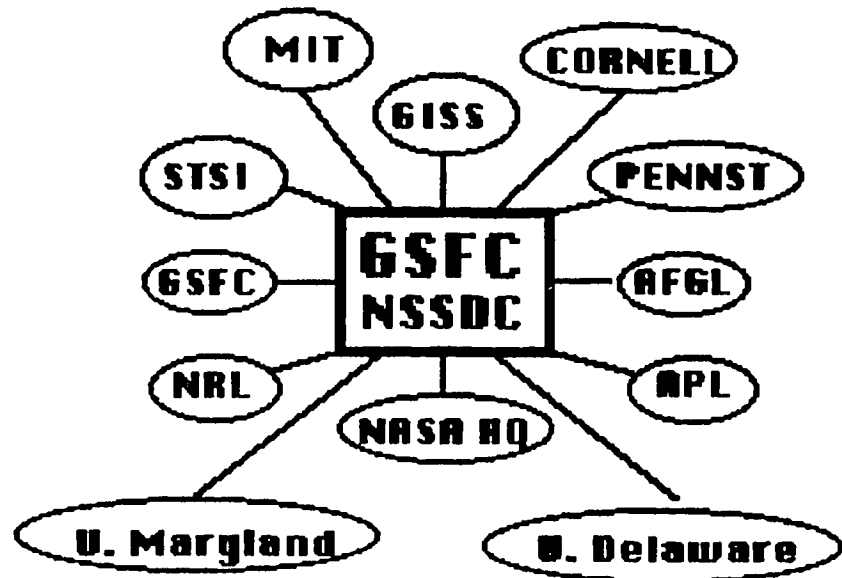
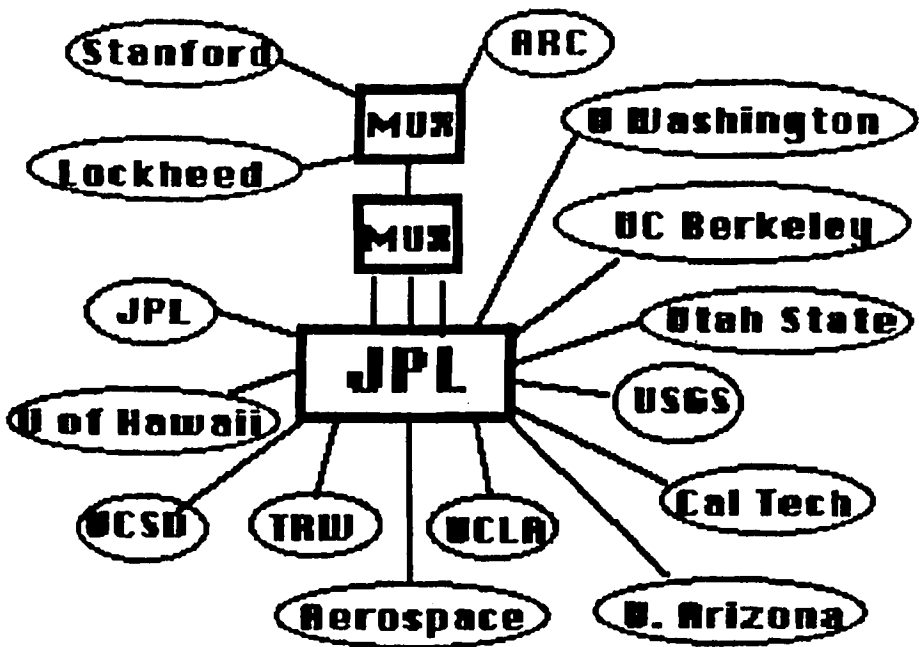
FUTURE GOALS OF NSSDC/SPAN

- "OPEN UP" NSSDC RESOURCES TO ELECTRONIC ACCESS
 - PCDS, PLDS
- DATA CATALOGS AND DIRECTORIES ONLINE
 - "ROAD MAP" FOR SPACE AND EARTH SCIENCE DATA
- SERVICE REQUEST
 - NSSDC::REQUEST
 - NETWORK DESIRED DATA (SMALL AMOUNTS, DOCUMENTATION, PLOT FILES, ETC.)
- NSSDC FACILITIES TO COME ON SPAN
 - ASTRONOMICAL DATA CENTER
 - CDAWS AND SSC
- PSC WILL PROVIDE THE LINES (MARCH/APRIL 86)
 - REDESIGN SPAN WITH HIGHER (DYNAMIC) BANDWIDTHS
- MAJOR LINES TO EUROPE AND JAPAN
- DEVELOP GATEWAYS TO OTHER NETWORKS (NPSS, ESN, SESNET, ETC.)

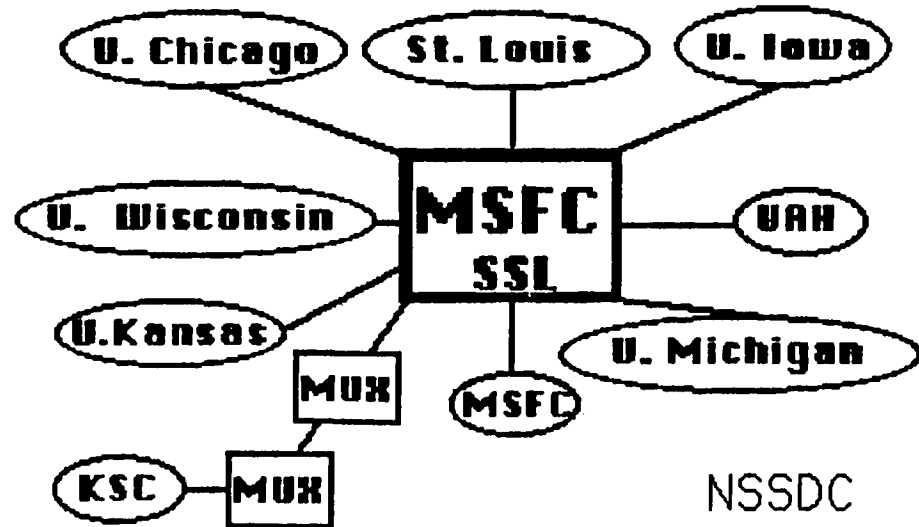
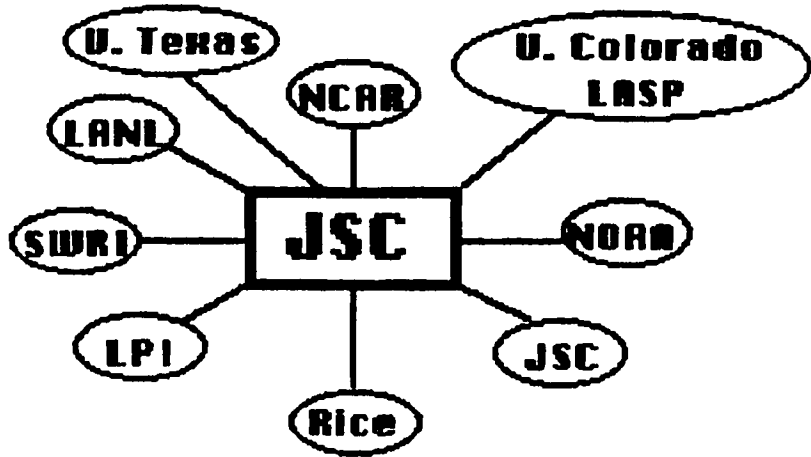
SPAN Use Of PSC



5-27



SPAN CONFIGURATION



NSSDC
Nov 15/85-3

RECENT REFERENCES ABOUT SPAN

D.N. BAKER, R.D. ZWICKL, AND J.L. GREEN, THE NASA DATA SYSTEMS USERS WORKING GROUP: RECOMMENDATIONS FOR IMPROVED SCIENTIFIC INTERACTIONS EOS (MEETING REPORT) 65, 46, 1984.

SPAN PILOT PROJECT REPORT, EOS (MEETING REPORT), 65, 111, 1984.

J.L. GREEN, SPACELAB DATA ANALYSIS USING THE SPAN SYSTEM, IN THE NATIONAL SYMPOSIUM AND WORKSHOP ON OPTICAL PLATFORMS, PROC., SPIE 493 (C. WYMAN EDITOR), 370, 1984.

J.L. GREEN, D.N. BAKER, AND R.D. ZWICKL, DSUWG MEETING REPORT, EOS, (MEETING REPORT), 66, 565, 1985.

J.L. GREEN AND D. PETERS (EDITORS), INTRODUCTION TO THE SPACE PHYSICS ANALYSIS NETWORK (SPAN), NASA TM-86499, APRIL 1985.

D.L. GALLAGHER, J.L. GREEN, AND R. NEWMAN, SPAN GRAPHICS DISPLAY UTILITIES HANDBOOK, NASA TM-86500, MAY 1985.

J.L. GREEN, AND R.D. ZWICKL, DATA SYSTEMS USERS WORKING GROUP ACCEPTED IN EOS, NOVEMBER 1985.

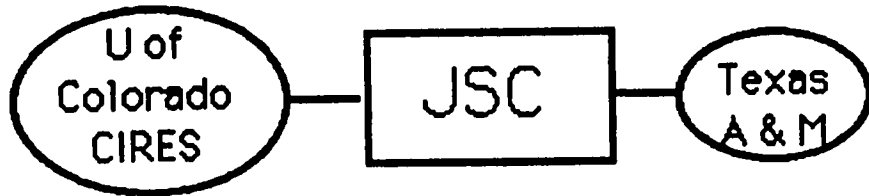
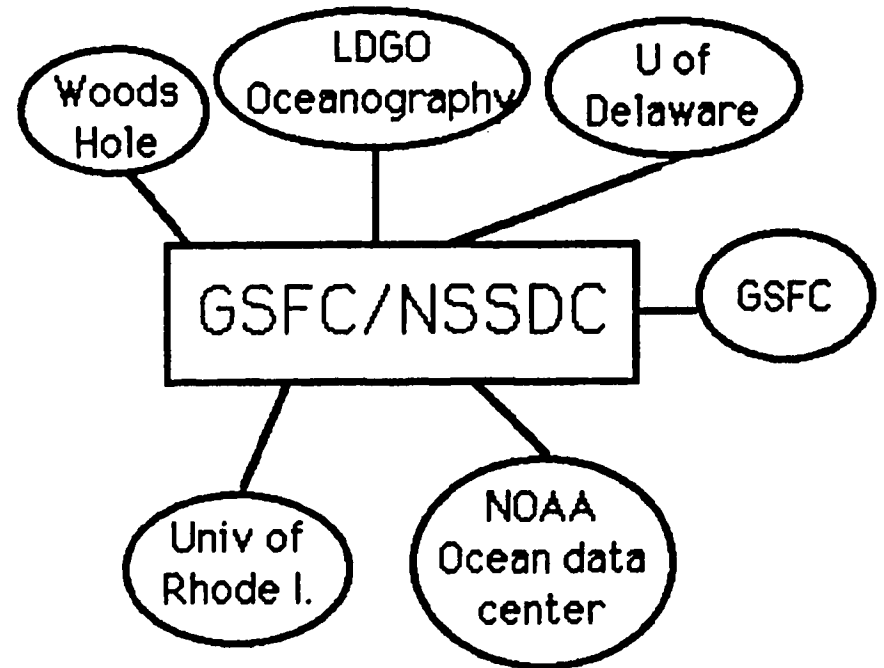
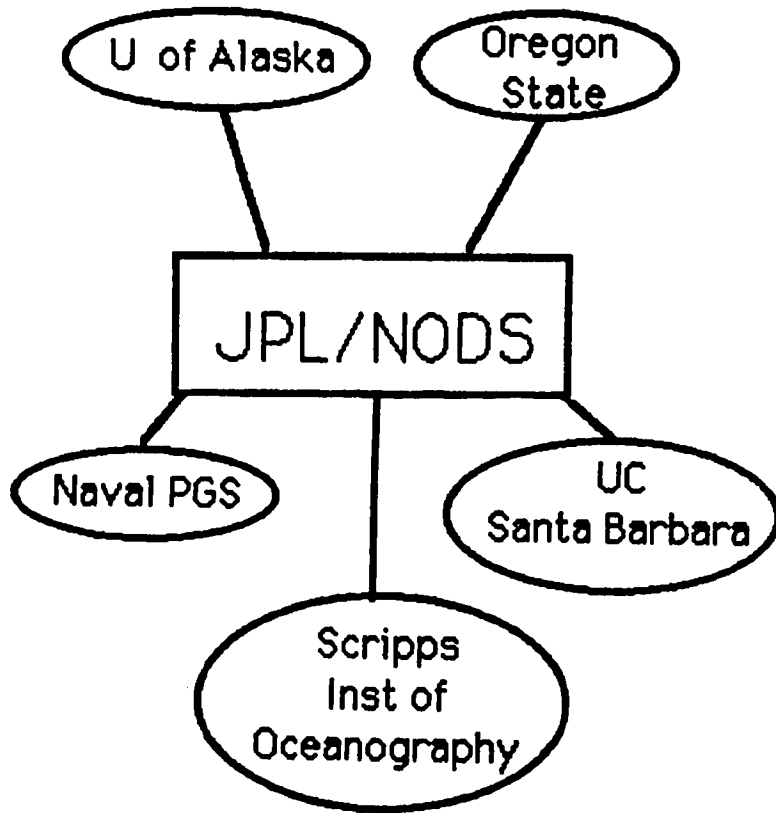
T. SANDERSON, S. HO, N. HEIJDEN, E. JABS, AND J.L. GREEN, NEAR-REALTIME TRANSATLANTIC TRANSMISSION OF ICE SPACECRAFT DATA USING THE SPAN NETWORK: THE COMET GIACOBINI-ZINNER ENCOUNTER, ACCEPTED IN THE ESA BULLETIN, DECEMBER 1985.

J.L. GREEN, AND J.H. KING, BEHIND THE SCENES DURING A COMET ENCOUNTER, ACCEPTED IN EOS, DECEMBER 1985.

EARTH SCIENCE NETWORK (ESN)

- BASED ON PILOT LAND AND OCEANS COMMUNICATIONS REQUIREMENTS
- PSC WILL PROVIDE THE LINES (AUGUST/SEPTEMBER 86)
- PROTOCOL CHOSEN TCP/IP AND DECNET
- CURRENT DESIGN SIMILAR TO SPAN
 - USE 56 KB/S BACKBONE
 - TAIL CIRCUITS CONNECTED TO ROUTING CENTERS AT 9.6 KB/S
 - PROPOSED ROUTING CENTERS GSFC, MSFC, JPL, AND AMES
- SOFTWARE/HARDWARE TO BE DETERMINED AND PROCURED
 - ROUTERS
 - INTERFACE

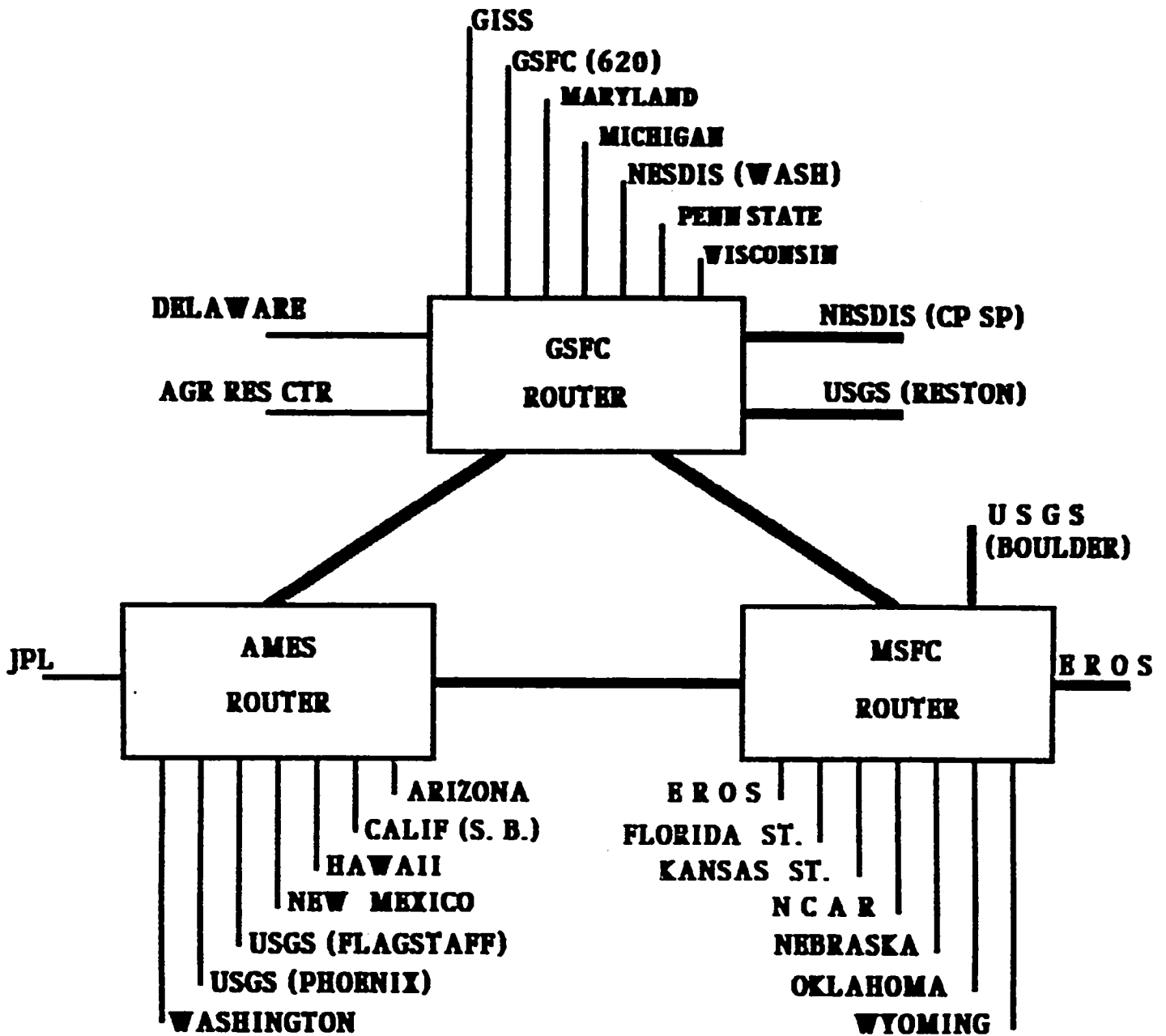
SPAN/OCEAN NETWORK



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NSSDC
DEC 19/85

EARTH SCIENCE NETWORK



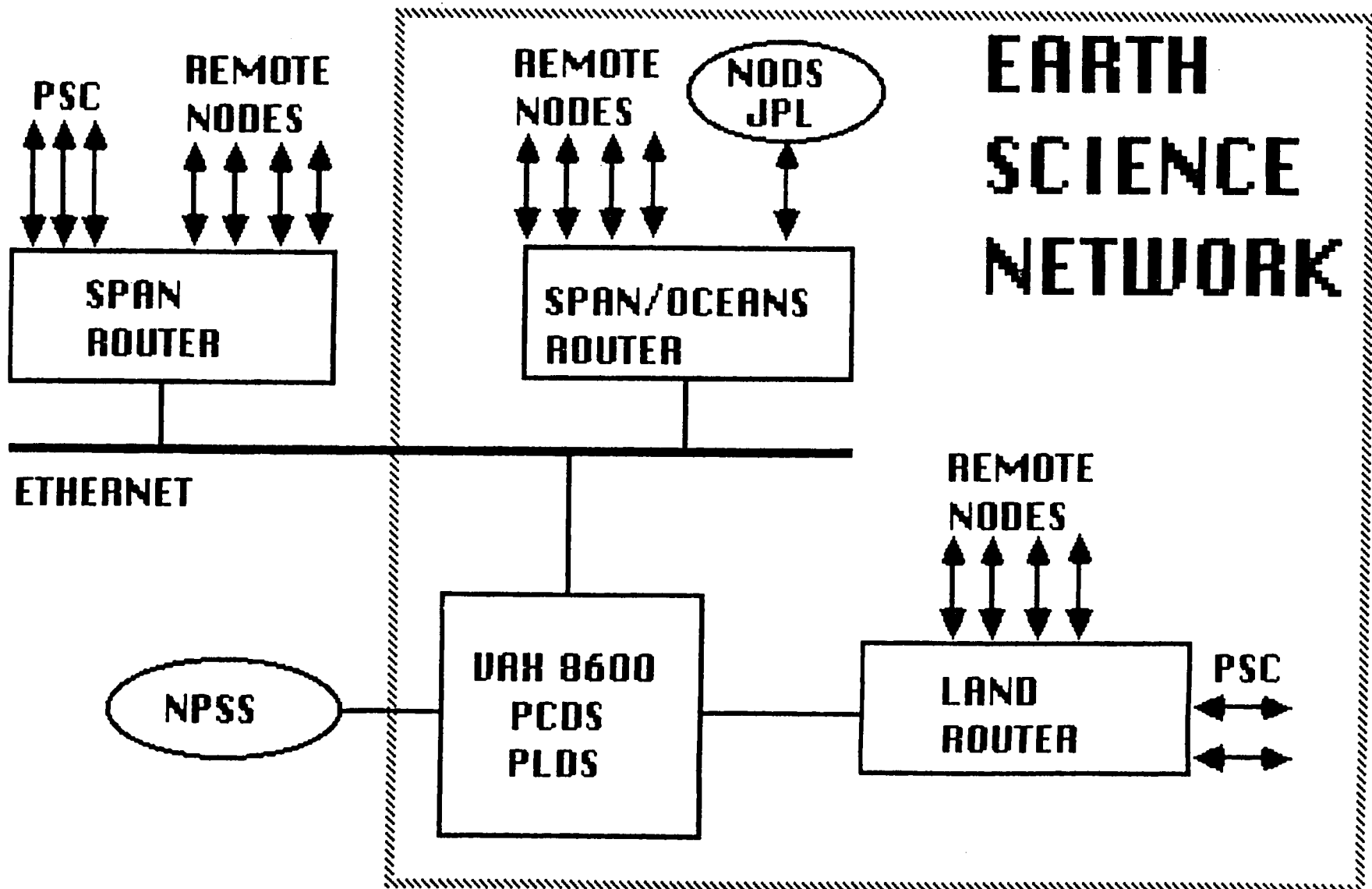
PSCN DATA LINKS

- 56 K bits/sec. (SOURCE DATA)**
- 9.6 k bits/sec. (USER DATA)**

NSSDC

NOVEMBER 1985

NSSDC NETWORK ACTIVITIES



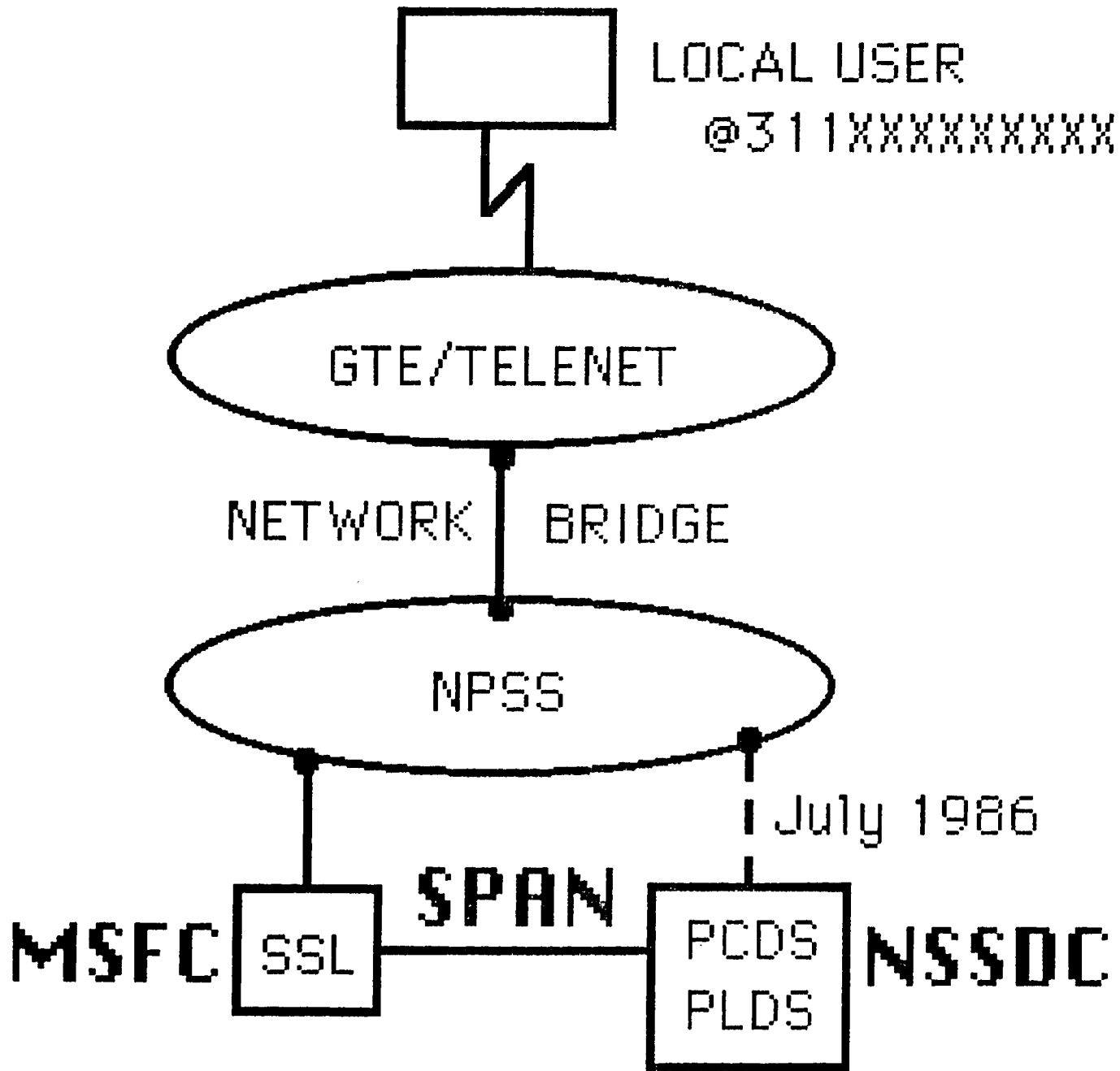
5-33

NSSDC

Dec 9/85

NPSS ACCESS TO NSSDC

- CURRENT NPSS CONNECTION AT MSFC
 - GTE/TELENET TRANSPARENT
 - MUST LOGON TO SSL
 - USE SPAN TO GET TO NSSDC
- NSSDC/NPSS CONNECTION OPERATIONAL BY JULY 86
 - PROVIDE TERMINAL ACCESS
 - LIMITED FILE TRANSFER
- NASA PAYS TELENET BILL



FUTURE GOALS

- ADD PCDS SPECIFIC NODES TO SPAN OR ESN
- LOOK FOR WAYS TO MERGE SPAN AND ESN INTO A UNIFIED NASA SCIENCE NETWORK

SPAN Node Contact Information List

MSFC Routing Center Location

=====

SSL

Discipline: Solar Terr., Planetary

Dennis Gallagher
Mail Code ES01
Marshall Space Flight Center
Huntsville, Alabama 35812
205/453-0108

Machine : SSL
Bldg. : 4481
Rm. : 303

MSFC PSCN Tail Circuits

=====

UAH

Discipline: Solar Terrestrial

J. R. Sisk
Roy Torbert (Alt)
Research Institute Bldg.
The University of Alabama in Huntsville
Huntsville, Alabama 35899
205/895-6318
205/895-6417 (Alt)

Machine : UAH
Bldg. : Research Institute
Rm. : D14

U OF KANSAS

Discipline: Solar Terrestrial

Rick Desko
University of Kansas
Department of Physics and Astronomy
Lawrence, Kansas 66045
913/864-3610

Machine : KUPHSX
Bldg. : Malott Hall
Rm. : B096

IOWA

Discipline: Solar Terr., Planetary, Astro-
physics

Larry H. Schroeder
Room 114 VAN
Department of Physics and Astronomy
University of Iowa
Iowa City, IA 52242
319/353-5693
319/353-5148

Machine : VAX-11/780
Bldg. : Van Allen Hall
Rm. : 209

SPRLA

Discipline: Atmospheric, Astrophysics

Salim Linggi
Space Physics Research Lab.
University of Michigan
2455 Hayward, Ann Arbor
Michigan 48109
313-763-6229

Machine : SPRLA
Bldg. : Space Physics Research Lab
Rm. : 2136

UNIVERSITY OF MIAMI

Robert A. Evans
RSMAS/MPO
4600 Rickenbacker Cswy
Miami, FL 33149
305/361-4018

Discipline: Oceans

Machine: VAX-11/780
Bldg. : Marine Science Center
Rm. : 222

NAVY NORDA

John Schmidt
NORDA
Code 321
NSTL, Miss. 39529
601/688-5266
FTS (494-5266)

Discipline: Oceans

Machine: VAX 8600
Bldg. : 1105
Rm. : 604

WASHINGTON UNIVERSITY

Susan Slavney
Washington University
St. Louis, MO 63130
314/889-5493

Discipline: Planetary

Machine : WURST
Bldg. : Wilson Hall
Rm. : 10

CHICAGO

Gordon Lentz
Laboratory for Astrophysics and
Space Research
Enrico Fermi Institute
The University of Chicago
933 East 56th Street
Chicago, Illinois 60637
312/962-7836

Discipline: Astrophysics

Machine : PDP-11/44
Bldg. : Lab for Astrophysics and Space
Research
Rm. : 52

UNIVERSITY OF WISCONSIN

Chris Anderson
University of Wisconsin
Madison, WI 53706
608/262-0492

Discipline: Astrophysics

Machine : VAX-11/780
Bldg. : Sterling Hall
Rm. : 5507

MIPS1 (MSFC/HOSC)

Harrell Phillips
Mail Code EL23
Marshall Space Flight Center
Huntsville, Alabama 35812
205/453-2617
205/453-2850

Discipline: Spacelab, Space Station

Machine : TMIS VAX
Bldg. : 4663
Rm. : A109

KSC

Mark Jühr
MS/PRC 2204
Kennedy Space Center, FL 32899
305/823-3180

Discipline: Spacelab, Space Station

Machine :
Bldg. : Hg. Building
Rm. : 3468

GSFC Routing Center Location
=====

NSSDC

Discipline: All

Lee Foster
Code 633
GSFC
Greenbelt, MD 20771
(301) 344-5574

Machine : NSSDC
Bldg. : 26
Rm. : 121

GSFC PSCN Tail Circuits
=====

NASA/HQ

Discipline: All

Dave Lavery
NASA Headquarters
Washington, DC 20546
202/453-1772

Machine : POLLUX
Bldg. : FOB10B
Rm. : A13

ESOC

Discipline: All

Robert Bosch
ESOC
6100 Darmstadt
West Germany
49-6151-886-659

Machine :
Bldg. : Meteorat Bldg.
Rm. : 190 (2nd floor)

AFGL

Discipline: Solar Terr.

Donna Pelekasis
Air Force Geophysical Laboratory
Hanscom AFB, MA
617/861-241

Machine : AFGL
Bldg. : 1107
Rm. : 120

BARTOL RESEARCH FOUNDATION

Discipline: Solar Terr.

William Matthaeus
University of Delaware
Bartol Research Foundation
Newark, Delaware 19716
302/451-8111

Machine :
Bldg. : Sharp Lab
Rm. : 217

U of Maryland

Discipline: Solar Terr.

Dr. Chuck Goodrich
Dept of Physics and Astronomy
University of Maryland
College Park, MD 20742
301/454-5938

Machine :
Bldg. : Space Sciences Bldg.
Rm. : 1235

NRL

Dr Paul Rodriguez
David Walker (Alt)
Code 4706

NRL
Plasma Physics Division
455 Overlook Ave.
Washington, DC 20375
FTS 767-3844
FTS 767-3329 (Alt)

Discipline: Solar Terr.

Machine :
Bldg. : 209
Rm. : 320A

APL

Lora Suther 2-150
JHU APL
Johns Hopkins Rd.
Laurel, MD 20707
(301) 953-5000 x84

Discipline: Solar Terr.. Planetary

Machine : S1PVAX
Bldg. : 2
Rm. : 50

Goddard Institute of Space Studies

Sol Broder
Rm. 210
Goddard Institute for Space Sciences
NASA
2880 Broadway
New York, NY 10025
FTS (664-5500)

Discipline: Atmospheric

Machine :
Bldg. : 26
Rm. : 132

PENNST

Jim Breon
Penn State University
423 Walker Building
University Park, PA 16802
814/865-9495

Discipline: Climate

Machine : PENNST
Bldg. : Walker Bldg.
Rm. : 616

MIT

John Richardson
MIT
Cambridge, MA 02139
617/253-6112

Discipline: Planetary

Machine :
Bldg. : 37
Rm. : 685

Cornell University

Phillip Nicholson
Dr. Peter Gierasch (Alt)
Space Sciences Bldg.
Cornell University
Ithaca, NY 14853
607/255-8543 (Exchange converts from 256 to 255 on March 3, 1986)
607/255-8544 (Alt)

Discipline: Planetary

Machine : Astronomy Dept. VAX-11/750
Bldg. : Space Sciences Bldg.
Rm. : 310

LAMONT-DOHERTY

Bruce Huber
LDGO - Oceanography
Palisades, NY 10964
914/359-2900

Discipline: Oceans

Machine : VAX-11/780
Bldg. : Oceanography Bldg.
Rm. : 202B

WOODS HOLE OCEANOGRAPHIC INSTITUTE

Andy Maffil
Woods Hole Oceanographic
Clark 1
Woods Hole, MA 02543
617/548-1400 (X2759)

Discipline: Oceans

Machine : VAX-11/780
Bldg. : Clark Laboratory
Rm. : 128

SPACE TELESCOPE INSTITUTE

Dr. Peter Shames
Space Telescope Institute
3700 San Martin Drive
Homewood Campus
Baltimore, MD 21218
301/338-4748

Discipline: Astrophysics

Machine :
Bldg. : ST Science Institute Bldg.
Rm. : 128

UNIVERSITY OF DELAWARE

Ferris Webster
College of Marine Studies
University of Delaware
Lewes, DE 19958
302/645-4266

Discipline: Oceans

Machine : MicroVAX II
Bldg. : Cannon Bldg.
Rm. : 205

NOAA - NODC

Robert Fish
National Oceanogr. Data Center
2001 Wisconsin Ave., NW
Washington, DC
202/634-7479
FTS (634-7479)

Discipline: Oceans

Machine : VAX-11/750
Bldg. : Universal-South Bldg.
Rm. : Unknown before 2/86

UNIVERSITY OF RHODE ISLAND

Peter Cornillon
Grad. School of Oceanography
Kingston, RI 02882
401/792-6283

Discipline: Oceans

Machine : VAX-11/750
Bldg. : Watkins
Rm. : 1st floor computer room

JPL Routing Center Location

PPDS and JPLnet

John Piotrowski N/S 264/785
Jet Propulsion Lab
4800 Oak Grove Drive
Pasadena, CA 91109
(818) 354-5491

Discipline: Solar Terr., Planetary, Earth
Science

Machine :
Bldg. : 171
Rm. : 85

JPL Tail Circuits

LOCKHD

Dayton Datlowe
0/91-20 B 255
Lockheed Palo Alto Research
Laboratories
3251 Hanover Street
Palo Alto, Ca. 94304
415/424-3274

Discipline: Solar Terr.

Machine : LOCKHD
Bldg. : 255
Rm. : OE-105

UNIVERSITY of WASHINGTON

Douglas W. Potter
George Pitt (Alt)
Geophysics Program, AK-50
University of Washington
Seattle, Washington 98195
206/543-9055
206/543-0208 (Alt)

Discipline: Solar Terr.

Machine :
Bldg. : Johnson Hall
Rm. : 365

TRV

Sandra Chang
TRV
One Space Park
Bldg R1/1170
Redondo Bch, CA 90278
(213) 538-2017

Discipline: Solar Terr.

Machine : TRVATB
Bldg. : 01
Rm. : 1120

AEROSPACE

Dr. Joseph Fennell
Space Sciences Laboratory
The Aerospace Corporation
El Segundo, California, 90245
213-648-7075

Discipline: Solar Terr.

Machine :
Bldg. : 26
Rm. : 150

VXBMS (UCLA)

Nancy L. Keder
Molecular Biology Institute
UCLA
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(213) 825-8901

Discipline: Solar Terr..Planetary

Machine : VXBMS
Bldg. : Slichter Hall
Rm. : 5880

LJSP01 and LJSP02 (UCSD)

Ed Hoopes
University of California San Diego
Center for Astrophysics and
Space Science
C-011
La Jolla, California 92093
(619) 452-4987

Discipline: Solar Terr..Astrophysics

Machine :
Bldg. : AP & M
Rm. : 2839

UNIVERSITY OF CALIFORNIA, BERKELEY

Dr. Forrest Moser
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Space Science Laboratory
Berkeley, California 94720
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415/642-5998 (Alt)

Discipline: Solar Terr.

Machine : VAX-11/750
Bldg. : Space Scienc Lab
Rm. : 240

USU

Prof. Joe R. Douppnik
Center for Atmospheric and
Space Sciences, UMC-34
Utah State University
Logan, Utah 84322
(801) 750-2982

Discipline: Atmospheric

Machine : USU
Bldg. : Lund Hall
Rm. : 101

STAR

Dr. Calvin C. Teague
Center for Radar Astronomy
Durand Building, Room 229
Stanford, California 94305
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**Discipline: Solar Terr..Atmospheric,
Spacelab**

Machine : STAR
Bldg. : Durand
Rm. : 216

ARIZONA

Joe Gotobed
Lunar and Planetary Lab
The University of Arizona
Tucson, AZ 85721
602/621-4021

Discipline: Planetary

Machine : MicroVAX II
Bldg. : 92
Rm. : 429

University of Hawaii

Karl Hinck
University of Hawaii
Planetary Geosciences
2525 Correa Road
Honolulu, Ha 96822
(808) 948-6321

Discipline: Planetary

Machine : UHPGVX2
Bldg. : Sinclair Library
Rm. : 6

Cal Tech

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California Institute of Technology
Geology and Planetary Science
169D S. Mudd
Pasadena, Ca 91125
(818) 356-6861

Discipline: Planetary, Astrophysics

Machine : JUPIT1
Bldg. : South Mudd
Rm. : 169D

UC SANTA BARBARA

Ray Smith
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University of California
Santa Barbara, CA
805/961-2618

Discipline: Oceans

Machine : VAX-11/750
Bldg. : Engineering Bldg. 1
Rm. : 3152

OREGON STATE U.

Dudley Chelton
College of Oceanography
Oregon State University
Corvallis, OR 97331

Discipline: Oceans

Machine : MicroVAX II
Bldg. : Oceanography Bldg. 1
Rm. : 444
Discipline: Planetary, Earth Science

JPL

Burt Goldstein
Mail Stop 202-101
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Pasadena, CA
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FTS (792-7452)

Discipline: Oceans

Machine : VAX-11/780
Bldg. : 202
Rm. : 101

NAVY POST GRAD SCHOOL

James Mueller
Dept. of Oceanography
Naval Post Graduate School
Monterey, CA 93943-5100
408/646-3268

Discipline: Oceans

Machine : VAX System
Bldg. : Root Hall
Rm. : 123

UNIVERSITY OF ALASKA

David Fritte
Geophysical Institute
University of Alaska
Fairbanks, AK 99775-6800

Discipline: Oceans

Machine : VAX-11/780 or VAX-11/785
Bldg. : Elvey Bldg.
Rm. : 219

SCRIPPS INST. OF OCEANOGRAPHY

Mark Abbott
Scripps Inst. of Oceanography
University of California, A-002
La Jolla, CA 92093
619/452-4791

Discipline: Oceans

Machine : MicroVAX II
Bldg. : Scripps Satellite Oceanographic
Rm. : Facility in trailers

Eric Eliason
United States Geological Survey
Astrogeology
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Flagstaff, Az 86001
(602) 527-7113

Machine : ASTOG
Bldg. : 4
Rm. : 40

AMES

Maureen Ockert
Ames
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Moffet Field, California 94035
414/694-5593
FTS (464-5593)

Discipline: Earth Science

Machine :
Bldg. : 240
Rm. : 111

JSC Routing Center Location
=====

Johnson Space Center *

Discipline: Planetary

Dan Anderson
JSC
Code SN
Houston, TX 77058
FTS (525-4464)
713/483-4464

Machine : SM
Bldg. : 31
Rm. : 262A

JSC Tail Circuits
=====

ESSDP1 and ESSDP2 (LANL)

Discipline: Solar Terr.

Steve Blair
Mail Stop D440
Los Alamos National Laboratory
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Los Alamos, NM 87545
Office: (505)667-9211
Group Office: (505)667-9268

Machine : ESSDP2
Bldg. : SM40
Rm. : N114A

FTS (843-9211)
FTS (843-9268)

Rice University

Discipline: Theory Solar Terr.

Professor Patricia Reiff
Rice University
Dept. of Space Physics and
Astrophysics
P.O. Box 1892
Houston, Texas 77251
713/527-8101, ext. 2650

Machine : MicroVAX II
Bldg. : Space Science Bldg.
Rm. : 263

UTD

Discipline: Solar Terr., Atmospheric

Bob Power
Center for Space Sciences,
M.S. F02.2
University of Texas at Dallas
P.O. Box 830688
Richardson, TX 75083-0688
214-690-2852

Machine : PDP-11/23
Bldg. : Founders Building
Rm. : F01.604

SWRI

**Discipline: Solar Terr., Atmospheric,
Spacelab**

Ron Janetzke
Southwest Research Institute
Division 15
P. O. Drawer 28510
San Antonio, Texas 78284
(512) 684-5111 ext.-3318

Machine : VAX-11/750
Bldg. : 68
Rm. : F9

NOAA

Joe H. Allen
National Oceanic and Atmospheric
Administration
325 Broadway
Boulder, Colorado 80303
303/497-6323
FTS 320-6323

Discipline: Solar Terr., Space Environ-
ment

Machine : VAX-11/750
Bldg. : Research Lab Bldg. #3
Rm. : 138

NCAR

Barb Emery
NCAR
P.O. Box 3000
Boulder, CO 80307
303/497-1596

Discipline: Atmospheric

Machine : Micro PDP-11
Bldg. : Mesa Lab
Rm. : 498

UNIVERSITY OF COLORADO AT BOULDER

Randy Davis
University of Colorado
Boulder Colorado 80309
303/492-6867
303/492-5440 (Alt)

Discipline: Atmospheric, Astrophysics

Machine : LASP DECnet router
Bldg. : Duane Physics Complex
Rm. : D322

Lunar and Planetary Institute

Kinpong Leung
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