TOP500 Supercomputer Sites

10th Edition

Jack J. Dongarra

Computer Science Department
University of Tennessee
Knoxville, TN 37996-1301

and

Mathematical Science Section
Oak Ridge National Laboratory
Oak Ridge, TN 37831-6367

dongarra@cs.utk.edu

Hans W. Meuer

Computing Center
University of Mannheim
D-68131 Mannheim
Germany

meuer@rz.uni-mannheim.de

Erich Strohmaier

Computer Science Department
University of Tennessee
Knoxville, TN 37996-1301

erich@cs.utk.edu

RUM 53/97
UT-CS-97-377

November 15, 1997

TOP500 Supercomputer Sites

Jack J. Dongarra, Hans W. Meuer, and Erich Strohmaier

November 15, 1997

Abstract

To provide a better basis for statistics on high-performance computers, we list the sites that have the 500 most powerful computer systems installed. The best LINPACK benchmark performance achieved is used as a performance measure in ranking the computers.

1 Introduction and Objectives

Statistics on high-performance computers are of major interest to manufacturers, users, and potential users. These people wish to know not only the number of systems installed, but also the location of the various supercomputers within the high-performance computing community and the applications for which a computer system is being used. Such statistics can facilitate the establishment of collaborations, the exchange of data and software, and provide a better understanding of the high-performance computer market.

Statistical lists of supercomputers are not new. Every year since 1986 Hans Meuer [1] has published system counts of the major vector computer manufacturers, based principally on those at the Mannheim Supercomputer Seminar. Statistics based merely on the name of the manufacturer are no longer useful, however. New statistics are required that reflect the diversification of supercomputers, the enormous performance difference between low-end and high-end models, the increasing availability of massively parallel processing (MPP) systems, and the strong increase in computing power of the high-end models of workstation suppliers (SMP).

To provide this new statistical foundation, we have decided in 1993 to assemble and maintain a list of the 500 most powerful computer systems. Our list has been compiled twice a year since June 1993 with the help of high-performance computer experts, computational scientists, manufacturers, and the Internet community in general who responded to a questionnaire we sent out; we thank all the contributors for their cooperation.

In the present list (which we call the TOP500), we list computers ranked by their performance on the LINPACK Benchmark. While we make every attempt to verify the results obtained from users and vendors, errors are bound to exist and should be brought to our attention. We intend to continue to update this list half-yearly and, in this way, to keep track with the evolution of computers. Hence, we welcome any comments and information; please send electronic mail to *top500@rz.uni-mannheim.de*. The list is freely available by anonymous ftp to

ftp.uni-mannheim.de/top500/ or to www.netlib.org/benchmark/top500.ps. The interested reader can additionally create sublists out of the TOP500 database and can make statistics on his own by using the WWW interface at
http://parallel.rz.uni-mannheim.de/top500.html or
http://www.netlib.org/benchmark/top500.html.
Here you also have access to postscript versions of slides dealing with the interpretation of the present situation as well as with the evolution over time since we started this project.

2 The LINPACK Benchmark

As a yardstick of performance we are using the "best" performance as measured by the LINPACK Benchmark [2]. LINPACK was chosen because it is widely used and performance numbers are available for almost all relevant systems.

The LINPACK Benchmark was introduced by Jack Dongarra. A detailed description as well as a list of performance results on a wide variety of machines is available in postscript form from *netlib*. To retrieve a copy send electronic mail to *netlib@ornl.gov* and by typing the message *send performance from benchmark* or from any machine on the internet type:
rcp anon@netlib2.cs.utk.edu:benchmark/performance performance.

The benchmark used in the LINPACK Benchmark is to solve a dense system of linear equations. For the TOP500, we used that version of the benchmark that allows the user to scale the size of the problem and to optimize the software in order to achieve the best performance for a given machine. This performance does not reflect the *overall performance* of a given system, as no single number ever can. It does, however, reflect the *performance of a dedicated system for solving a dense system of linear equations.* Since the problem is very regular, the performance achieved is quite high, and the performance numbers give a good correction of peak performance.

By measuring the actual performance for different problem sizes n, a user can get not only the maximal achieved performance R_{max} for the problem size N_{max} but also the problem size $N_{1/2}$ where half of the performance R_{max} is achieved. These numbers together with the theoretical peak performance R_{peak} are the numbers given in the TOP500. In an attempt to obtain uniformity across all computers in performance reporting, the algorithm used in solving the system of equations in the benchmark procedure must confirm to the standard operation count for LU factorization with partial pivoting. In particular, the operation count for the algorithm must be $2/3n^3 + O(n^2)$ floating point operations. This excludes the use of a fast matrix multiply algorithm like "Strassian's Method". This is done to provide a comparable set of performance numbers across all computers. If in the future a more realistic metric finds widespread usage, so that numbers for all systems in question are available, we may convert to that performance measure.

3 The TOP500 List

Table 1 shows the 500 most powerful commercially available computer systems known to us. To keep the list as compact as possible, we show only a part of our information here:

• N_{world}	Position within the TOP500 ranking
• Manufacturer	Manufacturer or vendor
• Computer	Type indicated by manufacturer or vendor
• Installation Site	Customer
• Location	Location and country
• Year	Year of installation/last major update
• Field of Application	
• # Proc.	Number of processors[1]
• R_{max}	Maximal LINPACK performance achieved
• R_{peak}	Theoretical peak performance
• N_{max}	Problemsize for achieving R_{max}
• $N_{1/2}$	Problemsize for achieving half of R_{max}

If R_{max} from Table 3 of the LINPACK Report [2] is not available, we use the TPP performance given in Table 1 of the LINPACK Report [2] for solving a system of 1000 equations. To use a consistent yardstick for all systemwe we do not use results achieved by advanced parallel algorithm as defined in [2]. In case of the Cray T90, C90 and J90 systems we had to use older able 3 or Table 1 results. In a few cases we interpolated between two measured system sizes.

For models where we did not receive the requested data, the performance of the next smaller system measured is used.

If there should be any changes in the performances given in Table 1 we will update them.

In addition to cross checking different sources of information, we select randomly a statistical representative sample of the first 500 systems of our database. For these systems we ask the supplier of the information to establish direct contact between the installation site and us to verify the given information. This gives us basic information about the quality of the list in total.

As the TOP500 should provide a basis for statistics on the market of high-performance computers, we limit the number of systems installed at vendor sites. This is done for each vendor separately by limiting the accumulated performance of systems at vendor sites to a maximum of 5% of the total accumulated installed performance of this vendor. Rounding is done in favor of the vendor in question.

In Table 1, the computers are ordered first by their R_{max} value. In the case of equal performances (R_{max} value) for different computers, we have chosen to order by R_{peak}. For sites that have the same computer, the order is by memory size and then alphabetically.

TOP500 **Supercomputers - Worldwide**

N *world*	Manufacturer Computer	Installation Site Location/Year	Field of Application	# Proc.	**R_{max}** R_{peak} [Mflop/s]	N_{max} $N_{1/2}$
1	Intel ASCI Red	Sandia National Labs Albuquerque USA /1997	Research	9152	**1338000** 1830400	235000 63000
2	SGI/Cray T3E900 LC1248-128	Government USA /1997	Classified	1248	**634200** 1123200	. .
3	SGI/Cray T3E900 LC840-128	United Kingdom Meteorological Office Bracknell UK /1997	Research Weather	840	**430300** 756000	. .
4	Hitachi/Tsukuba CP-PACS/2048	Center for Computational Physics, Univ of Tsukuba Tsukuba Japan /1996	Academic	2048	**368200** 614000	103680 30720
5	SGI/Cray T3E900 LC512-256	NERSC/LBNL Berkeley USA /1997	Research	512	**264800** 460800	79744 14000
6	Hitachi SR2201/1024	University of Tokyo Tokyo Japan /1996	Academic	1024	**232400** 307000	155520 34560
7	Fujitsu Numerical Wind Tunnel	NAL Japan /1996	Research Aerospace	167	**229700** 281000	66132 18018
8	Fujitsu vpp700/116	ECMWF Reading UK /1997	Research Weather	116	**213000** 255200	111360 18560
9	SGI/Cray T3E LC672-128	Max-Planck-Gesellschaft MPI/IPP Garching Germany /1997	Research	672	**196100** 403200	. .
10	SGI/Cray T3E LC544-128	Cray Research Eagan USA /1997	Vendor	544	**196100** 326400	. .
11	SGI/Cray T3E LC512-128	Forschungszentrum Juelich (FZJ) Juelich Germany /1996	Research	512	**196100** 307200	77824 11264
12	SGI/Cray T3E LC512-128	NASA/Goddard Space Flight Center Greenbelt USA /1996	Research Weather	512	**196100** 307200	77824 11264
13	SGI/Cray T3E LC512-128	Pittsburgh Supercomputer Center Pittsburgh USA /1996	Research	512	**196100** 307200	77824 11264
14	SGI/Cray T3E LC512-128	Universitaet Stuttgart Stuttgart Germany /1996	Research	512	**196100** 307200	77824 11264
15	SGI/Cray T3E900 LC312-256	DOD/CEWES Vicksburg USA /1997	Research Mechanics	312	**166280** 280800	. .
16	SGI/Cray T3E LC400-128	Deutscher Wetterdienst Offenbach Germany /1997	Research Weather	400	**153400** 240000	. .
17	IBM SP P2SC 120 MHz	Pacific Northwest National Laboratories/Batelle Richland USA /1997	Research	472	**151800** 226560	61000 22600
18	Intel XP/S140	Sandia National Labs Albuquerque USA /1993	Research	3680	**143400** 184000	55700 20500
19	SGI/Cray T3E1200 LC256-512	Cray Research Chippewa Falls USA /1997	Vendor	256	**138700** 307200	. .
20	SGI/Cray T3E900 LC256-128	Forschungszentrum Juelich (FZJ) Juelich Germany /1997	Research	256	**138700** 230400	81920 10192

Mannheim/Tennessee November 15, 1997

TOP500 **Supercomputers - Worldwide**

N *world*	Manufacturer Computer	Installation Site Location/Year	Field of Application	# Proc.	**R_{max}** R_{peak} [Mflop/s]	N_{max} $N_{1/2}$
21	SGI/Cray T3E900 LC256-512	Minnesota Supercomputer Center USA /1997	Academic	256	**138700** 230400	81920 10192
22	SGI/Cray T3E900 LC256-256	Naval Oceanographic Office (NAVOCEANO) Bay Saint Louis USA /1997	Research Weather	256	**138700** 230400	81920 10192
23	SGI/Cray T3E900 LC256-128	University of Edinburgh Edinburgh UK /1997	Academic	256	**138700** 230400	81920 10192
24	Intel XP/S-MP 150	Oak Ridge National Laboratory Oak Ridge USA /1995	Research	3072	**127100** 154000	86000 17800
25	SGI/Cray T3E750 LC280-128	Commissariat a l'Energie Atomique (CEA) Grenoble France /1997	Research Energy	280	**125350** 210000	. .
26	NEC SX-4/64	Atmospheric Environment Service (AES) Dorval Canada /1997	Research Weather	64	**122200** 128000	30080 4352
27	NEC SX-4/64	Osaka University Osaka Japan /1997	Academic	64	**122200** 128000	30080 4352
28	Fujitsu VPP700/56	Kyushu University Fukuoka Japan /1996	Academic	56	**110300** 123200	109200 10752
29	Fujitsu VPP500/80	National Lab. for High Energy Physics Japan /1994	Research	80	**109800** 128000	46400 11030
30	Intel XP/S-MP 125	Japan Atomic Energy Research Japan /1996	Research	2502	**103500** 125100	. .
31	SGI/Cray T3E750 LC224-128	CSC (Center for Scientific Computing) Espoo Finland /1997	Academic	224	**101060** 168000	. .
32	SGI/Cray T3D MC1024-8	Government USA /1994	Classified	1024	**100500** 152000	81920 10224
33	SGI/Cray T3E LC256-128	CNRS/IDRIS Orsay France /1996	Research	256	**98500** 154000	56960 8000
34	SGI/Cray T3E LC256-128	UCSD/San Diego Supercomputer Center San Diego USA /1996	Academic	256	**98500** 154000	56960 8000
35	SGI/Cray T3E LC216-128	National Supercomputer Centre (NSC) Linkoping Sweden /1997	Academic	216	**83470** 129600	. .
36	IBM SP P2SC 160 MHz	IBM/Poughkeepsie Poughkeepsie USA /1997	Vendor	256	**83370** 163840	. .
37	IBM SP P2SC 135 MHz	DOD/CEWES Vicksburg USA /1997	Industry	256	**83370** 138240	. .
38	IBM SP P2SC 135 MHz	Wright-Patterson Air Force Base USA /1997	Research	256	**83370** 138240	. .
39	SGI/Cray T3E900 LC152-128	ZIB/Konrad Zuse-Zentrum fuer Informationstechnik Berlin Germany /1997	Academic	152	**82300** 136800	. .
40	SGI/Cray T3E LC200-128	ARPA USA /1997	Academic	200	**77460** 120000	. .

Mannheim/Tennessee November 15, 1997

TOP500 **Supercomputers - Worldwide**

N *world*	Manufacturer Computer	Installation Site Location/Year	Field of Application	# Proc.	$\mathbf{R_{max}}$ R_{peak} [Mflop/s]	N_{max} $N_{1/2}$
41	Fujitsu/SNI VPP700/34	Leibniz Rechenzentrum Muenchen Germany /1997	Academic	34	**71150** 74800	. .
42	IBM SP2/402	Chip Manufacturer (B) USA /1997	Industry	402	**69330** 106530	. .
43	SGI/Cray T3E900 LC128-128	KIST/System Engineering Research Institute (SSC) Korea /1997	Research	128	**69300** 115200	57344 7040
44	SGI/Cray T3E LC176-128	Commissariat a l'Energie Atomique (CEA) Limeil France /1997	Research	176	**68450** 105600	. .
45	IBM SP2/384	Maui High-Performance Computing Center (MHPCC) USA /1994	Research	384	**66300** 102400	. .
46	SGI/Cray T3E LC160-128	NRI for Earth Science and Disaster (NIED) Japan /1997	Research	160	**62440** 96000	. .
47	NEC SX-4/32	NEC Fuchu Plant Tokyo Japan /1995	Vendor Benchmarking	32	**61770** 64000	20480 1688
48	NEC SX-4/32	National Institute for Environmental Studies Tsukuba Japan /1997	Research Environment	32	**61770** 64000	20480 1688
49	NEC SX-4/32	Tohoku University Aramaki Japan /1997	Academic	32	**61770** 64000	20480 1688
50	NEC SX-4/32	Tohoku University Aramaki Japan /1997	Academic	32	**61770** 64000	20480 1688
51	NEC SX-4/32	Tohoku University Aramaki Japan /1997	Academic	32	**61770** 64000	20480 1688
52	NEC SX-4/32	Tohoku University Aramaki Japan /1997	Academic	32	**61770** 64000	20480 1688
53	NEC SX-4/32	Universitaet Stuttgart Stuttgart Germany /1996	Research	32	**61770** 64000	20480 1688
54	Fujitsu VPP500/42	Japan Atomic Energy Research Japan /1994	Research	42	**59600** 67200	. .
55	Fujitsu VPP500/42	Nagoya University Nagoya Japan /1995	Academic	42	**59600** 67200	. .
56	Hitachi SR2201/256	Real World Computing (RWCP) Tokyo Japan /1997	Research	256	**58680** 77000	77760 13440
57	IBM SP P2SC 160 MHz	UCSD/San Diego Supercomputer Center San Diego USA /1997	Academic	128	**57240** 81920	39000 9180
58	Fujitsu VPP500/40	National Institute of Genetics Mishima Japan /1995	Research	40	**56900** 64000	. .
59	Fujitsu VPP500/40	Tokyo University - Inst. of Solid State Physics Tokyo Japan /1994	Academic	40	**56900** 64000	. .
60	IBM SP P2SC 120 MHz	Cornell Theory Center Ithaca USA /1997	Academic	160	**52960** 76800	. .

Mannheim/Tennessee November 15, 1997

TOP500 **Supercomputers - Worldwide**

N *world*	Manufacturer Computer	Installation Site Location/Year	Field of Application	# Proc.	$\mathbf{R_{max}}$ R_{peak} [Mflop/s]	N_{max} $N_{1/2}$
61	TMC CM-5/896	Minnesota Supercomputer Center USA /1994	Academic	896	**52300** 114700	. .
62	SGI/Cray T3E900 LC96-128	University of Alaska - ARSC Fairbanks USA /1997	Academic	96	**52050** 86400	. .
63	Hewlett-Packard Exemplar X-Class	Caltech/JPL Pasadena USA /1997	Research	128	**51300** 92160	46128 .
64	Hewlett-Packard Exemplar X-Class	Hewlett-Packard CXTC Richardson USA /1997	Vendor Benchmarking	128	**51300** 92160	46128 .
65	Hitachi SR2201/224	University of Cambridge Cambridge UK /1997	Academic	224	**51130** 67200	. .
66	SGI/Cray T3D MC512-8	Los Alamos National Laboratory Los Alamos USA /1994	Research Energy	512	**50800** 76000	57856 7136
67	SGI/Cray T3D MC512-8	Minnesota Supercomputer Center USA /1995	Academic	512	**50800** 76000	57856 7136
68	SGI/Cray T3D MC512-8	Pittsburgh Supercomputing Center Pittsburgh USA /1994	Academic	512	**50800** 76000	57856 7136
69	SGI/Cray T3D MC512-8	University of Edinburgh Edinburgh UK /1996	Academic	512	**50800** 76000	57856 7136
70	SGI/Cray T3E LC128-128	CINECA Bologna Italy /1996	Research	128	**50430** 77000	58848 7392
71	SGI/Cray T3E AC128-64	Japan Adv. Inst. of Science and Technology (JAIST) Hokuriku Japan /1997	Academic	128	**50430** 77000	58848 7392
72	SGI/Cray T3E LC128-128	Ohio Supercomputer Center Columbus USA /1997	Academic	128	**50430** 77000	58848 7392
73	IBM SP P2SC 120 MHz	Chip Manufacturer (A) USA /1997	Industry	152	**50420** 72960	. .
74	NEC SX-4/25	NAL Japan /1997	Research	25	**48350** 50000	. .
75	Fujitsu VPP500/32	The Angstrom Technology Partnership Tsukuba Japan /1993	Research	32	**46100** 51200	29760 5350
76	IBM SP2/256	Lawrence Livermore National Laboratory Livermore USA /1996	Research Energy	256	**44200** 68000	53000 13500
77	IBM SP2/256	Lawrence Livermore National Laboratory Livermore USA /1996	Research Energy	256	**44200** 68000	53000 13500
78	IBM SP2/256	Universitaet/Forschungszentrum Karlsruhe Karlsruhe Germany /1997	Academic	256	**44200** 68000	53000 13500
79	SGI/Cray T3E900 AC80-64	The Scripps Research Institute La Jolla USA /1997	Research	80	**43420** 72000	. .
80	Fujitsu VPP500/28	Institute of Physical and Chemical Res. (RIKEN) Tokyo Japan /1993	Research	28	**40475** 44800	. .

Mannheim/Tennessee November 15, 1997

TOP500 **Supercomputers - Worldwide**

N *world*	Manufacturer Computer	Installation Site Location/Year	Field of Application	# Proc.	$\mathbf{R_{max}}$ R_{peak} [Mflop/s]	N_{max} $N_{1/2}$
81	NEC SX-4/20	Japan Marine Science and Technology Yokosuka Japan /1995	Research	20	**38760** 40000	. .
82	NEC SX-4/20	National Research Institute for Metals Tsukuba Japan /1996	Research	20	**38760** 40000	. .
83	NEC SX-4/20	Toyota Central Research Development Japan /1996	Industry Automotive	20	**38760** 40000	. .
84	SGI/Cray T3E LC96-128	NERSC/LBNL/Berkeley Labs Berkeley USA /1997	Research	96	**37810** 57600	. .
85	SGI/Cray T3E900 AC64-128	Phillips Petroleum Company Bartlesville USA /1997	Industry Geophysics	64	**34800** 57600	40960 4992
86	SGI/Cray T3E AC88-128	Norwegian University of Science and Technology Trondheim Norway /1997	Academic	88	**34650** 52800	. .
87	Fujitsu VPP300/16	Japan Atomic Energy Research Japan /1996	Research	16	**34100** 35200	59200 3520
88	Fujitsu VPP300/16	Japan Science and Technology Tokyo Japan /1996	Research	16	**34100** 35200	59200 3520
89	Fujitsu VPP300/16	Reactor Nuclear Fuel Development Japan /1996	Research	16	**34100** 35200	59200 3520
90	Fujitsu/SNI VPP300/16	Universitaet/Forschungszentrum Karlsruhe Karlsruhe Germany /1997	Academic	16	**34100** 35200	59200 3520
91	Intel XP/S-MP 41	Rome Laboratory USA /1995	Research	816	**33700** 40800	. .
92	IBM SP P2SC 120 MHz	Argonne National Laboratory USA /1996	Research	94	**32050** 45120	. .
93	SGI/Cray T3E AC80-128	Technical University Delft (TUD) Delft Netherlands /1997	Academic	80	**31500** 48000	. .
94	NEC SX-4/16	Atmospheric Environment Service (AES) Dorval Canada /1997	Research Weather	16	**31100** 32000	20480 960
95	NEC SX-4/16	Danish Meteorological Institute Copenhagen Denmark /1997	Research	16	**31100** 32000	20480 960
96	NEC SX-4/16	National Aerospace Laboratory (NLR) Noordoostpolder Netherlands /1996	Research Aerospace	16	**31100** 32000	20480 960
97	NEC SX-4/16	National Cardiovascular Center Japan /1996	Research	16	**31100** 32000	20480 960
98	NEC SX-4/16	Swiss Scientific Computing Center (CSCS) Manno Switzerland /1996	Research	16	**31100** 32000	20480 960
99	SGI/Cray Y-MP T932/321024	Government USA /1996	Classified	32	**29360** 58000	. .
100	SGI/Cray Y-MP T932/321024	Government USA /1997	Classified	32	**29360** 58000	. .

Mannheim/Tennessee November 15, 1997

TOP500 **Supercomputers - Worldwide**

N *world*	Manufacturer Computer	Installation Site Location/Year	Field of Application	# Proc.	$\mathbf{R_{max}}$ R_{peak} [Mflop/s]	N_{max} $N_{1/2}$
101	SGI/Cray Y-MP T932/321024	NRI for Earth Science and Disaster (NIED) Japan /1997	Research	32	**29360** 58000	. .
102	SGI/Cray Y-MP T932/321024	Nippon Telegraph and Telephone (NTT) Tokyo Japan /1995	Industry Finance	32	**29360** 58000	. .
103	Hitachi S-3800/480	Hitachi Ltd. GPCD Japan /1994	Vendor Software	4	**28400** 32000	15500 830
104	Hitachi S-3800/480	Japan Meteorological Agency Japan /1995	Research Weather	4	**28400** 32000	15500 830
105	Hitachi S-3800/480	University of Tokyo Tokyo Japan /1993	Academic	4	**28400** 32000	15500 830
106	Fujitsu VPP300/13	Australian National University Canberra Australia /1996	Academic	13	**27720** 28600	. .
107	Hewlett-Packard Exemplar X-Class	Caltech/JPL Pasadena USA /1997	Research	64	**27560** 46080	29956 4584
108	Hewlett-Packard Exemplar X-Class	Caltech/JPL Pasadena USA /1997	Research	64	**27560** 46080	29956 4584
109	Hewlett-Packard Exemplar X-Class	HTC Babelsberg Germany /1997	Industry Image Proc.	64	**27560** 46080	29956 4584
110	Hewlett-Packard Exemplar X-Class	NCSA Urbana-Champaign USA /1997	Academic	64	**27560** 46080	29956 4584
111	Hewlett-Packard Exemplar X-Class	Naval Research Laboratory (NRL) Washington D.C. USA /1997	Classified	64	**27560** 46080	29956 4584
112	IBM SP P2SC 120 MHz	CNUSC Montpellier France /1997	Academic	79	**27300** 37920	. .
113	SGI/Cray Y-MP T932/261024	NOAA/Geophysical Fluid Dynamics Laboratory (GFDL) Princeton USA /1997	Research Weather	26	**26960** 47120	. .
114	Sun Ultra HPC 10000	ATT USA /1997	Industry	64	**26450** 32000	19968 3072
115	Sun Ultra HPC 10000	ATT USA /1997	Industry	64	**26450** 32000	19968 3072
116	Sun Ultra HPC 10000	ATT USA /1997	Industry	64	**26450** 32000	19968 3072
117	Sun Ultra HPC 10000	Chalmers University of Technology Goteborg Sweden /1997	Academic	64	**26450** 32000	19968 3072
118	Sun Ultra HPC 10000	Sun San Diego USA /1997	Vendor	64	**26450** 32000	19968 3072
119	Sun Ultra HPC 10000	Sun San Diego USA /1997	Vendor	64	**26450** 32000	19968 3072
120	Sun Ultra HPC 10000	University of Tokyo Tokyo Japan /1997	Academic	64	**26450** 32000	19968 3072

Mannheim/Tennessee November 15, 1997

TOP500 **Supercomputers - Worldwide**

N *world*	Manufacturer Computer	Installation Site Location/Year	Field of Application	# Proc.	$\mathbf{R_{max}}$ R_{peak} [Mflop/s]	N_{max} $N_{1/2}$
121	Sun Ultra HPC 10000	Virginia Social USA /1997	Research Database	64	**26450** 32000	19968 3072
122	SGI/Cray Y-MP T932/24512	Commissariat a l'Energie Atomique (CEA) Grenoble France /1997	Research Energy	24	**26170** 43500	. .
123	SGI/Cray Y-MP T932/24512	Commissariat a l'Energie Atomique (CEA) Limeil France /1997	Research	24	**26170** 43500	. .
124	SGI/Cray Y-MP T932/241024	Ford Motor Company Dearborn USA /1996	Industry Automotive	24	**26170** 43500	. .
125	Fujitsu VPP300/12	Japan Atomic Energy Research Japan /1996	Research	12	**25600** 26400	. .
126	IBM SP2 77 MHz wide	Pacific Northwest National Laboratories/Batelle Richland USA /1997	Research	128	**25420** 39420	. .
127	SGI/Cray T3D MC256-8/464	Bear Stearns USA /1996	Industry Finance	256	**25300** 38000	40960 4918
128	SGI/Cray T3D SC256-8/264	Caltech/JPL Pasadena USA /1994	Research	256	**25300** 38000	40960 4918
129	SGI/Cray T3D MC256-8	Defense Research Agency Farnborough UK /1994	Classified	256	**25300** 38000	40960 4918
130	SGI/Cray T3D MC256-8	EXXON USA /1995	Industry Geophysics	256	**25300** 38000	40960 4918
131	SGI/Cray T3D MC256-8	Ecole Polytechnique Federale de Lausanne Lausanne Switzerland /1994	Academic	256	**25300** 38000	40960 4918
132	SGI/Cray T3D SC256-8/464	ZIB/Konrad Zuse-Zentrum fuer Informationstechnik Berlin Germany /1995	Academic	256	**25300** 38000	40960 4918
133	SGI/Cray T3E AC64-128	EDS/General Motors Auburn Hills USA /1996	Industry Automotive	64	**25190** 38000	39936 4896
134	Digital AlphaServer 8400 5/440	Lawrence Livermore National Laboratory Livermore USA /1996	Research	80	**24700** 70400	30712 4584
135	Digital AlphaServer 8400 5/440	Digital Equipment Corporation Maynard USA /1997	Vendor Benchmarking	64	**24700** 56300	30712 4584
136	Fujitsu VPP500/16	Reactor Nuclear Fuel Development Japan /1996	Research	16	**23600** 25600	21120 3360
137	NEC SX-4/12	Veritas DGC Crawley UK /1997	Industry Geophysics	12	**23260** 32000	. .
138	NEC SX-3/44R	Tohoku University Aramaki Japan /1993	Academic	4	**23200** 26000	6400 830
139	IBM SP P2SC 120 MHz	University of Umea Sweden /1997	Academic	66	**23180** 31680	. .
140	IBM SP P2SC 120 MHz	University of Houston USA /1997	Academic	64	**22550** 30720	27400 6500

Mannheim/Tennessee November 15, 1997

TOP500 **Supercomputers - Worldwide**

N *world*	Manufacturer Computer	Installation Site Location/Year	Field of Application	# Proc.	$\mathbf{R_{max}}$ R_{peak} [Mflop/s]	N_{max} $N_{1/2}$
141	Hewlett-Packard Exemplar X-Class	Arnold Engineering Development Center (AEDC) Arnold AFB USA /1997	Classified	48	**22310** 34560	29956 .
142	Hewlett-Packard Exemplar X-Class	Tohoku University Aramaki Japan /1997	Academic	48	**22310** 34560	29956 .
143	Hewlett-Packard Exemplar X-Class	Universitaet Leipzig Leipzig Germany /1997	Academic	48	**22310** 34560	29956 .
144	Hewlett-Packard Exemplar X-Class	Universitaet Mainz Mainz Germany /1997	Academic	48	**22310** 34560	29956 .
145	Fujitsu VPP500/15	Kyoto University Kyoto Japan /1994	Academic	15	**22150** 24000	. .
146	SGI/Cray T3E900 AC40-128	NOAA/Geophysical Fluid Dynamics Laboratory (GFDL) Princeton USA /1997	Research Weather	40	**21750** 36000	. .
147	SGI/Cray T3E900 AC40-128	Universitaet Rostock Germany /1997	Academic	40	**21750** 36000	. .
148	Sun Ultra HPC 10000	Micron Technology Boise USA /1997	Industry	52	**21680** 26000	19968 2496
149	Hitachi S-3800/380	Hokkaido University Sapporo Japan /1994	Academic	3	**21600** 24000	15680 760
150	Hitachi S-3800/380	Institute for Materials Research/Tohoku University Japan /1994	Academic	3	**21600** 24000	15680 760
151	Sun Ultra HPC 10000	Allstate Insurance Chicago USA /1997	Industry Database	50	**21050** 25000	19968 2496
152	SGI/Cray T3E AC52-128	AWI (Alfred Wegener Institut) Bremerhaven Germany /1996	Research	52	**20430** 31200	. .
153	SGI/Cray T3E AC52-128	University of Texas Austin USA /1997	Academic	52	**20430** 31200	. .
154	IBM SP2/110	KTH - Royal Institute of Technology Stockholm Sweden /1996	Research	110	**20370** 29210	. .
155	Sun Ultra HPC 10000	Ministry of the Interior Seoul Korea /1997	Classified	48	**20300** 24000	19968 2496
156	Sun Ultra HPC 10000	Ministry of the Interior Seoul Korea /1997	Classified	48	**20300** 24000	19968 2496
157	Sun Ultra HPC 10000	National Reserve Bank Moscow Russian Federation/1997	Industry	48	**20300** 24000	19968 2496
158	Sun Ultra HPC 10000	Oracle Corporation Redwood Shores USA /1997	Industry Database	48	**20300** 24000	19968 2496
159	Sun Ultra HPC 10000	Oracle Corporation Redwood Shores USA /1997	Industry Database	48	**20300** 24000	19968 2496
160	Sun Ultra HPC 10000	Toshiba Tokyo Japan /1997	Industry	48	**20300** 24000	19968 2496

Mannheim/Tennessee November 15, 1997

TOP500 **Supercomputers - Worldwide**

N *world*	Manufacturer Computer	Installation Site Location/Year	Field of Application	# Proc.	$\mathbf{R_{max}}$ R_{peak} [Mflop/s]	N_{max} $N_{1/2}$
161	SGI/Cray Y-MP T916/161024	Naval Oceanographic Office (NAVOCEANO) Bay Saint Louis USA /1997	Research	16	**19980** 29000	. .
162	SGI/Cray Y-MP T916/16512	Nissan Motor Kanagawa Japan /1997	Industry Automotive	16	**19980** 29000	. .
163	IBM SP P2SC 120 MHz	Chase Manhatten New York USA /1997	Industry Database	56	**19750** 26880	. .
164	SGI/Cray T3E900 AC36-128	North Carolina Supercomputing Center (NCSC) USA /1997	Academic	36	**19570** 32400	. .
165	IBM SP2/104	MCI USA /1994	Industry Database	104	**19340** 27620	. .
166	SGI/Cray ORIGIN 2000	Cray Research Eagan USA /1997	Vendor	128	**19230** 49920	32000 6000
167	SGI/Cray ORIGIN 2000	NCSA Urbana-Champaign USA /1997	Research	128	**19230** 49920	32000 6000
168	SGI/Cray ORIGIN 2000	Boston University Boston USA /1997	Academic	64	**19230** 24960	32000 6000
169	SGI/Cray ORIGIN 2000	Boston University Boston USA /1997	Academic	64	**19230** 24960	32000 6000
170	SGI/Cray ORIGIN 2000	Boston University Boston USA /1997	Academic	64	**19230** 24960	32000 6000
171	SGI/Cray ORIGIN 2000	C4 / Centre Europeo del Parallelismo de Barcelona Barcelona Spain /1997	Academic	64	**19230** 24960	32000 6000
172	SGI/Cray ORIGIN 2000	CRIHAN Japan /1997	Research	64	**19230** 24960	32000 6000
173	SGI/Cray ORIGIN 2000	Chalmers University of Technology Goteborg Sweden /1997	Academic	64	**19230** 24960	32000 6000
174	SGI/Cray ORIGIN 2000	Denso Japan /1997	Industry	64	**19230** 24960	32000 6000
175	SGI/Cray ORIGIN 2000	E-Systems/Raytheon USA /1997	Industry	64	**19230** 24960	32000 6000
176	SGI/Cray ORIGIN 2000	EDS USA /1997	Research	64	**19230** 24960	32000 6000
177	SGI/Cray ORIGIN 2000	INRIA-Lorraine/Centre Charles Hermite Nancy France /1997	Research	64	**19230** 24960	32000 6000
178	SGI/Cray ORIGIN 2000	Indiana University Bloomington USA /1997	Academic	64	**19230** 24960	32000 6000
179	SGI/Cray ORIGIN 2000	Kyoto University Kyoto Japan /1997	Academic	64	**19230** 24960	32000 6000
180	SGI/Cray ORIGIN 2000	Kyoto University Kyoto Japan /1997	Academic	64	**19230** 24960	32000 6000

Mannheim/Tennessee November 15, 1997

TOP500 **Supercomputers - Worldwide**

N *world*	Manufacturer Computer	Installation Site Location/Year	Field of Application	# Proc.	$\mathbf{R_{max}}$ R_{peak} [Mflop/s]	N_{max} $N_{1/2}$
181	SGI/Cray ORIGIN 2000	Lockheed Martin USA /1997	Research	64	**19230** 24960	32000 6000
182	SGI/Cray ORIGIN 2000	Los Alamos National Laboratory Los Alamos USA /1996	Research	64	**19230** 24960	32000 6000
183	SGI/Cray ORIGIN 2000	Los Alamos National Laboratory Los Alamos USA /1996	Research	64	**19230** 24960	32000 6000
184	SGI/Cray ORIGIN 2000	Los Alamos National Laboratory Los Alamos USA /1996	Research	64	**19230** 24960	32000 6000
185	SGI/Cray ORIGIN 2000	Los Alamos National Laboratory Los Alamos USA /1996	Research	64	**19230** 24960	32000 6000
186	SGI/Cray ORIGIN 2000	NASA USA /1997	Research	64	**19230** 24960	32000 6000
187	SGI/Cray ORIGIN 2000	NASA USA /1997	Research	64	**19230** 24960	32000 6000
188	SGI/Cray ORIGIN 2000	NASA/Ames Research Center/NAS Mountain View USA /1997	Research Aerospace	64	**19230** 24960	32000 6000
189	SGI/Cray ORIGIN 2000	NASA/Langley Research Center Langley USA /1997	Research	64	**19230** 24960	32000 6000
190	SGI/Cray ORIGIN 2000	NCSA Urbana-Champaign USA /1997	Research	64	**19230** 24960	32000 6000
191	SGI/Cray ORIGIN 2000	NCSA Urbana-Champaign USA /1997	Research	64	**19230** 24960	32000 6000
192	SGI/Cray ORIGIN 2000	NCSA Urbana-Champaign USA /1997	Research	64	**19230** 24960	32000 6000
193	SGI/Cray ORIGIN 2000	NCSA Urbana-Champaign USA /1997	Research	64	**19230** 24960	32000 6000
194	SGI/Cray ORIGIN 2000	NSWC USA /1997	Research	64	**19230** 24960	32000 6000
195	SGI/Cray ORIGIN 2000	Naval Oceanographic Office (NAVOCEANO) Bay Saint Louis USA /1997	Research Aerospace	64	**19230** 24960	32000 6000
196	SGI/Cray ORIGIN 2000	Naval Research Laboratory (NRL) Washington D.C. USA /1996	Research	64	**19230** 24960	32000 6000
197	SGI/Cray ORIGIN 2000	Naval Research Laboratory (NRL) Washington D.C. USA /1997	Research	64	**19230** 24960	32000 6000
198	SGI/Cray ORIGIN 2000	Princeton University Princeton USA /1997	Academic	64	**19230** 24960	32000 6000
199	SGI/Cray ORIGIN 2000	Sandia National Labs Albuquerque USA /1997	Research	64	**19230** 24960	32000 6000
200	SGI/Cray ORIGIN 2000	Sandia National Labs Albuquerque USA /1997	Research	64	**19230** 24960	32000 6000

Mannheim/Tennessee November 15, 1997

TOP500 **Supercomputers - Worldwide**

N *world*	Manufacturer Computer	Installation Site Location/Year	Field of Application	# Proc.	**R_{max}** R_{peak} [Mflop/s]	N_{max} $N_{1/2}$
201	SGI/Cray ORIGIN 2000	Sandia National Labs Albuquerque USA /1997	Research	64	**19230** 24960	32000 6000
202	SGI/Cray ORIGIN 2000	Silicon Graphics Mountain View USA /1997	Vendor Software	64	**19230** 24960	32000 6000
203	SGI/Cray ORIGIN 2000	Sylvest Management Systems USA /1997	Industry	64	**19230** 24960	32000 6000
204	SGI/Cray ORIGIN 2000	TRW USA /1997	Industry	64	**19230** 24960	32000 6000
205	SGI/Cray ORIGIN 2000	US Air Force San Antonio USA /1997	Classified	64	**19230** 24960	32000 6000
206	SGI/Cray ORIGIN 2000	University of Bergen Bergen Norway /1997	Academic	64	**19230** 24960	32000 6000
207	SGI/Cray ORIGIN 2000	University of Bergen Bergen Norway /1997	Academic	64	**19230** 24960	32000 6000
208	SGI/Cray ORIGIN 2000	University of Tokyo Tokyo Japan /1997	Academic	64	**19230** 24960	32000 6000
209	SGI/Cray ORIGIN 2000	University of Tokyo Tokyo Japan /1997	Academic	64	**19230** 24960	32000 6000
210	SGI/Cray ORIGIN 2000	University of Tokyo Tokyo Japan /1997	Academic	64	**19230** 24960	32000 6000
211	SGI/Cray ORIGIN 2000	University of Tokyo Tokyo Japan /1997	Academic	64	**19230** 24960	32000 6000
212	SGI/Cray ORIGIN 2000	University of Valencia Valencia Spain /1997	Academic	64	**19230** 24960	32000 6000
213	SGI/Cray ORIGIN 2000	Wright-Patterson Air Force Base USA /1996	Research	64	**19230** 24960	32000 6000
214	SGI/Cray ORIGIN 2000	Wright-Patterson Air Force Base USA /1997	Research	64	**19230** 24960	32000 6000
215	Fujitsu VPP300/9	ECMWF Reading UK /1997	Research Weather	9	**19225** 19800	. .
216	Digital AlphaServer 8400 5/612	Sandia National Labs Albuquerque USA /1997	Research	48	**19200** 58800	23032 4048
217	SGI/Cray T3E AC48-128	Mobil / Technical Center Tulsa USA /1997	Industry Geophysics	48	**18840** 28800	. .
218	Intel XP/S-MP 22	ETH Zuerich Switzerland /1995	Academic	450	**18700** 22500	. .
219	SGI/Cray POWER CHALLENGEarray	US Army Research Laboratory (ARL) Aberdeen USA /1995	Research	96	**18455** 28800	53000 20000
220	IBM SP2/98	Citicorp USA /1996	Industry Finance	98	**18310** 26030	. .

Mannheim/Tennessee November 15, 1997

TOP500 **Supercomputers - Worldwide**

N *world*	Manufacturer Computer	Installation Site Location/Year	Field of Application	# Proc.	$\mathbf{R_{max}}$ R_{peak} [Mflop/s]	N_{max} $N_{1/2}$
221	SGI/Cray ORIGIN 2000	University of Utah Salt Lake City USA /1997	Academic	60	**18120** 23400	. .
222	IBM SP P2SC 120 MHz	Maui High-Performance Computing Center (MHPCC) USA /1997	Research	51	**18010** 24480	. .
223	IBM SP P2SC 120 MHz	Western Geophysical Houston USA /1997	Industry Geophysics	50	**17660** 24000	. .
224	SGI/Cray T3E900 AC32-64	MIT/Lincoln Laboratory Cambridge USA /1997	Academic	32	**17400** 28800	28672 3200
225	NEC SX-3/34R	National Inst. for Molecular Science Okozaki Japan /1993	Research	3	**17400** 19500	6144 691
226	NEC SX-3/34R	VW (Volkswagen AG) Wolfsburg Germany /1996	Industry Automotive	3	**17400** 19500	6144 691
227	Sun Ultra HPC 10000	Enron Capital Houston USA /1997	Industry	40	**17120** 20500	19968 2496
228	Sun Ultra HPC 10000	Federal Express USA /1997	Industry Database	40	**17120** 20500	19968 2496
229	Sun Ultra HPC 10000	General Electric Supply USA /1997	Industry Database	40	**17120** 20500	19968 2496
230	Sun Ultra HPC 10000	National Semiconductors USA /1997	Industry Electronics	40	**17120** 20500	19968 2496
231	Sun Ultra HPC 10000	Universitaet Koeln Koeln Germany /1997	Academic	40	**17120** 20500	19968 2496
232	Fujitsu VPP300/8	Nippon University Japan /1996	Academic	8	**17100** 17600	41600 2080
233	Fujitsu VPP300/8	Osaka Gas Osaka Japan /1997	Industry Chemistry	8	**17100** 17600	41600 2080
234	Fujitsu/SNI VPP300/8	Universitaet Aachen Aachen Germany /1996	Academic	8	**17100** 17600	41600 2080
235	Fujitsu VPP300/8	Western Geophysical Houston USA /1997	Industry Geophysics	8	**17100** 17600	41600 2080
236	SGI/SNI ORIGIN 2000	Universitaet Dresden Dresden Germany /1997	Academic	54	**16470** 21060	. .
237	IBM SP2/85	NIH (National Institute of Health) Frederick USA /1995	Research	85	**16090** 22570	. .
238	SGI/Cray POWER CHALLENGEarray	NCSA Urbana-Champaign USA /1996	Research	64	**15598** 23040	37000 8500
239	IBM SP P2SC 120 MHz	Centre de Supercomputacio de Catalunya Barcelona Spain /1997	Academic	44	**15560** 21120	. .
240	SGI/Cray Y-MP T932/121024	EDS/General Motors Auburn Hills USA /1997	Industry Automotive	12	**15430** 21750	. .

Mannheim/Tennessee November 15, 1997

TOP500 **Supercomputers - Worldwide**

N *world*	Manufacturer Computer	Installation Site Location/Year	Field of Application	# Proc.	**R_{max}** R_{peak} [Mflop/s]	N_{max} $N_{1/2}$
241	SGI/Cray Y-MP T916/12512	Forschungszentrum Juelich (FZJ) Juelich Germany /1996	Research	12	**15430** 21750	. .
242	SGI/Cray Y-MP T916/12512	UCSD/San Diego Supercomputer Center San Diego USA /1997	Academic	12	**15430** 21750	. .
243	NEC SX-4/8	ATR Optical Communication Lab Japan /1996	Research	8	**15430** 16000	9984 860
244	NEC SX-4/8	German Aerospace Laboratory (DLR) Goettingen Germany /1996	Research Aerospace	8	**15430** 16000	9984 860
245	NEC SX-4/8	National Geographic Agency Japan /1996	Research	8	**15430** 16000	9984 860
246	Sun Ultra HPC 10000	Enron Capital Houston USA /1997	Industry	36	**15420** 18000	19968 2112
247	Sun Ultra HPC 10000	KT Freetel Seoul Korea /1997	Industry	36	**15420** 18000	19968 2112
248	IBM SP2/80	National Center for High Performance Computing Taiwan /1996	Academic	80	**15230** 21250	. .
249	Digital AlphaServer 8400 5/612	Lawrence Livermore National Laboratory Livermore USA /1997	Research	36	**15200** 44100	19176 4584
250	Digital AlphaServer 8400 5/612	Sandia National Labs Albuquerque USA /1997	Research	36	**15200** 44100	19176 4584
251	Intel XP/S35	Caltech Pasadena USA /1994	Research	512	**15200** 26000	23000 9000
252	Intel XP/S35	Oak Ridge National Laboratory Oak Ridge USA /1992	Research	512	**15200** 26000	23000 9000
253	TMC CM-5/256	Geco-Prakla Houston USA /1994	Industry Geophysics	256	**15100** 33000	26112 12032
254	TMC CM-5/256	Geco-Prakla Houston USA /1995	Industry Geophysics	256	**15100** 33000	26112 12032
255	TMC CM-5/256	Naval Research Laboratory (NRL) Washington D.C. USA /1992	Research	256	**15100** 33000	26112 12032
256	Hewlett-Packard Exemplar X-Class	Arnold Engineering Development Center (AEDC) Arnold AFB USA /1997	Classified	32	**15010** 23040	26848 1840
257	Hewlett-Packard Exemplar X-Class	CILEA Milano Italy /1997	Research	32	**15010** 23040	26848 1840
258	Hewlett-Packard Exemplar X-Class	DoD Classified USA /1997	Classified	32	**15010** 23040	26848 1840
259	Hewlett-Packard Exemplar X-Class	ETH Zuerich Switzerland /1997	Research	32	**15010** 23040	26848 1840
260	Hewlett-Packard Exemplar X-Class	Hilti Schaan Liechtenstein /1997	Industry	32	**15010** 23040	26848 1840

Mannheim/Tennessee November 15, 1997

TOP500 **Supercomputers - Worldwide**

N *world*	Manufacturer Computer	Installation Site Location/Year	Field of Application	# Proc.	**R_{max}** R_{peak} [Mflop/s]	N_{max} $N_{1/2}$
261	Hewlett-Packard Exemplar X-Class	Martin-Luther Universitaet Halle-Wittenberg Halle Germany /1997	Academic	32	**15010** 23040	26848 1840
262	Hewlett-Packard Exemplar X-Class	Ritzumeikan Japan /1997	Research	32	**15010** 23040	26848 1840
263	Hewlett-Packard Exemplar X-Class	Tokyo University Tokyo Japan /1997	Academic	32	**15010** 23040	26848 1840
264	Hewlett-Packard Exemplar X-Class	Yukawa Institute for Theoretical Physics (YITP) Japan /1997	Academic	32	**15010** 23040	26848 1840
265	Hewlett-Packard Exemplar X-Class	Zydeco Energy USA /1997	Research	32	**15010** 23040	26848 1840
266	IBM SP2/78	DKFZ Heidelberg Germany /1996	Research	78	**14890** 20710	. .
267	Hitachi SR2201/64	Central Res. Inst. of Electric Power Ind. Japan /1997	Research	64	**14890** 19000	38880 6720
268	Hitachi SR2201/64	Hitachi Mechanical Engineering Res. Lab. Japan /1997	Research	64	**14890** 19000	38880 6720
269	Hitachi SR2201/64	Hitachi RCS Ebina Japan /1996	Vendor	64	**14890** 19000	38880 6720
270	Hitachi SR2201/64	Japan Atomic Energy Research Japan /1996	Research	64	**14890** 19000	38880 6720
271	Hitachi SR2201/64	Suzuki Motor Japan /1997	Industry Automotive	64	**14890** 19000	38880 6720
272	SGI/Cray ORIGIN 2000	MS Financing USA /1997	Research	48	**14825** 18720	. .
273	IBM SP2/77	Leibniz Rechenzentrum Muenchen Germany /1995	Academic	77	**14720** 20450	. .
274	IBM SP2/77	Sears Product Service Group USA /1996	Industry Database	77	**14720** 20450	. .
275	IBM SP2/77	Sears Roebuck USA /1996	Industry Database	77	**14720** 20450	. .
276	Hitachi S-3800/280	Central Res. Inst. of Electric Power Ind. Japan /1996	Research	2	**14600** 16000	15680 570
277	IBM SP2/76	SARA (Stichting Academisch Rekencentrum) Amsterdam Netherlands /1995	Research	76	**14550** 20180	. .
278	IBM SP2/75	Atomic Weapons Establishment Aldermaston UK /1996	Classified	75	**14380** 19920	. .
279	IBM SP2/75	Pennsylvania State University USA /1997	Academic	75	**14380** 19920	. .
280	Digital AlphaServer 8400 5/466	MIT, Lab for Computer Science Cambridge USA /1997	Research	28	**14200** 26096	15344 3208

Mannheim/Tennessee November 15, 1997

TOP500 **Supercomputers - Worldwide**

N *world*	Manufacturer Computer	Installation Site Location/Year	Field of Application	# Proc.	$\mathbf{R_{max}}$ R_{peak} [Mflop/s]	N_{max} $N_{1/2}$
281	IBM SP P2SC 120 MHz	CENAPAD-MG/CO Belo Horizonte Brazil /1997	Research	40	**14160** 19200	. .
282	Intel Delta	Caltech Pasadena USA /1991	Academic	512	**13900** 20480	25000 7500
283	IBM SP2/72	Nuclear Power Engineering Japan /1995	Industry Energy	72	**13860** 19120	. .
284	Sun Ultra HPC 10000	ATT USA /1997	Industry	32	**13770** 16000	19968 1920
285	Sun Ultra HPC 10000	American Airlines USA /1997	Industry	32	**13770** 16000	19968 1920
286	Sun Ultra HPC 10000	CENAPAD-MG/CO Belo Horizonte Brazil /1997	Research	32	**13770** 16000	19968 1920
287	Sun Ultra HPC 10000	Ecole Normale Superieure France /1997	Research	32	**13770** 16000	19968 1920
288	Sun Ultra HPC 10000	General Motors/Hughes Missile Systems Company Tuscon USA /1997	Industry Aerospace	32	**13770** 16000	19968 1920
289	Sun Ultra HPC 10000	General Motors/Hughes Missile Systems Company Tuscon USA /1997	Industry Aerospace	32	**13770** 16000	19968 1920
290	Sun Ultra HPC 10000	Incyte Pharma USA /1997	Industry Pharmaceutics	32	**13770** 16000	19968 1920
291	Sun Ultra HPC 10000	Informix Menlo Park USA /1997	Industry Database	32	**13770** 16000	19968 1920
292	Sun Ultra HPC 10000	Micron Technology Boise USA /1997	Industry	32	**13770** 16000	19968 1920
293	Sun Ultra HPC 10000	Nippon Telegraph and Telephone (NTT) Tokyo Japan /1997	Industry	32	**13770** 16000	19968 1920
294	Sun Ultra HPC 10000	Nippon Telegraph and Telephone (NTT) Tokyo Japan /1997	Industry	32	**13770** 16000	19968 1920
295	Sun Ultra HPC 10000	Oracle Tokyo Japan /1997	Industry Database	32	**13770** 16000	19968 1920
296	Sun Ultra HPC 10000	WBSG/BB Data Germany /1997	Industry Database	32	**13770** 16000	19968 1920
297	Sun Ultra HPC 10000	Worldcom USA /1997	Industry Database	32	**13770** 16000	19968 1920
298	SGI/Cray Y-MP C916/16256	DKRZ Hamburg Germany /1995	Research Weather	16	**13700** 15238	10000 650
299	SGI/Cray Y-MP C916/161024	DOD/CEWES Vicksburg USA /1994	Research Mechanics	16	**13700** 15238	10000 650
300	SGI/Cray Y-MP C916/16256	DOE/Bettis Atomic Power Laboratory USA /1993	Research	16	**13700** 15238	10000 650

Mannheim/Tennessee November 15, 1997

TOP500 **Supercomputers - Worldwide**

N *world*	Manufacturer Computer	Installation Site Location/Year	Field of Application	# Proc.	**R_{max}** R_{peak} [Mflop/s]	N_{max} $N_{1/2}$
301	SGI/Cray Y-MP C916/16256	DOE/Knolls Atomic Power Laboratory USA /1993	Research	16	**13700** 15238	10000 650
302	SGI/Cray Y-MP C916/16512	Ford Motor Company Dearborn USA /1993	Industry Automotive	16	**13700** 15238	10000 650
303	SGI/Cray Y-MP C916/16512	Ford Motor Company Dearborn USA /1995	Industry Automotive	16	**13700** 15238	10000 650
304	SGI/Cray Y-MP C916/161024	Government USA /1992	Classified	16	**13700** 15238	10000 650
305	SGI/Cray Y-MP C916/161024	Government USA /1992	Classified	16	**13700** 15238	10000 650
306	SGI/Cray Y-MP C916/161024	Government USA /1992	Classified	16	**13700** 15238	10000 650
307	SGI/Cray Y-MP C916/161024	Government USA /1992	Classified	16	**13700** 15238	10000 650
308	SGI/Cray Y-MP C916/16512	Government USA /1994	Classified	16	**13700** 15238	10000 650
309	SGI/Cray Y-MP C916/16256	Government Communications Headquarters Benhall UK /1994	Classified	16	**13700** 15238	10000 650
310	SGI/Cray Y-MP C916/16512	KIST/System Engineering Research Institute (SSC) Korea /1993	Academic	16	**13700** 15238	10000 650
311	SGI/Cray Y-MP C916/161024	MITI - AIST - RIPS Tsukuba Japan /1994	Research	16	**13700** 15238	10000 650
312	SGI/Cray Y-MP C916/161024	NASA/Ames Research Center/NAS Moffett Field USA /1993	Research	16	**13700** 15238	10000 650
313	SGI/Cray Y-MP C916/16256	NERSC/LBNL Berkeley USA /1992	Research	16	**13700** 15238	10000 650
314	SGI/Cray Y-MP C916/16256	NOAA/National Centers for Environment Prediction Suitland USA /1994	Research	16	**13700** 15238	10000 650
315	SGI/Cray Y-MP C916/16512	National Security Agency USA /1994	Classified	16	**13700** 15238	10000 650
316	SGI/Cray Y-MP C916/161024	Naval Oceanographic Office (NAVOCEANO) Bay Saint Louis USA /1994	Research Weather	16	**13700** 15238	10000 650
317	SGI/Cray Y-MP C916/16512	Pittsburgh Supercomputing Center Pittsburgh USA /1994	Academic	16	**13700** 15238	10000 650
318	SGI/Cray Y-MP C916/161024	Tohoku University, Institute of Fluid Science Aramaki Japan /1994	Academic	16	**13700** 15238	10000 650
319	SGI/Cray Y-MP C916/161024	Wright-Patterson Air Force Base USA /1996	Research	16	**13700** 15238	10000 650
320	Sun Ultra HPC 6000	Southwest Bell St. Louis USA /1997	Industry	30	**13390** 15000	19968 1920

Mannheim/Tennessee November 15, 1997

TOP500 **Supercomputers - Worldwide**

N *world*	Manufacturer Computer	Installation Site Location/Year	Field of Application	# Proc.	$\mathbf{R_{max}}$ R_{peak} [Mflop/s]	N_{max} $N_{1/2}$
321	IBM SP2/69	PIK Potsdam Germany /1996	Research	69	**13350** 18320	. .
322	IBM SP2/68	DLR Koeln Germany /1996	Research	68	**13180** 18060	. .
323	SGI/Cray Y-MP T916/10512	Chrysler Motors Company USA /1997	Industry Automotive	10	**13150** 18125	. .
324	SGI/Cray Y-MP T916/101024	Toshiba Kanagawa Japan /1997	Industry	10	**13150** 18125	. .
325	SGI/Cray T3E900 AC24-128	TU Berlin Berlin Germany /1997	Research	24	**13050** 21600	. .
326	SGI/Cray T3E900 AC24-128	Technische Universitaet Braunschweig Braunschweig Germany /1997	Academic	24	**13050** 21600	. .
327	IBM SP2/67	Bell South USA /1995	Industry Database	67	**13010** 17790	. .
328	Fujitsu VPP300/6	CNRS/IDRIS Orsay France /1997	Research	6	**12850** 13200	. .
329	Fujitsu VPP300/6	Meiji University Japan /1996	Academic	6	**12850** 13200	. .
330	Fujitsu/SNI VPP300/6	Universitaet Darmstadt Darmstadt Germany /1996	Academic	6	**12850** 13200	. .
331	Fujitsu/SNI VPP300/6	Universitaet Erlangen Erlangen Germany /1997	Academic	6	**12850** 13200	. .
332	IBM SP2/66	University of Umea Sweden /1997	Academic	66	**12840** 17530	. .
333	SGI/Cray T3D MC128-8	Air Force/Eglin Air Force Base Eglin USA /1994	Classified	128	**12800** 19000	20736 3408
334	SGI/Cray T3D MCA128-8	CERFACS Toulouse France /1997	Research	128	**12800** 19000	20736 3408
335	SGI/Cray T3D MCA128-8	CNRS/IDRIS Orsay France /1995	Research	128	**12800** 19000	20736 3408
336	SGI/Cray T3D MC128-8	Commissariat a l'Energie Atomique (CEA) Limeil-Valenton France /1993	Research	128	**12800** 19000	20736 3408
337	SGI/Cray T3D MCA128-8	Compagnie Generale de Geophysique (CGG) Massy France /1995	Industry Geophysics	128	**12800** 19000	20736 3408
338	SGI/Cray T3D MCA128-8	Environmental Protection Agency USA /1995	Research	128	**12800** 19000	20736 3408
339	SGI/Cray T3D MCA128-8	NCAR (National Center for Atmospheric Research) Boulder USA /1997	Research Weather	128	**12800** 19000	20736 3408
340	SGI/Cray T3D MC128-8	Phillips Petroleum Company Bartlesville USA /1994	Industry Geophysics	128	**12800** 19000	20736 3408

Mannheim/Tennessee November 15, 1997

TOP500 **Supercomputers - Worldwide**

N *world*	Manufacturer Computer	Installation Site Location/Year	Field of Application	# Proc.	$\mathbf{R_{max}}$ R_{peak} [Mflop/s]	N_{max} $N_{1/2}$
341	SGI/Cray T3D MCA128-2	Reactor Nuclear Fuel Development Japan /1994	Research	128	**12800** 19000	20736 3408
342	SGI/Cray T3D MCA128-8	Tohoku University, Institute of Fluid Science Aramaki Japan /1994	Academic	128	**12800** 19000	20736 3408
343	SGI/Cray T3D MC128-8	University of Alaska - ARSC Fairbanks USA /1995	Academic	128	**12800** 19000	20736 3408
344	IBM SP2/65	CERN Geneva Switzerland /1995	Research	65	**12670** 17260	. .
345	Sun Ultra Enterprise 6000	Chase Manhatten London UK /1997	Industry	28	**12530** 14000	19968 1728
346	Sun Ultra Enterprise 6000	Chase Manhatten London UK /1997	Industry	28	**12530** 14000	19968 1728
347	Sun Ultra HPC 6000	KLA Instruments Semiconductor San Jose USA /1997	Industry Electronics	28	**12530** 14000	19968 1728
348	Sun Ultra HPC 6000	KT Freetel Seoul Korea /1997	Industry	28	**12530** 14000	19968 1728
349	IBM SP2/64	InterUniversity Israel /1996	Academic	64	**12500** 17000	26500 7000
350	Sun Ultra HPC 10000	American Express USA /1997	Industry Database	29	**12480** 14500	. .
351	IBM SP P2SC 120 MHz	Chase Manhatten New York USA /1996	Industry Database	35	**12420** 16800	. .
352	Intel XP/S-MP 15	ONERA Chatillon France /1995	Research Aerospace	294	**12250** 14700	. .
353	Sun Ultra HPC 6000	Comdisco Carlstadt USA /1997	Industry	27	**12090** 13500	. .
354	Sun Ultra HPC 6000	Posten Alingsas Sweden /1997	Industry	27	**12090** 13500	. .
355	Sun Ultra HPC 10000	Braun Germany /1997	Industry	28	**12050** 14000	19968 1728
356	Sun Ultra HPC 10000	Deutsche Telekom AG Darmstadt Germany /1997	Industry	28	**12050** 14000	19968 1728
357	Sun Ultra HPC 10000	GTE Communications USA /1997	Industry Database	28	**12050** 14000	19968 1728
358	Sun Ultra HPC 10000	News International UK /1997	Industry	28	**12050** 14000	19968 1728
359	Intel XP/S-MP 14	Oak Ridge National Laboratory Oak Ridge USA /1995	Research	288	**12000** 14400	. .
360	SGI/Cray Y-MP C916/14512	Ford Koeln Germany /1997	Industry Automotive	14	**11980** 13333	. .

Mannheim/Tennessee November 15, 1997

TOP500 **Supercomputers - Worldwide**

N *world*	Manufacturer Computer	Installation Site Location/Year	Field of Application	# Proc.	**R_{max}** R_{peak} [Mflop/s]	N_{max} $N_{1/2}$
361	Hewlett-Packard Exemplar X-Class	EPPE Spain /1997	Industry	24	**11760** 17280	26848 .
362	Hewlett-Packard Exemplar X-Class	Hyper Info Systems Korea /1997	Research	24	**11760** 17280	26848 .
363	Hewlett-Packard Exemplar X-Class	Rice University Houston USA /1997	Academic	24	**11760** 17280	26848 .
364	Hewlett-Packard Exemplar X-Class	SNPE France /1997	Industry	24	**11760** 17280	26848 .
365	Hewlett-Packard Exemplar X-Class	Sharp Osaka Japan /1997	Industry	24	**11760** 17280	26848 .
366	IBM SP2/60	Tokyo Metropolitan University Tokyo Japan /1995	Academic	60	**11750** 15930	. .
367	Sun Ultra HPC 6000	Bloomberg USA /1997	Industry Finance	26	**11660** 13000	19968 1728
368	Sun Ultra HPC 6000	Bloomberg USA /1997	Industry Finance	26	**11660** 13000	19968 1728
369	Sun Ultra HPC 6000	Bloomberg USA /1997	Industry Finance	26	**11660** 13000	19968 1728
370	Sun Ultra HPC 6000	Bloomberg USA /1997	Industry Finance	26	**11660** 13000	19968 1728
371	Sun Ultra HPC 6000	Bloomberg USA /1997	Industry Finance	26	**11660** 13000	19968 1728
372	Sun Ultra HPC 6000	Bloomberg USA /1997	Industry Finance	26	**11660** 13000	19968 1728
373	Sun Ultra HPC 6000	Bloomberg USA /1997	Industry Finance	26	**11660** 13000	19968 1728
374	Sun Ultra HPC 6000	Pratt and Whitney Hartford USA /1997	Industry	26	**11660** 13000	19968 1728
375	NEC SX-3/24R	National Institute of Fusion Science (NIFS) Japan /1993	Research	2	**11600** 13000	4352 516
376	NEC SX-4/6	Veritas DGC Houston USA /1996	Industry Geophysics	6	**11570** 12000	. .
377	IBM SP2 66 MHz wide	Argonne National Laboratory USA /1996	Research	64	**11400** 17000	. .
378	IBM SP P2SC 120 MHz	EP Company (A) Australia /1997	Industry Geophysics	32	**11380** 15360	19500 4100
379	IBM SP P2SC 120 MHz	EP Company (A) USA /1997	Industry Geophysics	32	**11380** 15360	19500 4100
380	IBM SP P2SC 120 MHz	EP Company (A) USA /1997	Industry Geophysics	32	**11380** 15360	19500 4100

Mannheim/Tennessee November 15, 1997

TOP500 **Supercomputers - Worldwide**

N *world*	Manufacturer Computer	Installation Site Location/Year	Field of Application	# Proc.	**R_{max}** R_{peak} [Mflop/s]	N_{max} $N_{1/2}$
381	IBM SP P2SC 120 MHz	EP Company (A) USA /1997	Industry Geophysics	32	**11380** 15360	19500 4100
382	IBM SP P2SC 120 MHz	EP Company (A) USA /1997	Industry Geophysics	32	**11380** 15360	19500 4100
383	IBM SP P2SC 120 MHz	EP Company (A) USA /1997	Industry Geophysics	32	**11380** 15360	19500 4100
384	IBM SP P2SC 120 MHz	EP Company (A) USA /1997	Industry Geophysics	32	**11380** 15360	19500 4100
385	IBM SP P2SC 120 MHz	EP Company (A) USA /1997	Industry Geophysics	32	**11380** 15360	19500 4100
386	IBM SP P2SC 120 MHz	EP Company (A) USA /1997	Industry Geophysics	32	**11380** 15360	19500 4100
387	IBM SP P2SC 120 MHz	IBM - Thomas Watson Research Center - Deep Blue Yorktown Heights USA /1997	Research Chess	32	**11380** 15360	19500 4100
388	IBM SP P2SC 120 MHz	Shell Intl. Petroleum Netherlands /1997	Industry Geophysics	32	**11380** 15360	19500 4100
389	Sun Ultra HPC 6000	Tokyo Mitsubishi Bank London UK /1997	Industry	25	**11220** 12500	. .
390	Sun Ultra HPC 10000	Allstate Insurance Chicago USA /1997	Industry Database	26	**11200** 13000	19968 1728
391	Sun Ultra HPC 10000	Banco International Mexico /1997	Industry Finance	26	**11200** 13000	19968 1728
392	IBM SP2/56	BC Tel Canada /1996	Industry	56	**11010** 14870	. .
393	SGI/Cray Y-MP T916/8256	Agency for Defense and Development Korea /1997	Classified	8	**10880** 14500	. .
394	SGI/Cray Y-MP T916/8256	Merck Co USA /1997	Industry Chemistry	8	**10880** 14500	. .
395	SGI/Cray Y-MP T916/8512	US Army Research Laboratory (ARL) Aberdeen USA /1997	Research	8	**10880** 14500	. .
396	SGI/Cray Y-MP T916/8512	US Army Research Laboratory (ARL) Aberdeen USA /1997	Research	8	**10880** 14500	. .
397	SGI/Cray T3E900 AC20-128	Universitaet Hannover / RRZN Germany /1997	Academic	20	**10870** 18000	. .
398	Sun Ultra HPC 6000	Abbey National London UK /1997	Industry	24	**10780** 12000	19968 1728
399	Sun Ultra HPC 6000	Abbey National London UK /1997	Industry	24	**10780** 12000	19968 1728
400	Sun Ultra HPC 6000	Bundesamt fr Seeschiffahrt und Hydrographie (BSH) Hamburg Germany /1997	Research	24	**10780** 12000	19968 1728

Mannheim/Tennessee November 15, 1997

TOP500 **Supercomputers - Worldwide**

N *world*	Manufacturer Computer	Installation Site Location/Year	Field of Application	# Proc.	**R_{max}** R_{peak} [Mflop/s]	N_{max} $N_{1/2}$
401	Sun Ultra HPC 6000	CSX Jacksonville USA /1997	Industry	24	**10780** 12000	19968 1728
402	Sun Ultra HPC 6000	Corporate Leasing USA /1997	Industry	24	**10780** 12000	19968 1728
403	Sun Ultra HPC 6000	Disney World Lake Buena Vista USA /1997	Industry	24	**10780** 12000	19968 1728
404	Sun Ultra HPC 6000	Informix Menlo Park USA /1997	Industry Database	24	**10780** 12000	19968 1728
405	Sun Ultra HPC 6000	LSI Logic Milpitas USA /1997	Industry	24	**10780** 12000	19968 1728
406	Sun Ultra HPC 6000	Nederlandse Aardolie Maatschappij BV Assen Netherlands /1997	Industry Geophysics	24	**10780** 12000	19968 1728
407	Sun Ultra HPC 6000	OR Telematique Paris France /1997	Industry	24	**10780** 12000	19968 1728
408	Sun Ultra HPC 6000	OR Telematique Paris France /1997	Industry	24	**10780** 12000	19968 1728
409	Sun Ultra HPC 6000	S3 Santa Clara USA /1997	Industry	24	**10780** 12000	19968 1728
410	Sun Ultra HPC 6000	Weizman Research Institute Israel /1997	Research	24	**10780** 12000	19968 1728
411	Sun Ultra HPC 10000	Itochu Electronics UK /1997	Industry	25	**10770** 12500	. .
412	Fujitsu VPP300/5	Fujitsu San Jose USA /1996	Vendor	5	**10720** 11000	. .
413	IBM SP P2SC 120 MHz	Shell Oil Corporation USA /1997	Industry Geophysics	30	**10670** 14400	. .
414	IBM SP P2SC 120 MHz	Universitaet Dortmund Germany /1997	Academic	30	**10670** 14400	. .
415	IBM SP2/54	Autozone Memphis USA /1995	Industry Database	54	**10640** 14340	. .
416	Fujitsu VPP500/7	Institute of Space Astronautical Science (ISAS) Tokyo Japan /1993	Research	7	**10525** 11200	. .
417	SGI/Cray ORIGIN 2000	Albert-Einstein-Institut - MPI Potsdam Germany /1996	Research	32	**10420** 12480	22000 4000
418	SGI/Cray ORIGIN 2000	BMW AG Muenchen Germany /1996	Industry Automotive	32	**10420** 12480	22000 4000
419	SGI/Cray ORIGIN 2000	Cambridge University Cambridge UK /1997	Academic	32	**10420** 12480	22000 4000
420	SGI/Cray ORIGIN 2000	DOD/CEWES Vicksburg USA /1996	Research	32	**10420** 12480	22000 4000

Mannheim/Tennessee November 15, 1997

TOP500 **Supercomputers - Worldwide**

N *world*	Manufacturer Computer	Installation Site Location/Year	Field of Application	# Proc.	$\mathbf{R_{max}}$ R_{peak} [Mflop/s]	N_{max} $N_{1/2}$
421	SGI/Cray ORIGIN 2000	Ecole Polytechnique Federale de Lausanne Lausanne Switzerland /1996	Academic	32	**10420** 12480	22000 4000
422	SGI/Cray ORIGIN 2000	Industrial Light Magic USA /1997	Industry Image Proc.	32	**10420** 12480	22000 4000
423	SGI/Cray ORIGIN 2000	Informix Menlo Park USA /1997	Industry Database	32	**10420** 12480	22000 4000
424	SGI/Cray ORIGIN 2000	Informix Menlo Park USA /1997	Industry Database	32	**10420** 12480	22000 4000
425	SGI/Cray ORIGIN 2000	Informix Menlo Park USA /1997	Industry Database	32	**10420** 12480	22000 4000
426	SGI/Cray ORIGIN 2000	Japan Information Processing Service Japan /1996	Industry	32	**10420** 12480	22000 4000
427	SGI/Cray ORIGIN 2000	Lockheed Martin USA /1997	Research	32	**10420** 12480	22000 4000
428	SGI/Cray ORIGIN 2000	Los Alamos National Laboratory Los Alamos USA /1996	Research	32	**10420** 12480	22000 4000
429	SGI/Cray ORIGIN 2000	Los Alamos National Laboratory Los Alamos USA /1996	Research	32	**10420** 12480	22000 4000
430	SGI/Cray ORIGIN 2000	Los Alamos National Laboratory Los Alamos USA /1996	Research	32	**10420** 12480	22000 4000
431	SGI/Cray ORIGIN 2000	Los Alamos National Laboratory Los Alamos USA /1996	Research	32	**10420** 12480	22000 4000
432	SGI/Cray ORIGIN 2000	Los Alamos National Laboratory Los Alamos USA /1996	Research	32	**10420** 12480	22000 4000
433	SGI/Cray ORIGIN 2000	Los Alamos National Laboratory Los Alamos USA /1996	Research	32	**10420** 12480	22000 4000
434	SGI/Cray ORIGIN 2000	Los Alamos National Laboratory Los Alamos USA /1996	Research	32	**10420** 12480	22000 4000
435	SGI/Cray ORIGIN 2000	Los Alamos National Laboratory Los Alamos USA /1996	Research	32	**10420** 12480	22000 4000
436	SGI/Cray ORIGIN 2000	MS Financing USA /1997	Research	32	**10420** 12480	22000 4000
437	SGI/Cray ORIGIN 2000	NCSA Urbana-Champaign USA /1997	Research	32	**10420** 12480	22000 4000
438	SGI/Cray ORIGIN 2000	NCSA Urbana-Champaign USA /1997	Research	32	**10420** 12480	22000 4000
439	SGI/Cray ORIGIN 2000	NCSA Urbana-Champaign USA /1997	Research	32	**10420** 12480	22000 4000
440	SGI/Cray ORIGIN 2000	NCSA Urbana-Champaign USA /1997	Research	32	**10420** 12480	22000 4000

Mannheim/Tennessee November 15, 1997

TOP500 **Supercomputers - Worldwide**

N *world*	Manufacturer Computer	Installation Site Location/Year	Field of Application	# Proc.	**R_{max}** R_{peak} [Mflop/s]	N_{max} $N_{1/2}$
441	SGI/Cray ORIGIN 2000	Nara Institute of Science and Technology (NAIST) Japan /1997	Academic	32	**10420** 12480	22000 4000
442	SGI/Cray ORIGIN 2000	Schlumberger Doll Research Ridgefield USA /1997	Industry Geophysics	32	**10420** 12480	22000 4000
443	SGI/Cray ORIGIN 2000	US Army Research Laboratory (ARL) Aberdeen USA /1997	Research	32	**10420** 12480	22000 4000
444	SGI/Cray ORIGIN 2000	US Army Research Laboratory (ARL) Aberdeen USA /1997	Research	32	**10420** 12480	22000 4000
445	SGI/Cray ORIGIN 2000	US Army Research Laboratory (ARL) Aberdeen USA /1997	Research	32	**10420** 12480	22000 4000
446	SGI/Cray ORIGIN 2000	US Army Space and Missile Defense Command Arlington USA /1997	Research	32	**10420** 12480	22000 4000
447	SGI/Cray ORIGIN 2000	US Army Space and Missile Defense Command Arlington USA /1997	Research	32	**10420** 12480	22000 4000
448	SGI/Cray ORIGIN 2000	US Army Space and Missile Defense Command Arlington USA /1997	Research	32	**10420** 12480	22000 4000
449	SGI/Cray ORIGIN 2000	US Army Space and Missile Defense Command Arlington USA /1997	Research	32	**10420** 12480	22000 4000
450	SGI/Cray ORIGIN 2000	US Army Space and Missile Defense Command Arlington USA /1997	Research	32	**10420** 12480	22000 4000
451	SGI/Cray ORIGIN 2000	US Army Space and Missile Defense Command Arlington USA /1997	Research	32	**10420** 12480	22000 4000
452	SGI/Cray ORIGIN 2000	US Army Space and Missile Defense Command Arlington USA /1997	Research	32	**10420** 12480	22000 4000
453	SGI/Cray ORIGIN 2000	US Army Space and Missile Defense Command Arlington USA /1997	Research	32	**10420** 12480	22000 4000
454	SGI/Cray ORIGIN 2000	US Army Space and Missile Defense Command Arlington USA /1997	Research	32	**10420** 12480	22000 4000
455	SGI/Cray ORIGIN 2000	US Army Space and Missile Defense Command Arlington USA /1997	Research	32	**10420** 12480	22000 4000
456	SGI/Cray ORIGIN 2000	US Naval Air Warfare Center China Lake USA /1997	Classified	32	**10420** 12480	22000 4000
457	SGI/Cray ORIGIN 2000	US Naval Air Warfare Center China Lake USA /1997	Classified	32	**10420** 12480	22000 4000
458	SGI/Cray ORIGIN 2000	Universidad Nacional Autonoma de Mexico Mexico /1997	Academic	32	**10420** 12480	22000 4000
459	SGI/Cray ORIGIN 2000	Universitaet der Bundeswehr Muenchen Germany /1997	Academic	32	**10420** 12480	22000 4000
460	SGI/Cray ORIGIN 2000	University of California - Santa Barbara Santa Barbara USA /1997	Academic	32	**10420** 12480	22000 4000

Mannheim/Tennessee November 15, 1997

TOP500 **Supercomputers - Worldwide**

N *world*	Manufacturer Computer	Installation Site Location/Year	Field of Application	# Proc.	**R_{max}** R_{peak} [Mflop/s]	N_{max} $N_{1/2}$
461	SGI/Cray ORIGIN 2000	University of Minnesota/Supercomputing Institute Minneapolis USA /1997	Academic	32	**10420** 12480	22000 4000
462	SGI/Cray ORIGIN 2000	Vertex Pharmaceuticals Cambridge USA /1997	Industry Chemistry	32	**10420** 12480	22000 4000
463	SGI/Cray ORIGIN 2000	Western Geophysical Houston USA /1997	Industry Geophysics	32	**10420** 12480	22000 4000
464	SGI/Cray ORIGIN 2000	Wright-Patterson Air Force Base USA /1997	Research	32	**10420** 12480	22000 4000
465	SGI/Cray ORIGIN 2000	Wright-Patterson Air Force Base USA /1997	Research	32	**10420** 12480	22000 4000
466	SGI/Cray ORIGIN 2000	Wright-Patterson Air Force Base USA /1997	Research	32	**10420** 12480	22000 4000
467	Sun Ultra HPC 10000	Alitalia SPA Rome Italy /1997	Industry	24	**10350** 12000	19968 1728
468	Sun Ultra HPC 10000	BMW South Africa /1997	Industry	24	**10350** 12000	19968 1728
469	Sun Ultra HPC 10000	Loisirs Paris France /1997	Industry	24	**10350** 12000	19968 1728
470	Sun Ultra HPC 10000	Nihon Unisys Japan /1997	Industry	24	**10350** 12000	19968 1728
471	Sun Ultra HPC 10000	Nihon University Tokyo Japan /1997	Academic	24	**10350** 12000	19968 1728
472	Sun Ultra HPC 10000	Salomon Bros. UK /1997	Industry	24	**10350** 12000	19968 1728
473	IBM SP P2SC 120 MHz	Shell Netherlands /1997	Industry Geophysics	29	**10320** 13920	. .
474	SGI/Cray Y-MP C916/121024	SARA (Stichting Academisch Rekencentrum) Amsterdam Netherlands /1997	Academic	12	**10270** 11430	. .
475	SGI/Cray Y-MP C916/12256	Tokyo Institute of Technology Tokyo Japan /1995	Academic	12	**10270** 11430	. .
476	IBM SP2 77 MHz wide	Tokyo Denryoko Japan /1996	Industry	45	**10220** 13860	. .
477	Sun Berkley NOW	University of California at Berkeley Berkeley USA /1997	Academic	100	**10140** 33400	32768 8192
478	IBM SP2/51	Shell Intl. Petroleum Netherlands /1996	Industry Geophysics	51	**10090** 13540	. .
479	IBM SP2/51	ShopKo Stores Green Bay USA /1996	Industry Database	51	**10090** 13540	. .
480	Intel XP/S25	NAL Japan /1994	Research	336	**10000** 16800	. .

Mannheim/Tennessee November 15, 1997

TOP500 **Supercomputers - Worldwide**

N *world*	Manufacturer Computer	Installation Site Location/Year	Field of Application	# Proc.	$\mathbf{R_{max}}$ R_{peak} [Mflop/s]	N_{max} $N_{1/2}$
481	Intel XP/S25	Space and Naval Warfare Systems Center (NRAD) San Diego USA /1994	Research	336	**10000** 16800	. .
482	IBM SP2/50	Deutsche Telekom AG Darmstadt Germany /1996	Industry Database	50	**9900** 13280	. .
483	IBM SP2/50	Federal Express USA /1995	Industry Database	50	**9900** 13280	. .
484	IBM SP2/50	Nihon Genken Tokai Japan /1995	Research	50	**9900** 13280	. .
485	Sun Ultra HPC 6000	France Telecom France /1997	Industry	22	**9887** 11000	19968 1728
486	Sun Ultra HPC 6000	GlaxoWellcom Raleigh USA /1997	Industry Pharmaceutics	22	**9887** 11000	19968 1728
487	IBM SP P2SC 120 MHz	TongMyong University of Information Technology Pusan Korea /1997	Academic	27	**9620** 12960	. .
488	SGI/Cray Y-MP T916/7256	Chrysler Motors Company USA /1997	Industry Automotive	7	**9590** 12600	. .
489	IBM SP2/48	Chip Manufacturer (C) USA /1997	Industry	48	**9530** 12750	. .
490	IBM SP2/48	Ensign UK /1996	Industry Geophysics	48	**9530** 12750	. .
491	IBM SP2/48	Institute of Math and Statistics Japan /1995	Research	48	**9530** 12750	. .
492	IBM SP2/48	NASA/Langley Research Center Hampton USA /1994	Research	48	**9530** 12750	. .
493	IBM SP2/48	Okazaki Bunshi Ken Japan /1994	Research	48	**9530** 12750	. .
494	IBM SP2/48	PCS Inc USA /1996	Industry	48	**9530** 12750	. .
495	IBM SP2/48	Rika dai Japan /1996	Academic	48	**9530** 12750	. .
496	IBM SP2/48	University of Michigan Michigan USA /1996	Academic	48	**9530** 12750	. .
497	Sun Ultra HPC 10000	May Speh USA /1997	Industry	22	**9513** 11000	19968 1728
498	Sun Ultra HPC 10000	News International UK /1997	Industry	22	**9513** 11000	19968 1728
499	Sun Ultra HPC 10000	News International UK /1997	Industry	22	**9513** 11000	19968 1728
500	Sun Ultra HPC 10000	News International UK /1997	Industry	22	**9513** 11000	19968 1728

Mannheim/Tennessee November 15, 1997

4 Statistics on Manufacturers and Continents

As basic statistics of the complete list, we give the number of systems installed with respect to the different manufacturers in the different countries or continents (Table 2) as well as the accumulated R_{max} values (Table 3) and R_{peak} values (Table 4) for those systems. More extensive analyses of the situation and its evolution over time can be found in the series of TOP500Reports (TOP500Report 1993 [3], 1994 [4], 1995 [5] and, 1996 [6]). Customized statistics can be obtained by using WWW at http://parallel.rz.uni-mannheim.de/top500.html or http://www.netlib.org/benchmark/top500.html.

Table 2: Number of Systems Installed

TOP500 Statistics — Number of Systems Installed					
	USA/Canada	Europe	Japan	others	Total
SGI/Cray	144	48	21	4	217
Cray only	63	36	11	3	113
SGI only	81	12	10	1	104
Sun	46	26	7	8	87
IBM	44	19	7	5	75
Fujitsu	2	8	19	1	30
NEC	3	7	17		27
Hewlett-Packard	11	9	5	1	26
Hitachi		1	14		15
Intel	9	2	2		13
others	10				10
Total	269	120	92	19	500

Mannheim/Tennessee November 15, 1997

Table 3: Installed $\mathbf{R_{max}}$

TOP500 Statistics — Installed R_{max} [Gflop/s]					
	USA/Canada	Europe	Japan	others	Total
SGI/Cray	4608.8	2683.6	442.7	104.3	7839.3
Cray only	3431.1	2499.6	268.0	93.9	6292.6
SGI only	1177.7	184.0	174.7	10.4	1546.7
Sun	697.3	320.9	108.8	114.7	1241.6
IBM	1249.2	303.1	74.3	62.9	1689.5
Fujitsu	27.8	393.1	1000.6	27.7	1449.3
NEC	164.9	211.2	771.6		1147.6
Hewlett-Packard	291.9	155.7	79.1	11.8	538.5
Hitachi		51.1	876.7		927.9
Intel	1708.5	31.0	113.5		1853.0
others	210.8				210.8
Total	8959.3	4149.6	3467.3	321.3	16897

Mannheim/Tennessee November 15, 1997

Table 4: Installed $\mathbf{R_{peak}}$

TOP500 Statistics — Installed R_{peak} [Gflop/s]					
	USA/Canada	Europe	Japan	others	Total
SGI/Cray	7136.4	4347.8	640.6	157.4	12282.2
Cray only	5594.8	4114.6	416.0	144.9	10270.0
SGI only	1541.6	233.2	224.6	12.5	2012.0
Sun	834.4	369.0	128.0	133.0	1464.4
IBM	1882.4	423.6	100.4	85.8	2492.2
Fujitsu	28.6	442.2	1131.8	28.6	1631.2
NEC	172.0	227.5	804.5		1204.0
Hewlett-Packard	489.6	241.9	121.0	17.3	869.8
Hitachi		67.2	1253.0		1320.2
Intel	2312.9	37.2	141.9		2492.0
others	513.5				513.5
Total	13421	6156.4	4321.3	422.1	24270

Mannheim/Tennessee November 15, 1997

References

[1] H. W. Meuer, *The Mannheim Supercomputer Statistics 1986—1992* in [3]

[2] J. J. Dongarra, *Performance of Various Computers Using Standard Linear Equations Software*, Computer Science Department, University of Tennessee, CS-89-85, 1994

[3] J. J. Dongarra, H. W. Meuer and E. Strohmaier, eds. *TOP500 Report 1993*, University of Mannheim, 1994

[4] J. J. Dongarra, H. W. Meuer and E. Strohmaier, eds. *TOP500 Report 1994*, SUPERCOMPUTER 60/61, volumne 11, number 2/3, June 1995

[5] J. J. Dongarra, H. W. Meuer and E. Strohmaier, eds. *TOP500 Report 1995*, SUPERCOMPUTER , volumne 12, number 1, January 1996

[6] J. J. Dongarra, H. W. Meuer and E. Strohmaier, eds. *TOP500 Report 1996*, SUPERCOMPUTER , volumne 13, number 1, January 1997