Reference Material

In order to assist each of the groups and divisions in preparing their strategic plans, we have accumulated some reference material from a variety of sources which may be of use in identifying market potential and establishing competitive position. If you have more accurate or more specific data for your area, please use it, but also provide that information to corporate so that it may be available for use by other groups.

The material is organized at three levels as shown in the Table of Contents:

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2. Data Management
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C. Government Professional Services

D. Financial Institutions

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SECTION I

GENERAL MARKETING INFORMATION

A. International

B. United States

World Labor Force 1984

(millions)

North America	USA	237
	Canada	25
	Mexico	78
	Middle	103
	Caribbean	31
Europe		491
Asia	East	1,240
	South	1,545
	Oceania	24
South America		264
Latin America		398
Africa		532
		4,968

Source: Annual Abstract

Relative Size of World Economic Activity

Gross Domestic Product

	1984 ($ billion)
North America	4,075
Western Europe	2,929
Asia/Pacific	2,419
Rest of World	3,311
	12,734

Source: Bank of America (taken from Entering the European Software Market).

US Gross Domestic Product

($ billion)

	1981	1983
Discrete manufacturing Process manufacturing	651	692
Transportation	184	209
Utilities	79	100
Telecommunications		
Distribution	491	556
Banking and finance Insurance	604	732
Medical Education Services	236	285
Federal government	39	43
State and local gov't	367	424
Other industry specific	240	311
Total	2991	3352

Source: Bureau of Economic Analysis, U.S. Dept. of Commerce
EUROPA Year Book 1985, p. 2765

US Pretax Profits 1983

($ billion)

Discrete manufacturing Process manufacturing	70
Transportation	2
Utilities	14
Telecommunications (radio, TV, etc.)	6
Distribution	39
Banking, finance & insurance	31
Medical, education, services	12
Other (construction, mining, agriculture)	4
Overseas	25
	203

Size of Industry in USA 1982

No. of Establishments (in thousands) with No. of Employees

	Over 99	20 to 99	Under 20	Total
Discrete manufacturing Process manufacturing	37	85	207	329
Transportation, utilities & telecommunications	9	30	138	177
Distribution				
Wholesale	5	55	344	404
Retail	14	155	1,116	1,285
Banking, finance and insurance	7	41	378	426
Medical, education, services	25	110	1,306	1,441
Other industries	na	na	na	572
Total	na	na	na	4,634

Source: Annual Abstract

Government Business Units in USA

Numbers

	1977	1982
State	50	50
Local		
County	3,042	3,041
Municipal	18,862	19,076
Township and Town	16,822	16,734
School District	15,174	14,851
Special District	25,962	28,588

Source Statistical Abstract

Employment in USA

(including self-employed and unpaid family workers)

(millions)

	1983
Manufacturing	18
Transportation	3
Utilities	1
Telecommunications	1
Radio, TV	neg
Distribution wholesale	5
retail	16
Banking	2
Finance	1
Insurance	1
Medical	6
Services	14
Federal Government	3
State Government	4
Local Government	9
Other	6
	90

SECTION II

COMPUTER INDUSTRY ANALYSIS

A. IBM Overview

B. Software Products Market

C. Computer Software and Services Industry

Number of Machines

IBM 1984

	Mainframe	Mini	Micro
USA	23,015	83,400	2,007,000
Rest of World	17,505	47,780	408,000
Total	40,520	131,180	2,415,000

Source: International Data Corporation

Systems Software Installed - U.S. and Canada

IBM and IBM Compatible Mainframe Computers

Operating System (primary only)

OS	4,036
DOS	5,740
VM	288
Others	352
	10,416

Communications (any of the following)

CICS/OS	2,915
CICS/DOS	4,604
IMS/DC	605
TSO	2,771
VM/CMS	2,203
ROSCOE	551

Databases (any of the following)

DL1/OS	1,404
DL1/DOS	1,294
IDMS/DB+R	938
DB2	50
TOTAL	403
Other DBMS	1,882

Total sites in sample 10,416
May 1986

Source: FOCUS RESEARCH May 1986

Estimated Number of IBM and IBM Compatible Mainframes Running

	DOS/VSE	VM	MVS
U.K.	750	600	350
Germany	2,500	2,000	na
France	1,200	250	300
Italy	1,100	250	300
Australia	200	na	na

Source: Macro 4 PLC prospectus January 1986

IBM and IBM Compatible Mainframes by Industry

Unique Sites as of May 19, 1986

	DOS	OS	VM	Total
Agriculture	16	8	-	24
Banking	427	329	3	759
Construction & Mining	63	50	3	116
Diverse Financial	110	105	6	221
Education	370	262	42	674
Federal Government	51	186	9	246
Gas & Oil	65	104	14	183
Health Services	257	115	10	382
Insurance	320	407	8	735
Communications	17	36	1	54
Computer Services	464	330	43	837
Local Government	197	99	3	299
Manufacturing	1,656	906	67	2,629
Software Manufacturing	5	15	8	28
Other	69	24	6	99
Printing & Publishing	134	70	5	209
Retail	301	184	6	491
State Government	56	165	3	224
Transportation	95	88	4	187
Utilities	96	215	4	315
Business Services	222	142	35	399
Wholesale & Distribution	433	93	2	528
Totals	5,424	3,933	282	9,639

Source: FOCUS

Note: This excludes any secondary sites (316 DOS and 103 OS)

US User Expenditure on Software Products

($ billions)

	Mainframe	Mini	Micro	Total
1970				0.3
1975				0.7
1980				2.9
1983	← 6.9 →		1.0	7.9
1984	5.2	3.7	2.2	11.1
1985	← 10.7 →		2.6	13.3

Source: INPUT

1985 US User Expenditures on Software Products

($ billions)	Main frame	Mini	Micro	Total
Systems Software				
. Systems Control	—1.8—		0.3	2.1
. Data Control Mgmt	—1.4—		neg	1.4
. Application Development Tools	—2.4—		0.4	2.8
. Total	3.6	2.0	0.7	6.3
Applications Software				
. X Industry	—2.3—		1.4	3.7
. Industry Specific	—2.8—		0.5	3.3
. Total	—5.1—		2.6	13.3
TOTAL	—10.7—		2.6	13.3

Source: INPUT

Systems Software for IBM/PCM Mainframes

percentages of sites who use commercial packages for

	1982	1985
Disk/tape management	38	53
Data base management	40	51
Application development	24	36
Performance measurement	13	34
Job accounting	23	28
Security	9	23
Data dictionary	4	18
Data entry	8	16
Job scheduling	4	13

Base interviews 10,800

Source: Computer Intelligence

Applications Software for IBM/PCM Mainframes in USA

Percentage of sites who use commercial packages for

	1982	1985
General Ledger	17	24
Data Analysis	11	22
Graphics	10	20
Payroll	12	17
Accounts Payable	7	14
Personnel	7	11
Fixed Assets	6	10
Accounts Receivable	4	7
Spreadsheet	1	7

Base interviews 10,800

Source: Computer Intelligence

1984 Expenditures in USA by Industry -- $ billions

	1984 Computer Software & Services	OF WHICH Mini/ Mainframe Software	Micro Software	Professional Services
Industry Specific				
Discrete Manufacturing	4.0	0.6	neg	1.4
Process Manufacturing	1.8	0.1	neg	0.7
Transportation	0.5	0.1	neg	0.1
Utilities	0.3	neg	neg	0.1
Telecommunications	0.7	neg	neg	0.2
Distribution	1.8	0.2	0.1	0.4
Banking & Finance	5.1	0.7	0.1	1.0
Insurance	1.6	0.2	neg	0.6
Medical	1.7	0.2	neg	0.2
Education	0.3	neg	neg	0.1
Services	1.2	0.1	neg	0.1
Federal Government	3.4	neg	neg	2.8
State & Local Gov't	1.4	neg	neg	1.0
Other specific	0.8	0.1	neg	0.2
	24.5	2.2	0.4	8.9
Cross Industry				
Planning & Analysis	1.9	0.5	0.6	--
Accounting	2.2	0.8	0.2	--
Human Resources	1.4	0.4	neg	--
Engineering/Scientific	1.2	0.1	neg	--
Education/Training	0.2	neg	neg	--
On-line Data Bases	0.6	--	--	--
Other cross industry	1.9	0.2	0.3	--
	9.5	1.9	1.2	--
Utility Processing	1.9	--	--	--
Systems Software	5.3	4.7	0.6	--
VANS	0.3	--	--	--
TOTAL	41.5	8.9	2.2	8.9

Source: INPUT

Professional Services
1985 Market Users Expenditures

($ Billions)	Commercial	Federal	Total
Software Development	4.9	1.3	6.2
Consulting	1.4	0.3	1.7
Education & Training	0.8	0.3	1.1
Facilities Management	0.1	0.6	0.7
Systems Integration-Fed	--	0.8	0.8
	7.2	3.3	10.5

1984 Market Users Expenditures

	Commercial	Federal	Total
Software Development	4.2	1.1	5.3
Consulting	1.1	0.3	1.4
Education & Training	0.6	0.2	0.8
Facilities Management	0.2	0.5	0.7
Systems Integration-Fed	--	0.6	0.6
	6.1	2.7	8.8

Source: INPUT

Professional Services User Expenditures

($ Billion)	1984	1985
Discrete Manufacturing	1.4	1.7
Process Manufacturing	0.7	0.8
Transportation	0.1	0.1
Utilities	0.1	0.1
Telecommunications	0.2	0.3
Distribution	0.4	0.5
Banking & Finance	1.0	1.3
Insurance	0.6	0.7
Medical	0.2	0.2
Education	0.1	0.1
Services	0.1	0.1
Federal Government	2.7	3.3
State & Local Gov't	1.0	1.1
Other specific	0.2	0.2
	8.8	10.5

Source: INPUT

SECTION III

COMPETITIVE PRODUCTS AND COMPANY INFORMATION

A. Systems Software

B. Commercial Professional Services

C. Government Professional Services

D. Financial Institutions

E. Distribution Industry

F. Litigation Services

Company	RESOURCE MANAGEMENT			DATA MANAGEMENT		
	Operating System Facility	Resource Optimization Management	Resource Protection	Data Management Facilities	Data Source Management	Info. Delivery Systems & Presentation
Applied Data Research Princeton, NJ	ADR/DE II 15 users - $20-25K	ADR/LOOK 1291 users - $13-50K	ADR/Data Secure $11-14K	ADR/DATACOM System ADR/Datacom/DB 1082 users $90-116K ADR/DataDesigner 43 users, $35-44K ADR/DL1 - $30-40K	ADR/VSAM 487 users $20-25K ADR/DataDictionary 971 users, $33-40K	ADR/DataQuery 833 users - $20-35K ADR/DataReporter 363 users, $13-16K
Battelle Software Products Center Columbus, OH				DM - 15 users $29K		BASIS 360 users - $15K
BGS Systems, Inc. Waltham, MA		BEST/1-MVS BEST/1-VM CAPTURE/VM CAPTURE/MVS Crystal - 800 users				
Boole & Babbage Sunnyvale, CA		IMF/Trans. Acct. CMF/Workload Planning IMF/System Manager $33K DASD Response Manager $11 - 17K CMF/Monitor,450 users, $13K Resolve/MVS,450 users, $13K CMF/Model - $10K Control/SMF - $10K TSA/PPE, 555 users-$10K	Secure CICS 130 users, $8-18K	CMF/Performance $20-35K IMF/Resource Analyzer 500 users, $20K IMF/Workload Analyzer 100 users, $22K IMF/Workload Monitor 500 users, $13K IMF/Performance Reporter 350 users, $21K		Screenform 100 users, $5-13K
Candle Corp. Los Angeles, CA	Deltamon Dexan/MVS-1000+users Omegamon-1400 users	Epilog/MVS		Epilog/IMS Omegamon/IMS-200 users Dexan/IMS - 200 users		

	RESOURCE MANAGEMENT			DATA MANAGEMENT		
Company	Operating System Facility	Resource Optimization Management	Resource Protection	Data Management Facilities	Data Source Management	Info. Delivery Systems & Presentation
Cincom Systems, Inc. Cincinnati, OH				TIS - 150 users $193K TOTAL - 3900 users $60K Ultra Interactive DB 160 users - $45-80K		
Computer Associates Jericho, NY	CA Convertor 90 users -$17-50K	CA Dispatch - $40K CA Unicenter - $180K VS Manager 375 users CA-APEX 100 users - $36K CA-SCHEDULER 250 users - $10-36K CA-DYNAM/D $1800 users, $8K CA-JARS/CMS $10K CA-JARS/CICS 2200 users - $7-10K CA-JARS OS/DOS $8-14K CA-RAMS 1250 users, $5K CA-VIEW 90 users, $3K CICS Disc Record Display	Top Secret 800 users CA-DYNAM/T 2300 users - $8K CA-MANAGE/SMF 65 users VSTAPE - 250 users		CA-Sort 6100 users - $5-6K CA-SRAM 3100 users - $5-6K CA-DYNAM/F1 700 users - $4K	CA-Earl,CA-Early 650 users, $13-17K
Computer Corp. of America Cambridge, MA				Model 204 $155-195K	Dictionary/204 125 users, $25K	Access/204 50 users, $40-50K
Compuware, Inc./ Rock Island, IL SOUTHFIELD, MI		Display Users			ABEND-AID, 4000 users ABEND-AID/CICS, 500 users ABEND-AID/IMS, 1200 users ABEND-AID/SPF, 250 users DOS-ABEND/AID, 300 uers DOS DL/1 ABEND AID, 150 users FILE-AID, 1500 users COMPARE/34	

	RESOURCE MANAGEMENT			DATA MANAGEMENT		
Company	Operating System Facility	Resource Optimization Management	Resource Protection	Data Management Facilities	Data Source Management	Info. Delivery Systems & Presentation
Cullinet Software Westwood, MA				Cullinet Information DB - $75K IDMS/R Escape, 48 users, $25K Escape/DL/1, 10 users TOTAL/EDP-Auditor	Information Directory 30 users Integrated Data Dictionary, 993 users, $35K	On-Line English 80 users, $60K On-Line Query, 794 users, $30K Culprit, 1161 users, $27K IMS/Culprit - 250 users TOTAL Culprit 100 users
Duquesne Systems, Inc. Pittsburgh, PA	Quick-Fetch 275 users, $10K	DASDMON - $10K Perf.DB Facility 50 users, $12K QCM Perf.Monitor 2000 users, $14K Syst.Perf. Interogator 250 users, $8K Billing DB Facility 25 users, $15K Joblog Mgt. & Ret. 40 users, $9K SCON-SuperConsole 250 users, $8K SYSLOG Mgt. & Ret. 60 users, $6K MSM - 407 users QCD - 247 users	Shared Tape Allocation Mgr. 400 users, $12-16K		SDSI-475 users, $14-19K Catalog Performance Optimizer, 150 users, $8K Super MSI, 603 users	
Goal Systems Intl. Columbus, OH	FAQS/VM - $5K FAQS/XP 1200 users, $5K RSDMAN/XP, 300+users	EXPLORE/VM 150 users, $6K EXPLORE/XP 600 users, $6K	Alert/CICS 150 users, $9K		FAVER/XP 2400 users, $3-5K VSAMAID/XP 300 users, $3-5K	
Information Builders Inc, New York, NY				FOCUS 1675 users, $43-110K		
Martin Marietta Princeton, NJ				RAMIS II 1600 users, $40-90K		

	RESOURCE MANAGEMENT			DATA MANAGEMENT		
Company	Operating System Facility	Resource Optimization Management	Resource Protection	Data Management Facilities	Data Source Management	Info. Delivery Systems & Presentation
Morino Associates Vienna, VA		MICS/Capacity Planning 250 users, $8K MICS/Critical Index Mgt. $16 K MVS Integrated Control System, 500 users; $38K MICS/DASD, 100 users, $8K MVS Prob. Alert System $12K TSO/MON 650 users; $20K TSO/MON Online 60 users; $7K TSO/MON SPIF 550 users; $4K MICS/CICS 350 users; $3K MICS/IMS 250 users; $8K MICS/INST. ACCT 200 users, $11K MICS/SYST. Rel. 200 users, $7K MIS/VM 100 users, $8K				
On-Line Software International Fort Lee, NJ	Data Entry $2K		Guardian 250 users, $20K	Datavantage 154 users, $33-58K		Executrieve/EICS 32 users, $15-19K Executrieve 34/36 450 users, $4-12K
Oracle Corporation Menlo Park, CA				Oracle 300 users, $12-96K		
Pansophic Systems, Inc. Oak Brook, IL		PanAudit Plus 800 users, $20K				
SAS Institute, Inc. Cary, NC				SAS/IML 85 users System 2000 50 users Multi-User System 2000 QUEX-System Create System 2000		Screen Write Sys. 25 users BASE SAS Software 7300 users SAS/FSP Software 2800 users SAS/IMS-DL/1 5000 users SAS/REPLAY 27 users

	RESOURCE MANAGEMENT			DATA MANAGEMENT		
Company	Operating System Facility	Resource Optimization Management	Resource Protection	Data Management Facilities	Data Source Management	Info. Delivery Systems & Presentation
KK, Inc. osemont, IL	Multi-Pak VM, $8K					
oftware AG of orth America eston, VA				ADABAS 1800 users, $106K	Predict Data Dictionary 1000 users, $10K	Super Natural 200 users, $20K
terling ancho Cordova, CA		Execution Scheduling Processor 40 users,$15K DMS/OS DASD Mgt. Sys. 1000 users, $14K Shrink Encrypt/Decrypt 200 users SMART/DASD 40 users DYL-AUDIT 225 users MARK IV/Auditor 140 users, $4K	DYL-Security 11 users		Comparex 200 users, $5-9K	Answer Series DYL-260 1512 users DYL-280 & DYL-280 -II 1438 users DYL-ONLINE DYL/INQUIRY IMS 200 users Answer/2 206 users,$29-40K
yncsort, Inc. nglewood Cliffs, NJ					Syncsort CMS-700 users Syncsort DOS-3000 users Syncsort OS-650 users	
CCFL oston, MA	System/Manager 800 users, $10-30K UCC-2 DOS/OS Transition 1000 users, $42K	UCC-4 100 users, $15K UCC-8 Data Center Mgt. Software, 110 users $29K System Scheduler 30 users, $14K UCC-7 Auto, Prod. Cont. Sys. 1000 users $65K Space Manager, 800 users $11K UCC-3 DASD Mgt. Sys. 550 users, $17K UCC-9 Reliability Plus 830 users, $20K	UCC-11 Auto Rerun & Tracking System 1100 users, $21K TAPE/MANAGER 600 users, $10K UCC-1 Tape Mgt. Syst. 3000 users, $26K UCC-1 VM Tape 100 users, $10K		UCC-10 Data Dictionary Mgr.300 users,$30K VSAM/CALC,50 users,$1K VSAM/DISPLAY 50 users, $2K VSAM/List 50 users, $2K	UCCFL Imagine Query & Rep. UCC-7/Rpt. $21K

RESOURCE MANAGEMENT

COMPETITOR	PRODUCT	INSTALLED
THE CAMBRIDGE SYSTEMS GROUP	ASM-2	800
COMPUTER ASSOCIATES	CA-DYNAM/D	1,800
DUQUESNE	MSM	407
	DASDMON	(NEW)
WESTINGHOUSE	DSM	350
SDI	INSTANT FBA	1,500
MORINO ASSOCIATES	MICS/DASD	100
UCCEL	SPACE MANAGER	800+
	UCC-3	550+

INFORMATION RETRIEVAL/REPORT WRITERS

COMPETITOR	PRODUCT	INSTALLED
COMPUTER ASSOCIATES	CA-EARL	650
COMPRO	EXTRACTO	700
MSA	INFORMATION EXPERT	1,500
PANSOPHIC	EASYTRIEVE	4,500
COMPUTE LTD (UK)	SELCOPY	600
SOFTWARE AG	SUPERNATURAL	200+
ADR	DATAREPORTER	363
CULLINET	CULPRIT	1,161
TSI INTERNATIONAL	DATA ANALYZER	700+
NAT'L COMPUTING CTRE (UK)	FILETAB	1,500
GOAL SYSTEMS (FROM SSI)	QUIKJOB	1,000+

PROGRAM DEVELOPMENT

COMPANY	APPL. DEVELOPMENT SYSTEMS	APPL. DEVELOPMENT SUPPORT	PROCEDURAL LANGUAGES	PROCEDURAL LANGUAGE SUPP.SYS	TELEPROCESSING	NETWORKING
ADR	ADR/DL 158 users, $24-29K ADR/IDEAL 590 users, $73-98K ADR/ROSCOE 1592 users, $60K ADR/VOLLIE 2155 users, $21K	ADR//The Librarian 5898 users, $19-29K	ADR/Metacobol 678 users, $10-12K FORTRAN OUTPUT EXPEDITER 50+ users, $3K			
Battelle						
BGS						
Boole & Babbage Appl.		XPF/COBOL (MVS) 50 users, $30K			VAM/SPF 30 users, $20K CONTROL/CICS 100 users, $10K	DCATS Data Com Test System $100K
Candle Corp.					PSRA/CICS OMEGAMON/CICS RTA/CICS 600 users	
Cincom	Mantis 1800 users, $30-60K				Environ/1 350 users, $44K	
Computer Associates		CA-Driver 170 users, $6-8K				
Computer Corp. of America						
Compuware		ABEND-AID/COBOL 275 users CICS DBUG-AID 100 users CompuCode (Sys. 34)				

COMPANY	APPL. DEVELOPMENT SYSTEMS	APPL. DEVELOPMENT SUPPORT	PROCEDURAL LANGUAGES	PROCEDURAL LANGUAGE SUPP.SYS	TELEPROCESSING	NETWORKING
Cullinet	Appl. Dev. Sys/ On-Line 518 users, $40K ADS/Batch 77 users, $20K	Interact 132 users, $30K			IDMS-DC 362 users, $60K Universal Communications Facility 331 users, $40K	
Duquesne Systems		Program Mgt. Optimizer 550 users, $6K			Single-Image S/W 1257 users Terminal Prod. Exec. 120 users, $20K	
Goal Systems		FLEE/XP 1500 users, $5K				
Info. Builders						
Martin Marietta	COBOL/XE 150 users, $24-33K CONSENSUS $40-55K UFO/IMS 50 users, $60K					
Morino Associates						
On-Line S/W Intl.		Intertest 1400 users, $20-24K Verify 10 users, $25-35K			MICS/NPA 250 users $1K	DB/LINK 10 users, $4K Telefile $10-25K
Oracle						
Pansophic	Easytrieve Plus 4500 users, $21-27K Geiser/CL 600 users, $35-49K On-Line Without Limit 700 users; $20-27K	PanExec 600 users, $35K PanValet 5000 users, $10-22K VMLIB 120 users, $18-20K		Telon 100 users, $140-175K		

COMPANY	APPL. DEVELOPMENT SYSTEMS	APPL. DEVELOPMENT SUPPORT	PROCEDURAL LANGUAGES	PROCEDURAL LANGUAGE SUPP.SYS.	TELEPROCESSING	NETWORKING
SAS Institute	SAS/AF 250 users	SAS/DMI				
SKK						
Software AG	Natural 1700 users, $40K				Com-Plete 300 users, $50K	
Sterling	Mark IV 2500 users $78-98K Mark V 180 users, $30-100K	DYL-270 4 users			SUPERTRACS $12-15K	
Syncsort		SYDOC				
UCCEL		JCL/Manager 600 users $4K UCC-20 $11K				

APPLICATION DEVELOPMENT SYSTEMS

COMPETITOR	PRODUCT	INSTALLED
PANSOPHIC	GENER-OL	600
	TELON	100+
SOFTWARE AG	NATURAL	1,700+
ADR	IDEAL/ROSCOE/ DL	2,000+
CULLINET	ADS ON-LINE	518
PHOENIX COMPUTER	CONDOR	400+
CINCOM	MANTIS	1,800+

Micro to Mainframe Link Systems

		Mainframe System Requirements			Features			
Product	Manufacturer	Operating systems	Software required	Mainframe databases accessed	Menu-driven	Command-driven	Virtual diskettes	Real time upload possible
Network Navigator — DCS 5000	American International Communications	VM and MVS	Network Navigator — DCS 5000	CMS files, QS, PDS's	✓	✓	-	✓
ADR/PC DATACOM	Applied Data Research	SSX/VSE, DOS/VSE	ADR/DATAQUARY, ADR/DATACOM, DB, DATACOMDICTIONARY	AADR/DATACOM DB	✓			✓
ADR/PC EMPIRE		MVS/TSO, VM/CMS, MVS	ADR/EMPIRE	ADR/DATACOMM DB	✓			✓
Baseline	Baseline Inc.	DOS, MVS, VM	CIDS	VSAM files	✓			✓
PC Contact 1.0	Cincom Systems	OD, DOS, MVS, VM, VSE	MANTIS PC, PC CONTACT	DL1, IMS, TOTAL, TIS VSAM, SQL	✓	✓		✓
CA Link	Computer Associates	DOS/VSE, VM/CMS, MVSCICS, CMS, TSO	CICS, CMS, TSO	CA-Universe, VSAM	✓	✓		✓
PC/204	Computer Corporation of America	OS, DOS, VM	Model 204 DBMS	Model 204	✓		✓	✓
W/Information Gateway/W Communications	Comshare Inc.	VM/CMS, MVS/TSO, VMS	W/Communications	Any through terminal interaction	✓	✓		✓
Goldengate Information Link	Cullinet Software Inc.	OS, DOS/VS, VSE, VM/CMS, MVS/XA	ICMS	IDMS/R, VSAM, IMS, TOTAL	✓	✓	✓	✓
INFOGATE		OS, DOS/VS, VSE, VM/CMS, MVS/XA	ICMA	IDMS/R, VSAM, IMS, TOTAL	✓	✓	✓	✓
BEAMIT	D&B Computing Services	VM/CMS, MVS/TSO, MVS/TSO, VP/CSS	BEAMIT, NOMAD2	NOMAD2	✓	✓		✓
IBMAlink FT/3270, FT/TSO, FT/CMS	DCA	DOS/CICS, MVS/CICS, MVS/TSO, VM/CMS	IBM host file transfer software	VSAM	✓	✓		✓
Mobius	FEI Computing	TOPS-10, TOPS-20, VMS	Host Mobius	All	✓	✓	✓	✓
Forte PJ/FTS	Forte Communications	VM/CMS, MVS/TSO, CICS	IBM 3270 File Transfer Software	TSO, CMS, CICIS, ISAM		✓		✓
ForteNet		MVS/TSO, VM/CMS, CICS	NVS/TSC VM CMS	ISAM, CMS/TSO	✓			✓
Attachment 370 Edition	IBM	VM, MVS	Attachmate/VM ATTACHMENT/MVS	CMS, VSAM Sequential files	✓			✓
iLINK	InfoCenter Software	MVS/TSO & VM/CMS	Mainframe iLINK and product bridges	RAMIS II, FOCUS, SAS Info Center/1, ADES 2	✓			✓
* dBase/Answer	Informatics General Corp.	OS VS, DOS, VSE, MVS, TSO, CICS, IMS/DC	Answer Extractor	VSAM, IMS, AL1, IDMS TOTAL, ADABAS, others	✓			
* Lotus Answer		OS VS, DOS VSE, MVS, TSO, CICS, IMS/DC	Answer Extractor	VSAM, IMS, AL1, IDMS TOTAL, ADABAS, others	✓			
* Visi/Answer		OS VS, DOS VSE, MVS, TSO, CICS, IMS/OC	Answer Extractor	VSAM, IMS, AL1, IDMS TOTAL, ADABAS, others	✓			
EXPRESS-mate	Information Resources	VM/CMS, PRIMOS	EXPRESS	EXPRESS	✓			✓
TALKSHOW/PC	Interchart Software	MVS/TSO, VM/CMS	InterTAG	InterTAG	✓			✓
Linkware: Information Server	Linkware Corp.	VM/SP, VAX/VMS, MVS/TSO, UNIX 4.1, 4.2, System 38, MPE	Linkware Information Server	SEQ, PDS, CMS	✓	✓		✓
Expertlink	Management Science America	OS, MVS, VSI, SSX, DOS/VSE	MSA Database Sharing	VSAM/CICS, DATACOM DB, IDMS, DU, IMS	✓	✓		✓
pcMainframe 1.3	Martin Marietta Data Systems	DOS/VSE, MVS/XA, SSX OS/VSI	CICS/VSE	VSAM, DL/1, TOTAL, ADABAS, IDMS	✓			✓
UNISON RAMLink		VM, OS/VS1, MVS, CICS, DOS/VSE, CMS, TSO, TONE	RAMIS II, RAMLink	RAMIS II, IMS, DL/1, TOTAL, VSAM, ADABAS	✓	✓		✓
Interactive PC Link	McCormack and Dodge	DOS, OS, MVS, VTAM	CICS, IMS	VSAM, DL/1, IDMA, TOTAL, DATACOM, ADABAS	✓	✓		✓
PC/SQL-link	Micro DecisionWare Inc.	VM/CMS, MVS/TSO	VM/CMS, MVS/TSO, DOS/VSE	SQL/DS, DB2, TERADATA, Britton Lee	✓	✓		✓
Tempus-Link	Micro Tempus Inc.	ODS, MVS, VM, MVS/XA	CICS, TSO, CMS, IMS	All OS datasets	✓	✓	✓	✓
EXCELLINK	OBS Software	MVS/TSO, VM/CMS	Host-based Ecellink	VM/CMS files, sequential datasets	✓	✓		✓
OMNILINK	On-Line Software International	OS/VS1, MVS, MVS/XA, MVS/SP, DOS/VS, DOS/VSE	CICS 1.5 and up	VSAM, ISAM, BDAM, IDMS, DL/1	✓	✓	✓	✓
FREE-LINK		OS/VS1, MVS, MVS/XA, MVS/SP, DOS/VS, DOS/VSE	CICS 1.5 and up	VSAM, ISAM, BDAM	✓	✓	✓	✓
SIM3278/PC	Simware Inc.	MVS/VTAM, VM/SP	SIM3278	Any accessible	✓	✓		
The Natural/Connection v. 2.0	Software AG of North America	DOS/VSE, DOS/SP1.1, OS/VSI, OS/MVS, MVS/XA, VM/CMS	Natural ADABAS, Natural/VSAM	DLVSAM, ADABAS, DL/1	✓	✓		✓
Smartlink	Software International Corp.	DOS or OS with CICS or IMS/DC	SI General Ledger	Software Int'l General Ledger files	✓	✓		✓
SPSS/PC+	SPSS Inc.	CMS-OS, VMA, PRIMOS, AOS/VS, GCOS	SPSS-X	SAS		✓		
* DYL-VLINK	Sterling Software, Dylator Division	OS/MVS, TSO/CICS, DOS/VSE/CICS, VM/CMS	DYL-VFILE	Virtual disk on mainframe	✓	✓	✓	✓
Merlin/IDL (Intelligent Data Link)	Tesseract Corp.	OS, DOS, VM, MVS	Merlin	Adabas, IDMS, IMS, VSAM	✓	✓		✓
PC. COM	The MOM Corp.	VM/CMS, MVS/TSO, DOS/CICS, VM/MVS/CICS	PC/COM	VSAM, QSAM	✓	✓	✓	✓
Network Datamover PC	The Systems Center	MVS	Network Datamover MVS	SAM, ISAM, IMS, CICS, VSAM, ANSWER DB, PDS	✓	✓		✓
Perfect Link	UCCEL Corp.	DOS/VS VSE, OS VS 1/VS2, MVS CICS	VSAM and UCCEL mr applications	VSAM	✓	✓	✓	
RELAY VM, RELAY TSO, RELAY CICS	VM Personal Computing	VM, TSO	RELAY VM, RELAY TSO	VM DB/DC				

Micro to Mainframe Link Systems

Data Download						Security		System Requirements			Cost		
Level of data selection	DIF	WKS/WRK	dBASE	CSV/formatted ASCII	Binary	Password required on micro	On mainframe	Minimum memory (in K bytes)	Disk drives required	Name of terminal emulation board required	PC, single copy	Mainframe portion	Combined cost
Field	✓	✓	✓	✓	✓	✓	✓	256K	1	CXI, Async, IRMA	$175-$325	$35,000	
By content	✓			✓			✓	512K	2	IRMA, IRMALETTE	$495	$145,500	
File level		✓					✓	512K	2	IRMA	$195	$45,000 to $60,000	
Field	✓			✓			✓	256K	2	IRMA, Forte	$695	$25,000	
Field content	✓			✓		✓	✓	56K	1	IRMA, CXI	$500	$10,000	
Field content	✓	✓		✓	✓	✓	✓	256K	2	IRMA	$100		$1,395
Field content	✓			✓			✓	384K	1	IRMA	$750	$10,000	$17,500
File		✓	✓	✓	✓			512K	1	IBM 3278,3279, IRMA, CXI	$450	$10,000	$10,450
To cell level	✓	✓	✓	✓			✓	384K	2	IRMA, FORTE PJ, IBM 3278/79, CXI, INS	$300	$75,000	$150,000
To cell level	✓	✓	✓	✓			✓	384K	2	IRMA, FORTE PJ, IBM 3278/79, CSI, INS	$300	$75,000	$150,000
Field content	✓	✓	✓	✓			✓	64K	1				$5,000
File				✓	✓			256K	1	IRMA or IRMAcom	$125		$2,500
All	✓	✓	✓	✓	✓			128K	1	VT100 emulation boards	$250	$3,500	
File				✓	✓		✓	128K	1	FORTE PJ			$1,000
File	✓	✓		✓	✓		✓	128K	1	FORTE PJ			$1,000
Field	✓			✓			✓	384K	2	IBM	$200	$16,000	
Field, record	✓	✓	✓	✓				128K	1	Any	$450	$8,000	$12,500
Field content			✓			✓	✓	256K	2	IRMA	$550	$45,000	
Field content		✓				✓	✓	256K	1	IRMA	$550	$45,000	
Field content						✓	✓	256K	1	IRMA	$550	$30,000	
Field	✓	✓	✓				✓	192K	1	None required	$295	$45,000	$45,295
Field content	✓	✓					✓	128K	2		$395	$15,000	
Field, record	✓	✓	✓	✓	✓		✓	256K	1	IRMA, PCOX, FORTE, IBM	$15,000	$12,000+	
Field content	✓	✓	✓				✓	256K	?	IRMA, MP01, IBM 3278			$3,000
Field	✓	✓	✓	✓	✓	✓	✓	128K	1	IRMA, FORTE, CXI, AST-BSC	$300		$9,000 to $12,000
Field content	✓			✓			✓	192K	1	Optional	$185	$4,000 to $9,000	
Character	✓	✓	✓	✓		✓	✓	256K	1	IRMA, CXI, Forte, INS, Attachmate	$1,100	$27,000	
Field, file	✓	✓	✓	✓		✓	✓	256K	2	IRMA, IBM 3270, other 3270 compatible boards	$295 to $595	$14,000 to $19,800	
Field content	✓	✓	✓	✓	✓	✓	✓	128K	1	IRMA, IBM, AST, PCOX, Forte, INS, ITT		$4,200	
File	✓	✓	✓	✓	✓		✓	64K	1	IRMA, Forte, CXI, IBM	$200	$7,500	
Field content	✓	✓	✓	✓	✓	✓	✓	256K	2	IRMA and compatible 3270	$495	$20,000	$30,000
Field content	✓	✓	✓	✓	✓	✓	✓	256K	2	IRMA and compatible 3270 boards	$495	$6,000	$10,000
File	✓				✓		✓	192K	1	None required	$250	$9,000 to $15,000	
Field level	✓	✓	✓	✓	✓	✓	✓	320K	1	IRMA, FORTE, IBM, CXI, ITT	$250 to $1,000	$15,000	$25,000
Field content	✓						✓	256K	2	IRMA			$3,500
File				✓				384K	1	None required	$795	$4,500	
File	✓	✓	✓	✓	✓	✓	✓	256K	1	IRMA, IBM, AST, PCOX			$4,200
Data element	✓	✓	✓	✓		✓	✓	196K	1	IRMA, ITA/PC Express	$850	$20,000	
Field, record	✓	✓			✓			256K	1	Most 3278 coax boards	$250 to $495	$400 to $5,000	$650 to $5,495
File	✓	✓	✓	✓		✓	✓	192K	1		$300	$18,500	
Field	✓	✓	✓	✓		✓	✓	256K	2	Forte, IRMA, ITT	$500	$20,000+	
File	✓	✓	✓	✓	✓		✓	128K	1	None required	$149 to $225	$5,000	$9,500

Micro-Mainframe

(Editor's Note: The companies included in this chart manufacture both the micro and the mainframe software necessary for a micro-to-mainframe system.)

Data download: At what database level can data be selected from the mainframe? Options include field content, where the user can access the information in a field; field name, where the user has access to a storage unit that forms a record; and file, which allows the user access to a group of records.

File formats supported: Into which microcomputer applications-software packages can the user load mainframe information? Popular ones include VisiCalc (DIF), WKS (1-2-3), SYLK (Multiplan), and ASCII files.

Real-time upload possible: Can the program upload data directly to mainframe applications, allowing immediate access to the uploaded information? A few products have the ability to perform real-time updates with the supervision of the data-processing department and with proper password clearance.

Communications: Are there any hardware requirements, such as a terminal-emulation board, a communications board, or a modem?

Security: Is there password access at the micro level, where users must give a password before asking to be logged onto the mainframe? Or is the password access at the mainframe level? In this case, the package integrates the standard password-protection schemes that are at work on the mainframe system.

3270 series terminal emulation: The product supports emulation of the indicated IBM 3270 series terminals.

3274/3276 controller emulation: The emulator can function in both 3274 and 3276 communications environments.

Channel attachment to 3274/76 controller: Allows connection to a mainframe computer in SNA or non-SNA mode through a direct channel alone or remotely, through telephone lines and a front-end processor.

SNA: IBM's major protocol for transferring information among its systems.

Bisync: The emulator transfers data in a binary synchronous fashion, which is half duplex—one direction at a time, one character at a time.

SDLC: The emulator transfers under IBM's SDLC protocol, which is full duplex, or both directions, and transfers data one bit at a time.

Transfers binary files: Transfers files in binary code, which uses bits to represent numbers and characters for machine instructions and data.

Half duplex: Data can be transferred in only one direction at a given time.

Full duplex: Data can be transferred in both directions at the same time.

Speed: The speed at which the emulator can transmit data. Speed is expressed in bits per second. Emulator software products that attach to the mainframe via coaxial cable have a standard transmission speed of 2.35 megabits per second.

Multisession capability: The emulator can work in a multisession or multitasking environment, handling more than one application at a time.

Data stream to disk: The emulator can take the data stream coming into the PC and write it to disk for storage.

Network-addressable printer support: The emulator has a feature that allows a user at a PC to initiate the printing of mainframe applications, on any printer that is under the mainframe's control. ■

Communications Software

Product[*]	Vendor	System Characteristics							Dialing features			
PC-Dial	Buttonware	128K	[illegible]		✓	[illegible]	300 to 4800	Both	✓	✓	✓	✓
BSTAM 5000	Byrom Software	128K	1		✓		300 to 1M	Both	✓	✓	✓	✓
BLAST	Communications Research Group	64K	[illegible]	✓	✓	✓	Up to 19.2K	Both	✓	✓	✓	✓
Traverse	Complexx Systems	64K	1	✓	✓		1200 to 9600	Full	✓	✓	✓	✓
Intellicom	Computer Toolbox	128K	[illegible]		✓	✓	Up to 9600	Both	✓	✓	✓	✓
PASSPORT	Datalex	256K	1	✓		✓	110 to 9600	Both	✓	✓	✓	✓
MicroLink II	Digital Marketing	64K	[illegible]		✓	[illegible]	300 to 9600	Both	✓	[illegible]	[illegible]	✓
The Impersonator	Direct*Aid Inc.	192K	1		✓	✓	300 to 9600	Both	✓	✓	✓	✓
ASCOM IV	Dynamic Microprocessor Associates[3]	256K	[illegible]		✓	✓	Up to 19.2K	Both	✓	[illegible]	✓	✓
logOn	Ferox Microsystems Inc.	192K	1		✓		300	Both	✓	✓		✓
Compac	Frontier Technologies Inc.	128K	1		✓		300 to 9600	Both				✓
Microgate/FT	Gateway Microsystems	128K	1	✓		✓	Up to 9600	Both	✓	✓	✓	✓
Telios	GENASYS Corp.	128K	1			✓	300 to 9600	Both	✓	✓	✓	✓
COMMX-PAC	Hawkeye Grafix	64K	1		✓		300 to 9600	Both	✓	✓	✓	✓
Smartcom II	Hayes Microcomputer Products	192K	1		✓	[illegible]	300, 1200	Both	✓	✓	✓	✓
PC-Talk III	The Headlands Press Inc.	64K	1			✓	110 to 9600	Both	✓	✓	✓	✓
Acculink	IE Systems Inc.	128K	1		✓		300 to 19.2K	Both	✓	✓	✓	✓
Genterm	Information Analysis Systems	64K	1		✓		110 to 9600	Both	✓	✓		✓
Infoshare II Universal Communications Interface	Information People	128K	[illegible]		✓		300 to 9600	Both	✓	✓		✓
Asynchronous Communications Support Program	IBM	64K	1	✓	✓	✓	120 to 9600	Both	✓		✓	✓
Personal Communications Manager		128K	1		✓		300 to 9600	Both	✓	✓	✓	✓

Product[*]	Program features							Function Modes						Security		
PC-Dial			✓	[illegible]	[illegible]				✓		[illegible]		XModem			$29.00
BSTAM 5000	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	Proprietary	[illegible]	✓	$249.00
BLAST	✓	✓	✓	[illegible]	[illegible]	[illegible]	✓	✓	✓	✓	[illegible]	✓	Proprietary	[illegible]	✓	$250.00
Traverse		✓			[illegible]	✓	✓		✓	✓	✓	✓	Hayes, Proprietary	✓		$295.00
Intellicom	✓	✓	✓	[illegible]	[illegible]	✓			✓			✓	XModem	[illegible]		$69.95
PASSPORT		✓	✓		✓				✓	✓	[illegible]	✓	Proprietary	[illegible]		$260.00
MicroLink II	[illegible]	✓		[illegible]	[illegible]	✓	✓		✓	✓			XModem			$99.00
The Impersonator	✓	✓			✓	✓	✓	✓	✓		[illegible]	✓	XModem			$245.00
ASCOM IV	✓	✓	✓	✓	[illegible]	✓	✓		✓	✓		✓	XModem, Proprietary	✓		$195.00
logOn	✓		✓		✓				✓		[illegible]		Proprietary	[illegible]		$150.00
Compac	[illegible]		✓	[illegible]	[illegible]	[illegible]		[illegible]	✓	✓	✓	✓	Hayes			$40.00 to $195.00[4]
Microgate/FT			✓	✓	✓				✓	✓	[illegible]		Bisync			$195.00[5]
Telios		✓	✓	[illegible]	✓	✓			✓	✓	[illegible]	✓	XModem, KERMIT			$119.95
COMMX-PAC	✓	✓	✓		✓	✓	✓		✓	✓	✓	✓	XModem, Proprietary	✓	✓	$249.00
Smartcom II	✓	✓	✓	[illegible]	[illegible]	✓		✓	✓		[illegible]	✓	Hayes, XModem	✓		$149.00
PC-Talk III	✓	✓	✓	✓	✓	✓			✓		[illegible]		XModem			$35.00
Acculink	✓	✓	✓	✓	[illegible]	✓			✓	✓	✓	✓	XModem, Proprietary			$245.00
Genterm	✓	✓	✓		✓	✓			✓	✓	[illegible]	✓	XModem			$129.95
Infoshare II Universal Communications Interface	✓	✓	✓	[illegible]	[illegible]	[illegible]			✓	✓	✓	✓	Proprietary	✓		$149.00
Asynchronous Communications Support Program					✓		✓		✓	✓	[illegible]	✓	Proprietary	[illegible]	✓	$60.00
Personal Communications Manager	✓	✓			✓		✓		✓			✓	MNP			$100.00

Omniterm 2	Lindbergh Systems	128K	1		✓		50 to 19.2K	Both	✓	✓		✓	✓	✓	✓	✓		✓	✓	✓		✓		XModem		$175.00
PC Workstation	Logical Data	192K	1	✓	✓		110 to 19.2K	Both	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	XModem, Proprietary	✓	$500.00
Connect	MainStream Software	192K	1		✓		Up to 9600	Both	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	KERMIT, XModem	✓	$195.00
Link	Martin Marietta/ITSoftware	128K	1		✓		300 to 9600	Both	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	XModem	✓	$150.00
Benchmark Telecom	Metasoft Corp.	128K	1				Up to 19.2K	Both														✓		Proprietary	✓	$150.00
ERA 2	Microcom Inc.	128K	1		✓		Up to 2400	Both	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓				Proprietary		$195.00
Telmerge²	MicroPro	128K	1				300 to 1200	Both	✓	✓	✓	✓	✓	✓		✓		✓	✓	✓				MNP		$499.00 to $999.00⁴
Crosstalk XVI	Microstuf Inc.	128K	1		✓	✓	110 to 9600	Both	✓	✓	✓	✓	✓	✓	✓	✓		✓						None		$145.00
Remote		128K	1		✓		110 to 9600	Both		✓														XModem, Crosstalk		$195.00
M-Term	Micro-Systems Software Inc.	64K					110 to 9600	Both	✓	✓		✓	✓	✓	✓									Proprietary	✓	$195.00
Miracle		256K					300 to 9600	Both	✓	✓	✓	✓	✓	✓	✓									Proprietary		$79.95
Mite/MS³	Mycroft Labs Inc.	96K	1		✓		Up to 19.2K	Both	✓	✓	✓	✓		✓	✓			✓	✓	✓		✓	✓	XModem		$299.00
Mist	New Era Technologies	256K					300 to 1200	Both	✓	✓	✓	✓	✓	✓	✓	✓								Hayes, XModem, Crosstalk, MITEX		$195.00
Sync	Norton-Lambert Corp.	64K	1			✓	Up to 19.2K	Both	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓		✓	✓	XModem	✓	$295.00
Poly-COM	Polysoft Associates Inc.	64K					300 to 9600	Both				✓	✓	✓	✓	✓		✓	✓	✓		✓	✓	XModem, LYNC	✓	$195.00
QS Call	Quality Software	128K	1		✓	✓	110 to 9600	Both	✓	✓		✓	✓					✓					✓	Proprietary		$200.00
George	Racal-Vadic	128K					110, 300, 1200	Both	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓				Proprietary		$150.00
Readiterm	Readiware Systems	96K	1			✓	Up to 9600	Both	✓	✓	✓	✓		✓	✓							✓	✓	XModem		$95.00
Softerm PC	Softronics Inc.	128K	1	✓	✓	✓	50 to 9600	Both	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓		✓	✓	XModem		$75.00
PFS: Access	Software Publishing Co.	128K	1	✓	✓		300, 1200	Both	✓	✓		✓	✓	✓	✓			✓	✓	✓				XModem, Proprietary		$195.00
Data Capture/pc	Southeastern Software	128K					110 to 19.2K	Both	✓	✓		✓	✓	✓	✓			✓	✓	✓		✓	✓	XModem	✓	$140.00
Perfect Link	THORN EMI Computer Software	128K	2		✓		300 to 9600	Both	✓	✓		✓		✓		✓		✓	✓			✓	✓	None		$120.00
Transend PC Complete	Transend Corp.	256K					300 to 19.2K	Both	✓	✓	✓	✓	✓	✓	✓	✓		✓		✓		✓	✓	XModem		$129.00
UAP-Link	Unique Automation Products	64K	1	✓		✓	300 to 9600	Both	✓	✓			✓	✓	✓			✓	✓	✓		✓	✓	XModem	✓	$229.00
ASCII PRO	United Software Industries	64K					Up to 38.4K	Both	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓				Proprietary		$250.00
Relay	VM Personal Computing	128K	1		✓		50 to 19.2K	Both	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓		✓	✓	XModem	✓	$189.95
Move It Intercomputer Communication System	Woolf Software Systems	32K					110 to 19.2K	Both	✓	✓	✓	✓	✓		✓	✓						✓	✓	XModem, Proprietary	✓	$149.00
																								Proprietary	✓	$150.00

¹Information not available
²Requested donation
³ASCOM also marketed by Wescо Inc.
⁴Volume for Frontier Technologies communications computer

Price depends on baud rate.
Price for two copies required for file transfers.
(A single copy costs $99.)
⁷Program sold only with Avio's modems.

Price reflects cost of modem and software
⁹Requires Windows
¹⁰Program also bundled with Novation Inc.'s Smart CAT Plus modems.
¹¹All packages are Hayes Smartmodem compatible.

Local Area Networks

Product	Vendor	Architectural: Topology	Architectural: Cable (bandwidth)	Architectural: Data rate (Mbps)	Architectural: Access protocol	Compatibility: Gateway to mainframe	Compatibility: Links multiple operating systems	Software: File-locking	Software: Record-locking	Software: Electronic mail	Software: Remote access	Software: Print spooling	Capacities: Maximum no. of stations	Capacities: Maximum cable length (feet)	Price[1]	
AST-PCnet I	AST Research	Bus	Coaxial (baseband)	.8	CSMA/CD	✓		✓	✓		✓	✓	223	5,000	$9,595.00	a
AST-PCnet II		Bus	Twisted pair	1	CSMA/CA	✓		✓	✓		✓	✓	160	500	$9,340.00	
Split/Net	Autocomat Inc.	Bus	Coaxial (baseband)	1.0	CSMA/CA			✓	✓	✓	✓	✓	255	7,000	$8,163.00	
Net-worker	B-Kamo Inc.	Tree	Twisted pair	2.5	Token passing	✓		✓	✓	✓	✓	✓	4,080	4,000	$8,388.00	
XLAN	Commoss Systems	Bus	Coaxial (baseband) Twisted pair	1.8	CSMA/CA	✓	✓			✓	✓	✓	192	8,000	$3,580.00	a
Token/Net	Concepe Data Systems	Bus	Coaxial (broadband)	5 per 6 channels	Token passing	✓							1,000 per channel	30 miles	$5,295.00	
Connect	Cornes Systems	Bus	Twisted pair	1.0	CSMA/CA	✓	✓					✓	63	1,000	$7,250.00	
Corvog /NetLink	Corvog Systems	Star	Coaxial (baseband)	2.5	Token passing	✓		✓	✓	✓		✓	255	2,000	$10,365.00	
Dosnet	The Dostec Group	Bus	Coaxial (baseband)	2.0	CSMA/CA	✓		✓	✓	✓		✓	250	2,500	$9,000.00	
miNet	Digital Microsystems	Bus	Twisted pair, flat ribbon, fiber optic	.5	SDLC	✓	✓	✓	✓	✓	✓	✓	63	4,000	$13,155.00	
NetCommander	Digital Products Inc.	Star	RS-232	.019 (19.2 Kbps)			✓			✓	✓	✓	16	200	$5,650.00	a
10-Net	Fox Research Inc.	Bus	Twisted pair	1.0	CSMA/CA	✓		✓	✓	✓		✓	160	2,000	$5,600.00	c d
G-Net	Gateway Communications	Bus	Coaxial (baseband)	1.43	CSMA/CA/CD	✓		✓	✓	✓		✓	255	7,500	$10,400.00	c
IDEAnet	IDEAssociates	Bus	Coaxial (baseband)	.8	CSMA/CD Ethernet			✓	✓		✓	✓	20	2,000	$8,628.00	
LAN/1	Interactive Systems 3M Corp.	Bus	Coaxial (broadband)	2.5 per 5 channels	Token passing						✓		10,000	14 miles	$9,600.00	c d
LAN/PC		Bus	Coaxial (broadband)	2.5 per 5 channels	Token passing	✓	✓	✓	✓	✓	✓	✓	1,200	14 miles	$7,525.00	a
Net/Plus PC Connection	Interlan Inc.	Bus	Coaxial (baseband)	10	CSMA/CD			✓	✓			✓	1,024	990/1,650 [10]	$9,695.00	a
PC Cluster	IBM	Bus	Coaxial (baseband)	.375	CSMA/CA	✓		✓		✓	✓		64	3,280	$4,166.00	
PC Network		Bus	Coaxial (broadband)	2.0	CSMA/CD	✓		✓	✓	✓	✓	✓	72[9]	2,030[9]	$8,664.00	
L-Net	Legent Business Machines	Bus	Twisted pair	2.5	CSMA/CD			✓	✓		✓		64	3,280	$4,166.00	
Power Line Network	Mallard Systems Design	Bus	Existing power lines	.0028	Proprietary			✓					254	[7]	$3,992.00	a b
PLAN Series	Nestar Systems	Tree	Coaxial (baseband, coaxial (broadband), twisted pair, fiber optic	2.5	Token passing	✓	✓	✓	✓	✓	✓	✓	255	baseband 22,000 broadband 25 miles	$21,835.00	
DNA (Device Network Architecture)	Network Development Corp.	Star	Twisted pair	.8	Polling	✓		✓	✓		✓	✓	64	1 mile	$3,975.00	a
Netware/Connect	Novell Inc.	Bus	Twisted pair	1.0	CSMA/CA	✓		✓	✓	✓	✓	✓	50	4,000	$10,720.00	
Netware/S		Star	Dual twisted pair	.5	Proprietary	✓	✓	✓	✓	✓	✓	✓	24	2,000	$15,000.00	
Netware/ARCNET		Ring	Coaxial (baseband)	2.5	Modified token passing	✓		✓	✓	✓	✓	✓	50	2,000	$11,530.00	
PCnet	Orchid Technology	Bus	Coaxial (baseband)	1.0	CSMA/CD	✓		✓		✓	✓	✓	254	7,000	$9,670.00	
ProNet	Proteon Inc.	Ring	Twisted pair, coaxial (baseband), fiber optic, infrared link	10	Token passing	✓		✓	✓	✓	✓	✓	255	1,000[4]	$14,700.00	
Quadnet VI	Quadram Corp.	Bus	Coaxial (baseband)	2	CSMA/CA/CD			✓	✓	✓	✓	✓	255	1,250	$6,885.00 $8,165.00	
Quadnet IS		Star/ring	Fiber optic, twisted pair, infrared link	10	Token passing			✓	✓	✓	✓	✓	255	100	$8,735.00 10,085.00	
SCS PCnet	Santa Clara Systems	Bus	Coaxial (baseband)	1	CSMA/CD			✓	✓	✓	✓	✓	54	$4,500.00	$20,140.00	
StandardNET	Standard Data Corp.	Bus	Coaxial (baseband)	3	CSMA/CD			✓		✓		✓	255	1,800	$5,665.95	a
ARCNET-PC	Standard Microsystems Corp.	Ring	Coaxial (baseband)	2.5	Token passing			✓	✓	✓	✓	✓	255	$2,000	$4,995.00	a d
Sun* Net	Sunet Systems	Star	Flat ribbon	8.0	Multiplexing		✓	✓				✓	64	500	$7,595.00	
Sun*Net II		Bus	Twisted pair	.25	CSMA/CA		✓	✓	✓			✓	64	1 mile	$6,827.00	
Think Link	Tangent Technologies	Star	Twisted pair	1.0	SDLC	✓		✓	✓	✓	✓	✓	24	3,000	$21,275.00	
EtherSense	Texas Instruments	Bus	Coaxial (baseband)	10.0	CSMA/CD	✓				✓		✓	1,000	1,000/1,640 [10]	$16,585	
EtherSense	3Com	Bus	Coaxial (baseband)	10.0	CSMA/CD	✓		✓	✓	✓		✓	1,024	1,000/3,200 [10]	13,890.00	
Net/One	Ungermann-Bass Inc.	Bus	Coaxial (baseband broadband)	5.0 broadband 10.0 baseband and fiber optic	CSMA/CD	✓		✓	✓	✓	✓	✓	1,024	656/1,640 [10]	$8,445.00	a
X-Net	XComp Inc.	Bus	Twisted pair	2.5	CSMA/CD			✓	✓			✓	255	600	$5,755.00	

*Not available
[1]Pricing is based on the following typical LAN setup: eight workstations, 400 feet of cable, networking software, file server and 40-50 megabyte hard disk, unless otherwise noted
[a]Price does not include cable
[b]Price does not include file server
[c]Price does not include hard disk
[d]No server and/or system or not required
[4]Distances are length of building x cabling
[5]Longer distances may be available with fiber optics
[6]With standard cabling set. Additional stations can be added with coaxial cabling
[10]Distances depend on thin or thick Ethernet cables

STERLING SOFTWARE
COMMERCIAL PROFESSIONAL SERVICES
ANALYSIS OF MAJOR PLAYERS
1984 REVENUE DATA

NAME OF COMPANY	TOTAL P/S REVS	TOTAL COM'L REVS	SOFTWARE DEVELOPMENT	CONSULTING	EDUCATION & TRAINING	FACILITIES MANAGEMENT
ARTHUR ANDERSEN	297	193	125	19	48	0
COMPUTER SCIENCES CORP	463	139	42	28	7	63
MCGRAW-HILL	107	107	0	59	48	0
IBM	200	100	50	35	15	0
COMPUTER TASK GROUP	77	77	62	0	0	15
MARTIN-MARIETTA	208	73	29	25	1	17
DIGITAL EQUIPMENT CORP	90	72	58	14	0	0
GEISCO	75	71	50	18	4	0
BURROUGHS (SDC)	223	67	40	20	7	0
PEAT MARWICK	104	62	47	6	9	0
PRICE WATERHOUSE	95	62	46	6	9	0
CAP GEMINI	61	55	55	0	0	0
DBA SYSTEMS	53	53	40	11	3	0
INFORMATICS GENERAL	76	49	27	15	2	5
MCDONNELL DOUGLAS	52	44	27	13	4	0
ANALYSTS INTERNATIONAL	46	44	37	7	0	0
ELECTRONIC DATA SYSTEMS	145	44	17	11	15	0
SCIENCE APPLICATIONS	215	43	28	11	4	0
COMPUTER HORIZONS	43	43	30	9	4	0
AGS COMPUTER	45	43	34	9	0	0
AMERICAN MANAGEMENT SYSTEMS	75	38	24	9	4	0
CONTROL DATA	125	38	28	6	4	0
CGA COMPUTER	36	36	23	9	4	0
PLANNING RESEARCH CORP	120	36	14	7	4	11

STERLING SOFTWARE
COMMERCIAL PROFESSIONAL SERVICES
ANALYSIS OF MAJOR PLAYERS
1984 REVENUE DATA

NAME OF COMPANY	TOTAL P/S REVS	TOTAL COM'L REVS	SOFTWARE DEVELOPMENT	CONSULTING	EDUCATION & TRAINING	FACILITIES MANAGEMENT
ARTHUR D. LITTLE	41	35	0	35	0	0
DELTAK	43	34	14	0	21	0
SPERRY CORP	54	32	26	6	0	0
KEANE	31	31	11	3	2	16
HONEYWELL	50	30	18	9	3	0
KENTRON INT'L(ACQ BY PRC)	60	30	0	0	0	30
GENIGRAPHICS	30	30	24	5	2	0
DATA GENERAL	39	27	19	5	3	0
TOUCHE ROSS	32	26	17	3	6	0
ADVANCED SYSTEMS INC	26	26	13	9	4	0
COMPUCARE	35	25	7	5	5	7
LOGICON	161	24	12	6	6	0
COMPUWARE	25	23	16	7	0	0
ASPEN SYSTEMS CORP	26	23	21	2	0	0
DELOITTE HASKINS + SELLS	46	23	21	2	0	0
ERNST & WHINNEY	31	23	16	2	5	0
BOEING	58	23	16	6	1	0
THE CONTINUUM CORP	21	21	11	7	3	0

STERLING SOFTWARE
GOVERNMENT PROFESSIONAL SERVICES
ANALYSIS OF MAJOR PLAYERS
1984 REVENUE DATA

NAME OF COMPANY	TOTAL P/S REVS	TOTAL GOVT REVS	SOFTWARE DEVELOPMENT	CONSULTING	EDUCATION & TRAINING	FACILITIES MANAGEMENT
COMPUTER SCIENCES CORP	463	324	97	65	16	146
MITRE	226	226	147	79	0	0
SCIENCE APPLICATIONS	215	172	112	43	17	0
BURROUGHS (SDC)	223	156	94	47	16	0
LOGICON	161	137	68	34	34	0
MARTIN-MARIETTA	208	135	54	47	3	31
ARTHUR ANDERSEN	297	104	68	10	26	0
ELECTRONIC DATA SYSTEMS	145	102	41	25	36	0
IBM	200	100	50	35	15	0
CONTROL DATA	125	88	66	13	9	0
BATELLE INSTITUTE	85	85	34	38	13	0
PLANNING RESEARCH CORP	120	84	34	17	8	25
SYSCON	92	83	46	29	8	0
CACI	91	77	54	12	12	0
BDM INTERNATIONAL	78	74	22	22	15	15
GRUMMAN DATA SYSTEMS	63	63	44	13	6	0
OAO CORP	60	60	36	12	0	12
SOFTECH	55	55	39	8	8	0
VANGUARD TECHNOLOGIES	50	50	20	10	5	15
SYSTEMS & COMPUTER TECHNOLOGY	58	49	7	5	0	37
BENDIX	49	49	7	5	0	37
LEMSCO (LOCKHEED)	48	48	10	0	0	38
SYSTEMS & APPLIED SCIENCES	45	45	32	11	2	0
TELOS	45	45	41	5	0	0

STERLING SOFTWARE
GOVERNMENT PROFESSIONAL SERVICES
ANALYSIS OF MAJOR PLAYERS
1984 REVENUE DATA

NAME OF COMPANY	TOTAL P/S REVS	TOTAL GOVT REVS	SOFTWARE DEVELOPMENT	CONSULTING	EDUCATION & TRAINING	FACILITIES MANAGEMENT
PEAT MARWICK	104	42	31	4	6	0
COMPUTER DATA SYSTEMS	45	41	16	6	2	16
CALSPAN	39	39	18	21	0	0
AMERICAN MANAGEMENT SYSTEMS	75	38	24	9	4	0
ANALYTICS	38	38	13	25	0	0
GTE TELENET	45	36	25	9	2	0
BOOZ ALLEN HAMILTON	52	36	18	15	4	0

[illegible]	Total Rev.	Bank-Software Rev.	Bank Management	Integrated Banking Systems	Teller Support	Automated Teller Systems	Customer Info. Systems
[illegible]man Corp. Florida Software) (Private) IBM, Burroughs)	52.0 (12/84)	52.0 (12/84)	o Customer profitability analysis (185+) o Service link (66+) o Supplies inventory (175+) Asset/Liab Mgmt (80+) Financial Mgmt (280+)		Teller Terminal (45+)	ATM (70+)	CIF (375+) Mktg model (60)
[illegible]gan (IBM)	28.2 (3/85)	28.2 (3/85)	FIS (?) Preferred client svcs (?) Umbrella System (127)		On-line Del. Sys (54)	-	Prophet (101)
[illegible]CEL (IBM)	194.0 (9/85)	26.0	Banking Fin Ctrl Mgr (400) Profitability Mgr (40) U Exception Item Mgr (20) Multisort (?) Proof of deposit (50) Super MICR (150)		UCCEL Teller Mgr (?)	-	CIM (125) Customer Mgr (20)
[illegible] (Lincoln, NE) Private) (Burroughs) Revs Net of Hardware)	21.0 (85)	21.0 (85)		BDS (400) (Burroughs)		-	
[illegible] Saddlebrook Corp. Private) (DEC)	19.0 (84)	19.0 (84)	Pro forma modeling (200) DEC; $15K+ A/P (50) Cost Acctg (75) Fin Plan & Ctrl (300)	-	-	-	

Vendor	Deposit	Loan	Money Management	Other Fin. Inst.	Investment
Burchman Corp.	Demand dep acctg(380+) Savings (380+) C of D (580+)	Instal. loan (500+) Com'l loan (400+) Dealer Flr Plan (125+) Mortgage loan (440+)	Acct reconciliation (130+)		
Hogan	Integ. dep sys (100)	Int. loan sys (58) O/L call sys (31)			
UCCEL	UCCEL dep. mgr (70)	Infoloans (-) Instal loans mgr (100) Com'l loan mgr (100)	U. Paperless item proc (250) U. asset cash mgr (50)		
IFI					
The Saddlebrook Corp.		System M (62) Consumer loan (15) Com'l loan (73)			Securities acctg & Port. mgmt (175)

Company	Total Rev.	Bank-Software Rev.	Bank Management	Int. Banking Systems	Teller Support	Automated Teller Systems	Customer Info. Systems
Harrington Associates (Sub. of SDL-U.K.) IBM (Burroughs)		17.0 (12/84)	(?)Bank investment Portfolio System (140) $15K BOLT (On-line) 4K/mo				
BaCorp (IBM)	131.9 (9/84)	13.0 (9/84)	Bankserv 10800 (14) (Perkin-Elmer) Bankserv APS (?) IBM				CSA (?) (IBM)
Stockholder Systems (IBM)	12.8 (9/85)	12.8 (9/85)	-	-	PTT (43) $60-75K	-	
Systematics (IBM)	110.5 (11/85)	11.0 (11/85)	Fixed asset acctg (200) Integ. trans. mgmt (50+)	IMPACS (95) S. Source Sys (300+)	Transaction Sys. (3)	-	CIF (?)
Software Alliance (Div. of Teknekron) (Products are developed by M&I, Wisconsin)		11.0 (3/85) (Est)		M&I Int Bank sys (30)	M&I Teller Sys, Sys (4)	-	M&I CIS (5)
Strategic Info (Ziff) (DEC)	11.0 (85)	11.0 (85)		Bankmaster (25) 30-$130K		-	
BKW Wang (VS)	10.6 (9/84)	10.6 (9/84)	o BKW Banking Sys (50) Wang VS $100-250K	-	-	-	

Company	Deposit	Loan	Money Management	Other Fin. Inst.	Investment
rrington Associates					Security safekeeping sys (80) BOLT (85)
acomp		Bankserv instal Loan sys (140) Bankserv com'l loan (30) Bankserv coll mgmt (40)	Bankserv charge card sys (55)		
ockholder Systems		ALAS (100) $50-139K	CAPS (35) $50K PEP+ (370) $25-100K		
stematics	Savings & Time dep acctg (95)	Instal credit sys (88) Com'l loan (73) R/E System (30)	Item reconciliation (?)		
ftware Alliance	M&I deposit mgmt (30)	M&I loan mgmt sys (6)	M&I wire transfer (2) Credit C. mgmt sys (16)		
ategic Info	Moneymarket II (MMS) (DEC)		(Key Fin) Trust Master (5)		

Company	Total Rev.	Bank-Software Rev.	Bank Management	Int. Banking Systems	Teller Support	Automated Teller Systems	Customer Info. Systems
CEI (IBM)	102.6 (9/85)	8.0 (9/85)	Letter of credit (100)				
MTech (Tandem) (Sub of MCorp)	116.0 (84)	7.0 (84)	CASHMGT (Tandem) Moneynet FS (2) (Tandem)		Universal POS System (11)	MTECH EBD (81)	
DISC (Div. of AGS) (IBM/Burroughs)	221.6 (12/84)	5.0 (85)	IRS (200)				
Directions (IBM)			V1(76); V2(53); V3(163) V4(28); V5(21); V6(6)				
Check Consultants (IBM)			APTS (10+) Option 4 (5+) TUTR (15+) Superfiche (25+) SPRAYER (15+) ACLS (25+) CCISORT A.E.A.S. Guardian M-Route (10+) Zoom (10+) (CC) ALLO (15+) (CC) Extract 2000 (10+) Jobs (10+) Expand (10+) CCI FLOAT (10+) IMBS (10+) BANNER	-	-	-	

	Deposit	Loan	Money Management	Other Fin. Inst.	Investment
		SEI Collection (7)	Trust-aid 300 (30)		PMS (5) SEI fundtrack (11)
h			Moneynet FTS, II (45) PCCS (64)		
			DISC TCS (17) DISC ARP (45) DISC DUE-REC (25) DISC RRS (325)		
ctions			V VII (New)		
k Consultants	Automated dep acct (10+)				

DISTRIBUTION MARKETPLACE

RETAIL & WHOLESALE

Company City, State	Revs.	Delivery Mode S/W	Delivery Mode TK	Delivery Mode PR	Retail	Wholesale	Industries Served
Distribution Management Systems Corp. Rocky Mt., NC	$12MM Estimated 1985		X		X	X	Parts distribution.
MCBA, Inc. Glendale, CA	$7.7MM 1985	X			X	X	Cross-industry, companies with revenues from $500,000 to $60MM.
Northeast Data Systems, Inc. Burlington, MA	$6.0MM Estimated 1985		X			X	Cross-industry
Systems Management, Inc. Rosemont, IL	$17.5 1985	X	X			X	Cross-industry, with emphasis in electronics, office supply and automotive wholesale distributors.
Distribution Management Systems, Inc. Lexington, MA	$9.0MM 1985		X		-	-	Fortune 1000 companies who warehouse finished goods inventory and who maintain multiple distribution centers.
GSI Transcomm Pittsburgh, PA	$3.7MM 1984	X					Cross-industry, including electronics, electrical supplies, chemicals, industrial equipment, pharmaceuticals, heavy equipment, building supplies, household appliances and paper products.

DISTRIBUTION MARKETPLACE

RETAIL & WHOLESALE

Company City, State	Revs.	Delivery Mode S/W	TK	PR	Retail	Wholesale	Industries Served
Display Data Corp. Hunt Valley, MD	$58.0MM 1985		X		X	X	Automotive dealers, building supplies, beverage distribution.
Triad Systems Corp. Sunnyvale, CA	$120.0MM 1984		X		X	X	Automotive parts wholesalers, automotive warehouse distributors, retail hardware dealers and independent tire dealers.
McDonnell Douglas Information Systems EDI-NET				X			Grocery, transportation, electronics, communications, oil, warehousing.
GEISCO's EDI Express on MARKNET				X			Cross-industry.
Kleinschmidt, Divison of SCM Corp.				X			Primarily rail transportation, but also cross industry distribution markets.

Litigation Support Services

Companies that provide automated litigation support services work with firms on a case-by-case basis. At the law firm or at their own offices, these companies provide a staff that inputs and indexes the documents. The staff stays with the firm throughout the case, or they teach law firm personnel to work with the data base that has been created. Basic litigation support functions include: document organization and preparation, document retrieval, data base design, and document coding and analysis. Some companies provide microfilming and copying of documents. A law firm with a large computer can use its in-house system to store the data. Or firms can usually rent time on the litigation support service's computer, which can be accessed through telephone lines.

AAA MICRO GRAPHICS
55 New Montgomery St. #505
San Francisco, CA 94105
(415) 543-2888
Contact: Jerry McGinnis
Branch: Castro Valley, CA

In addition to document preparation and system design, AAA Micro Graphics microfilms documents and provides computer-assisted access and retrieval of microimages.

ALL STATE MICROFILM CORPORATION
155 Avenue of the Americas
New York, NY 10013
(212) 349-0268
Contact: Sam Martin
Branch: Santa Fe Springs, CA

Offers on-site preparation and microfilming of documents.

AMERICAN LEGAL SYSTEMS
31 E. 28th St.
Suite 800
New York, NY 10016
(212) 684-6330
(800) 221-3076
Contact: A. Martin Erim
Branches: Washington, DC; Chicago; San Francisco; Los Angeles

In addition to basic litigation support, American Legal does full-text data base design, creation, and maintenance, as well as deposition and trial transcript digesting. ALS provides staff and/or trains law firm personnel. It usually operates on a time-sharing basis, but can also develop in-house systems. Open 24 hours a day, seven days a week.

APTECH COMPUTER SYSTEMS, INC.
135 Delta Dr.
Pittsburgh, PA 15238
(412) 782-5550
Contact: M. Patrick Sullivan
Branch: New York

Aptech's litigation support software package runs on Wang VS hardware. Aptech consults on litigation support systems and can provide personnel training.

ASPEN SYSTEMS CORP.
330 Madison Ave.
New York, NY 10017
(212) 883-0126
(800) 221-3177
Contact: M.J. Goldenberg
Branches: Rockville, MD; Los Angeles

In addition to basic litigation support services, Aspen offers micrographics, duplicate document elimination, data base design, and bibliographic coding. Aspen staff can input material at the law firm or at Aspen and will train firm personnel. ASPENET, Aspen's information services network, provides phone access to litigation data bases through the TELENET communications network. Aspen works with STAIRS, BASIS, INQUIRE, and SAMANTHA software.

ATLIS SYSTEMS INC.
8460 Tyco Rd.
Vienna, VA 22180
(703) 883-1900
(800) 852-3700
Contact: John Aseltine
Branches: Gales Ferry, CT; Des Plaines, IL; Los Angeles

Atlis's litigation support staff designs document processing systems, enters data, and trains law firm personnel. ATSearch and ATComm software are available to law firms through Atlis's mainframe computer system. Atlis also offers in-house litigation support.

BARRISTER INFORMATION SYSTEMS CORP.
One Technology Center
45 Oak St.
Buffalo, NY 14203
(716) 845-5010
Contacts: Elaine Whitehead, Susan Robinson
Branches: 18 nationwide, 1 in Toronto

Barrister's Information Management Services Department has a full staff to input material and train personnel. After the data base is created, a firm can access it on its own Barrister system, on a rented system, or through time-sharing. Barrister also provides consulting services and automated conflict-of-interest checking.

CRAIG MANAGEMENT ASSOCIATES INC.
666 Fifth Ave.
New York, NY 10103
(212) 315-1305
Contact: Stanley Schiffman

Craig's Law-In-Order software for litigation support runs on small or large in-house computer systems, or on a time-sharing basis through Craig's mainframe. Craig has a staff of four that organizes documents and trains firm personnel.

INFORMATICS GENERAL CORPORATION

6011 Executive Blvd.
Rockville, MD 20852
(301) 770-3000
(800) 638-6595
Contact: Joanne Finney
Branches: 8

Informatics's Legal Information Services Division uses RECON IV and BASIS software, which are available to law firms on a time-sharing basis. The "enhanced" version of BASIS is available for in-house use and runs on the Wang VS series. Informatics provides full staffing for basic litigation support, in addition to data conversion, consulting, and training and management. The Legal Information Services Division has a staff of approximately 300.

INFORMATION CONSULTANTS INCORPORATED

1133 15th St., N.W.
Suite 300
Washington, DC 20005
(202) 822-5200
Contact: Jack O'Brien, Catherine Wieczorek

ICI's full-text litigation support service handles on- or off-site data entry and can work with court reporters to permit next-day access to testimony transcripts. Also offers data base management and electronic mail. ICI's VERSUS time-sharing mainframe system is accessed through a telephone and is available 24 hours a day, seven days a week. ICI is a subsidiary of the Bureau of National Affairs.

INTERAMERICA LEGAL SYSTEMS

1555 Wilson Blvd.
Suite 700
Rosslyn VA 22209
(703) 522-0870
Contact: James Turner

InterAmerica, with a staff of 200, provides full litigation support management and personnel training. In its largest case, InterAmerica handled more than 1.2 billion documents. InterAmerica's three-computer macrosystem has a DEC PDP 11/70 minicomputer and two Alpha Micro AM100L microcomputers.

LITIGATION SCIENCES, INC.

655 Deep Valley Dr.
Suite 350
Palos Verdes, CA 90274
(213) 544-0503
Contact: Donald Vinson
Branches: New York, Houston

Litigation Sciences has a staff of 25 social scientists who assist lawyers in developing strategies for complex or high-risk cases. This involves jury research and an evaluation of the case from a juror's point of view. Litigation Sciences does not handle document preparation and organization.

MATHEMATICA

P.O. Box 2393
Princeton, NJ 08540
(609) 799-2600
Contact: Christine Moline
Branches: 10

Mathematica, a subsidiary of Martin Marietta Data Systems, handles litigation support, research, surveys, software and computing systems, and management consulting services. The litigation support service is menu-driven and can be done on a time-sharing basis or with a firm's own mainframe.

MICROTRON INDUSTRIES

5514 Satsuma Ave.
North Hollywood, CA 91601
(213) 877-8761
Contacts: Steve Strong, David Allen

Microtron provides litigation support services for discovery projects of at least 10,000 documents. Microtron will load data bases and bring in a microsoftware data base package that is compatible with a firm's own hardware. Also offers on-site microfilming.

PLANNING RESEARCH CORP.

1749 Old Meadow Rd.
McLean, VA 22102
(203) 827-9000
Contact: Kirk Balcony
Branches: more than 50

Planning Research's Sterling Systems litigation support division provides staffing for basic litigation support, in addition to quantitative analysis and research, witness preparation, and exhibit tracking. Sterling can also access trial transcripts within 24 hours. The company uses BASIS, BRS/Search, and Inquire software.

QUORUM SYSTEMS

5165 Campus Dr.
Plymouth Meeting, PA 19642
(215) 825-7500
(800) 328-4454
Contact: Betty Shirar
Branches: 7

Quorum Systems, formerly Computer-R-Systems and Control Data Corporation, provides personnel to organize and index documents (in the law firm or at Quorum) and train law firm personnel. Quorum uses PALLAS litigation support software, which can run on DEC, IBM, Control Data, and Prime computers.

SUPERIOR INTERNATIONAL MICROFILM CORP.

47 West St.
New York, NY 10006
(212) 514-6500
Contact: Michael Zuckerman
Branch: Washington, DC

Superior International offers photocopying, printing, microfilm, and microfiche services. Does not work with computer data bases. Sets up libraries and indexes to organize the documents in a case. Open 24 hours a day, seven days a week.

BURTON GRAD ASSOCIATES, INC.
570 TAXTER ROAD
ELMSFORD, NEW YORK 10523
(914) 592-4700

May 20, 1986

Mr. Sterling Williams
Sterling Software, Inc.
8080 N. Central Expressway
Suite 1140, LBS 3
Dallas, Texas 75206-1895

Dear Sterling:

Enclosed is a preliminary version of the package to be available for distribution at the 6/4 - 6/6 President's Council meeting in Dallas.

You have seen draft versions of many of these items in previous letters. This, however, provides a comprehensive update of all of the material, so that we can get your opinions, suggestions, corrections and additions (as well as those from Phil and George) to produce a "final" copy by May 30.

Sincerely,

Burton Grad

Enclosures
BG:403B
cc: Mr. G. Ellis
Mr. P. Moore
Ms. E. Virgo

Sterling Strategic Planning Package

Prepared for:

President's Council
June 5 - June 6, 1986
Dallas, Texas

Prepared by:

Burton Grad Associates
570 Taxter Road
Elmsford, New York 10523

Burton Grad
Elizabeth Virgo
Rich Vines

Date:

May 21, 1986

Table of Contents

Enclosure 1

President's Council

Agenda - 6/5 and 6/6/86

* Quarterly Review Updates — Content and schedule from SW/GE
* FY87 Budget Process — Content and schedule from SW/GE
* Strategic Plan

Introduction and Timetable

Part 1. Game Plan — 2 hours

What is involved

Timing

How it is to be done

Who is to do what

What is to be produced

Part 2. Corporate Strategic Plan — 6 hours

Slide presentation and
Extensive Discussion

Part 3. Group Strategic Planning — 2 hours

Guide

Instructions

Discussion for each Group

Part 4. Reference Materials - handouts — 1 hour

Part 5. Summary/Actions for Strategy and Budget Planning — 1 hour

Specific review meeting dates

Contacts/liaison

Enclosure 2

Proposed Schedule of Events

Presentation of Strategic Planning Process and Distribution of Package at President's Council	SW/BG	6/5-6/6 Dallas
Group Presidents provide feedback and questions at President's Council	Presidents	6/6
Groups submit list of proposed major strategic directions and identify concerns regarding corporate or group strategies	Presidents	6/20
Provide feedback to groups on strategic issues	SW	6/27
Outline of Strategic Plan for each group/division	Presidents	1 week prior to site level review mtg
Site level review meetings; reach agreement in principle on strategic directions for each group/division	SW/BG/PM	7/14-7/18 through 8/4-8/8
Prepare final draft of corporate strategy	BG/SW	8/15
Groups to submit final draft of strategic plans	Presidents	8/29
Corporate and group strategic plans are consolidated, reviewed and edited	BG/EV	9/8
Strategic Plan is ready for submission to Board of Directors for approval	SW	9/15
Disseminate Strategic Plans	SW/BG	9/30
Discuss and evaluate Strategic Plan process and set up framework for 1987	SW/BG	11/30

Corporate Strategic Plan Format

SECTION A. Business Mission

SECTION B. Long-Term Objectives

SECTION C. Business Principles

SECTION D. Strategic Themes

SECTION E. Operating Strategy

SECTION F. Marketing Strategy

SECTION G. Technical Strategy

SECTION H. Acquisition/Divestiture Strategies

BUSINESS MISSION

- PROVIDE PACKAGED SOFTWARE TO IBM USERS IN SPECIFIC NICHES WITHIN BOTH THE SYSTEMS AND APPLICATIONS SOFTWARE MARKETS...WORLDWIDE

- PROVIDE PROFESSIONAL SERVICES TO THE COMMERCIAL AND FEDERAL MARKETPLACES... PRIMARILY IN THE UNITED STATES

- PROVIDE PROPRIETARY INFORMATION SERVICES TO SPECIFIC NICHES WITHIN CERTAIN INDUSTRY MARKETS...WORLDWIDE

LONG-TERM OBJECTIVES

- GROW REVENUE AT 30% PER YEAR
- GROW EPS AT 30% PER YEAR...BY QUARTER
- ACHIEVE 40% OF THE FULL YEAR'S PROFITS EACH YEAR IN THE FIRST HALF
- MAINTAIN OPERATING PROFIT MARGINS AT 25%...BY GROUP
- MAINTAIN A DEBT-TO-EQUITY RATIO OF 50%
- MAINTAIN RETURN ON EQUITY AT 10%
- MAINTAIN A CURRENT RATIO OF 2:1
- MAINTAIN A CUSTOMER SATISFACTION RATING IN THE TOP 10% OF THE INDUSTRY
- MAINTAIN A P/E RATIO IN THE TOP 20% OF THE INDUSTRY

BUSINESS PRINCIPLES

- MAINTAIN AN ATTITUDE AT ALL TIMES THAT SERVICING THE CUSTOMER IS OUR #1 PRIORITY.

- BE "PRODUCT-ORIENTED" RATHER THAN PRIMARILY "NUMBERS-ORIENTED"... THE NUMBERS WILL FOLLOW.

- MAINTAIN AN IMAGE, AT ALL TIMES, OF THE HIGHEST QUALITY:

  - PRODUCTS
  - SERVICE
  - PEOPLE

- OUR PEOPLE ARE OUR GREATEST ASSETS. THEY MUST BE TREATED THAT WAY.

- MAINTAIN THE "ENTREPRENEURIAL SPIRIT" AND AVOID POLICIES AND PROCEDURES.

- STRIVE AT ALL TIMES TO HAVE OPEN AND CLEAR COMMUNICATIONS INTERNALLY IN ALL DIRECTIONS.

- BE SENSITIVE TO THE PRESSURES OF THE STOCK MARKET, NOT BE DRIVEN BY THEM.

STRATEGIC THEMES

- BUILD ON THE BASE -- WE SHOULD GIVE OUR CURRENT CUSTOMERS MORE ATTENTION THAN WE GIVE TO PROSPECTS:
  - CONTINUING SUPPORT
  - ADD-ONS AND UPGRADES
  - RELATED PRODUCTS AND SERVICES
- BUY LEVERAGEABLE SUCCESSES -- IF THE PRODUCT/SERVICE UNITS ARE THERE, THERE SHOULD BE A WAY TO INCREASE THE PROFITS:
  - COMPANIES
  - PRODUCTS
  - SERVICES
- FOCUS ON THE WINNERS -- DON'T WASTE MONEY ON LOSERS; CUT THE LOSSES; DIVEST IF NECESSARY:
  - PRODUCTS
  - SERVICES
  - PEOPLE
  - CUSTOMERS
- MAKE A NICHE FOR YOURSELF -- SPECIALTIES PAY OFF AND CAN AVOID COMPETITION:
  - INDUSTRY
  - GEOGRAPHY
  - CRADLE-TO-GRAVE SERVICE
  - INTERNATIONAL
- GOOD SOFTWARE KNOWS NO LANGUAGE BARRIERS.

OPERATING STRATEGY

- GROW THE COMPANY BY BUILDING GROUPS OF COMPANIES (DIVISIONS) ADDRESSING COMMON MARKETS (APPENDIX 1)

- OPERATE EACH GROUP AS A UNIFIED COMPANY

- OPERATE EACH DIVISION AS AN INDEPENDENT P&L CENTER

- MAINTAIN SYNERGISTIC ENVIRONMENTS WHEREBY EACH DIVISION HAS AVAILABLE WHAT IT NEEDS TO GROW...FROM THE OTHER DIVISIONS, FROM THE GROUP OR FROM THE PARENT

- WITHIN EACH SOFTWARE GROUP, ESTABLISH BOTH A "MARKETING-ONLY DIVISION" AND A "MAINTENANCE AND SUPPORT DIVISION" TO SERVICE OTHER DIVISIONS IN THE GROUP, AS NEEDED

- ELIMINATE UNNECESSARY BUREAUCRACY AND KEEP OVERHEAD LOW...AT ALL LEVELS (APPENDIX 2)

- MAINTAIN HIGHLY PRODUCTIVE DEVELOPMENT ENVIRONMENTS BY KEEPING THE PRODUCT DEVELOPMENT ACTIVITY AT THE LOWEST ORGANIZATIONAL LEVELS

- GROW AGGRESSIVELY BOTH THROUGH EXISTING OPERATIONS AND ADDITIONAL ACQUISITIONS

MARKET STRATEGY

- FOCUS ON THE FOLLOWING SOFTWARE PRODUCTS MARKETS:
  - "APPLICATION ENABLING SYSTEMS SOFTWARE" PRODUCTS FOR IBM MAINFRAMES
  - "SYSTEMS UTILITIES SOFTWARE" PRODUCTS FOR IBM MAINFRAMES
  - "BANKING APPLICATIONS SOFTWARE" PRODUCTS FOR IBM MAINFRAMES

- FOCUS ON THE FOLLOWING PROFESSIONAL SERVICES MARKETS:
  - "BODY SHOP" PROFESSIONAL SERVICES FOR THE COMMERCIAL SECTOR
  - "PROJECT-ORIENTED" PROFESSIONAL SERVICES FOR CERTAIN INDUSTRIES WITHIN THE COMMERCIAL SECTOR
  - "PROJECT-ORIENTED" PROFESSIONAL SERVICES FOR THE FEDERAL GOVERNMENT SECTOR

MARKET STRATEGY

- FOCUS ON THE FOLLOWING INFORMATION SERVICES MARKETS:
  - "ELECTRONIC DOCUMENT INTERCHANGE" SERVICES FOR CERTAIN DISTRIBUTION-ORIENTED INDUSTRIES
  - "DATA BASE DEVELOPMENT AND SUPPORT" FOR THE LITIGATION SUPPORT AREA OF THE LEGAL MARKET
  - "APPLICATIONS SOFTWARE AND SERVICES" FOR THE DISTRIBUTION AND RETAIL INDUSTRIES
- EXPLOIT INTERNATIONAL MARKETING OPPORTUNITIES
- AVOID THE FOLLOWING MARKETS:
  - TURNKEY SYSTEMS (UNRELATED TO OUR PRIMARY MARKETS)
  - RAW MACHINE TIME PROCESSING SERVICES
  - PROCESSING SERVICES NOT INTEGRAL TO OUR OTHER PRODUCT OFFERINGS
  - BIG TICKET, SUPPORT-INTENSIVE SOFTWARE PRODUCTS
  - MICRO SOFTWARE UNRELATED DIRECTLY TO OUR MAINFRAME SOFTWARE PRODUCTS
  - INTEGRATED SOFTWARE PRODUCTS

TECHNICAL AND DEVELOPMENT STRATEGY

- BUY PROVEN PRODUCTS TO ENTER NEW MARKETS OR EXPAND EXISTING MARKETS
- BUILD NEW CAPABILITIES BY EXTENDING EXISTING PRODUCTS OR REPLACING USING NEW TECHNOLOGY
- DEVELOP FOR IBM MAINFRAME WITH IBM PC SUPPORT
- USE STANDARD PROGRAMMING LANGUAGES WITH FOURTH-GENERATION FACILITIES WHERE USEFUL
- DEVELOP MODULAR, WELL-DOCUMENTED PROGRAMS WITH PARAMETERS OR TABLES FOR FLEXIBILITY BY INDUSTRY OR GEOGRAPHY

ACQUISITION STRATEGY

- SEARCH FOR ACQUISITIONS IN THE FOLLOWING ORDER OF PRIORITY:
  - SMALL COMPANIES...TO OBTAIN THE OPTION TO ACQUIRE
  - SMALL COMPANIES...TO ACQUIRE OUTRIGHT
  - PRODUCTS...TO OBTAIN THE MARKETING RIGHTS, WITH THE OPTION TO ACQUIRE OUTRIGHT
  - PRODUCTS...TO ACQUIRE OUTRIGHT
- MAINTAIN A PORTFOLIO OF OPTIONS TO ACQUIRE FOUR TO SIX SMALL COMPANIES AT ANY POINT IN TIME (SEE APPENDIX 3)
- WHEN ACQUIRING COMPANIES OUTRIGHT, USE STOCK RATHER THAN CASH...AND DO ONLY POOLING TRANSACTIONS
- WHEN ACQUIRING PRODUCTS, USE MINIMAL CASH UP FRONT...AND PAY THE REST OUT OVER TIME BASED ON PERFORMANCE (E.G., ROYALTIES)
- BUY "QUALITY" AND EXPLOIT POTENTIAL FOR LEVERAGE
- SEARCH FOR PRODUCTS AND SERVICES TO SELL TO THE CUSTOMER BASE
- LOOK FOR NICHE/PRODUCTS

DIVESTITURE STRATEGY

- REEVALUATE ALL ACTIVITIES REGULARLY TO ENSURE DIVESTITURE WHERE IT IS CALLED FOR -- BY TECHNICAL OBSOLESCENCE, LOW GROWTH, LOW PROFIT OR EXCESS INVESTMENT

- CONSIDER OFFERS AS MADE BY QUALIFIED BUYERS

- LOOK FOR BUYERS WITH SPECIAL INTRINSIC VALUE IN THE PRODUCT/SERVICE (E.G., CRITICAL MASS)

- GET OUT OF COMMODITY BUSINESSES

DETAILED ORGANIZATION AND NOMENCLATURE

SYSTEMS SOFTWARE GROUP
- SYSTEMS SOFTWARE MKTG. DIVISION
- SOLUTIONS DIVISION
- SOFTWARE LABS DIVISION
- DYLAKOR DIVISION
- STERLING SOFTWARE INTL. DIVISION

FEDERAL SYSTEMS GROUP
- INTELLIGENCE & MILITARY DIVISION
- INFORMATION SERVICES DIVISION
- SYSTEMS & SCIENTIFIC DIVISION

INFORMATION SERVICES GROUP
- DISTRIBUTION SERVICES DIVISION
- ORDERNET SERVICES DIVISION
- CREATIVE DATA SYSTEMS DIVISION
- LEGAL INFORMATION SERVICES DIVISION
- PUBLISHING SYSTEMS DIVISION

FINANCIAL SOFTWARE GROUP
- DIRECTIONS DIVISION
- CHECK CONSULTANTS DIVISION
- DECISION SYSTEMS DIVISION
- BANKING SOFTWARE MKTG. DIVISION

PROFESSIONAL SERVICES GROUP
- PROFESSIONAL SERVICES DIVISION

DELEGATION OF AUTHORITY

	CORPORATE	GROUP	DIVISION
STRATEGIC PLANNING	X	X	X
PRODUCT PLANNING	X	X	X
COMPANY ACQUISITIONS	X		
PRODUCT ACQUISITIONS	X	X	
PRODUCT DEVEL., MAINT. & ENHANCE.		X	X
SALES & MARKETING		X	X
PRODUCT ADVERTISING & PROMOTION			X
INDUSTRY RELATIONS	X	X	X
INVESTOR RELATIONS	X		
GENERAL ACCOUNTING			X
FEDERAL TAXES	X		
STATE & LOCAL TAXES			X
TREASURY	X		
EMPLOYEE TRAINING & DEVELOPMENT			X
BENEFITS PROGRAMS	X		X
STOCK OPTIONS	X		
PERSONNEL ADMINISTRATION			X
LEGAL	X		X

APPENDIX 3

ACQUISITION RESPONSIBILITIES

	CORPORATE	GROUP	DIVISION
COMPANIES			
IDENTIFICATION	**	*	*
EVALUATION	**	*	
NEGOTIATION	**	*	
FINAL APPROVAL	***		
PRODUCTS			
IDENTIFICATION	*	**	*
EVALUATION	*	**	**
NEGOTIATION	**	*	
FINAL APPROVAL	***		

*** - SOLE AUTHORITY
** - PRIMARY RESPONSIBILITY
* - ACTIVE INVOLVEMENT

Market/Product Grids

Groups	U.S. & CANADA				INTERNATIONAL			
	Proc. Svcs.	Integ. Svcs.	Soft. Prod.	Prof. Svcs.	Proc. Svcs.	Integ. Svcs.	Soft. Prod.	Prof. Svcs.
Systems Software			X	X			X	
Information Services	X	X	X	X				
Financial Software			X					
Federal Systems				X				
Commercial Professional Services				X				X

Foundation Grid for Software Products

Functional Areas	Equipment		
	Mainframe	Mini	Micro
Systems Programs			
Application Enabling System			
Application X Industry			
Application Industry Specific			
Communications			

Foundation Grid for Information Processing Services

Functional Areas	Equipment		
	Mainframe	Mini	Micro
Time usage (customer's programs)			
Time sharing (providers' programs)			
Service Bureau			
Transaction Processing			
Facilities Management			
Database Access			

Foundation Grid for Professional Services

Functional Areas	Mainframe	Mini	Micro
Commercial Custom Programming			
Consulting			
Training & Education			
DP Center Management			
Federal Custom Programming			
Consulting			
Training & Education			
DP Center Management			

Sterling Software Products Analysis

Groups	Systems Programs	Application Enabling Systems	Application X Industry	Application Industry Specific	Communications
Systems Software Group	X	X			X
Information Services Group				X	
Financial Software Group				X	

Sterling Professional Services Analysis

Functional Areas	Federal Systems	Commercial Professional Services
U.S. Custom Programming	X	X
Consulting	X	X
Training & Education		
DP Center Management	X	
Int'l Custom Programming		X
Consulting		X
Training & Education		
DP Center Management		

Market Channel by Customer Size

Channels	US			International		
	Fortune 1000	Medium size company	Small size company	Fortune 1000	Medium size company	Small size company
Telemarketing						
Representatives						
VAR						
Retail						

Market Channel by Type of Industry

U.S.

	Commercial	Manufacturing & Distribution	Services	Federal Gov't	State Gov't	Local Gov't
Telemarketing						
Represen-tatives						
VAR						
Retail						

Market Channel by Type of Industry

International

	Commercial	Manufacturing & Distribution	Services	Federal Gov't	State Gov't	Local Gov't
Telemarketing						
Represen-tatives						
VAR						
Retail						

Strategic Themes

Selling to the Customer Base

To implement the theme of building on the customer base for software products, there are number of specific actions that can be taken which should provide a growing revenue from those customers who already own one or more software products within a particular business area:

1. Currently, salesmen and telemarketing sales personnel are usually not directly compensated for selling maintenance to existing customers. This is normally handled through some kind of administrative procedure whereby an invoice is sent to the client for the maintenance renewal and telephone calls and contacts are made only if they do not respond by some specific date. Even these follow-ups are typically done by people who are not primarily sales oriented.

   The logical reason for this has been that most existing customers will sign up without serious prodding and, therefore, it doesn't appear to pay to offer any type of commission or special incentive to the sales force to get those maintenance renewal orders.

   However, one can view this in a completely different way. While you may get 90%-95% renewals, it may be possible to get closer to 100% by direct sales follow-up. But more important is that this provides a unique opportunity for salesreps to market their products in a special situation where there is no competition and where the salesrep has a chance to find out what the client likes about his product and what he doesn't like, and then to ask what else can be done to be of help.

   For most of the product lines, there are follow-ons and add-ons that can be sold and there are additional sites which could be sold. This type of follow-on contact helps to ensure that the client isn't becoming unhappy, dis-illusioned or even disinterested in the product or that there hasn't been a change in the contact person so that the product may get displaced by competitive action. It is also an opportunity to find out what other buying plans for hardware or software the client has and to get in on those at an early stage.

To carry out this type of function, it may require some level of direct incentive for the maintenance renewal for the salesrep. This might be a smaller percentage than compared to the normal commission, but then again the effort level is radically smaller. Once the good salesrep sees the effect of this kind of follow-up, I believe they will make it a regular part of their sales activity.

2. To go a step further, one need not wait until the annual renewal of maintenance in order to make follow-on sales. Some form of regular review (by telephone) with each client should be a must for every good sales person. One could do almost all the things that were described above (find out what they are happy with, unhappy with, changes in plans for hardware or software, changes or acquisitions, determine who the current contacts are, identify training needs, recommend attendance at a user group meeting, share some new information about usage of the product, make sure the client is staying current on new releases). In other words, use a service type call as a basis for getting sales information and for initiating follow-on sales activities.

3. A similar kind of follow-up program might be organized through direct mailings to clients with special offers, possibly on follow-on services or products. I happen to like the survey approach which asks the customer what they are doing, what they plan to do and what they would like in the future. Often, it is of interest to clients to find out what's going on with their peers so that one can take the results of the survey and distribute them to all the clients for even another contact.

   Even a product without strong competition can benefit from this kind of solid service and ongoing support. It certainly gives the client a major reason to continue to pay his maintenance and ongoing service/support fees with a good feeling for the value of the fee.

4. Sending out new releases is, of course, another opportunity to really show the customers that you care and to emphasize the value that they are obtaining from their ongoing service. We all do too little of this. The new release is usually accompanied by a very terse technical letter which lists five pages of changes at a line of code level and does not really make an effective sales pitch in terms of the current product and its usefulness or for follow-on features, options or related products. Here is a built-in sales opportunity that should be exploited to the fullest in a service mode rather than in a direct sales mode. Again, the client might be asked to prioritize future changes desired off of a check list.

5. Another idea that has impressed me has been the opportunity of giving an existing client the use of certain features and functions on a "try it, you'll like it" basis and only charging them after they have had up to three months to check it out. It would seem to me that this can be combined with special maintenance renewal deals whereby you will get the first year of use of the product at a discounted rate if you order it at the same time that you renew the basic product. As a matter of fact, what you might do is charge only the renewal on a combined package and then offer the add-on on a lease basis to pay for the product itself. While this may reduce the initial revenue received on the option or feature, it should make the sale so easy (without competition or major negotiation) that the total revenue received may more than make up for the reduction in direct sales revenue. A similar approach may be taken on new site sales and on other products which are marketed by the same organization.

B. Grad
4/29/86

694D

Strategic Themes

Looking for the Overlays

In horserace parlance, there is a situation which is called an overlay. This is where the "true" odds of a horse winning a particular race is more favorable (better) than the odds that are on the tote board. If one can identify these situations on a regular basis, then the long-term gain will be substantial. The same kind of reasoning holds forth in blackjack. If you can count the cards, you know when the odds have swung in your favor so that it's worth drawing on a 17 or worth staying on a 16. Baseball managers do the same thing regularly by switching their pitchers to pitch againt left-handed or right-handed batters where the odds of success are greater.

This does not mean you are going to win every time by following the overlay strategy or lose every time by ignoring it, but it does mean that, on a percentage basis over time, you will be slightly ahead and that the small shift in percentages (two, three, four percent) will be enough to really make the business a top rated profitable situation instead of a mediocre also-ran.

Let's apply that reasoning to the acquisition of products and companies. What we are looking for is not to buy cheap (and certainly not to buy expensive), but rather to find overlays where the intrinsic value in something is greater than the perceived value by the marketplace. At any point in time, the whole scale may be shifted so that one cannot have absolutes such as anything that is more than a five to one PE is too high, or unless the pre-tax margin is at least 10%, you're not interested, or unless the growth rate is at least 25% a year, you won't consider it. In other words, each situation must be examined at the point in time depending on the relative market values and the relative disposition values.

My inclination is to acquire successful, proven products, but to be willing to invest substantial sums of money to make those acquisitions. In some cases, this means that you will be paying a pretty high price earnings ratio and even paying to some extent for future growth. Ideally, in those situations, one can make some kind of combination between the initial purchase and some type of earn-out which ensures that the expected growth materializes.

The term we used in the strategic themes is to "buy valuable successes." Now the word success, I think, is self-defining. It is a product or service that has done well and you have every reason to believe will continue to do well. The word valuable is meant to relate to the fact that people perceive more value from an overlay standpoint than others rate them.

Often, there will be a hidden value in a product or market that is not perceived by the marketplace. This may be because of a particular synergism between the two organizations, customer bases or products (or even people) or that there is an expectation of something happening in the environment which will make the product or customer base far more valuable than anyone else currently sees. For instance, if it is clear that the product can be sold on a telemarketing basis where it has been sold primarily through direct sales, then this makes the product much more valuable since the cost will drop significantly and growth may, in fact, be enhanced. Similar items might be the ability to change a company from an accrual basis to a cash basis and, therefore, have substantial tax savings. Another would be the ability to capitalize products and, therefore, be able to get tax benefits from them.

B. Grad
5/20/86

694D

Strategic Themes

Exploiting the Winners

It seems to me that one of the greatest failings of most of the software products and professional services companies has been the desire for diversification. It's all well and good to talk about not having all your eggs in one basket and not being susceptible to weakness in one particular area (or even to be concerned about moves by IBM which can suddenly destroy a particular marketplace), but it seems to me that far more often companies have been hurt by not growing as fast as they could and losing money in ventures through not following their own mainstream.

While one can look at Mark IV and say, "Gee, Informatics got a long run out of that and it's still pulling in maintenance revenue and even occasional new sales revenue," one has to wonder what would have happened if Informatics had really put effective development dollars into the growth and exploitation of Mark IV in the fourth generation language area so that it could have become a true end user facility and a more effective, more productive application building facility. One can point at Mark V and say it was certainly an attempt to get productivity improvement through having a compiled version, but Mark V went to a free form language against the historic pattern of a successful forms-driven approach. Similarly, the investment in Informaticom was an attempt to see what could be done with Mark IV at the micro level. Unfortunately, this attempt was marred by lack of money and by working on computers that turned out not to be in the mainstream of micro development.

While one can argue any particular case in the products area or the professional services area, there seems to me to be a theme that the really successful companies have to ride a particular horse as far and as hard as they can. This seems to me what Lotus has done with 1-2-3, although I see a change in their strategy which is weakening the company in that they are investing the bulk of their money into new areas, none of which have, so far, been a bell ringer.

In contrast, Ashton-Tate has really kept going in the data base management area. On top of the success of dBase II, they built the fresh success of dBase III and now appear to be on their way to doing the same thing with dBase III Plus to cover network facilities and the multi-user environment. When they tried to follow Lotus into the integrated systems arena, they did produce a better product than Lotus did, but none of the integrated systems have been successes. So Ashton-Tate's investment in Framework has to be considered questionable. In contrast, their decision to acquire a successful word processing system (MultiMate) would normally be a wise choice in that one is investing the money in a success situation rather than trying to build a competitor in a well-entrenched area.

One would, therefore, argue that each division and each group should identify and concentrate on their winners and put the bulk of their money where their success has been. These could be products and key customer accounts in the professional services area. These could be the top salesreps and best technical people. In other words, identifying those products, people and customers which have provided the previous successes and then investing strongly in them so that it's not a day late and a dollar short; this would seem to me to be the most conservative of strategies.

There is another side to this coin. In order to get the money to invest in these winners, it is necessary to cut off the losers quickly. This cutoff can take place by selling them to someone else, by milking them, by starving them or simply by not trying to encourage their growth or resuscitate a dying situation.

IBM, itself, has been very guilty of not following this optimal behavior. Remember, someone has really invested their time, reputation and money in these losers. It is very hard for them to admit that they are not going to make it. IBM sunk many, many tens of millions of dollars trying to salvage a product called System 7 (may it rest in peace), but once you have a loser, hardly anything can save it.

IBM, for many years, tried to find a way to make IMS run faster and better and while one wouldn't consider IMS a loser, it was certainly not a winner in the same sense that CICS was. One wonders if IBM had had the courage to move quickly into the relational data base area (remember, they had Sequel and what became System R running in California during the mid-1970's), possibly DB2, instead of being late to the marketplace, would have been a dominant factor and might have turned around the entire data base area so that IBM would be the really dominant supplier instead of merely one of two or three top suppliers.

We often do the same thing with our key people, particularly with the salesmen. We say, "No salesmen should really be able to earn that much money, so we'll have to adjust the compensation plan or put some cap on it." It seems to me that we should literally take the opposite approach. The more they make, the happier we are, and the more acceleration we can give to the top, top sales people, the more apt we are to keep them indefinitely and keep them happy.

The same sort of story certainly applies in the technical area. It is well-known that the top technical people can outproduce the "normal" analyst or programmer by up to five to one. This is besides the higher quality and conceptual capability of those who really can see the new opportunities or new structures which the normal technical person is not even aware of. These special people have to be nurtured and rewarded. Each group, each division should be on the lookout for them and be able to give them the special attention that will most help the company. In some cases, this may mean that technical people should get some piece of the action (akin to a royalty) to hook them into staying instead of having them look for the greener pastures outside the corporate umbrella.

As a strategic theme then, we would ask each division to have the courage to identify its top product or products, its top customers, and its top people and to make investment decisions and concentrate their efforts so as to exploit those areas and not spread their shots so as to weaken the thrust of the winners. Remember though that the counterbalance to this "identify the winners" is to identify the losers, and to come up with a plan to get out of those businesses, cut them off and starve them out, so that the money does not get wasted and kept away from the winning areas.

Strategic Themes

A New Industry Niche Strategy?

Historically, niche marketing in particular industries (except for banking and insurance) has been focused primarily in the mini-computer (and more recently the microcomputer) turnkey systems arena. Whether the vendors are called VAR's or OEM's or other more esoteric names, the concept has been the same. These vendors gain the right to remarket someone else's hardware (and sometimes sell their own) and combine that with certain available systems programs (of which they also become licensed remarketers), and then add on a set of application packages designed explicitly for that market. In addition, they usually provide some level of installation services including custom programming and often file conversions, training and installation support so that the client really has a single vendor.

Another aspect of their emphasis has been to have a whole range of applications (sometimes effectively integrated) which perform the primary operational functions of the business and also take care of their key accounting needs. In many cases, the so-called industry specific applications (particularly in the accounting and personnel area) are really cross-industry programs that have been adapted through some type of veneer (such as using industry-oriented names in the various fields and columns) to make it look like it's unique to that particular industry.

Since the late 1960's, IBM has tried a variety of mechanisms on the mainframe to produce package programs for both the cross-industry and industry specific areas which would give IBM a major leg up on particular industries. They have tried this approach for the cross-industry areas such as accounting and personnel with almost zero success. They have also tried this with large insurance programs, retail and wholesale packages, health applications, etc.; none of these have been successful as packages although many have provided guidelines or frameworks for customers to do their own custom application building (or to have it done by a third party professional services firm).

One area in which they had some significant success was in the manufacturing control field where they introduced PICS which was "no charge" software back in the 1960's, and then replaced it with COPICS for the mainframe (and MAPICS for the small business and mini machines). COPICS has probably not made any money as a software product for IBM, but has been successful in selling a reasonable amount of hardware and at providing a strong guideline for customers to develop in-house the application programs they need.

Let's use manufacturing as a prime example of the potential new opportunity that I see for niche marketing and support of application software on IBM mainframes. A number of factors have come together to make the economic viability of IBM mainframe computers attractive for both operational applications as well as for administrative and financial applications. The price performance of the 4300 Series computers is attractive and the power all the way up the line is certainly sufficient to handle the on-line real time needs of the operational applications along with the data base and transaction processing requirements.

There are many changes in the DP shop's view of their relations to end users:

- Time-sharing, which for quite a period of time, was essentially a service provided by third parties since the in-house data processing groups either were incapable of or unwilling to perform this role has now become a desirable activity. The time-sharing firms are gradually getting less and less business and more and more corporations are setting up their own time-sharing operations.

- The information center has become a principal area of interest and activity for almost all significant corporations. These information centers provide facilities for end users to have direct access to the computers plus appropriate support and consulting to help them use the facilities.

- The broader acceptance of fourth generation languages as well as report writers and query systems has increased the interest in and access to various data bases by end users.

- The incredible growth in the number and distribution of microcomputers in corporations has made many people computer literate and computer familiar. They are now pushing very hard to get access to the mainframe data bases for their own analysis work and everyone expects this to increase further. One of the side benefits of the micro access is that the languages and tools that are available are generally more comfortable for end users; they are not just mainframe programming systems. One of the interesting issues, of course, is the ability to have compatible data base structures between micros and mainframes.

- Mini's still suffer an identity crisis so that they continually perform specialized functions but have not become the broad base DP "mainframe" in most shops. The DEC VAX is an exception, particulary in certain engineering and manufacturing organizations. Hewlett-Packard's 3000 series has also been used widely, particularly in medium to smaller companies, and Prime continues to have its aficionados.

Wang seems to have lost a lot of its previous momentum in its attempt to hook applications processing to their office systems penetration.

- Mainframe computers have a high degree of standardization in terms of operating systems, communications systems and even data base management systems. While in most cases, there are two or three contenders, it is not the same as in the mini area where there are ten different systems, none of which talk very effectively with each other.

Depending upon the industry, there are certain other factors which tend to lead toward higher degrees of standardization. There are an increasing number of professional managers who are operating within these organizations, all of whom have learned a similar set of tools through their college and graduate school training. A large percentage of these new managers have been computer users both in college and in their initial jobs within the organizations. They seem to understand the concept that one needs to have standardized packages rather than focusing on building their own on a "to order" basis. Further, the relative success of minicomputers in attacking these industry niches has introduced some pattern and structure to the operations area and, therefore, it is far easier for a company to see how it can convert from one automated system to another rather than trying to install their first computerized system.

Manufacturing is becoming more automated from three directions:

1. The normal administrative, financial and personnel activities have been automated for medium to large corporations over the past fifteen years, so that today almost every company of more than $25 million in sales has a significant set of installed applications on their own computers.

2. Most have some form of manufacturing control system in place to take care of their requirements analysis, production planning, inventory control and production control activities.

3. Microcomputers have arrived in force and most large companies use them for financial analysis, product planning and business projections.

In other words, the technical environment is now in place for an integration of the various business and operational control activities. Moreover, one other thing that has occurred has been the growth of computer assisted design, computer assisted engineering and now computer assisted manufacturing. All of these lead to the desire for companies to introduce computer integrated manufacturing (CIM) which involves tying together the manufacturing requirements planning activities with the actual control and management of the manufacturing processes. Note, however, that the size of this undertaking is so great that individual minis cannot do the job for most companies and the power of IBM mainframe computers, appropriately shared among multiple applications, will be appropriate for the activities.

It is this environment and this set of circumstances that encourages me to believe that the time has come to produce and support a fully integrated set of manufacturing applications written in a carefully selected application development system, capable of being modified or customized to particular needs and with the structure necessary to tie all the pieces together both from a data base and an operational viewpoint.

One interesting factor is that the competitive situation, in terms of companies providing this type of software, leaves a major opening that can be exploited by a professional software products company. In an IBM environment, there is no particular advantage (or need) to be a turnkey shop. Rather, one can view the role two ways:

A. Providing a comprehensive set of applications software operating under an available application development system and with standard communications interfaces, designed to meet the needs of particular manufacturing industry segments.

B. The successful vendors will also, in effect, perform the systems integration function by providing custom services including programming, training, conversion of existing data bases, as well as assisting in the installation and integration of the hardware and operating systems needed to make the applications run effectively.

The risk of this opportunity is shown by the dismal stories in the banking and insurance area. The experience by Informatics in claims processing area and the lack of improvement of this operation under TCC have really cast a pall on what companies are capable of doing and the investment required to cover these industry functions. Similarly, the experience in banking, particularly with Hogan and Anacomp, have to make you think very hard whether this can be an effective, profitable business or whether the investment to produce the packaged programs is so great as to make the venture somehow economically unreasonable. In the manufacturing area, one looks at Comserv and their dreadful situation (possibly now recovering) and even the downturn for ASK in the high end mini area.

I think before venturing into these areas, the problems that these firms have had would have to be analyzed carefully to determine whether there is something structurally wrong that would preclude a high profit, high growth business opportunity.

However, I think the fundamental reasoning is right and that the problems have been more in terms of poor execution and the lack of a concept of systems integration. The industry-specific area would really seem to be a significant strategic opportunity in a whole range of specific industries. One could really show that niche marketing and niche customer support is a way to have special margins and still block competition without the high dependency on hardware. It has the ability to ride the IBM mainframe and build on the customer's confidence in IBM's maintenance ability. In these areas, as in others, it would seem logical that one would get an initial position by buying an existing set of products and capability rather than trying to construct them from scratch. This speeds up the process and reduces the cost and risk.

One other caveat would be to recognize the risk that IBM may try to dominate the applications marketplace by acquiring (since they haven't been able to build) suitable products and then using its marketing expertise to provide single vendor penetration. It is my view that this is not a high probability scenario, because of IBM's inability to support customers at the level of detail that they want, their lack of in-depth specialized understanding of particular industries and their attempt to be all things to all people using only IBM system software and IBM equipment. A competitor could take advantage of all of these weaknesses in order to provide strong penetration; and as a practical matter, the IBM salesman would not fight too hard because his primary money is still going to be coming from the hardware sale which the niche vendor will be supporting rather than trying to take away.

B. Grad
5/13/86

694D

Strategic Themes

International Opportunity

It is well-known that Systems Software has sold well outside the United States, with American companies often dominating the mainframe systems software business. The reason seems to be that systems software knows no language barriers. Software works the same way inside the computer and, in the systems area, the needs are very similar if you are using a particular machine regardless of what country you are in.

However, it has been true that international sales of application software has often been much more difficult. This relates not just to language differences (which can reasonably be solved through language-specialized screens and good documentation in the proper language), but more importantly, is due to the way in which applications are performed in various countries. While there is standard accounting theory, the actual accounting practices vary considerably. Similarly, while one would think that payroll would be pretty well standardized except for the output reports, there are many differences in the ways in which people are paid. This doesn't say that the basic programs cannot be used in these areas, but it does require a considerable degree of understanding of the needs in a particular country and the willingness to spend the money to adapt the program to those needs and then to maintain them as those needs change. In other words, the company that wants to sell its application products has to make a major investment in each particular country and to be willing to get the skills and capabilities needed to support their products.

Nevertheless, when one looks at a list of major U. S. software companies, one is struck by the relatively high percentage of their sales that are accounted for by non-U. S. operations. This theme of planning for, and exporting the software capabilities from, the U. S. to non-U. S. countries should be an integral element of every division's product plan. Sterling certainly has the beginnings of an effective strategy to broaden this international impact beyond the products currently being sold. The concept of a Sterling Software International organization which can support all Sterling products in each of the significant non-U. S. markets is certainly consistent with the way Sterling has organized its U.S. activities and provides a relatively less expensive approach to non-U.S. growth.

Whether the actual sales are performed through country offices (which can be quite expensive unless the volumes are high) or whether they are done through selected agents is both an economic decision and an effectiveness decision. One cannot look at international sales as simply an incremental opportunity, but it should be fully profitable in its own right including appropriate transfer payments for the software at a wholesale level.

A number of other issues have to be examined carefully including the ability to provide training and support for the professional staff outside the United States as well as for the customers in other countries. Another question deals with whether hot lines should be on a local basis or handled through the United States.

My personal experience has been that the more effective sales and support organizations are staffed with nationals of each country. The use of Americans in those countries is a somewhat mixed blessing. They often come with a great deal of knowledge from their experience in the United States, but usually with a lack of understanding of style and business practice which somewhat negates their value and does not give the software company the local identification that is often so valuable. This same kind of problem can arise when using people from one European country in another. Here again, the style and business differences are substantial and sales effectiveness may be adversely impacted.

Another area for international use would be to look further at the possibility of building professional services groups outside the United States, through acquisition of local companies or through extending U. S. based services to these countries, particularly for user companies which are international in character. One interesting idea for this expansion is to build upon equipment or application specialization. In this case, using Americans to lead the projects (not perform the bulk of the work) is probably a viable approach, particularly if they have a co-leader who is knowledgeable about the country's practices.

I have no strong feeling about the value of information services activities outside the United States, but it might be better to consider acquiring or buying companies who are performing these services rather than exporting the services from the United States.

All in all, the international connection would seem to be one by which Sterling could significantly increase its revenues without major development investment and could, therefore, improve its growth and profitability.

B. Grad
5/20/86

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Enclosure 5F

Strategic Directions

Technology

One of the interesting strategic development possibilities is to try to relate technology directions to product and market opportunities.

Specifically, I have been reading about CD/ROM and its potential impact on the information services business as well as a storage device in normal data processing applications. We should look at what effect this technology may have on the various Sterling business segments. In terms of professional services work, it might involve systems programming activities on a custom basis to help companies use CD/ROM; certainly an applications viewpoint, it might open up some new avenues that have not been available in the past. It can provide an extension to the distribution services work, but also could change the basic concepts of storing and accessing banking and accounting data.

Similarly, the technology trends for Expert Systems and Artificial Intelligence provide other opportunities for application development systems. Possibly, new language constructs could be implemented in conjunction with a Mark VI which could allow users access to heuristic type approaches to problem solving.

There are probably five or more other other key technologies, whose emergence in the next three to five years, might offer significant new business opportunities for Sterling. It would be important to identify what these are and to find some way to monitor their progress; to keep informed on who the leaders are and obtain access to these leaders so as to be of benefit to Sterling's products and services.

B. Grad
5/20/86

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Strategic Directions

Strategy and Style

Sterling Software has followed a unique approach in becoming a major factor in the software products business. They provide a wide range of mainframe and microcomputer software serving the needs of large and small businesses. But the special ingredient is that they have obtained their programs and marketed them using relatively autonomous business units. This autonomous business unit approach offers the opportunity of attracting and motivating entrepreneurs upon whom the software products business has been built. It allows them to continue the kind of creative, cost-effective innovation that has been the hallmark of so many of the growth companies in the past.

Added to this ABU approach, Sterling offers three other vital ingredients: experienced executive, technical marketing and financial management to assist the ABU's in planning and executing their strategies; synergy in both development and marketing through the partnership among the various companies (note that this is synergy by opportunity, not synergy by edict); and significant financial resources which permit the entre- preneurs to concentrate on doing the job that they do well without wasting their time on the procurement of financial resources and negotiating away ownership and decision making responsibilities.

All in all, Sterling has structured a novel way to grow in the software products field and the initial results in terms of the quality of the companies acquired and the stock market view of the worth of the company seem to bear out the value of the approach. However, there are some serious dangers in this concept which have been, and need to be, addressed. Sterling Software will have to continue to pay close attention to these areas to avoid their undermining a fundamentally sound proposition. The two primary concerns are:

- Avoiding the pitfalls of conglomerates where the individual units bear no relationship to each other, and the parent becomes solely a financial management organization.

- The risk of adverse selection where only poor quality companies are obtained without sufficient care for the long-term quality of the people, the products and the market value.

To the extent that the stock market continues to place a substantial value on the company as a whole, rather than trying to assess the individual components, then it is possible for Sterling to acquire quality companies without undue dilution of the initial Sterling owners' equity positions.

The most effective way to ensure that these pitfalls are avoided is to consciously create a product, market and company strategy which establishes guidelines for acquisition of products and companies, and ensures that attention is paid to those areas which will best assist in achieving the corporate financial and business goals.

B. Grad
5/20/82

693D

Strategic Directions

Additional Strategic Opportunities

There are two special strategic opportunities that I think should be examined. In one of them, I clearly have a personal bias so you may want to take the recommendation with a greater than usual grain of salt. The second, however, does seem to be a major opportunity, but the form and shape of it is so difficult to discern that it may require waiting a little longer until the market opportunity is better defined.

Training and Support

The first of these areas is that of training and support. Training and Support have been a major opportunity for profitmaking by most of the major software products companies. But their offerings have been limited to training and support related to their own products. It is my belief that there is a growing opportunity for supporting other people's products through specific offerings. These offerings may take the shape of regular lecture courses; they may include books and manuals; they may be using computer based training; they may involve various kinds of diagnostic and support activities for applications or systems programs which are not necessarily produced by the company itself. One could go so far as to even tie in a certain amount of customizing and processing services work within the purview of training and support.

There are some companies, of course, that are in this business already including Deltak, ASI and a number of companies in the microcomputer field, such as Crwth, ATI and many other small firms. To my knowledge, no one has been in the support business per se except where it involved support of hardware systems.

Looking at the numbers would suggest that a company may spend or be willing to spend as much as 10% to 15% of its software and services budget to buy training and support. The numbers may even be greater when one talks about the support of IBM mainframe systems.

I performed a study about two years ago on the opportunity for industrial training in the various segments of the marketplace. As usual, I produced a grid trying to classify the work and where the growth was taking place. I have enclosed a copy of this grid for you to examine. Remember, the numbers are at least two years out of date and there have been further changes in the world since the time this report was prepared. Nevertheless, there does seem to be a strong trend away from standup lectures on non-computer subjects toward more industrial training about using the computer and related to computer oriented topics. Whether this opportunity remains the purview of the companies that produce the products or whether one can really deal with this on a user-oriented basis is not completely clear, but there are certainly indications that companies are already making money out of writing courses in specialized areas such as communications and I don't see why this cannot be expanded considerably.

One thought is to note that a number of companies who are in the professional services business have introduced courses on IBM systems as part of their offerings. Similarly, some of the micro companies have started to go into the publishing arena for manuals and computer based training materials (not just for their own products).

I have no idea yet how these pieces can be put together or whether one can, in fact, create a reasonably sized business opportunity and how to market these offerings effectively. It seems to me that training and support is one of those special market areas where the right company could give itself special entré to virtually every data processing shop in the U. S. and internationally and use that as a springboard to sell other products and services.

Communications

We have talked numerous times about Sterling's investment and interest in the communications area. This includes at least three activities within the company and two or three potential acquisitions that have been examined and evaluated. It has appeared to me that the most difficult problem has been to classify and structure the opportunity in such a way as to identify that which can be handled most effectively from a software basis and where the marketing channels follow reasonably standard software marketing approaches. It is also important to try to identify areas which cannot easily be taken away by a single action by IBM or be readily replaced through hardware.

As a first attempt at classification, I have enclosed a draft report prepared by Martin Sidwell and myself trying to show what the software opportunities are in the communications field. This grid is really a first cut and I have not even tried yet to place the current Sterling products into that grid. It does show that there is a range of things to be done and, with some investigation, we should be able to determine what the growth opportunities are in each of these areas, identify the principal competitors and try to understand how the technology will influence the growth and direction of those opportunity areas.

I still seem to be most interested in those software communications products which will be running on mainframe computers, even though their primary purpose is to get information from and provide information to microcomputers and minicomputers. It seems to me that this thrust best ties in with Sterling's experience and will give you the most familiar approach to product development, product support and marketing.

I feel that this area is of such significance that it is worthwhile to identify a key person right now reporting to Corporate who has the responsibility for strategizing and structuring the Sterling communications business both from a tedchnical and marketing viewpoint. It may be that the current operations responsibility should continue for the present, but that growth in this area should be treated as a new activity and should not be within one of the current Groups.

Summary

There may well be other Corporate opportunities that should be examined. First, these would need to be defined and then a judgment made as to whether the business opportunity is large enough to justify an investment of time. Then the availability of companies on which to build the opportunity would be opportune. With that information in hand, then a strategy can be put in place and we can follow the usual approach of strategic opportunism.

As you know, all good quantitative analyses use a variety of statistical schemes to establish market opportunity and financial projections. In this case, I have used a special form of analysis for which I claim full rights. This is called intuitive weighting. Some people might consider this a SWAG or a guestimate, or even a gut feel, but I think the more technical term is appropriate for our future discussions.

In this above context, I believe that the business opportunity in the communications area will end up being in the order of magnitude of one-third of the present systems software business after a five-year period. I also believe that the training and support area may be of a size of 20% to 30% of the professional services business. If these estimates are close, we have identified very substantial business opportunities. The major question is: how to get into the business on a profitable basis.

I would like to add one other item. Note that there must be a number of other possibilities and opportunities and that we should at least identify two to three of these which are worth putting on our "to consider" list for Corporate strategic planning over the next three to five years.

B. Grad
5/20/86

693D

Group Strategic Plan Outline

I. Group Strategy

- A. Group Business Objectives
- B. Group Business Areas
- C. Group Assumptions
- D. Group Strategic Directions
- E. Group Key Actions
- F. Group Financials

II. Division A Strategy

- A. Division A Business Areas
- B. Division A Assumptions
- C. Division A Level Strategy
- D. Product Line X
    1. Summary
    2. Product Facts
    3. Market Assumptions for X
    4. Assessment of Competition
    5. Product X Strategy
    6. Product X Key Actions
    7. Product X Resources Required
- E. Product Line Y
    1. Summary
    2. Product Facts
    3. Market Assumptions for Y
    4. Assessment of Competition
    5. Product Y Strategy
    6. Product Y Key Actions
    7. Product Y Resources Required
- F.

etc.
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III. Division B Strategy

A. Division B Business Areas

B. Division B Assumptions

C. Division B Level Strategy

D. Product Line R

1. Summary
2. Product Facts
3. Market Assumptions for R
4. Assessment of Competition
5. Product R Strategy
6. Product R Key Actions
7. Product R Resources Required

E. Product Line S

1. Summary
2. Product Facts
3. Market Assumptions for S
4. Assessment of Competition
5. Product S Strategy
6. Product S Key Actions
7. Product S Resources Required

F.

etc.
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IV.

etc.
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Strategic Planning Instructions

I. High Level Game Plan (draft attached)

II. Examining Internal Historic Operations to Produce Product Facts

III. Analyzing Market Opportunities

IV. Describing the Competitive Environment

V. Selecting Strategic Directions and Identifying Major Actions

VI. Projecting Business Results

I. High Level Game Plan

The basic framework for carrying out a combined strategic planning/operational budgeting process follows:

A. The Corporate objectives and strategies are built using a series of grids which outline the various areas of opportunity; these identify those in which Sterling is currently involved and focuses on those other areas for future action. These grids will, at the highest level, describe the major areas of the computer software and services marketplace. At the next level, the classes of offerings (the type of functions or solutions offered to the marketplace) will be compared to the specific markets which are interested in buying these offerings.

   The third level of grids would relate to the composition of the offerings which may well involve elements of people, processing services, software products, information and equipment.

B. Objectives are to be quantifiable and reflect the primary concerns of the business. They should be indicators which, when examined as a whole, measure the health of the business: its ability to satisfy customers, owners and employees.

C. Strategies are those particular directions which the company wishes to pursue either within the areas of current interest or related to new areas of strategic opportunity.

In producing this integrated strategy/budget, the following process will be followed:

A. A global, top-down view will be the basis for the initial corporate strategy and plan. This sets a firm foundation which should underlie the work of each of the groups, both in functional and quantitative terms.

B. Following this corporate plan, the strategy becomes the responsibility of the group presidents who are considered to be the primary strategists.

C. In turn, the group president will use the business unit managers as a primary resource in establishing the appropriate assumptions and directions for each division, but he is still responsible for bringing these elements together in a cohesive fashion and determining the relative importance he wishes to place on the various strategies and investment opportunities.

D. As part of the process at both the corporate and group levels will be a careful determination of an acquisition plan as well as a thoughtful consideration of divestiture opportunities (where the worth of the product or service is greater to someone else than it is to Sterling).

It is intended that the process go through a number of cycles:

- The first cycle is a corporate preparation cycle which includes the construction of the initial corporate strategy/budget.

- The second cycle begins after the detailed introduction of the process to the group presidents. It involves the group presidents working with their key division people to analyze the information provided to them, and combining this material with their own experience and division oriented data. They must be prepared to discuss their preliminary conclusions and recommendations with a small corporate strategic planning team, agree upon objectives, strategies and actions and then produce a strategic plan.

- Following approval of the Strategic Plan, there should be an evaluation and planning cycle to effectively disseminate and understand the corporate directions and prepare for the 1987 cycle.

II. Internal Operation

For each named product or service:

- profile to include date first released, purpose, equipment, operating system, development history and ownership
- sales history - new installation 3 years history (1983, 1984 and fiscal 1985) with latest 1986 in units and $
  - lease, rental, purchase, features
  - options (units and $)
  - crossover sales: industry/size
- financial history where easily available
- installed position - current (geographically if available)
- maintenance history - units and $ (1983, 1984 and fiscal 1985) with latest 1986, in units and $
- number discontinuing maintenance as against renewing
- who markets
- geographic coverage
- who supports; offerings; training; documentation
- sales strategy
- pricing and discounts for product and maintenance
- sales terms and conditions
- marketing channels (quantitative)
- technical information (lines, language...)
- functionality
- environment
- dependencies
- personnel - number and expense by function

III. Analyzing Market Opportunities

This should be done for each product, service or family of products and services, e.g.:

- professional services for Federal Government
- banking software
- international

Each analysis should contain information which is identified as to date and source and should contain historic trend information where possible. (These figures and references may be at a supporting level.) The analysis should cover:

- market size
  - potential customers classified by revenues, assets, # employees
  - units (e.g. # of financial institutions of different types))
  - segmentation (e.g. S&L's, etc.)
  - growth expectations and likely direction
- machines installed
  - manufacturer
  - size
  - distinguishing features
  - penetration
  - growth expectations and likely direction
- special considerations
  - legal or regulatory requirements
- international
  - as above, where appropriate

IV. Competitive Environment

For each product and service, or family, there shall be an appraisal of current competitive activity to include:

- players, giving some history (how old? how big? what other products? owned by whom? etc.) This should cover competitors in alternate solutions (turnkey, machine oriented, etc.).
- geographic location and coverage
- product description and pluses/minuses against Sterling
- machine environment
- pricing and discount policy
- end user profile (e.g. sells to smaller companies; sells to universities, etc.)
- marketing policies on maintenance, other products, training, manuals, etc.
- sales channels and distribution
- likely/known technical developments
- significant customers
- likely market share
- overall competitive assessment for immediate future and longer term (e.g. new competitors entering, dying market, etc.)
- international to be considered separately, where appropriate

V. Selecting Strategic Directions and Identifying Major Actions

1. Selection Process

- Assess background information and make preliminary assessment
- test and re-evaluate
- amend as necessary. Retest
- state final conclusions in required format
- consolidate lower levels to Divisional level
- assess consolidated level for each Division
- amend where necessary
- overlay group strategy and make final changes to draft
- create final documentaiton and ensure completion of necessary supportive documentation

2. Major Actions

- identify major actions required to move from existing base, over time
- product financial projections
- identify investment (resource units, cost, timing) and disinvestment
- produce resources schedules
- identify acquisition needs

VI. Projection of Business Results

This calls for:

- revenue projections for the next 5 years, by quarter for first 2 years
- cost projections for the same period
- penetration to be achieved, with comment on competitive situation
- marketing requirements
- risk analysis
- cash flow

PRODUCT LINE STRATEGY

Group: Systems Software

Division: Software Labs

Product: DMS/OS

By:

Date:

DRAFT MODEL

Table of Contents

SECTION 1. Summary

(one page each topic probably, with bullets)

A. Product Facts

B. Market Assumptions

C. Assessment of Capitalization

D. Product Strategy

E. Key Actions

F. Resources

SECTION 2. Product Facts Statement

A. Profile

DMS/OS was first released in 1977. The product was designed to provide the data center manager with the information necessary to manage existing disk storage capacity. It also provides for infrequently used data files stored on disk to be automatically transferred to more economical magnetic tapes and for the files to be automatically returned to disk when required.

It was designed by Application Development Systems of San Jose, CA and was acquired for $1 million by Sterling in 1982 when it formed Software Laboratories, Inc. (SLI) to take on the key development and maintenance personnel who had developed DMS/OS.

It is one of the leading direct access storage (DASD) management products currently available. In 1985, it had 1035 installations out of an estimated total installation of competitive products of 5005, or 20.7%.

B. Sales History

	New Installations - Fiscal Year			
	1983	1984	1985	1986 (x months)
Domestic				
Units*	132	158		
$ Units	2312	3916		
International				
Units*	100	106		
$				

* including optional features (?)

The product is licensed primarily under perpetual agreements. There are seven optional features:

	% of First Time Buyers Typically Buying
VSAM	89
Volume Configurator	85
Dasd Billing	33
TSO Command Processes	54 -
SPF Interface	40 +
Security Interfaces	52
.....?	

C. Financial History

Not available

D. Installed Position

Sales and Installed Position

	Prior to 1983	1983	Fiscal 1984	1985	1986 (x months)
Domestic					
Unit Sales	341	132	158		
Installed Position	341	473	631		
Foreign					
Unit Sales	133	100	106		
Installed Position	133	233	339		
Total Installed Position	474	706	970	1213	

E. Maintenance History

	Prior to 1982	1983	Fiscal 1984	1985	1986 (x months)
Domestic					
Sales in Units	341	132	158		
On Maintenance at May 1, 1986 Who Originally Purchased in					
% Still on Maintenance					
% "Lost" Off Maintenance					

F. Responsibility for Marketing

DMS/OS has always been marketed in the U.S.A. and Canada by Sterling Software Marketing (SSM), which acquired marketing rights outright in 1982.

Responsibility for international marketing is both through SSM and Sterling Software International in Great Britain, France and Germany as well as by nine independent sales operations in other countries.

G. Geographic/Industry Coverage

DMS/OS is sold throughout the U.S.A. and Canada. Sales are concentrated in the following areas:

- Fortune 1000
- (Specify particular industries or geographic areas, etc.)
- .
- .

DMS/OS has been sold to the following countries:

- U.K.
- .
- .
- .
- .

H. Support

DMS/OS is supported by Software Laboratories in the U.S.A. Hot line service is provided within the maintenance agreement. Seminars for existing customers are offered from time to time.

I. Sales Strategy

SSM markets through direct mail, telephone solicitations and media advertising. Test for ____ months are offered. Target customers have been large users with mainframes.

J. Pricing and Discounts

Base System	$	last increased 198_
Selectable Units		
VSAM	$	
Volume Configurator	$	
Dasd Billing	$	
TSO Command Processors	$	
SPF Interface	$	
Security Interfaces	$	

DMS/OS has been discounted deliberately, mostly due to second and third site purchases for existing customers.

	Average sales price before discounting	After discounting
1983		
1984		
1985		
1986		

Maintenance is charged at 15% of prevailing permanent license fee.

K. Sales Terms and Conditions

L. Marketing Channels

All sales are made in the U.S.A. directly to customers.

M. Technical Information

DMS/OS is written entirely in structured assembler language. It consists of approximately 500 modules with about 500,000 lines of code.

Version 7.1 is now the latest version developed. Release 8.0 is planned for October 1986 and will contain _____.

There is a concentrated effort to keep in touch with the market place and competition developments. Current and planned activities include:

. (e.g. user conferences; competition comparison, etc.)
.
.

N. Functionality

O. Environment

P. Dependencies

Q. Personnel

Personnel employed directly on DMS/OS are:

		Nos.	Approximate annual cost
U.S.A.	Programmers		
	Maintenance		
Overseas	Programmers in (France)		
e.g.	Programmrs in (Germany)		
	Maintenance in (France)		
	Maintenance in (Germany)		

SECTION 3. Market Assumption

A. Market Size

DMS/OS's primary market place is any IBM 360/370, Series 30xx or Series 43xx installation using MVS which needs or will need DASD management. It can also be used by Amdahl, Facon or Fujitsu plug compatible.

The market is thought to be:

Number of MVS Sites		
USA and Canada	Int'l	Total
4,000	2,600	6,600

The customers are typically large scale companies with vast quantities of data to be processed with budgetary contact on data processing costs.

It is thought that market penetration is such that the prospects remaining are the smaller companies using minis, some of the overseas segments and the marginal users who are far harder to sell to.

B. Machines Installed

There are about 8,000 MVS IBM machines currently installed in the U.S. projected, planned to grow to about 13,000 by 1988.

The number of U.S. sites is currently about 4,000, projected to reach 5,500 by 1988.

Internationally, the number of installed machines and sites is assumed to be two-thirds the U.S. numbers.

IBM market strategy is clearly aimed at migrating customers into the MVS environment as rapidly as possible, although there are signs that IBM will continue to support VSE for the forseeable future.

C. Special Considerations

None

D. International

SECTION IV. Assessment of Capitalization

Main competitors are:

A. Cambridge with ASM2. Version 3.0

- Cambridge was formed in 1974 by president Shawn McLaren (the original developer). ASM2 was the first archive system on the market (1974?), primarily geared for TSO users and has been enchanced consistently over the years to remain competitive with DMS/OS. It markets the leader in dataset security (ACF2 with over 1,500 users) which has piggybacked ASM2 successfully, and ADC2 which is a data center scheduling system. Overall, the company claims more than 1,800 customers worldwide (1985).

  Written in Assembler, ASM2 runs under OS/VS1, VM and MVS.

- An independent company, with about 60 employees, it is based in Santa Clara, California but covers U.S.A., Canada and Europe (branch offices in France and Germany, and an agent in the U.K.).

- It has consistently underpriced ASM2 against DMS/OS and has often won on this basis ($19,500 against $27,500 as at 9/84).

- It has the following pluses against DMS/OS:

  - more flexible
  - more compatible with IBM facilities
  - tailored reports (though SPF Interactive Report Writer should correct this)
  - cheaper
  - an automatic restore facility
  - can handle VSAM and non-VSAM data sets in the same pass through a volume
  - appeals to system programmer who is less concerned about complexity but turned on by ASM2's functionality

- It has the following negatives:

  - less VSAM support
  - less active when it comes to service and support
  - high turnover rate of staff in technical development and support area (Mclaren is not a good delegator).
  - no disk-to-disk archival so can't support IBM strategy
  - harder to install and use
  - cannot be operated by non-technical personnel

- sells to Fortune 500 companies including major banks, insurance and oil companies, manufacturing companies and universities.

- cheaper maintenance. They offer hot line. They are also offering workshop/training schedules, at a charge, which they began in 1985.

- All sales are made by direct mail (more effective in the past and higher expenditures than DMS/OS) or telephone, using a small sales force. Salesmen are all ex-technicians and have extensive DP backgrounds. The product may be purchased outright or leased over three years.

- It is thought they are moving towards developing _____.

- Significant customers include _____.

- With 750 users (ICP) or 705 (Sterling), they probably have 14% of the market, growing. (____% in 1982, ____% in 1983.)

- ASM2 is a strong and threatening competitor.

B. Computer Associates' Manage - DASD

- Formed in 1976, this company is based in Jericho, New York and has over 1,600 employees. It has five branch offices in the U. S. A. as well as agents or branch offices in Australia, Belgium, Canada, West Germany (three), Denmark, Netherlands, Switzerland, U. K., Argentina, Brazil, Japan, Philippines, Singapore, South Africa and Venezuela.

- Sterling estimates it has 415 installations (1985) or 8.3% of the market.

- Advantages:

  - considerably less expensive than DMS/OS

- Disadvantages:

  - provides only basic functions

C. UCC - UCC3

- One of the top fifty dp firms in the U. S. A. with revenues of $100 million plus and 1,600 employees worldwide.

- UCC3 runs under OS/VS1 and MVS on IBM 360/370. It is written in Assembler.

- Claims 550+ users (ICP) or 1,140 installations (Sterling), the latter implying a market share of 22.8%.
- Is marketed by UCCEL out of Dallas, Texas.
- Product sells for about $17,000 and is available for purchase, or for $26,640 leased over three years.

D. IBM with DFHSM

IBM has a new version of HSM launched in April 1985 but the product is not competitive technically. HSM is promising to deliver what DMS/OS and Cambridge's ASM2 already have. Sterling believes it has 955 installations or 19% of the market in 1985.

IBM has made DASD management strategic area and may have influenced prospects to delay a buying decision or buy HSM.

- DFHSM disadvantages include:
  - no reporting, disaster recovery back-up, idle space and PDS management, effective handling of GDG's, interface to tape management systems, effective VSAM management.
  - does not manage data, only moves it

E. Other Systems Solutions

- FAST DASD
- ABR
- Faver
- VSAM - ASSIST
- others

Sterling estimates in 1985, these totalled 755 installations or 15.15% of the market.

Product Line Strategy

Group: Information Services Group

Division Creative Data Systems Division

Product: SFR

By:

Date:

DRAFT MODEL

Table of Contents

SECTION 1. Summary

(one page each topic probably, with bullets)

A. Product Information

B. Market Assumptions

C. Assessment of Competition

D. Product Strategy

E. Key Actions

F. Resources

SECTION 2. Product Facts

A. Profile

Systems for Retailing (SFR) was first released in 1982. The product was designed to provide a small to medium size retailer with a group of application modules. The purchaser is likely to be a first time computer user.

It was developed in-house by the small team put together by Creative Data Systems, using the earlier product Systems for Distribution (SFD) as a major input.

SFR contains:

- Inventory Control
- Replenishment
- Point ofSale Collections
- Sales Reporting
- Accounts Payable
- Accounts Receivable
- General Ledger
- Retail Accounts Receivable
- Inventory Replenishment

B. Sales History

Officially released in 1982 (there was one sale made in 1979), the package has been sold direct and through third parties in both the U.S.A. and Canada.

	Sales				
	Pre 1983	1983	Prior to 1984	1985	1986
Domestic Sales					
Customer Direct	5	10(?)			
Indirect	-				
Revenue $Direct					
Indirect					
Canada Sales					
Customer Direct	1	1 (?)			
Indirect	-				
Revenue $Direct					
Indirect					

Installations

	Pre 1983	1983	Prior to 1984	1985	1986
Domestic Sales Installations by End of	11				
	11				(25-30)
International Sales Installations by End of	3				
	3				
Total Installations	14			19	

C. Financial History

Not available separately until _____.

D. Installed Position

E. Maintenance History

Maintenance

	Prior to 1982	1983	Fiscal 1984	1985	1986
Domestic Complete Installations Sold		5			
On Maintenance at May 1, 1986 Who Originally Purchased in					
% Still on Maintenance					
% "Lost" Off Maintenance					

F. Responsibility for Marketing

This product is marketed by the Creative Data Systems Division.

G. Geographic/Industry Coverage

Sold in the U.S.A. and Canada to small to medium-sized retailers (not necessarily chains) with turnovers of between $6 million to $10+ million. The retailers will normally be handling ticket items, e.g., clothing, soft goods.

H. Support

Maintenance is offered after six months of free coverage following installation. It includes enhancements to keep the product current and competitive but not any major new developments (separately priced). Programming, education and consulting services are provided too.

I. Sales Strategy

Sold as a total package solution based on Wang VS systems, but also available as a standalone. Of necessity, there is normally a certain amount of customization caried out. SFR is mainly sold direct, through its own sales representatives, but occasionally through cross-licensees and OEM affiliates.

J. Pricing and Discounts

SFR-VS Suggested Customer License Fees

Package Name	Description	License Fees*	Training Package (In Days)
SFR-UNIT	UNIT INVENTORY MANAGEMENT PACKAGE including:		
	-- Purchase Order Management		
	-- Unit Inventory		
	-- Level I	$18,000	8
	-- Level II	28,000	10
SFR-DOL	DOLLAR MANAGEMENT PACKAGE		
	-- Dollar Sales		
	-- Stock Ledgers		
	-- Open-to-Buy		
	-- Level I	8,000	3
	-- Level II	14,000	6

SFR-VS Suggested Customer License Fees

Package Name	Description	License Fees*	Training Package (In Days)
SFR-AP	ACCOUNTING PACKAGE		
	-- Accounts Payable		
	-- Financial Reporting & General Ledger		
	-- Level I	10,000	4
	-- Level II	16,000	5
SFR-A/R	ACCOUNTS RECEIVABLE		
	-- Level I	10,000	2
	-- Level II	16,000	3
SFR-MP	MERCHANDISE PLANNING		
	-- Level I	6,000	1
	-- Level II	10,000	2
SFR-P/R	PAYROLL		
	-- Level I	4,000	1
	-- Level II	6,000	2
SFR-REP	REPLENISHMENT		
	-- Level I	6,000	1
	-- Level II	10,000	2
SFR-POL	POLLING		
	-- Sales Audit		
	-- Scheduler		
	-- Interfaces to SFR-UNI, SFR-DOL, SFR-A/R		
	-- Standard DCR Interfaces		
	-- Level I	10,000	**
	-- Level II	16,000	**

* These are License Fees for the initial use of a package by a customer. Subsequent uses by the same customer are at 20% of these suggested License Fees.

** Polling module includes 40 hours of technical support covering software install, modems, lines, registers, etc. Additional hours, at time and material, are often required where the polling network is complex and the communication problems more extensive.

Note: Level I = VS15
Level II = All other VS systems

- Discounts for multiple unit sales.
- Maintenance is 18% of the package sales price.

K. Sales Terms and Conditions

License for perpetual use only.

L. Marketing Channels

M. Technical Information

Runs on Wang VS (usually VS90 or VS100). This is an on-line system with associated batch functions. SFR is written in modular form using Wang VS Cobol. The programs are quite large. There are ten processing programs (Inventory Planning, Unit Sales, etc.) divided into 325 modules, with about 300,000 unique lines of code. The lines of code are the specific source statements written in the specified language, including not just functional statements but also items incorporated for testing or debugging purposes. it does not include any code which is duplicative of code included elsewhere.

N. Functionality

O. Environment

Wang VS - usually VS90 or VS100.

P. Dependencies

Q. Personnel

SECTION 3. Market Assumptions for SFR

A. Market Size

The SFR market is seen as a firt-time user, not necessarily a chain, who requires home office capability. Sales size will be $6 million to $10 million and the products sold will generally be ticket type such as clothes and soft goods.

The U. S. marketplace for SFR is large. The number of retail stores is shown below, broken by size of sales, excluding the specific SIC codes for food items, automotive dealers and gasoline service stations, eating and drinking places.

Number of Retail Establishments with Annual Sales of (M Dollars)

	$1-5	$5-10	$10-25	$25-50	Total
General Merchandise*	1,005	1,156	131	57	2,349
Building Materials,etc.**	6,086	477	152	44	6,741
Apparel/Accessory	3,047	265	131	32	3,475
Furniture, etc.***	7,793	514	216	60	8,583
Miscellaneous****	7,793	514	216	60	8,583

* Department store, variety store and miscellaneous general merchandise store.

** Hardware, garden supply stores; mobile home dealers.

*** Home furnishings and equipment stores.

**** Drug stores, proprietory, liquor and jewelry stores; mail order houses; fuel and ice dealers.

Source: International Data Corporation

The penetration of in-house systems was also measured and reported on in the International Data Corporation Report "Small System Use by Industry" published in December 1982. With the exception of the category Miscellaneous Retail (see footnote to the previous table for a more detailed definition), where the penetration was much higher in every size category, the patterns were very similar in each category of retailer type.

Penetration was much lower in the sales size of $1 to $5 million (4% to 6%) improving as the revenues by organization grew to $10 to $25 million (20% to 21%). This suggests sizeable market opportunities still exist (although some of the retailers may already be using computer based solutions supplied by service bureaus).

Miscellaneous Retail

Annual Sales ($M)	# with In-House System	Total # of Establish.	%**
$1 - $5	1,183	7,793	15.2
$5 - $10	113	514	22.0
$10 - $25	81	216	37.5
$25 - $50	30	60	50.0
	1,407	8,583	16.4

Specified Other Retail Organizations

Annual Sales ($M)	# with In-House System	Total # of Establish.	%**
$1 - $5	792	17,913	4.4
$5 - $10	284	2,410	11.8
$10 - $25	129	630	20.5
$25 - $50	52	193	26.9
	1,257	21,146	5.9

* General merchandise, building materials, etc. apparel/accessory, furniture, etc. as defined in the footnote to the previous table.

** Penetration

Once again, computer penetration is not as high as might be expected, given the attractiveness of applications such as order entry and inventory control. It is likely that this will be remedied over time as organizations endeavor to manage to greater levels of efficiency and cost effectiveness.

Retailers will also see a great many changes and developments in structure in the next decade. Chains have certainly grown historically at the expense of the small independent. This is the fast growth area at present, and already accounts for a sizeable proportion of retail sales and, in some cases, the majority of sales. As a chain grows, it generally changes from buying direct from manufacturers and local wholesalers to establishing its own distribution center. This should provide SFR with new market opportunities.

Some sales have beenmade to the Canadian market, which is not covered here.

B. Machines Installed

SFR only runs on Wang VS90 and VS100 in a market which is dominated by IBM hardware and, to a far lesser extent, by NCR and Burroughs equipment.

IDC suggests that there were in 1984:

	U. S. Installed	International Installed
VS100	1,026	730
VS90	670	320

C. Special Consideration

D. International

Canada only.

SECTION IV. Competitive Environment

A. IBM's Island Pacific

- This is the most important competitor. The software was developed for IBM to sell for System 34 and System 38 equipment.
- It has improved its price performance against SFR who is now, at best, equally positioned.
- It probably has over one-half the installed systems in retailing (in 1983, it was thought to have about one-half).

B. Turnkey

- A number of turnkey houses supply products in this field, probably based on DEC or Hewlett-Packard for the main part.

C. Small Systems Houses

- These also service this market.

D. Other Hardware

- NCR
- Burroughs

BURTON GRAD ASSOCIATES, INC.
235 MARTLING AVENUE
TARRYTOWN, NEW YORK 10591
(914) 631-1129
(914) 631-1164 FAX

November 25, 1991

Mr. Ed Lott
Mr. Phil Moore
Sterling Software, Inc.
8080 N. Central Expressway
Dallas, Texas 75206

Dear Ed and Phil:

Putting together a new set of matrices to help structure the current/future market opportunity for Sterling is quite a challenge since the opportunities are so much greater and the environments (platforms) are so much more complex than ten years ago.

There are two key problems that we are facing (just in doing the structuring):

- Layout out the axes for the primary grid so as to provide both the functional and platform dimensions in a non-restricting way. My first cut at this is Attachment A.

- Picking up the additional dimensions (such as distributor channels, US/Europe/Asia, individual industry segments, size of customer/prospect, etc. My first cut at this is Attachment B.

Please call me as soon as you can (conference call for the three of us on Wednesday?) or send me your thoughts by fax so that we can settle on an initial structure and I can start writing about each of the cells in the grid.

Is December 16 and 17 good for both of you? If so, I need to get tickets and hotel reservations.

Phil, do you have any grids from 1982? I have the December 28, 1981 letter to Sterling with the 12/15/81 grid (and the related notes), but can't quickly find any later drafts. If you can find them, please send them to me.

Also, if either of you has other structuring or analysis material (from the groups or Corporate) that you feel would be helpful, please send that to me.

Sincerely,

Burton Grad
BG:7059

Business Structure Matrix

	Mainframe	Midrange	Client/ Server	Work- Stations
Systems Facilities				
Operating systems				
Information base				
Information communic.				
Utilities				
System Bldg tools				
Application Bldg Syst				
Communications				
Office Applic. Tools				
Spreadsheets				
Word Processing				
Electronic mail				
Document mgmt				
Text mgmt				
X-industry Application				
Eng. & Development				
Finance & Admin.				
Sales & Marketing				
Production				
Distribution				
Service and Support				
Industry Spec. Applic.				
Government				
Manufacturing				
Service				
Scient/Tech Applic.				

Platform Details

Mainframe

- IBM MVS, VSE, VM, ACP
- DB2, SQL/DS, IMS, etc.
- CICS

Midrange

- IBM AS/400, DEC VAX/VMS
  HP/UX, DEC Ultrix
  IBM AIX, NCR/ATT UNIX

Servers

- UNIX
- OS/2
- Windows (NT)

Clients

- MS/DOS
- Windows
- OS/2
- Motif

Interface Details

Communications
Data Bases
Languages

Other Dimensions of Market/distribution Analysis

Size of Company

- Large
- Medium
- Small

Buying Organization Within Company

- MIS
- Operating departments
- Buying groups (suppliers/distributors)

Geographic Locations

- U.S.
- Canada
- Europe
- Asia
- other

Distribution Channels

- Direct sales
- Telesales
- Distributors
- VARs
- Manufacturers
- ISVs
- Partnerships
- Joint ventures

BUDGET/PLANNING OUTLINE

ITEM	WHO	WHEN
o Finalize Planning Calendar	All	June 8, 1986
o List of Major Objectives & Concerns	McHone	June 4, 1986
o Revenue Growth o Profitability o "Blackhole" Is Gone o Continued Expense Control		
o Summarized Financial Goals	Russell	
By Group		
o Revenue Growth		First Pass - June 2, 1986
o Revenue $		Second Pass - June 4, 1986
o OP $		Third Pass - June 5, 1986
o OP %		Fourth Pass - June 6, 1986
o Receivables Index		Final - June 9, 1986
By Corporation		
o Earnings Per Share o Finance Assumptions		
o "How To" For FASB 86	Ellis	June 6, 1986
o Provide Summary Line Items For Interim Plan Review	McHone	June 4, 1986
o First Pass - P&L Summary o Second Pass - More Detailed		
o Synchronize Budget & Strategic Issues	All	June 6, 1986
o Provide Detailed Line Items and Use of "FRS"	Russell	June 6, 1986

June 2, 1986

FY87 BUDGET
Schedule of Events

o KICK-OFF AT GROUP LEVEL	Corp	6/11-12
o KICK-OFF AT DIVISION LEVEL	GP's, DP's, Corp	6/16-20
o PREPARATION OF PRELIMINARY PLANS	GP's, DP's	6/20-7/25
o QUARTERLY REVIEW & REVIEW OF PRELIMINARY PLANS - Federal Systems...2 days - Financial Software...2 days - Information Services...3 days - Professional Services...1 day - Systems Software...3 days	Corp, GP's, DP's	7/28-8/22
o REVIEW & APPROVAL OF PRELIMINARY PLANS BY THE BOARD	BOD, Corp	9/03
o PREPARATION OF FINAL PLANS	GP's, DP's	8/22-9/15
o FINAL DRAFT OF GROUP PLANS	GP's, DP's	9/15
o FINAL DRAFT OF CORPORATE OVERVIEW PLAN	Corp	9/15
o FINAL DRAFT OF CONSOLIDATED PLAN	Corp	9/29
o REVIEW & APPROVAL OF FINAL PLAN BY THE EXECUTIVE COMMITTEE	EC, Corp	9/30
o ANNUAL REVIEW & REVIEW OF FINAL FY87 PLAN	Corp, GP's, DP's	11/06-10
o RATIFICATION OF FINAL FY87 PLAN BY THE BOARD	BOD, Corp, GP's	11/19

6/02/86

Sterling Software, Inc.
Financial Objectives/Concerns

- Aggressive Revenue Growth
  - Internal
  - Acquisition

- Continued Strong Expense Controls
  - More PDE&M
  - Less SG&A
  - No Negative Revenue Impact

- Sustained/Improved Operating Profit Margins
  - Ensure Going Concern (PDE&M)
  - Competitive Pricing (Expense Controls)
  - Correct Strategic Thrusts (Market Niche)

- Growth Funding

  - Elevate Priority of Cash/Balance Sheet Management
  - P&L Performance...Market Value

- Fiscal Management Without Acquisition Related Goodwill "Blackhole"
  - Actions To Eliminate Recurring Costs
  - Prioritization of Operational Issues Versus "One Shot" Performance Enhancements

- Fiscal Cohesiveness
  - Operate On The "What Is Right" For The Company Plane

STERLING SOFTWARE, INC.
CONSOLIDATED PROFIT & LOSS
1987 PLAN - 1986 ACTUALS THROUGH APRIL - 1985 PRO FORMA

($ in thousands)	1Q			2Q			3Q			4Q			YEAR		
	1987	1986	1985	1987	1986	1985	1987	1986	1985	1987	1986	1985	1987	1986	1985
REVENUES															
CONTINUING OPS		69,498	63,127		58,883	56,247		57,225	61,279		50,559	60,813		236,165	241,466
DISCONTINUED OPS		0	0		0	0		0	0		0	0		0	0
TOTAL		69,498	63,127		58,883	56,247		57,225	61,279		50,559	60,813		236,165	241,466
OPER EXPENSES															
DEPRECIATION		1,309	596		1,333	605		981	542		798	556		4,421	2,299
OTHER EXPENSES		56,947	53,907		47,140	52,064		47,373	55,154		38,212	55,078		189,672	216,203
TOTAL OP EXP		58,256	54,503		48,473	52,669		48,354	55,696		39,010	55,634		194,093	218,502
OPER PROFIT															
CONTINUING OPS		11,242	8,624		10,410	3,578		8,871	5,583		11,549	5,179		42,072	22,964
DISCONTINUED OPS		0	0		0	0		0	0		0	0		0	0
TOTAL - $		11,242	8,624		10,410	3,578		8,871	5,583		11,549	5,179		42,072	22,964
- %		16%	14%		18%	6%		16%	9%		23%	9%		18%	10%
CORP EXPENSES		1,462	2,590		1,872	2,485		1,575	2,647		1,575	2,850		6,484	10,572
AMORTIZATION		2,221	1,950		1,883	1,950		1,551	1,962		1,395	1,969		7,050	7,831
INTEREST EXPENSE		3,782	3,603		3,608	3,666		3,354	3,727		2,833	3,789		13,577	14,785
INTEREST INCOME		(629)	(300)		(796)	(300)		(700)	(300)		(700)	(300)		(2,825)	(1,200)
INC BEF TAXES - $		4,406	781		3,843	(4,223)		3,091	(2,453)		6,446	(3,129)		17,786	(9,024)
- %		6%	1%		7%	-8%		5%	-4%		13%	-5%		8%	-4%
TAX RATE		51%	50%		50%	50%		50%	50%		50%	50%		50%	50%
INCOME TAXES		2,247	391		1,922	(2,112)		1,546	(1,227)		3,223	(1,565)		8,937	(4,512)
NET INCOME		2,159	391		1,922	(2,112)		1,546	(1,227)		3,223	(1,565)		8,849	(4,512)
PER SHARE		$0.39	$0.08		$0.23	($0.43)		$0.14	($0.25)		$0.30	($0.32)		$1.00	($0.92)
PREFERRED DIVIDEND		1,269	1,286		509	1,221		53	1,227		53	1,232		1,884	4,966
PER SHARE		$0.23	$0.27		$0.06	$0.25		$0.00	$0.25		$0.00	$0.25		$0.21	$1.02
EARN TO COMMON - $		890	(896)		1,413	(3,333)		1,493	(2,454)		3,170	(2,797)		6,964	(9,478)
- %		1%	-1%		2%	-6%		3%	-4%		6%	-5%		3%	-4%
EARNINGS PER SHARE		$0.16	($0.19)		$0.17	($0.69)		$0.14	($0.50)		$0.30	($0.57)		$0.79	($1.94)
WORKING CAP - $		4,420	2,025		4,629	(302)		4,025	645		5,363	176		18,435	2,544
- %		6%	3%		8%	-1%		7%	1%		11%	0%		8%	1%
PER SHARE		$0.79	$0.42		$0.56	($0.06)		$0.37	$0.13		$0.50	$0.04		$2.09	$0.52
AVG COMMON SHARES		4,910	4,817		7,392	4,857		9,174	4,950		9,174	4,939		7,663	4,890
FULLY DILUTED SHS		5,562	4,817		8,334	4,857		10,734	4,950		10,734	4,939		8,841	4,890

STERLING SOFTWARE GROUPS COMBINED
1987 PLAN - 1986 ACTUALS THROUGH APRIL - 1985 PRO FORMA

($ in thousands)	1Q			2Q			3Q			4Q			YEAR		
	1987	1986	1985	1987	1986	1985	1987	1986	1985	1987	1986	1985	1987	1986	1985
BUS MGT SYS GROUP															
OPER REVENUE	15,722	15,729		12,448	10,286		8,879	11,624		0	11,885		37,049	49,524	
OPER PROFIT - $	2,333	2,540		1,293	(574)		92	(399)		2,250	836		5,968	2,403	
- %	15%	16%		10%	-6%		1%	-3%		NA	7%		16%	5%	
FEDERAL SYS GROUP															
OPER REVENUE	14,014	11,801		11,082	10,825		11,177	11,901		10,645	12,631		46,918	47,158	
OPER PROFIT - $	1,736	1,310		1,389	816		1,236	1,146		1,156	1,548		5,517	4,820	
- %	12%	11%		13%	8%		11%	10%		11%	12%		12%	10%	
FIN S/W GROUP															
OPER REVENUE	2,295	1,647		3,279	1,961		3,550	2,789		3,999	2,278		13,123	8,675	
OPER PROFIT - $	183	135		993	185		901	875		1,329	556		3,406	1,751	
- %	8%	8%		30%	9%		25%	31%		33%	24%		26%	20%	
INFO SVCS GROUP															
OPER REVENUE	10,991	11,780		8,830	11,487		9,480	13,431		10,150	12,068		39,451	48,766	
OPER PROFIT - $	1,740	1,938		956	691		905	1,431		1,428	(608)		5,029	3,452	
- %	16%	16%		11%	6%		10%	11%		14%	-5%		13%	7%	
INSUR SYS GROUP															
OPER REVENUE	1,374	1,050		1,207	1,356		0	1,264		0	1,481		2,581	5,151	
OPER PROFIT - $	(135)	2		(22)	260		0	(193)		0	(136)		(157)	(67)	
- %	-10%	0%		-2%	19%		NA	-15%		NA	-9%		-6%	-1%	
PROF SVCS GROUP															
OPER REVENUE	9,780	8,370		11,006	8,584		10,368	8,806		12,128	8,600		43,282	34,360	
OPER PROFIT - $	1,682	1,837		1,831	1,297		1,714	1,571		1,966	1,278		7,193	5,983	
- %	17%	22%		17%	15%		17%	18%		16%	15%		17%	17%	
SYS S/W GROUP															
OPER REVENUE	15,039	12,750		12,109	11,748		13,771	11,464		13,637	11,870		54,556	47,832	
OPER PROFIT - $	5,092	862		3,109	903		3,523	1,152		3,232	1,705		14,956	4,622	
- %	34%	7%		26%	8%		26%	10%		24%	14%		27%	10%	
ELIMS & ADJUST															
OPER REVENUE	283	0		(1,078)	0		0	0		0	0		(795)	0	
OPER PROFIT	(1,389)	0		861	0		500	0		188	0		160	0	
TOTAL OPERATIONS															
OPER REVENUE															
CONTINUING	69,498	63,127		58,883	56,247		57,225	61,279		50,559	60,813		236,165	241,466	
DISCONTINUED															
TOTAL	69,498	63,127		58,883	56,247		57,225	61,279		50,559	60,813		236,165	241,466	
OPER PROFIT															
CONTINUING	11,242	8,624		10,410	3,578		8,871	5,583		11,549	5,179		42,072	22,964	
DISCONTINUED															
TOTAL - $	11,242	8,624		10,410	3,578		8,871	5,583		11,549	5,179		42,072	22,964	
- %	16%	14%		18%	6%		16%	9%		23%	9%		18%	10%	
CORPORATE															
REVENUE	0	260		3	365		0	203		0	0		3	828	
EXPENSES	1,462	2,850		1,875	2,850		1,575	2,850		1,575	2,850		6,487	11,400	
INTEREST INC	629	300		796	300		700	300		700	300		2,825	1,200	
INTEREST EXP	3,782	3,603		3,608	3,666		3,354	3,727		2,833	3,789		13,577	14,785	
OPER PROFIT	(4,615)	(5,893)		(4,684)	(5,851)		(4,229)	(6,074)		(3,708)	(6,339)		(17,236)	(24,157)	
ACQUISITION AMORT	2,221	1,950		1,883	1,950		1,551	1,962		1,395	1,969		7,050	7,831	
TOTAL COMBINED															
OPER REVENUE	69,498	63,387		58,886	56,612		57,225	61,482		50,559	60,813		236,168	242,294	
PRETAX INC - $	4,406	781		3,843	(4,223)		3,091	(2,453)		6,446	(3,129)		17,786	(9,024)	
- %	6%	1%		7%	-7%		5%	-4%		13%	-5%		8%	-4%	

SYSTEMS SOFTWARE GROUP
1987 FINANCIAL GOALS

	4Q/1Q Growth	1Q	1Q/2Q Growth	2Q	2Q/3Q Growth	3Q	3Q/4Q Growth	4Q	Full Year
Revenue:									
Proforma 1985		12,750	-8%	11,748	-2%	11,464	4%	11,870	47,832
85/86 Growth		18%		3%		20%		15%	14%
Actual/Forecast 1986	27%	15,039	-19%	12,109	14%	13,771	-1%	13,637	54,556
86/87 Growth	---)	15%	---)	15%	---)	15%	---)	15%	15%
1987 Plan	27%	17,295	-19%	13,925	14%	15,837	-1%	15,683	62,739
Operating Profit:									
Proforma 1985 $		862		903		1,152		1,705	4,622
Proforma 1985 %		7%		8%		10%		14%	10%
Actual/Forecast 1986 $		5,092		3,109		3,523		3,232	14,956
Actual/Forecast 1986 %		34%		26%		26%		24%	27%
1987 Plan $		4,324		3,899		4,751		5,018	17,992
1987 Plan %	---)	25%	---)	28%	---)	30%	---)	32%	29%
Accounts Receivable:		12/31		3/31		6/30		9/30	
Proforma 1985 $		3,602 ?		4,305 ?		4,216 ?		11,521 ?	
Proforma 1985 % Qtr Sales		28%		37%		37%		97%	
Actual/Forecast 1986 $		14,814		10,128		11,425		11,225	
Actual/Fcst 1986 % Qtr Sales		99%		84%		83%		82%	
1987 Plan $		13,836		10,212		10,558		9,410	
1987 Plan % Qtr Sales	---)	80%	---)	73%	---)	67%	---)	60%	

Assumptions:

- Group will be successful moving toward return on sales goal of 30%.

Note: "---)" indicates independent (input) variables.

INFORMATION SERVICES GROUP
1987 FINANCIAL GOALS

	4Q/1Q Growth	1Q	1Q/2Q Growth	2Q	2Q/3Q Growth	3Q	3Q/4Q Growth	4Q	Full Year
Revenue:									
Proforma 1985		11,780	-2%	11,487	17%	13,431	-10%	12,068	48,766
85/86 Growth		-7%		-23%		-29%		-16%	-19%
Actual/Forecast 1986	-9%	10,991	-20%	8,830	7%	9,480	7%	10,150	39,451
86/87 Growth	---)	15%	---)	15%	---)	15%	---)	15%	15%
1987 Plan	25%	12,640	-20%	10,155	7%	10,902	7%	11,673	45,369
Operating Profit:									
Proforma 1985 $		1,938		691		1,431		(608)	3,452
Proforma 1985 %		16%		6%		11%		-5%	7%
Actual/Forecast 1986 $		1,740		956		905		1,428	5,029
Actual/Forecast 1986 %		16%		11%		10%		14%	13%
1987 Plan $		1,896		1,523		1,635		1,751	6,805
1987 Plan %	---)	15%	---)	15%	---)	15%	---)	15%	15%
Accounts Receivable:		12/31		3/31		6/30		9/30	
Proforma 1985 $									
Proforma 1985 % Qtr Sales		0%		0%		0%		0%	
Actual/Forecast 1986 $									
Actual/Fcst 1986 % Qtr Sales		0%		0%		0%		0%	
1987 Plan $		0		0		0		0	
1987 Plan % Qtr Sales	---)	0%	---)	0%	---)	0%	---)	0%	

Assumptions:

Note: "---)" indicates independent (input) variables.

FINANCIAL SOFTWARE GROUP
1987 FINANCIAL GOALS

	4Q/1Q Growth	1Q	1Q/2Q Growth	2Q	2Q/3Q Growth	3Q	3Q/4Q Growth	4Q	Full Year
Revenue:									
Proforma 1985		1,647	19%	1,961	42%	2,789	-18%	2,278	8,675
85/86 Growth		39%		67%		27%		76%	51%
Actual/Forecast 1986	1%	2,295	43%	3,279	8%	3,550	13%	3,999	13,123
86/87 Growth	---)	50%	---)	30%	---)	25%	---)	15%	28%
1987 Plan	-14%	3,443	24%	4,263	4%	4,438	4%	4,599	16,742
Operating Profit:									
Proforma 1985 $		135		185		875		556	1,751
Proforma 1985 %		8%		9%		31%		24%	20%
Actual/Forecast 1986 $		183		993		901		1,329	3,406
Actual/Forecast 1986 %		8%		30%		25%		33%	26%
1987 Plan $		344		1,279		1,442		1,610	4,675
1987 Plan %	---)	10%	---)	30%	---)	33%	---)	35%	28%
Accounts Receivable:		12/31		3/31		6/30		9/30	
Proforma 1985 $		1,014		1,843		2,043		3,518	
Proforma 1985 % Qtr Sales		62%		94%		73%		154%	
Actual/Forecast 1986 $		3,277		5,728		6,403		7,061	
Actual/Fcst 1986 % Qtr Sales		143%		175%		180%		177%	
1987 Plan $		5,852		5,968		4,881		3,679	
1987 Plan % Qtr Sales	---)	170%	---)	140%	---)	110%	---)	80%	

Assumptions:

- 4Q86 revenue forecast is high.
- Group will be successful moving toward return on sales goal of 30%.
- 1Q return on sales is typically lower than average.

Note: "---)" indicates independent (input) variables.

FEDERAL SYSTEMS GROUP
1987 FINANCIAL GOALS

	4Q/1Q Growth	1Q	1Q/2Q Growth	2Q	2Q/3Q Growth	3Q	3Q/4Q Growth	4Q	Full Year
Revenue: [Note: not yet adjusted for handoff of ASD]									
Proforma 1985		0	ERR	0	ERR	0	ERR	0	0
85/86 Growth		ERR		ERR		ERR		ERR	ERR
Actual/Forecast 1986	ERR	0	ERR	0	ERR	0	ERR	0	0
86/87 Growth	---)	50%	---)	30%	---)	25%	---)	15%	ERR
1987 Plan	ERR	0	ERR	0	ERR	0	ERR	0	0
Operating Profit:									
Proforma 1985 $		0		0		0		0	0
Proforma 1985 %		ERR		ERR		ERR		ERR	ERR
Actual/Forecast 1986 $		0		0		0		0	0
Actual/Forecast 1986 %		ERR		ERR		ERR		ERR	ERR
1987 Plan $		0		0		0		0	0
1987 Plan %	---)	10%	---)	30%	---)	30%	---)	30%	ERR
Accounts Receivable:		12/31		3/31		6/30		9/30	
Proforma 1985 $		0		1,843		2,043		3,518	
Proforma 1985 % Qtr Sales		ERR		ERR		ERR		ERR	
Actual/Forecast 1986 $		0		5,728		6,403		7,061	
Actual/Fcst 1986 % Qtr Sales		ERR		ERR		ERR		ERR	
1987 Plan $		0		0		0		0	
1987 Plan % Qtr Sales	---)	170%	---)	140%	---)	110%	---)	80%	

Assumptions:

Note: "---)" indicates independent (input) variables.

Canada

Annual Plan Data
Corporate Expenses

	1	2	3	4	5	6
			1987			
	1Q	2Q	3Q	4Q	YR	88
Interest Exp.	1938	1938	1938	1938	7752	7752
Sub. Debent. 30m @ 15½%						
New Conv. Debt 20m @ 9%	450	450	450	450	1800	1800
X Total	2388	2388	2388	2388	9552	9552
Interest Inc						
TCC	100	100	100	100	400	
Spinnel	60	—	—	—	60	—
New Debt @ 5%	250	250	250	250	1000	
Other Cash Inv @ 8%	250	250	250	250	1000	
X Total Int. Inc	660	600	600	600	2460	
HP Expense						
Dallas	1575	1575	1575	1575	6300	
LH	100	20	20	20	210	
X Total	1675	1595	1595	1595	6510	
Goodwill Amort	325	325	325	325	1300	
Software Amort	975	975	975	975	3900	
X Total	1300	1300	1300	1300	5200	

Sterling Software, Inc.
Summary (1st Pass) Financial Reports

	1986	1987	1988	1989
Revenue				
Oper. Profit				
Oper. Profit % Revenue				
Cash Flow				
Accounts Receivable				
A/R Index				

Sterling Software, Inc.
Detailed (2nd Pass) Financial Reports
Profit & Loss

	1986	1987	1988	1989
		&		
	1Q87	2Q87	3Q87	4Q87	1987
Revenue					
Cost of Sales/Hardware					
% Revenue					
Amort. & Depr. Cost					
% Revenue					
Product Development, Maint., and Enhancement Expenses					
% Revenue					
Sales, General & Admin. Expense					
% Revenue					
Total Operating Cost					
% Revenue					
Oper. Profit					
% Revenue					

Sterling Software, Inc.
Detailed (2nd Pass) Financial Reports
Revenue

Federal Systems Group
Professional Services Group

	1Q87	2Q87	3Q87	4Q87	1987
Major Projected Contract Renewals					
Number					
Revenue					
Major Projected New Business					
Number					
Revenue					
Projected Beginning Backlog					

Sterling Software, Inc.
Detailed (2nd Pass) Financial Reports
Revenue

Information Services Group

	1Q87	2Q87	3Q87	4Q87	1987
Revenue From 1986 Products/Contracts					
A. Hardware					
Service					
Maintenance					
Software					
B. Hardware					
Service					
Maintenance					
Software					
Etc.					
Revenue From New Products/Contracts					
A. Hardware					
Service					
Maintenance					
Software					
B. Hardware					
Service					
Maintenance					
Software					
Etc.					

Sterling Software, Inc.
Detailed (2nd Pass) Financial Reports
Revenue

Systems & Financial Software Groups

	1Q87	2Q87	3Q87	4Q87	1987
Revenue From 1986 Products					
A. Product Maintenance					
B. Product Maintenance					
C. Product Maintenance					
Etc.					
Projected From New Products					
A. Product Maintenance					
B. Product Maintenance					
C. Product Maintenance					
Etc.					

Sterling Software, Inc.
Detailed (2nd Pass) Financial Reports
Balance Sheet

	4Q86	1Q87	2Q87	3Q87	4Q87
Accounts Receivable					
A/R Index					
Other Current Assets					
Fixed Assets					
Other Assets					
Total Assets					
Asset Index					
Accounts Payable					
A/P Index					
Other Current Liabilities					
Non-Current Liabilities					
Total Liabilities					
Liability Index					
Equity					
Liabilities & Equity					

Sterling Software, Inc.
Detailed (2nd Pass) Financial Reports
Cash Flow

	1Q87	2Q87	3Q87	4Q87	1987
Pretax Income					
Add: Depreciation & Amortization					
Working Capital From Operations					
Add/(Deduct):					
Decr (Incr) A/R					
Decr (Incr) Other Current Assets					
Decr (Incr) Other Non-Current Assets					
Incr (Decr) Liabilities					
Capital Expenditures					
Disposal of Fixed Assets					
Subtotal					
Cash Flow					

Sterling Software, Inc.
Detailed (2nd Pass) Financial Reports
Capital Expenditures

	1986	1Q87	2Q87	3Q87	4Q87	1987
Capital Expenditures						
DP Equipment						
Other Equipment						
Furniture						
Fixtures/Plant						
Property						
Other: _____						
_____						
Total						

Sterling Software, Inc.
Detailed (2nd Pass) Financial Reports
Capital Expenditures

Expenditure Project Descriptions

1Q87

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2Q87

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3Q87

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4Q87

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