

Spring '77
LCG
Beige Book

Volume 4

digital

COMPANY CONFIDENTIAL

LCG BEIGEBOOK

Table of Contents

	Page
I. LCG BEIGEBOOK.....	
A. LCG Central Software Engineering.....	1
B. LCG Advanced Software Engineering.....	71
C. LCG Central Hardware Engineering.....	90

A. LCG CENTRAL SOFTWARE ENGINEERING

SOFTWARE ENGINEERING

FY 78 & FY 79

LEVEL MANPOWER BUDGET

VERSION 2.7

E. J. CHRISTIANSEN
6-16-77

CONTENTS

- . EXPOSURES
- . CHANGES TO VERSION 2.6
- . FY78-FY79 TOTAL FUNDING SOURCES
- . TOTAL FUNDING FY78-FY79
- . PROJECT FUNDING - N. ABLE
- . PROJECT FUNDING - C. TURLEY
- . PROJECT FUNDING - F. HOWELL
- . FY78/79 FAMILY PLANS AND PRODUCT SUMMARIES

TURLEY

ABEL

HOWELL

GLANTZ

EXPOSURES

- . No P/L revenue forecast on which to judge ROI for projects.
- . Hardware/software mismatches still exist, i.e., TU78.
- . No plans to include Advanced System products into mainstream products.
- . Computer operations hardware plans.
- . Replanning of TOPS-20 Release 4,5,6 is not complete.
- . Next System resources.
- . TPS-20 late FCS.
- . System performance resources.
- . ARPA follow-on Date Q2/78.

NO P/L REVENUE FORECASTS ON WHICH TO JUDGE ROI FOR PRODUCTS.

Only intuitive judgement and emotion have been used in building this plan. There may be items in this plan which are of little true revenue value to DEC.

HARDWARE/SOFTWARE MISMATCHES STILL EXIST.

Devices like the TU78 are supported late. Plan additions like the integrated file adapter on 2020 and the generalized peripheral interface are unsized exposures. In the following months attempts will be made to improve schedules where possible and size the exposures in unknown areas.

NO PLANS TO INCLUDE ADVANCED SYSTEM PRODUCTS INTO THE MAINSTREAM PRODUCTS.

At present it appears the PC10 support and DX20/TU70,71,72 support are of volume which makes mainstream product support desirable. There are no plans to accomplish this and the level of effort has not been sized.

COMPUTER OPERATIONS HARDWARE PLANS.

Keeping 2136, 2137 systems has been budgeted through February 1978. The support of Model A's which is the most significant component of field installs cannot be done without a Model A in house. This problem must be revisited in Q2/78 planning. I do not plan to support what I cannot service effectively. At present there are no hardware plans to support TOPS-20 SMP.

Rattan Dhar
June 23, 1977
Page 2

REPLANNING OF TOPS-20 RELEASE 4,5,6 IS NOT COMPLETE.

This pass does not contain the results of the communications replanning which is almost complete and will affect TOPS-20 R.4 and TPS directly. TOPS-20 R.5 and R.6 will be affected by the resources required to complete R.4. The target is to have R.4 plans complete in June including TPS and the R.5 and R.6 in July.

NEXT SYSTEM RESOURCES.

There are no resources in this plan dedicated to work on the next system. I view this as an unacceptable exposure which could result in perturbation in both hardware design and software implementation in future years. This could be solved with funding for one additional person in FY78 and FY79.

TPS LATE FCS.

The current plan has TPS ship in Q2/79 which does not meet the requirement for Van Dusen. We will attempt to solve Van Dusen as a special case.

SYSTEM PERFORMANCE RESOURCES.

Only one of the two requested people were funded to start this project. I believe that the addition of networks, especially in the commercial environment requires that we deliver a predictable quality product. I am uncertain of the size of this exposure and how much can be accomplished with the level of funding approved.

ARPA FOLLOW-ON AFTER Q2/78.

A request has been received to continue support of ARPA integration and documentation as well as to complete performance analysis on TOPS-20. This will be pursued as a business justified request for net additional funding.

CHANGES TO 2.6

1. Includes basic follow-on
2. TOPS-20 Release names changed
 - 3.1 to 4.0
 - 3.2 to 5.0
 - 4.0 to 6.0
3. GALAXY Release names changed
 - 3.1, 3.2, 3.3 to 3.0, 4.0
 - 4.0 to 5.0
4. Include Performance Project

FY78-FY79 Total Funding Sources*

<u>SOURCE</u>	<u>\$K-78</u>	<u>\$K-79</u>
LCG - Marlboro	<u>3,424.29</u>	<u>3,516.1</u>
P/L-20 - Maynard		
APL-11	51.26	121.20
COBOL/VAX	162.73	313.20
	<u>213.99</u>	<u>434.40</u>
	<u>3,638.28</u>	<u>3,950.5</u>
TOTAL FUNDING	3,638.28	3,950.5

*Based on Level Manpower Loading

Revised 6/15/77

Total Funding

	<u>FY 78</u>	<u>FY 79</u>
Manpower Contingency	14.32	--
Tape Prep	16.00	16.00
Norma Abel (includes Europe)	1,506.72	1,857.2
Chuck Turley	1,757.34	1,848.04
Fred Howell	343.9	229.3
	<hr/>	<hr/>
TOTAL	3,638.28	3,950.5

Project Funding

<u>Project Description</u>	<u>FY 78</u>	<u>FY 79</u>
COBOL VAX (PL-20)	162.73	313.2
APL-11 (PL-20)	51.26	121.2
FORTRAN V6 & V7	116.72	134.8
COBOL 68,74 SORT	204.52	--
MACRO/LINK	68.30	108.15
OTS-20	40.26	47.2
FORTRAN EXT EXPONENT	--	274.15
APL-10	40.26	--
COBOL 79	253.28	234.90
MCS V2	5.77	--
TPS-20 V1	209.77	144.1
TPS-20 V2	--	98.3
DATA MGT (RMS,DBMS V6, DBMS-79	161.04	248.8
BASIC	47.93	--
COMMERCIAL CONV	--	47.2
LANG. MICROCODE	66.6	--
ALGOL (EUROPE)	38.0	38.0
COMM PERFORMANCE	40.28	47.2
	<hr/>	<hr/>
TOTAL	1,506.72	1,857.2

C. Turley

Project Funding
(includes SQM, Murphy)

<u>Project Description</u>	<u>FY 78</u>	<u>FY 79</u>
RELEASE ENGINEERING	131.76	165.84
GALAXY V3 & V4	211.34	99.4
GALAXY MDA/V5	40.97	221.3
TOPS-10 V6.04 (incl. 6.03A)	243.27	246.3
TOPS-20 RELEASE 3.0	435.83	--
TOPS-20 RELEASE 4.0	361.92	--
TOPS-20 RELEASE 5.0	70.94	456.1
TOPS-20 RELEASE 6.0	--	463.9
TOPS-20 AN RELEASE 103	45.0	--
2020 PHASE I	17.05	--
2020 PHASE II	99.17	--
2020 PHASE III	31.25	148.0
NEXT SYSTEM	28.58	47.2
PERF. ANALYSIS	<u>40.26</u>	<u>--</u>
TOTAL	1,757.34	1,848.04

Revised 6/15/77

Howell/Meidell

MANPOWER ONLYProject Funding

<u>Product Description</u>	<u>FY 78</u>	<u>FY 79</u>
DEC10 COMM 603A	62.5	--
DEC10 COMM 604	38.4	--
DEC10 COMM 4.0	--	40.8
DEC20 COMM 3.0	102.5	--
DEC20 COMM 4.0	102.7	--
DEC20 COMM 5.0	--	106.1
DEC20 COMM 6.0	--	41.6
KLFE KLINIK	37.8	--
KLFE RP-MOS	--	40.8
	<hr/>	<hr/>
TOTAL	343.9	229.3

Revised 6/15/77

TURLEY

LCG Development Beige Book
Family Plan Summary

Product Family OPERATING SYSTEMS Date 6/77 Rev. LHC

Product Manager David Kiarsis Engineering MGR./Super. Chuck Turley

Strategy/Goals summary:

- . Provide state of the art networking, timesharing, and interactive computing.
- . Provide increase system performance through operating system optimizations.
- . Provide industry leadership in large scale timesharing.
- . Provide support for DEC-10 to DEC-20 migration.
- . Provide hardware support for new hardware options.

Major Risks:

- TOPS-10 V6.04 - Funding depends on IPC
- Need Field Service to do fault insert
- Need assistance from Software Support for availability
- TOPS-20 V3.0 - COMM/NETS (task to task)
- TOPS-20 V4 & 5 - COMM/NETS dependencies MOS hardware
- TOPS-20 V6 - SMP hardware availability

C= committed

8- Quarter Product Plan/Budget Summary

*P= planned

Product C/P System(s)	FY78	FY79	FY78				FY79				Prior
	Budget	Budget	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
1. TOPS-10 V6.04	243.27	246.3	P1				P2	P3	P4,5		3-2
2.											
3. TOPS-20 V3.0	435.83		C2	C3	C4,5						1-2
4. TOPS-20 V4	361.92			P1	P2	P3,4,5					1-2
5. TOPS-20 V5	70.94	456.1			P1		P2	P3	P4,5		1-20
6. TOPS-20 V6		463.9	(Q1'80	P2)					P1		3-14
			Q2'80	P3							
			Q3'80	P4,5							

LEGEND: PLAN/FUNC.SPEC. CODE FREEZE/DESIGN COMP. ANNOUNCE MFG/SDC REL. FCS

1	2	3	4	5
---	---	---	---	---

Note: At A minimum, (1) (3) (5) must be estimated. Add as many milestones as practical for committed products.

*Planned dates are provided for budget and planning purposes internal to DEC and not for general announcement or establishing customer commitments.

LCG Development Beige Book
Family Plan Summary

Product Family OPERATING SYSTEMS Date 6/77 Rev. LHC

Product Manager David Kiarsis Engineering MGR./Super. Chuck Turley

Strategy/Goals summary:

Major Risks:

- DEC-2020 Phase I - hardware availability
- Phase II - hardware availability
- TOPS-20 AN V103 - no plans beyond Q2'78

C= committed
*P= planned

8- Quarter Product Plan/Budget Summary

Product C/P System(s)	FY78	FY79	FY78				FY79				Prior
	Budget	Budget	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
1. DEC-2020 Phase II	99.17			P2	P3,4,5						2-1
2. DEC-2020 Phase II	31.25	148.0									5-2
3. TOPS-20 AN V103	45.0		C2	C3	C4,5						0-11
4. NEXT SYSTEM	28.58	47.2									2-4
5. DEC-2020 Phase I	17.05		C5	(DEMO)							1-29
6.											

LEGEND: PLAN/FUNC.SPEC. CODE FREEZE/DESIGN COMP. ANNOUNCE MFG/SDC REL. FCS

1	2	3	4	5
---	---	---	---	---

Note: At A minimum, (1) (3) (5) must be estimated. Add as many milestones as practical for committed products.

Planned dates are provided for budget and planning purposes internal to DEC and not for general announcement or establishing customer commitments.

Product Designation TOPS-10 Date 6/14/77 Rev. LHC
 Product Family Operating Systems Planned (X) Committed ()
 System(s) DECsystem-10 Priority 3-2
 Product MGR David Kiarsis Engineering MGR/Super. Turley/Oxley

Product Description: Monitor Release 6.04

- . Hardware support for 2 KL10 or 2 KI10 in a master/master relationship
 - . 15% thrupt improvement over 6.03 single system
 - . High availability
 - . KLINIK support
 - . High-end system performance and capacity
 - . State-of-the-art maintainability
 - . Scheduler LIR
 - . Monitor Release 6.03A
 - . Migration from TOPS-10 to TOPS-20 planning
 - . ENQ/DEQ improvements
 - . Support for TM03/TU45/TU77 -
- . Accounting (system utilities)

Product Strategy:

The introduction of 6.04 SMP operating system will provide a solution to the high end computing needs of our customers. It will provide a growth path from medium size DECsystem-10's. Release 6.04 will be the last development release of TOPS-10.

Competitive Products:

This product will allow us to be competitive with other vendor's multi-processor systems as well as opening an additional market where we did not have the processing power required in the past.

<u>Proposed Schedule:</u>	<u>Plan/Spec</u>	<u>Code Freeze</u>				<u>Announce</u>	<u>Release</u>	<u>FCS</u>				
		<u>Des.</u>	<u>Comp.</u>									
	<u>Q1'78</u>	<u>Q1'79</u>			<u>Q2'79</u>	<u>1/79</u>	<u>1/79</u>					
<u>Proposed Budget:</u>	FY78	3	3	4	4	FY79	4	4	3	3	DEV	
		1	1	1	1		1	1	1	1	1	SQM
		1	1	1	1		1	1	1	2	2	DOC

Product Cost Goals & Proposed Pricing:

Major Risks:

Manpower does not include one programmer from IPC.

Product Designation	TOPS-20	Date	6/14/77	Rev.	LHC
Product Family	Operating Systems	Planned ()	Committed (XX)		
System(s)	DECsystem-20	Priority	1-2		
Product MGR	David Kiarsis	Engineering MGR/Super.	Turley/Snyder		

Product Description: TOPS-20 Release 3.0

This operating system release provides a number of synchronous communication facilities and a number of commercial enhancements.

- . Tree Structured Directories
 - . Support for Extended Addressing KL10 (monitors)
 - . TM03/TU45/TU77 Support
 - . EXEC consistency improvements
 - . Account Validation/Reporting
 - . DECNET/20 (task-task comm.)
 - . DN64 - 2780/3780 termination & emulation
 - . Auto - Baud Detection
 - . KLINIK
- . ARPA Integration
 - . PSECTS
 - . Performance Improvements
- (See page for TOPS-20 AN Release 103)

Product Strategy:

This operating system release will make TOPS-20 much more commercially viable and it will provide a number of basic flavors of synchronous communication as well as participation in the corporate DECNET program.

Competitive Products:

<u>Proposed Schedule:</u>	<u>Plan/Spec</u>	<u>Code Freeze</u>				<u>Announce</u>	<u>Release</u>	<u>FCS</u>						
		<u>Des.</u>	<u>Comp.</u>											
	4/1/77	8/1/77			Q3'78	1/78	1/78							
<u>Proposed Budget:</u>	FY78	8.5	8.5	0	0	FY79	0	0	0	0	DEV			
		4	4	0	0		0	0	0	0	SQM			
		7	7	0	0		0	0	0	0	DOC			

Product Cost Goals & Proposed Pricing:

Major Risks:

The major risk is TOPS-20's dependency on Maynard for most of its synchronous communication/DECNET capabilities. TU77 hardware required in August '77 on development system for development and test.

Product Designation	TOPS-20	Date	6/14/77	Rev.	LHC
Product Family	Operating Systems	Planned (XX)	Committed ()		
System(s)	DECsystem-20	Priority	1-2		
Product MGR	David Kiarsis	Engineering MGR/Super.	C. Turley/D. Snyder		

Product Description: TOPS-20 Release 4

This operating system release provides support for MOS memory facilities and some commercial enhancements.

- . Tape Label Processing
- . Monitor basis for TPS-20
- . MOS memory support
- . Maintainability/serviceability

Product Strategy:

This operating system release is timed to be available in sync with FCS of MOS memory and TPS-20.

Competitive Products:

<u>Proposed Schedule:</u>	<u>Plan/Spec</u>	<u>Code Freeze</u>				<u>Announce</u>	<u>Release</u>	<u>FCS</u>			
		<u>Des.</u>	<u>Comp.</u>								
	Q2'78	Q3'78	Q4'78	6/78	6/78						
<u>Proposed Budget:</u>	FY78	0	0	6.5	6.5	FY79	0	0	0	0	DEV
		0	0	3	3		0	0	0	0	SQM
		0	0	6	6		0	0	0	0	DOC

Product Cost Goals & Proposed Pricing:

Major Risks:

- . Failure of MOS memory hardware project.

Product Designation	TOPS-20	Date	6/14/77	Rev.	LHC
Product Family	Operating Systems	Planned (XX)	Committed ()		
System(s)	DECsystem-20	Priority	1-20		
Product MGR	David Kiarsis	Engineering MGR/Super.	Turley/Snyder		

Product Description: TOPS-20 Release 5

This operating system release provides a number of synchronous communication facilities.

- . Combinations of synchronous communications
- . DN98 Remote Stations
- . DN92 Remote Stations
- . Execute only

Product Strategy:

This operating system release will provide a number of basic flavors of synchronous communication as well as participation in the corporate DECNET program.

Competitive Products:

<u>Proposed Schedule:</u>	<u>Plan/Spec</u>	<u>Code Freeze</u>		<u>Announce</u>	<u>Release</u>	<u>FCS</u>					
		<u>Des.</u>	<u>Comp.</u>								
	<u>Q3'78</u>	<u>Q1'79</u>		<u>Q2'79</u>	<u>Q3'79</u>	<u>Q3 '79</u>					
<u>Proposed Budget:</u>	FY78	0	0	2	2	FY79	8.5	8.5	0	0	DEV
		0	0	0	0		3	3	0	0	SQM
		0	0	1	1		7	7	0	0	DOC

Product Cost Goals & Proposed Pricing:

Major Risks:

The major risk is TOPS-20's dependency on Maynard for most of its synchronous communication/DECNET capabilities.

- . FCS cannot be committed.

Product Designation	TOPS-20	Date	6/14/77	Rev.	LHC
Product Family	Operating Systems	Planned (X)	Committed ()		
System(s)	DECsystem-20	Priority	3-14		
Product MGR	David Kiarsis	Engineering MGR/Super.	Turley/Snyder		

Product Description: TOPS-20 Release 6
This operating system release provides high availability, improved performance, support for new hardware, and migration path for TOPS-10 customers.

- . Both Model A and Model B KL10 CPU's
- . Dual port RP04/RP06, TU78, RP08, RP07
- . Extended Addressing in User Mode (Model B only)
- . Monitor Performance Improvements
- . Migration tools (TOPS-10 to TOPS-20)
- . SMP-20 (Model B only)
- . Support for new terminals

Product Strategy:

This operating system release is required to support the newer technology hardware and peripherals. It will also involve substantial efforts at improving performance and it will make it possible for the language developers to make use of the extended addressing facilities of the Model B hardware.

Competitive Products:

This will allow us to be competitive with other vendors which offer similar hardware.

<u>Proposed Schedule:</u>	<u>Plan/Spec</u>	<u>Code Freeze</u>				<u>Announce</u>	<u>Release</u>	<u>FCS</u>			
		<u>Des.</u>	<u>Comp.</u>								
	Q3'79	Q1'80	Q2'80	Q3'80	Q3'80						
<u>Proposed Budget:</u>	FY78	0	0	0	0	0	0	8.5	8.5	DEV	
		0	0	0	0	FY79	0	0	3	3	SQM
		0	0	0	0		0	0	7	7	DOC

Product Cost Goals & Proposed Pricing:

Major Risks:

- No additional features for Model A CPU's can be added due to address space limitations.
- Hardware availability delays. Changes in required functionality. Must have R. Schultz contract by Q1'79.

Product Designation	TOPS-20 AN	Date	6/14/77	Rev.	LHC
Product Family	Operating Systems	Planned (XX)	Committed ()		
System(s)	DECsystem-20/-10	Priority	0-11		
Product MGR	David Kiarsis	Engineering MGR/Super.	Turley/Snyder		

Product Description: TOPS-20 AN Release 103

This release of the ARPANET version of TOPS-20 will be a reintegration of the ARPANET version of TOPS-20 with the standard Release 3.0 of TOPS-20. It will run on a Model B CPU only. In addition, the following new facilities will be added:

- . JSYS traps
- . Set controlling terminal JSYS
- . Timer facilities

Product Strategy:

This is the last planned development release of the ARPANET version of TOPS-20. This release puts the ARPANET code back into the standard monitor sources so that one set of sources will exist.

Competitive Products:

<u>Proposed Schedule:</u>	<u>Plan/Spec</u>	<u>Code Freeze</u>				<u>Announce</u>	<u>Release</u>	<u>FCS</u>			
		<u>Des.</u>	<u>Comp.</u>								
	4/1/77	Q1'78				Q2'78	1/78	1/78			
<u>Proposed Budget:</u>	FY78	1	1	0	0	FY79	0	0	0	0	DEV
		0	0	0	0		0	0	0	SQM	
		1	1	0	0		0	0	0	DOC	

Product Cost Goals & Proposed Pricing:

Major Risks:

Contract with BBN to be signed.

Product Designation TOPS-20 on 2020 Date 6/14/77 Rev. LHC
 Product Family Operating Systems Planned () Committed (XX)
 System(s) DECsystem-20 Priority 1-29
 Product MGR David Kiarsis Engineering MGR/Super. Turley/Snyder

Product Description: DEC 2020 Phase I

This is TOPS-20 running on the 2020 (SM10) for demonstration purposes.

Product Strategy:

The 2020 is an entry level product in the -20 line. All -20 products will still run the same operating system.

Competitive Products:

Proposed Schedule: Plan/Spec Code Freeze Announce Release FCS
DEMO SYSTEM ONLY Des. Comp. 8/77

<u>Proposed Budget:</u>	FY78	Code Freeze				FY79	FCS				
		Des.	Comp.	Announce	Release		Des.	Comp.	Announce	Release	
	2	0	0	0	0	0	0	0	0	0	DEV
	0	0	0	0	0	0	0	0	0	0	SQM
	0	0	0	0	0	0	0	0	0	0	DOC

Product Cost Goals & Proposed Pricing:

Major Risks:

Hardware just doesn't work at all.

Product Designation	TOPS-20 on 2020	Date	6/14/77	Rev.	LHC
Product Family	Operating Systems	Planned (XX)	Committed ()		
System(s)	DECsystem-20	Priority	2-1		
Product MGR	David Kiarsis	Engineering MGR/Super.	Turley/Snyder		

Product Description: DEC 2020 Phase II

Further development for limited shipment.

Support for: TU45
DZ
RH11/RP06
System Utilities
RM03

Product Strategy:

The 2020 is an entry level product in the -20 line. All -20 products will still run the same operating system.

Competitive Products:

<u>Proposed Schedule:</u>	<u>Plan/Spec</u>	<u>Code Freeze</u>	<u>Announce</u>	<u>Release</u>	<u>FCS</u>
	6/77	Q2'78	Q3'78	2/78	2/78

<u>Proposed Budget:</u>	FY78	0	2	2	0	FY79	0	0	0	0	DEV
		0	0	0	0		0	0	0	SQM	
		2	2	1	0		0	0	0	DOC	

Product Cost Goals & Proposed Pricing:

Major Risks:

Timing of hardware for load test.

Product Designation	TOPS-20 on 2020	Date	6/14/77	Rev.	LHC
Product Family	Operating Systems	Planned (XX)		Committed ()	
System(s)	DECsystem-20	Priority	5-2		
Product MGR	David Kiarsis	Engineering MGR/Super.	Turley/Snyder		

Product Description: DEC 2020 Phase III

Further development for support of volume shipment.

Product Strategy:

The 2020 is an entry level product in the -20 line. All -20 products will still run the same operating system.

Competitive Products:

<u>Proposed Schedule:</u>	<u>Plan/Spec</u>	<u>Code Freeze</u>				<u>Announce</u>	<u>Release</u>			<u>FCS</u> to be <u>established</u>	
		<u>Des.</u>	<u>Comp.</u>								
<u>Proposed Budget:</u>	FY78	0	0	0	2		2	2	2	.2	DEV
		0	0	0	0		0	0	0	0	SQM
		0	0	0	1		1	1	1	1	DOC

Product Cost Goals & Proposed Pricing:

Major Risks:

Product Designation NEXT SYSTEM Date 6/14/77 Rev. LHC
 Product Family Operating Systems Planned (XX) Committed ()
 System(s) Next System Priority 2-4
 Product MGR Brian Samuels Engineering MGR/Super. Turley/Snyder

Product Description:

This involves planning for the operating system (perhaps a TOPS-20 derivative) on the NEXT SYSTEM.

Product Strategy:

Competitive Products:

Proposed Schedule: Plan/Spec Code Freeze Announce Release FCS
Des. Comp. Established

<u>Proposed Budget:</u>	FY78	.5	.5	.5	.5	FY79	.5	.5	1.5	1.5	DEV SQM DOC
		0	0	0	0		0	0	0	0	
		0	0	0	0		0	0	0	0	

Product Cost Goals & Proposed Pricing:

Major Risks:

- Lack of manpower to complete design in I/O area.
- Lack of -20 SMP hardware for research project.

LCG Development Beige Book
Family Plan Summary

Product Family Batch System Date 6/14/77 Rev. LHC

Product Manager David Kiarsis Engineering MGR./Super. Chuck Turley

Strategy/Goals summary:

Provide a superior state of the art batch subsystem that will meet the needs of the commercial and educational market place. This batch subsystem should provide high thruput, low overhead, tape labeling, device allocation, simple, and an easy to use operator interface.

Major Risks:

The lack of a state-of-the-art batch subsystem has a negative impact on sales. This impact could result in lost sales, additional resources to continually solve individual problems, or additional sales expense to sell around the problem.

C= committed
*P= planned

8- Quarter Product Plan/Budget Summary

Product C/P System(s)	FY78	FY79	FY78				FY79				Prior
	Budget	Budget	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
1. GALAXY V3/V4	211.34	99.4		P1			P2	P3	P4,5	1-10	
2. GALAXY MDA/V5	40.97	221.3		P1				P2	P3	P4,5	3-2
3.											
4.											
5.											
6.											

LEGEND: PLAN/FUNC.SPEC. CODE FREEZE/DESIGN COMP. ANNOUNCE MFG/SDC REL. FCS

1	2	3	4	5
---	---	---	---	---

Note: At A minimum, (1) (3) (5) must be estimated. Add as many milestones as practical for committed products.

*Planned dates are provided for budget and planning purposes internal to DEC and not for general announcement or establishing customer commitments.

Product Designation GALAXY-10/-20 Date 6/14/77 Rev. LHC
 Product Family Batch Systems Planned (X) Committed ()
 System(s) DECsystem-10/-20 Priority 1-10
 Product MGR David Kiarsis Engineering MGR/Super. Turley/Oxley

Product Description: Release 3 and 4

Provide support for links to IBM systems that will allow DEC-10/20 users to submit jobs and receive results from a 360/370 batch processor. Support 2780's and 3780's as remote job entry stations. Support DEC built remote job entry stations. Provide support facilities in GALAXY to implement these features which includes improved scheduling mechanisms and a new operator interface.

Product Strategy:

This will support the IBM co-existence philosophy.

Competitive Products:

<u>Proposed Schedule:</u>	<u>Plan/Spec</u>	<u>Code Freeze</u>				<u>Announce</u>	<u>Release</u>		<u>FCS</u>			
	<u>Q2'78</u>	<u>Q1'79</u>					<u>Q2'79</u>	<u>Q3'79</u>		<u>Q3'79</u>		
<u>Proposed Budget:</u>	FY78	4	3	3	2	FY79	2	2	0	0	DEV	
		0	0	0	0		0	0	0	0	0	SQM
		2	2	2	2		2	2	0	0	0	DOC

Product Cost Goals & Proposed Pricing:

Major Risks:

Customer will perceive difference between DAS-60 and DECNET commands in GALAXY.
 Dependent upon timelines of Phase III protocols.

Product Designation GALAXY-20/10 Date 6/14/77 Rev. LHC
 Product Family Batch System Planned (X) Committed ()
 System(s) DECsystem-20/10 Priority 3-2
 Product MGR David Kiarsis Engineering MGR/Super. Turley/Oxley

Product Description: GALAXY Release 5

Provide a mountable device allocation facility that will effectively manage the resources of the system. This facility will provide automatic scheduling of the system resources and the jobs requiring those resources so as to minimize human interaction and resource conflicts.

Product Strategy:

This product will allow the batch system to achieve higher batch thruput and ease of operation by having the system resolve a larger amount of conflicts. This facility provides greater functionality to the customer and reduces the time that it takes to accomplish production batch runs.

Competitive Products:

Our current batch subsystem is behind the industry in these areas. In order to provide a competitive product, we must expand the capabilities in these areas.

<u>Proposed Schedule:</u>	<u>Plan/Spec</u>	<u>Code Freeze</u>				<u>Announce</u>	<u>Release</u>	<u>FCS</u>			
		<u>Des.</u>	<u>Comp.</u>								
	<u>Q2'78</u>	<u>Q2'79</u>			<u>Q3'79</u>	<u>Q4'79</u>	<u>Q4</u>	<u>FY'79</u>			
<u>Proposed Budget:</u>	FY78	0	1	1	2	FY79	2	2	4	4	DEV
		0	0	0	0		0	0	0	SQM	
		0	0	0	0		0	0	1	1	DOC

Product Cost Goals & Proposed Pricing:

Major Risks:

University of Oslo (MDA commitment)

ABEL

LCG Development Beige Book
Family Plan Summary

Product Family BASIC Date 6/1/77 Rev. ---

Product Manager John Xenakis Engineering MGR./Super. Abel/Keller

Strategy/Goals summary:

Provide backup for product support and maintenance releases. Slowly correct V1 deficiencies encountered.

Major Risks:

Not enough resource to do all that is required.

C= committed
*P= planned

8- Quarter Product Plan/Budget Summary

Product C/P System(s)	FY78	FY79	FY78				FY79				Prior
	Budget	Budget	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
1. Maintenance release. 1A			P2	P3	P4				P4		
2. Maintenance release 1B						P1	P2	P3	P4,5		
3.											
4.											
5.											
6.											
	47.93										

LEGEND: 1 PLAN/FUNC. SPEC. 2 CODE FREEZE/DESIGN COMP. 3 ANNOUNCE 4 MFG/SDC REL. 5 PLS

Note: At A minimum, (1) (3) (5) must be estimated. Add as many milestones as practical for committed products.

Planned dates are provided for budget and planning purposes internal to DEC and not for general announcement or establishing customer commitments.

Product Designation	BASIC	Date	6/1/77	Rev.	
Product Family	BASIC	Planned (X)		Committed ()	
System(s)	20 Only	Priority			
Product MGR	John Xenakis	Engineering MGR/Super.	Abel/Keller		

Product Description:

1. Maintenance release.
2. REL files.
3. Eliminate minor incompatibilities with 11 implementation.
4. Performance improvements.

Product Strategy:

Provide backup for product support and maintenance releases. Slowly current V1 deficiencies and evolve the product.

Competitive Products:

BASIC-PLUS.

Proposed Schedule:	Plan/Spec	Code Freeze	Announce	Release	FCS
	Q1/78	Des. Comp.	Q2/78	Q3/78	Q3FY78
Proposed Budget:	FY78	I I I I	FY79	I I I I	

Product Cost Goals & Proposed Pricing:

Major Risks:

LCG Development Beige Book
Family Plan Summary

Product Family Transaction Processing Date 6/1/77 Rev. LHC

Product Manager John Haldeman Engineering MGR./Super. Abel/Talmadge

Strategy/Goals summary:

Provide a high quality transaction processing capability on the DECsystem-10 and DECsystem-20. Traffic-20 is an interim product to satisfy the immediate needs for TP-like applications. TPS-20 should do away with Traffic-20 because TPS-20 will provide greater functionality and higher performance.

Major Risks:

DEC has limited experience in commercial TP applications.
TPS V1 - will not ship on target (6/78)

C= committed
*P= planned

8- Quarter Product Plan/Budget Summary

Product C/P System(s)	FY78	FY79	FY78				FY79				Prior
	Budget	Budget	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
1. TPS-20 V1	209.77	144.1		P1		P2	P3	P4,5			2-5
2. TPS-20 V2		98.3									5-1
3. MCS-10 V2	5.77										0-11
4.											
5.											
6.											
	215.54	242.4									

LEGEND: 1 PLAN/FUNC.SPEC. 2 CODE FREEZE/DESIGN COMP. 3 ANNOUNCE 4 MFG/SDC REL. 5 FCS

Note: At A minimum, (1) (3) (5) must be estimated. Add as many milestones as practical for committed products.

*Planned dates are provided for budget and planning purposes internal to DEC and not for general announcement or establishing customer commitments.

Product Designation TPS-20 V1 Date 6/1/77 Rev. LHC
 Product Family _____ Planned () Committed ()
 System(s) DECsystem-20 Priority 2-5
 Product MGR John Haldeman Engineering MGR/Super. Abel/Talmadge

Product Description:

TPS-20 Release 1

- . Forms filling on DN20:VT62 and LA36 (see Comm/Nets and TOPS-20 Release 4.0)
- . Forms definition language
- . Data base integrity
- . Basic queuing and journaling
- . Error recovery - detection, notification and correction
- . Cobol interface

Product Strategy:

Have only "1" TPS product on -20.
 Eliminate sales of interim TP product (Traffic-20) by providing greater functionality and performance.
 Maintain upgrades compatibility of user program interfaces and TP user terminal displays in later releases of TPS-20.

Competitive Products:

CICS - IBM
 ENVIRON I - CINCOM
 TASK MASTER - TURN KEY SYSTEMS, INC.
 TP 2,000 - MRI
 SHADOW II - CULLINANE CORP.

<u>Proposed Schedule:</u>	<u>Plan/Spec</u>	<u>Code Freeze</u>				<u>Announce</u>	<u>Release</u>	<u>FCS</u>			
		<u>Des. Comp.</u>						<u>Q1/79</u>	<u>Q2/79</u>	<u>Q2 '79</u>	
		<u>Q2/78</u>	<u>Q4/78</u>								
<u>Proposed Budget:</u>	FY78	2.5	3	3	3	FY79	3	3	0	0	DEV
		0	0	1	1		1	1	0	0	SQM
		1	1	1	1		1	1	0	0	DOC

Product Cost Goals & Proposed Pricing:

Major Risks:

Does not meet Marketing requirements for FCS date.
 No Application Design manual.
 Very minimal performance testing.

Product Designation TPS-20 V2 Date 6/1/77 Rev. LHC
 Product Family _____ Planned (X) _____ Committed () _____
 System(s) DECsystem-20 Priority 5-1
 Product MGR John Haldeman Engineering MGR/Super. Abel/Talmadge

Product Description: TPS-20 Version 2

- Forms filling on remote concentrator
- Increased performance
- Integrated network and shared data file recovery
- Future terminals

Product Strategy:

Competitive Products:

<u>Proposed Schedule:</u>	<u>Plan/Spec</u>	<u>Code Freeze</u>				<u>Announce</u>	<u>Release</u>	<u>FCS</u>			
		<u>Des.</u>	<u>Comp.</u>					<u>to be</u>	<u>establishe</u>		
	<u>Q3/79</u>										
<u>Proposed Budget:</u>	FY78	0	0	0	0	FY79	0	0	3	3	DEV
		0	0	0	0		0	0	1	1	SQM
		0	0	0	0		0	0	1	1	DOC

Product Cost Goals & Proposed Pricing:

Major Risks:

Product Designation MCS-10 V2 Date 6/1/77 Rev. LHC
Product Family _____ Planned () Committed (X)
System(s) DECsystem-10 Priority 0-11
Product MGR John Haldeman Engineering MGR/Super. Abel/Talmadge

Product Description: MCS-10 Release 2

- . Selective failsofting
- . Task scheduling improvements
- . Recovery from Dial-up line and Network failures

Product Strategy:

Stabilize product

Competitive Products:

<u>Proposed Schedule:</u>	<u>Plan/Spec</u>	<u>Code Freeze</u>				<u>Announce</u>	<u>Release</u>	<u>FCS</u>				
		<u>Des.</u>	<u>Comp.</u>									
<u>Proposed Budget:</u>	FY78	.5	0	0	0	FY79	0	0	0	0	DEV	
		0	0	0	0		0	0	0	SQM		
		0	0	0	0		0	0	0	DOC		

Product Cost Goals & Proposed Pricing:

Major Risks:

LCG Development Beige Book
Family Plan Summary

Product Family Data Management Date 6/1/77 Rev. LHC

Product Manager John Haldeman Engineering MGR./Super. Abel/Tolman

Strategy/Goals summary: Provide a data management facility on the DECSYSTEM-10 and DECSYSTEM-20 which includes record oriented file management (RMS, 20 only), data management and information retrieval system (IQL) and a data base management system (DBMS).

Major Risks:

No IQL documentation; SQM (test development) not provided: transparent file access (for networks), journaling and recovery for TPS, RMS, DBMS, COBOL-79.

C= committed
*P= planned

8- Quarter Product Plan/Budget Summary

Product C/P System(s)	FY78	FY79	FY78				FY79				Prior.
	Budget	Budget	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
1. RMS	69.58	148.0	C1						P2**		3-16
2. DBMS-71 V6	91.46		P1	P2	P3	P4,5					3-5
3. DBMS-79		100.8							P2**		3-20
4.											
5.											
6.											
	161.04	248.8	* correlates with release of COBOL68, ** ships with COBOL-79								

LEGEND: PLAN/FUNC.SPEC. CODE FREEZE/DESIGN COMP. ANNOUNCE MFG/SDC REL. F.C.

1	2	3	4	5
---	---	---	---	---

Note: At A minimum, (1) (3) (5) must be estimated. Add as many milestones as practical for committed products.

Planned dates are provided for budget and planning purposes internal to DEC and not for general announcement or establishing customer commitments.

Product Designation	RMS V3	Date	6/1/77	Rev.	LHC
Product Family		Planned (X)		Committed ()	
System(s)	DEC-20	Priority	3-16		
Product MGR	John Haldeman	Engineering MGR/Super.	Abel/Tolman		

Product Description:

- Access methods and sequential, relative, ISAM multi-key
- ANSI/IBM tape handling (labels, etc.)
- Simultaneous update
- Utilities: display, create, statistics

Product Strategy:

Will be released as part of COBOL-79.

Competitive Products:

Proposed Schedule:	Plan/Spec	Code Freeze			
		Des. Comp.	Announce	Release	FCS
	Q4/77	Q3/79		Q1/80	Q1/80
Proposed Budget:	FY78		1		
		1	1	1	1
		FY79	1	1	1
			1	1	1

Product Cost Goals & Proposed Pricing:

Major Risks:

		(71 CODASYL Compatible)	
Product Designation	DBMS-10-20 V6	Date	6/1/77 Rev. LHC
Product Family		Planned (x)	Committed ()
System(s)	DEC-10/20	Priority	3-5
Product MGR	John Haldeman	Engineering	MGR/Super. Abel/Tolman

Product Description:

- Performance improvements
eliminate unnecessary enqueueing
shared file pages
- Additional functionality
sorted find statement, enqueue at an "area" level
- d/b restructuring utility
restructure d/b from old schema layout to new schema layout

Product Strategy:

Stablize the product and improve performance.

Competitive Products:

<u>Proposed Schedule:</u>	<u>Plan/Spec</u>	<u>Code Freeze</u>				<u>Announce</u>	<u>Release</u>	<u>FCS</u>	
		<u>Des.</u>	<u>Comp.</u>						
	<u>Q1/78</u>	<u>Q2/78</u>	<u>Q3/78</u>	<u>Q4/78</u>	<u>Q4/78</u>				
<u>Proposed Budget:</u>	FY78	1	1	1	1	FY79			DEV
		1	1	1	1				SQM
								DOC	

Product Cost Goals & Proposed Pricing:

Major Risks:

Product Designation DBMS-79 V1 Date 6/1/77 Rev. LHC
 Product Family Languages Planned () Committed ()
 System(s) DEC-20 Priority 3-20
 Product MGR John Haldeman Engineering MGR/Super.

Product Description:

- Syntax conforming to DEC DBMS Standard
- COBOL-79 Interface
- Must run in Model A Machine
- Ability to run in non zero section of Model B Machines

Product Strategy:

Provide the high end corporate/CODASYL compatible DBMS product and interface it to COBOL-79

Competitive Products:

Proposed Schedule: Plan/Spec Code Freeze Announce Release FCS
Des. Comp. Q1 79 Q1/80 Q1/80

<u>Proposed Budget:</u>	FY78	FY79				FY80				
						1	1	1	1	DE
										SQ
						1	1	1	1	DO

Product Cost Goals & Proposed Pricing:

Major Risks:

LCG Development Beige Book
Family Plan Summary

Product Family FORTTRAN Date 6/1/77 Rev. LHC

Product Manager John Xenakis Engineering MGR./Super. Abel/Keller

Strategy/Goals summary:

- (1) -20 Native Mode FOROTS.
- (2) Forots performance and reliability.
- (3) US Navy Validations.
- (4) V5A Maintenance Release.

Major Risks:

Sudden need for ANS-77.

C= committed
*P= planned

8- Quarter Product Plan/Budget Summary

Product C/P System(s)	FY78	FY79	FY78				FY79				Price
	Budget	Budget	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
1. FOROTS Performance					P1		P2	P3	P4,5		3-4
2. 20 native mode					P1		P2	P3	P4,5		3-4
3. V5A Maintenance & Navy Validation			P1	P2,3	P4,5						3-4
4.											
5.											
6.											
	116.72	134.8									

LEGEND: PLAN/FUNC.SPEC. CODE FREEZE/DESIGN COMP. ANNOUNCE MFG/SDC REL. PLS

1	2	3	4	5
---	---	---	---	---

Note: At A minimum, (1) (3) (5) must be estimated. Add as many milestones as practical for committed products.

Planned dates are provided for budget and planning purposes internal to DEC and not for general announcement or establishing customer commitments.

Product Designation FORTRAN Date 6/1/77 Rev. LHC
 Product Family Languages Planned () Committed ()
 System(s) Priority 3-4
 Product MGR John Xenakis Engineering MGR/Super. Abel/Tolman

Product Description:

- (1) -20 Native Mode FOROTS.
- (2) Forots performance and reliability.
- (3) US Navy Validations.
- (4) V5A Maintenances releases.

Product Strategy:

Implement engineering five year plan as documented in the ESG long range plan.

Competitive Products:

IBM FORTRAN-H, UNIVAC, CDC.

Proposed Schedule: Plan/Spec Code Freeze Announce Release FCS
Des. Comp. Q3/78 Q1/79 Q2/79 Q3/79 Q3/79

<u>Proposed Budget:</u>	FY78				FY79				DE
	2	2	2	2	2	2	2	2	
			1	1	1		1	1	CG
									DC

Product Cost Goals & Proposed Pricing:

Need input from Product Manager.

Major Risks:

Sudden need for ANS-77.

ICG Development Beige Book
Family Plan Summary

Product Family OTS-20 Date 6/1/77 Rev. LHC

Product Manager John Xenakis Engineering MGR./Super. Abel/Tolman

Strategy/Goals summary:

Provide a mechanism to facilitate coherent co-existence of all 20 non-monitor systems software. This includes all languages, RMS-20 and TPS. Provide user transparent transition to the use of multiple sections and user transparent upward compatibility of OTS releases.

Major Risks:

Delay will impact RMS-20, BASIC, COBOL-79 and FORTRAN.
If OTS-20 is not done, an OTS function will have to be replicated in all language and data management projects.

8- Quarter Product Plan/Budget Summary

C= committed
*P= planned

Product C/P System(s)	FY78 Budget	FY79 Budget	FY78				FY79				Prior
			Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
1. Base Version			P1	P2					P5*		1-18
2. Debugger (COBOL-79) Not a product						P1				P2**	1-18
3.											
4.											
5.											
6.											
	40.26	47.2									

** With COBOL-79
* With FORTRAN BASIC
V2 RMS

LEGEND: PLAN/FUNC.SPEC. CODE FREEZE/DESIGN COMP. ANNOUNCE MFG/SDC REL. FCS

1	2	3	4	5
---	---	---	---	---

Note: At A minimum, (1) (3) (5) must be estimated. Add as many milestones as practical for committed products.

*Planned dates are provided for budget and planning purposes internal to DEC and not for general announcement or establishing customer commitments.

Product Designation	OTS-20	Date	6/1/77	Rev.	LHC
Product Family	Languages	Planned (X)	Committed ()		
System(s)	DECsystem-20	Priority	1-18		
Product MGR	John Xenakis	Engineering MGR/Super.	Abel/Tolman		

Product Description: An object time system kernel for the -20 that performs all functions requiring coordination across languages and object time systems. This includes OTS management, core management, interrupt handling, section management, etc., and allows object programs composed of more than one language. OTS-20 will also provide utility functions such as error message building. The design will also facilitate extension of languages to use sections.

Product Strategy:

Provide a mechanism to facilitate coherent coexistence of all -20 non-monitor systems software. This includes all languages, RMS-20, TPS-20, etc.

Competitive Products:

N/A

Proposed Schedule:	Plan/Spec	Code Freeze				Announce	Release	FCS			
	Q4/77	Des.	Comp.	Q2/78	Q2/79						
Proposed Budget:	FY78	1	1	1	1	FY79	1	1	1	1	DEV
											SQM
											DOC

Product Cost Goals & Proposed Pricing:

Product not separately priced.

Major Risks:

LCG Development Beige Book
Family Plan Summary

Product Family MACRO/LINK Date 6/1/77 Rev. LHC

Product Manager John Xenakis Engineering MGR./Super. Abel/Keller

Strategy/Goals summary:

Provide fundamental tools required for monitor and language development.

Major Risks: Products which depend on this product will not be able to complete unless this project is accomplished. These products include BLISS-36 and COBOL-79 which are dependent on the PSECT capability of LINK to be able to process their output which is required for more efficient use of virtual memory. TOPS-20 Rel 3 is also dependent the PSECT capability of both MACRO and LINK.

8- Quarter Product Plan/Budget Summary

C= committed
*P= planned

Product C/P System(s)	FY78	FY79	FY78				FY79				Prior
	Budget	Budget	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
1. LINK V4				C5							1-15
2. LINK V5				P1				P2	P5		1-15
3. MACRO V53				C5							1-14
4.											
5.											
6.											
	68.30	108.15									

LEGEND: PLAN/FUNC.SPEC. CODE FREEZE/DESIGN COMP. ANNOUNCE MFG/SDC REL. FCS

1	2	3	4	5
---	---	---	---	---

Note: At A minimum, (1) (3) (5) must be estimated. Add as many milestones as practical for committed products.

*Planned dates are provided for budget and planning purposes internal to DEC and not for general announcement or establishing customer commitments.

Product Designation	LINK V4	Date	6/1/77	Rev.	LHC
Product Family	Languages	Planned ()	Committed (X)		
System(s)	10-20	Priority	1-15		
Product MGR	John Xenakis	Engineering MGR/Super.	Abel/Keller		

Product Description:

- (1) EXE Files
- (2) PSECTS
- (3) Essential for Release TOPS-20

Product Strategy:

Bring product up to level of PDP-11/VAX task builder.
Provide support required by compilers (COBOL-79).

Competitive Products:

<u>Proposed Schedule:</u>	<u>Plan/Spec</u>	<u>Code Freeze</u>	<u>Announce</u>	<u>Release</u>	<u>FCS</u>
	04/77	Des. Comp. 04/77	none	Q2/78	Q2FY78

<u>Proposed Budget:</u>	FY78	.75	.75	.75	.75	FY79					DE
		.5	.5								SQ
											DC

Product Cost Goals & Proposed Pricing:

Free

Major Risks:

Product Designation	LINK V5	Date	6/1/77	Rev.	LHC
Product Family	Languages	Planned (X)	Committed ()		
System(s)	10-20	Priority	1-15		
Product MGR	John Xenakis	Engineering MGR/Super.	Abel/Keller		

Product Description:

- (1) Argument type checking
- (2) Extended addressing support
- (3) Compiler generated PSECTS
- (4) Essential features for COBOL-79 rel files

Product Strategy:

Provide facilities necessary for the support of BLISS-36, and compiler generated code.

Competitive Products:

N/A

Proposed Schedule:	Plan/Spec	Code Freeze				Announce	Release	FCS			
	Q2/78	Des. Comp.	Q3/79		Q4/79						
Proposed Budget:	FY78	.5	.5	.5	.5	FY79	1.5	1.5	1.5	1.5	DE
									.5	.5	SQ
											DO

Product Cost Goals & Proposed Pricing:

Major Risks:

Product Designation	MACRO V53	Date	6/1/77	Rev.	LHC
Product Family	Languages	Planned ()	Committed (X)		
System(s)	10,20	Priority		1-14	
Product MGR	John Xenakis	Engineering MGR/Super.	Abel/Keller		

Product Description:

Add PSECTS.

Product Strategy:

Minor future enhancements to provide MACRO support for extended addressing.

Competitive Products:

<u>Proposed Schedule:</u>	<u>Plan/Spec</u>	<u>Code Freeze</u>				<u>Announce</u>	<u>Release</u>	<u>FCS</u>		
		<u>Des.</u>	<u>Comp.</u>							
									Q2FY78	
<u>Proposed Budget:</u>	FY78	.25	.25	.25	.25	FY79				DEV
										DOC

Product Cost Goals & Proposed Pricing:

Free.

Major Risks:

LCG Development Beige Book
Family Plan Summary

Product Family Language Microcode Date 6/1/77 Rev. -- LHC

Product Manager John Xenakis Engineering MGR./Super. Abel/Keller

Strategy/Goals summary:

Improve existing microcode for performance improvement gains in COBOL-68. Add extended range exponents double precision numbers. Add microcode instructions to enhance COBOL-79 performance. Simulate and test the microcode. Provide for use of extended range exponent in ALGOL and FORTRAN

Major Risks:

C= committed
*P= planned

8- Quarter Product Plan/Budget Summary

Product C/P System(s)	FY78	FY79	FY78				FY79				Prior
	Budget	Budget	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
1. Hardware microcode for COBOL-68, COBOL-79	51.29		P1	P2	*						
2. Test and simulation for COBOL-68-COBOL-79	15.31		P1	P2	*						
3. FORTRAN extended exponent		74.15								P1	
4. ALGOL extended exponent		38.0								P1	
5. Outside library for ALGOL + FORTRAN		200K									
6.											
	66.6	312.15	* Not a product. No 3-5.								

LEGEND: 1 PLAN/FUNC.SPEC. 2 CODE FREEZE/DESIGN COMP. 3 ANNOUNCE 4 MFG/SDC REL. 5 FCS

Note: At A minimum, (1) (3) (5) must be estimated. Add as many milestones as practical for committed products.

Planned dates are provided for budget and planning purposes internal to DEC and not for general announcement or establishing customer commitments.

Product Designation Microcode test & Date 6/1/77 Rev. LHC(2)
 Product Family Languages Simulation Planned (X) Committed ()
 System(s) 20 Priority
 Product MGR John Xenakis Engineering MGR/Super. Abel/Tolman

Product Description:

Simulate and test microcode.

Product Strategy:

Provide simulators and tests for micro code:

- 1) improvements added for COBOL-68
- 2) new commercial instructions for COBOL-79

Competitive Products:

Proposed Schedule: Plan/Spec Code Freeze Announce Release FCS
Des. Comp.
Q1/78 Q2/78 none none none

Proposed Budget:	FY78	FY79				DE
	.5	.5	.5	.5		SQ
						DO

Product Cost Goals & Proposed Pricing:

Major Risks:

Lack of Model B hardware accessible by languages group.

Product Designation	Extended Exponent	Date	6/1/77	Rev.	LHC
Product Family	Languages (FORTRAN)	Planned (x)		Committed ()	
System(s)	20 Model B only	Priority	3-4		
Product MGR	John Xenakis	Engineering	MGR/Super.		Abel/Keller

Product Description:

Extended exponent support in:

- FORTRAN Compiler
- FORTRAN OTS
- FORTRAN Mathematical Library

Product Strategy:

Provide a FORTRAN compiler and object time system that supports the extended range exponent. Contract for rewrite of the mathematical library to an outside vendor.

Competitive Products:

UNIVAC 1108, 1110. DEC has smallest exponent range in the industry.

<u>Proposed Schedule:</u>	<u>Plan/Spec</u>	<u>Code Freeze</u>	<u>Announce</u>	<u>Release</u>	<u>FCS</u>
		<u>Des. Comp.</u>			
	Q1/79	Q2/80		Q4/80	Q1/81

<u>Proposed Budget:</u>	FY78											
								1	1	1	1	DE
									1	.5	.5	.5
												DO

Product Cost Goals & Proposed Pricing:

Major Risks:

LCG Development Beige Book
Family Plan Summary

Product Family ALGOL Date 6/1/77 Rev. -- LHC

Product Manager John Xenakis Engineering MGR./Super. Abel/Skinner

Strategy/Goals summary: Stabilize the product providing no further enhancements other than the addition in FY79 of extended range exponent. Maintain the product with minimal effort.

Major Risks:

C= committed
*P= planned

8- Quarter Product Plan/Budget Summary

Product C/P System(s)	FY78	FY79	FY78				FY79				Priority
	Budget	Budget	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
1. Maintenance Releases			P2	P3	P4,5						
2.											
3.											
4.											
5.											
6.											
	38,0	38.0									

LEGEND: PLAN/FUNC.SPEC. CODE FREEZE/DESIGN COMP. ANNOUNCE MFG/SDC REL. FCS

1	2	3	4	5
---	---	---	---	---

Note: At A minimum, (1) (3) (5) must be estimated. Add as many milestones as practical for committed products.

Planned dates are provided for budget and planning purposes internal to DEC and not for general announcement or establishing customer commitments.

Product Designation	ALGOL	Date	6/1/77	Rev.	LHC
Product Family	Languages	Planned (x)	Committed ()		
System(s)	10, 20	Priority			
Product MGR	John Xenakis	Engineering MGR/Super.	Abel/Skinner		

Product Description:

Maintain the product providing tested maintenance releases as required.

Product Strategy:

Stabilize the product providing no further enhancements other than the addition in FY79 of extended range exponent. Maintain the product with minimal effort.

Competitive Products:

<u>Proposed Schedule:</u>	<u>Plan/Spec</u>	<u>Code Freeze</u>				<u>Announce</u>	<u>Release</u>	<u>FCS</u>			
		<u>Des.</u>	<u>Comp.</u>								
	Q1/78	Q1/78				Q3/78	Q3/78				
<u>Proposed Budget:</u>	FY78	I	I	I	I	FY79	.25	.25	.25	.25	DE SQ DO

Product Cost Goals & Proposed Pricing:

Major Risks:

LCG Development Beige Book
Family Plan Summary

Product Family Commercial Date: 6/1/77 Rev. LHC
Compilers

Product Manager John Xenakis Engineering MGR./Super. Abel/Tolman

Strategy/Goals summary:

Provide short range COBOL-68 performance improvements to solve 20
send back problems. Provide a COBOL-74 product. Provide a high
performance COBOL product for the 20.

Major Risks:

C= committed
*P= planned

8- Quarter Product Plan/Budget Summary

Product C/P System(s)	FY78		FY78				FY79				Priority
	Budget	Budget	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
1. COBOL 68, 74, SORT performance	204.52		C1	C2	C4,5						1-12
2. COBOL-79	253.28	234.90					P1	P2			3-10
3. Commercial Conversion		47.2					P1	P2			3-17
4. Commercial performance analysis	40.28	47.2									
5.											
6.											
	498.08	329.30									

LEGEND: ▽ PLAN/FUNC. SPEC. ▽ CODE FREEZE/DESIGN COMP. ▽ ANNOUNCE ▽ MFG/SDC REL. ▽ FCS
1 2 3 4 5

Note: At A minimum, (1) (3) (5) must be estimated. Add as many milestones as practical for committed products.

Planned dates are provided for budget and planning purposes internal to DEC and not for general announcement or establishing customer commitments.

Product Designation	COBOL-68 V12	Date	6/1/77	Rev.	LHC
Product Family	Languages	Planned ()	Committed (X)		
System(s)	-10, -20	Priority	1-12		
Product MGR	John Xenakis	Engineering	MGR/Super.	Abel/Tolman	

Product Description:

- 1) Combine COBOL-68 Cobol 74 sources.
- 2) Make COBOL-74 product.
- 3) performance improvements for COBOL and SORT.

COBOL-68 }
COBOL-74 } included
SORT-V4 }

Product Strategy:

Improve performance and stabilize. Support until 1982. On the 20 support COBOL-68 for one year after release of COBOL-79.

Competitive Products:

All competitors have a faster COBOL. General customer performance dissatisfaction.

Proposed Schedule:	Plan/Spec	Code Freeze				Announce	Release	FCS	
		Des.	Comp.						
	Q4/77	Q2/78	none	Q3/78	Q3 FY78				
Proposed Budget:	FY78	5	4	4	1	FY79			DEV
		1	1	1	0				SQM
		1.5	1.5	1	0				DOC

Product Cost Goals & Proposed Pricing:

\$2000 price increase for performing version.

Major Risks:

Product Designation	COBOL-79	Date	6/1/77	Rev.	LHC
Product Family		Planned (X)		Committed ()	
System(s)	-20	Priority	3-10		
Product MGR	John Xenakis	Engineering MGR/Super.		Abel/Tolman	

Product Description:

- high performance, twice that of the current compiler (COBOL V11)
- support for DBMS, SORT
- functional superset of COBOL-74/20
- TPS-20 interface

Product Strategy:

A high performance COBOL compiler targeted towards the next ANS COBOL Standard (expected in 1979).

Competitive Products:

No other vendors are known to be working on an equivalent compiler, however ANS-74 compilers are expected to close to a strict subset of the next standard. D.G., PDP, IBM (soon).

Proposed Schedule:	Plan/Spec	Code Freeze				Announce	Release	FCS			
	Now	7/78						Q1/80			
Proposed Budget:	FY78	4	4	4	4	FY79	3	3	3	3	DE
					1		.5	.5	.5	.5	SG
				1	2		2	2	1	1	DO

Product Cost Goals & Proposed Pricing:

Major Risks:

- (1) Transportability to VAX
- (2) VAX funding loss
- (3) BLISS project failure

Product Designation Commercial Conversion Date 6/1/77 Rev. LHC
 Product Family Languages Planned (X) Committed ()
 System(s) Priority 3-17
 Product MGR John Xenakis Engineering MGR/Super. Abel/Tolman

Product Description:

Utility programs for automated translation of COBOL-68 and COBOL-74 program and data files.

Product Strategy:

Essential for smooth transition to new COBOL product.

Competitive Products:

NONE.

Proposed Schedule: Plan/Spec Code Freeze Des. Comp. Announce Release FCS
Q1/79 Q1/80

<u>Proposed Budget:</u>	FY78					FY79	1	1	1	1	DEV SQM DOC

Product Cost Goals & Proposed Pricing:

Major Risks:

Required documentation (1 person, Q3, Q4, 79) cannot be covered in Level Plan.

Product Designation Commercial Perf. Analysis Date 6/1/77 -- Rev. LHC
 Product Family Commercial Languages Planned (X) Committed ()
 System(s) 10, 20 Priority
 Product MGR Xenakis/Haldeman Engineering MGR/Super. Abel/Tolman

Product Description:

Provide performance analysis for commercial software products including COBOL-68, COBOL-79, SORT, DBMS, RMS, Journaling and recovery to ensure that future performance problems will not exist.

Product Strategy:

Competitive Products:

Proposed Schedule: Plan/Spec Code Freeze Des. Comp. Announce Release FCS not a product
Q1/78

Proposed Budget:	FY78	1	1	1	1	FY79	1	1	1	1	DE
											DO

Product Cost Goals & Proposed Pricing:

Major Risks:

LCG Development Beige Book
Family Plan Summary

Product Family APL-10/20 Date 6/1/77 Rev. -LHC

Product Manager John Xenakis Engineering MGR./Super. Abel/ Keller

Strategy/Goals summary:

Provide flexibility to potentially add small features as required for special sales.

Major Risks:

C= committed
*P= planned

8- Quarter Product Plan/Budget Summary

Product C/P System(s)	FY78	FY79	FY78				FY79				Prior
	Budget	Budget	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
1.			P1	P2	P3	P4;5					
2.											
3.											
4.											
5.											
6.											
	40.26										

LEGEND: PLAN/FUNC.SPEC. CODE FREEZE/DESIGN COMP. ANNOUNCE MFG/SDC REL. PUS

1	2	3	4	5
---	---	---	---	---

Note: At A minimum, (1) (3) (5) must be estimated. Add as many milestones as practical for committed products.

Planned dates are provided for budget and planning purposes internal to DEC and not for general announcement or establishing customer commitments.

Product Designation	APL-10/20	Date	6/1/77	Rev.	LHC
Product Family	Languages	Planned (X)	Committed ()		
System(s)	10/20	Priority			
Product MGR	John Xenakis	Engineering	MGR/Super.	Abel/Keller	

Product Description:

Minor enhancements as required by special sales.
Backup for lack of planned support.

Product Strategy:

Potentially add small features as required for special sales.

Competitive Products:

Proposed Schedule:	Plan/Spec	Code Freeze				Announce	Release	FCS
		Des.	Comp.					
	Q1/78	Q2/78	Q3/78	Q4/78	Q4/78			
Proposed Budget:		1	1	1	1			DE
Funded in Europe	FY78					FY79		SG
								DO

Product Cost Goals & Proposed Pricing:

Major Risks:

HOWELL

LCG Development Beige Book
Family Plan Summary

Product Family COMM/NETS Date 1 JUN 77 Rev. LHC

Product Manager Kiarsis Engineering MGR./Super. Howell/Meidell

Strategy/Goals summary:

1. DEC10 COMM: Finish outstanding customer commitments.
2. DEC20 COMM: Provide DECNET to TOPS-20 customer.
3. KL Front End:

Major Risks:

KL Front Ends: No FY79 resource to support 11/34 FE.

Any slip in sched-1e in FY78 will affect resource available to following projects.

8- Quarter Product Plan/Budget Summary

C= committed
*P= planned

Product C/P System(s)	FY78	FY79	FY78				FY79				Priori
	Budget	Budget	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
1. DEC10 COMM 6.03A	81.5	0	C1	C2	C3,4,5						
2. DEC10 COMM 6.04*	19.4	0			P1	P2,3,4	P5				
3. DEC10 COMM 4.0	0	40.8					P1				
4. DEC20 COMM 3.0	102.5	0	C1,2	C3,4,5	C5						
5. DEC20 COMM 4.0	102.7	0	P1			P2	P3,4,5	P5			
6. DEC20 COMM 5.0	0	106.1				P1	P2	P3,4,5	P5		
7. DEC20 COMM 6.0	0	41.6					P1				
8. KLEE KLINIK	0	0	C5								
9. KLEE RP-MOS	0	40.8		P1	P2,3,4	P5					

LEGEND: PLAN/FUNC.SPEC. CODE FREEZE/DESIGN COMP. ANNOUNCE MFG/SDC REL. FCS

1	2	3	4	5
---	---	---	---	---

Note: At A minimum, (1) (3) (5) must be estimated. Add as many milestones as practical for committed products.

Planned dates are provided for budget and planning purposes internal to DEC and not for general announcement or establishing customer commitments.

Product Designation	DEC 10 COMM 603A	Date	1 JIN 77	Rev.	LHC
Product Family	COMM/NETS	Planned ()	Committed (X)		
System(s)	10	Priority			
Product MGR	Kiarsis	Engineering	MGR/Super.	Howell/Meidell	

Product Description: DN87/87S support available with TOPS-10 V. 6.03A

1. DECnet compatible port supporting task-to-task communication with any system using DECNET phase II protocols.
2. RDX enhancements for point-to-point, dial and leased; network multipathing support, and simultaneous dial capability.

Product Strategy:

Finish customer commitments for DEC-10 COMM.

Competitive Products:

<u>Proposed Schedule:</u>	<u>Plan/Spec</u>	<u>Code Freeze</u>		<u>Announce</u>	<u>Release</u>	<u>FCS</u>
		<u>Des. Comp.</u>				
	Q1 '78	Q2 '78	Q3 '78	Q3 '78	Q3 '78	

<u>Proposed Budget:</u>	FY78	2	2		FY79					DEV
										SQM
		1	1							DOC

Product Cost Goals & Proposed Pricing:

Major Risks:

Product Designation DEC10 COMM 604 Date 1 JUN 77 Rev.
 Product Family COMM/NETS Planned () Committed (X)
 System(s) 10 Priority
 Product MGR Kiarsis Engineering MGR/Super. Howell/Meidell

Product Description:

- . Continued engineering support of the ANF10 Network Products through 6.04 including SMP.
- . Integrate software developed for 6.03/L.I.R.
- . Provide additional RAMP features.

Product Strategy:

Assure customer satisfaction with DEC10 COMM and stabilize product.

Competitive Products:

Proposed Schedule:	Plan/Spec	Code Freeze		Announce	Release	FCS	
		Des.	Comp.				
	Q3 '78	Q4 '78	Q4 '78		Q1 '79	Q1 '79	
Proposed Budget:	FY78		2	FY79	P5		DEV
			2				SQM
							DOC

Product Cost Goals & Proposed Pricing:

Major Risks:

Product Designation DEC10 COMM 4.0 Date 1 JUN 77 Rev. LHC
 Product Family COMM/NETS Planned (X) Committed ()
 System(s) 10 Priority 4-2
 Product MGR Kiarsis Engineering MGR/Super. Howell/Meidell

Product Description: DN20 support available to TOPS-10 customers with Release of TOPS-20 via Migration Strategy.

1. Provide MCB support of DN87S.

product Strategy:

Competitive Products:

Proposed Schedule: Plan/Spec Code Freeze
Des. Comp. Announce Release FCS
Q1 '79

<u>Proposed Budget:</u>	FY78	0	0	0	0	FY79	1	1	1	1	DEV SQM DOC

Product Cost Goals & Proposed Pricing:

Major Risks:

Product Designation	DEC 20 COMM 3.0	Date	1 JUN 77	Rev.	LHC
Product Family	COMM/NET	Planned ()	Committed (x)		
System(s)		Priority			
Product MGR	Kiarsis	Engineering MGR/Super.		Howell/Meidell	

Product Description: Available with TOPS-20 R. 3.0

1. DECNET/MCB capability for task-to-task communication.

Product Strategy:

Support task-to-task and provide IBM terminal support on interim basis until R. 3.1. IBM support to be provided by DAS-61 developers.

Competitive Products:

<u>Proposed Schedule:</u>	<u>Plan/Spec</u>	<u>Code Freeze</u>		<u>Announce</u>	<u>Release</u>	<u>FCS</u>
		<u>Des.</u>	<u>Comp.</u>			
	Q1 '78	Q1 '78		Q2 '78	Q3 '78	Q3 '78

<u>Proposed Budget:</u>	FY78	4	4		FY79					DEV
										SQM
		1	1							DOC

Product Cost Goals & Proposed Pricing:

Major Risks:

Product Designation DEC20 COMM 4.0 Date 1 JUN 77 Rev. _____
 Product Family Comm/NETS Planned (X) Committed ()
 System(s) _____ Priority _____
 Product MGR Kiarsis Engineering MGR/Super. Howell/Meidell

Product Description: Available with TOPS-20 R. 4.0

Termination of unit record devices (LP11, LP20, CD20) using NURD protocol.
 Termination of application terminals devices (VT52, VT62, LA36) using
 ATS protocol, TOPS-20 will use this service.
 Termination of command terminal devices (VT52) using CTS protocol.

Product Strategy:

Competitive Products:

Proposed Schedule:

Plan/Spec	Code Freeze		Announce	Release	FCS
	Des.	Comp.			
Q1 '78	Q4 '78		Q1 '79	Q2 '79	Q2 '79

Proposed Budget:

FY78	FY79		DEV	SQM	DOC
	4	4			
	1	1			

Product Cost Goals & Proposed Pricing:

Major Risks:

Product Designation DEC 20 COMM 5.0/6.0 Date 1 JUN 77 Rev. _____
 Product Family COMM/NETS Planned (X) Committed ()
 System(s) _____ Priority _____
 Product MGR Kiarsis Engineering MGR/Super. Howell/Meidell

Product Description: Available with TOPS-20 R. 5.0

The capability to operate an MCB based front end with combinations of items delineated in releases 3.0 and 4.0.

Provide DECNET support for DN98 and DN92.

product Strategy:

competitive Products:

<u>Proposed Schedule:</u>	<u>Plan/Spec</u>	<u>Code Freeze</u>				<u>Announce</u>	<u>Release</u>		<u>FCS</u>		
		<u>Des. Comp.</u>									
	<u>Q4 '78</u>	<u>Q1 '79</u>			<u>Q2 '79</u>	<u>Q3 '79</u>	<u>Q4 '79</u>				
<u>Proposed Budget:</u>	FY78				FY79	4	4	2	2	DEV	
											SQM
							1	1			

product Cost Goals & Proposed Pricing:

Major Risks:

LCG Development Beige Book
Product Summary

P.66

Product Designation	KLFE/KLINIK	Date	1 JUN 77	Rev.	LHC
Product Family	COMM/NETS	Planned ()		Committed (x)	
System(s)		Priority	1-27		
Product MGR	Kiarsis	Engineering MGR/Super.			Howell/Meidell

Product Description:

KLINIK support available prior to TOPS-10 6.03A.
KLINIK support with TOPS-20 Rel. 3.

Make software modifications to KL initialization to configure 1 port
MOS memory in the host processor.

Product Strategy:

Competitive Products:

Proposed Schedule:	Plan/Spec	Code Freeze				Announce	Release	FCS		
		Des.	Comp.							
								Q1 '78		
Proposed Budget:	FY78	1	1	1	1	FY79			DEV	
										SQM
										DOC

Product Cost Goals & Proposed Pricing:

Major Risks:

All documentation and testing to be provided by Field Service - Walter Manter.

Product Designation KLFE MOS/Support Date 1 JUN 77 Rev. LHC
 Product Family COMM/NETS Planned (x) Committed ()
 System(s) _____ Priority _____
 Product MGR _____ Engineering MGR/Super. Howell/Meidell

Product Description:

MOS memory -- Make software modifications to KL initialization to configure MOS memory in the host processor.

Product Strategy:

Competitive Products:

<u>Proposed Schedule:</u>	<u>Plan/Spec</u>	<u>Code Freeze</u>		<u>Announce</u>	<u>Release</u>	<u>FCS</u>
		<u>Des.</u>	<u>Comp.</u>			
	<u>Q2 78</u>	<u>Q3 78</u>		<u>Q3 78</u>	<u>Q4 78</u>	<u>Q4 78</u>

<u>Proposed Budget:</u>	FY78					FY79					DEV SQM DOC	

Product Cost Goals & Proposed Pricing:

Major Risks:

GLANTZ

LCG Development Beige Book
Family Plan Summary

Product Family Performance Analysis Date June 10, 1977 Rev. _____

Product Manager N/A Engineering MGR./Super. Richard Glantz

Strategy/Goals summary:

Measure and analyze the performance characteristics of software under development, using existing hardware/software tools or new ones if necessary. Continually compare development software with a base level software to give us advance warning of subtle degradation. Measure both software components and the system as a whole.

Develop rudimentary performance/configuration guidelines as a pre-sales and upgrade tool.

Major Risks:

Delays in shipment of required emulator hardware.
Senior-level analysts not on-board and not plentiful in the market-place.

C= committed
*P= planned

8- Quarter Product Plan/Budget Summary

Product C/P System(s)	FY78	FY79	FY78				FY79				Prior
	Budget	Budget	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
1. (uncommitted)											
2. Remote terminal emulator			2		4						
3.											
4.											
5.											
6.											
	40.26										

LEGEND: PLAN/FUNC. SPEC. CODE FREEZE/DESIGN COMP. ANNOUNCE MFG/SDC REL. FCS

1	2	3	4	5
---	---	---	---	---

Note: At A minimum, (1) (3) (5) must be estimated. Add as many milestones as practical for committed products.

*Planned dates are provided for budget and planning purposes internal to DEC and not for general announcement or establishing customer commitments.

Product Designation Remote Term. Emulator Date June 10, 1977 Rev. _____
 Product Family Performance Analysis Planned () Committed (x)
 System(s) DECsystem-10, DECsystem-20, Priority _____
 Product MGR TOPS-20 Engineering MGR/Super. Richard Glantz

Product Description:

Set of four independent software packages which are each able to run on the in-house 11/50. Will be able to simulate up to 128 asynchronous VT52's, 6 synchronous VT62's, (both radially-linked and multi-dropped), at line speeds up to 19.2 Kbaud full-duplex. Through a patch panel, will be able to run against a host -10 or -20.

Product Strategy:

Competitive Products:

N/A

<u>Proposed Schedule:</u>	<u>Plan/Spec</u>	<u>Code Freeze</u>				<u>Announce</u>	<u>Release</u>	<u>FCS</u>
		<u>Des. Comp.</u>						
						<u>N/A</u>	<u>1/78</u>	<u>N/A</u>
<u>Proposed Budget:</u>	FY78	1	1	1	1	FY79		
								DEV
								SQM
								DOC

Product Cost Goals & Proposed Pricing:

Major Risks:

B. LCG ADVANCED SOFTWARE ENGINEERING

T. LOFGREN

Expenses/Project (3R1)

#		Q1	Q2	Q3	Q4	FY78
1	ASG	9.3	11.2	11.3	11.4	43.2
2	DN61	2.8	3.4	3.4	3.5	13.1
3	DN62 *)	4.6	5.6	5.7	5.8	21.7
4	DN64 *)	18.6	22.4	22.6	22.8	86.4
5	DN65 *)	4.6	5.6	5.7	5.8	21.7
6	DN98	1.8	5.6	5.7	4.6	17.7
7	DX20/TU70,1,2	4.6	5.6	5.7	5.8	21.7
8	BC Tel	9.3	5.6	2.3	2.3	19.5
9	Indiana Bell	6.5	7.8	7.9	8.0	30.2
10	SNETCO	---	2.3	1.1	1.1	4.5
11	Telemed	4.6	5.6	3.4	3.4	17.0
12	Superdisk	2.8	5.6	5.7	---	14.1
13	Dutch PTT	2.8	---	---	---	2.8
14	PC20	---	3.4	5.7	2.3	11.4
15	CP20	1.8	---	---	---	1.8
16	Surplus	---	---	4.6	14.8	19.4
	Machine Time	74.1	89.7	90.8	91.6	346.2
		2.0	2.0	2.0	2.0	8.0
		76.1	91.7	92.8	93.6	354.2

*) Add Technical writer for total project cost as

#		Q1	Q2	Q3	Q4	FY78
3	DN62	---	---	6.3	6.3	12.6
4		12.0	12.5	---	---	24.5
5	DN65	---	---	6.3	6.3	12.6
		12.0	12.5	12.6	12.6	49.7

corresponding to 1 writer/Q assigned to 3R1.

Impacts/Risks/Exposures

- No ITPS support budgeted.
- The DN60 projects are budgeted for a total of four people through FY78. All requests for development, maintenance consulting, lecturing, etc, have to come out of these four programmers. In the event that one or more of the DN60 projects are cancelled that means that resources will be freed up to create more support of the remaining projects. However, some additional development from currently available bases (DN61 and DN64) is needed to keep the key people on the project. The Indiana Bell project will be based on DN60 and will be called DN63.
- CP20 will be completed and shippable in early July 1977.
- The PC20 project significantly slipped partly because of lack of manpower and partly because of change of hardware configuration for PC20.
- Dutch PTT project will be completed in June 1977. Some contingency consulting expected in July.
- No NZDOH consulting budgeted.
- The effort to upgrade the DS40/1 software for SNETCO will be delegated and is expected to be done by Lou Dimino in the FSG group. By allocating some manpower in 3R1 we can do some trading.
- Two replacement req's (for Todd and Bator) are being submitted. Without these two slots being filled, we are exposed to significant risk on the DN60 project plus the PC20 and Dual Disk (Telemed) projects will simply not be done.

Product Designation CP Software ASG Date 5/26/77 Rev. _____
Product Family _____ Planned () Committed ()
System(s) _____ Priority _____
Product MGR _____ Engineering MGR/Super. Lofgren

Product Description:

Contingency effort to meet outstanding DAS commitments, (in particular maintenance) on the following products:
DN92, DAS78, and XTCSE/LIPS11M, DN92 is expected to be the major item.

Product Strategy:

Competitive Products:

<u>Proposed Schedule:</u>	<u>Plan/Spec</u>	<u>Code Freeze</u>		<u>Announce</u>	<u>Release</u>	<u>FCS</u>
		<u>Des.</u>	<u>Comp.</u>			

<u>Proposed Budget:</u>	<u>FY 78</u>	<u>43.2</u>	<u>FY 79</u>
-------------------------	--------------	-------------	--------------

Product Cost Goals & Proposed Pricing:

Major Risks:

Access to hardware allowing reproduction of field problems is critical.

Product Designation DN61/TOPS-10 Rev. 5/26/77
Product Family _____ Planned () Committed ()
System(s) _____ Priority _____
Product MGR _____ Engineering MGR/Super. Lofgren

Product Description:

DN61 is the IBM 2780/3780 emulation and termination software on TOPS-10 6.03 and Galaxy 2. The budgetted effort is for installation support (as committed by DAS) and SPR-service

Product Strategy:

Competitive Products:

<u>Proposed Schedule:</u>	<u>Plan/Spec</u>	<u>Code Freeze</u>		<u>Announce</u>	<u>Release</u>	<u>FCS</u>
		<u>Des.</u>	<u>Comp.</u>			
						<u>7/77</u>

Proposed Budget: FY 78 13.1 FY 79 _____

Product Cost Goals & Proposed Pricing:

Major Risks:

Product Designation DN62/TOPS-10 Date 5/26/77 Rev. _____
 Product Family _____ Planned () Committed ()
 System(s) _____ Priority _____
 Product MGR _____ Engineering MGR/Super. Lofgren

Product Description:

Support of HASP multileaving plus support of IBM 2780/3780. The software will either support DL10 (DN62) or DTE (DN62S) interfaces to DEC-10.

Product Strategy:

This product is an extension to DN61.

Competitive Products:

<u>Proposed Schedule:</u>	<u>Plan/Spec</u>	<u>Code Freeze</u> <u>Des. Comp.</u>	<u>Announce</u>	<u>Release</u>	<u>FCS</u>
	<u>10/77</u>	<u>12/77</u>	<u>10/76</u>	<u>3/78</u>	<u>3/78</u>
<u>Proposed Budget:</u>	FY 78 <u>34.3</u>		FY 79	<u>\$20</u>	

Product Cost Goals & Proposed Pricing:

Major Risks:

Product Designation DN64/TOPS-20 Date 5/26/77 Rev. _____
 Product Family DAS Planned () Committed ()
 System(s) _____ Priority _____
 Product MGR _____ Engineering MGR/Super. Lofgren

Product Description:

IBM 2780/3780 termination/emulation support on TOPS-20. This is a stand-alone product that does not run under MCB or support the corporate network protocols. Support of the latter is planned for Q3 of FY78. The budgeted effort includes home office support of the field test sites and some work to make the non-supported field test pre/release work. Details will be worked out as soon as software support policies are defined.

Product Strategy:

Use what we have working on DEC-10 and make it work in an acceptable way on TOPS-20 release 3.0.

Competitive Products:

<u>Proposed Schedule:</u>	<u>Plan/Spec</u>	<u>Code Freeze</u>		<u>Announce</u>	<u>Release</u>	<u>FCS</u>
		<u>Des.</u>	<u>Comp.</u>			
			<u>5/77</u>		<u>6/77</u>	<u>1/78</u>
<u>Proposed Budget:</u>		<u>FY 78</u>	<u>110.9</u>	<u>FY 79</u>	<u>70.0</u>	

Product Cost Goals & Proposed Pricing:

Major Risks:

The plan assumes fairly active participation of the local software specialist for the respective sites.

Product Designation DN65/TOPS-20 Date 4/5/77 Rev. _____
 Product Family _____ Planned () Committed ()
 System(s) _____ Priority _____
 Product MGR _____ Engineering MGR/Super. Lofgren

Product Description:

Support of HASP multileaving on TOPS-20. At no extra cost this could also support IBM 2780/3780 emulation/termination if marketing so decides. The software will run on DN20 but will not run under MCB and will initially not support the corporate network protocols.

Product Strategy:

Use the effort from DN62 (HASP multileaving on TOPS-10) and DN64.

Competitive Products:

<u>Proposed Schedule:</u>	<u>Plan/Spec</u>	<u>Code Freeze</u>		<u>Announce</u>	<u>Release</u>	<u>FCS</u>
		<u>Des.</u>	<u>Comp.</u>			
	<u>10/77</u>	<u>12/77</u>		<u>10/76</u>		<u>3/78</u>
<u>Proposed Budget:</u>		FY 78	<u>34.3</u>	FY 79	<u>20.0</u>	

Product Cost Goals & Proposed Pricing:

Major Risks:

Product Designation DN98/TOPS-10 Date 5/28/77 Rev. _____
 Product Family _____ Planned () Committed ()
 System(s) _____ Priority _____
 Product MGR _____ Engineering MGR/Super. Lofgren

Product Description:

Make the DN8X (The DEC-10 front-end and RJE software) run on DN98 hardware (PDP11/34, DUP11, D11, KMC11, etc.)

Product Strategy:

Add handlers for the new devices to the current DN8X software plus insure that it runs on PDP11/34.

Competitive Products:

<u>Proposed Schedule:</u>	<u>Plan/Spec</u>	<u>Code Freeze</u>		<u>Announce</u>	<u>Release</u>	<u>FCS</u>
		<u>Des.</u>	<u>Comp.</u>			
	<u>Available</u>			<u>6/77</u>	<u>12/77</u>	<u>2/78</u>
<u>Proposed Budget:</u>		<u>FY 78</u>	<u>17.7</u>	<u>FY 79</u>	<u>20.0</u>	

Product Cost Goals & Proposed Pricing:

Major Risks:

Product Designation DX20/TU70,1,2 Date 5,26,77 Rev. _____
Product Family _____ Planned () Committed ()
System(s) _____ Priority _____
Product MGR _____ Engineering MGR/Super. Lofgren

Product Description:

Meet the DAS commitments on DX20/TU70, 1, 2 on TOPS-20 and TOPS-20AN. There is currently one firm order for DX20/TU72 on TOPS-20AN and some outstanding quotes for TOPS-20 Release 2. Effort is also planned to allow some integration of the DX20/TU7X handler in standard TOPS-20 although that is not yet a committed product. The plan does not include support of DX20/TU70 as a standard volume product.

Product Strategy:

Competitive Products:

<u>Proposed Schedule:</u>	<u>Plan/Spec</u>	<u>Code Freeze</u> <u>Des. Comp.</u>	<u>Announce</u>	<u>Release</u>	<u>FCS</u>
	_____	<u>6/77</u>	_____	_____	<u>7/77</u>

Proposed Budget: _____ FY 78 21.7 _____ FY 79 _____

Product Cost Goals & Proposed Pricing:

Major Risks:

Product Designation BC Tel Date 5/26/77 Rev. _____
Product Family _____ Planned () Committed ()
System(s) _____ Priority _____
Product MGR _____ Engineering MGR/Super. Lofgren

Product Description:

Upgrade BC Tel's user macros in their DN81 RJE stations to work with 6.03 software. Firm order.

CSG product line specific commitments.

Product Strategy:

Competitive Products:

<u>Proposed Schedule:</u>	<u>Plan/Spec</u>	<u>Code Freeze</u>		<u>Announce</u>	<u>Release</u>	<u>FCS</u>
		<u>Des.</u>	<u>Comp.</u>			
	<u>7/77</u>				<u>10/77</u>	

Proposed Budget: FY 78 19.5 FY 79 _____

Product Cost Goals & Proposed Pricing:

Major Risks:

Product Designation Indiana Bell Date 5/26/77 Rev. _____
 Product Family _____ Planned () Committed ()
 System(s) _____ Priority _____
 Product MGR _____ Engineering MGR/Super. Lofgren

Product Description:

Provide support for IBM 3780 and Data Speed 40/4 terminals. This is to meet the outstanding quote for Indiana Bell. The detailed product requirements are not yet agreed on with the customer and the proposed budget reflects our best understanding at this point in time. The end product will also be referred to as DN63.

CSG product line specific commitment.

Product Strategy:

As much as possible of the effort and code from the other DN60 products should be used. We are planning to base the effort on DN61 code. It assumes the customer is agreeable to our approach.

Competitive Products:

<u>Proposed Schedule:</u>	<u>Plan/Spec</u>	<u>Code Freeze</u>		<u>Announce</u>	<u>Release</u>	<u>FCS</u>
		<u>Des.</u>	<u>Comp.</u>			
			1/78			5/78
<u>Proposed Budget:</u>		FY 78	30.2	FY 79	20.0	

Product Cost Goals & Proposed Pricing:

Major Risks:

Product Designation SNETCO Date 5/26/77 Rev. _____
Product Family _____ Planned () Committed ()
System(s) _____ Priority _____
Product MGR _____ Engineering MGR/Super Lofgren

Product Description:

Upgrade the Data Speed 40/1 software for 6.03 at SNETCO. Firm order/commitment.
CSG product line specific commitment.

Product Strategy:

Competitive Products:

<u>Proposed Schedule:</u>	<u>Plan/Spec</u>	<u>Code Freeze</u>	<u>Announce</u>	<u>Release</u>	<u>FCS</u>
		<u>Des. Comp.</u>		<u>12/77</u>	
<u>Proposed Budget:</u>		<u>FY 78 4.5</u>	<u>FY 79</u>		

Product Cost Goals & Proposed Pricing:

Major Risks:

Product Designation Telemed Date 5/26/77 Rev. _____
Product Family _____ Planned () Committed ()
System(s) _____ Priority _____
Product MGR _____ Engineering MGR/Super. Lofgren.

Product Description:

Provide support for the dual port feature on RP04/RP06 and have one port on DEC-10 and one port on RSX-11M. This could also potentially satisfy certain real time needs on TOPS-10 and TOPS-20. There is one firm order from Telemed and lots of additional interest, but no other outstanding quotes.

CSG product line specific commitment.

Product Strategy:

The effort will be based on the dual port software in RSX11 F. Most work will be done in writing an RSX-11M driver that can talk to a DEC-10 formatted disk.

Competitive Products:

<u>Proposed Schedule:</u>	<u>Plan/Spec</u>	<u>Code Freeze</u>	<u>Announce</u>	<u>Release</u>	<u>FCS</u>
		<u>Des. Comp.</u>			
	<u>5/77</u>				<u>11/77</u>

Proposed Budget: FY 78 17.0 FY 79 _____

Product Cost Goals & Proposed Pricing:

Major Risks:

For the success of this project it is imperative that adequate development hardware is made available.

Product Designation DX20/Superdisk(commitment) Date 5/26/77 Rev. _____
Product Family _____ Planned () Committed ()
System(s) _____ Priority _____
Product MGR _____ Engineering MGR/Super Lofgren

Product Description:

Software to support the STC Superdisk on TOPS_10. The effort is primarily to ensure successful installation at IPC, Maynard. This is not a committed product yet.

Product Strategy:

The software is to be developed by STC and the budgeted effort is to cover consulting effort to STC and for installation at IBC.

Competitive Products:

<u>Proposed Schedule:</u>	<u>Plan/Spec</u>	<u>Code Freeze</u>		<u>Announce</u>	<u>Release</u>	<u>FCS</u>
		<u>Des. Comp.</u>	<u>_____</u>			
	<u>Available</u>	<u>7/77</u>	<u>_____</u>	<u>_____</u>	<u>_____</u>	<u>12/77</u>

Proposed Budget: FY 78 14.1 FY 79 _____

Product Cost Goals & Proposed Pricing:

Major Risks:

Product Designation Dutch PTT Date 5/26/77 Rev. _____
Product Family _____ Planned () Committed ()
System(s) _____ Priority _____
Product MGR _____ Engineering MGR/Super. Lofgren

Product Description:

Consulting and back-up support for Dutch PTT project, which will be completed and delivered in June 77.

Product Strategy:

Competitive Products:

<u>Proposed Schedule:</u>	<u>Plan/Spec</u>	<u>Code Freeze</u>		<u>Announce</u>	<u>Release</u>	<u>FCS</u>
		<u>Des.</u>	<u>Comp.</u>			
<u>Proposed Budget:</u>	FY 78	2.8		FY 79		

Product Cost Goals & Proposed Pricing:

Major Risks:

Product Designation PC20 Date 5/26/77 Rev. _____
Product Family _____ Planned () Committed ()
System(s) _____ Priority _____
Product MGR _____ Engineering MGR/Super. Lofgren

Product Description:

Support of Paper Tape Reader Punch on TOPS-20. There is at least one firm order for this product. The hardware is not defined yet!

ESG product line specific commitment.

Product Strategy:

Two approaches are open:

- 1) Use the same monitor and FE hoods that DAS developed for the XY20 project allowing TTY lines to be defined as special peripheral lines. Put a PDP-11/04 with a standard PC11 on this TTY-line.
- 2) Use the DIA I/O interface available, but never used on TOPS-20.

Competitive Products:

<u>Proposed Schedule:</u>	<u>Plan/Spec</u>	<u>Code Freeze</u>		<u>Announce</u>	<u>Release</u>	<u>FCS</u>
		<u>Des.</u>	<u>Comp.</u>			
	<u>7/77</u>					<u>11/77</u>
<u>Proposed Budget:</u>		<u>FY 78</u>	<u>11.4</u>	<u>FY 79</u>		

Product Cost Goals & Proposed Pricing:

Major Risks:

Product Designation CP20 Date 5/26/77 Rev. _____
Product Family _____ Planned () Committed ()
System(s) _____ Priority _____
Product MGR _____ Engineering MGR/Super. Lofgren

Product Description:

Support of LC50 as card Punch on TOPS-20. The product requirements need to be defined before any work can start. There is one firm order for this product.

EDU product line specific commitment.

Product Strategy:

Use the same monitor and FE hoods that DAS developed for the XY20 project allowing TTY lines to be defined as "special peripheral lines".

Competitive Products:

<u>Proposed Schedule:</u>	<u>Plan/Spec</u>	<u>Code Freeze</u>	<u>Announce</u>	<u>Release</u>	<u>FCS</u>
	<u>Available</u>	<u>Des. Comp.</u>			<u>7/77</u>

Proposed Budget: FY 78 1.8 FY 79 _____

Product Cost Goals & Proposed Pricing:

Major Risks:

Non-availability of development hardware and expected poor reliability of LC50:

ICG Development Large Box
Product Summary

#16 P.89

Product Designation SURPLUS - ASG Date 5/26/77 Rev. _____
Product Family _____ Planned () Committed ()
System(s) _____ Priority _____
Product MGR _____ Engineering MGR/Super. Lofgren

Product Description:

Not yet allocated manpower available for contingencies.

Product Strategy:

Competitive Products:

<u>Proposed Schedule:</u>	<u>Plan/Spec</u>	<u>Code Freeze</u>		<u>Announce</u>	<u>Release</u>	<u>FCS</u>
		<u>Des.</u>	<u>Comp.</u>			
<u>Proposed Budget:</u>	FY 78	19.4		FY 79		

Product Cost Goals & Proposed Pricing:

Major Risks:

C. LCG CENTRAL HARDWARE ENGINEERING

G. HOFF

L.C.G. HARDWARE ENGINEERING-BEIGE BOOK SUMMARY

BY: GEORGE HOFF-MANAGER, LCG HARDWARE ENG.

ORGANIZATIONAL ASSESSMENT:

The overall budget for Hardware Engineering for FY78 is essentially a carry forward budget from FY77 ie no growth. The project load is higher in several areas, we will operate with tighter engineering and support levels in FY78. The risks have been assessed and within the constraints of the data which follows the commitments to schedules/functionality are firm. The budget limitations of FY78 has left essentially zero funds available for organizational investments or long range technology investigations. On the positive side the Next System (Dec System 40) will provide advanced high speed circuit technology. The Dec System 2020 will provide engineering expertise in the development of lower cost systems. In summary the organizational growth and technology development in LCG for FY78/79 will be driven by aggressive pursuit of key products on tight budgets. The pressures on the organization have implied short term risks (attrition, project slips etc) however; the challenge will result in a stronger organization in the long run. The economic realities of the industry require a constant process to find how to do more, do it better, with less money, in less time. The budget pressures will also be felt by Marlboro support groups-ie the return for a \$ invested there must go up or other solutions will be pursued.

PROJECT PRIORITIES:

The priority within LCG Engineering are as follows:

1. Support Existing Products:
Support within constraints of budget allocated on a priority basis.
2. Meet commitments for Products to ship in FY78;
Priorities within this group will be determined by revenue impact.
3. Meet commitments for Products beyond FY78:
Priorities within group to be determined by revenue impact FY79.
4. Develop plans for additional Products requested and commit:
Particular emphasis on technology extensions.
5. Organizational Extensions-Advanced developments:
To be achieved primarily by items above.

PROJECT OVERVIEW:

KEY PROJECTS:

1(ONE) PORT MOS for 2Ø series FCS by Q1/FY79. Key technology development-key mid life kicker for 2Ø series.

2020-FCS pilot units by Q3/78 Forecast of production units is Q1/79 (not committed). Major new product.

DECSysstem 4Ø-Successor to KL1Ø. Design start up in FY78 with major push in technology area. ECL gate array technology. Key product for LCG in the 8Ø's.

TU77 for 2Ø series-FCS Q4/78 key extension for 20 series, tape capabilities

Communications on 2Ø series Hardware in place, support to software integration critical in FY78. Diagnostic extension and documentation required.

RPØ7/Ø8 Key disc product for 2Ø series in FY79

TU78 Key tape product for 2Ø series in FY79

SMP-Hardware support to key software development for TOPS-1Ø bases systems.

LCG Development Beige Book
Family Plan Summary

Product Family Product Support Date 03/23/77 Rev. 0

Product Manager Dick Hill Engineering MGR./Super. L.Kreidermacher

Strategy/Goals summary:

1. Reduce Warranty and maintenance expenses by improving reliability and improving maintenance documentation.
2. Reduce Manufacturing cost by reducing rework cost.
3. Modify equipment to meet International Regulations
4. Refurbish equipment to meet Safety Regulations

Major Risks:

C= committed
P= planned

8- Quarter Product Plan/Budget Summary

Product C/P System(s)	FY78	FY79	FY78				FY79				Priority
	Budget	Budget	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
1. CP HDW Eng.	609.1	651.9	0	-----	-----	-----	-----	-----	-----	-----	0A
2. KLL0 Cooling	50.0	-	0	----	-----	-----	-----	-----	-----	-----	0A
3. Inter/Reg.	276	280.6	0	-----	-----	-----	-----	-----	-----	-----	0A
4. Maint.Users Guide	60.8	66.8	0	-----	-----	-----	-----	-----	-----	-----	0A
5.											
6.											

LEGEND: PLAN/FUNC.SPEC. CODE FREEZE/DESIGN COMP. ANNOUNCE MFG/SDC REL. FCS
 1 N/A 2 N/A 3N/A 4 N/A 5N/A

Note: At A minimum, (1) (3) (5) must be estimated. Add as many milestones as practical for committed products.

LCG Development Beige Book
Product Summary

P.94

Product Designation CP Hardware Eng. Date 3/77 Rev. 0
Product Family Product Support Planned () Committed (x).
System(s) DECSYSTEM 10 and 20 Priority 0
Product MGR John Jorgenson Engineering MGR/Super. L.Kreidermacher

Product Description: A. Continuation Engineering and ECO'S for

KA System and peripherals
KI Systems and peripherals
KL Systems thru KL10D and E (excluding KL10F and COBOL/
Fortran enhancements)
KL peripherals starting 1-2 quarters after FCS.

B. Maintain Computer Equipment required for Hardware
Product Development

Product Strategy: Problems causing equipment failures or poor reliability
will be rectified by ECO. Lower priority problems including
documentation changes and product cost reduction will not be
rectified.

Competitive Products:

<u>Proposed Schedule:</u>	<u>Plan/Spec</u>	<u>Code Freeze</u>	<u>Announce</u>	<u>Release</u>	<u>FCS</u>
		<u>Des. Comp.</u>			
<u>Proposed Budget:</u>		FY 78	<u>609.1</u>	FY 79	<u>651.9</u>

Product Cost Goals & Proposed Pricing:

Major Risks:

LCG Development Beige Book
Product Summary

P.95

Product Designation KL1Ø Cooling Date 3/77 Rev. Ø
Product Family Product Support Planned () Committed (x)
System(s) DECSYSTEM 1Ø and 2Ø Priority Ø
Product MGR _____ Engineering MGR/Super. L. Kreidermacher

Product Description:

Chargebacks from Manufacturing for materials and Labor and from Field Service for materials for the KL1ØB Cooling Improvement.
KL1ØD Cooling Improvement will be released in time for inclusion in FCS.

Product Strategy:

Competitive Products:

<u>Proposed Schedule:</u>	<u>Plan/Spec</u>	<u>Code Freeze</u>		<u>Announce</u>	<u>Release</u>	<u>FCS</u>
		<u>Des.</u>	<u>Comp.</u>			
	_____	_____	_____	_____	_____	_____
<u>Proposed Budget:</u>		FY 78	<u>50.0</u>	FY 79	<u>-</u>	

Product Cost Goals & Proposed Pricing:

Major Risks:

LCG Development Beige Book
Product Summary

P.96

Product Designation Intel/Reg. Date 03/23/77 Rev. A
Product Family _____ Planned () Committed (x)
System(s) DEC System 10 and 20 Priority 0
Product MGR John Jorgenson Engineering MGR/Super. Bill Walton

Product Description:

To assure that all current and future DEC Products conform to current U/L, CSA and IEC Requirements. This will involve:

1. Correction of Safety Related Problems on existing Products.
2. Review and submittal of new equipment to U/L for listing.
3. Assure products meet CSA's plant certification requirements.
4. Direct new Design so that the IEC Impact will be minimized.

Product Strategy:

1. Review all new products during the design cycle.
2. Work with applicable corporate groups to resolve general problems such as; grounding, cabinet locks, leakage current, color codes, etc.

Competitive Products:

<u>Proposed Schedule:</u>	<u>Plan/Spec</u>	<u>Code Freeze</u>	<u>Announce</u>	<u>Release</u>	<u>FCS</u>
		<u>Des. Comp.</u>			
<u>Proposed Budget:</u>		<u>FY 78</u>	<u>276.0</u>	<u>FY 79</u>	<u>280.6</u>

Product Cost Goals & Proposed Pricing:

Major Risks: If we don't assure equipment is up to current safety requirements we assure the following risks;

1. We may violate the law in certain geographical areas.
2. We potentially increase DEC's liabilities in the case of personal injury and/or property damage.
3. We may be prohibited from Installing equipment in some municipalities.

LCG Development Beige Book
Product Summary

P.97

Product Designation Maint. User's Guide Date 3/77 Rev. ∅
Product Family Product Support Planned () Committed ()
System(s) DECSys_{tem} 1∅ and 2∅ Priority 7
Product MGR _____ Engineering MGR/Super. L.Kreidermacher

Product Description:

A hardcopy manual containing KL System 1∅ and System 2∅ maintenance procedure and data. Cost does not include printing. This manual will reduce warranty and maintenance cost.

Product Strategy:

Requires only Technical Documentation Department effort.

Competitive Products:

<u>Proposed Schedule:</u>	<u>Plan/Spec</u>	<u>Code Freeze</u>	<u>Announce</u>	<u>Release</u>	<u>FCS</u>
		<u>Des. Comp.</u>			
	_____	_____	_____	_____	_____
<u>Proposed Budget:</u>		FY 78 <u>6∅.8</u>	FY 79	<u>66.8</u>	

Product Cost Goals & Proposed Pricing:

Major Risks:

LCG Development Beige Book
Family Plan Summary

Product Family Development Tools Date _____ Rev. _____

Product Manager N/A Engineering MGR./Super. Hoff/Ku

Strategy/Goals summary:

1. Provide Design Aids capability
2. Provide Performance Analysis function

Major Risks:

C= committed
P= planned

8- Quarter Product Plan/Budget Summary

Product C/P System(s)	FY78		FY78				FY79				Priority
	Budget	Budget	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
1. Design Aides	53.2	84.0									0A
2. Performance Analysis	47.6	44.0									0A
3.											0A
4.											
5.											
6.											

LEGEND: PLAN/FUNC.SPEC. CODE FREEZE/DESIGN COMP. ANNOUNCE MFG/SDC REL. FCS

1	2	3	4	5
---	---	---	---	---

Note: At A minimum, (1) (3) (5) must be estimated. Add as many milestones as practical for committed products.

Product Designation Design Aid Date 3/24/77 Rev. 0
Product Family Product Support Planned () Committed (x)
System(s) DECSYSTEM 10 and 20 Priority 0
Product MGR N/A Engineering MGR/Super. Hoff/Ku

Product Description:

1. To maintain and improve the Stanford drawing system.
2. To support and improve the wirelist and delay analysis programs.
3. To provide logic simulation and new design aids programs to support MOS, SM10 and Next System requirements.

Product Strategy:

N/A

Competitive Products:

N/A

<u>Proposed Schedule:</u>	<u>Plan/Spec</u>	<u>Code Freeze</u>	<u>Announce</u>	<u>Release</u>	<u>FCS</u>
		<u>Des. Comp.</u>			
		<u>N/A</u>			

<u>Proposed Budget:</u>	<u>FY 78</u>	<u>53.2</u>	<u>FY 79</u>	<u>84.0</u>
-------------------------	--------------	-------------	--------------	-------------

Product Cost Goals & Proposed Pricing:

N/A

Major Risks:

Requirements for SM10 and the Next System are not well defined.

Product Designation Performance Analysis Date 3/24/77 Rev. 0
 Product Family CPU Planned Committed
 System(s) DECSysystem 10/20/40 Priority _____
 Product MGR J.S.Jorgenson Engineering MGR/Super. G.Hoff/Vic Ku

Product Description: To implement system performance analysis projects for 10/20/ and 40.
 a) review and comment on performance criteria and goals in Hardware/Software Project plans.
 b) Assist Marketing in understanding system configuration guidelines
 c) Raise visibility on system performance issues.
 d) Analyze and propose Hardware/Software projects that will enable performance/cost ratios of systems 10/20 to be raised in years ahead.

Product Strategy:

N/A

Competitive Products:

N/A

<u>Proposed Schedule:</u>	<u>Plan/Spec</u>	<u>Code Freeze</u>		<u>Announce</u>	<u>Release</u>	<u>FCS</u>
		<u>Des.</u>	<u>Comp.</u>			
	<u>7/77</u>	_____	_____	_____	_____	_____
<u>Proposed Budget:</u>		<u>FY 78</u>	<u>47.6</u>	<u>FY 79</u>	<u>44.0</u>	

Product Cost Goals & Proposed Pricing:

N/A

Major Risks:

1. A hardware performance analysis person must be available to assist Paul Kampas
2. A software performance analysis person must be available from the Software Engineering Group.

LCG Development Beige Book
Family Plan Summary

Product Family CPU Date 3/23/77 Rev. ∅

Product Manager J. S. Jorgensen Engineering MGR./Super. G. Hoff/Vic Ku

Strategy/Goals summary:

See Attachment.

Major Risks:

The large number of system configurations created severe equipment problems in support of engineering qualification.

Technology (LSI gate array and cooling) risks on DECSYSTEM 40.

C= committed
P= planned

8- Quarter Product Plan/Budget Summary

Product C/P System(s)	FY78	FY79	FY78				FY79				Priority
	Budget	Budget	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
1. KL10E/PV	∅	∅									
2. 2020 CPU	609.5	403.9									
3. DEC 40 Phase 1	602.1	1646.8									
4. SMP	123.1	∅									
5.											
6.											

LEGEND: PLAN/FUNC. SPEC. CODE FREEZE/DESIGN COMP. ANNOUNCE MFG/SDC REL. FCS

1	2	3	4	5
---	---	---	---	---

Note: At A minimum, (1) (3) (5) must be estimated. Add as many milestones as practical for committed products.

CPU HARDWARE FAMILY PLAN: STRATEGY/GOALS SUMMARY

1. Overall Strategy

- a. The basic KL10PV CPU (30 MHz, Extended Addressing feature, 2K word control store and MOS memory hooks) will form the base for a wide range of system configurations of the DECsystem 10 and DECsystem 20.
- b. The SM10 CPU (KA10 performance) will be used in DECsystem 2020 and will serve as a base for a range of lower cost system configurations.
- c. Feasibility studies into a cost effective, modular and high performance computer system architecture (DECsystem 40) will be conducted.
- d. System performance analysis projects for the above will be carried out.

2. DECsystem 10

The developments to follow the 1090 and 1099 are the 1090 SMP (KL10D). The project is primarily a software project. System test to service up to 2 CPUs will be required.

3. DECsystem 20

The first systems utilizing the KL10PV CPU will be shipped in October 1977. These are labelled DECsystem 2041 and 2051 (KL10E). Three multi-processor systems will be configured at later dates:

2061 (2 CPUs), 2070 (3 CPUs) and 2081 (4 CPUs).

These multi-processor systems require the multiple port MOS memory. Detailed definition and planning work remains to be done on 2061, 2071 and 2081.

4. DECsystem 2020

A lower cost system based on the SM10 CPU is proposed. The plan for FY78 is to build 50 prototype machines to determine marketability, servicability and manufacturability of this system.

5. DECsystem 40

The plan for FY78 is to establish marketing requirements, to determine the needed technology, to establish preliminary system design and implementation plan. A breadboard system will be constructed to prove the design in the early part of FY79.

LCG Development Beige Book
Product Summary

P.103

Product Designation KL10E/PV Date 2/77 Rev. 0
Product Family CPU Planned () Committed (X)
System(s) DEC-20 PHASE II Priority 1
Product MGR J.S. Jorgensen Engineering MGR/Super. G.Hoff

Product Description:

1. New model CPU for DECSYSTEM-20, successor to KL10C
2. 20% improved internal Speed.
3. Reduced manufacturing cost
4. Micro Storage expansion from 1 to 2K Words
5. Includes CPU, CFE, internal Memory

Product Strategy:

1. Phase in as a replacement for KL10C in Sept. '77
2. Required for future TOPS-20 functionality (Rel 4 and Beyond)
3. Provide field upgrade for KL10C
4. Can be used with future MOS Memory
5. Provide product "kicker" for 2040 series.

Competitive Products:

N/A

<u>Proposed Schedule:</u>	<u>Plan/Spec</u>	<u>Code Freeze</u>	<u>Announce</u>	<u>Release</u>	<u>FCS</u>
	_____	<u>Des. Comp.</u>	<u>8/77</u>	_____	<u>9/77</u>
<u>Proposed Budget:</u>		FY 78 <u>Ø</u>		FY 79 <u>Ø</u>	

Product Cost Goals & Proposed Pricing:

Cost \$45K \$302K

Major Risks:

2020/CPU/RISKS/ASSUMPTIONS re. BUDGET

BY TOM DUNDON

ASSUMPTIONS:

1. Pilot machines not available with battery backups.
2. Systems do not require high simultaneous disk/tape thruput, ie, batch work is disk-oriented. Limitation of pilots only.
3. System exerciser not needed for pilots ll-emulator speeds development of some ll diagnostics.
4. OEM-type documentation not needed for pilots
5. FY79 budget assumes release of a Model B machine with Multiwire and minimal change to existing modules.

RISKS:

1. Single Unibus may not have enough bandwidth for disk, tape, printer, and sync. line. Hardware is in machine for 2 Unibus adapters. Software not planned.
2. Above assumptions not valid.
3. Multiwire availability (single source)

SUMMARY:

Release to Pilot Manufacturing facility and then Volume Manufacturing a design for computer system which:

1. Runs TOPS-20 Release 3. No extended addressing
2. Performance at least KA10 level
3. Minimum system cost less than \$30K
4. Capacity for 512k words MOS memory and 32 terminals.

Design documented to level of 50 unit pilot run, then for Volume Ship. Engineering backup available to Manufacturing during Pilot Build of 50 units.

GOALS :

1. Release Pilot design for FCS of first of 50 machines, January 78.
2. Min. system cost less than \$30k
3. Release substantially the same design for Volume ship in Q1/79
4. Support of RP06/RM03, DZ11, KMC/DUP TU45, and LP05/14, LP20 only.

NON GOALS:

1. Complete gate-level diagnostics for FCS.
2. Support of random 'll peripherals
3. Release of extended-address 2020.
4. Substitute for Multiwire (except on experimental basis)

Product Designation	<u>2020 CPU</u>	Date	<u>05/27/77</u>	Rev	<u>1</u>
Product Family	<u>20</u>	Planned (X)	Committed ()		
System(s)	<u>DEC 2020 Phase 2</u>	Priority	<u>6</u>		
Product Manager	<u>T. Campbell</u>	Engineering Mgr/Sup	<u>T. Dundon</u>		

Product Description: Release to Pilot Manufacturing Facility and then Volume Manufacturing a design for computer system which:

- Runs TOPS-20 Release 3. No extended addressing.
- Performance at least KA10 level
- Min system cost less than \$30K
- Capacity for 512K words MOS memory and 32 terminals.

Design documented to level of 50-unit pilot run, then for Volume Ship. Engineering backup available to Manufacturing during Pilot Build of 50 units.

Product Strategy: About 50 "Pilot" or Market Test machines will be built and "sold" inside DEC and to qualified outside customers. "Pilots" will provide feedback on marketability, maintenance and manufacturability. Feedback will be used to formulate Phase III (Volume Ship) marketing, maintenance and manufacturing strategy. Volume ship development to be done in parallel with Pilot effort.

Competitive Products: HP3000, SEL 32/75, Interdata 8/32, Prime 600.

Proposed Schedule:	<u>Plan/Spec</u>	<u>Des. Comp.</u>	<u>Announce</u>	<u>"Pilot" Rel.</u>	<u>Vol Rel</u>	<u>FCS</u>
	<u>6/77</u>	<u>7/77</u>	<u>5/78</u>	<u>8/77</u>	<u>3/78</u>	<u>1/78</u>

Proposed Budget: FY78 609.5 FY79 403.9

Product Cost Goals & Proposed Pricing:

- 128K 1 Disk, CTY, 8 lines
- FY78 Cost = \$29K
- Markup = 4.5:1 (avg)
- Use Corporate Type I, III discounts (depending on P.L.)

Major Risks:

1. Diagnostics late
2. Multiwire deliveries and other material
3. Software late

NEXT SYSTEM-VIC KU-06/15/77

I. PROJECT SUMMARY

- a) To plan and propose a new computer system using LSI gate array technology
- b) To get detailed manufacturing costs, system performance data and set diagnostics/ RAMP goals,
- c) To do detailed high bandwidth backpanel bus design and protocol
- d) To do detailed logic design on CPU
- e) To complete detailed project implementation plan and hot box proposals (floating point, decimal arithmetic, etc)
- f) To make technology and vendor selections
- g) To comply detailed technology and power supply implementation plan
- h) To work on preliminary cooling, backpanel/cache connectors and packaging proposals and implementation plans.
- i) To track the latest corporate developments on disk, magtape, communication, and unit record devices/subsystems.

II. MAJOR GOALS: The major goals for the new system are:

- a) Capable of running TOPS10/20 monitors
- b) 1.5 times the 2050 performance
- c) Air cool
- d) Efficient power supply (switching regulator)
- e) 90 per-cent hard error diagnosable to chip level
- f) 100 per-cent hard error diagnosable to board level
- g) Minimize ownership costs
- h) Internal memory ranged from 128k to 768k
- i) Hot boxes (fast floating point, decimal arithmetic, etc)
- j) Utilize corporate disk, magtape, communication and unit record subsystem.

III. MAJOR NON-GOALS:

- a) 100 per-cent instruction set exec. mode compatible with KL10
- b) Emulation of other instruction sets (including VAX)
- c) Support of user mode writable control store
- d) Microcode compatible between KL10 and the new system

IV. ASSUMPTIONS:

- a) The level of resources (system, mechanical and circuit engineers, etc.) is not significantly affected or drained by other activities (KL ECO's, etc).
- b) The new system proposal is largely accepted by LCEG and corporate management by Q2,78
- c) ECL Gate array technology poses no big surprises (low MTBF, exceedingly high front-end vendor funding, etc).
- d) Good support/response from software and product management.

Page (2)
Vic Ku

Next System

V. MAJOR RISKS:

- a) All the above assumptions
- b) SAGE II logic simulation turns out to be ineffective
(too slow,etc)
- c) Computer time for simulations, stanford drawing may not be
adequate.
- d) Test method for ECL Gate technology

LCG Development Beige Book
Product Summary

P.108

Product Designation DEC 40 Phase 1 Date 3/29/77 Rev. 1
Product Family CPU Planned (X) Committed ()
System(s) DEC 40 Phase 1 Priority 5
Product MGR Brian Samuels Engineering MGR/Super. Hoff/Ku

Product Description:

- To propose a range of new computer systems to supplant KL10 based systems.
- Define technology.
 - Define detailed architecture.
 - Set machine speed and cost goals.
 - Determine feasibility of project/cost goals through detailed technology investigations and a preliminary system and logic design.
 - Provide detailed implementation plan.

Product Strategy:

- Provide computer systems to meet the price/performance demands of the marketplace in the 1980's.
- Provide a viable migration path for DEC-20 customers.

Competitive Products:

N/A

<u>Proposed Schedule:</u>	<u>Plan/Spec</u>	<u>Code Freeze</u>		<u>Announce</u>	<u>Release</u>	<u>FCS</u>
		<u>Des.</u>	<u>Comp.</u>			
	<u>12/77</u>	_____	_____	_____	_____	_____
<u>Proposed Budget:</u>		<u>FY 78</u>	<u>602.1</u>	<u>FY 79</u>	<u>1646.8</u>	

Product Cost Goals & Proposed Pricing:

Major Risks:

- Capital test equipment for new technology not budgeted.
- IC vendor start up costs not budgeted.
- LSI gate array technology; power supply and cooling; logic simulation software; design aids programs.
- Limited technology manpower available

LCG Development Beige Book
Product Summary

Product Designation SMP Date 03/24/77 Rev. 0
 Product Family CPU Planned (x) Committed ()
 System(s) DECsystem 10 Phase II Priority _____
 Product MGR J.S.Jorgenson Engineering MGR/Super. G.Hoff/V.Ku

Product Description:

1. To design and document a work station capable of serving up to 4 CPU's
2. To support system fault insertion
3. To update system exerciser and user mode diagnostic programs.
4. To provide site preparation guide.
5. To provide a hardware project leader to coordinate the project.
6. To provide up to double the throuput of a 1090 with support of up to 256 users (2 processors).

Product Strategy:

1. Ship high end DECsystem-10 in July, 1978 (2 processors)
2. To provide a product to feed the growth of installed base through add-ons and upgrades.
3. Can be used with future MOS Memory
4. Provide a viable migration path for DEC-10 customers to move to TOPS-20

Competitive Products:

N/A

<u>Proposed Schedule:</u>	<u>Plan/Spec</u>	<u>Code Freeze</u>		<u>Announce</u>	<u>Release</u>	<u>FCS</u>
		<u>Des.</u>	<u>Comp.</u>			
	<u>7/77</u>	_____	_____	_____	_____	<u>7/78</u>
<u>Proposed Budget:</u>		FY 78	<u>123.1</u>	FY 79	<u>0</u>	

Product Cost Goals & Proposed Pricing:Major Risks:

Cooling problems for maximum system configurations.

LCG Development Beige Book
Family Plan Summary

Product Family MEMORY Date 2/77 Rev. 0

Product Manager J. S. Jorgensen Engineering MGR./Super. G. Hoff/S. Zia

Strategy/Goals summary:

The design goal in the memory development projects is to reduce the manufacturing costs 50% every two years so we can stay competitive in the market place.

Major Risks:

Availability of custom integrated circuits that go into the memories.

C= committed
P= planned

8- Quarter Product Plan/Budget Summary

Product	C/P	System(s)	FY78		FY78				FY79				Priority
			Budget	Budget	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
1.	MF20	C	668.9	71.4									3A
2.	MD20	P	277.3	561.2									3A
3.													
4.													
5.													
6.													

LEGEND: PLAN/FUNC.SPEC. CODE FREEZE/DESIGN COMP. ANNOUNCE MFG/SDC REL. FCS

1	2	3	4	5
---	---	---	---	---

Note: At A minimum, (1) (3) (5) must be estimated. Add as many milestones as practical for committed products.

LCG Development Beige Book
Product Summary

P.111

Product Designation MF 20 1 PORT Date 2/77 Rev. 0
 Product Family MEMORY Planned () Committed (x)
 System(s) DEC-20 PHASE III Priority 3A
 Product MGR J. S. Jorgensen Engineering MGR/Super. G. Hoff/S. Zia

Product Description:

1. SINGLE PORT EXTERNAL MOS MEMORY
2. Will provide Max of 1 Meg words on 2040 or 2050
3. > performance of MB20
4. Improved reliability over MB20
5. Improved Maintainability

Product Strategy:

1. Phase in as a MB20 replacement for new ships
2. Include as part of 20 series cost/performance improvement for FY79
3. Upgradable to 4 PORTS for multi processors.

Competitive Products:

N/A

<u>Proposed Schedule:</u>	<u>Plan/Spec</u>	<u>Code Freeze</u>		<u>Announce</u>	<u>Release</u>	<u>FCS</u>
		<u>Des.</u>	<u>Comp.</u>			
	<u>7/76</u>	<u>10/77</u>		<u>9/77</u>	<u>11/77</u>	<u>1/78</u>
<u>Proposed Budget:</u>		<u>FY 78</u>	<u>668.9</u>	<u>FY 79</u>	<u>71.4</u>	

Product Cost Goals & Proposed Pricing:

Steady State COST > \$.06/word. '78/79 '80 '81
 Sell \$.30/wrd. \$.25/wrd. \$.20/wrd.

Major Risks:

1. Availability of 16K RAMS
2. Availability of Multiplexer & Transceiver Chips.

LCG Development Beige Book
Product Summary

P.112

Product Designation MD20 4 PORT Date 2/77 Rev. 0
 Product Family MEMORY Planned (x) Committed ()
 System(s) DEC 10 III DEC-20 II Priority 4A
 Product MGR J. S. Jorgensen Engineering MGR/Super. G. Hoff/S. Zia

Product Description:

Four port (4KL10 CPU's) EXTERNAL MOS.
 Provide 4 Meg words on a KL10 A,B,C,D,E..CPU.
 > performance of MH10.
 State of the art

Product Strategy:

Phase in as a replacement for MB20 (and MH10)
 on DEC-20 and 1080, 1090 SMP.
 Support DEC-20 SMP.

Competitive Products:

N/A

<u>Proposed Schedule:</u>	<u>Plan/Spec</u>	<u>Code Freeze</u>	<u>Announce</u>	<u>Release</u>	<u>FCS</u>
		<u>Des. Comp.</u>			
	<u>10/77</u>	<u>1/79</u>	<u>10/78</u>	<u>5/79</u>	<u>1/80</u>
<u>Proposed Budget:</u>		<u>FY 78</u>	<u>277.3</u>	<u>FY 79</u>	<u>561.2</u>

Product Cost Goals & Proposed Pricing:

Steady State Cost > \$.06/word '79 '80 '81
 Sell \$.30 \$.25 \$.20 word

Major Risks:

Same as MF20

LCG Development Beige Book
Family Plan Summary

Product Family TAPES Date 8 April 77 Rev. 0

Product Manager H. Prindle Engineering MGR./Super. G. Hoff

Strategy/Goals summary:

Major Risks:

C= committed
P= planned

8- Quarter Product Plan/Budget Summary

Product C/P System(s)	FY78	FY79	FY78				FY79				Priority
	Budget	Budget	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
1. TM03/TU45 [C]	29.7				5						1
2. TM03/TU77 [C]	43.2	20.0			3	5					1
3. TU78 [P]	53.3	62.9	1				3	5			4
4. DX20/TU70,1,2 [C]	59.2										FSG
5. 2020/TS04 [P] *											6
6.											
7.											
8.											
9. Successor Tech [P]											

LEGEND: 1 PLAN/FUNC.SPEC. 2 CODE FREEZE/DESIGN COMP. 3 ANNOUNCE 4 MFG/SDC REL. 5 FCS

Note: At A minimum, (1) (3) (5) must be estimated. Add as many milestones as practical for committed products.

* Part of SM10 Peripherals

LCG DEVELOPMENT BEIGE BOOK

FAMILY PLAN SUMMARY

PRODUCT FAMILY: Low Cost Removable Media Storage DATE: 2/8/77 REVISED: 0

PRODUCT MANAGER: H. A. Prindle ENGINEERING MANAGER: F. Previd

GOALS

Support LCG Systems Products with low cost removable media storage devices that provide optimum price, performance and satisfy application requirements as defined by market plans. Utilize corporate products where applicable to maximize revenue/profit.

OBJECTIVES

Establish a family of LCG low cost removable media products to meet specific market needs within a minimum of types to match the wide range of LCG system requirements. Ensure a growth path to the successor technology and/or products. Product margins and mix should provide optimum return on investment within the competitive environment.

STRATEGY

Enhance and consolidate our current magnetic tape storage product offering for DEC-10 and DEC-20 to offer a line of magnetic tape storage product from the low cost, quality TU45 to high performance TU72. Announce new magnetic tape storage products which offer improved cost/performance advantages in the LCG marketplace. Specify and fund the development of new technology to attain competitive leadership in system support.

TACTICS (illustrated on Figure 1 and Figure 2)

1. / Discontinue TU16 from product offering. Relatively high cost, poor performance, poor customer acceptance since introduction, high maintenance costs.
2. / Introduce TU45 on DEC10 (RH20) thereby offering TU45 both on DEC10 and DEC20 in same package. Increases quantity build, provides low wne of tape offering on both DEC10 and DEC20, provides ease of migration, reduces risk of slippage in new magnetic tape drive offerings.

- 2 -

3. Introduce TU77 on DEC10 (RH10 and RH20) and DEC20. Provides competitively priced product in mid range performance, upgrade path for installed base, low cost with same controller as TU45, reduce systems price for high performance system, auto load, industry compatible.
4. Introduce TU78 on DEC10 and DEC20 (RH20). Provides state of the art recording technology (GCR) at a competitive price to enhance systems sales. Provides dual channel and tape switching capability for high availability redundancy systems. Decreases dependency on competitive vendor drives.
5. Continue to offer TU70 and TU72. Provides high duty cycle, high band width quality drives to customers requiring IBM equivalency at any price. We will make every effort to reduce costs for these drives by using common controller, reduction in options etc. This vendor supplied family offers the additional capability of 200 ips 6250 bpi.
6. Evaluate TS04 (Tension Av'm, low cost tape drive). This corporate offering may provide the costs and performances required for entry level systems as well as reliability and low maintenance to offer on other LCG systems. TS04 is for 2020 only.
7. Support successor technology development to ensure continuing competitive offerings for low cost removable media storage.
8. Provide support for large numbers of tape drives, potentially multi-pathed. Right now, under the guise of high availability systems, we are shipping TU70 and TU72 tape subsystems that are larger than standard supported configurations and that are really multi-path. SMP will increase the need for these capabilities as standard supported products.

MAJOR RISKS

- Continued loss of revenue to systems and peripheral competitors unless we meet price/performance parity plus 20%.
- Slippage of TU77 and TU78 causes dependence on buyout STC subsystems which we are not offering at competitive price.
- Dependence on one vendor (PERTEC) for TU45, TU77 and TU78.
- Limited functionality with TU77 (no dual channel, no tape switching.)
- Introduction of successor technology which makes our product offering obsolete.

Addendum: Low Cost Removable Media Storage

9. The DEC 20 PER INT allows interface of 11 based special peripherals and high speed communication to DEC-20s. Thus engineering dollars for specials and warranty expenses are greatly reduced with this cost effective, high speed Unibus port.

DECSYSTEM20

DECSYSTEM10

PHASE	II	III	IV	II III	III IV	V
	CP					
COMM						
PERIPHERALS						
RANDOM ACCESS	RM03 RP06	RP07	R80 SUCCESSOR	RP06	RP07 SUPERDISK	R80 SUCCESSOR
LOW COST REMOVABLE	TU77	TU78 TU72	SUCCESSOR	TU77 TU77 TU45 TU46	TU78 TU78	
PRINTED OUTPUT	LP14 LP07	LP01		LP14 LP07		
I/O DEVICES	XY20 PC20	CP20		XY10C		
CHANNEL INTERFACE			DX20		DX20	

LCG MAGNETIC TAPE PLAN

FY'77		FY'78				FY'79	
Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2

TU16	(RH10) (DEC-10-1050)						
	(RH20) (DEC-10-1090)						
TU45	(RH20) (DEC-20)						
	(A) (F) RH20 (DEC-10-1090)						
TU77		(A)	(F) RH20 (DEC-20)				
		(A)	(F) RH20/RH10 (DEC-10)				
TU78				(A)	(F) RH20 (DEC-20)		
				(A)	(F) RH20 (DEC-10)		
TU70	(DX10) (DEC-10)						
TU72	(F) (DX10) (DEC-10)						
	(F) (DX20) (DEC-20)						
TU13							
TU15							
TU79							

(A) - Announce

(F) - First Customer Ship

FIGURE 1

MAGNETIC TAPE COMPARISON CHART

CONTROLLER	SPEED (ips)	DENSITY (bci)	NOMINAL Transfer Rate (K char/sec)	PRICE (\$K)				
				SUBSYSTEM RH10	RH20	MASTER***	DRIVE	
TU16	TM02	45	8/1600	72	49.5	32	22	9.4
TU45	TM02 -> TM03	75	8/1600	120	N/A	36	26	14
TU77	TM03	125	8/1600	200	55	45	30	18
TU78	TM72	125	1600/6250	780	N/A	60	50	25
TU70	TX01	200	8/1600	320	<u>DX10</u> 100		73	27
TU70	TX02	200	8/1600	320		<u>DX20</u> 138	101	27
TU72	TX02	125	1600/6250	780	135	145	100	34

* Proposed approximate prices

*** Controller plus drive

FIGURE 2

HARDWARE/SOFTWARE RELEASE SUMMARY

Device Class TAPES

Device	Controller	Channel	Hdw.Fcs.	Mon.Rev.	Mon.Load Test Start	Monitor Rel.	Remarks
TM03/ TU45	RH20	-	1/78	TOPS-20 3.0	5/77	1/78	
TM03/ TU45	RH20	-	3/78	TOPS-10 LIR	9/77		Note that as of 1/78 TM02 no longer is shipped.
TM03/ TU77	RH20	-	Q4, FY78	TOPS-20 3.0	9/77	1/78	Assume minimal delta from TM03/TU45.
TM03/ TU77	RH20	-	Q4, FY78	TOPS-10 LIR	9/77	3/78	Same LIR as TM03/TU45
TM03/ TU77	RH10	DF10C	Q4, FY78	TOPS-10 LIR	9/77	3/78	KI and KL only.
TU72	DX10		1/77	TOPS-10 LIR	9/77	A3, FY79	Presently shipped and supported by DAS. Req. Hardware for Stnd. Support
TM78/ TU78	RH20	-	Q2, FY79	TOPS-20 5.0	Q2, FY79	Q3, FY79	What is Hardware availability
DX20	RH20	-	Q1, FY78	ARPA	-	-	TU70, 1, 2 only. Special software.
TU45	TM03	RH11	2/78	TOPS-20 3.0 - SM	11/77	2/78	SM10 only (2020 peripheral)

LCG Development Beige Book
Product Summary

Product Designation TU45/TM03 Date 8 April 77 Rev. _____
 Product Family Low Cost Removable Media Storage Planned () Committed (X)
 System(s) DEC10 and DEC20 Priority 1
 Product MGR H. A. Prindle Engineering MGR/Super. Phil Wilson

Product Description: 9 track (800 NRZI and 1600 PE bpi) 75 inches per second
 120,000 character per second transfer rate and capacity of 40 million characters.
 The drive is vendor supplied (PERTEC) industry compatible, manual load column
 with error correction, read reverse, fast rewind.
 The controller TM02 is DEC designed and currently being upgraded to TM03 to support TU16,
 TU45 and new TU77. Budget reflects TM03 expenses. in load test and release to
 manufacturing.

Product Strategy: The TU45 is the standard offering on the DEC20 and will be offered on the
 DEC10 (RH20) by March 1, 1977. The packaging for DEC10 and DEC20 will be identical
 except for color of top cover of cabinet. The TU45 will be migratable from DEC10 to DEC20
 and supported on both TOPS10 and TOPS20.

Competitive Products:

SEE FIGURE 1

<u>Proposed Schedule:</u>	<u>Plan/Spec</u>	<u>Code Freeze</u>		<u>Announce</u>	<u>Release</u>	<u>FCS</u>
		<u>Des.</u>	<u>Comp.</u>			
		TM03	October 1977	Q2, FY78	Q2, FY78	
				Jan. 78	TU45/TM03/RH20/TOPS10	
<u>Proposed Budget:</u>		FY 78	29.7K	JAN. 78	TU45/TM03/RH20/TOPS20	
				FY 79	0	

Product Cost Goals & Proposed Pricing:

		PRICE	COST
DEC10	TU45-EW, EX	\$36,400	
DEC10	TU45C-EA, EB	\$26,400	
DEC20	TU45A-EA, EB	\$26,400	
DEC20	TU45A-EE, EF	\$14,000	

Major Risks: Low risk since it is a current product but phase in of TM03 while retaining
 availability of TM02 is a risk.

TM03/TU45Project Summary:

9-track (800 NRZI and 1600 PE bpi), 75 inches per second, 120,000 character per second transfer rate and capacity of 40 million characters. The drive is vendor supplied (PERTEC) industry compatible, manual load column with error correction, read reverse, fast rewind. The controller TM02 is DEC designed and currently being upgraded to TM03 to support TU16, TU45 and new TU77. Budget reflects TM03 expenses in load test and release to manufacturing.

Specific Tasks:

1. Complete Design of Bit Fidler Board
2. Support Diagnostic development
3. Introduce TM03 to Marlboro Manufacturing

Development Risks:

Risk is that hardware for software development may not be in place for load test before monitor release (TOPS-10).

COMPETITIVE COMPARISON

	DENSITY bpi	SPEED ips	TRANSFER KB/sec	<u>Channel</u>	PRICE \$K <u>Control & Drive</u>	<u>Drive</u>
IBM 3420-3	8/1600	75	120	37.1	36.0	12.4
CDC 34231-3	8/1600	75	120	65.2*	27.7	11.4
STC 3430	8/1600	75	120	63.2*	25.7	16.8
MOHAWK 8420-3	8/1600	75	120	76.1*	38.6	15.6
TELEX 6420-3	8/1600	75	120	61.5*	24.0	11.0
TU45	8/1600	75	120	34.5*	24.0	14.0

Using SA-10 on DEC-10

COMPETITIVE COMPARISON

	DENSITY bpi	SPEED ips	TRANSFER KB/sec	<u>Channel</u>	<u>PRICE \$K</u> <u>Control & Drive</u>	<u>Drive</u>
IBM 3420-5	8/1600	125	200	41.4	40.3	16.6
CALCOMP 345	8/1600	125	200	63.8*	26.3	11.8
CDC 34201-5	8/1600	125	200	72.6*	35.1	13.9
STC 3450	8/1600	125	200	84.3*	46.8	21.0
TELEX 6420-5	8/1600	125	200	63.4*	25.9	12.9
TU77	8/1600	125	200	45.0	30.0	12.0

Using SA-10 on DEC-10

Product Designation	TM03/TU77	Date	8 April 77	Rev.	
Product Family	Low Cost Removable Media	Planned ()	Committed (X)		
System(s)	DEC-10 & DEC-20	Storage	Priority		
Product MGR	H. Prindle	Engineering MGR/Super.			

Product Description: 9 track (800 NRZI and 1600 PE bpi) density 125 inches per second, 200,000 characters per second transfer rate and capacity of 40 million characters. The drive is vendor developed to DEC specifications (PERTEC) industry compatibility auto load, vacuum column. The controller is the TM03 DEC designed and an upgrade from the currently used TM02 on TU16 and TU45. (See Tape Products Beige Book)

Product Strategy: The TU77 will become the standard midrange magnetic tape storage offering for DEC-10 and DEC-20 and allow a more competitive systems price than that possible with the TU70 on DEC-10 and more performance and small cost increase on DEC-20 than that being offered by TU45.

Competitive Products:

SEE ATTACHED

<u>Proposed Schedule:</u>	<u>Plan/Spec</u>	<u>Code Freeze</u>	<u>Proto</u>	<u>Release</u>	<u>FCS</u>
	March '77	Des. Comp. Q2, FY78	Works Q3, FY78	Q3, FY78	Q4, FY78

<u>Proposed Budget:</u>	FY 78	43.2K	FY 79	0
-------------------------	-------	-------	-------	---

<u>Product Cost Goals & Proposed Pricing:</u>		<u>PRICE</u>	<u>COST</u>
DEC-10 (RH10)	TTU77-ES, ET	55	16.5
DEC-10 (RH20)	TTU77-EW, EX	45	8.5
DEC-20	TU77A-EA, EB	30	7.5
DRIVE	TU77A-EE, EF	18	

Major Risks: Risk associated with PERTEC meeting manufacturing delivery schedule at acceptable quality levels. Manufacturing plan not finalized.

TM03/TU77Project Summary:

9-track (800 NRZI and 1600 PE bpi) density 125 inches per second, 200,000 characters per second transfer rate and capacity of 40 million characters. The drive is vendor developed to DEC Specifications (PERTEC) industry compatibility auto load, vacuum column. The controller is the TM03 DEC designed and an upgrade from the currently used TM02 on TU16 and TU45.

Specific Tasks:

1. Diagnostic Effort
2. DEC-20 System Integration

Specific Non-Tasks:

1. TU77 will undergo Engineering Evaluation and Design Maturity Testing in Maynard.

Assumptions:

1. Diagnostic effort appears to be relatively small therefore completion is planned for Q4, FY'77.
2. New ship date is June, 1978.

Problems:

Continued TU45 manufacturing problems is diverting allotted Q4 resources to this project.

LCG Development Beige Book
Product Summary

Product Designation TU78 Date 8 April 77 Rev. _____
 Product Family Low Cost Removable Media Storage Planned Committed
 Item(s) DEC10 and DEC20 Priority 4
 Product MGR H. A. Prindle Engineering MGR/Super. P. Wilson

Product Description: 9 track (1600 PE and 6250 GER bpi) density, 125 inches per second
 780,000 characters per second transfer rate and capacity of 100 million characters.
 The drive is vendor supplied (PERTEC) based on TU77 drive with joint effort specified by DEC,
 industry compatible, autoloader, vacuum column, dual channel tape switches.
 The controller (TM78) is DEC developed and introduces new 6250 GER bpi density formatter
 to DEC product line.

Product Strategy: The TU78 will become standard high performance offering for
 DEC20 on RH20 allowing a more competitive systems price over that possible with TU72
 but retaining equivalent functionality.
 Provides increased possibility of improved failsafe and backup operations.

Assumptions: TOPS-20 only
 Dual port phased in as an option

Competitive Products:

SEE ATTACHED

<u>Proposed Schedule:</u>	<u>Plan/Spec</u>	<u>Code Freeze</u>	<u>Announce</u>	<u>Release</u>	<u>FCS</u>
	<u>April '77</u>	<u>Des. Comp.</u>			
		<u>July 78</u>	<u>Q1, FY79</u>	<u>Q1, FY79</u>	<u>Q2, FY79</u>
<u>Proposed Budget:</u>	<u>FY 78</u>	<u>53.3K</u>	<u>FY 79</u>	<u>62.9K</u>	

Product Cost Goals & Proposed Pricing:

		<u>Price Cost</u>	
DEC10 (RH20)	TTU78A-EW, EX	60	12.0
DEC20	TU78A-EA, EB	50	10.0
DEC10	TU78C-EA, EB	50	
DRIVE	TU78A-EE, EF	25	
	TU78C-EE, EF	25	

Major Risks:

Risk of not accomplishing 6250 bpi formatter. Risk of Tape Engineering
 not providing dual channel and tape switching. Risk of slip in schedule.

TU78Project Summary:

9-track (1600 PE and 6250 GER bpi) density, 125 inches per second, 780,000 characters per second transfer rate and capacity of 100 million characters. The drive is vendor supplied (PERTEC) based on TU77 drive with joint effort specified by DEC, industry compatible, auto load, vacuum column, dual channel tape switches. The controller (TM78) is DEC developed and introduces new 6250 GER bpi density formatter to DEC product line.

Specific Tasks:

1. Product definition and design review participation
2. Develop microcode loader
3. System reliability diagnostics and "print" interfaces to internal microdiagnostics.
4. System integration to DEC-10 and-20

Specific Non-Tasks:

1. TU78 will undergo Engineering Evaluation and Design Maturity Testing in Maynard.

Risks:

1. PERTEC 6250 Technology is new
2. Central Engineering Design Effort in very early stages.

COMPETITIVE COMPARISON

	DENSITY bpi	SPEED ips	TRANSFER KB/sec	<u>Channel</u>	PRICE \$K <u>Control & Drive</u>	<u>Drive</u>
IBM 3420-6	16/6250	125	780	66.5	65.1	25.7
STC 1900	16/6250	75	470		13.4 (OEM)	
STC 3650	16/6250	125	720		70.9	22.0
TU78	16/6250	125	720	60.0	50.0	25.0

LCG Development Beige Book
Product Summary

P.130

Product Designation DX20/TU70, 1, 2 Date 8 April 77 Rev. _____
 Product Family Low cost removable media storage Planned () Committed (X).
 System(s) DEC10 and DEC20 Priority FSG
 Product MGR H. Prindle Engineering MGR/Super. P. Wilson

Product Description: 9 track (1600 PE and 6250 GER bpi) density 125 ips
 780,000 character per sec and 100 megabyte reel capacity
 Both controller (TX02) and drive (TU72) are vendor supplied (STC) with the state of
 the art recording technique (GCR) providing high density high reliability storage for
 our high availability, high reliability markets.
 No PC layout of boards is included in this project.
 This is an FSG project.

Product Strategy: The TU72 will continue to be our high performance, high quality
 tape offerings to customers who are not satisfied with the TU78 functionality. The
 vendor capability also offers a 200 ips 6250 bpi drive which could improve the transfer
 rate capabilities of this family of drives.

Competitive Products: With total buyout and current accounting practices the TU72
 is uncompetitive on both systems and device level. This differential cost has impacted
 system sales as well as provided opportunity for independent supplies to sell to DEC10
 sites. (See attached).

<u>Proposed Schedule:</u>	<u>Plan/Spec</u>	<u>Code Freeze</u>		<u>Announce</u>	<u>Release</u>	<u>FCS</u>
		<u>Des.</u>	<u>Comp.</u>			
			<u>6/77</u>	<u>6/77</u>	<u>3/77</u>	<u>7/77</u>
<u>Proposed Budget:</u>		<u>FY 78</u>	<u>59.2K</u>	<u>FY 79</u>		

Product Cost Goals & Proposed Pricing:

		<u>Price</u>	<u>Cost</u>
<u>DX10</u>	<u>TU72</u>	<u>135</u>	<u>47.9</u>
<u>DX20</u>	<u>TU72</u>	<u>145</u>	<u>48.7</u>

Job Risks: The equivalent functionality (16 drive support, multipath support)
 has to be incorporated in TOPS10 and TOPS20 to improve competitive position.

COMPETITIVE COMPARISON

	DENSITY lpi	SPEED ips	TRANSFER KB/sec	Channel	PRICE \$K <u>Control & Drive</u>	<u>Drive</u>
IBM 3420-7	8/1600	200	320	57.1	56.0	24.4
STC 3470	8/1600	200	320	92.3 *	54.8	23.9
TU70 (DX10)	8/1600	200	320	100	73	27
TU70 (DX20)	8/1600	200	320	138	101	27
IBM 3420-6	16/6250	125	780	79.7	78.5	28.8
STC 3650	16/6250	125	780	111.2 *	73.7	27.4
TU72 (DX10)	16/6250	125	780	135	108	34.0
TU72 (DX20)	16/6250	125	780	135	108	34.0

Using SA-10 on DEC-10

LCG DEVELOPMENT BEIGE BOOK
FAMILY PLAN SUMMARY

Product Family Random Access Storage Date 8 April 77 Rev. _____

Product Manager H. Prindle Engineering MGR./Super. P. Wilson

Strategy/Goals summary:

Continue to support and evaluate the current random access storage products being offered to enhance their performance and keep their price attractive to avoid jeopardizing systems sales.

Introduce new products to meet the market demands for capacity, improved performance, data integrity and reliability. These new products are preferably products developed by DEC responsive to the product requirements defined by LCG.

(continued on 2nd page)

Major Risks:

Introduction of new discs by Data General and Hewlett Packard at very low prices has caused the RP04 to be noncompetitive with little margin left for price adjustment.

(continued on 2nd page)

C= committed
P= planned

8- Quarter Product Plan/Budget Summary

Product C/P System(s)	FY78	FY79	FY78				FY79				Priority
	Budget	Budget	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
1. 2020/RM03	21.3			④	⑤						6
2. RP07/RP08	62.4	61.6	①	-----	-----	-----	-----	⑤			4
3. 2020/INT DISC	107.0	85.5	①	-----	-----	-----	-----	⑤			6
4. 2020/Peripherals	56.1	30.0								⑤	6
5.											
6.											

LEGEND: ▽ PLAN/FUNC. SPEC. ▽ CODE FREEZE/DESIGN COMP. ▽ ANNOUNCE ▽ MFG/SDC REL. ▽ FCS

1	2	3	4	5
---	---	---	---	---

Note: At A minimum, (1) (3) (5) must be estimated. Add as many milestones as practical for committed products.

Strategy/Goals summary (cont'd)

Support LCG Systems Products with random access storage devices that provide optimum price, performance and satisfy application requirements as defined by market plans. Utilize corporate products where applicable to maximize revenue/profit.

OBJECTIVES

Establish a family of LCG random access storage products to meet specific market needs within a minimum of types to match the wide range of LCG system requirements. Ensure a growth path to the successor technology and/or products. Product margins and mix should provide optimum return on investment within the competitive environment.

TACTICS

1. The RP04 will continue to be the lowest capacity offering on DEC10 and DEC20 until such time that it is no longer price competitive. This point is projected to be January 1978,
2. The RP06 will continue to be the highest capacity offering on DEC10 and DEC20 with some margin for price adjustment to maintain a competitive position.
3. The RM03 will be offered as part of our new family of random access storage devices. The RM03 will be the lowest capacity offering within the family at 67MB but offer 50% improvement in transfer rate and compatibility with larger storage devices. It provides lower price response if the RP04 cannot be made competitively responsive. RM03 is on DEC 2020 only.
4. The RP07 will be offered as part of our new family of random access storage devices. The RP07 will be a large capacity state of the art technology (Winchester) offering providing the functionality required by the market demands. The new family should be made available by early Q2 1979.
5. Superdisk is an Advanced Systems product specific to a customer (STC) need, but also provides a near term response to large capacity (800 MB/drive) requirements and a contingency to the state of the art technology via the STC 8350 offerings. DEC would be performance responsive but not as price responsive as with RP07.

TACTICS (Cont'd)

6. The R80 development will provide a price competitive, state of the art technology product with more flexibility and commonality with other DEC products. The economy of scale of large production of this "Winchester Technology" removable disc that can be configured modularly into volume storage will make a very attractive offering by July 1979.
- 6A. Engineering will participate with Central Engineering in R80 controller and drive definition. Our goal is to arrive at a usable subsystem for the next system.
7. The swapping device based on charge coupled device (CCD) offering improved performance over rotating devices will be offered if cost goals, capacity and latency requirements can be met.
- 7A. Engineering will keep abreast of CCD etc. developments but no hardware project start is anticipated.
8. The 2020 INT DISC will give both a high performance and extremely cost effective approach to disc storage on the SM10. Savings for a one drive system is about \$3K cost with add-on savings of around \$1.5K per device.

MAJOR RISKS (Continued)

The development cycle for a corporate designed controller for R80 with competitive functionality may be too long to meet market window requirements.

The ability of corporate designers to create state of the art products (R80) within market window may be difficult to achieve. Also, commonality of needs between LCG and Central Engineering's other product line requirements may not be adequate enough for our future system requirements.

HARDWARE/SOFTWARE RELEASE SUMMARY

Device Class DISKS

Device	Controller	Channel	Hdw.Fcs.	Mon.Rev.	Mon.Load Test Start	Monitor Rel.	Remarks
RM03	MBA	RH11	Q3, FY78	TOPS-20 3.0 - SM	11/77	2/78	SM10 only.
RP07	RH20	-	Q2, FY79	TOPS-20 5.0	Q2, FY79	Q3, FY79	RP04 style and additional features.
RP06	DCL	RH11	2/78	TOPS-20 3.0 - SM	11/77	2/78	SM10 only (2020 peripheral)

LCG Development Beige Book
Product Summary

Product Designation 2020 / RM03 Date 8 April 77 Rev. _____
 Product Family RANDOM ACCESS STORAGE Planned () Committed ()
 System(s) DEC10 and DEC20 Priority 6
 Product MGR H. Prindle Engineering MGR/Super. P. Wilson

Product Description: A 15 megaword (36 bit) random access storage device providing 36ms average access with a transfer rate of 1.2 MB/sec maximum. It employs a removable 5 plotter media with 3330-II technology of 400 tracks per inch running at 3600 rpm. Slight improvement in performance at lower cost.

Product Strategy: The RM03 should be a responsive introduction to lower priced devices offered by competition.

Competitive Products: The DG And HP devices announced to complete in PDP-11 market will make the RP04 uncompetitive and probably drive the RM03 drive down to make it a justifiable offering for entry level .

<u>Proposed Schedule:</u>	<u>Plan/Spec</u>	<u>Code Freeze</u>	<u>Announce</u>	<u>Release</u>	<u>FCS</u>
		<u>Des. Comp.</u>			
		<u>Q2, FY78</u>	<u>Q2, FY78</u>	<u>Q2, FY78</u>	<u>Q3, FY78</u>

<u>Proposed Budget:</u>	<u>FY 78</u>	<u>21.3K</u>	<u>FY 79</u>	<u>φ</u>
-------------------------	--------------	--------------	--------------	----------

Product Cost Goals & Proposed Pricing:

	<u>Price</u>	<u>Cost</u>
RM03	\$18K	\$6.4K

Major Risks: Manufacturing capacity may not be in place and maintenance features not settled.

2020 RM03Project Summary:

A 15 megaword (36 bit) random access storage device providing 36 ms average access with a transfer rate of 1.2 MB/sec maximum. It employs a removable 5 plotter media with 3330-II technology of 400 tracks per inch running at 3600 rpm. Slight improvement in performance at lower cost.

Specific Tasks:

1. Complete 2020/RM03 Maintenance Mode Diagnostics

NOTE:

1. If the RM03 is not a corporate product this effort is not required.

LCG Development Reige Book
Product Summary

Product Designation RP07/RP08 Date 8 April 77 Rev.
 Product Family RANDOM ACCESS STORAGE Planned () Committed ()
 System(s) DEC10 and DEC20 Priority
 Product MGR H. Prindle Engineering MGR/Super. P. Wilson

Product Description: 120 mega random access storage device
 providing 20 ms average access with a transfer rate of 1.2 mb/sec
 maximum. This is a fixed media "Winchester Technology" with 480
 tracks per inch. It will provide all the RP functionality.
 It can also optionally
 provide up to 3.6 megabytes of fixed head faster access storage
 (8 ms) for swapping and in discs.

Product Strategy: The state of the art technology high capacity drives would
 be offered to our large users and prospects that are growing
 toward the 240 megaword (6-RP06) storage requirements and the RP06
 does not offer the price/performance competitive alternative. It
 would be offered with a compatible removable device (RM03) and a
 backup philosophy to justify its use.
 RP07/RP08 is introduced on TOPS-20 only.

Competitive Products:

IBM3350	317MB
CDC3380	635MB
SIEMONS	500MB
ISS	336MB
STC8350	317MB

<u>Proposed Schedule:</u>	<u>Plan/Spec</u>	<u>Code Freeze</u>	<u>Announce</u>	<u>Release</u>	<u>FCS</u>
	<u>Q1 '78</u>	<u>Des. Comp.</u>	<u>Q1, FY79</u>	<u>Q1, FY79</u>	<u>Q2 FY79</u>
<u>Proposed Budget:</u>	<u>FY 78</u>	<u>62.4K</u>	<u>FY 79</u>	<u>61.6K</u>	

Product Cost Goals & Proposed Pricing:

	<u>Price</u>	<u>Cost</u>
RP08 (240 megaword)	\$85	\$19K
Depopulated RP08 (120 megaword)	\$70	\$19K

Major Risks: Vendor will be supplying the entire subsystem design and manufacture
 Close cooperation between Central Engineering and the vendor is
 necessary.

RP07/RP08

Project Summary:

120 megaword (36 bit) random access storage device providing 20ms average access with a transfer rate of 1.2 mb/sec maximum. This is a fixed media "Winchester Technology" with 480 tracks per inch. It will provide all the RP functionality. It can also optionally provide up to 3.6 megabytes of fixed head faster access storage (8 ms) for swapping and in discs.

Specific Tasks:

1. System Engineering on DEC-10 and -20 applications
2. Diagnostic Development Support
3. System Reliability Testing

Specific Non-Tasks:

1. Engineering Evaluation and Design Maturity Testing be performed by Maynard.

Assumptions:

1. First Customer Ship to be Q2 - Q4, FY'79.
2. Vendor product will have internal microdiagnostics such that LCG need not write "maintenance mode diagnostics".

Problems:

1. A vendor has not been selected to date
2. Disk Engineering is in a state of budget fluctuation. We therefore, are not sure as to type of product or specific time frame.

LCG Development Beige Book
Product Summary

P.140

Product Designation	<u>2020/INT DISC</u>	Date	<u>8 April 77</u>	Rev	<u> </u>
Product Family	<u> </u>	Planned ()	<u> </u>	Committed ()	<u> </u>
System(s)	<u>2020</u>	Priority	<u>6</u>		
Product Manager	<u> </u>	Engineering Mgr/Super	<u>Previd/Wilson</u>		

Product Description: This is a controller attaching to the SM10 bus and driving the CDC 9762 drives used in the RM01. One controller with drive 4 CDC drives. The new controller offers a \$3K savings over the RH11/RM01 approach with \$1.6K per drive savings for add-ons. It will provide the same level of functionality as an RP04 system.

Product Strategy: Replace RH11/RM03 with the new controller for volume ship machines thus achieving low cost and eliminating the Unibus bandwidth restrictions of RH11/RM03. This project is a design and prototype effort only for FY78. No dollars exist for proto material or outside cost center support. As estimated, this product will be produced with MULTI-wire technology.

Competitive Products:

<u>Proposed Schedule:</u>	<u>Plan/Spec</u>	<u>Code Freeze</u>	<u>Announce</u>	<u>Release</u>	<u>FCS</u>
		<u>Des. Comp.</u>			
	<u>Q1'78</u>	<u>Q1, FY79</u>	<u>Q1, FY79</u>	<u>Q2, FY79</u>	<u>Q2'79</u>
<u>Proposed Budget:</u>	<u>FY78</u>	<u>107K</u>	<u>FY79</u>	<u>85.5K</u>	

Product Cost Goals & Proposed Pricing:

Major Risks: No budget exists other than for 35E man power. No diagnostic dollars.

2020 INT DISKProject Summary:

This is a controller attaching to the SMIØ bus and driving the CDC 9762 drives used in the RMØ1. One controller with drive 4 CDC drives. The new controller offers a \$3K savings over the RH11/RMØ1 approach with \$1.6K per drive savings for add-ons. It will provide the same level of functionality as an RPØ4 system.

Specific Tasks:

1. Design Multiwire Prototype for 2020 Disk Controller with layout of interconnect only.
2. Develop Maintenance Diagnostics

Specific Non-Tasks:

1. GR Testing not in Budget
2. High Volume Manufacturing Phase-In not in Budget
3. Etch layout not in Budget

Assumptions:

Disk to used is an RMØ3

Risks:

1. Circuit analysis effort not in Budget.

Product Designation	2020/Peripherals	Date	8 April 77	Rev.	
Product Family		Planned ()		Committed ()	
System(s)	2020	Priority	6		
Product MGR	H. Prindle	Engineering MGR/Super.	P. Wilson		

Product Description:

The DEC RP04/RH11 and TU45/RH11 will be integrated into the 2020 I/O subsystem to provide tape and disk storage for the product. Up to 8 80MB RM03 drives can be supported on the system. Diagnostics for these options are developed as part of this project. Also DZ11 and DUP11 diagnostics are included.

Product Strategy:

Provide on line disk storage/swapping and a tape interchange/backup product for the 2020.

Competitive Products:

RP04/RP06

<u>Proposed Schedule:</u>	<u>Plan/Spec</u>	<u>Code Freeze</u>		<u>Announce</u>	<u>Release</u>	<u>FCS</u>
		<u>Des.</u>	<u>Comp.</u>			
	Q1	Q3, FY78		Q3, FY78	Q4, FY78	Q4, FY78

<u>Proposed Budget:</u>	FY 78	56.1K	FY 79	30.0
-------------------------	-------	-------	-------	------

Product Cost Goals & Proposed Pricing:

Major Risks:

Software must accomodate high transfer rate of RM03 by scheduling disk transfers.

2020 PERIPHERALSProject Summary:

The DEC RP04/RH11 and TU45/RH11 will be integrated into the 2020 I/O subsystem to provide tape and disk storage for the product. Up to 8 80MB RM03 drives can be supported on the system.

Specific Tasks:

1. Diagnostic for RH11/RM03, RH11/TU45, DZ11 and DUP11.
2. System Integration of Devices on 2020 System

Risks:

1. Low technical risk, consisting of translation from PDP-11 Diagnostics.

LCG Development Beige Book
Family Plan Summary

P.144

Product Family CHANNEL INTERFACE Date 8 April 77 Rev. _____

Product Manager H. Prindle Engineering MGR./Super. P. Wilson

Strategy/Goals summary:

(See DEC-20 PER INT)

Major Risks:

C= committed
P= planned

8- Quarter Product Plan/Budget Summary

Product C/P	System(s)	FY78	FY79	FY78				FY79				Priority
		Budget	Budget	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
1.	DEC-20 PER INT	64.2	85.2	1							5	
2.												
3.												
4.												
5.												
6.												

LEGEND: PLAN/FUNC. SPEC. CODE FREEZE/DESIGN COMP. ANNOUNCE MFG/SDC REL. FCS

1	2	3	4	5
---	---	---	---	---

Note: At A minimum, (1) (3) (5) must be estimated. Add as many milestones as practical for committed products.

Product Designation DEC-20 PER INT Date 2/77 Rev. _____
 Product Family _____ Planned () Committed ()
 System(s) DEC-10 & DEC-20 Priority _____
 Product MGR H. Prindle Engineering MGR/Super. F. Freyid/P.Wil

Product Description: A flexible and versatile interface for DEC-20 must be provided to allow the attachment of:

- (1) Electrostatic Plotters
- (2) Paper tape readers and Punches
- (3) Card Punches
- (4) Incremental Plotters
- (5) Diskette devices
- (6) Specials

The product provides a Unibus interface to the DEC-20. An 11 system with special peripherals may then be attached.

Product Strategy: The DEC-20 is currently limited to the support of line printers and card readers. A large number of customers are requesting the attachment of I/O devices other than that currently offered. A standard solution to support medium volume peripherals provides a reasonable source of revenue for DEC-20 systems. This project develops the interface from DEC-20 to the Unibus but is restricted by budget limitations this year. This project starts Q2, FY78-and the goal for FY78 is to provide the design and prototype.

Competitive Products:

<u>Proposed Schedule:</u>	<u>Plan/Spec</u>	<u>Des. Comp.</u>	<u>Announce</u>	<u>Release</u>	<u>FCS</u>
	<u>Q1'78</u>	<u>Q1, FY79</u>	<u>Q1, FY79</u>	<u>Q2, FY79</u>	<u>Q3, '79</u>

<u>Proposed Budget:</u>	<u>FY 78</u>	<u>64.2</u>	<u>FY 79</u>	<u>85.2</u>
-------------------------	--------------	-------------	--------------	-------------

Major Risks:

Budget insufficient to provide high bandwidth solution to peripheral add-ons for this year. Three (3) man/quarters of Diagnostics has been shifted to FY79.

Major Risks:

DEC-20 PER INTProject Summary:

A flexible and versatile interface for DEC-20 must be provided to allow the attachment of:

- (1) Electrostatic Plotters
- (2) Paper Tape Readers and Punches
- (3) Card Punches
- (4) Incremental Plotters
- (5) Diskette devices
- (6) Specials

The product provides a Unibus interface to the DEC-20. An 11 system with special peripherals may then be attached.

Specific Tasks:

1. Design and build a wirewrap prototype model in FY'78.
2. Diagnostic Design Effort in Q1, FY'78. Coding effort start Q2, FY'78.

Specific Non-Tasks:

1. GR Testing not in Budget till FY'79
2. PC Board Layout not in Budget till FY'79
3. Manufacturing Start up not in Budget till FY'79

NOTE:

The PC20 and CP20 projects are the first two products supported by this project.

Product Family Peripherals/Unit ReDate 8 April 77 Rev. _____

Product Manager Dave Kiarsis Engineering MGR/Super. F. Previd

Strategy/Goals Summary:

Re-evaluate current I/O objective to identify possible enhancements or costs reductions to extend product life. Define technology equipment pursuant to marketing needs and monitor development of products responsive to these definitions. Optimize product mix to attain optimum return on investment within the product lines.
Support LCG Systems Products with input and output devices that enhance system capabilities and provide optimum price, performance and satisfy application requirements as defined by market plans. (Continued on attache Page...)

Major Risks:

C = committed
P = planned

8 - Quarter Product Plan/Budget Summary

Product C/P System(s)	FY78	FY79	FY78				FY79				Prior
	Budget	Budget	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
1. LP07	38.6	∅	①		⑤						1
2. LP14	11.∅	∅									1
3.											4
4. PC2∅	41.9	∅	①			⑤					PLS
5. CP2∅	57.3	∅	①					⑤			PLS
6.											

LEGEND: ▽ PLAN/FUNC SPEC ▽ CODE FREEZE/DESIGN COMP ▽ ANNOUNCE ▽ MFG/SDC REL ▽
 1 2 3 4 5

NOTE: At a minimum, (1) (3) (5) must be estimated. Add as many milestones as practical for committed products.

LCG DEVELOPMENT BEIGE BOOK
FAMILY PLAN SUMMARY

Strategy/Goals Summary (continued...)

Establish a family at I/O products to meet specific market within a minimum of types to match a wide range at LCG system requirements. The products should be responsive to the competitive environment and satisfy LCG customer media devices.

Product Designation LP07 Date 8 April 77 Rev. _____
 Product Family Peripherals Planned () Committed ()
 System(s) _____ Priority _____
 Product MGR H. Prindle Engineering MGR/Super. M. Drumm

Product Description: The LP07 is a 1220 LPM 132 print position charaband* printer developed by Dataproducts. Currently offered by ASG as high speed, high duty cycle, reliable printer for large systems with heavy printed output usage. The charaband* design provides improved quality of print and flexibility of character font selection. This project includes evaluation and testing of LP07-A, DP's new version of the LP07, DEC STD 102 testing, any mods to interface, diagnostic and/or maintenance manual as a result of the LP07-A. The current funding assumes printers shipment out of ASG MFG. in FY78.

Product Strategy:

The LP07 has had a high level of acceptance after announcing as an ASG product with levels of product forecasted up to 20 units per quarter. With that level of activity the vendor (DPC) is willing to discuss lower purchase prices and the printer should be qualified as a standard offering.

Competitive Products:

IBM 1403-AN - this is the printer that most users use as a benchmark of comparison.

<u>Proposed Schedule:</u>	<u>Plan/Spec</u>	<u>Code Freeze</u>	<u>Announce</u>	<u>Release</u>	<u>FCS</u>
	<u>Aug. 77</u>	<u>Des. Comp.</u>	<u>Oct. 77</u>	<u>Dec. 77</u>	<u>Jan. 78</u>

Proposed Budget: FY 78 38.6K FY 79 _____

Product Cost Goals & Proposed Pricing:

	<u>Price</u>	<u>Cost</u>
LP100 - B	\$ 68,250	\$ 23,915
LP200 - B	63,000	20,865

Major Risks:

Charaband technology still in infancy stage. New technology replacing this product.

LP07Project Summary:

This project is aimed at evaluating the new version of the LP07 being produced by Dataproducts, putting the printer through DEC STD 102 testing and providing continuing support for the product during FY'78, and also for the LP100, and LP20.

Specific Tasks:

1. Evaluation of changes in LP07, effect on diagnostics and LP20 and LP100 Controller.
2. Revise Purchase Specification.
3. DEC STD 102 testing
4. Evaluate KEVLAR Band
5. Revise maintenance manual.
6. Continuing support (Manufacturing and ECO)
7. Incoming Inspection Specification
8. Continuing support (Manufacturing and ECO) for LP07, LP20, LP100.

Specific Non-Tasks:

1. Does not include dollars to fund Line Printer Engineering for evaluation.
2. Continuing support for LP100.

Project Disapproval Risks:

Dataproducts is pressing ahead full steam implementing design improvements to the LP07. These improvements are based upon design change inputs from DEC and other companies/customers. Project disapproval would leave LCG wide open to any mechanical or interface problems caused by the changes and DEC would not have an updated purchase specification. Dataproducts is also replacing the standard Charaband with an improved band because of a field failure rate of 10 - 20%. Project disapproval would not allow complete evaluation of this new band.

Product Designation	LP14	Date	8 April 77	Rev.
Product Family	Peripherals	Planned ()	Committed ()	
System(s)		Priority		
Product MGR	Hap Prindle	Engineering MGR/Super.	M. Drumm	

Product Description:

900 LPM 132 print position drum printer with automatic vertical format unit and long line interface. Provides faster printed output based on LP05 technology currently a standard offering. A new introduction from Dataproducts.

LP20-C/D (LP14 on DEC-20)
LP100-F/H (LP14 on DEC-10)

This project is follow-on support of the LP14.

Product Strategy:

Provides midrange printed output capability between 300 LPM (LP05) and 1200 LPM (LP10 or LP07) at attractive price. Fill out product option for printing across the full range of systems.

Competitive Products:

<u>Proposed Schedule:</u>	<u>Plan/Spec</u>	<u>Code Freeze</u>		<u>Announce</u>	<u>Release</u>	<u>FCS</u>
		<u>Des.</u>	<u>Comp.</u>			

<u>Proposed Budget:</u>	FY 78	11.0K	FY 79	0
-------------------------	-------	-------	-------	---

Product Cost Goals & Proposed Pricing:

	<u>Price</u>	<u>Cost</u>
LP20 - C	\$ 34,125	\$9212.58 + 1333 = 10,546
LP20 - D	35,385	9747.58 + 1333 = 11,081
LP100- F	41,475	9212.58 + 1333 = 12,697
LP100- H	42,275	9747.58 + 1333 = 13,232

Major Risks:

- Reliability of product undetermined at this time.
- Customer usage higher than anticipated for midrange unit.
- Change of Engineering personnel during product release cycle.

LP14

Project Summary:

This is a continuing support project for the LP14 and includes dollars for manufacturing, ECO and Technical Documentation support for FY'78.

Specific Tasks:

1. Manufacturing/ECO support
2. Technical Documentation support for maintenance manual revision
3. Diagnostic ECO/support

Specific Non-Tasks:

Continuing support for LP10.

Project Disapproval Risks:

No continuing support for LP14 could result in manufacturing reluctance/refusal to ship/support product, and equivalent field service reaction.

Product Designation	<u>PC20</u>	Date	<u>8 April 77</u>	Rev.	
Product Family	<u>Peripherals</u>	Planned ()		Committed ()	
System(s)		Priority			
Product MGR	<u>H. Prindle</u>	Engineering MGR/Super.			

Product Description:

This project will put a paper tape reader/punch on a PDP-11 interface attached to a DEC-20. It will use the same general interface as the one used for the CP20. The project includes product specification, documentation, release and support. This project depends on the DEC-20 peripheral interface project.

Tasks:

1. Product specification and release
 2. Documentation
 3. Continuing support
 4. Diagnostic support
-

Competitive Products:

<u>Proposed Schedule:</u>	<u>Plan/Spec</u>	<u>Code Freeze</u>	<u>Announce</u>	<u>Release</u>	<u>FCS</u>
	<u>Aug. 77</u>	<u>Des. Comp.</u>	<u>Dec. 77</u>	<u>Apr. 78</u>	<u>June 78</u>
		<u>Oct. 77</u>			

Proposed Budget: FY 78 41.9K FY 79

Product Cost Goals & Proposed Pricing:

Interface to other reader/punches other than PC11 not part of project.

PC20Project Summary:

This project will put a paper tape reader/punch on a PDP-11 interface attached to a DEC-20. It will use the same general interface as the one used for the CP20. The project includes product specification, documentation, release and support. This project depends on the DEC-20 peripheral interface project.

Specific Tasks:

1. Product specification and release
2. Documentation
3. Continuing support
4. Diagnostic support

Specific Non-Tasks:

1. Interface of other reader/punches other than PC11.

Project Dissapproval Risks:

Same as CP20.

LCG Development Beige Book
Product Summary

P.156

Product Designation	CP20	Date	8 April 77	Rev.	
Product Family	Peripherals	Planned ()	Committed ()		
System(s)		Priority			
Product MGR	H. Prindle	Engineering MGR/Super.	M. Drumm		

Product Description:

This project will put an LC50 MOD II Card Punch on a PDP-11 interface. Specification for using the peripheral interface that the card punch is attached to will be produced. This project depends on the DEC-20 peripheral interface project.

Tasks:

1. Product Specification and evaluation
2. CP20 Interface evaluation and purchase specification
3. Peripheral Interface documentation and specification and release
4. Diagnostic development for LC50.

Competitive Products:

<u>Proposed Schedule:</u>	<u>Plan/Spec</u>	<u>Code Freeze</u>	<u>Announce</u>	<u>Release</u>	<u>FCS</u>
	Sept. 77	Des. Comp. Jan. 78	Apr. 78	June 78	July 78

<u>Proposed Budget:</u>	FY 78	57.3K	FY 79
-------------------------	-------	-------	-------

Product Cost Goals & Proposed Pricing:

Major Risks: Peripherals will continue to be attached by outside engineering groups over asynchronous lines, resulting in decreased functionality and wider use of vendor peripherals for equivalent DEC produced peripherals and/or high interface cost.

CP20Project Summary:

This project will put an LC50 MOD II Card Punch on a PDP-11 interface. Specification for using the peripheral interface that the card punch is attached to will be produced. This project depends on the DEC-20 peripheral interface project.

Specific Tasks:

1. Product Specification and evaluation
2. CP20 Interface evaluation and purchase specification.
3. Peripheral Interface documentation and specification and release
4. Diagnostic development for LC50

Specific Non-Tasks:

1. Card Reader Specification and support
2. Additional option support

Project Disapproval Risks:

Peripherals will continue to be attached by outside engineering groups over asynchronous lines, resulting in decreased functionality and wider use of vendor peripherals for equivalent DEC produced peripherals, and/or high interface cost.

LCG Development Beige Book
Family Plan Summary

P.158

Product Family Communications Date 8 April 77 Rev. _____
Product Manager Dave Kiarsis Engineering MGR/Super. F.Previd

Strategy/Goals Summary:

See Attached Sheets.

Major Risks:

1 = committed
2 = planned

8 - Quarter Product Plan/Budget Summary

Product C/P System(s)	FY78	FY79	FY78				FY79				Priority
	Budget	Budget	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
1. LA12/VT100/KRY	22.3	95	①			④		⑤			4
2. VT62	40.4		①		③	⑥					PLS (C
3. DN20/21/25	31.3	25.0									1
4. DN98/TOPS20/HDW	25.6	15.0			③	⑤					1
5. Network Diagnostic	38.7	136.5	①							⑤	4
5. Network Perform.	20.6	60.0	①						④	⑤	4

LEGEND: ▽ PLAN/FUNC SPEC ▽ CODE FREEZE/DESIGN COMP ▽ ANNOUNCE ▽ MFG/SDC REL ▽
1 2 3 4 5

NOTE: At a minimum, (1) (3) (5) must be estimated. Add as many milestones as practical for committed products.

COMMUNICATIONS FAMILY PLAN SUMMARY

I. Overall Communication Goals

Stress function equivalence and communication commonality coexistence between DECsystem-10 and -20, supporting migration to -20 series products and corporate communications architecture.

Provide leadership and systems technical direction in communications network design, implementation, diagnosis and support.

Support LCG Return on Investment goals by reducing product proliferation, stressing system to system hardware commonality, and lowering warranty and product support costs.

Reduce product line engineering costs and increase engineering efficiency by leveraging development support, training and documentation efforts into compatible corporate programs consistent with acceptable risk criteria.

II. Implementation Strategy

The overall implementation strategy is to consistently orient end products and technical decisions toward the incremental/continuing achievement of the above goals.

Specifically, projects are planned in the areas of network/node performance and diagnosis, new terminal products, follow-on communication product support, standard/common communication product offerings on -10's and -20's (both front ends and remote) and new and interim system communication planning and support. Guidelines will be provided for the sales force and field service in the customer orientation and configuration of network systems. Documentation will be provided for DEC preferred or supported Telephone Comm. Hdw.

III. DEC-20 Communications Goals

Phase II

- Basic communication capabilities on secondary front end.
- RJE and terminal concentration
- IBM co-existence

IV. DEC-20 Communications Goals (continued...)

- Corporate network compatibility
- First phase of transaction processing communications capability

Implementation

These goals are satisfied by the following current/planned projects:

- The DN20 communications front end on the -20 that provides low and high speed synchronous links and asynchronous terminal support.
- The current DN98 remote concentrator project and the proposed extremely low cost remote project, both providing RJE and remote terminal concentration.
- Initial 2780/3780 and HASP multileaving support on the DN20 at Release 3.
- Commitment to DECNET communications network architecture on the -20 for Release 3 and beyond.
- Current and planned terminal projects on VT62 multidrops specifications. Follow on projects for continuing communication support of DN20 and -20 remote station are planned.
- Sales and Field Service Telephone Communications

V. Phase III Goals

- Enhanced IBM co-existence (SNA)
- World Standard protocol interfaces - X.25
- Full implementation of MCB (distributed processing entry products for remote file access, etc.).
- Network/remote diagnosis capability.
- Marketing/technical communications performance specifications.
- Console Front End enhancements.

VI. Implementation Strategy

The first three goals are primarily software oriented. It is perceived that because of the heavy corporate impetus on communications networks and LCG's implementation of these networks on both the -10 and -20 systems, network and remote node diagnostic tools are required to lower current and projected product support costs. Network diagnostic efforts would concentrate on initially developing manual/semi automatic procedures for Field Service to trouble shoot networks. A plan and implementation strategy for a more generalized form (automatic) form of network diagnosis will be developed. Follow on projects would implement the next level of network diagnostics to include automatic network mapping, fault location, monitoring of RSL, SNR and message traffic/errors etc. The end product would be a DEC implemented or recommended vendor network/technical control station. Maximum coordination/compatibility/leverage would be maintained with corporate DECNET/RAS efforts.

A project for network performance is planned to produce a marketing/technical guide for matching customer throughput requirements to LCG communications system offerings. The product would be a tool/configurator for marketing/salesmen to specify number/types/speed of communication lines that individual network nodes can support. The project would develop throughput tables, general response times, and a method/test procedure to be used during development/field test to obtain performance figures concurrently with system development. An extension of this project could include the development of a standard network acceptance test procedure.

VII. DEC-10 Communications Goals

- Hardware/Software compatibility with DEC-20 communications.
- Migration to DEC-20 communications
- More reliable, supportable, higher performance communications capabilities.

VIII. Implementation Strategy

The major thrust of DEC-10 communications will be to replace current DEC-10 networking with MCB and ultimately provide a migration path to future DEC-20 products. Initial compatibility with DECNET (early version) was achieved through the DECNET compatible port. Enhancing this product to accommodate version 2 will provide compatibility with Release 3 DEC-20 communications (task-task). Replacement of the DN87 and DN87S Front Ends with the DN20 along with MCB on TOPS-10 provides a hardware/software compatibility product on the -10 with DEC-20 communication functionality. This product also provides an easy communications migration path to DEC-20 systems. The hardware strategy is to capitalize very heavily on the DN20 development effort. The only risk seen is the DN87 replacement (DN20 on DL10). Migration of a -20 remote stations to the -10 would occur at the same time.

MD/ik

HARDWARE/SOFTWARE RELEASE SUMMARY

Device Class COMMUNICATIONS

Device	Controller	Channel	Hdw. Fcs.	Mon. Rev.	Mon. Load Test Start	Monitor Rel.	Remarks
DN20	-	DTE	6/15/77	TOPS-20 3.0		1/78	Task to task.
DN98	-			TOPS-20 5.0		Q3, FY79	
VT62				TOPS-10 4.0		Q4, FY78	Issue is VT100 to supercede VT62.
DUP11	-	DW10B	2/78	TOPS-20 3.0 - SM			SM10 only (2020 Peripheral)
DZ11	-	DW10B	2/78	TOPS-20 3.0 - SM	11/77	2/78	SM10 only (2020 Peripheral)
DN21		DTE		TOPS-20 4.0		6/78	
DN25		DTE		TOPS-20 4.0		6/78	
DN92				TOPS-20 5.0		Q3, FY79	
DN64		DTE	6/15/77	TOPS-20 3.0		1/78	IBM 2780 Lofgren to support.
DN98				TOPS-10 Lofgren			LIR

Product Designation LA12/VT100/KRY Date 8 April 77 Rev. _____
 Product Family Communications Planned () Committed ()
 System(s) _____ Priority _____
 Product MGR Dave Kiarsis Engineering MGR/Super. _____

Product Description:

Budget for terminals for LCG, VT100, LA120, and Krypton remote station. Support release of terminals, diagnostics and associated hardware interfaces. In FY79 develop low cost remote station to replace DAS 92. Unit could also be used for an inexpensive TP controller and/or word processing work station.

Product Strategy:

NOTE: FY79 spending for low cost remote using KRYPTON.

Competitive Products:

Proposed Schedule:	Plan/Spec	Code Freeze		Announce	Release	FCS
		Des.	Comp.			
VT100 Terminal	<u>Aug. 77</u>	<u>Jan. 77</u>		<u>Apr. 77</u>	<u>June 77</u>	<u>Jul. 77</u>

Proposed Budget: FY 78 22.3K FY 79 95.0K

Product Cost Goals & Proposed Pricing:

Major Risks:

LAl2Ø, VT1ØØ/KRY

Project Summary:

This project is aimed at evaluation, support and release to manufacturing of the LAl2Ø, VT1ØØ terminals. Also included is a paper design effort for a KRYPTON based remote station.

Specific Tasks:

Terminals

1. Evaluation of hardware/microcode
2. Configuration and interface specification
3. Manufacturing support (Acceptance Test Procedure)

Remote Station

1. Functional Specification

Specific Non-Tasks:

Terminals

1. Special Diagnostic development (use existing diagnostic)

Remote Station

1. Hardware breadboard/prototypes
2. Drafting or Diagnostics
3. Manufacturing integration or support

Product Designation	<u>VT62</u>	Date	<u>8 April 77</u>	Rev.	<u> </u>
Product Family	<u>Communications</u>	Planned ()	Committed ()		
System(s)		Priority			
Product MGR	<u>Dave Kiarsis</u>	Engineering MGR/Super.			

Product Description:

This project develops multidrop specifications and configuration guidelines for using the VT62 multidrop terminal for transaction processing environments on the DEC-20. Also included is hardware evaluation and diagnostic development.

Product Strategy:

Competitive Products:

<u>Proposed Schedule:</u>	<u>Plan/Spec</u>	<u>Code Freeze</u>			
	<u>Sept. 77</u>	<u>Des. Comp.</u>	<u>Announce</u>	<u>Release</u>	<u>FCS</u>
		<u>Nov. 77</u>	<u>Feb. 78</u>	<u>May 78</u>	<u>June 78</u>

Proposed Budget: FY 78 40.4 FY 79

Product Cost Goals & Proposed Pricing:

Major Risks:

VT62

Project Summary:

This project includes evaluation of the VT62 and product specification for LCG markets. It includes release to manufacturing and diagnostic evaluation and support.

Specific Tasks:

1. Terminal evaluation: hardware/microcode
2. Multidrop specifications, load limits, response times
3. Existing diagnostic qualification
4. Manufacturing support (Acceptance/Test Procedures).

Specific Non-Tasks:

1. Special diagnostic development

Project Disapproval Risks:

VT62 could not be shipped out of LCG.

Product Designation	DN20/21/25	Date	8 April 77	Rev.	
Product Family	Communications	Planned ()	Committed ()		
System(s)		Priority			
Product MGR	Dave Kiarsis	Engineering MGR/Super.		M. Drumm	

Product Description:

Finish maintenance manual. Initiate follow on support. Budget for ECO changes resulting from field test. Support build and test of first six DN20's for field test. Follow on support for DN87, DN87S, DAS92, DC20, DAS 61, DAS 62.

Product Strategy:

Competitive Products:

<u>Proposed Schedule:</u>	<u>Plan/Spec</u>	<u>Code Freeze</u>		<u>Announce</u>	<u>Release</u>	<u>FCS</u>
		<u>Des. Comp.</u>				
<u>Proposed Budget:</u>	FY 78	31.3		FY 79	25.0	

Product Cost Goals & Proposed Pricing:

Major Risks:

DN20/21/25

Project Summary:

This is a continuing support project for communications. It includes money for finishing the DN20 maintenance manual in Q1 and Q2 and continuing product engineering for the DN20, 21, 25, DN87, DN87S, DN80 series, DAS92 and DC76. Support for the DN98 is included in the DN98/TOPS20/HDW Project.

Specific Tasks:

The dollars in this project cover:

1. Maintenance manual for DN20/21/25
2. Low level ECO support for Communication Systems, Phase-In
3. Diagnostic revision support
4. Manufacturing support
5. Technical Publication support for Maintenance Manual revision.

Specific Non-Tasks:

The money in this budget does not cover:

1. ECO and/or support activity for the DL10 and other older communication devices not listed above.
2. Retrofit ECO's
3. Model shop construction
4. Computer usage charges for system related engineering.

Project Disapproval Risks:

No formal support for communications projects would be available and the maintenance manual for the DN20 would not be written. Many of the engineers for the above projects are no longer available for continuing support (due to moves, promo's, etc.), and without a formal support commitment, lead time for support would greatly increase.

LCG Development Beige Book
Product Summary

Product Designation	<u>DN98/TOPS20/HDW</u>	Date	<u>8 April 77</u>	Rev.	<u> </u>
Product Family	<u>Communications</u>	Planned ()		Committed ()	
System(s)		Priority			
Product MGR	<u>Dave Kiarsis</u>	Engineering MGR/Super.			

Product Description:

This is a continuing support project for the DN98. Included here is funding for the maintenance manual and manpower for ECO support.

Product Strategy:

Competitive Products:

<u>Proposed Schedule:</u>	<u>Plan/Spec</u>	<u>Code Freeze</u>			
		<u>Des. Comp.</u>	<u>Announce</u>	<u>Release</u>	<u>FCS</u>
	<u>Q1, FY78</u>	<u>Q2, FY78</u>	<u>Q3, FY78</u>	<u>Q3, FY78</u>	<u>Q4, FY78</u>

<u>Proposed Budget:</u>	FY 78	25.6K	FY 79	15K
-------------------------	-------	-------	-------	-----

Product Cost Goals & Proposed Pricing:

Major Risks:

DN98/TOPS20/HDW

Project Summary:

This project is for finishing off the DN98 print set and maintenance manual in Q1 and Q2, and continuing support in Q3 and Q4. It assumes that a great deal of the technical detail and support activity for the DN98 is accomplished in Q4, FY'77.

Specific Tasks:

The dollars in this project cover:

1. Maintenance manual for DN98
2. Drafting cleanup
3. Manufacturing support
4. Continuing ECO and manual revision support

Specific Non-Tasks:

1. Major revisions in the DN98 architecture based on future MCB release/support commitment plans.
2. Specials on the DN98 and major enhancements
3. Support for the design of a low cost remote station
4. Network and/or network diagnostic specifications and support
5. Diagnostic ECO support

Project Disapproval Risks:

The DN98 would not ship.

Product Designation	Network Diagnostics	Date	8 April 77	Rev.	
Product Family	Communications	Planned ()	Committed ()		
System(s)		Priority			
Product MGR	Dave Kiarsis	Engineering MGR/Super.		M. Drumm	

Product Description:

Develop manual/semi automatic procedures for field service to trouble shoot networks. Develop plan for more generalized (automatic) format network diagnostics. In FY79, develop product that implements second level of network diagnostics. Remote terminal map of networks fault location, possible monitoring of RSL, SNR and message traffic. Develop procedures for using reverse diagnostic channel on specified modems.

SPECIFIC TASKS:

1. Specification, documentation and possibly standardization of software/hardware modem control.
 2. Documentation of manual isolation techniques for troubleshooting networks, recommended test equipment.
 3. Specification of preferred vendor modems containing diagnostic features
 4. DECNET RAMP support.
-

SPECIFIC NON-TASKS:

1. Remote diagnostics development. (KLINIK in a remote).
 2. Development of a Tech. Control/Network Control Station.
 3. Channel noise/error rate analysis.
-

<u>Proposed Schedule:</u>	<u>Plan/Spec</u>	<u>Code Freeze</u>			
		<u>Des. Comp.</u>	<u>Announce</u>	<u>Release</u>	<u>FCS</u>
	<u>Sept. 77</u>	<u>Nov. 78</u>	<u>-</u>	<u>June 78</u>	<u>Q4, FY79</u>

<u>Proposed Budget:</u>	<u>FY 78</u>	<u>38.7</u>	<u>FY 79</u>	<u>136.5</u>
-------------------------	--------------	-------------	--------------	--------------

Product Cost Goals & Proposed Pricing:

Major Risks:

NETWORK DIAGNOSTICSProject Summary:

This project is aimed at initially, developing manual/semi-automatic methods for troubleshooting networks. Contact will also be maintained with DECNET RES and RAMP groups to input LCG's requirements for more sophisticated diagnostic systems.

Specific Tasks:

1. Specification, documentation and possibly standardization of software/hardware modem control.
2. Documentation of manual isolation techniques for troubleshooting networks, recommended test equipment.
3. Specification of preferred vendor modems containing diagnostic features.
4. DECNET RAMP support.

Specific Non-Tasks:

1. Remote diagnostics development. (KLINIK in a Remote)
2. Development of a Tech. Control/Network Control station.
3. Channel noise/error rate analysis.

Project Disapproval Risks:

Warranty costs are currently high and appear to be growing in the network area. LCG will soon be shipping the largest network sold by DEC to the New Zealand Department of Health, and DECNET networks will be shipping in FY'78 and '79. No diagnostic documentation or training currently exists specifically for networks, only for hardware devices used for communications. Without some basic diagnostic procedures/tools complex systems problems that inherently exist in networks could cause extremely high warranty and/or BMC charges, and the expenditure of large amounts of engineering time to solve field network problems on an individual basis.

Product Designation	Network Performance	Date	8 April 77	Rev.	
Product Family	Communications	Planned ()	Committed ()		
System(s)		Priority			
Product MGR	Dave Kiarsis	Engineering MGR/Super.	M. Drumm		

Product Description:

Develop tool/configurator for marketing and salesmen to specify number/types/speed of comm lines that individual network nodes can support. Develop throughput tables, response times under general circumstances. Develop a method/test procedure we can use during development/field test to get these numbers in the future. Develop Acceptance Tests for network configurations. Generate field service training documentation for general network and telephone communications.

Product Strategy:

Competitive Products:

<u>Proposed Schedule:</u>	<u>Plan/Spec</u>	<u>Code Freeze</u>			
	Sept. 77	Des. Comp.	Announce	Release	FCS
		Feb. 78	-	Mar. 79	June 79
<u>Proposed Budget:</u>	FY 78	20.6	FY 79	60K	

Product Cost Goals & Proposed Pricing:

Major Risks:

NETWORK PERFORMANCEProject Summary:

This project will develop a configurator (tool) that marketing and salesmen can use to specify the number, types and speed of communication lines that individual network nodes can support. Throughput tables and response times under general circumstances will be developed.

Specific Tasks:

1. Basic throughput analysis of remote stations (DN98, DAS 80) front ends (DN87, DN87S, DN20). Assumes code for DN98 and DN20 available by December 1977.
2. Response time analysis using system loading as a parameter.
3. Cost/Performance analysis to help define marketing strategies and trade-offs between remote stations, TDM MUX's, multidrop lines, etc.

Specific Non-Tasks:

1. Application dependent throughput analysis
2. Statistical analysis/simulation
3. Sales/benchmark support

Project Disapproval Risks:

Marketing and field salesmen have a difficult time matching customer network/workload requirements to communications products currently developed by LCG.

Risks of inadequate information include

- A. Higher system costs to customers who buy more than they need.
- B. Customer dissatisfaction over communications systems not matched to their requirements.

