

A COMPARISON OF INTERNATIONAL
FIELD SERVICE ACTIVITIES, 1982

INPUT

About INPUT

INPUT provides planning information, analysis, and recommendations to managers and executives in the information processing industries. Through market research, technology forecasting, and competitive analysis, INPUT supports client management in making informed decisions. Consulting services are provided in the areas of computers, communications, and services.

The company carries out research. Working closely with clients on important issues, INPUT's staff interprets the research data and makes recommendations and innovations.

OFFICES

Headquarters

1943 Landings Drive
Mountain View, CA 94035
(415) 960-3990
Telex 171407

New York

Park 80 Plaza West-1
Saddle Brook, New Jersey
(201) 368-9471
Telex 134630

United Kingdom

INPUT, Ltd.
Airwork House
35 Piccadilly
London, W1V 9PB
England
01-439-8985
Telex 23116

Japan

Overseas Data Service Company, Ltd.
Shugetsu Building
No 12 - 7 Kita Aoyama
3-Chome Minato-ku
Tokyo, 107
Japan
(03) 400-7090
Telex 26487

needs. Clients receive reports, presentations, access to data on which analyses are based, and continuous consulting.

Many of INPUT's professional staff members have 10-20 years' experience in their areas of expertise. Most have held senior management positions in operations, marketing, or planning. INPUT is available to supply practical solutions to your business problems.

F-1982
C2E

AUTHOR

A COMPARISON OF INTERNATIONAL
FIELD SERVICE ACTIVITIES, 1982

DATE

BORROWER'S NAME

F-1982
C2E

INPUT has become a leading consulting services firm. Clients include the world's largest and most technologically advanced companies.

Sweden

Athena Konsult
P.O. Persson & Co AB
Box 22114
S-104 22 Stockholm
Sweden
08-52 07 20
Telex 17041

INPUT

Planning Services for Management

000032

A COMPARISON OF INTERNATIONAL
FIELD SERVICE ACTIVITIES, 1982

DECEMBER 1982



Digitized by the Internet Archive
in 2015

<https://archive.org/details/comparisonofinte02unse>

A COMPARISON OF INTERNATIONAL FIELD SERVICE ACTIVITIES, 1982

CONTENTS

	<u>Page</u>
I INTRODUCTION	1
II EXECUTIVE SUMMARY	7
A. General	7
B. Field Service Revenue Growth, 1982-1987	7
C. Field Service Expenses	9
D. Maintenance Pricing	9
E. Growth Of Software Maintenance	11
III USER AND VENDOR ANALYSIS OF IMPORTANT SERVICE CONSIDERATIONS	13
A. General	13
B. User Ranking Of Service Vendors	13
C. System Availability	15
D. Response Time	15
E. Repair Times	18
F. Pricing	18
IV VENDOR ANALYSIS	21
A. Introduction	21
B. Analysis Of Vendor Financial Performance	21
1. Revenue, Budget, And Profits	21
2. Field Service Revenue Sources	23
3. Typical Fault Call Costs, 1982-1983	26
4. Profit And Loss (P&L) Versus Cost Centre	26
5. Costs And Revenue Tracking	29
6. Accounting Treatment Of Spare Parts	29
C. Organisation And Staffing	32
1. Field Service Personnel Distribution	32
2. Typical Field Service Salaries	32
3. Field Engineering Performance Indicators/ Measurement Techniques	32
D. Field Service Pricing	36
1. Pricing Methodology	36
2. Maintenance Pricing By Equipment Category	36
3. Price Reductions By Delivery Mode	49
E. Equipment Distribution By Type Of Environment	49

	<u>Page</u>
F. Field Service Management Performance	49
1. Principal Activities For Field Service Managers, 1982-1983	49
2. Success In Resolving 1981 Problems	53
3. Involvement And Influence Of Field Service Management In Critical Issues, 1981-1982	53
4. Field Service Performance, 1981-1983	56
5. Most Significant Field Service Issues, 1981-1983	59
APPENDIX A: U.S. INDUSTRY SECTOR DEFINITIONS	63
APPENDIX B: QUESTIONNAIRES	67
User - U.S.	67
Vendor - U.S.	71

A COMPARISON OF INTERNATIONAL FIELD SERVICE ACTIVITIES, 1981

EXHIBITS

			<u>Page</u>
I	-1	Vendor Interviews - United States	3
	-2	User Interviews - By Industry - United States	5
II	-1	Forecast Field Service Maintenance Growth, 1982-1987	8
	-2	Trend Analysis Of Field Service Costs Per Call	10
III	-1	User Ratings Of Service Vendors	14
	-2	Vendor Perceptions Of System Availability	16
	-3	Vendor Perceptions Of Response Times	17
	-4	Vendor Perceptions Of Mean Time To Repair	19
IV	-1	Summary Of Respondent Vendor Financials	22
	-2	Forecast Of Revenue Per Field Maintenance Person	24
	-3	Source Of Field Service Revenue, 1982	25
	-4	Cost Breakdown Of A Typical Fault Call	27
	-5	Profit And Loss Or Cost Control Delegation	28
	-6	Costs And Revenue Tracking	30
	-7	Accounting Treatment Of Spare Parts	31
	-8	Field Service Personnel Distribution By Function	33
	-9	Average Salary Ranges	34
	-10	First-Line Managers' Performance Measurement	35
	-11	Maintenance Pricing Methodology	37
	-12	Average Charge-Out Hourly Rate	38
	-13	Maintenance Pricing - Western Europe	39
	-14	U.S. Maintenance Pricing Of Selected Vendors Of Large Mainframes	40
	-15	U.S. Maintenance Pricing Of Selected Vendors Of Medium Mainframes	41
	-16	U.S. Maintenance Pricing Of Selected Vendors Of Small Business And Minicomputer Systems Under \$25,000	42
	-17	U.S. Maintenance Pricing Of Selected Vendors Of Small Business Computers And Minicomputers Over \$25,000	43
	-18	U.S. Maintenance Pricing Of Selected Vendors Of Fast Printers	44

	<u>Page</u>
-19 U.S. Maintenance Pricing Of Selected Vendors Of Tape And Disk Drives	45
-20 U.S. Maintenance Pricing Of Selected Vendors Of Terminals	46
-21 U.S. Maintenance Pricing Of Selected Vendors Of Word Processors	47
-22 U.S. Maintenance Pricing Of Selected Vendors Of Communications Processors	48
-23 Price Reductions By Delivery Mode	50
-24 Equipment Distribution By Type Of Environment	51
-25 Principal Activities Of Field Service Managers	52
-26 Field Service Managers' Evaluation Of Their Success In Handling Problems	54
-27 Influence Of Field Service Management On Critical Issues, 1981-1982	55
-28 Vendors' Response On System Availability	57
-29 Vendors' View Of Response Time	58
-30 Vendors' Response On Repair Time And Mean Time Between Failures (MTBF)	60

I INTRODUCTION

I INTRODUCTION

- This report is produced as part of the 1982 European Field Service Programme.
- The data for the report were drawn from interviews and analyses performed during the development of the 1982 Annual Reports for the European and United States Field Service Programmes.
- The objectives of the report are to:
 - Highlight the similarities and differences between the European and United States field service issues.
 - Provide basic comparative information to executives with interests in both the European and United States markets.
 - Compare and contrast user attitudes towards service provided on both sides of the Atlantic.
- This report is written as a supplement to either of the two field service annual reports, not as an independent document.
- The outline of this report follows most closely the outline of 1982 Annual Report of Field Services in Europe.

- Exhibit I-1 displays United States vendors interviewed by the categories of equipment maintenance they provide.
- Exhibit I-2 provides a look at respondent user demographics by industry sector.
- The appendices from the United States 1982 Field Service Annual Report are provided for the reader to examine industry sector definitions and survey questionnaires.
- INPUT invites and welcomes client comments on the Field Service Programmes.

EXHIBIT I-1

VENDOR INTERVIEWS - UNITED STATES

COMPANY	MAINFRAME	SMALL BUSINESS SYSTEM	MINICOMPUTERS	MICROCOMPUTERS	PERIPHERALS	TERMINALS	WORD PROCESSORS	EXECUTIVE WORK STATIONS	DATA COMMUNICATIONS
A. B. Dick					•	•	•	•	
Apple Computer				•					
Applied Data Communications			•						
Astrocom		•							•
Beehive						•			
Bell and Howell	•	•	•	•	•				
Calcomp	•				•				
Cambex	•								
Centronics					•				
Control Data	•	•	•	•	•	•			•
Computer Automation		•	•						
Computer Communications									•
CFE		•	•	•	•	•	•	•	•
Data General	•	•	•	•	•	•	•	•	
Decision Data		•	•	•	•	•	•		
Delta Data						•			
Diablo Systems					•				
Floating Point	•		•						
Four Phase			•						
General Datacom									•
Hewlett Packard	•	•	•	•	•	•	•	•	
Honeywell	•	•	•	•	•	•	•	•	•
Indeserve		•	•	•	•	•	•	•	•

Continued

EXHIBIT I-1 (CONT.)

VENDOR INTERVIEWS - UNITED STATES

COMPANY	MAINFRAME	SMALL BUSINESS SYSTEMS	MINICOMPUTERS	MICROCOMPUTERS	PERIPHERALS	TERMINALS	WORD PROCESSORS	EXECUTIVE WORK STATIONS	DATA COMMUNICATIONS
ITT Courier					•	•			•
3M		•				•	•		
Modular Computer			•		•				•
NAS	•								
NBI							•		
Northern Telecom		•			•	•			•
Olivetti		•	•	•					
Paradyne			•	•	•	•	•	•	•
Printronic					•				
QI		•							
Raster Technologies					•				
Rolm									•
Scandata		•			•	•			
Siemens						•			
Storage Technology					•				
Stratus			•						
Tektronix						•			
Telegenics			•		•	•			
Triad		•	•						
TRT Data Products			•						
TRW		•	•	•	•	•	•	•	•
Xerox						•			
TOTALS	9	17	20	11	22	19	10	8	13

EXHIBIT I-2

USER INTERVIEWS - BY INDUSTRY -
UNITED STATES

INDUSTRY SECTOR	COMPANY SIZE			
	SMALL ≤\$100M	MEDIUM >\$100M- ≤\$250M	LARGE >\$250M	TOTAL
Discrete Manufacturing	13	11	15	39
Process Manufacturing	10	10	17	37
Transportation	7	3	9	19
Utilities	4*	4*	12	20
Banking and Finance	4*	4*	17	25
Insurance	13	5	7	25
Medical	9	9	3	21
Education	8	4	4	16
Retail	9	5	11	25
Wholesale	8	8	10	26
Federal Government	1*	4	4	9
State and Local Government	8	6	3	17
Services and Other	19	2†	6†	27
TOTAL	113	75	118	306

* Industry sector composed principally of large corporations.

† Industry sector composed principally of small corporations.

II EXECUTIVE SUMMARY



II EXECUTIVE SUMMARY

A. GENERAL

I. GENERAL

- Office automation (OA) and distributed data processing (DDP) systems continue to fulfill processing requirements that would otherwise have gone to mainframes. DDP is now an accepted concept; OA has not been fully defined nor has it been fully accepted by users in Europe or the United States.
- Field service vendors in the United States are nevertheless rapidly reorienting their thinking about information processing equipment service needs from traditional perspectives of hardware (systems and peripherals) towards modern thinking that includes office automation, data networks, software and communications.

B. FIELD SERVICE REVENUE GROWTH, 1982-1987

- The United States field service revenue base is expected to grow at a much healthier rate than that of Europe (19.8% versus 14.4%), as shown in Exhibit II-1.

EXHIBIT II-1

FORECAST FIELD SERVICE MAINTENANCE GROWTH, 1982-1987

YEAR	FIELD SERVICE REVENUE (\$ millions)		FIELD MAINTENANCE PERSONNEL (thousands)		REVENUE PER FIELD MAINTENANCE PERSON (\$ thousands)	
	Western Europe	U.S.	Western Europe	U.S.	Western Europe	U.S.
1982	\$ 4,756	\$ 9,130	58	147	\$82	\$62.1
1983	5,488	10,990	61	157	90	70.0
1984	6,311	13,460	64	166	99	81.1
1985	7,220	15,960	67	175	108	91.2
1986	8,216	19,320	69	184	119	105.0
1987	9,301	22,890	72	193	129	118.6
AAGR (percent)	14.4%	19.8%	4.6%	6.0%	9.5%	13.0%

SOURCE: INPUT Information Services Survey

- The Average Annual Growth Rate (AAGR) for revenue per field service engineer is also expected to be greater in the United States. The revenue per field service engineer in Western Europe is expected to remain higher in absolute terms until the end of the decade.

C. FIELD SERVICE EXPENSES

- United States field service organisations delegate revenue cost and P&L controls to much lower organisational levels than in Europe.
- Even though field service is highly profitable in the United States, the maintenance organisations are being required to increase growth and profitability and continue to cut costs.
- Trends in the distribution of fully burdened costs are compared in Exhibit II-2 and show that United States groups have so far been more successful than their European counterparts in containing cost increases.

D. MAINTENANCE PRICING

- United States vendors favour a bottom-up (cost-based) approach to maintenance pricing whereas their Western European counterparts favour the simple "percentage ratio of purchase price" approach.
- The increase in hourly rates for charge-out calls in the United States will increase 21% in 1983 in the mainframes category down to less than 1% in the small business systems category. The average increase in 1983, disregarding the high and low numbers already mentioned, is expected to be 8%.

EXHIBIT II-2

TREND ANALYSIS OF FIELD SERVICE COSTS PER CALL

COMPONENT	PERCENT CHANGE 1982-1983	
	Western Europe	U.S.
Average Cost	+16 %	+5.9%
Direct Labour	+ 0.3	-0.3
Travel Labour	+ 6	+0.9
Parts and Materials	0	+0.9
Travel Expense	-11	-4.5
Burden/Overhead	- 6	+3.0
Number of Calls Per Engineer Per Week	+ 6	+10.6

- More vendors in the United States offer maintenance price discounts for customer involvement than in Europe. The practice is spreading in the United States as United States vendors seek ways of reducing the cost of field service to end users.

E. GROWTH OF SOFTWARE MAINTENANCE

- In the United States, customer demands for consolidation of the after-market support functions are creating a demand for vendors to develop greater capabilities in software maintenance.
- As in Western Europe, the United States vendors have an opportunity to increase support revenues by 25% to 35% through software maintenance services. INPUT believes that significant increases in service revenue can be gained from software maintenance without measurable customer resistance.

III USER AND VENDOR ANALYSIS OF IMPORTANT
SERVICE CONSIDERATIONS

III USER AND VENDOR ANALYSIS OF IMPORTANT SERVICE CONSIDERATIONS

A. GENERAL

- This chapter will highlight the points and issues raised by users in both the Western European and United States surveys.
- The survey of 306 users in the United States was structured differently from the one used in Europe; therefore direct comparisons will be more limited than in Chapter IV on vendor issues.

B. USER RANKING OF SERVICE VENDORS

- Exhibit III-1 compares user ratings of service vendors who were rated in both surveys. These ratings are subjective evaluations by users and should not be interpreted as absolute values.
- Western European users were asked to rate vendors on a scale of 1 to 10. Their counterparts in the United States were asked to respond on a scale of high, medium, and low.

EXHIBIT III-1

USER RATINGS OF SERVICE VENDORS

VENDOR	WESTERN EUROPE *	U.S. USERS' RATINGS (percent)		
		HIGH	MEDIUM	LOW
Amdahl	10.0	89%	11%	0.0%
Burroughs	7.0	46	50	4
DEC	6.8	68	32	0
Hewlett-Packard	5.5	17	83	0
Honeywell	6.4	82	18	0
IBM	7.3	72	26	2
NCR	6.5	25	50	25
Univac	7.1	59	41	0
Wang	7.0	33	67	0

* European Scale: 1 = Poor; 10 = Excellent

- Amdahl appears to enjoy the best service image on both sides of the Atlantic.
- Hewlett-Packard elicits more neutral responses.
- NCR has both strong advocates and opponents in the United States.

C. SYSTEM AVAILABILITY

- United States service vendors provide consistently lower system availability than the Western Europeans, as shown in Exhibit III-2.
- According to the vendors, users in the United States are less critical about availability in all cases. There are no reliable indications from the users themselves, however, that this is the case.
- When users in the United States were asked to rank issues of greatest importance, they gave system availability a rating of 4.8 (on a scale of 1 to 5), a clear indication that current vendor performance is inadequate in this aspect.

D. RESPONSE TIME

- United States vendors respond to calls more quickly than Western European vendors, as shown in Exhibit III-3, despite the fact that United States users are less demanding than their Western European counterparts. Western European users are more critical in all categories but peripherals and word processors, according to respondent vendors.

EXHIBIT III-2

VENDOR PERCEPTIONS OF SYSTEM AVAILABILITY

TYPE OF EQUIPMENT	VENDOR PROVIDES UPTIME OF (percent)		UPTIME ACCEPTABLE TO USER (vendor perspective)	
	Western Europe	U.S.	Western Europe	U.S.
Large Systems	97.7%	97.6%	97.0%	95.0%
Medium Systems	97.4	95.8	94.9	92.4
Small Systems	98.5	96.1	97.5	93.9
Minicomputers	98.4	95.9	95.0	92.4
Peripherals	98.1	95.3	95.0	92.2
Terminals	99.0	96.7	97.5	92.8
Word Processors	98.0	94.0	98.0	93.8

EXHIBIT III-3

VENDOR PERCEPTIONS OF RESPONSE TIMES

TYPE OF EQUIPMENT	VENDOR RESPONDS IN: (hours)		USERS EXPECT RESPONSE IN: (hours)	
	Western Europe	U.S.	Western Europe	U.S.
Large Systems	2.0	1.3	1.5	2.2
Medium Systems	2.5	2.4	2.0	2.7
Small Systems	2.0	2.2	2.0	2.3
Minicomputers	2.8	3.3	1.5	5.4
Peripherals	12.9	6.4	15.0	8.8
Terminals	3.5	6.4	3.5	6.5
Word Processors	3.0	2.8	4.0	3.1

- It was noted in the 1982 Annual Report of Field Service in Europe that Western European respondent vendors were very unrealistic about the acceptable level of response to peripheral equipment calls in particular, and to response times in general.
- Users in the United States rated response time second in importance to availability at 4.3 on a scale of 1 to 5. This is, in their eyes, another aspect of system availability since repair times are consistently dropping.

E. REPAIR TIMES

- Western European field service engineers take longer to repair most categories of equipment than their United States counterparts, as shown in Exhibit III-4.
- The exceptions to the general observation about comparable repair times are in medium systems and peripherals.

F. PRICING

- Maintenance pricing moved from sixth place in 1981 to third place in 1982 among issues of importance to purchase decisions in the United States. Price increases have become a strong point of user resistance over the last 24 months, and vendors have become alarmed at the implications.
 - The source of much of their revenue growth was historically a regular annual increase in field service prices; user resistance to this impacts revenue growth and cuts profitability.

EXHIBIT III-4

VENDOR PERCEPTIONS OF MEAN TIME TO REPAIR

TYPE EQUIPMENT	REPAIR TIME (hours)	
	Western Europe	U.S.
Large Systems	2.9	2.2
Medium Systems	2.3	2.7
Small Systems	2.5	2.0
Minicomputers	3.8	1.9
Peripherals	1.5	1.8
Terminals	3.0	1.6
Word Processors	3.5	2.4

- Top management has placed stiff goals for service managers in margin contribution; if the "easy" source (price increases) cannot be relied upon, where can they turn?
- INPUT has recommended a number of solutions to this growing problem, which apply to both the United States and European markets, including integration of software maintenance, doubling software maintenance prices, expansion of the field service role into full after-sales support, using engineers for add-on sales, etc.

IV VENDOR ANALYSIS

IV VENDOR ANALYSIS

A. INTRODUCTION

- This chapter compares field service vendor views and financial performance in Western Europe and the United States.
 - Fifteen field service vendors were interviewed in Europe.
 - Forty-five service vendors were surveyed in the United States.
- The questionnaire used in European interviews was almost identical to that used for the United States interviews.
- Seventy-one percent of the United States respondents were either vice presidents or directors of field service; the remainder were in charge of field service planning.

B. ANALYSIS OF VENDOR FINANCIAL PERFORMANCE

I. REVENUE, BUDGET, AND PROFITS

- The average maintenance revenue generated by the typical United States vendor organisation in 1982 was approximately four times the average for Western European companies, as shown in Exhibit IV-1.

EXHIBIT IV-1

SUMMARY OF RESPONDENT VENDOR FINANCIALS

COMPONENT	1982		1983		GROWTH (percent)	
	Western Europe	U.S.	Western Europe	U.S.	Western Europe	U.S.
Total Sample Revenue (millions)	\$94.3	\$1,546.0	\$113.5	\$1,782.7	20.4%	15.3%
Average Field Service Revenue (thousands)	10,478	42,900	12,623	59,400	20.5	38.5
Average Field Service Budget (thousands)	8,539	30,600	9,430	39,000	10.4	27.5
Average Gross Margins (percent)	18.5%	28.7%	25.3%	34.3%	36.8	19.5
Average Profit before Tax (percent)	12.7	19.6	16.4	22.3	29.1	13.8

SOURCE: Vendor Surveys

- The United States respondents indicated that they expect their revenues to grow at a more rapid rate than those of the Europeans (38.5% compared to 20.5%).
- United States maintenance vendors continue to show higher profit margins than Europeans. However, the European respondents forecast a growth rate (20.1%) in profits which should overtake the United States by the end of 1984. This is the result of American companies putting pressure on their European service organisations to improve their performance.
- Note: The difference in United States total revenue growth of 15.3% and average revenue growth of 38.5% in Exhibit IV-1 is explained by the fact that not all respondents provided a forecast for 1983.
- The typical field service engineer in Europe continues to be allocated a heavier revenue burden than his United States counterpart (\$82,000 compared to \$62,000), as shown in Exhibit IV-2.
 - The revenue per field service engineer is growing at a more rapid rate in the United States (13% compared to 9.5%).

2. FIELD SERVICE REVENUE SOURCES

- Vendors in the United States are slightly ahead of European maintenance vendors in generating revenues from sources other than hardware service and providing spare parts, as shown in Exhibit IV-3.
- The average contribution columns in Exhibit IV-3 were calculated differently in the United States report.

EXHIBIT IV-2

FORECAST OF REVENUE PER FIELD MAINTENANCE PERSON

YEAR	FIELD SERVICE REVENUE (\$ millions)		FIELD MAINTENANCE PERSONNEL (thousands)		REVENUE PER FIELD MAINTENANCE PERSON (\$ thousands)	
	Western Europe	U.S.	Western Europe	U.S.	Western Europe	U.S.
1982	\$ 4,756	\$ 9,130	58	147	\$82	\$62.1
1983	5,488	10,990	61	157	90	70.0
1984	6,311	13,460	64	166	99	81.1
1985	7,220	15,960	67	175	108	91.2
1986	8,216	19,320	69	184	119	105.0
1987	9,301	22,890	72	193	129	118.6
AAGR (percent)	14.4%	19.8%	4.6%	6.0%	9.5%	13.0%

SOURCE: INPUT Information Services Survey

EXHIBIT IV-3

SOURCE OF FIELD SERVICE REVENUE, 1982

COMPONENT	PERCENT			
	AVERAGE CONTRIBUTION		RANGE	
	Western Europe	U.S.	Western Europe	U.S.
Hardware and Spares	79%	89%	40-100%	85-96%
Installation, Relocation, and Upgrades	8	2	3-15	1-5
Credits from Sales	4	3	4	1-5
Training and Documentation	5	1	5	1
Supplies	6	1	5-7	1
Systems Software	40	1.5	40	1-3
Applications Software	30	*	30	-

* Less than 1%

- For example, the average contribution to all vendors' revenues from system software was 1.5% in the United States.
- The average contribution for the two European vendors reporting system software revenues was 40% for those specific companies.

3. TYPICAL FAULT CALL COSTS, 1982-1983

- Exhibit IV-4 compares the cost breakdown of a typical fault call in Europe to the breakdown of four categories of equipment service in the United States.
- The average cost for all European equipment is nearly as high as the fully burdened cost of a mainframe call in the United States (\$262 compared to \$307).
- United States respondents indicated substantial shifting of the structure of fully burdened costs in small business systems and terminals.
- Except for peripheral maintenance, direct labour contributes substantially more to fully burdened costs in Europe than in the United States.
- Except for mainframe calls, the United States field service engineers are expected to take more calls per week than the average European field engineer.

4. PROFIT AND LOSS (P&L) VERSUS COST CENTRE

- The percentage of United States maintenance vendors that have moved to profit centre operations in the United States remains ahead of Western Europe, as shown in Exhibit IV-5.
- Trends in the United States would suggest that the number of vendors operating as P&L centres will stabilise at 90% within the next three years.

EXHIBIT IV-4
COST BREAKDOWN OF A TYPICAL FAULT CALL

COMPONENT	UNITED STATES											
	WESTERN EUROPE		MAINFRAMES		SMALL SYSTEMS		TERMINALS		PERIPHERALS			
	1982	1983	1982	1983	1982	1983	1982	1983	1982	1983		
Average Cost (\$)	\$262	\$305	\$307	\$331	\$245	\$247	\$132	\$147	\$129	\$136		
Direct Labour (%)	32%	33%	15%	NO CHANGE	27%	25%	22%	24%	39%	NO CHANGE		
Travel Labour (%)	18	19	9		21	24	18	19	16			
Parts and Materials (%)	23	23	26		14	19	25	21	27			
Travel Expense (%)	9	8	13		19	5	11	9	4			
Burden/Overhead (%)	18	17	37		19	27	24	27	7			
Number of Calls per FE per Week	9.7	10.3	4.1	5.6	13	17	11.8	14.4	10.8	12.0		

EXHIBIT IV-5

PROFIT AND LOSS OR
COST CONTROL DELEGATION

	WESTERN EUROPE	U.S.
Profit and Loss	80%	88%
Cost Control	20	12
Profit/Loss Delegation		
Headquarters	58	55
Regional	33	38
District	17	29
Branch	25	36

NOTE: Categories are multiple choice and are not mutually exclusive.

- Delegation of profitability control to lower levels of management is consistent with the approximately two-year advance United States field service operations have over European organisations in this area.

5. COSTS AND REVENUE TRACKING

- Exhibit IV-6 displays the differences between European and United States vendors regarding the level of cost control and revenue tracking implemented in the two markets.
- The survey questions addressing cost controls were segmented differently in the United States, and all data have been supplied in the comparative table.
- There is a significantly greater emphasis in the United States on controlling costs and revenues by product and product line than there is in Europe.
- It can be inferred that cost controls are more important at the branch office level in the United States than they are at the country level in Europe.

6. ACCOUNTING TREATMENT OF SPARE PARTS

- United States maintenance vendors are just as inconsistent in accounting for spares as expense versus capitalised goods as are their European counterparts, as shown in Exhibit IV-7.
- Other criteria for deciding whether to expense parts elicited comments such as:
 - 'We inventory parts manufactured at our company and expense parts we purchase from others'.
 - 'We expense all parts under \$500 that are expected to be used within 12 months'.

EXHIBIT IV-6

COSTS AND REVENUE TRACKING

LEVEL OF CONTROL	PERCENT ACTIVE	
	Western Europe	U.S.
Product Line	13%	42%
Product	27	42
Customer	13	16
Site	20	21
Region	7	N/A
Country	7	N/A
Branch	N/A	12
District	N/A	7
Department	N/A	5
Others	N/A	14

NOTE: Categories are multiple choice and are not mutually exclusive.

EXHIBIT IV-7

ACCOUNTING TREATMENT OF SPARE PARTS

CATEGORY	PARTS EXPENSED BELOW		PERCENT OF VENDORS WHO INVENTORY ALL PARTS
	AVERAGE VALUE	VALUE RANGE	
A. Western Europe All Systems	\$135	\$8-280	-
B. U.S. Vendor Categories			
Mainframes	\$ 79	\$50-100	14%
Small Business Systems	59	1-250	9
Minicomputers	145	50-500	14
Microcomputers	90	10-250	-
Terminals	116	1-500	-
Peripherals	77	10-250	8
Word Processors	94	50-250	-
Data Communications	118	15-250	-

C. ORGANISATION AND STAFFING

1. FIELD SERVICE PERSONNEL DISTRIBUTION

- Western European support organizations are growing at a much greater rate than are their United States counterparts, as shown in Exhibit IV-8.
- United States companies use 7% of their personnel in technical support versus 3.5% for Europe.
- Vendors on both sides of the Atlantic employ approximately 4% of the field service division in first-line management positions.

2. TYPICAL FIELD SERVICE SALARIES

- United States salaries are considerably higher than those in Western Europe, as shown in Exhibit IV-9.
- In addition, European vendors are increasing salaries at a much higher rate than are United States vendors.
- All United States positions above technical support engineer earn more in absolute dollars than the first-line manager in Western Europe.

3. FIELD ENGINEERING PERFORMANCE INDICATORS/MEASUREMENT TECHNIQUES

- In both the United States and Western Europe, first-line managers are measured first and foremost by the level of customer satisfaction, as shown in Exhibit IV-10.

EXHIBIT IV-8

FIELD SERVICE PERSONNEL DISTRIBUTION BY FUNCTION

PERSONNEL	1982		1983		CHANGE (percent)	
	Western Europe	U.S.	Western Europe	U.S.	Western Europe	U.S.
Average Field Service Employees	335	678	345	756	3.0%	11.5%
Average Number FS Engineers	236	476	242	539	3.0	13.2
Average Number Technical Support Engineers	22	37	26	41	18.2	10.8
Average Number FS Administrators	28	77	28	80	0	3.9
Average Number FS Supervisors	29	61	29	65	0	6.6
Average Number Field Line Managers	20	27	20	31	0	14.8

SOURCE: Vendor Surveys

EXHIBIT IV-9

AVERAGE SALARY RANGES

FUNCTION	U.S.				WESTERN EUROPE			
	AVERAGE YEARLY SALARY 1982 (\$ thousands)	RANGE OF SALARY (\$ thousands)	PERCENT INCREASE		AVERAGE YEARLY SALARY 1982 (\$ thousands)	RANGE OF SALARY (\$ thousands)	PERCENT INCREASE	
			1981	1982			1981	1982
Trainee Engineer	\$16.1	\$13.9-19.2	8.7%	8.5%	\$12.5	\$10.5-14.5	12.5%	9.9%
Qualified Engineer	20.4	17.3-23.5	8.9	8.9	13.5	12.5-17.1	14.1	12.5
Senior Engineer	23.1	22.6-28.3	11.6	9.3	16.6	11.6-18.2	14.3	12.4
Technical Support H/W	26.2	25.1-32.7	9.0	9.9	21.6	18.3-23.4	14.1	11.9
Technical Support S/W	27.3	23.3-33.2	9.6	10.1	18.8	14.4-20.5	15.0	13.5
Supervisor	28.3	23.6-31.6	8.7	8.7	20.9	17.5-23.1	14.7	12.0
Line Manager	29.9	25.8-39.9	9.7	9.9	24.0	22.3-29.5	13.6	10.9

EXHIBIT IV-10

FIRST-LINE MANAGERS' PERFORMANCE MEASUREMENT

RANK	CRITERION	INCLUDED	PERCENT OF ALL MENTIONS	
			Western Europe	U.S.
1	Customer Satisfaction	System performance, customer satisfaction, repeat calls, MTTR/MTBF,* response time	48%	47%
2	Financial	Revenue, costs, P&L, direct versus indirect, receivables overtime to base, asset to revenue ratio	35	47
3	No Measure		10	0
4	Employee Satisfaction	Attrition rate, employee satisfaction	7	65 †
Total			100%	‡

* Mean Time to Respond, Mean Time Between Failures.

† Included among MBO (Management by Objectives) measurements.

‡ U.S. survey structured such that "all mentions" total greater than 100%.

- United States vendors place a somewhat greater emphasis on financial performance at the first-line manager level. This is consistent with lower delegation of P&L accountability as indicated previously in this chapter.
- A slight difference in the construction of survey questionnaires forces a total of 100% in Western Europe but not in the United States. As a result of this difference, percentages in the two columns cannot be directly compared; only the relative weight of factors is comparable.

D. FIELD SERVICE PRICING

I. PRICING METHODOLOGY

- The primary approach to maintenance pricing in the United States is based on cost analysis using models containing the elements of mean time between failure, projected repair times, and other estimated cost factors, as shown in Exhibit IV-11.
- Europe and the United States find about equal popularity with pricing based on a simple ratio of list price for the equipment being serviced.
- Exhibit IV-12 provides a comparison between the average European charge out hourly rate and the United States rates by equipment category.

2. MAINTENANCE PRICING BY EQUIPMENT CATEGORY

- Exhibits IV-13 through IV-22 provide considerable comparative detail of United States maintenance prices versus purchase prices of equipment serviced.
- In nearly every case, the range of United States ratios of annual maintenance price to purchase price bracket the Western European ratios.

EXHIBIT IV-11

MAINTENANCE PRICING METHODOLOGY

CRITERION	PERCENT OF ALL MENTIONS	
	Western Europe	U.S.
Percent of Hardware Sales Price	32%	30%
Cost of Service	27	51
Competition	27	10
Other (corporate guidelines, nature and value of support required)	14	9
Total	100%	100.0%

EXHIBIT IV-12

AVERAGE CHARGE-OUT HOURLY RATE

CATEGORY	AVERAGE HOURLY RATE		PERCENT INCREASE
	1982	1983	
A. Western Europe All Systems	\$63	\$ 69	9.5%
B. U.S. Equipment Categories			
Mainframes	\$93.60	\$113.50	+21.0%
Small Business Systems	57.63	58.05	+ 0.7
Minicomputers	74.55	76.83	+ 3.1
Microcomputers	65.00	70.50	+ 8.5
Peripherals	87.00	96.00	+10.0
Terminals	59.29	65.00	+ 9.6
Word Processors	60.00	62.75	+ 4.6
Data Communications	50.00	56.00	+12.0

EXHIBIT IV-13

MAINTENANCE PRICING - WESTERN EUROPE

EQUIPMENT CATEGORY	AVERAGE PURCHASE PRICE (\$ thousands)	AVERAGE MONTHLY MAINTENANCE CHARGE (\$ hundreds)	AVERAGE ANNUAL MAINTENANCE AS PERCENT OF PURCHASE
Large Systems	\$1,400.0	\$6,000	5.0%
Medium Systems	800.0	3,300	5.0
Small Systems and Minicomputers	58.5	521	10.7
Microcomputers	2.0	20	12.0
Peripherals	6.0	45	9.0
Terminals	1.0	10	12.0
Word Processors	5.0	50	12.0
Data Communications	5.9	39	7.9

SOURCE: Vendor Interviews

EXHIBIT IV-14

U.S. MAINTENANCE PRICING OF SELECTED VENDORS OF LARGE MAINFRAMES

VENDOR	MODEL NUMBER	MEMORY SIZE OF BASIC CONFIGURATION	FIRST SHIPPED	AVERAGE PURCHASE PRICE	AVERAGE MONTHLY MAINTENANCE CHARGE	ANNUAL MAINTENANCE AS PERCENT OF PURCHASE PRICE
Amdahl	470 V/8	16 MB	1979	\$2,525,000	\$16,950	8.1%
Burroughs	B7850	6 MB	1980	3,150,000	9,900	3.3
CDC	Cyber 176	1.31 Million Characters	1976	4,426,800	13,537	3.7
Honeywell	DPS 8/70 M	4 MB	1982	2,054,919	8,772	5.1
IBM	3033 U	16 MB	1978	2,229,000	7,280	3.9
IBM	3081 K16	16 MB	1982	4,520,000	8,375	2.2
NAS	AS/9000N	4 MB	1981	1,995,000	7,161	4.3
UNIVAC	1100/80	4 MB	1977	2,293,000	5,543	2.9

EXHIBIT IV-15

U.S. MAINTENANCE PRICING OF SELECTED VENDORS OF MEDIUM MAINFRAMES

VENDOR	MODEL NUMBER	MEMORY SIZE OF BASIC CONFIGURATION	FIRST SHIPPED	AVERAGE PURCHASE PRICE	AVERAGE MONTHLY MAINTENANCE CHARGE	ANNUAL MAINTENANCE AS PERCENT OF PURCHASE PRICE
Burroughs	B 5930	1.5 MB	1981	\$210,000	\$600	3.4%
CDC	480-II Omega	1.05 MB	1978	279,000	1,915	8.2
DEC	VAX 11/780	1 MB	1977	219,100	1,137	6.2
Honeywell	DPS 80/20	2 MB	1980	483,748	2,456	6.1
IBM	4331 Group I	4 MB	1979	197,000	381	2.3
IBM	4341 Group I	12 MB	1979	516,000	1,139	2.7
Perkin-Elmer	3250	16 MB	1979	200,000	2,000	12.0
UNIVAC	1100/62	4 MB	1980	938,254	3,499	4.5

EXHIBIT IV-16

U.S. MAINTENANCE PRICING OF SELECTED VENDORS OF SMALL BUSINESS
AND MINICOMPUTER SYSTEMS UNDER \$25,000

VENDOR	MODEL NUMBER	MEMORY SIZE OF BASIC CONFIGURATION	FIRST SHIPPED	AVERAGE PURCHASE PRICE	AVERAGE MONTHLY MAINTENANCE CHARGE	ANNUAL MAINTENANCE AS PERCENT OF PURCHASE PRICE
IBM	System/32	8 KB	1975	\$23,490	\$168	8.6%
Texas Instruments	DS 990	64 KB	1979	9,995	114	13.7
Wang	VS-100	256 KB	1977	22,000	235	12.8
Basic Four	System 200	40 KB	1978	24,990	260	12.5
Burroughs	B 90	128 KB	1979	7,900	56	8.5
NCR	8150	32 KB	1978	18,300	192	12.6
Hewlett Packard	3000/30	256 KB	1979	24,925	220	10.6
DEC	Data System 336	128 KB	1980	25,000	242	11.6

EXHIBIT IV-17

U.S. MAINTENANCE PRICING OF SELECTED VENDORS OF SMALL BUSINESS COMPUTERS
AND MINICOMPUTERS OVER \$25,000

VENDOR	MODEL NUMBER	MEMORY SIZE OF BASIC CONFIGURATION	FIRST SHIPPED	AVERAGE PURCHASE PRICE	AVERAGE MONTHLY MAINTENANCE CHARGE	ANNUAL MAINTENANCE AS PERCENT OF PURCHASE PRICE
Data General	CS-50 Model C5	128 KB	1980	\$37,000	\$262	8.5%
Data Point	8630	256 KB	1981	33,500	240	8.6
DEC	Data System 356	256 KB	1980	41,900	288	10.6
Hewlett Packard	3000/40 SX	256 KB	1982	42,100	320	9.1
Honeywell	DPS 6/48	512 KB	1981	116,060	814	8.4
IBM	System 38 Model 03 21	512 KB	1980	59,210	358	7.3
Perkin-Elmer	8/32	1 MB	1978	100,000	750	7.5
Prime	150/II	256 KB	1981	54,000	272	6.0

EXHIBIT IV-18

U.S. MAINTENANCE PRICING OF SELECTED VENDORS OF FAST PRINTERS

VENDOR	MODEL NUMBER	PRODUCT DESCRIPTION	FIRST SHIPPED	PURCHASE PRICE	MONTHLY MAINTENANCE CHARGE	ANNUAL MAINTENANCE AS PERCENT OF PURCHASE PRICE
IBM	1403 NI	1100 lpm	1978	\$ 40,040	625	18.7
IBM	3800	Up To 20,040 lpm	1978	373,150	938	3.0
CDC	580/200	2000 lpm	1977	91,956	797	10.4
Honeywell	PPS II/E	18,000 lpm	1981	240,745	1,697	8.5
Honeywell	PRU 1600	1600 lpm	1974	\$ 64,940	1,538	28.4

EXHIBIT IV-19

U.S. MAINTENANCE PRICING OF SELECTED VENDORS OF TAPE AND DISK DRIVES

VENDOR	MODEL NUMBER	PRODUCT DESCRIPTION	FIRST SHIPPED	PURCHASE PRICE	MONTHLY MAINTENANCE CHARGE	ANNUAL MAINTENANCE AS PERCENT OF PURCHASE PRICE
Honeywell	MTU 0610	Tape	1980	\$21,000	122	7.0
Honeywell	MSU 0501	Disk	1979	49,650	197	4.8
CDC	858/11	Disk	1980	59,900	166	3.3
CDC	679-6	Tape	1978	31,540	134	5.1
STC	3670	Tape	1974	26,312	343	15.6
STC	8650 A2	Disk	1979	60,880	251	5.0
IBM	3370 A1	Disk	1978	29,550	94.50	3.8
Univac	8470	Disk	1979	87,200	327	4.5

EXHIBIT IV-20

U.S. MAINTENANCE PRICING OF SELECTED VENDORS OF TERMINALS

VENDOR	MODEL NUMBER	PRODUCT DESCRIPTION	FIRST SHIPPED	PURCHASE PRICE	MONTHLY MAINTENANCE CHARGE	ANNUAL MAINTENANCE AS PERCENT OF PURCHASE PRICE
CDC	751-10	CRT	1979	\$1,995	\$30	18.1
Honeywell	VIP-7100	CRT	1976	1,500	23	18.4
IBM	3278 2A	CRT	1978	2,505	22.50	10.8
IBM	3279 2C	Color CRT	1978	4,525	39.50	10.5
Univac	UTS-20	CRT	1980	\$2,597	28	12.9

EXHIBIT IV-21

U.S. MAINTENANCE PRICING OF SELECTED VENDORS OF WORD PROCESSORS

VENDOR	MODEL NUMBER	FIRST SHIPPED	AVERAGE PURCHASE PRICE	AVERAGE MONTHLY MAINTENANCE CHARGE	ANNUAL MAINTENANCE AS PERCENT OF PURCHASE PRICE
CPT	8100	1981	\$13,965	\$95	8.2%
IBM	Display Writer	1981	12,360	114.50	11.1
	3000s	1982	13,200	87	7.9
NBI	System 8	1980	22,200	179	9.7
	Wangwriter	1980	6,400	75	14.1
Philips	MICOM 2002	1980	15,870	142	10.7
Xerox	860	1980	12,625	100	9.5

EXHIBIT IV-22

U.S. MAINTENANCE PRICING OF SELECTED VENDORS OF COMMUNICATIONS PROCESSORS

VENDOR	MODEL NUMBER	PRODUCT DESCRIPTION	YEAR INTRODUCED	AVERAGE PURCHASE PRICE	24HR/7DAY MONTHLY MAINTENANCE CHARGE	ANNUAL MAINTENANCE AS PERCENT OF PURCHASE PRICE
Amdahl	4705	64 lines 64 KB	1980	\$54,300	490	10.8
IBM	3705-II	"	1979	59,600	268	5.4
Honeywell	Datanet 6661	"	1980	48,805	261	6.4
Univac	DCP/40	128 KB	1979	62,815	292	5.6
CCI	3650 II	64 KB 16 lines	1979	42,645	212	5.0
NCR	721-II	128 KB 14 lines	1978	56,700	390	6.9

3. PRICE REDUCTIONS BY DELIVERY MODE

- A greater proportion of United States field service respondents reported discounts to users who become involved either directly in maintenance or in delivering equipment to repair centres, as shown in Exhibit IV-23.
- The average discounts offered to Western European customers are higher than those offered in the United States.

E. EQUIPMENT DISTRIBUTION BY TYPE OF ENVIRONMENT

- As shown in Exhibit IV-24, there is a slightly greater shift in the United States towards removing equipment from the controlled environment of the traditional data processing facility.
- Both markets show that there is an increasing tendency to install equipment in environments for which the equipment was not designed.

F. FIELD SERVICE MANAGEMENT PERFORMANCE

1. PRINCIPAL ACTIVITIES FOR FIELD SERVICE MANAGERS, 1982-1983

- While Western European executives indicate increased activity levels in all areas of management for 1983, their United States counterparts indicate a very slight shift away from managing profitability, as shown in Exhibit IV-25.
- The trend in the United States is indicated to be more towards managing the constituents of profitability, i.e., customer satisfaction and retention of personnel.

EXHIBIT IV-23

PRICE REDUCTIONS BY DELIVERY MODE

DELIVERY MODE	PERCENT OF VENDORS OFFERING		AVERAGE PERCENT REDUCTION OFFERED	
	Western Europe	U.S.	Western Europe	U.S.
Carry-In/Mail-In	20%	33%	40%	35%
Device Swapout	7	19	0	28
Pickup/Delivery	N/A	5	N/A	9
<u>SPECIAL CONDITIONS</u>				
User Self-Maintenance	10	21	13	37
Cluster Maintenance	7	5	20	13
Customer-Owned Parts	N/A	2	N/A	15
Self Installation (Terminals)	7	N/A	50	N/A

EXHIBIT IV-24

EQUIPMENT DISTRIBUTION BY TYPE OF ENVIRONMENT
(percent)

EQUIPMENT CATEGORY	DP ROOM		OFFICE		PLANT /FACTORY	
	Western Europe	U.S.	Western Europe	U.S.	Western Europe	U.S.
Mainframes	88%	69%	12%	27%	0	4%
Small Business Systems	25	26	64	67	11%	7
Minicomputers	29	44	51	45	20	11
Microcomputers	2	20	91	78	7	2
Word Processors	5	7	92	93	3	0
Executive Workstations	2	9	78	87	13	4
Peripherals	60	36	25	51	15	13
Terminals	1	19	79	67	20	14
Data Communications	45	41	40	46	15	13

EXHIBIT IV-25

PRINCIPAL ACTIVITIES OF FIELD SERVICE MANAGERS

ACTIVITY	CLASSIFICATION BY AMOUNT OF TIME SPENT IN YEAR			
	1982		1983	
	Western Europe	U.S.	Western Europe	U.S.
Promoting New Maintenance Business (Europe)	4.67	-	8.00	-
Profitability (U.S.)	-	8.89	-	8.27
Equipment Reliability	7.00	7.74	7.71	8.27
Response Time	6.85	8.18	7.40	8.27
System Availability	6.58	7.86	7.23	8.24
Repair Time	6.77	7.50	6.93	7.88
Price of Maintenance Services	5.92	6.51	6.79	7.18
Retaining Engineers	5.69	7.30	6.40	7.54
Escalation Procedures	4.23	5.39	6.00	6.24

Rating: 1 = Low, 10 = High

- Western European executives, on the other hand, appear to feel the need to concentrate more on financial and marketing matters.
- It is interesting to observe that United States executives reported spending more energy, on a scale of 1 to 10, in all management activities. Because of the different environments and resulting attitudes towards survey scales, it is suggested that comparisons be drawn on relative weighting of factors in the vertical rather than the horizontal dimension.

2. SUCCESS IN RESOLVING 1981 PROBLEMS

- Exhibit IV-26 delineates the respective rankings and ratings of problem resolutions as reported by European and United States field service executives.
 - Western European companies are solving the problems with data communications service relatively better than the United States companies.
 - United States companies reported relatively greater success in training field service engineers.
 - Neither group reported significant success in controlling the market place or implementing remote diagnostics.

3. INVOLVEMENT AND INFLUENCE OF FIELD SERVICE MANAGEMENT IN CRITICAL ISSUES, 1981-1982

- There is a striking difference in the reported levels of influence that field service executives have over critical internal issues, as shown in Exhibit IV-27.
 - Western European field service executives feel that they have little influence in most critical issues, especially in the design of service-ability and reliability.

EXHIBIT IV-26

FIELD SERVICE MANAGERS' EVALUATION OF THEIR SUCCESS IN HANDLING PROBLEMS

RELATIVE SUCCESS		PROBLEM	AVERAGE ACTUAL RATING		IMPLEMENTATION (percent)	
U.S.	Western Europe		U.S.	Western Europe	U.S.	Western Europe
1	2	Living Within Budget Limitations	8.39	8.42	95%	86%
2	7	Training Field Service Engineers	7.90	7.15	93	93
3	4 (tie)	Meeting Customer Demands	7.79	7.54	98	100
4	4 (tie)	Providing Competitive Salary/ Compensation	7.69	7.54	93	93
5	3	Recruiting Field Service Engineers	7.65	7.58	90	86
6	6	Reducing Turnover of Staff	7.45	7.30	90	71
7	8	Improving FE Technical Competence	7.40	6.23	93	93
8	11	Improving Product Quality	7.03	5.90	90	71
9	1	Maintaining Data Communications Products	7.00	8.80	52	79
10	9	Making Adequate Diagnostic Equipment Available	6.92	6.10	81	71
11	10	Reducing Spare Parts Shortages	6.59	5.92	95	100
12	13	Marketing Field Service	6.18	5.30	81	71
13	12	Providing Adequate Remote Diagnostics	6.12	5.57	62	57
14	14	Maintaining Products Through Distributors	5.50	5.25	55	21

Rating: 1 = Low, 10 = High

EXHIBIT IV-27

INFLUENCE OF FIELD SERVICE MANAGEMENT ON
CRITICAL ISSUES, 1981-1982

ISSUE	1981 RATING		1982 RATING	
	WESTERN EUROPE	U.S.	WESTERN EUROPE	U.S.
Selection of Test Equipment	4.15	7.46	5.23	7.73
Spare Requirements Levels	6.00	7.08	6.64	8.18
Pricing of Field Service	6.14	6.24	6.21	7.55
Contractual Terms/Acceptability	4.71	6.11	5.43	7.04
Sale of Field Services	4.43	5.87	5.00	6.56
Serviceability Design	1.64	5.64	2.36	7.32
Site Environment Acceptability	3.79	5.34	4.43	6.35
User Education	2.77	5.08	3.67	5.69
Equipment Specification	2.30	4.70	3.25	5.71
Nonbuilt-in Diagnostics	2.00	4.70	2.45	5.95
Built-in Diagnostics	2.09	4.67	2.73	6.18
Order Acceptance	3.64	4.44	4.43	5.18
Equipment Design	1.18	4.24	1.73	5.73
Geographical Marketing	2.83	3.64	3.33	4.36

Rating: 1 = Low, 10 = High

- Both groups of respondents indicated that their influence has increased in 1982 over 1981.

4. FIELD SERVICE PERFORMANCE, 1981-1983

- Western European respondents reported higher levels of equipment availability in all categories, as shown in Exhibit IV-28.
 - The differences in communications terminals and peripherals is quite significant.
 - Western European executives indicated by their responses that their users are more critical than those in the United States.
- Exhibit IV-29 compares Western Europe and the United States in average response time by category.
 - The United States vendors respond sooner in most cases.
 - European users are again portrayed as being more critical of response time, except in peripherals.
- The United States maintenance vendors repair most equipment more quickly than European vendors, as shown in Exhibit IV-29.
 - The most significant difference is in the ability of the European field engineer to repair microcomputers.
 - The reported MTBF for Data Communications included the calculated MTBF for a communications satellite. The average of other communications equipment was closer to 3,000 hours.
 - Because of so many averages being averaged, the reported figures will not allow direct calculation of system availability.

EXHIBIT IV-28

VENDORS' RESPONSE ON SYSTEM AVAILABILITY

EQUIPMENT CATEGORY	SYSTEM AVAILABILITY (percent)					
	CURRENT		ESTIMATE 1983		MINIMUM USER WOULD ACCEPT	
	Western Europe	U.S.	Western Europe	U.S.	Western Europe	U.S.
Large Mainframes	97.7%	97.6%	98.8%	98.5%	97.0%	95.0%
Medium Mainframe	97.4	95.8	97.8	97.3	94.9	92.4
Small Business Systems	98.5	96.1	98.5	96.7	97.3	93.9
Minicomputers	98.4	95.9	98.4	96.1	95.0	92.4
Microcomputers	97.0	96.8	97.0	97.3	96.0	93.3
Peripherals	98.1	95.3	98.5	95.4	95.0	92.2
Terminals	99.0	96.7	99.6	96.6	97.5	92.8
Word Processors	98.0	94.0	98.0	95.3	98.0	93.8
Executive Workstations	99.0	95.0	99.0	95.0	99.0	92.5
Data Communications	98.5	91.0	99.3	97.3	97.1	94.3

EXHIBIT IV-29

VENDORS' VIEW OF RESPONSE TIME

EQUIPMENT CATEGORY	AVERAGE RESPONSE TIME (hours)					
	CURRENT		ESTIMATE 1983		EXPECTATION	
	Western Europe	U.S.	Western Europe	U.S.	Western Europe	U.S.
Large Mainframes	2.0	1.3	2.0	1.3	1.5	2.2
Medium Mainframes	2.5	2.4	2.5	2.5	2.0	2.7
Small Business Systems	2.0	2.2	2.0	2.1	2.0	2.3
Minicomputers	2.8	3.3	2.5	2.9	1.5	5.4
Micromputers	4.5	3.1	8.0	2.8	8.0	3.8
Peripherals	12.9	6.4	10.0	7.6	15.0	8.8
Terminals	3.5	6.4	4.0	6.1	3.5	6.5
Word Processors	3.0	2.8	4.0	2.4	4.0	3.1
Executive Work Stations	3.0	3.3	4.0	2.9	4.0	3.5
Data Communications	7.3	5.0	3.8	4.4	8.0	8.2

- The relative numbers in Exhibits IV-28 through IV-30, however, do support the responses of higher availability in Western Europe, for example:
 - System availability is inversely related to response time and repair time. The United States is slightly better in both categories.
 - System availability is directly related to MTBF.
5. MOST SIGNIFICANT FIELD SERVICE ISSUES, 1981-1983
- The United States field service executives are generally concerned about the same issues as their Western European counterparts.
 - For the next two years, the United States field service managers have four major categories that will dominate their planning:
 - Revenue growth to support the 25% to 35% growth expectations of top corporate management.
 - Profitability through cost controls once revenues are identified.
 - New technology and "leap frog" training to remain competitive.
 - Improving service and reducing ratio of labour to capitalised support tools.
 - Although the United States field service organisations are producing record departmental profits, due largely to extended use of familiar equipment, the profits are being used to offset losses in other departments.
 - The United States economy has effected a significant drop in purchases of new equipment.

EXHIBIT IV-30

VENDORS' RESPONSE ON REPAIR TIME AND
MEAN TIME BETWEEN FAILURES (MTBF)

EQUIPMENT CATEGORY	REPAIR TIME (hours)				AVERAGE MTBF (hours)	
	CURRENT		ESTIMATE 1983			
	WESTERN EUROPE	U.S.	WESTERN EUROPE	U.S.	WESTERN EUROPE	U.S.
Large Mainframes	2.9	2.2	2.4	1.4	600	371
Medium Mainframe	2.3	2.7	2.0	2.1	450	522
Small Business Systems	2.5	2.0	2.5	1.9	650	274
Minicomputers	3.8	1.9	3.0	1.6	450	525
Microcomputers	1.0	2.5	1.0	2.0	1,500	No Data
Peripherals	1.5	1.8	1.4	1.0	2,250	1,943
Terminals	3.0	1.6	1.5	1.3	2,825	2,860
Word Processors	3.5	2.4	2.0	2.1	650	1,000
Executive Workstations	1.0	1.9	1.0	1.5	2,000	No Data
Data Communications	1.2	1.2	1.1	1.2	3,375	22,675

- It becomes more profitable to maintain equipment as the product line ages to the point of physical obsolescence.

- United States field service executives are caught in a situation where they cannot reinvest their own departmental profits in new product lines. The inevitable resurgence of new product purchases within the next two years therefore looms as a significant challenge in the United States.

APPENDIX A: U.S. INDUSTRY SECTOR DEFINITIONS



APPENDIX A

U.S. INDUSTRY SECTOR DEFINITIONS

INDUSTRY SECTOR	INDUSTRY SIC	INDUSTRY NAME
Discrete Manufacturing	23	Apparel
	25	Furniture
	27	Printing
	31	Leather
	34	Metal
	35	Machinery
	36	Electronics
	37	Transportation
	38	Scientific and Control Instruments
	39	Miscellaneous Manufacturing
Process Manufacturing	10	Metal Mining
	11	Anthracite Mining
	12	Coal Mining
	13	Oil and Gas Extraction
	20	Food Products
	21	Tobacco
	22	Textile Products
	24	Lumber and Wood Products
	26	Paper Products
	28	Chemicals
	29	Petroleum
	30	Rubber and Plastics
	32	Stone, Glass, Clay
	33	Primary Metals

APPENDIX A (Cont.)

U.S. INDUSTRY SECTOR DEFINITIONS

INDUSTRY SECTOR	INDUSTRY SIC	INDUSTRY NAME
Transportation	40	Railroads
	41	Local Transit
	42	Motor Freight
	43	U.S. Postal Service
	44	Water Transportation
	45	Air
	46	Pipelines
	47	Transportation Services
Utilities	48	Communications
	49	Electric, Gas, and Sanitary
Banking and Finance	60	Banks
	61	Credit Agencies
	62	Security and Commodity Brokers
	67	Holding and Investment Offices
Insurance	63	Insurance (Life, Health, Etc.)
	64	Insurance Agents
Medical	80	Health Services

APPENDIX A (Cont.)

U.S. INDUSTRY SECTOR DEFINITIONS

INDUSTRY SECTOR	INDUSTRY SIC	INDUSTRY NAME
Education	82	Educational Services
Retail	52	Building Materials, Hardware
	53	General Merchandise
	54	Food
	55	Automotive and Gas Stations
	56	Apparel
	57	Furniture
	58	Eating and Drinking
	59	Miscellaneous Retail
Wholesale	50	Durable Goods
	51	Non-Durable Goods
State and Local Government	91-97	As Appropriate
Federal Government	91-97	As Appropriate
Services	73	Business Services

APPENDIX A (Cont.)

U.S. INDUSTRY SECTOR DEFINITIONS

INDUSTRY SECTOR	INDUSTRY SIC	INDUSTRY NAME
Other Industries	01-09	Agriculture, Forestry, and Fishing
	15-17	Construction
	65	Real Estate
	66	Combinations of Real Estate, Insurance, Loans, Law Offices
	70	Hotels, Rooming Houses, Camps, and Other Lodging Places
	72	Personal Services
	75	Automotive Repair, Services, and Garages
	76	Miscellaneous Repair Services
	78	Motion Pictures
	79	Amusement and Recreation Services, Except Motion Pictures
	83	Social Services
	84	Museums, Art Galleries, Botanical and Zoological Gardens
	86	Membership Organizations
89	Miscellaneous Services	

APPENDIX B: QUESTIONNAIRES



USER QUESTIONNAIRE

A. GENERAL

1. What is the principal business of your firm?

2. What do you consider to be your top three EDP problems (with "1" being the most serious)? What action do you intend to take to resolve them?

PROBLEM		ACTION	
1.			
2.			
3.			

3. Please indicate the number of mainframe and minicomputer systems installed and on order; also indicate current and planned operating systems.

NUMBER		VENDOR NAME	MODEL NUMBER	OPERATING SYSTEM
INSTALLED	ON ORDER			

B. MAINTENANCE

4. Where is the equipment located that EDP is responsible for maintaining?

<input type="checkbox"/> In a computer room		_____ %
<input type="checkbox"/> In a general office environment		_____ %
<input type="checkbox"/> In a plant or factory		_____ %
<input type="checkbox"/> Other		_____ %
Total		100 %

5. Who supplies you with maintenance service? Please rate them.

VENDOR	High	Medium	Low

6. What type of maintenance plans do you use? (check as many as apply) Contract 2 hr. Contract 4 hr.
 Contract 8 hr. Repair depot Time and materials Other: _____

7. In evaluating maintenance, how important is each of the following criteria?

Maintenance For	CRITERIA (Circle: 1 = Low Importance, 5 = High Importance)																								
	Cost					Uptime (System Availability)					Response Time to Repair					Vendor Reputation					Other _____				
Hardware	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Software	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5

8. How extensive has your experience been in using third party maintenance (i.e., by an organization other than original vendor) and how satisfied have you been? Do you expect to increase your use of third party maintenance?

	MAINTENANCE AREA (Circle: 1 = Low, 5 = High)																																		
	CPUs					Peripherals					Office Equip.					Terminals					Communications Equipment					Software									
Amount of experience	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Satisfaction	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Likelihood of increased use	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5

9. Do you receive and act on purchasing suggestions by vendor maintenance personnel? (Circle: Y = Yes, N = No, DK = Don't know)

	New Systems	Peripherals	Communications	Software	Supplies
Receive suggestions	Y N DK	Y N DK	Y N DK	Y N DK	Y N DK
Act on them	Y N DK	Y N DK	Y N DK	Y N DK	Y N DK

C. SOFTWARE MAINTENANCE

10. What is the approximate number of programs being actively maintained?

_____ Lines of code? _____

11. How much of your purchased software do you maintain yourself? None Some Most All
Why? _____

12. Does the central EDP organization supply applications software maintenance?

None Some Most All

13. What percent of your applications analysts and programmers were/are/will be assigned to the maintenance of existing programs in:

1981 _____%, 1982 _____%, 1983 _____%.

14. In your opinion, during the next three years what is the likelihood of there being significantly greater productivity in maintaining existing software.

LIKELIHOOD IN YOUR COMPANY /DIVISION			LIKELIHOOD IN YOUR INDUSTRY			LIKELIHOOD IN EDP. GENERALLY		
LOW	MEDIUM	HIGH	LOW	MEDIUM	HIGH	LOW	MEDIUM	HIGH

D. EDP EXPENDITURES

15. Please categorize your 1982 EDP budget and indicate the expected change for 1983.

CATEGORIES	1982 EDP BUDGET	ANTICIPATED PERCENT CHANGE IN 1983		
	AMOUNT	Increase	Decrease	Percent
Mainframe processors	\$			%
Minicomputers	\$			%
Microcomputers / personal computers	\$			%
Terminals	\$			%
Peripherals	\$			%
Communications hardware and software	\$			%
Software maintenance	\$			%
Hardware maintenance	\$			%

16. What is your annual hardware maintenance budget for:	CPU		PERIPHERALS		COMMUN. EQUIP. TERMINALS		OFFICE EQUIP./WORD PROC.	
	Purchased	Leased/Rented	Purchased	Leased/Rented	Purchased	Leased/Rented	Purchased	Leased/Rented
Internal (in-house) maintenance	\$	\$	\$	\$	\$	\$	\$	\$
External (vendor) maintenance								
● Provided by manufacturer	\$	\$	\$	\$	\$	\$	\$	\$
● Provided by third party	\$	\$	\$	\$	\$	\$	\$	\$

E. PERSONAL COMPUTERS/SMALL BUSINESS SYSTEMS (Stand Alone System Costing Under \$15,000)

17. Are there personal computers installed in your organization:

Yes Number _____
 No

18. In deciding to purchase personal computers/small business systems how important is each of the following criteria to the EDP department and to user departments? (1 = low, 5 = High)

CRITERIA	IMPORTANCE (Circle)									
	TO EDP					TO USERS				
Maintenance Cost	1	2	3	4	5	1	2	3	4	5
Service Availability	1	2	3	4	5	1	2	3	4	5
Hardware Reliability	1	2	3	4	5	1	2	3	4	5

THANK YOU FOR YOUR TIME

U.S. FIELD SERVICE VENDOR SURVEY 1982

1. STAFFING LEVELS	1982	1983
Employees in company		
Number in field service		
Number of field engineers		
Number of technical support engineers		
Number of field service administrators		
Number of field service supervisors		
Number of field service line managers		

2. ORGANIZATION	1982	1983
Number of branch offices		
Number of sites with resident engineer		
Number of sites using remote diagnostics		
Number of spares holding centers		
Percent of staff at headquarters		
Percent of staff on training courses		
Percent of engineers working from home		

3. FINANCIAL	1982	1983
Field service revenue		
Field service budget		
Profit percentage before tax	%	%
Revenue per engineer		
Fully burdened cost of engineer		
Charge out hourly rate for engineer		
Percent field service revenue of total company revenue		

4. SALARY INFORMATION	DOLLAR RANGE		AVERAGE SALARY	PERCENT INCREASE		TRAINING INVESTMENT VALUE
	FROM	TO		1981	1982	
Trainee						
Qualified Field Engineer						
Senior Field Engineer						
Hardware Support Engineer						
Software Support Engineer						
Supervisor						
Line Manager						

5. DISTRIBUTION BY ENVIRONMENT			
EQUIPMENT CATEGORY	PERCENT DP ROOM	PERCENT OFFICE	PERCENT PLANT / FACTORY
Mainframe Systems			
Small Business Systems			
Minicomputers			
Microcomputers			
Word Processors			
Executive Workstation			
Peripherals			
Terminals			
Data Communications			

6. COST BREAKDOWN OF A TYPICAL FAULT CALL		
COMPONENT	1982	1983
Average Cost (\$)		
Direct Labor (Percent)		
Travel Labor (Percent)		
Parts and Material (Percent)		
Travel Expense (Percent)		
Burden and Over-head (Percent)		
Average Number of Calls Per Week/Per Engineer		

7. How do you set your maintenance charges (e.g., percent of sales value, based on costs, etc.)?

8. LABOR TURNOVER	1981	1982
Number of Field Engineers Lost		
Number of Field Engineers Gained		

9. What are the major reasons for losing engineers?

10. Please rate the following in terms of the amount of field service management attention paid to them in 1981, and your plans for 1982 in this regard (1 = Low, 10 = High)

AREA	1981 RATING	1982 RATING
● System Availability		
● Response Time		
● Repair Time		
● Preventive Maintenance		
● Remote Maintenance		
● Escalation Procedure		
● Price of Maintenance		
● Stability of Engineer Population		
● Uptime Guarantees		
● Equipment Reliability		
● Support Centers		
● Software Maintenance		
● Flexible Contracts		
● User Self-Maintenance		
● Other _____		
● Other _____		

11. Please rate your success at implementing the following during 1981:
 1 = Low, 10 = High
 P = Planned, I = Implemented/no data
 N = Not implemented

	RATING
Recruiting of Field Service Engineers	
Training of Field Service Engineers	
Reducing Labor Turnover	
Improving Product Quality	
Making Adequate Diagnostic Equipment Available	
Providing Adequate Remote Diagnostic Assistance	
Meeting Customer Demands	
Living with Budget Limitations	
Providing Competitive Salary/Compensation	
Reducing Spare Parts Shortages	
Improving FE Technical Competence	
Marketing Field Service	
Maintenance Through Distributors	
Maintenance of Data Communications Equipment	

12 Please rate the field service involvement and influence in the following issues.
 1 = Low
 10 = High

	1981	1982
Equipment Specification		
Equipment Design		
Equipment Serviceability Design		
Built-in Diagnostics		
Other Diagnostics		
Selection of Test Equipment		
Spares Requirements and Levels		
Geographic Marketing Control		
Order Acceptance Sign-Off		
Contractual Terms and Conditions		
Acceptability of Site Environment		
User Education		
Selling of Field Service		
Pricing of Field Service		

13. MAINTENANCE PRICING EQUIPMENT CATEGORY	PURCHASE VALUE OF YOUR EQUIPMENT	MONTHLY MAIN- TENANCE CHARGE	CONTRACT RESPONSE TIME	CONTRACT PERIOD OF NOTICE OF INCREASE	PERCENT INCREASE IN LAST 12 MONTHS	FORECAST INCREASE EXPECTED IN NEXT 12 MONTHS	PERCENT INCREASE THAT WOULD BE UNAC- CEPTABLE	T&M HOURLY CHARGE FOR AN ENGINEER
Large Mainframe Systems								
Medium Mainframe Systems								
Small Business Systems								
Minicomputers								
Microcomputers								
Peripherals								
Terminals								
Word Processors								
Executive Workstation								
Data Communications								
Systems Software								
Applications Software								

14. FIELD SERVICE PERFORMANCE	EQUIPMENT CATEGORY	SYSTEM AVAILABILITY (PERCENT)			MAINTENANCE AVERAGE RESPONSE TIME IN HOURS			MAINTENANCE AVERAGE REPAIR TIME IN HOURS			AVERAGE MEAN TIME BETWEEN FAILURES (HOURS)	NUMBER OF NO FAULT FOUND (PERCENT)	NUMBER OF REPEAT CALLS (PERCENT)
		CURRENT	ESTIMATE IN 1983	MINIMUM YOUR USER WOULD ACCEPT	CURRENT	WHAT DOES YOUR USER EXPECT	WHAT DO YOU HOPE TO ACHIEVE IN 1983	CURRENT	YOUR ESTIMATE FOR 1983	AFTER WHAT TIME DOES ENGINEER CALL FOR ASSISTANCE			
	Large Mainframe Systems												
	Medium Mainframe Systems												
	Small Business Systems												
	Minicomputers												
	Microcomputers												
	Peripherals												
	Terminals												
	Word Processors												
	Executive Workstation												
	Data Communications												
	Systems Software												
	Applications Software												

15. Do your field service revenues include revenues from the following?
 (or percent if possible)

- | | |
|---|---|
| <input type="checkbox"/> Hardware maintenance | <input type="checkbox"/> Systems software maintenance |
| <input type="checkbox"/> Applications software maintenance | <input type="checkbox"/> Training/documentation |
| <input type="checkbox"/> Installation fees | <input type="checkbox"/> Equipment relocation |
| <input type="checkbox"/> Spares | <input type="checkbox"/> Supplies (e.g., ribbons, disk packs, etc.) |
| <input type="checkbox"/> Credits from sales for special maintenance conditions. | |
| <input type="checkbox"/> Other (please specify) _____ | |

16. Do you operate field service P & L control at branch, district, regional, headquarters level, or cost/budget control?

17. Can you quantify the benefits versus costs of the principal new field service programs? (e.g., Remote Diagnostics, Support Centers, Automated Dispatch, etc.)

18. What key indicators or measurement techniques are used to control CE/ first line managers?

19. Do you offer reductions in standard maintenance contract prices for different delivery modes?

	YES	NO	PERCENT
Carry in/mail in:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
User self-maintenance:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Device swap-out:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other (_____):	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other (_____):	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

20. To what level do you track costs and revenues?
 Site Customer Product Product line Other _____

21. With regard to spare parts, do you:
 Expense low-cost parts (less than \$ _____)?
 Inventory parts over \$ _____?

22. What life expectancy do you apply to spares?

23. Who is responsible for marketing and sales of field service products and contracts?
 Field service organization Sales organization
 Both involved Other (_____)

24. In your view what was the most significant field service issue or development in 1981 (i.e., in your organization and/or in other field service companies)?

25. What will be the most significant issue in the next 24 months? (as for 24)

THANK YOU

The time you have spent with us is appreciated. If you would like to know more about INPUT's research programs and are not already a client, please check here .

