

User Ratings of Minicomputers and Small Business Computers

To determine the current level of user satisfaction with specific minicomputer systems and with minicomputers in general, Datapro Research Corporation recently conducted an extensive user survey. A Reader Survey Form was mailed to a sample of approximately 10,000 Datapro subscribers in June 1977.

By September 1, usable responses had been received from 816 users with a total of 2362 installed minicomputers and small business computer systems, a nearly 36 percent increase over the number of systems reported in last year's survey.

The users were asked to answer a number of questions designed to characterize their method of acquisition and their applications environment. The results are presented in Table 1, organized in terms of the responses for more than 60 popular minicomputer models from 30 vendors.

The users reported that their minicomputers are being used in a predictably broad spectrum of applications, which can be broadly categorized as follows:

	<u>No. of Users</u>	<u>% of Total</u>
Business data processing	548	67
Scientific/engineering computations	152	19
Real-time control	108	13
Data communications	194	24
Data base management	131	16
Program development	295	36

The percentage figures add up to well over 100 percent because many of the respondents were using their systems in multiple applications. The high incidence of business data processing usage is due in part to the inclusion in our survey of the widely used small business computer systems such as the IBM System/3 and System/32, Burroughs B 1700, and NCR Century Models 50 through 151.

The use of small computers for data base management showed a sizeable increase since last year's Datapro user survey. The number of responding users who checked this application category jumped from 12 percent in 1976 to 16 percent this year. Data communications usage also increased, from 22 percent in 1976 to 24 percent this year, while real-time control applications slipped from 15 percent in 1976 to 13 percent this year.

The users were asked how they acquired their systems, and the overall results were as follows:

	<u>No. of Users</u>	<u>% of Total</u>
Outright purchase	465	57.3
Rental from manufacturer	276	34.0
Third-party lease	71	8.7

This report presents the results of an extensive Datapro survey and summarizes the experience of 816 users representing 2362 installed minicomputers and small business computers. Extensive tables show how these users assessed the strengths and weaknesses of all the popular systems and their vendors.

The great majority of users of "classical" minicomputers such as those produced by DEC and Data General had purchased their machines outright, while users of small business computers from companies such as IBM and NCR were predominantly oriented toward rental from the manufacturer. The figures make it clear that third-party leasing is not widely practiced in the minicomputer field at this time.

The users were also asked who wrote the programs for their applications, with the following overall results:

	<u>No. of Users</u>	<u>% of Total</u>
In-house personnel	694	85
Computer manufacturer's personnel	139	17
Used "ready-made" programs from manufacturer	166	20
Used proprietary packages	135	17
Contract programming house	153	18

Here again, the percentage figures total well over 100 percent because numerous respondents called upon two or more sources for their applications programs.

Of the 816 survey respondents, 104 reported that they were using remote batch terminals and 703 said they were using interactive terminals with their systems. Here's a breakdown of the totals:

<u>Type of Terminal</u>	<u>No. of Users</u>	<u>Total No. of Terminals in Use</u>	<u>Average No. of Terminals per User</u>
Batch	104	820	7.9
Interactive	703	6795	9.7

The users were asked to report the extent of their usage of various types of "independent" peripheral devices from sources other than the minicomputer manufacturers. The overall results were as follows:

	<u>No. of Users</u>	<u>% of Total</u>
Using independent disk drives	206	25
Using independent tape drives	85	10
Using independent main memory	85	10
Using independent line printers	211	26



User Ratings of Minicomputers and Small Business Computers

TABLE 1. PROFILE OF SURVEY RESPONDENTS

Manufacturer and Model	Number of user replies	Number of computers represented	Acquisition Method			Applications						Source of Applications Programs				Use of Terminals		Use of Independent Peripherals				
			Outright purchase	Rental from mfr.	Third-party lease	Business data processing	Scientific/engineering	Real-time control	Data communications	Data base management	Program development	Written by user	Written by mfr.	Packages from mfr.	Proprietary packages	Contract prog. house	Batch	Interactive	Disk drives	Tape drives	Main memory	Line printers
Basic/Four (all models)	15	17	13	—	2	13	—	—	1	2	3	8	1	—	3	11	1	15	2	1	1	2
Burroughs:																						
L Series	5	5	3	2	—	4	—	—	—	—	1	3	3	—	—	2	0	1	—	—	—	—
B 700 Series	6	6	1	4	1	6	—	1	—	—	1	4	2	—	—	1	1	4	—	—	—	—
B 1700 Series	30	34	11	17	2	29	4	—	—	—	10	10	12	30	3	6	21	180	2	1	—	3
Burroughs Totals	41	45	15	23	3	39	4	1	10	10	14	37	8	13	3	8	22	185	2	1	—	3
Cincinnati Milacron (all models)	2	4	2	—	—	1	—	—	—	—	—	1	1	2	1	1	—	2	1	—	—	1
Computer Automation LSI-2	4	14	4	1	—	1	1	2	1	2	4	4	—	1	—	1	0	4	2	4	—	3
Control Data 1700	2	3	2	—	—	—	—	—	2	—	—	2	—	—	—	1	0	0	—	—	—	—
Data General:																						
Nova 2 and 2/10 Series	10	42	10	—	—	7	2	2	2	1	5	9	—	1	2	—	8	18	5	—	1	7
Nova 3 Series	6	6	6	—	—	4	2	—	1	—	3	5	1	1	2	3	3	19	1	2	—	2
Nova 800 Series	7	9	6	—	1	4	2	2	2	—	4	7	—	—	—	3	8	12	2	2	—	—
Nova Series, unspecified	4	160	4	—	—	1	—	2	—	—	1	4	—	1	1	16	5	15	2	2	1	3
Nova Totals	27	217	26	—	1	16	6	6	5	3	13	25	1	3	5	35	54	10	6	2	—	15
Eclipse S/200	7	13	6	—	—	4	2	2	3	—	1	7	—	—	—	1	97	2	1	—	—	3
Eclipse C/300	6	7	5	—	1	3	2	1	1	—	1	6	—	—	—	1	38	1	—	—	—	2
Eclipse C/330	4	4	3	—	1	4	1	—	2	—	1	3	—	—	—	3	15	1	—	—	—	—
Eclipse Series, unspecified	1	1	1	—	—	1	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—
Eclipse Totals	18	25	15	—	2	12	4	3	6	3	8	18	1	4	1	4	151	4	—	—	—	5
Data General Totals	45	242	41	—	3	28	10	9	11	6	21	43	2	7	6	39	205	14	6	2	—	20
Datapoint:																						
Datapoint 1100	18	139	3	14	1	13	—	—	9	1	3	15	—	5	1	2	18	13	1	—	—	2
Datapoint 2200	11	59	2	9	—	7	—	—	7	1	1	10	—	—	—	3	—	25	1	—	—	—
Datapoint 5500	21	54	7	15	—	18	—	—	10	7	8	21	1	4	5	6	4	137	4	1	—	5
Datapoint Totals	50	252	12	38	1	38	—	—	26	9	12	46	1	9	6	11	22	175	6	1	—	9
Digital Computer Controls D-116	3	368	3	—	—	2	—	1	2	—	—	3	—	—	—	—	1	11	3	2	1	3
Digital Equipment Corp.:																						
PDP-8 Series	19	48	17	—	1	6	6	2	6	3	7	12	—	2	4	2	1	434	2	4	4	9
PDP-11/03 thru 11/35	49	238	44	1	4	9	18	22	12	4	21	39	4	12	8	8	10	438	14	5	15	13
PDP-11/40 thru 11/70	75	106	61	1	13	39	33	18	26	19	34	68	7	9	18	9	120	1025	12	8	25	22
PDP-11, unspecified	9	51	7	1	1	3	4	2	3	1	3	8	—	1	1	1	—	65	6	4	3	4
PDP Totals	152	443	129	3	19	57	61	44	47	27	65	127	11	24	31	20	131	1962	34	21	47	48
Datasytem 300 Series	10	14	7	—	2	8	—	—	—	1	8	10	—	3	4	1	1	18	2	—	—	2
Datasytem 500 Series	3	3	2	1	—	2	—	—	1	1	2	3	1	—	—	1	—	19	1	—	—	1
Digital Equipment Totals	165	462	140	4	21	67	62	44	48	29	75	140	12	27	35	22	132	1999	37	21	47	51
Digital Scientific (all models)	5	6	3	2	1	5	2	—	1	—	3	5	—	—	3	2	1	27	2	—	—	1
Four-Phase Systems:																						
Model IV/40	4	16	—	4	—	4	1	1	2	—	—	4	—	1	—	2	—	19	—	—	—	—
Model IV/70	15	25	—	14	1	9	—	—	6	—	2	13	1	2	3	3	40	168	1	1	—	—
Other models	3	6	—	3	—	2	—	—	2	1	1	2	—	1	—	1	—	22	1	—	—	1
Four-Phase Totals	22	47	—	12	1	15	1	1	10	1	3	19	1	4	3	5	42	209	2	1	—	1
General Automation SPC-16	14	65	11	—	2	12	5	5	6	5	7	14	2	2	2	2	7	60	10	3	1	11
Harris Computer (all models)	6	7	6	—	—	1	2	—	2	2	3	5	2	2	2	1	3	74	2	2	1	4
Hewlett-Packard:																						
HP 2000 Series	10	13	10	—	—	—	4	1	2	1	2	9	4	6	3	2	1	368	—	—	—	1
HP 2100 Series	11	21	10	1	—	2	2	4	1	4	4	9	—	1	1	2	13	69	1	2	—	4
HP 21MX Series	15	134	14	2	2	6	4	4	2	6	9	14	2	—	—	1	129	152	4	3	2	9
HP 3000 Series	22	25	20	—	2	18	10	3	6	13	14	12	1	3	6	4	5	278	1	1	—	6
Other models	2	3	2	—	—	1	2	—	—	—	2	2	—	—	—	—	2	1	—	—	—	—
Hewlett-Packard Totals	60	196	56	3	4	27	22	12	12	24	31	46	7	10	10	9	150	868	6	6	2	20
Honeywell:																						
Honeywell 58 Series	3	3	—	3	—	3	—	—	—	—	—	2	1	1	—	—	—	2	—	—	—	—
Honeywell 700 Series	3	37	4	2	—	—	—	—	3	1	1	2	1	—	—	—	—	104	—	1	—	—
Honeywell Level 62	5	5	2	3	—	5	—	—	1	—	1	4	1	1	1	—	—	22	—	—	—	—
Other models	5	13	4	2	—	1	—	—	2	1	2	4	1	1	—	—	—	100	—	1	—	—
Honeywell Totals	16	58	10	10	—	9	1	—	6	2	4	12	4	3	1	—	—	228	—	2	—	—

**User Ratings of Minicomputers and
Small Business Computers**

TABLE 1. PROFILE OF SURVEY RESPONDENTS (Continued)

Manufacturer and Model	Number of user replies	Number of computers represented	Acquisition Method			Applications						Source of Applications Programs				Use of Terminals		Use of Independent Peripherals				
			Outright purchase	Rental from mfr.	Third-party lease	Business data processing	Scientific/engineering	Real-time control	Data communications	Data base management	Program development	Written by user	Written by mfr.	Packages from mfr.	Proprietary packages	Contract prog. house	Batch	Interactive	Disk drives	Tape drives	Main memory	Line printers
IBM: System/3— Model 6 Model 8 Model 10 Model 12 Model 15 Unspecified System/3 Totals	5 10 31 21 43 9 119	5 11 32 22 45 15 125	2 3 10 1 7 1 24	3 7 20 19 33 1 88	— — 1 1 3 3 2	5 10 29 21 42 8 115	1 — 1 3 1 — 6	1 — — — 3 — 4	1 2 1 2 14 8 22	— — 1 — 8 — 9	1 2 4 4 19 2 37	4 8 30 21 41 9 112	1 1 1 5 1 — 8	1 2 5 4 7 2 21	2 — 3 3 13 32 22	2 — 3 11 274 0 51	— 1 2 2 274 25 304	— — 10 — 2 1 22	— — — — 1 1 2	— — 11 — 4 1 16	— — 10 — 3 9 25	— — 3 3 1 1 1 25
System/7 System/32 System/360 Model 20 IBM 1130 IBM 1800 IBM 5100 IBM Totals	19 36 2 14 8 4 202	23 93 4 15 14 8 276	4 4 2 9 4 7 53	14 32 — 4 1 — 139	— 0 — 1 — — 8	— — — 8 2 1 17	— 0 — 1 7 1 20	4 4 — 5 1 — 35	1 1 — 1 — — 14	1 8 3 5 1 3 55	11 24 2 13 8 3 173	5 5 — 3 1 — 23	4 14 — 3 4 2 48	3 4 — 7 1 — 36	1 9 — 1 — — 36	121 286 — — 200 — 372	286 5 — — 5 — 602	1 1 0 6 2 — 32	1 0 2 2 1 — 9	— 0 0 5 1 — 22	— — — 5 2 — 16	— 1 0 2 1 — 36
Interdata: Interdata Model 70 Interdata 7/16 Interdata 7/32 Other models Interdata Totals	5 1 5 4 15	16 4 5 5 30	5 2 5 4 16	— — — — —	1 1 4 — 9	1 — 1 — 2	— 1 — — 1	— — — — —	— — — 2 — 2	3 — 4 1 8	5 2 5 2 14	— — 1 — 1	1 — 2 — 3	— — 1 — 3	— 0 0 2 0	19 3 25 7 54	4 2 4 2 11	1 2 4 2 7	2 — 3 — 5	3 2 4 3 12		
Jacquard J100 Litton (all models)	2 3	2 4	2 3	— —	1 3	— —	— —	— —	— —	1 —	2 —	— 1	— —	— —	— —	— —	— —	— —	— —	— —	— —	
Microdata: REALITY Other models Microdata Totals	14 2 16	34 2 36	8 2 10	— — —	4 1 12	— — —	1 — 1	— — 3	2 1 6	5 1 6	10 2 12	1 — —	— — —	4 4 4	4 2 4	190 3 193	— — —	— — —	— — —	— — —	— — —	
Modcomp (all models)	5	5	4	—	1	2	2	2	—	1	3	—	1	—	1	56	1	—	—	—	2	
NCR: Century 50 & 100 Century 101 Century 151 Century Totals NCR 299/399/499 NCR 8200/8250 NCR Totals	7 19 6 32 3 9 44	8 24 6 38 32 9 79	3 3 5 6 2 4 12	2 12 1 19 1 5 24	7 19 6 — 32 9 44	1 1 — — — — 2	— — — 2 — — 2	— 1 1 2 — — 2	— 1 1 1 — — 2	2 4 1 7 1 1 9	7 18 6 31 2 5 38	3 8 2 11 2 2 14	4 8 4 3 1 1 5	— 3 — 3 6 2 11	2 3 1 1 2 2 3	0 6 1 17 1 2 44	0 3 — 4 1 2 5	1 3 — 2 1 — 3	2 — — — — — —	— 3 — 3 — — 3		
Prime Computer (all models)	4	4	3	1	2	2	1	—	2	3	4	4	—	1	—	7	32	1	1	—	1	
Raytheon (all models)	3	3	2	1	—	2	1	—	1	1	1	3	—	—	—	0	10	—	—	—	—	
Singer (ICL) System Ten	7	36	5	—	2	5	—	1	1	1	4	2	2	—	4	665	1	1	—	2		
Sycor 440	3	8	—	3	1	3	—	—	1	—	3	3	—	—	—	0	8	—	1	—	—	
Systems Engineering Labs (all models)	2	2	2	—	—	1	2	1	—	1	1	2	—	—	1	0	8	1	2	1	2	
Texas Instruments (all models)	5	10	4	—	1	—	2	2	1	—	3	5	1	—	1	0	8	3	—	—	—	
Univac: Univac/Varian 620 Series Univac/Varian V70 Series Univac/Varian Totals Univac 90/30 Univac Totals	2 5 7 15 22	16 11 27 16 43	2 4 6 2 8	— — — 12 12	— 1 2 13 15	— — 1 4 5	1 2 3 — 3	1 — 3 4 6	1 — 2 — 3	— — — 8 11	2 1 3 15 20	2 — — 3 3	— — 1 4 5	— — 1 6 7	— 1 1 2 3	0 329 930 62 992	601 1 2 3 6	1 1 2 3 6	2 1 3 — 2	1 1 2 — 10	2 2 4 6 10	
Wang Labs, 2200 Series	16	21	11	2	1	12	5	—	1	5	8	13	1	3	2	4	0	11	2	1	4	
All Other Manufacturers	17	20	12	1	2	11	3	1	3	1	3	13	3	2	2	3	9	46	7	4	1	6
GRAND TOTALS	816	2362	465	276	71	548	152	108	194	131	295	694	139	166	135	153	820	6795	206	85	85	211

**User Ratings of Minicomputers and
Small Business Computers**

TABLE 2. USER RATINGS

Manufacturer and Model	No. of User Replies	No. of Computers Represented	Average Length of Time in Use, Months	Average Memory Size, Words or Bytes	Weighted Average User Ratings*											
					Ease of operation	Reliability of mainframe	Reliability of peripherals	Responsiveness of maintenance service	Effectiveness of maintenance service	Technical support	Operating system	Compilers and assemblers	Applications programs	Ease of programming	Ease of conversion	Overall satisfaction
Basic/Four (all models)	15	17	30	40KB	3.6	3.7	3.0	3.3	3.5	2.9	3.5	3.3	2.6	3.7	3.1	3.3
Burroughs:																
L Series	5	5	16	11KB	3.6	3.4	3.4	3.0	3.2	3.2	3.8	3.3	2.8	3.3	3.4	3.4
B 700 Series	6	6	24	35KB	2.8	3.0	2.2	2.7	1.8	1.8	2.3	2.0	2.3	2.4	1.7	2.4
B 1700 Series	30	34	23	137KB	3.8	3.0	2.4	2.6	2.3	2.2	3.6	3.4	2.9	3.5	3.2	3.0
Burroughs Totals	41	45	23	107KB	3.7	3.1	2.5	2.6	2.4	2.3	3.5	3.2	2.8	3.3	3.1	3.0
Cincinnati Milacron (all models)	2	4	5	64KB	3.0	3.5	3.5	2.5	2.5	3.5	2.5	2.5	3.0	3.0	3.0	3.0
Computer Automation LSI-2	4	14	46	54KW	2.5	3.0	2.8	1.0	1.5	2.3	3.7	3.3	2.0	2.8	2.5	2.5
Control Data 1700	2	3	—	120KW	3.5	3.5	3.0	3.5	3.5	2.5	1.0	1.0	3.0	3.0	—	3.0
Data General:																
Nova 2 and 2/10 Series	10	42	33	69KW	3.3	3.3	2.7	2.3	2.6	2.1	2.8	3.1	2.3	3.0	2.3	2.7
Nova 3 Series	6	6	6	75KW	3.7	3.7	3.3	3.0	3.0	2.8	2.8	2.8	2.5	3.2	2.8	3.0
Nova 800 Series	7	9	32	131KW	3.6	3.4	2.9	2.8	3.0	2.0	3.0	2.4	2.0	2.7	2.0	2.7
Nova Series, unspecified	4	160	36	28KW	3.5	2.8	3.3	3.0	3.3	2.3	3.3	3.0	2.0	3.0	2.5	2.8
Nova Totals	27	217	25	80KW	3.5	3.3	3.0	2.7	2.9	2.3	2.9	2.9	2.3	3.0	2.4	2.8
Eclipse S/200	7	13	15	102KW	3.1	2.9	2.9	2.6	2.6	2.0	3.0	2.8	2.7	3.0	2.8	2.9
Eclipse C/300	6	7	19	261KW	3.3	2.7	3.0	3.2	2.7	1.8	3.3	3.0	—	3.2	3.0	2.8
Eclipse C/330	4	4	6	352KW	3.8	3.5	3.0	3.8	3.3	3.3	3.3	3.5	3.0	3.5	3.7	3.5
Eclipse Series, unspecified	1	1	25	72KW	3.0	3.0	3.0	2.0	1.0	—	1.0	1.0	1.0	—	—	2.0
Eclipse Totals	18	25	14	209KW	3.3	2.9	2.9	2.2	2.7	2.2	3.1	2.9	2.4	3.2	3.1	2.9
Data General Totals	45	242	21	132KW	3.4	3.2	3.0	2.8	2.8	2.2	3.0	2.9	2.8	2.9	2.7	2.8
Datapoint:																
Datapoint 1100	18	139	18	15KB	3.5	3.2	2.8	3.2	2.8	2.6	3.5	3.1	2.4	2.7	2.9	3.2
Datapoint 2200	11	59	34	15KB	3.6	3.4	3.1	2.6	2.7	2.3	3.5	3.3	2.8	3.1	3.3	3.1
Datapoint 5500	21	54	14	55KB	3.6	3.4	3.1	3.0	3.0	2.6	3.5	3.5	3.0	2.9	3.1	3.1
Datapoint Totals	50	252	19	32KB	3.6	3.3	3.0	3.0	2.9	2.5	3.5	3.3	2.8	2.9	3.1	3.1
Digital Computer Controls D-116	3	368	21	43KW	3.3	3.0	3.0	—	—	3.0	3.0	3.0	—	3.0	—	3.0
Digital Equipment Corp.:																
PDP-8 Series	19	48	37	23KW	3.4	3.4	2.6	2.8	2.6	2.2	2.5	2.5	2.4	2.5	2.2	2.8
PDP-11/03 thru 11/35	49	238	22	51KW	3.2	3.2	2.9	2.8	2.9	2.5	2.8	2.8	2.7	2.9	2.6	3.0
PDP-11/40 thru 11/70	75	106	23	145KW	3.4	3.5	3.1	3.0	2.9	2.5	3.1	3.1	2.7	3.3	2.8	3.2
PDP-11, unspecified	9	51	25	44KW	3.1	3.4	2.9	3.1	2.7	2.4	2.4	2.8	2.1	3.1	2.7	2.9
PDP Totals	152	443	24	94KW	3.3	3.4	3.0	2.9	2.9	2.5	2.9	2.9	2.7	3.1	2.7	3.1
Datasystem 300 Series	10	14	11	21KW	3.7	3.7	3.5	3.6	3.3	3.0	3.2	3.2	3.1	3.7	3.3	3.5
Datasystem 500 Series	3	3	—	96KW	3.7	3.7	3.7	3.3	3.3	3.7	3.3	3.3	3.3	3.7	3.7	3.7
Digital Equipment Totals	165	462	23	90KW	3.3	3.4	3.0	3.0	2.9	2.5	2.9	2.9	2.7	3.1	2.8	3.1
Digital Scientific (all models)	5	6	38	70KB	3.4	3.6	3.0	2.8	2.8	2.8	2.7	3.3	3.0	2.8	3.6	3.4
Four-Phase Systems:																
Model IV/40	4	16	27	66KB	3.5	3.5	3.0	2.8	2.8	2.3	3.3	2.8	3.3	3.0	3.0	3.0
Model IV/70	15	25	26	83KB	3.4	3.6	3.2	3.0	2.9	2.3	2.5	2.7	2.9	3.3	2.8	3.1
Other models	3	6	8	69KB	3.0	3.7	3.7	2.7	3.3	2.3	3.3	3.5	3.3	3.5	4.0	3.3
Four-Phase Totals	22	47	24	78KB	3.4	3.6	3.2	2.9	2.9	2.3	2.8	2.8	3.1	3.3	2.9	3.1
General Automation SPC-16	14	65	32	37KW	3.0	3.0	2.9	2.1	2.1	1.8	1.9	2.6	2.2	2.8	2.9	2.3
Harris Computer (all models)	6	7	21	213KB	3.2	3.3	2.8	3.0	2.8	3.0	2.8	2.8	2.2	2.6	3.3	2.8
Hewlett-Packard:																
HP 2000 Series	10	13	42	44KW	3.5	3.4	3.1	3.0	3.4	2.7	2.8	3.1	2.8	3.5	2.6	3.0
HP 2100 Series	11	21	45	24KW	3.2	3.4	2.9	2.5	2.8	2.4	2.8	3.1	2.5	2.7	2.5	3.0
HP 21MX Series	15	134	29	45KW	3.1	3.3	3.2	2.7	2.8	2.5	2.7	2.6	2.3	3.1	3.1	2.9
HP 3000 Series	22	25	13	159KW	3.8	3.7	3.4	2.8	2.8	2.7	3.7	3.8	3.1	3.6	3.4	3.5
Other models	2	3	29	110KW	3.5	3.5	3.0	2.5	3.0	2.5	2.0	2.0	3.0	3.5	2.0	3.0
Hewlett-Packard Totals	60	196	28	88KW	3.4	3.5	3.2	2.7	2.9	2.6	3.1	3.2	2.8	3.3	3.4	3.2
Honeywell:																
Honeywell 58	3	3	41	10KB	3.3	3.3	2.7	3.0	2.7	2.0	2.0	2.0	2.0	3.3	3.0	2.3
Honeywell 700 Series	3	37	32	37KW	2.7	3.0	2.0	3.0	2.7	2.0	2.3	2.0	3.0	2.0	—	2.7
Honeywell Level 62	5	5	18	144KB	3.6	3.8	3.6	4.0	3.6	3.0	3.0	3.2	3.3	3.4	2.8	3.4
Other models	5	13	79	24KB	2.8	3.4	2.4	2.8	3.0	2.0	2.8	2.8	2.5	2.6	2.0	2.8
Honeywell Totals	16	58	40	—	3.1	3.4	2.8	3.3	3.1	2.3	2.6	2.7	2.9	2.9	2.6	2.9

*Weighted Average User Ratings are calculated on a scale of 4.0 for Excellent, 3 for Good, 2 for Fair, and 1 for Poor.

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**User Ratings of Minicomputers and
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TABLE 2. USER RATINGS (Continued)

Manufacturer and Model	No. of User Replies	No. of Computers Represented	Average Length of Time in Use, Months	Average Memory Size, Words or Bytes	Weighted Average User Ratings*													
					Ease of operation	Reliability of mainframe	Reliability of peripherals	Responsiveness of maintenance service	Effectiveness of maintenance service	Technical support	Operating system	Compilers and assemblers	Applications programs	Ease of programming	Ease of conversion	Overall satisfaction		
IBM:																		
System/3—																		
Model 6	5	5	64	16KB	3.6	3.6	3.6	3.6	3.8	3.4	3.2	3.4	3.3	3.4	3.5	3.4	3.4	
Model 8	10	11	16	27KB	3.3	3.8	3.6	3.2	3.2	2.9	3.3	3.2	2.7	3.2	2.8	2.8	3.5	
Model 10	31	32	56	26KB	3.4	3.7	3.4	3.5	3.4	2.9	3.4	3.4	2.7	3.4	2.9	3.3	3.4	
Model 12	21	22	19	54KB	3.7	4.0	3.5	3.4	3.5	3.0	3.2	3.2	3.0	3.5	3.5	3.5	3.3	
Model 15	43	45	27	165KB	3.4	3.7	3.4	3.4	3.4	3.0	3.1	3.2	2.8	3.3	3.1	3.1	3.2	
Unspecified	9	10	22	79KB	3.4	3.7	3.4	3.2	3.0	2.7	3.2	3.1	2.4	3.4	2.8	3.1	3.1	
System/3 Totals	119	125	19	85KB	3.5	3.8	3.4	3.4	3.4	3.0	3.2	3.2	2.8	3.4	3.1	3.1	3.3	
System/7	19	23	28	29KB	2.8	3.5	2.6	3.1	3.0	2.6	2.9	2.6	2.6	2.2	2.4	2.7	2.7	
System/32	36	93	16	22KB	3.6	3.8	3.6	3.6	3.5	3.1	3.3	3.2	2.7	3.3	3.1	3.1	3.3	
System/360 Model 20	2	2	120	16KB	3.0	3.5	3.5	4.0	4.0	3.0	3.0	3.0	3.0	3.0	3.0	3.5	3.5	
IBM 1130	14	15	102	16KW	3.1	3.7	3.0	3.4	2.9	2.3	2.5	2.5	2.4	2.8	2.4	3.0	3.0	
IBM 1800	8	14	91	26KW	2.9	3.8	2.9	3.0	3.3	2.6	3.4	3.1	3.2	2.9	2.3	3.3	3.3	
IBM 5100	4	4	8	48KW	3.5	4.0	4.0	3.5	3.5	2.7	3.5	2.5	2.7	3.5	2.7	3.0	3.0	
IBM Totals	202	276	26	—	3.4	3.7	3.3	3.4	3.3	2.9	3.1	3.1	2.8	3.2	2.9	3.0	3.0	
Interdata:																		
Interdata Model 70	5	16	45	67KB	3.2	3.4	3.3	3.0	3.3	3.0	3.0	2.8	2.0	3.5	2.7	3.3	3.3	
Interdata 7/16	1	4	6	64KB	3.5	3.0	3.5	3.0	3.0	3.0	3.0	—	—	3.5	2.0	3.0	3.0	
Interdata 7/32	5	5	24	237KB	3.0	3.0	2.8	2.8	2.8	2.3	2.8	3.0	2.0	3.2	2.8	2.6	2.6	
Other models	4	5	15	60KB	3.3	3.5	2.5	3.5	3.5	2.0	2.0	3.0	3.7	3.3	3.0	3.5	3.5	
Interdata Totals	15	30	25	118KB	3.2	3.3	2.9	3.1	3.1	2.5	2.7	2.9	3.0	3.3	2.8	3.1	3.1	
Jacquard J100	2	2	11	110KB	3.5	3.5	3.0	3.5	3.5	3.5	3.5	3.5	3.5	3.0	3.0	3.5	3.5	
Litton (all models)	3	4	29	19KB	2.3	2.0	1.7	2.0	1.7	1.3	2.0	2.0	2.7	1.0	1.0	2.0	2.0	
Microdata:																		
REALITY	14	34	15	55KB	3.7	3.1	3.2	3.4	3.2	2.9	3.2	3.0	2.4	3.2	3.0	3.2	3.2	
Other models	2	2	—	72KB	3.0	2.5	4.0	4.0	4.0	4.0	4.0	3.5	4.0	4.0	4.0	3.0	3.0	
Microdata Totals	16	36	15	151KB	3.6	3.1	3.3	3.5	3.2	3.0	3.3	3.1	2.6	3.3	3.1	3.2	3.2	
Modcomp (all models)	5	5	16	85KB	3.0	3.2	3.0	2.3	2.5	2.3	3.3	3.2	3.3	3.2	2.5	2.4	2.4	
NCR:																		
Century 50 & 100	7	8	73	27KB	3.1	2.4	2.6	3.4	2.7	2.1	2.9	2.6	2.5	2.9	2.7	2.7	2.7	
Century 101	19	24	48	54KB	3.4	3.6	2.8	3.3	2.9	2.2	3.2	3.1	2.9	3.3	3.3	3.2	3.2	
Century 151	6	6	17	120KB	3.2	3.2	2.7	3.2	2.7	2.7	3.0	3.0	2.4	3.0	3.2	3.0	3.0	
Century Totals	32	38	46	61KB	3.3	3.3	2.7	3.3	2.8	2.3	3.1	2.9	2.7	3.1	3.2	3.0	3.0	
NCR 299/399/499	3	32	15	19KB	3.0	3.0	2.7	3.0	3.3	2.3	3.0	3.5	3.5	3.3	2.3	3.0	3.0	
NCR 8200/8250	9	9	8	89KB	3.9	3.6	3.1	3.4	3.4	2.0	2.9	3.4	2.4	3.1	2.8	3.0	3.0	
NCR Totals	44	79	36	64KB	3.4	3.3	2.8	3.3	3.0	2.2	3.0	3.1	2.7	3.1	3.0	3.0	3.0	
Prime Computer (all models)	4	4	25	463KB	3.0	3.3	3.3	3.5	3.0	3.0	3.5	3.7	2.3	3.3	3.7	3.3	3.3	
Raytheon (all models)	3	3	12	117KB	2.7	2.0	1.7	2.0	1.7	2.0	1.0	1.3	2.0	2.3	1.5	2.0	2.0	
Singer (ICL) System Ten	7	36	43	42KB	3.7	3.3	3.0	2.9	2.9	1.9	3.0	2.9	2.0	3.0	2.8	2.6	2.6	
Sycor 440	3	8	11	64KB	3.3	3.7	3.0	2.3	2.7	2.3	2.3	2.7	2.0	2.7	2.5	3.0	3.0	
Systems Engineering Labs (all models)	2	2	—	96KW	3.5	4.0	3.0	2.5	2.5	2.5	3.0	3.0	1.0	3.5	3.5	3.0	3.0	
Texas Instruments (all models)	5	10	16	30KW	3.2	3.4	2.8	1.3	1.7	1.0	2.3	2.0	2.5	3.0	3.3	2.6	2.6	
Univac:																		
Univac/Varian 620 Series	2	16	92	20KW	3.0	4.0	3.5	4.0	4.0	2.0	2.0	2.0	1.0	3.0	3.0	3.5	3.5	
Univac/Varian V70 Series	5	11	7	132KW	3.5	3.5	3.2	2.5	2.5	2.5	2.5	2.8	3.0	2.4	2.5	2.8	2.8	
Univac/Varian Totals	7	27	24	95KW	2.9	3.1	3.3	2.8	2.8	2.4	2.4	2.6	2.3	2.6	2.7	3.0	3.0	
Univac 90/30	15	16	15	218KB	3.3	3.3	2.9	3.3	3.1	2.7	3.5	3.4	3.0	3.3	3.1	3.3	3.3	
Univac Totals	22	43	17	—	3.2	3.2	3.1	3.2	3.1	2.7	3.3	3.2	2.9	3.1	3.0	3.2	3.2	
Wang Labs, 2200 Series	16	21	13	26KB	3.7	3.4	3.0	2.9	2.6	2.7	2.9	3.4	2.3	3.6	3.2	3.2	3.2	
All Other Manufacturers	17	20	23	—	3.3	3.5	2.9	2.8	2.9	2.2	2.8	2.9	3.1	2.8	2.7	3.0	3.0	
GRAND TOTALS	816	2362	25	—	3.4	3.4	3.0	3.0	3.0	2.6	3.0	3.0	2.7	3.1	3.0	3.1	3.1	

*Weighted Average User Ratings are calculated on a scale of 4.0 for Excellent, 3 for Good, 2 for Fair, and 1 for Poor.

User Ratings of Minicomputers and Small Business Computers

▷ In this case, of course, the percentage figures total less than 100 percent because many of the respondents were not using any independent peripheral devices on their systems.

Finally, and most importantly, the users were asked to rate their minicomputers and the associated software and vendor support by assigning a rating of Excellent, Good, Fair, or Poor to each of 12 factors: ease of operation, reliability of mainframe, reliability of peripherals, responsiveness of maintenance service, effectiveness of maintenance service, technical support, operating system, compilers and assemblers, applications programs, ease of programming, ease of conversion, and overall satisfaction.

The resulting user ratings of more than 60 popular minicomputers and small business computers from 30 vendors are reported in Table 2. All ratings are expressed in terms of Weighted Averages, which were calculated by assigning a weight of 4 to each user rating of Excellent, 3 to Good, 2 to Fair, and 1 to Poor, and then dividing the sum by the number of users who rated each factor.

Prospective buyers should note that the small sample sizes for some of the minicomputer models make it unwise to draw firm conclusions from the indicated ratings. Rather, the ratings should be used as guides to potential product strengths and weaknesses that may call for further investigation in selecting the most suitable equipment for your needs. A minicomputer user's degree of satisfaction may depend heavily upon his specific application, the overall system in which the minicomputer is incorporated, and the quality of support and service provided by the vendor's nearest branch office. Also, as this survey clearly shows, many minicomputer users get

their software, technical support, and/or peripheral equipment from sources other than the minicomputer makers.

The ratings assigned by all of the responding users can be combined to form the following overall picture of user satisfaction with the current minicomputers and small business computers:

	<u>Weighted Average User Ratings</u>
Ease of operation	3.4
Reliability of mainframe	3.4
Reliability of peripherals	3.0
Responsiveness of maintenance service	3.0
Effectiveness of maintenance service	3.0
Technical support	2.6
Manufacturer's software:	
Operating system	3.0
Compilers and assemblers	3.0
Applications programs	2.7
Ease of programming	3.1
Ease of conversion	3.0
Overall satisfaction	3.1

None of these overall weighted average user ratings differs by more than 0.1 from the results of last year's survey. Therefore, we can conclude, as we did in 1976, that most minicomputer and small business computer users are fairly well pleased with their equipment and the associated software and maintenance service. The only significant weaknesses are in the areas of applications programs and technical support—and these are precisely the areas that have been neglected by many of the minicomputer vendors until quite recently. □