DEC LARGE SYSTEMS PRODUCT STRATEGY

RED BOOK PRESENTATION

LARGE SYSTEMS POT

VMS REVISION 10/30/78

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DEC LARGE SYSTEMS PRODUCT STRATEGY SUMMARY

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MAINFRAME PRODUCT STRATEGY

1.1 FOCUS

The mainframe business has been an exciting investment opportunity for DEC which has shown profitable growth over a 15 year period and has set the industry standard for cost performance in large scale, general purpose, interactive computing. There are currently over 850 DEC-10/20 installations with a total value of almost 600 million dollars; this base generates annual revenues equal to about 10% of its value.

The future represents even greater investment opportunities with exciting new technologies and applications. Industry leadership will be achieved by providing superior cost performance for a selection of small to large scale mainframe systems optimized for communications based data processing under a single operating system. Our uniqueness will be in the superior orchestration of this complement of product capabilities.

- Interactive Computing - for applications development and interactive problem solving (non-programmer) with access to the total system facilities.

- Ease of Use - Superior facilities permitting all levels of people usage.

- Transparent Distributed Data Processing - from tightly coupled SMP to a distribution of computing facilities with the same or cooperating operating system (Gateways) over global networks.

- Data Base - powerful, easy to use facilities

- Very High System Availability - Capable of virtually non-stop operation. Capable of not destroying more than one user job as a result of a fault. Fault tolerance.

- Transaction Processing - efficient state-of-the-art forms oriented data interconnect.

- Batch Processing _ Adequate level of capability

- Support Services for Target Markets with goal of High Customer Satisfaction and very competitive cost of ownership.

Specifically for the installed DEC-10 base migration tools will be provided to make the transfer of application programs, data and command files to TOPS-20 based systems economically feasible.

- The DEC LCG Mainframe Customer is the knowledgeable data processor who demands a complete complement of application tools tools to implement leading edge solutions to communications based data processing problems.

1.2 CHARTER

- Support and Development for DEC Mainframe Large Systems Products

CPU	TOPS-10	TOPS-20	VMS
KA	1040,1050,1055	--	--
KI	1060,1070,1077	--	--
KL	1080,1090,1091,1099SMP	2040,2050,2060	--
KS	2020	2020	--
KX	Minnow	Minnow	--
KM	Dolphin	Dolphin	Dolphin

Keeper of TOPS-10/20 architecture (LCG 36 bit instruction set).

1.3 PRODUCT STRATEGY

Summary

A. Operating Systems

- TOPS-20 - focus on performance, extended addressing, full networks, security, reliability, downward de-engineer for 2020, MINNOW

- TOPS-10 - Minimum investment to satisfy customer base needs and sustain revenue until TOPS-20 is a replacement (Rel 5 FY81/82). Support all new hardware.

- VMS - Provide a Star follow-on engine at 2-3 X performance.

B. Consolidate hardware KL10E, KS10

- 2020, 2040 (cacheless 2060) and 2060 from FY80 on.

C. Provide for Growth

- More CPU Capacity: SMP FY80, DOLPHIN FY81
- Multi Processing: TOPS-10 SMP FY79, TOPS-20 SMP FY81
- Distributed Computing: 2020 FY79, MINNOW FY80

D. Protect Software Investment

- Common Non-Extended Addressing Languages
- Migration Tools TOPS-10 7.02, 7.03 FY81

E. Emphasize RAMP

F. Stabilize Older Products

- Stabilize KA systems and non-VM systems at TOPS-10 6.03 Series
- Stabilize non-extended TOPS-20 at Release 4
- Stabilize TOPS-10 VM and SMP with 7. Series KI/Ext. Channels 7.01 FY81, KL 7.02 FY83

G. Aggressive New Product Development

- Exploit new hardware technology
- Push down - high volume, "seed" the market
- Time to market critical DOLPHIN (FY81) MINNOW (FY80) SUPER STAR (FY82)
- Significant Cost/Performance Leadership
- Support techniques to give maximum System Availability
- Productivity at lowest competitive cost
- Application Development Tools
- Integrated Language Capability
- Common User Interface, Data Base, and Transparent Network Interconnect Capability

H. Complement IBM - industry leadership in mainframe communication based systems. Easy, Interactive Interconnectability between DEC systems and IBM (SNA, X25)

Assumptions

- Installed base a big revenue generator (10-12% of base per year)
- KL hardware remains viable until 1982
- No major market direction change
- IBM architecture/software becomes industry standard necessitates high degree of compatibility

Risks

- New Technology
- KL hardware will not remain viable
- Invalid Market/Environment Assumptions
- No mid-range product
- High End Peripheral Strategy
- Migration of base to TOPS-20/VMS by 1985

MAINFRAME PRODUCT STRATEGY

FY79

TOPS-10 7.01
- HASP
- SMP
- D/N Ph 2

TOPS-20 Rel 4
- 8000 Directories
- D/N Ph 2 4 lines
- Execute only
- TPS20 V1
- File Transfer
- RJE

MOS (2060)
DN200
Tape Labels
File Archiving
RP07
TU77
Mountable Device Allocation
COBOL 68/74 V13 Performance
MACRO LINK V5 Performance
GALAXY V4
BASIC PLUS 2 V2
FORTRAN V6
APL V2

FY80

TOPS-10 7.01A
- Hdw Supp
- 2060 SMP

TOPS-20 Rel 5
- Usage Accounting
- TPS20 V2

TU78
RP08
MINNOW FCS
APL V3
GALAXY V5
MINI-DBMS
Migration Tools
Mountable Device Allocation

FY81

TOPS-10 7.02
- DOLPHIN FCS
- Hdw Supp

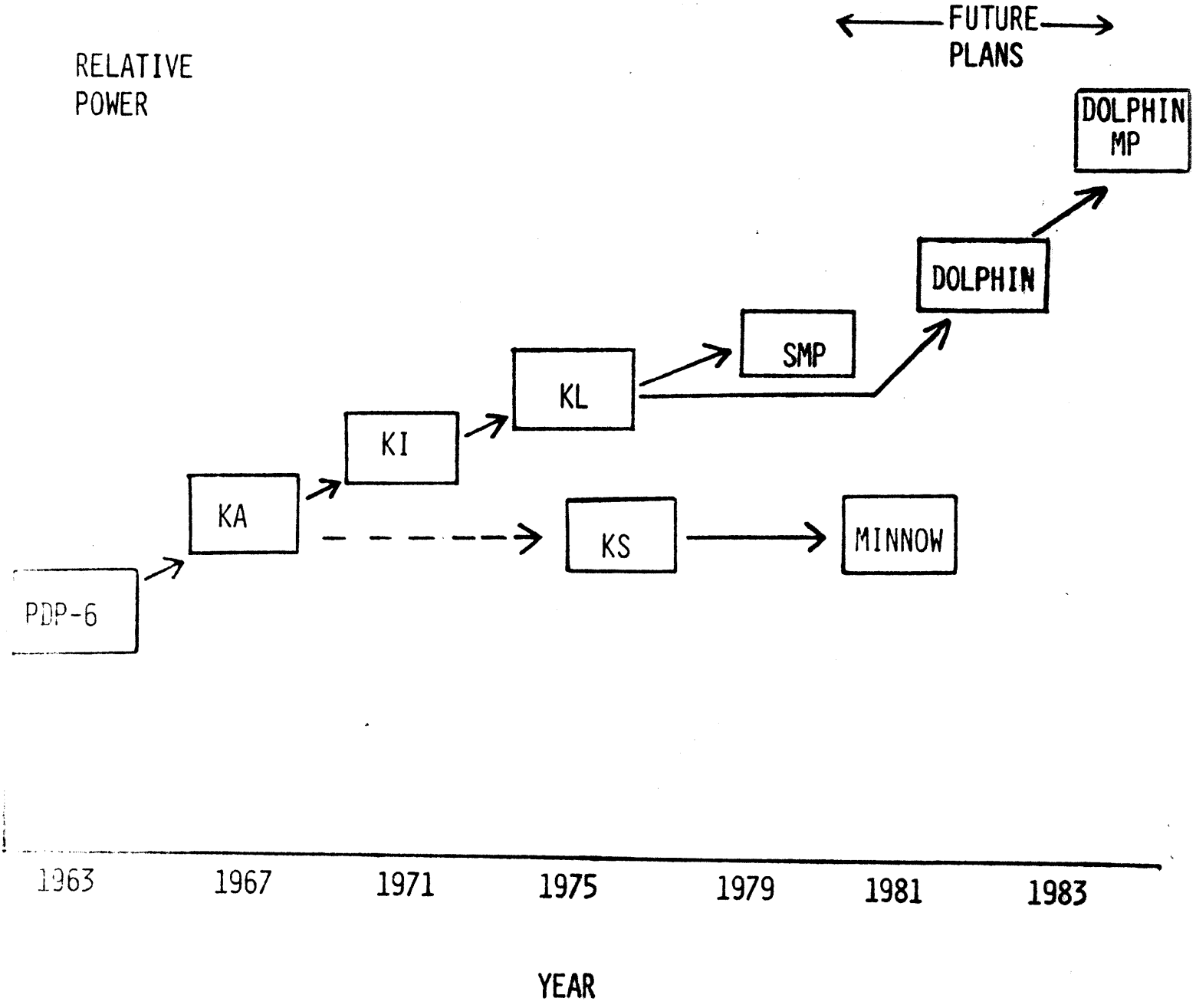
TOPS-20 Rel 6
- 2060 SMP
- DOLPHIN FCS

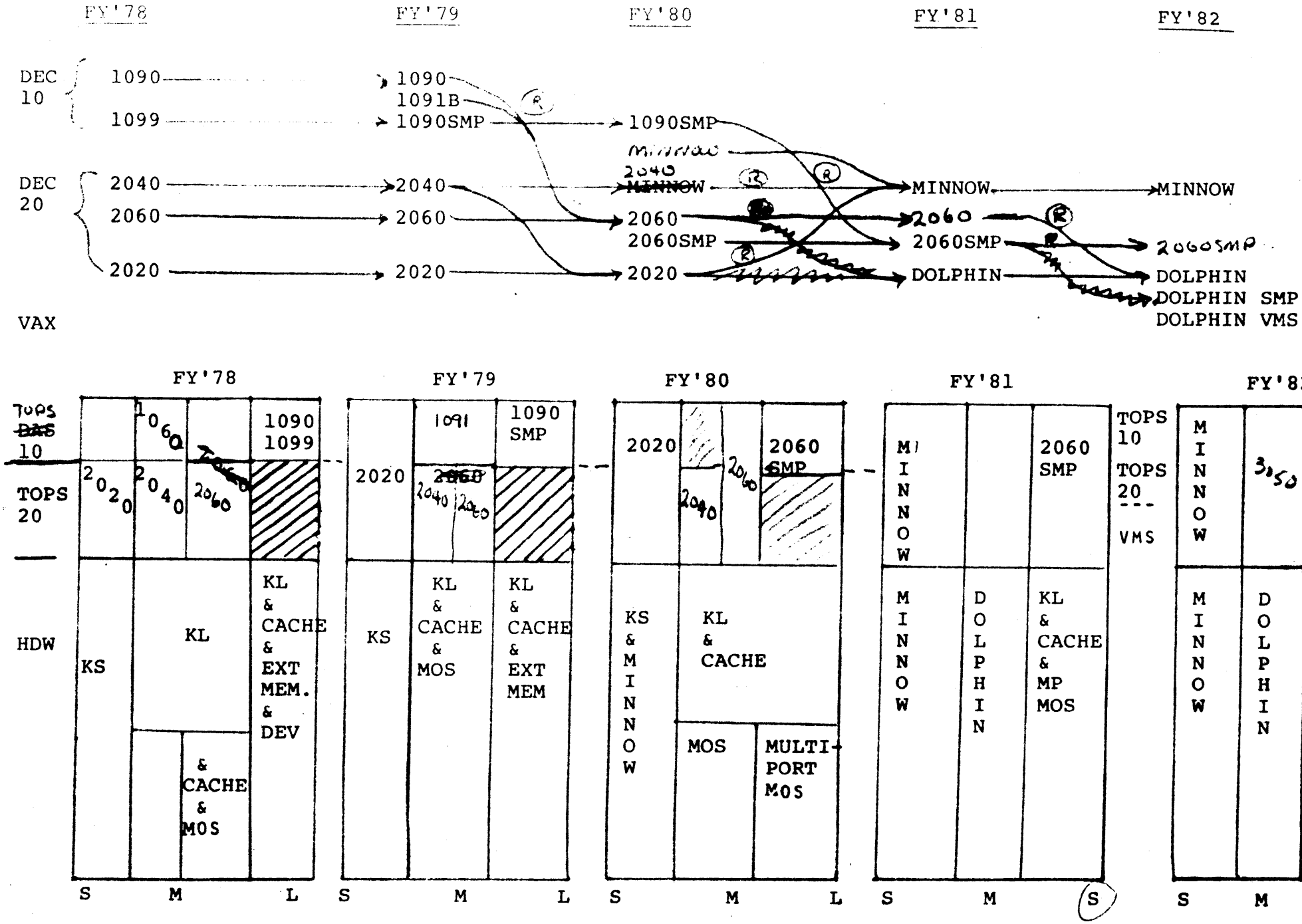
TOPS-20 Rel 5
COBOL 79
Distr.Proc V1
Distr. Data Base V1
NDS 50 I/O Subsystem
SDLC TOPS-20
High Availability
X25 Gateways

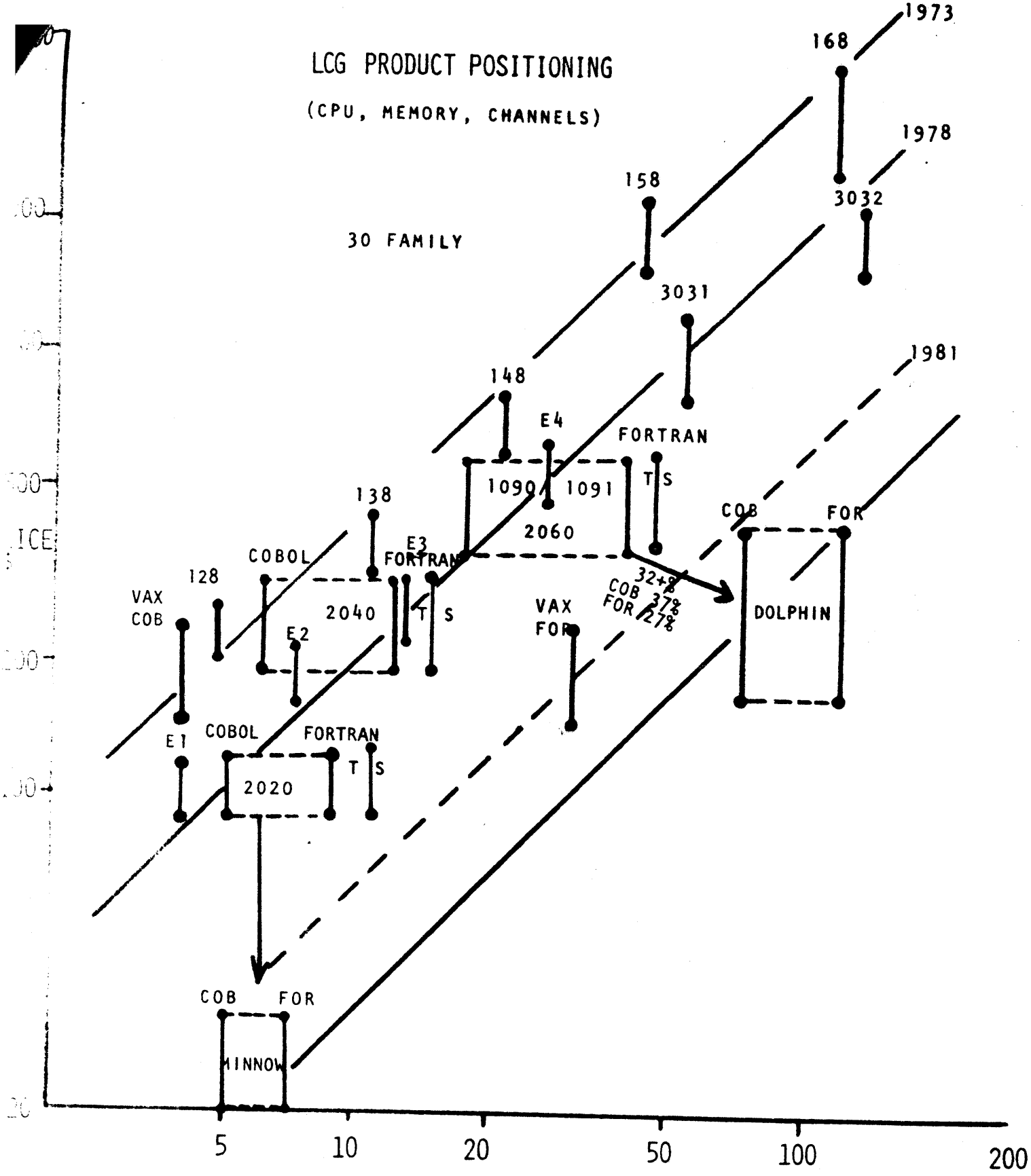
FY82

TOPS-10 7.03
DOLPHIN SMP
DOLPHIN VMS
TOPS-20 Rel 7
Distr Proc V2
PL/1
Natural Language
Data Base Interface
Programmer Workbench

DEC LARGE SYSTEMS PRODUCT FAMILIES

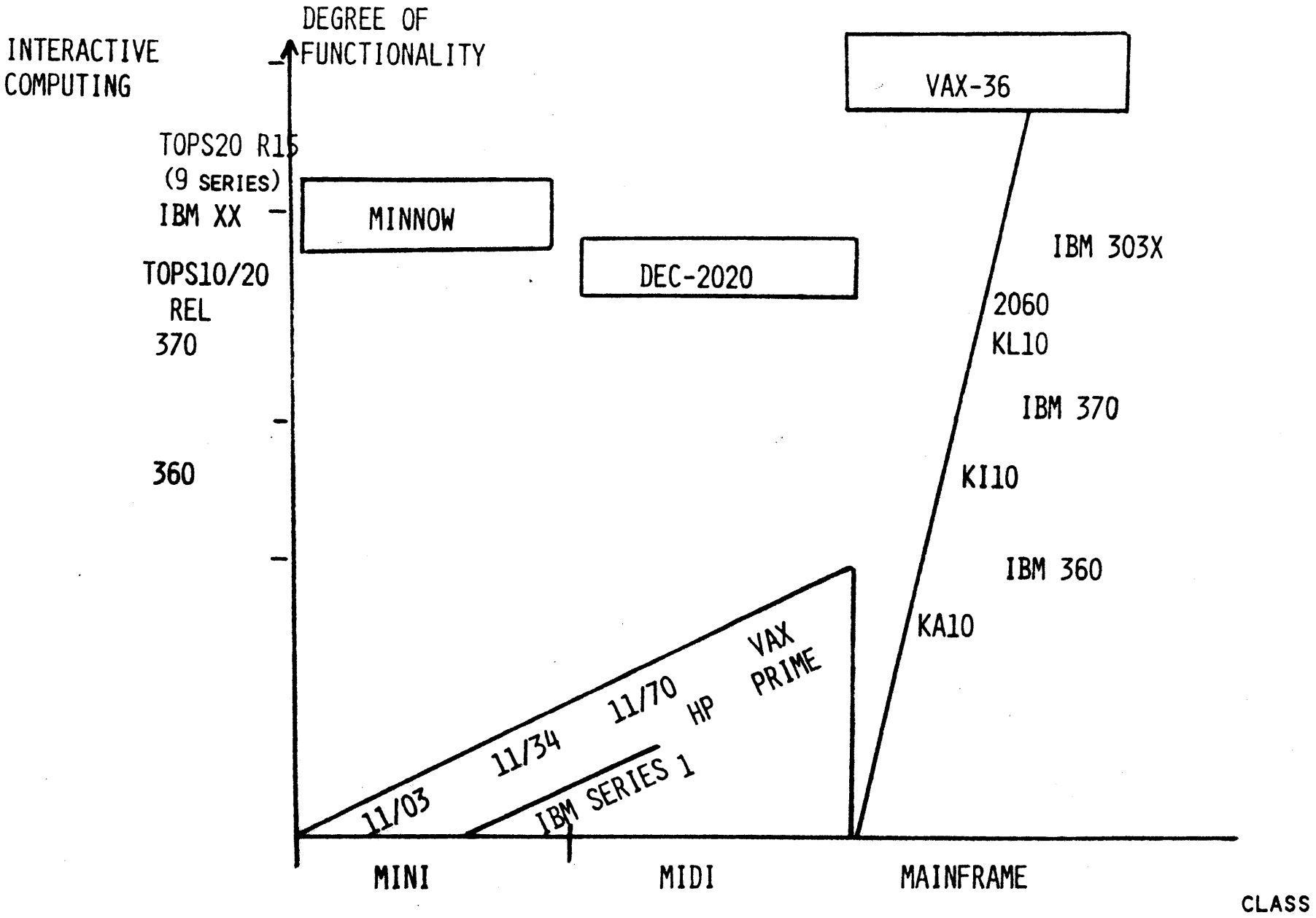



FY'78
FY'79
FY'80
FY'81
FY'82
DEC 10
1090
1099
1090
1091B
1090SMP
1090SMP
DEC 20
2040
2060
2020
2040
2060
2020
2040 MINNOW
2060
2060SMP
2020
MINNOW
2060
2060SMP
DOLPHIN
MINNOW
2060SMP
DOLPHIN
DOLPHIN SMP
DOLPHIN VMS
VAX
FY'78
FY'79
FY'80
FY'81
FY'82
TOPS 10
TOPS 20
HDW
1090 1099
KS
KL
KL & CACHE & EXT MEM. & DEV
& CACHE & MOS
1091
1090 SMP
KS
KL & CACHE & MOS
KL & CACHE & EXT MEM
2020
2060 SMP
KS & MINNOW
KL & CACHE
MOS
MULTI-PORT MOS
MINNOW
2060 SMP
MINNOW
DOLPHIN
KL & CACHE & MP MOS
TOPS 10
TOPS 20
VMS
MINNOW
3050
3050 3055
MINNOW
DOLPHIN
DOLPHIN SMP
S M L
S M L
S M L
S M L
S M L


LCG PRODUCT POSITIONING
(CPU, MEMORY, CHANNELS)
30 FAMILY
1973
168
1978
3032
158
3031
1981
148
E4
FORTRAN
T S
1090
1091
2060
138
E3
FORTRAN
COBOL
128
VAX
COB
E2
2040
T S
VAX
FOR
COB
FOR
32+8
COB 37%
FOR 27%
DOLPHIN
E1
COBOL
FORTRAN
T S
2020
COB
FOR
MINNOW
5
10
20
50
100
200
RELATIVE PERFORMANCE

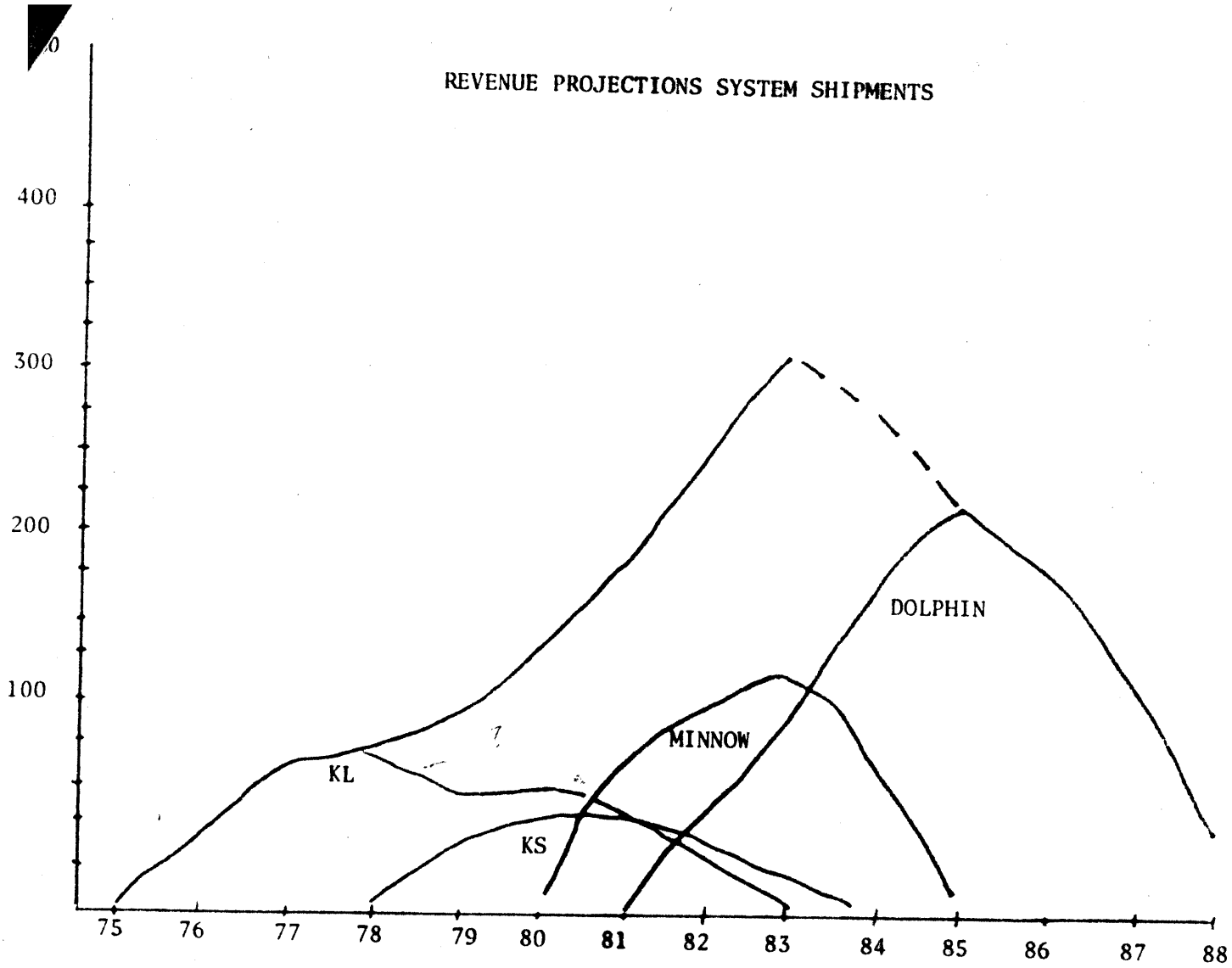
JSJ 11/78

1979 - 1985


DEGREE OF
FUNCTIONALITY
INTERACTIVE
COMPUTING
VAX-36
TOPS20 R15
(9 SERIES)
IBM XX
MINNOW
DEC-2020
IBM 303X
TOPS10/20
REL
370
2060
KL10
IBM 370
360
KI10
IBM 360
KA10
VAX
PRIME
11/70
HP
11/34
11/03
IBM SERIES 1
MINI
MIDI
MAINFRAME
CLASS

1.4 DEVELOPMENT INVESTMENT STRATEGY $M

'78	'79		FCS	'80	'81	'82	'83
1.046	.95	Current Product Support		1.10	1.20	1.33	1.47
		Hardware					
		Software					
		New System Development					
.65	2.96	Dolphin	Q4'81	4.20	3.28	2.00	1.01
--	--	Next System		--	2.70	6.18	10.07
--	.63	Minnow	Q4'80	1.40	.80	.5	--
		Memory					
--	.45	MF20 Single Port MOS	Q2'79	.17	--	--	--
--	--	MX20 Multiport MOS/SMP	Q2'80	--	--	--	--
.306	.28	Peripherals		.28	.30	.35	.40
		RP07	Q1'80				
		RP08	Q4'81				
		RM04					
		TU77	Q3'79				
		TU78	Q3'80				
		NDS-50	Q4'81				
		Unit Record					
	.18	Comm. Hardware		.17	--	--	--
.60	.82	2020 Volume		--	--	--	--
.073	5.32	Total Hardware		6.22	7.08	9.03	11.48
		Opr Systems/Utilities					
.541	.70	TOPS-10 + Migration	Q4'79	1.20	1.00	1.00	.50
.87	1.40	TOPS-20	Q4'79	2.00	2.00	2.00	2.00
--	.47	2020	Q2'79	--	--	--	--
.59	3.41	Languages		.90	.98	.80	1.00
		COBOL					
		FORTRAN					
		BASIC					
		APL					
		MACRO/LINK					
--	--	New System Software		4.00	7.00	9.93	13.66
.66	--	Communications					
5.66	5.98	Total Software		8.10	10.98	13.73	17.16
.554	12.25			15.42	19.26	24.09	30.11



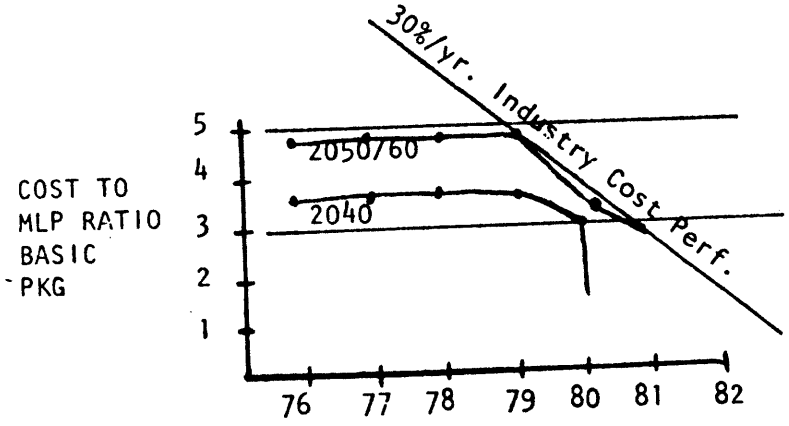
Inst Base															TOT
KL#	1	67	150	156	120	140	100	50							61
Ave Sys	.6	.6	.6	.6	.6	.6	.6	.6							
Rev.	1	27	90	94	72	84	60	30							
REV E		28	118	212	284	368	428	458							45
KS#			14	238	268	300	250	175	20						179
Ave Sys			.21	.22	.22	.22	.20	.20	.2						
Revenue			3	52	59	66	50	35	4						
REV E			3	55	114	180	230	265	269						39
MINNOW #					106	1383	1939	2296	1500						722
Ave Sys					.05	.05	.05	.05	.05						
Revenue					5.3	69	97	115	75						
REV E						743	890	955	1030						36
DOLPHIN #						12	125	350	400	400	350	250	75		196
Ave Sys						.35	.40	.45	.45	.45	.45	.45	.45		
Revenue						4.5	50	154	180	180	156	112	33		87
REV E							55	209	389	569	725	837	870		
TOTAL	1	27	90	97	124	198	200	227	304	259					-

1.5 SUMMARY OF PROJECTED REVENUES

The following Projected Revenues are based on these strategic assumptions:

1. TOPS-10 and TOPS-20 Based Systems only. No consideration given for DOLPHIN VMS.

2. KL Revenues can be sustained through FY82. Price can be reduced to maintain cost-performance competitiveness.



- 2040 is in marginal cost performance position in FY78/79
- 2050/2060 will be under pressure in FY79/80

Strategy will be to reduce price within profitable margin area and focus on installed base and applications where TOPS-10/20 have unique strengths.

3. MINNOW FCS Q3 FY80 Volume Q1 FY81

4. DOLPHIN FCS Q4 FY81 Volume Q2 FY82

5. DOLPHIN VMS Assumptions and Revenue Projections Not Yet Included

1.6 MARKET FIT

Customer Needs/Marketplace

- Reduce Total Cost of Ownership
- Cost of ownership will be 90% people
- Manageable Computing Facilities
- Add and Subtract Capacity from Environment Easily (contraction and growth)
- High Percent of Software will be Purchased "Standard" Packages (from Sears)
- IBM Defacto Software Standard
- "Data" Management more important than computing
- Ease of Use (programming and problem solving) of increasing importance
- High Availability very important
- Very Large Address Space
- Faster Response to Users
- Rapid Movement of Data in High Volume
- Program Generation Tools
- Complete Documentation
- People Productivity Most Important Selection Criteria

1.7 COMPETITION

IBM will continue to dominate based on:

- semiconductor to system manufacturer
- centralized hierarchial structures
- system cost shift from hardware to software
- Batch/T.P. emphasis vs. Interactive
- E Series will extend DOS/VM370 down from 30xx by '80
- 30xx on a "chip" by early 80's
- fierce competition with PCM's and PCP's

We will compete with our Service Bureaus selling "computing"

36 bit PCM's
HIS will probably go away - controls business
CDC will remain as Large Scale Scientific Specialist
Burroughs, NCR, Univac will retain "Specialized Market" positions

Increased competition from mini makers - D.G., Prime, Harris, H.P. with mainframe-like products.

1.8 TECHNOLOGY

- Component density increases 4 x every 3 years (RAMS)
- Development tools critical to success
- Bi polar gate array with Motorola looks best for Dolphin operating point
- H MOS for higher volume (Minnow?)
- SNA becomes industry standard
- Standard Peripheral Interface (IBM)
- Anyone will be able to build hardware; software will be deciding issue
- 370 Architecture/Software becomes Industry Standard
- Terminals get very smart and cheap
- Software - Natural language interface, Distr. Processing, security, shared data
- Sophisticated program development tools
- Relational Data Base

1.9 EPILOGUE

Notes

A. KL Model B Phase In

- 1090 will merely get slightly faster
- 2040 will not get faster (slower MB memory makes up for faster CPU) and will continue to be treated by TOPS-20 as a non-extended machine.
- 2050 will get faster and will, as 2040, be treated by TOPS-20 as a non-extended machine
- 2060 will be announced as Model B CPU + MOS and TOPS-20 will fully utilize the extended Model B
- 2060 will replace the 2050 in FY79
- 2040 to 2060 upgrades will be announced to allow all 2040 (Model A or Model B) to upgrade to 2060 - same kind of upgrade will be offered for 2050 to 2060
- 1091 (and its successors) will be Model B only

B. Language Support

- all new language developments will be run on extended machines only.

C. MOS Memory Strategy

MOS is to come in 3 flavors:

- single port internal - MF20 (up to 1 Mwd)
- single port external - MD20
- multi port (2) external - MD20

MOS memory is supported on KL10E only.

D. DX20/TU70,1,2

Is to be supported in both TOPS-10 and TOPS-20. To be supported as standard in TOPS-20 3A and TOPS-10 7.01.

Changes Since Last Edition

Changes Since Spring '77 Red Book

A. DECnet dropped from TOPS-20 Release 3 due to mobility for 1/78 FCS schedule to be met.

B. TOPS-20 Release 4 emphasis is TPS, DECnet/performance and new hardware support. Remote terminal concentration will not be available.

C. Lateness of TU77 project has been relieved by adding DX20/TU70,1,2 support to TOPS-10 and TOPS-20 for early FY79 availability.

D. 2020 Hardware volume release accelerated to early FY79.

E. TOPS-10 support added for 2020.

F. 1091 System added to plan. This is approximately TOPS-10 on 2050 hardware.

G. Four-port MOS project has been changed to two-port. This project will also allow up to 3 Mwd of MOS memory per system.

Changes Since Fall '77 Red Book

A. TU78 Support postponed.

B. Need to support TOPS-10 CUSPS recognized and being accomplished.

C. New language development COBOL 79 postponed to coincide with optimized Dolphin hardware.

D. Minnow, Dolphin investment out of R&D and into implementation.

E. Shift in system software direction to Distributed Processing, downward de-engineering, SOA Distributed Data Base and Hardware Optimized Languages. TOPS-10 minimized.

F. 2020 Follow-on at same to X2 operating point is not planned.

G. MINNOW is a cost reduced 2020 at about same operating point.

H. DOLPHIN VMS in R&D FY79 for FCS FY82

Unresolved Issues

A. TOPS-10 on 20 hardware not resolved, dependent on software support proposal for FY80 implementation.

B. Short term investments in long term products; COBOL 79, FORTRAN 77, Distributed Processing, Data Base

C. Extended Addressing Introduction Phase-Over

D. TOPS-10 to TOPS-20 Migration

E. DOLPHIN VMS Business Plan

F. Specific Software Implementation Plans

- Transparent Networks
- Distributed Data Base
- Programmer Work Shop