

VAX-11/730 BUSINESS PLAN

PHASE III

First Edition: August 1979
Second Edition: July 1980
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Product Manager
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History of VAX-11/730 Business Plan Editions

- First Edition: First release of the VAX-11/730 Plan, containing details on two Processor box types and up to five systems derived therefrom.
- Second Edition: Although not officially released, this edition was produced to document/record VAX-11/730 Product/System redefinitions approved by CPLMC, TPG, and TPLMC in the Spring 1980. This edition was also produced to assist Manufacturing in establishing schedules, inventory strategies, processes, etc. The Second Edition featured the new BALL-Z box, Packaged Systems #1 and #2, COMBO and IDC boards, and built-in RD. It also carried P/L predictions for FY'82 and FY'83.
- Third Edition: This is a major update of the Business Plan, including more comprehensive materials in almost all sections as well as entirely new sections. A revised Financial Analysis will be forthcoming by late Q4 FY'81. It also forms the information base necessary to conform to the proposed new DEC STD 130, governing Phase 1 Business Plans. (See Page 3 for a list of new and substantially revised entries.)
- Fourth Edition: This edition updates the Business Plan per Phase III requirements (Phase III Manufacturing Phase), with attention given to recording the PPC pricing decisions, sensitivity analyses, and first Build/Shipment quarters. The fourth edition also covers an updated VAX-11/730 Systems Plan covering FY'83 and FY'84. Lastly, the plan updates these topics: Software Offerings, RAMP Features, Markets, FCC/VDE Compliance, Competition, Standard Costs, Shipments, and Financials.

Acknowledgement:

Special thanks are extended to the VAX-11/730 Program Team and VAX-11/730 MTF P/L representatives for their inputs and understanding. My personal thanks to Ms. Gerry Connors and Ms. Pat VanOlinda for their word-processing contributions.

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1.0 MANAGEMENT SUMMARY

1.1 IDENTIFYING INFORMATION

1.1.1 Project Name: VAX-11/730 (NEBULA)

1.1.2 Type of Project: The Digital design, manufacture, marketing, and service of a low-end VAX family member.

1.1.3 People:

32-Bit Engineering, Vice President:	Bill Johnson
32-Bit Program Manager, Vice President:	Bill Demmer
32-Bit Program Office:	Bruce Ryan
32-Bit Current VAX Engineering Manager:	George Hoff
Current VAX Systems Manager:	Mary Breslin
VAX-11/730 Product Manager:	Lou Philippon
VAX-11/730 Program Manager:	Howard Hayakawa

Primary Manufacturing Manager:	Joe Pangraze
Field Service Manager:	Willy Bruneau
Diagnostics Manager:	Barry Poland
Manufacturing Systems Manager:	Dick Allen
Galway Manager:	
Systems Packaging:	Dave Carlson
Ayr Manager:	
European New Products, Galway:	Joe Dunne

VAX/VMS Version 3 Product Managers:	Trevor Kempself/ Dick Mahoney
VAX/VMS VAX-11/730 Support, Project Leader:	Trevor Porter
COMBO Board (DMF-32) Product Manager:	Roy Hugenberger
DMF-32 Project Engineer:	Mark Reich
DMF-32 VMS Project Supervisor:	Rick Spitz
Battery Back-Up Product Manager:	Jim Drew
LEM Power Supply Product Manager:	Jim Drew

1.1.4 Product Rationale: Why is the VAX-11/730 needed?

- o To fulfill market requirements for a low-priced VAX.
- o To establish Digital's leadership at the low-end of the 32-bit marketplace...until the LSI-VAX.
- o To extend the proven VAX/VMS family downward...to the \$25K box level and to the \$40K systems level...and lower.
- o To satisfy the low-end 32-bit market needs with a VAX system product (hardware and software), rated at 20% to 30% of the 11/780 performance.
- o To sell a 32-bit alternative to 16-bit users, an alternative rated at greater than 11/34A performance; or greater than and equal to 11/44 performance.

1.1.4.a) Project Goals

1. Offer entry-level 32-bit product that solidifies the low-end of the VAX Family; while protecting, migrating and expanding our customer base in the \$25K box through \$75K systems business range.
2. Produce today's smallest 32-bit VAX Architecture system running VAX/VMS, at 30% of VAX-11/780 performance, offered at 11/34 MLP prices, within the FY82 through FY87 timeframe.
3. Begin the Dock-Merge Certification of NEBULA specific modules no later than Q3 FY'81. Design/Build a dock-merged bounded VAX-11/730 system in volume environment for first shipment no later than Q3 FY83.

4. Market a reliable and serviceable product:

MTBF goal of 3600 hours for the standard BALL-Z box product, including dual TU58's and 1M bytes of memory. (See Page 45)

MTTR goal of 2.9 hours for the repair of the Processor utilizing RD aids.

Built-in Remote Support Capability

A BMC of less than \$145/month for the basic 3-board CPU in a 10 1/2" BALL-Z box with 1MB on a fourth board, power supply, dual TU58's, and console panel, in FY82, assuming Remote Diagnostic Support (RS).

5. Comply with FCC regulations governing Computer products of this class and market, from FCS onward.

1.1.4.b) Project Constraints

1. Position VAX-11/730 Systems for minimum overlap/maximum differentiation versus PDP-11s and within the VAX family... in performance, price, expansion, and offerings.
2. Design VAX-11/730 using state-of-the-art technology within industry-standard components (not custom), and with DIGITAL-designed/manufactured subsystems, during the 1978-1981 timeframe.
3. Utilize the full VAX/VMS operating system set. However, given that VAX-11/730 is marketed in hardware bounded configurations, provide a "VMS tailoring feature" for the bounded RL02 system and for specific user environments. (This is not a constraint for FCS.)
4. Starting at FCS, offer a VAX-11/730 diagnostic system that includes the existing VAX system, as well as a new VAX-11/730 CPU microdiagnostic package.
5. The VAX-11/730 Box and System Cab must be built and tested on a volume production line that integrates the final testing processes traditionally part of the separate FA&T method, and utilizes Point of Manufacturing (P.O.M.) Distribution Strategy.

1.2 OVERVIEW

1.2.1 Development Plan (See NEBULA PROJECT PLAN, 4/81)

1.2.1.1 Brief Descriptions

- o VAX-11/730 is a new low-cost, implementation of VAX architecture aimed at the low-end of the 32-bit marketplace, as well as, at the "11/34 and 11/44 systems space". The technology is standard, state-of-the shelf, it is not custom.
- o VAX-11/730 performance is estimated at 20-30% of VAX-11/780; its functionality is rated at 100% of VAX architecture and VMS software. VAX-11/730 runs VAX/VMS and layered products.
- o The VAX-11/730 module is standard HEX in form factor. The module set is packaged in a 10.5" box (BA11-Z); and the box packaged into two bounded, single-cab systems complete with disks and options.
- o The VAX-11/730 Options at FCS include: single HEX 1MB MOS memory modules; single HEX FPA; single HEX DMF-32 COMBO Board; Remote Support capabilities; and a separate already announced Unibus Expander Cab.
- o The MLP prices start at \$28,500 for the BA11-Z box product w/1MB and a VMS "DZ" License, up to \$59,400 for the largest single-cab system.

Technology

The VAX-11/730 CPU and its internal options are implemented using 1978/1982 state-of-the-art technology and components, including 64K MOS dynamic RAM's, 77 or more Programmed Array Logic (PAL) chips, PROM's, LSI Bit slices, two COMET gate array chips (for ECC correction), 8085 for the diagnostic console. This technology is employed to insure a low-risk position, a low-cost, standard-off-the-shelf industry component availability, and a performance level at 20% - 30% of a VAX 11/780, but at a 25% cost level of a VAX-11/780 CPU in 1982.

VAX Compatibility

VAX-11/730 is a compatible member of the VAX/VMS family; specifically it offers compatibility with the VAX-11/780 and 11/750 in these major areas:

VAX Hardware:

- o Instruction Sets: Commercial and Floating Point
- o Memory Management
- o Programmer Visible Register Set
- o Process/Interrupt Structure

VAX/VMS Systems Software Set

- o Operating System
- o Information Management
- o File Formats
- o System Utilities
- o Language Offerings
- o Communications
- o P/L VAX/VMS Applications

PDP-11 Compatibility

VAX-11/730 offers compatibility and migration avenues for the PDP-11 customers; a coherent plan is in place today. The major goal is to provide attractive and better alternatives than our competition. Included in the plan are:

1. Command Language
2. Higher-level native-mode languages like Fortran, Cobol, Basic, Pascal, PL/1, DIBOL, "C"
3. Data Management (RMS, On-disk structure)
4. RSX-11M - a compatibility mode "Application - Migration - Executive" enables many PDP-11 mapped RSX11-M non-privileged tasks to execute directly in compatibility mode
5. RSTS Migration Aids (Manual)
6. Support of Asynchronous and Synchronous communications interfaces
7. Customer and DIGITAL developed UNIBUS interfaces

VAX-11/730 Packaging

The VAX-11/730 marketable packaging consist of:

1. A 10.5" high, rack-mountable OEM and box product (officially called SV-11730-ZA).
2. A number of single-cab Corporate Packaged Systems, configured with distinct corporate mass storage, terminal, and communication subsystems, available over time; given market, competitive, and business requirements.

Starting in FY82, VAX-11/730 is offered in two, single-cab, bounded packaged systems, known as:

- Packaged System #1, and
- Packaged System #2

These offerings and their respective options are detailed in the pages upcoming.

3. With the availability of the AZTEC(RC25) and the UDA50 RA type disks, in FY83/84 and beyond, Product Management will propose a third VAX-11/730 Packaged System and Building Blocks incorporating other mass storage devices for corporate evaluation.

VAX-11/730 Processor

- o Three (3) Hex Modules
 - 1. Data Path (DAP)
 - 2. Memory Controller (MCT)
 - 3. VAX-11/730 Control Store (WCS)
- o Processor Capabilities and Characteristics
 - 32-bit wide Internal CPU and Memory Data Paths
 - 24-bit Physical Address Space (same as VAX-11/750).
 - Memory controller designed to accept 64K-chip MOS RAM memory up to 5MB maximum
 - All VAX Instructions including compatibility mode PDP-11 Instruction Set, and all Floating Point Data Types: F-Floating; D-Double; G-Grand; H-Huge
 - Soft Control Store (RAM - based, 48KB or 24 bits by 16K, parity included)

 - Interval Timer
 - Time-of-Year Clock (with optional Battery Back-up feature scheduled for Q1/Q2 FY'84)
 - Power Fail/Auto Restart
 - Diagnostic Console including Power Monitor

 - Three (3) Full Duplex Asynchronous line units (SLU's) for Console Terminal, TU58 subsystem, and Remote Support Option (RS)
 - Customer Runnable Diagnostics (CRD's)
 - Built-in RD capability on WCS module
 - Virtual-to-physical address translator buffer with parity

 - One Unibus Adaptor
 - VAX-11/730 reserved 32-bit Accelerator/Port Bus that allows CPU microcode control of optional Floating-Point Accelerator (FP730) and Integrated Disk Controller (RB730)
 - Extensive Diagnostic and Ramp Features

VAX-11/730 Box and OEM Product (SV-11730-ZA)

o Standard Box Features

- 12-slot backplane; no other expansion slots in the box. (See Page 16 for complete backplane details.)
- 3-board Processor, capabilities, and characteristics described above.
- One 1MB memory array
- Universal LEM-B Power Supply (60 Amps of +5V). Low-End Modular, Single Phase, power supply.
- Dual TU58 tape cartridge units with controller, integrated into the box; one for the system, one for the user. (See Box diagram for mounting locations, Page 15.)
- Console Front Panel, 6-position key switch, 3-position boot switch, and three LED's
- Air Flow Sensor that monitors the temperature and presence of air movement in logic section of the box.
- Space for the DMF-32 Distribution Panel which mounts on cabinet.
- BALL-Z Cable Management System.
- Sundry metal subassemblies that make up this rack-mountable, highly serviceable, 10.5" high product.
- VAX/VMS Ver. 3.X DZ License to Use
- 90 days Return-to-Factory Warranty

o Box Options

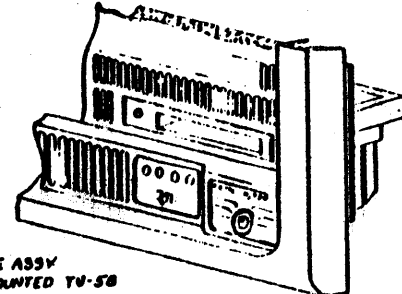
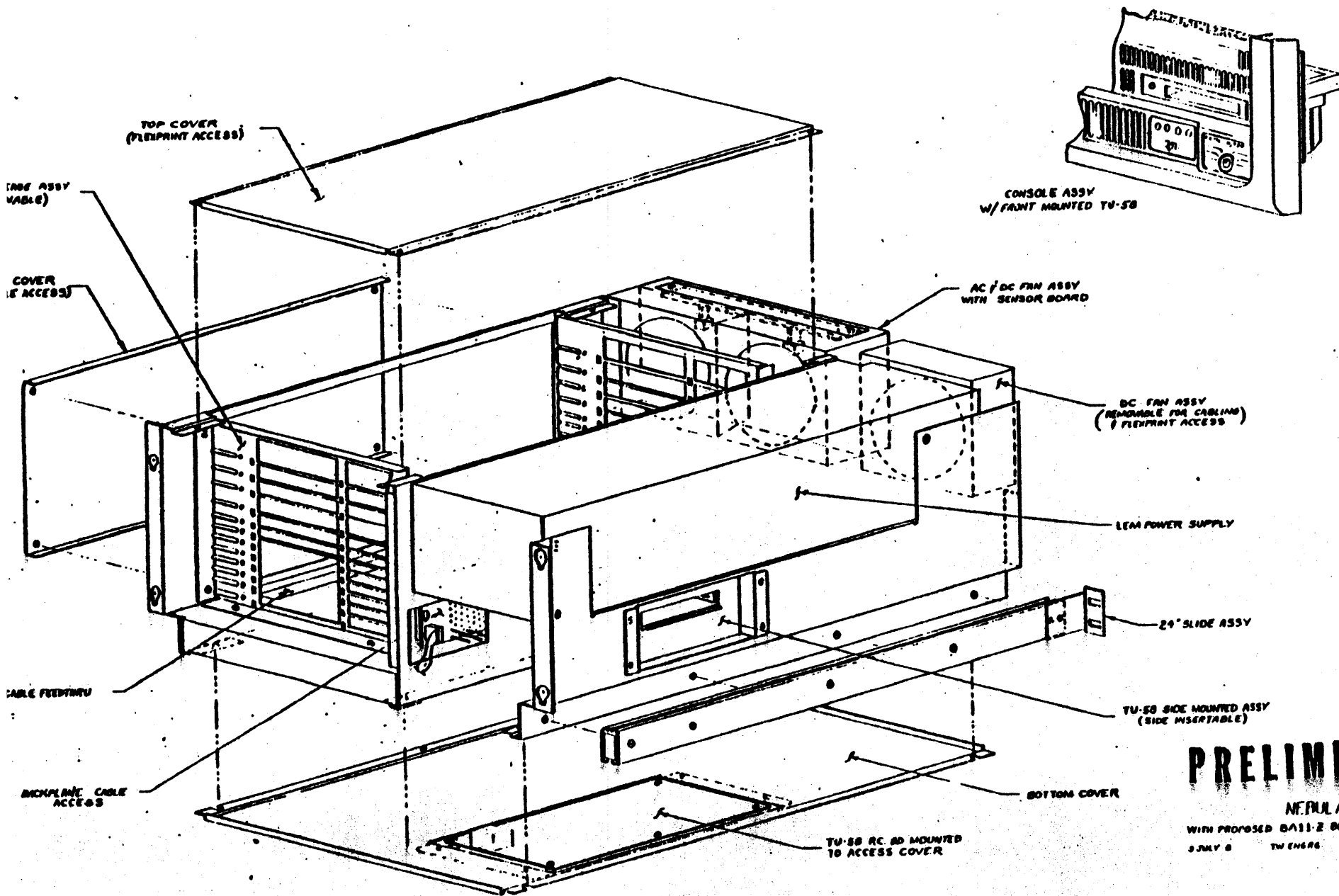
- Up to 4 additional memory modules for a total of 5 modules and a maximum capacity of 5MB per BALL-Z box using 64K chips memory.*
- FP730 Floating-Point Accelerator (1 HEX module)
- DMF32-AA COMBO board (1 HEX module) including:
 - 8 Asynchronous Lines w/speeds to 19.2 Kb/sec.
 - 2 with full modem control and split speeds
 - Choice of character, silo, or DMA Transmit mode
 - Choice of character or 32-word SILO Receive mode.

DMF32-AA COMBO board - (Continued)

- . 1 Synchronous Line w/speeds to 19.2K bits/sec.
 - DMA-Double buffered
 - Supports bit and byte oriented protocols
 - Modem Control
 - . Either 1 Line Printer Interface or 1 Parallel Interface (DR11-C type)
 - LP is DMA mode.
 - Parallel has (1) one word at a time; or (2) 64-word SILO mode; or (3) DMA mode.
 - Battery Back-Up for memory and full WCS module including console and Time-of-Year Clock. (Projected availability in Q1/Q2 FY'84)
 - TS11 Controller for the TS11-CA/CB Tape drive.
- o Options available to the VAX-11/730 Box Customers

The following options are available to the VAX-11/730 Box Customers as VAX/VMS supported options. However, the Box customer must order these "loose-piece", for mounting in his own cab(s) or in the recommended Corporate Unibus Expander Cab. Digital will not assemble or do FA&T on these options into an cab.

- H9642-DB/DC Unibus Expander Cab(s)*
- Additional DMF32's (DMF32-AB's)
- DZ11-A, B, E, -- described as DZ family
- DZ32-A, B, C
- UDA-50 -- Disk Controller for RA80, RA81, RA60
- DR11-W
- DMR11 and DMP Families
- DUP11-DA -- with pre-requisite, optional software for support
- CR11 Card Reader
- TU58-DA/DL11-W
- RX211-BA/BD
- RL211-BK/CK
- TS11-CA/CB tape drive in its own cab
- LP32 -- Line printers attached via DMF32-AA:
 - LP32-AA : LP25-AA (285 LPM)
 - LP32-EA : LP26-EA (600 LPM)
 - LP32-GA : LP07-GA (1,250 LPM)
- LP11 -- Line printers attached through their separate controllers.



PRELIMINARY

NEPLA
 WITH PROPOSED BALL-Z BOX ASSY
 3 JULY 8 TU ENGRS BOB MORIN

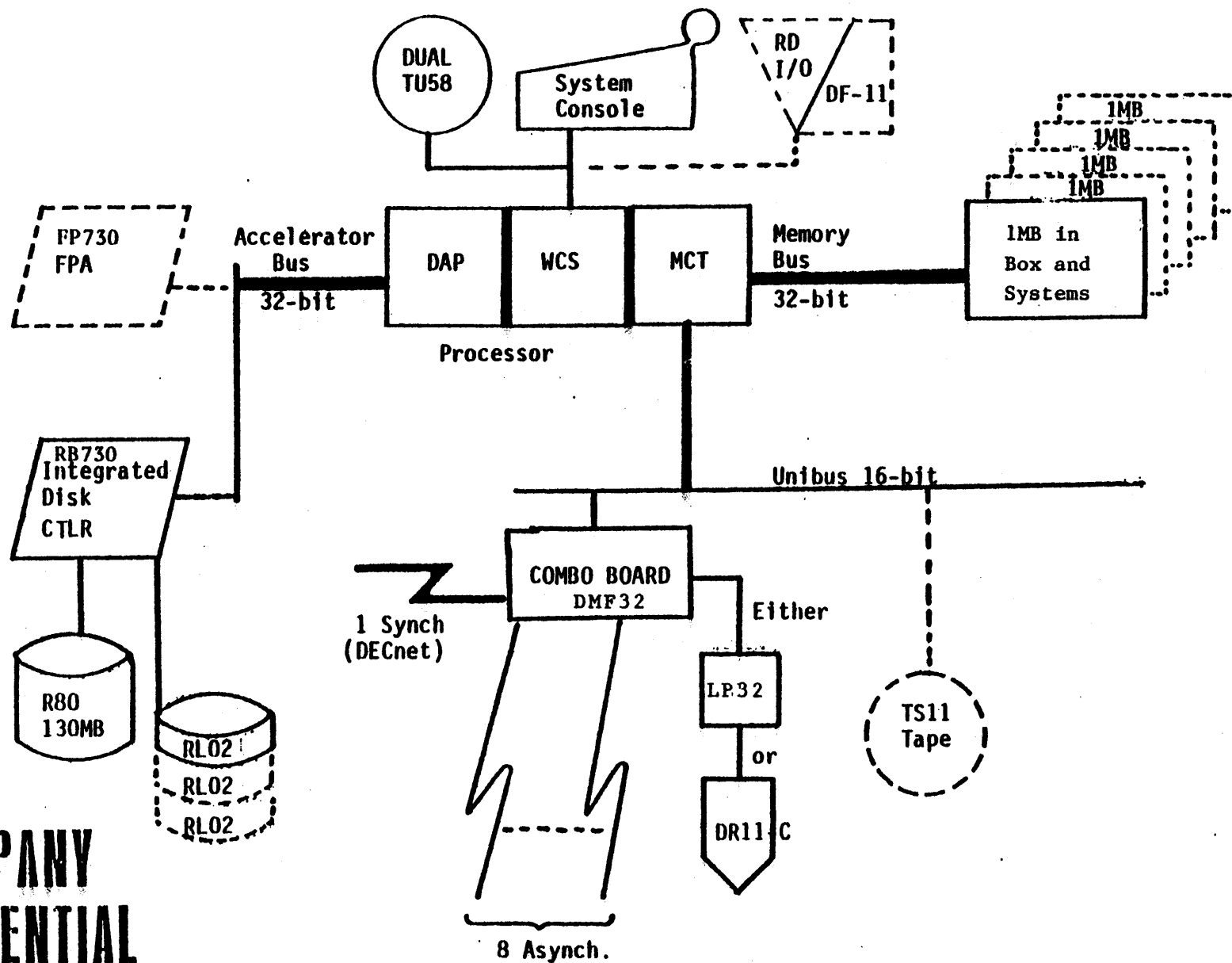
MODULE UTILIZATION OF BALL-Z BOX BACKPLANE

<u>SLOT #</u>	<u>USAGE</u>	<u>AMPS</u>	<u>SPACING AMONG SLOTS</u>
1	IDC	10	
2	FPA	10	
3	DAP	9.7	.75"
4	MCT	9.7	
5	WCS	---5.3 B.B.	
6	MEMORY ARRAY	1.0	
7	MEMORY ARRAY	1.0	
8	MEMORY ARRAY/SPC	1.0	.5"
9	MEMORY ARRAY/SPC	1.0	
10	MEMORY ARRAY/SPC	1.0	
11	COMBO/SPC	7.0	
12	TERMINATOR/SPC-QUAD	1.5	
		<hr/>	
		52.9 TOTAL USED	
		60.0 Total Available	
		<hr/>	
		7.0A EXTRA	

NOTES:

1. Maximum cumulative current allowed is 60 Amps @ 5V.
2. Slots dedicated to only one, specified module/function:
Slots #1, 2, 3, 4, 5, 6, 7, 11, and 12 quad terminator.
3. Slot #5 ...

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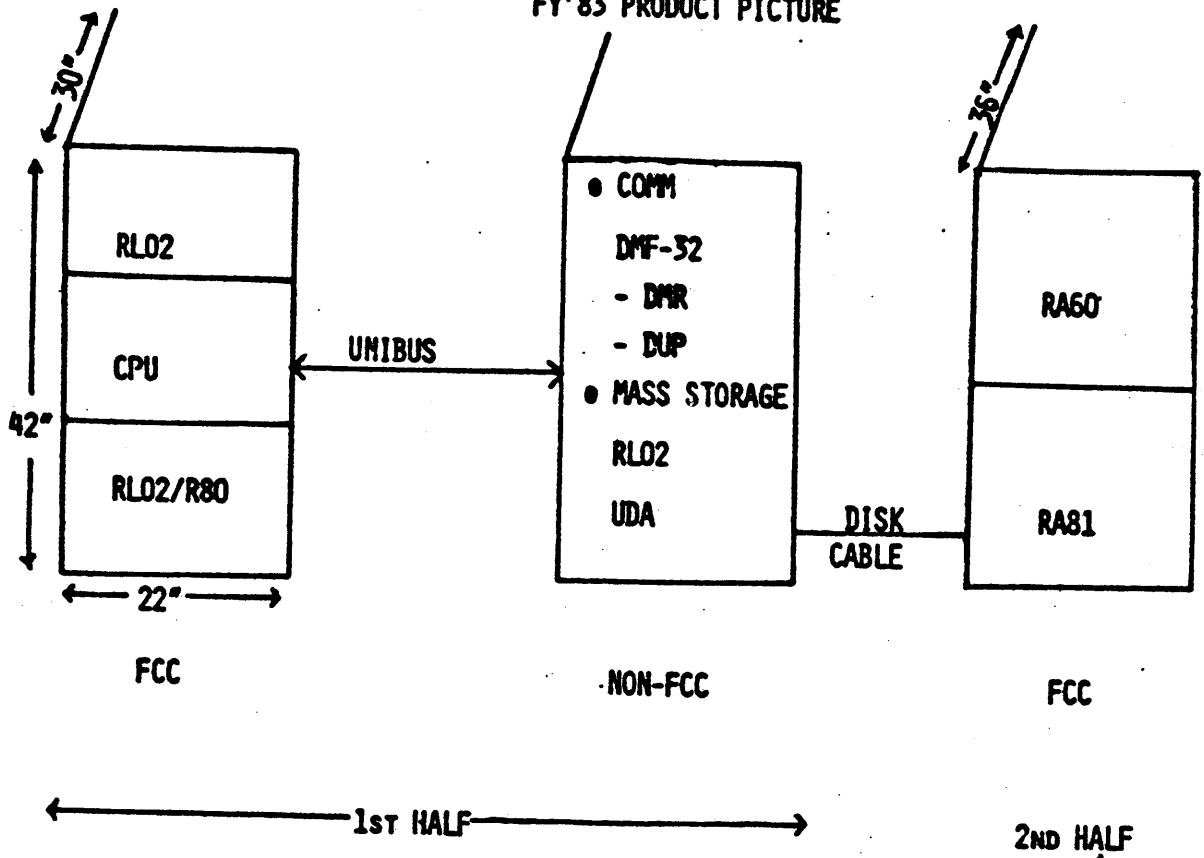


VAX-11/730 BLOCK DIAGRAM

NOTE: This diagram shows VAX-730 subsystem and functional inter-relationships; not electrical connections, nor packaged systems contents.

VAX-11/730

FY'83 PRODUCT PICTURE



VAX-11/730 PACKAGED SYSTEM #1 (SV-CXMMMA-AA/AD)

o Standard Contents

- BA11-Z 10.5" high box including 512KB of memory.
- RB730 Integrated Disk Controller
- RL02-AK Two RL02 Disks, 20 MB total
- DMF32-AA COMBO board
- One 874B/C Power Control
- Packaged in one 40" high H9642 corporate cab
- Separate LA120-DA System Console
- VAX/VMS Operating System Version 3.0
 - . Cat. "A" Fully Supported, or
 - . Cat. "DZ" License only

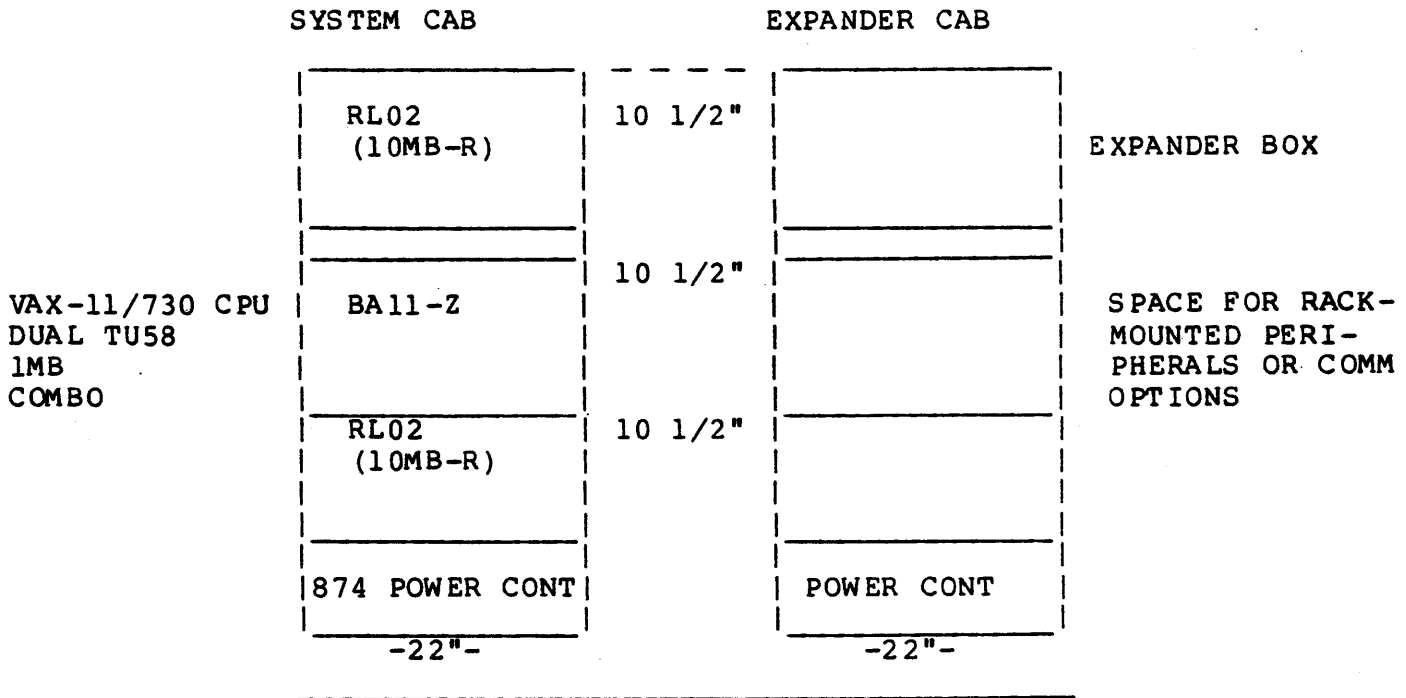
o System #1 Options in System Cab

- FP730 -- Floating point accelerator, one HEX option
- MS730-CA: Four extra 1MB Memory Modules for a total of five (5) modules yielding a system maximum of 5MB.
- TS11: 9-track tape controller at the expense of 1 memory array. In that case the memory system maximum is 4.0MB. (See backplane layout, Page 16)
- H7231-A Battery Back-up, (projected availability in Q1/Q2 FY '84)
- KC730-AA/BA Remote Support Option (RS) under FS Contract

o System #1 Expander Cab Options

Consult the VAX/VMS Systems-and-Options Summary and Software Product Description.

Packaged System #1 (SV-CXMMMA-AA/AD)



SYSTEM CAB OPTIONS

EXPANDER CAB OPTIONS

- FPA
- MEMORY TO 5.0MB
- TS11 CONTROLLER AT THE EXPENSE OF 1 MEMORY ARRAY
- BBU (by Q1/Q2 FY'84)
- REMOTE SUPPORT

- SELECTED VAX/VMS SUPPORTED UNIBUS OPTIONS:
(See the S-O-S or SPD)

MANUFACTURING POINTS

- SYSTEM CAB BUILT/TESTED COMPLETELY IN VOLUME, SHIPPED TO FIELD DISTRIBUTION CENTER (FDC) WITHOUT REDUNDANT TESTING.

- EXPANDER CAB ITSELF BUILT IN SYSTEMS.
- DOCK-MERGE OPTIONS ASSEMBLED/TESTED IN SYSTEMS WITH "MASTER" VAX-11/730 STATIONS.
- EXPANDER CAB MERGED WITH SYSTEM CAB, SOFTWARE, DOCUMENTATION, TERMINAL(S) AT FIELD DISTRIBUTION CENTER AND SHIPPED TO CUSTOMER.

VAX-11/730 Packaged System #2 (SV-CXWMA-AA/AD)

o Standard Contents

- BA11-Z, 10.5" high box including:
 - . 1MB of ECC MOS Memory, 64K chips
 - . One DMF-32-AA COMBO Board and Distribution Panel
 - . ONE RB730 -- Integrated DISK Controller
 - . Dual TU58
- One R80-AA disk (124MB - fixed)
- One RL02-AK disk (10MB - removable)
- H7231-A Battery Back-up
- One 874B/D Power Controller
- Packaged in one 40" high H9642 Corporate Cab
- Separate LA120-DA System Console
- VAX/VMS Operating System, Version 3.0-A.
 - . Cat. "A" Fully Supported, or
 - . Cat. "DZ" License only

o System #2 Options in Systems CAB

- FP730 -- Floating point accelerator, One HEX Option
- Four extra 1MB memory modules (MS730-CA) for a total of five (5) modules yielding a system maximum of 5.0MB.
- TS11: 9-track tape controller at the expense of 1 memory array; in that case, the memory system maximum is 4.0MB. (See backplane layout, Page 16).
- H7231-A Battery Back-up (BBU)
- KC730-AA/BA Remote Support Option (RS) under FS Contract

o System #2 Expander Cab Options

Consult the VAX/VMS Systems-and-Options Summary and Software Product Description.

1.2.1.1.B Manufacturing of Expansion CABs

The current process within Manufacturing is to build the Expansion Cabs in the Systems Integration plant, starting with the Salem NI facility and moving eventually to Westminster, Kanata, etc., as appropriate. The process calls for the manufacture and test of expansion cabs in CML/COG lines using VAX-11/730 System Cabs as test stations. Once tested the Expander Cabs will be sent to a Field Distribution Center(s) where total orders will be staged and sent to the customer.

1.2.1.1.C Source Inspection

With the exception of an occasional clause in a government contract, the Product Businesses report that there is very little need or request to have customers "Source Inspect" the system or systems before shipment. Should such a requirement exist, Manufacturing Systems could offer a quote to provide the services required.

Non-Standard Configurations

Non-packaged VAX-11/780 and VAX-11/750 systems are not being developed today by Digital. The VAX-11/730 will follow this tradition. Should the customer desire to "order the pieces" Digital will oblige by supplying/fulfilling the order and shipping the pieces. The customer must assemble and test himself (or contract with Field Service or PL90 to accomplish the task at their going rates in the field).

GENERAL CONFIGURATION RULES FOR VAX-11/730

A. Packaged Systems Sales

1. No substitutions or deletions will be allowed for any of the packaged system components.
2. All customer sales of VAX-11/730 will be limited to packaged system sales only, except for volume accounts of TOEM, COEM, GSG, TIG, and IEG as noted in B.
3. The allowed add-ons to a package system at the time of the initial order are specified in the previous pages.

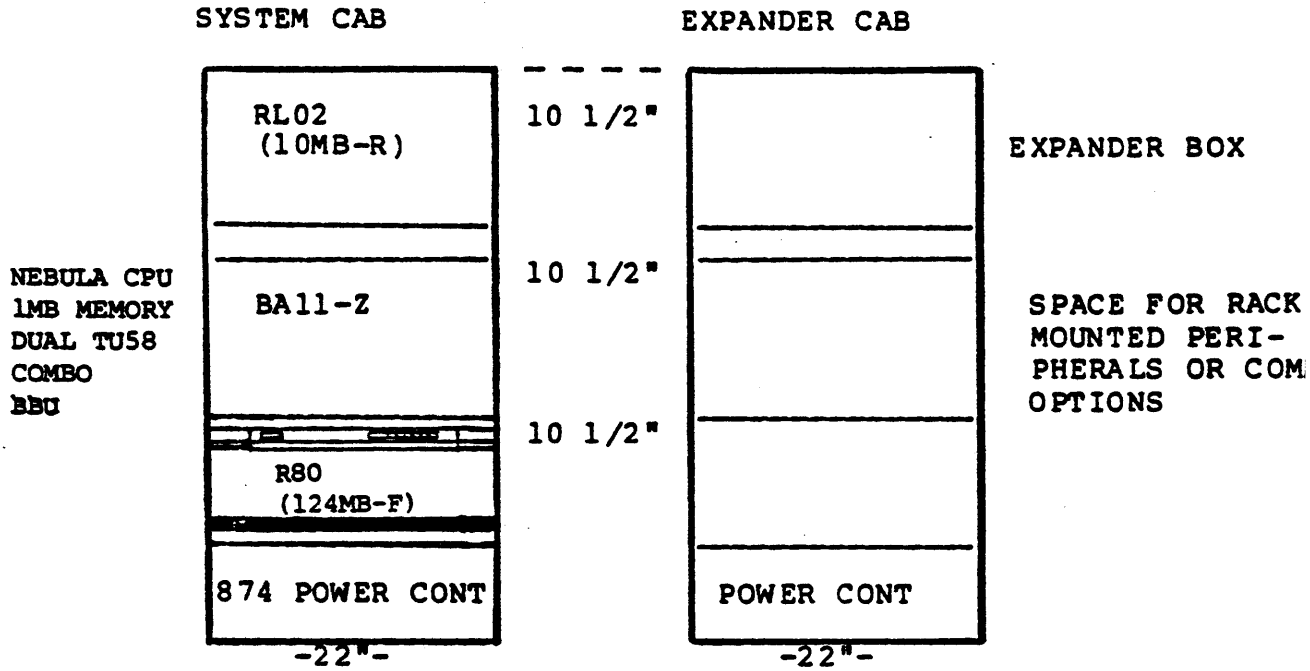
B. Ball-Z Box Sales Only

1. Only TOEM, COEM, GSG, TIG, and IEG will be allowed to sell the Ball-Z Box outside of a packaged system.
2. Purchase orders for the Ball-Z box may not contain any other hardware line items except the standard CPU, and those option modules that fit into the very limited 12-slot Box backplane. These options are DMF32, FPA, memory (up to 4 additional modules) TS11 controller (at the expense of memory), and license only software.

We will not build any "a la carte" systems for these box sales. The only systems that DEC will build will be those based on the VAX-11/730 Packaged Systems as defined here.

All other options that are allowed with VAX-11/730 Box will be honored; however they will not be integrated by DEC, but rather shipped directly to the customer.

Packaged System #2 (SV-CXWMA-AA/AD)



SYSTEM CAB OPTIONS

- FPA
- MEMORY TO 5.0MB
- TS11 CONTROLLER AT THE EXPENSE OF 1 MEMORY ARRAY
- REMOTE DIAGNOSIS

EXPANDER CAB OPTIONS

- UP TO 2 RL02'S
- SELECTED VAX/VMS SUPPORTED UNIBUS OPTIONS (Refer to the S-O-S or SPD).

MANUFACTURING POINTS

- SYSTEM CAB BUILT/TESTED COMPLETELY IN VOLUME, SHIPPED TO FIELD DISTRIB. CENTER (FDC) WITHOUT REDUNDANT TESTING.
- OPERATES UNDER FULL VMS VER. 3.0-A
- EXPANDER CAB ITSELF BUILT IN SYSTEMS.
- DOCK MERGE OPTIONS ASSEMBLED TESTED IN SYSTEMS WITH "MAST NEBULA STATIONS.
- EXPANDER CAB MERGED WITH SYS CAB, SOFTWARE, DOCUMENTATION TERMINAL(S) AT FIELD DISTRIB TION CENTER, AND SHIPPED TO CUSTOMER.

1.2.1.2 Software Offering

VAX/VMS Version 3.0 was announced together with, and carries the full support of, the VAX-11/730 Computer and System. Initial deliveries of VMS 3.0 to customers began on May 7, 1982 from the Software Distribution Center (SDC). The "Special Edition" of Sales Update, covering the VAX/VMS Announcement (April 11, 1982) carried a thorough summary of VMS Version 3.0 contents. For purposes of this Business Plan update, the author will review the VMS support history of the VAX-11/730 under three subtopics:

1. VMS Version 2.0 Initial Support
2. VMS Version 3.0 Support at FCS
3. Subsequent VMS Ver. 3.X Plans

1. VAX-11/730 Support in VAX/VMS Version 2.0

Recall that the NEBULA hardware engineering effort started in late 1977. Given the priorities and schedule commitments to the VAX-11/750, VMS software engineering undertook during FY'78-80 to provide a level of support for NEBULA on a "best effort" basis. (Reference: VMS V2.0 Systems Plan, Carchidi and Davis). Of particular significance was the VMS goal to provide early software required for the testing and debugging from the hardware design up to complete engineering prototypes.

This early/initial support of NEBULA under Version 2.0 should not be construed as the software version, nor the only version, that was to support NEBULA from FCS onward. Accordingly,

Version 2.0 support included the following:

- o Standard 3-board VAX processor
- o FPA Accelerator
- o Interval Timer

- o Time-of-Year Clock
- o Power Fail/Auto Restart
- o Address Translation Buffer

- o Diagnostic console including Power Monitor
- o One Unibus Adaptor
- o Dual TU58 Cartridge

- o Three Full-Duplex SLU's
- o RL02's, TS11's, terminals, and other selected Unibus peripherals.

2. VAX-11/730 Support in VAX/VMS Version 3.0

The following features, modules, and capabilities were not included in VMS Version 2.0, but are in Version 3.0, because they didn't exist or did not exist in their current form prior to April 1980, at which time VAX-11/730 experienced a partial redefinition and repackaging. Today considered in the Version 3.0 VMS for VAX-11/730 (in addition to the support outlined in Version 2.0) are:

- o Final machine check code
- o DMF32 COMBO board
- o RB730 Integrated Disk Controller
- o Complete VAX-11/730 console Subsystem
- o Backup/Restore features
- o RL02-to-R80 VMS loader
- o VMS support for Packaged System #1 (Dual RL02) and VMS for Packaged System #2 (RL02/R80)
- o VMS "Tailoring Feature" for Packaged System #1

VMS "Tailoring Feature"

For purposes of completeness, here are brief descriptions of the "Tailoring Feature".

The VAX/VMS tailoring facility is available and required on the VAX-11/730 basic, single-cabinet, Dual-RL02 configuration. It is not supported on other processors or disk configurations.

Tailoring VAX/VMS on the VAX-11/730 Dual-RL02 configuration allows customers to enjoy the full functionality of VAX/VMS, while providing a compact version of the operating system -- tailored to their needs on one RL02 disk cartridge.

Tailoring is made possible by dividing the VAX/VMS operating system into three savesets (container files produced by the BACKUP utility: 1) the required saveset, 2) the library saveset and 3) the optional saveset.

Layered Products in the Single RL02 System Disk Environment

VAX/VMS Version 3.0 is supported on a single RL02 disk, for application execution or for program development. This leaves the second RL02 disk drive free for mounting private user volumes.

The following group of layered products is available in the development environment on the VAX-11/730 Dual-RL02 Packaged System:

- o VAX-11 BASIC
- o VAX-11 COBOL
- o VAX-11 FORTRAN
- o VAX-11 PASCAL

Any one of these layered products, or any one of these layered products in combination with DECnet-VAX is available. Other layered products are not supported on the basic Dual-RL02 configuration. If your customer needs more layered products, you should sell the R80/RL02 Packaged System.

1.2.1.2.A RAMP Features of the VAX-11/730, Box and Systems

The Reliability, Availability, and Maintainability features designed into the VAX-11/730 are extensive, yet similar to those on the other VAX systems. We have listed some of the major features here for your convenience:

CPU

- o Box product consists of six removable subsystems for convenient trouble shooting, repair, and replacement
- o ECC MOS memory
- o CPU cluster exciser and diagnostic supervisor (over 30% of the 3-board CPU logic space is utilized from RAMP)
- o System ID register
- o Parity checking on address translation buffer
- o Single board options for FPA, COMBO, memory, and disk controller
- o Redundant TU58 Subsystem for microcode load backup
- o Parity of Soft Control Store RAM's

Power Supply

- o Universal off-the-line Power Switcher
- o Simple removal and replacement
- o Visual LED's for all three PC boards
- o Power Fail/Auto Restart
- o BBU Option
- o DC Power Monitor

Environmental and Mechanical

- o Insulated Key Switch
- o Airflow and air movement sensor within BA11-A box
- o UL and CSA approval
- o FCC compliant box and systems
- o VDE compliance achieved
- o Time-of-the-year clock and Interval Timer standard
- o Cable Management System to dress and shield up to 14 cables

Remote Diagnosis Option

- o Sockets exist on the VAX-11/730 WCS board to accept two chips that provide the Remote Diagnosis Function, given the customer contracts for the service. The RD option (KC730) allows dial in diagnosis from Colorado Center within 15 minutes, and detects failures to load and CPU logic string levels. The RD Center will be assisted by the following new program.

Customer Runnable Diagnostics (CRD)

- o There will exist by the VAX-11/730 PA date (October 1982) the capability (option?) for the customer to run a set of diagnostics that will exercise the system, identify failures on the module level, and notify the customer in clear sentences of what he is to phone in to his local service branch. It is the goal of this program that any non-technical customer be able to run diagnostics and communicate its results. The entire set of Customer Runnable Diagnostics will take no more than 15 minutes. We believe that the use of Customer Runnable Diagnostics will greatly alleviate the use of the Colorado Center resources to diagnose VAX-11/730 problems.

VMS

- o Power Fail Recovery code
- o On-line System Error Logging
- o Dynamic bad block handling
- o Stand alone and On-line functional diagnostics concurrent with user programs
- o User Environment Test Package (UETP's)

1.2.1.3 What the VAX-11/730 IS NOT:

- o VAX-11/730 in a BA11-A Box (11/44 processor box) was not approved and will not be announced as a box product, nor will that box be used to build packaged systems. However, due to the need to submit NEBULA for evaluation/testing early, we built a small number (36) of the systems in A-BOXES, for internal use only. (They are called "Surrogates" in other NEBULA Program documents.)
- o VAX-11/730 will not be packaged in a 5.25" box as was once planned because it is no longer needed to meet market requirements. On the other hand, the design of the new 10 1/2" box, utilizing 64K chip memory, bounded 12-slot backplane, and the 60 AMP (+5v) power supply now fulfills Corporate, P/L, and market needs.
- o VAX-11/730 will not be marketed with 16K-chips MOS memory; it uses 64K chips MOS RAM's exclusively.
- o VAX-11/730 is a soft-control store (RAM-based) system; it is not a hard-control store (ROM-based) processor. The development of a hard-control store capability is not funded at this time.
(See the Project Plan for details.)
- o VAX-11/730 has no MASSBUS; hence, it cannot accept MASSBUS peripherals.
- o VAX-11/730 has one UNIBUS only.
- o The WCS board of the VAX-11/730 set no longer contains 256KB of memory, as this space has been used to implement an RS option and control store improvements. Hence, the standard VAX-11/730 processor consists of 3 processor modules and 1 memory module.
- o VAX-11/730 Systems are not produced via the traditional three-step manufacturing process: Modules/Subsystems in volume; Kernels in volume; and Systems in FA&T facility. Rather, the VAX-11/730 is produced in two major steps: Modules/Subsystems in volume plants; and Bounded Packaged Systems in volume POM plants.
- o The VAX-11/730 is not a "Board Set" or Wireframe Product at this time. Anything less than the full VAX-11/730 has not been through an Engineering Release. Accordingly, no testing, documentation, interfacing specifications, marketing, or otherwise. This is not to say that it could not be done, nor that it is not needed.

A number of product groups and a small number of their largest customers have expressed expected enthusiasm, so far not enough support/volume to consider "productizing" this VAX-11/730 offering. The author is quick to add that the VAX-11/730 box has been designed with this potential offering in mind.

Anything less than the full box would require the customer to know and develop a power supply, a load device for microcode, air flow and cooling arrangement, mounting mechanisms, cabling scheme, and console panel interfaces. These are not trivial tasks for even the sophisticated user! Offering this type of product also means that customers must be able to obtain hardware, microcode, and software support from the Product Groups.

- o The VAX-11/730 specific Integrated Disk Controller (RB730) and its single R80 rack-mountable fixed disk cannot be ordered separately by the box customers. However, it is the standard disk controller with our systems.

Offering this disk and controller as an option for the box customer implies:

1. The development of documentation sets not produced thus far.
2. DEC Standards and Environmental Tests have been completed; which they have not.
3. Time and personnel resources to document, test, and market the RB730 and single R80. This activity was not in our budget and priorities.
4. The UDA-50/RA80 - RA81 products in an expander cab are viewed as higher capacity disk offerings in that the Unibus UDA can control up to four (4) RA80 or four (4) RA81 (more than the single R80 on the IDC).

Testing and documenting the two-board controller (UDA-50) in the VAX-11/730 box could be another more profitable alternative. Hence, we recommend against offering (and therefore pricing) the IDC-R80 as an allowable add-on for the OEM user until resolution of the engineering performance and packaging issues takes place to Product Group satisfaction.

1.2.1.4 Future Processor Enhancements

A. Battery Back-Up (BBU)

Originally scheduled for announcement and availability with the VAX-11/730 in Q4 FY'82, the 730 BBU was discovered, during systems field test, to need engineering redesign to have it produce the back-up power for the

1. VAX-11/730 RAM memory up to 5MB
2. VAX-11/730 control store RAM's
3. VAX-11/730 time-of-year clock

Planned BBU specifications and current schedules are as follows:

B. User Control Store (UCS) with Tools

This option would consist of two parts:

1. Existing sockets on WCS board to accept RAM's
 2. Software tools required for the customer's use of this firmware capability.
1. The WCS board today contains a 4K word space for this Option; however, the first 1KW is reserved for the Integrated Disk Controller (IDC) microcode and is always exercised. The remaining 3Kw has been reserved for this user microcode Option.

The mechanics of exercising this Option would consist of the addition of RAM's to the existing 3KW of IC sockets. Most probably, the user buying this Option would purchase a variation of the VAX-11/730 WCS module that would contain 3K words of socketed RAMs.

2. Purchasing the WCS module variation is only the Hardware portion of this Option. The other critical part are the "TOOLS", by which we mean software/documentation items the customer will need to write, debug, link, and run his own microcode routines. Hence the "TOOLS" will include an Assembler, Debugger, Linker, and supporting documentation.

Funding for the development of this project is not available in FY'83.

C. Hard Control Store:

As it is understood today, this CPU enhancement would involve a new layout of the WCS module. Generally speaking, this change involves the (1) replacement of the existing 16K dynamic MOS RAM's with PROM's or ROM's; (2) probably changes to the VAX-11/730 microcode and (3) probably changes to other loading functions/interfaces including those in the Console Subsystem. (RECALL that the Control Store today is SOFT; that is, located on one TU58 cartridge tape and loaded in dynamic RAM's. See the NEBULA Project Plan, Page 16, for additional details on the Soft Control Store.)

The objectives for the development of this enhancement are as follows: to eliminate the dependence on the TU58 load device and its inherent characteristics; to speed the microcode loading process; and to provide a VAX-11/730 CPU and System capable of operating in a Class C, unattended, harsh environment.

Funding for the development of this project is not committed.

D. DR 730:

This is a probable, future enhancement. The DR730 would be purchased as a one-HEX module Option, providing the customer with a high-speed port to memory.

Unlike the DR780 and DR750, the VAX-11/730 DR730 will "use" the CPU to get to memory, because VAX-11/730 has no SBI or VAX-11/750 internal bus through which to interface to memory. But this is not an unusual approach on the VAX-11/730; the IDC today interfaces via the CPU. Consequently, the DR730 would be installed at the expense of either the IDC or the FPA capability, as these are the only two CPU port slots in the VAX-11/730.

The development of this Option is seen to require CPU microcode interfacing changes, as well as complete VAX/VMS support. VAX-11/730 Engineering also believes that the DR730 implementation might utilize microcode space from the UCS area.

Funding for the development of this project is not committed.

E. Lower Power PAL's:

The major logic component of the VAX-11/730 is the PAL - Programmable Array Logic chips. The VAX-11/730 Team is aware of continued industry PAL design enhancements, including denser chips, and less power consuming chips. When these chips are available in reliable quantity from several industry vendors, VAX-11/730 Engineering plans to incorporate them in the CPU module set as appropriate. No special funding is required.

F. NEBULA and the NI:

We see two possible, non-excluding avenues:

1. The development of a Unibus to NI Port; and (2) the engineering of an NI VAX-11/730.

UNIBUS-to-NI Port. This could be a one or two HEX module that would allow the attachment of NI-based peripherals to be attached to the VAX-11/730 Unibus, at existing Unibus performance levels. Therefore, the "Port" would plug into the Unibus.

This is considered feasible and the least expensive. It may require changes to the VAX-11/730 backplane, and hence, probable Memory Controller changes as well.

2. NI VAX-11/730. This is the ultimate solution necessary to take advantage of all NI performance/packaging benefits. But it is also the most complex, expensive, and time-consuming approach; as it would require several changes including a new memory controller, new backplane, reconfiguration, repackaging. For all intents and purposes, this approach would "create" a new VAX-11/730...higher performance, smaller package, lower cost.

Both avenues above are gated by the development of the NI chips and the attainment of their goals. To the author's knowledge, no decision has been made on the feasibility of implementing this second approach.

G. Down-Line Loading:

As VAX/VMS Systems get smaller in size with equal or less performance than the existing VAX systems, and our customers want the "distributed processing" capabilities we and the industry flaunt, the Down-line loading capability is an ever increasing requirement of any computer family. The VAX-11/730 packages are typical first examples of systems that should provide this capability; but will NOT...for these reasons:

1. The VAX architecture does not define a common Down-line loading capability, and
2. VAX/VMS existing today does not support the Down-line loading of VAX/VMS Operating System Software.
3. VAX-11/730 hardware does not contain any capability required to effect down-line loading.

This is one VAX/VMS capability that VAX-11/730 Product Management believes needs concentrated attention and resolution.

1.2.1.5 Future VAX-11/730 Products and Packaged Systems:

It is expected that the number of VAX-11/730 Packaged Systems will change and new product options be introduced over the life of the product. This is due primarily to a larger and new selection of Unibus and NI-based peripherals/terminals and their full support - funded and anticipated over time. This Edition of the Business Plan details FY'83 and FY'84 product and systems strategies.

The FY'83 and FY'84 Product and Systems Strategy for the VAX-11/730 is as follows:

- o Box Product: As announced, unchanged

- o System #1: FY'83, as announced, unchanged
(RL/RL) FY'84, replaced by System #3, starting Q2'84

- o System #2: FY'83, as announced, unchanged
(R80/RL) FY'84, partially replaced by System #3, starting in Q2'84

- o System #3: FY'83, announced in Q4
(RC/RC25) FY'84, FRS in Q2'84, Dual AZTEC for 100MB minimum disk

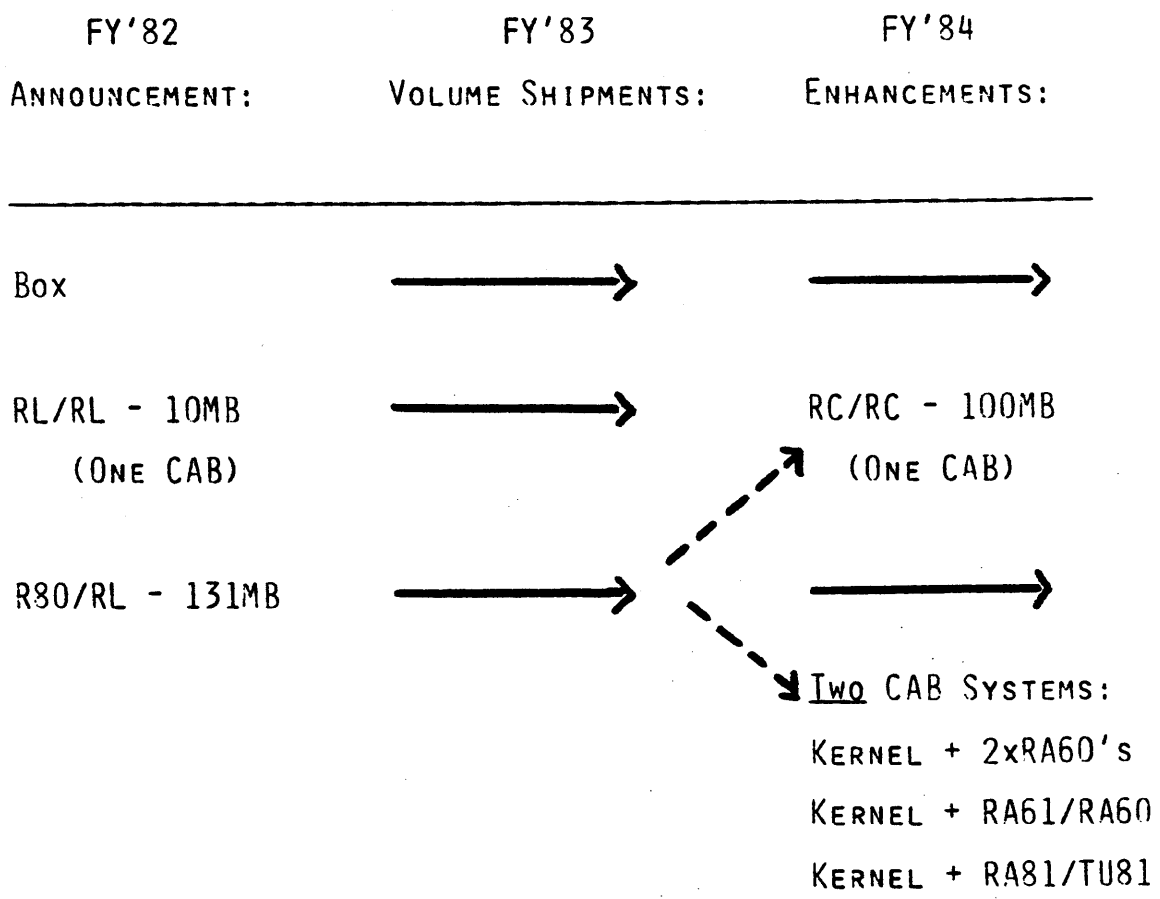
- o 11/730 Kernel: FY'83, announced in Q4
FY'84, FRS in Q1'84, the first cabinet of a minimum dual-cab VAX-11/730 system with larger disks and tapes.
Provides for systems selling at \$70K MLP and over.
Provides for 1.3 GBytes storage, 24 users, up to 5MB memory - all in two cabs.

- o BBU: FY'83, announced Q4
FY'84, FRS in Q1'84, limited supply
Standard in System #3 and 11/730 Kernel
Optional in other cases.

- o FCC Unibus Expander Cab: FY'83, announced in Q4
FY'84, FRS in Q1'84, July 1983 if possible

Detail descriptions of the new Packaged System #3, VAX-11/730 Kernel, and FCC Unibus Expander Cab are provided in the pages that follow.

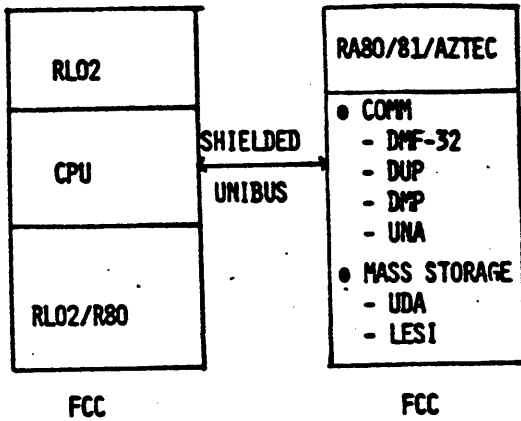
VAX-11/730 SYSTEMS PLAN



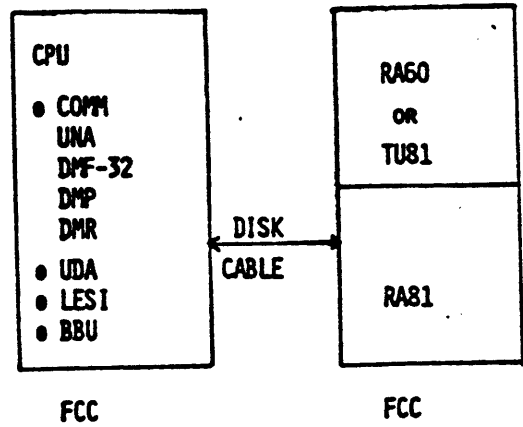
VAX-11/730

FY'84 PRODUCT PICTURE

Q1 FRS

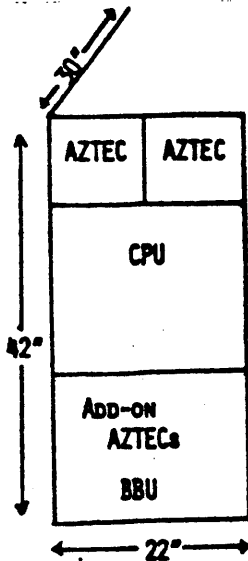


Q1 FRS



BASE SYSTEM EXPANSION

11/730 KERNEL



Q2 FRS

A. Packaged System #3 (SV-CXNNA-GA/GD)

- o Standard Contents
In a Corporate H9642 Cab, the VAX-11/730 CPU Box including:
 - Three Board CPU and Box Backplane
 - Dual TU58
 - LEM Power Supply
 - Fan Assemblies
 - Console Front Panel & Subsystem

 - Cable Management System
 - DMF32-AA Comm Board with System Distribution Panel
 - MS730-CA 1MB Memory

- Dual spindle RC25 (AZTEC) drives at 50MB per spindle for a total of 100MB. Both drives mounted side by side in the topmost 10 1/2" PAM space. (RC25 controller consists of a quad board mounted in the CPU slot 12.) At least one RC25 disk pack included in the system.
- H7231-A Battery Back-up, mounted at the bottom of the cabinet, in front of the H877 power controller.
- The H877 Power Controller, located at the bottom of cabinet.
- LA100 - System Console Hardcopy Terminal
- VAX/VMS Operating System (Category "A" or "DZ"), no sooner than Ver. 3.4 scheduled for SDC submittal in July 1983.
- Installation and Warranty

System #3 Expansion in System Cab

- Memory to 5MB system total
- FP730 1-Hex board, Floating Point Accelerator
- One, TS11, TU80, or TU81 tape controller at the expense of one MB memory board
- One additional RC25 (AZTEC) controller in slot 10 or 11, at the expense of one MB memory board

B. Contents of the VAX-11/730 Kernel: (70-19598-00/01)

o Standard Contents

In one shielded H9642 Corporate Cab:

- VAX-11/730 CPU including
 - Dual TU58
 - Power Supply
 - 3-Board Processor
 - 1 MS730-CA Memory Board
 - 1 DMF32-AA Comm Board
- One DD11-DK 9-Slot Backplane for the mounting of UDA, tape controller, comm options, and customer device controller.
- H7231-A - BBU
- H877 - Power Controller
- Bulkheads and Distribution Panel Option Mounting Space
- BC22D-25

o Expansion in this Kernel is as follows: (preliminary)

In the CPU Backplane area:

- Memory to 5MB system maximum
- FP730 Optional Floating Point Accelerator
- One Tape Controller (TS11, TU80 or TU81) at the expense of one memory slot.

In the DD-11DK Backplane area:

- Up to two Asynchronous Multiplexers, arrived at by choosing from DMF32's, DZ11, DZ32
- (Up to two HEX slots)
- UDA Disk Controller to control up to four RA type disks with the disks in separate cabs (two HEX slots)
- One of the following: DMR11, DMP11, or UNA (two HEX slots)
- One DUP11 Synchronous Multiplexer
(Complete configuration rules to be published after test results.)

Manufacturing Considerations

- VAX-11/730 Kernels are to be built in a Volume POM Plant, tested with storage test stations under VMS and released for shipment.
- Kernel line should have the capabilities of the 730 CPU line and some of the flexibilities of the Unibus Expander Cab, that is, should be able to insert and test the FP730, MS730 options as desired, UDA/tape controllers, and Comm option cards on the line as the Kernel proceeds down the assembly process.
- Hence, the 730 Kernel line should have the test and configuration flexibility of an expandable cabinet.

Importance of the VAX-11-730 Kernel

- o Allows the configuration of a series of minimum two-cab systems using the new UDA and tape Unibus controller.
- o Allows for maximum customer configuration flexibility with minimum cabinet/floor space utilization.
- o Allows for the Volume Point of Manufacture of the Kernel in one Volume Plant and the storage cabinet Point of Manufacture in another Volume Plant.
- o Allows for pricing innovations to meet short term and long term revenue decisions.

Implications of Not Getting a VAX-11/730 Kernel

- o All configurations having the UDA/RA type disks would result in a three-cabinet system (as it is the case currently):
 - 1st Packaged System Cab
 - 2nd Expander Cabinet to mount the two-board UDA
 - 3rd Storage Cabinet for the RA disks
- o Increased difficulty in ordering, configuring, and installing.
- o Increased cost (partial packaged system pricing plus expander cab price).
- o Large footprint - a minimum of three cabs.
- o Increased BMC, installation charges, etc.

C. Contents of the FCC Unibus Expander Cab

In one H9642 Corporate Cab, to have the following or to allow for the following, according to defined configuration rules (not altogether precise at this time).

- One 10 1/2" PAN Mounting Space for the rack placement of one of the following: RL02, one or two RC25 (AZTEC's)
 - RL02, 10MB
 - One/two RC25, 50 or 100MB total
 - One RA80, 121MB, fixed
 - One RA81, 456MB, fixed
- One, three-System Unit Unibus Backplane space to support a variety of Unibus peripheral and communication options, according to predefined FCC tested rules.
- Necessary, flexible bulkhead and power/cabing distribution panels to support a defined set of the following Unibus options to be determined later: DMR, DMP, DUP, UDA, TU80/81 controller, DR11-W

1.2.2 Marketing Plan

1.2.2.1 Market Description

One way to look at the VAX-11/730 market is to consider the total 32-Bit Systems Market first, followed by individual 32-bit segments at selected price levels second. One such approach was conducted by the 32-Bit Program Office, under the supervision of Ken Nisbet. The author is pleased to include this "32-Bit Systems Market Segmented by Priceband" in its entirety...as a way of scoping/defining the VAX-11/730 market in perspective.

This report details the methodology and concluding segmentation by priceband of the 32 Bit Systems Market from FY82-FY90. The purpose of this segmentation is to better understand the potential for our current and future systems. Thus the market segmentation shown in this memo will be a prime metric for judging our product forecasts. The 32 Bit Systems Market is defined as the market for all computer systems with address lengths at or exceeding 24 bits shipped worldwide from U.S. system vendors. For our purposes we are limiting our definition to systems under \$1M and over \$16K and all chip/board products to align the market definition to the set of products planned for the 32 Bit Program Office portfolio. Thus we exclude large (>\$1M) mainframe and all Desktops. For more information on the market segments or the projection techniques, consult the Business Strategy section of the 32 Bit Systems Strategy notebook.

A. Priceband Definition

We are adopting the logarithmic priceband definitions attributed to Gordon Bell with some slight modifications to optimize our product comparisons. They are:

<u>Priceband</u> *	<u>Description</u>
\$250K - \$1M	High-end
\$100K - 250K	Mid-range
40K - 100K	Low-end
16K - 40K	Low-low-end
6K - 16K	Chip-board
1K - 6K	Chip-board

Remember: desktop excluded from our market definition

B. Construction of Segmented Market

The 32 Bit Systems Market is a composite of three markets: Small General Purpose Computers (<\$1M), Minicomputers (including microcomputers) and Small Business Computers. (See Figure A) After an initial top-down distribution of each market into the standard pricebands, we followed-up with a detailed, system-by-system survey for all computer vendors (priceband distribution of 1980 revenues by system). The result is a fairly accurate representation of today's computer market segmented by priceband. (See Figure B)

C. Priceband Segmentation Futures

A more difficult assignment is to project how today's priceband distribution of shipped revenue will change over time (a function of customer buying behavior, sources of new applications, what systems are available, etc). In the past the distributions have not changed quickly -- it is perceived that customers tend to "replace-buy" within roughly the same price category. New applications (new growth) tend to occur more at the lower pricebands. However, within the Mainframe Market growth has occurred more at the extremely high end. Overall, there has been a gradual shift of the revenue base towards lower pricebands.

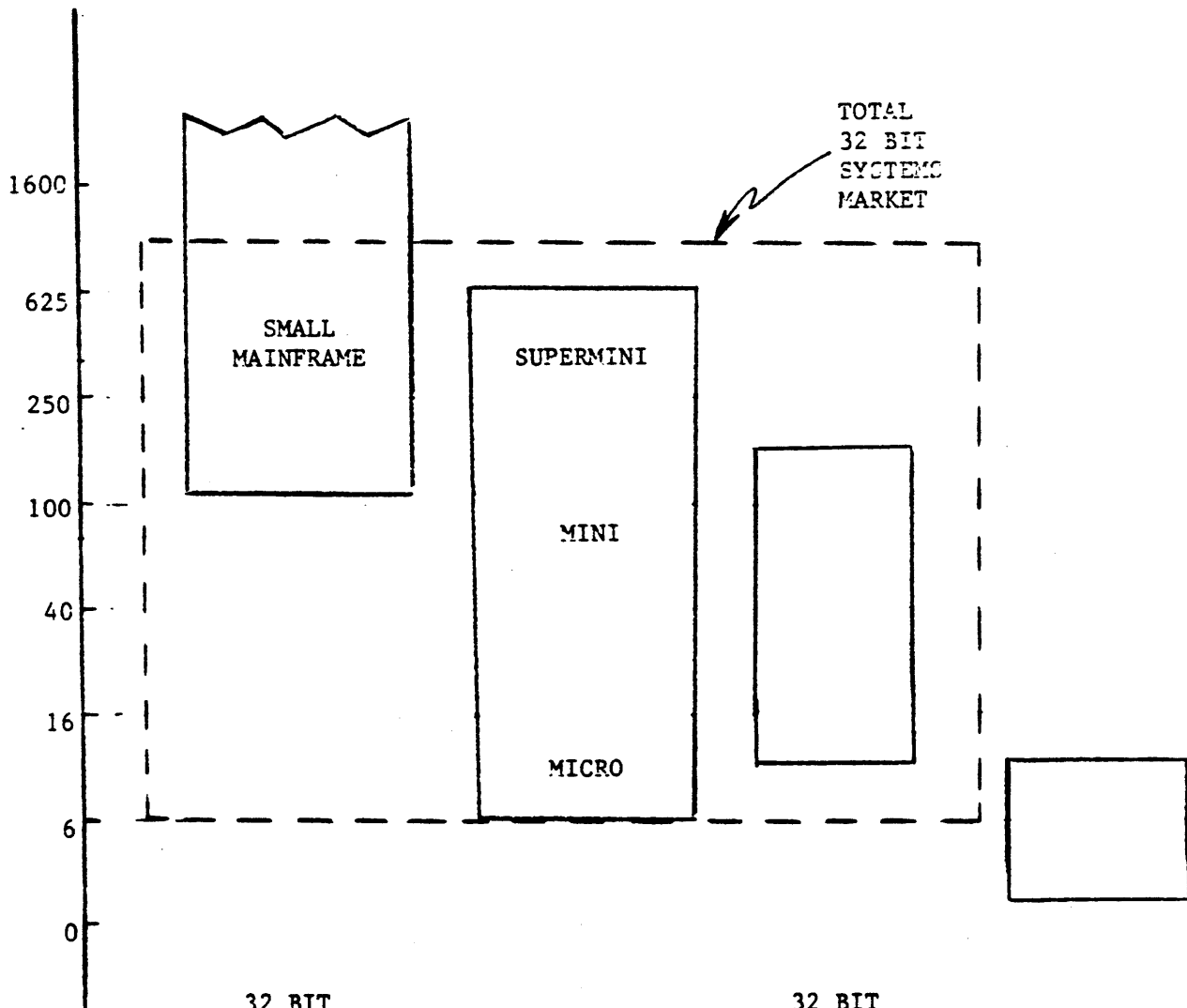
For our scenario we made two assumptions:

1. The lower pricebands would grow slightly faster within the Minicomputer and Small Business Markets.
2. The Supermini band within the Minicomputer Market and the High-end of the Small General Purpose Market would also have above-average growth.

The resultant forecast of the Total 32 Bit Computer Market by priceband through FY90 is shown in Figure C and Figure D.

* A product is measured by the system invoiced NES (all system components shipping on CPU order not the base package system MLP) in order to position within the pricebands above.

FIGURE A
 32 BIT SYSTEMS PROGRAM OFFICE
 MARKET DEFINITION



	32 BIT GENERAL PURPOSE COMPUTER	32 BIT MINICOMPUTER	32 BIT SMALL BUSINESS COMPUTER	DESKTOP
FY82 SIZE	\$7.7B*	\$2.4B	\$1.5B	\$0.6B
82-90 GROWTH RATE	14%	41%	27%	66%

* Under \$1M Systems Only
 (=Small General Purpose)

Figure B.

32 BIT MARKET DISTRIBUTION BY MARKET AND PRICEBAND

(from 1980 IDC data)

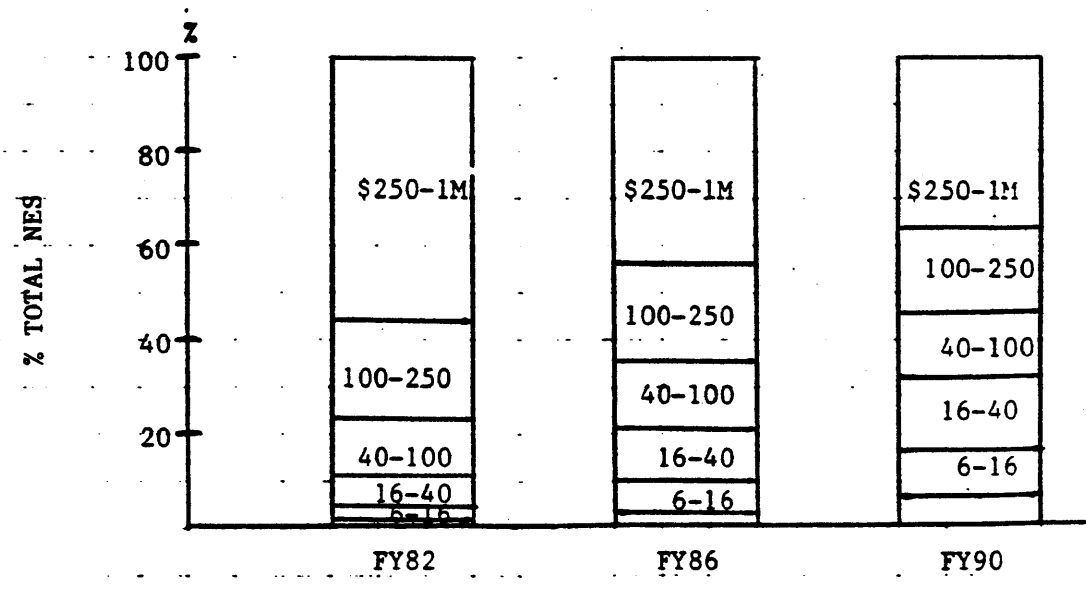
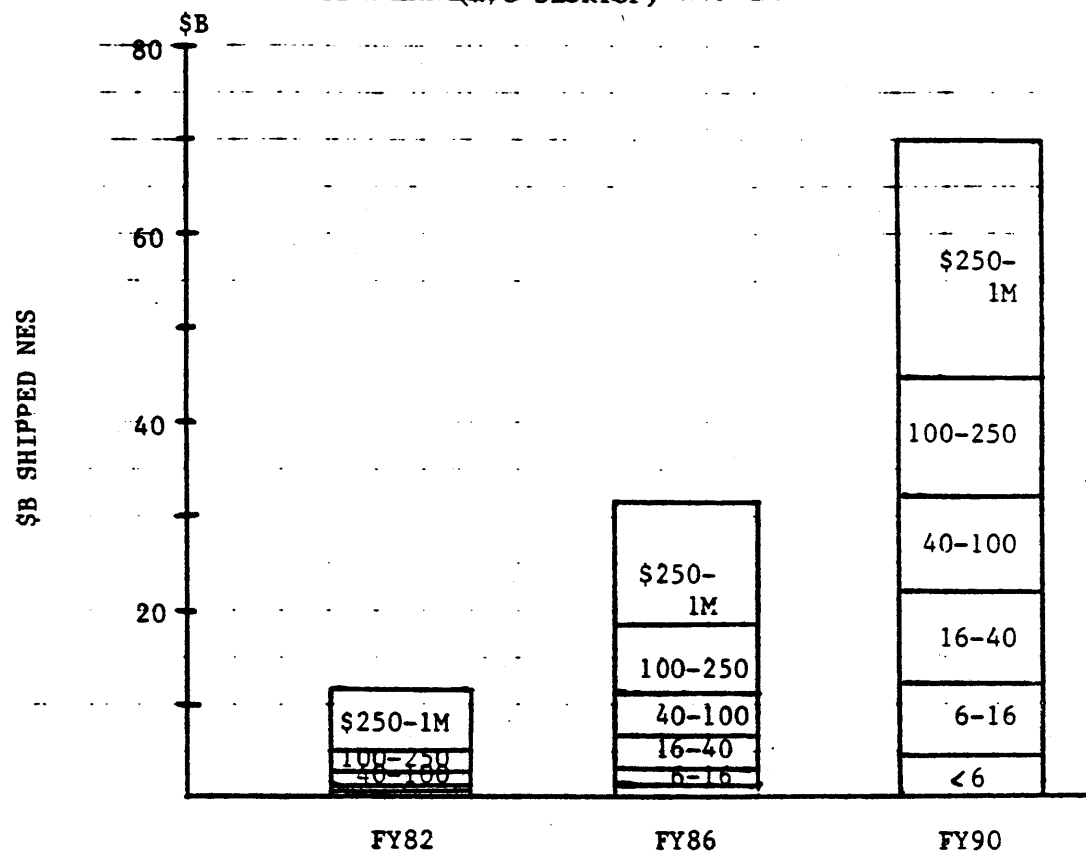
Priceband (\$ Invoiced) NES	TOTAL 32 BIT SYSTEMS MARKET			
	Small General Purpose	Mini	Small Business Computer	Total
\$250K - \$ 1M	80%	15%		39%
\$100K - 250K	20%	30%	10%	22%
\$ 40K - 100K		25%	50%	19%
\$ 16K - 40K		15%	30%	12%
\$ 6K - 16K		10%	10%	6%
<\$6K		5%		2%
TOTAL	100%	100%	100%	100%

Note: Excluded from market definition above:
 Desktop = 38% for \$6-16K
 62% for < \$6K

32 BIT MARKET PROJECTION

BY PRICEBAND

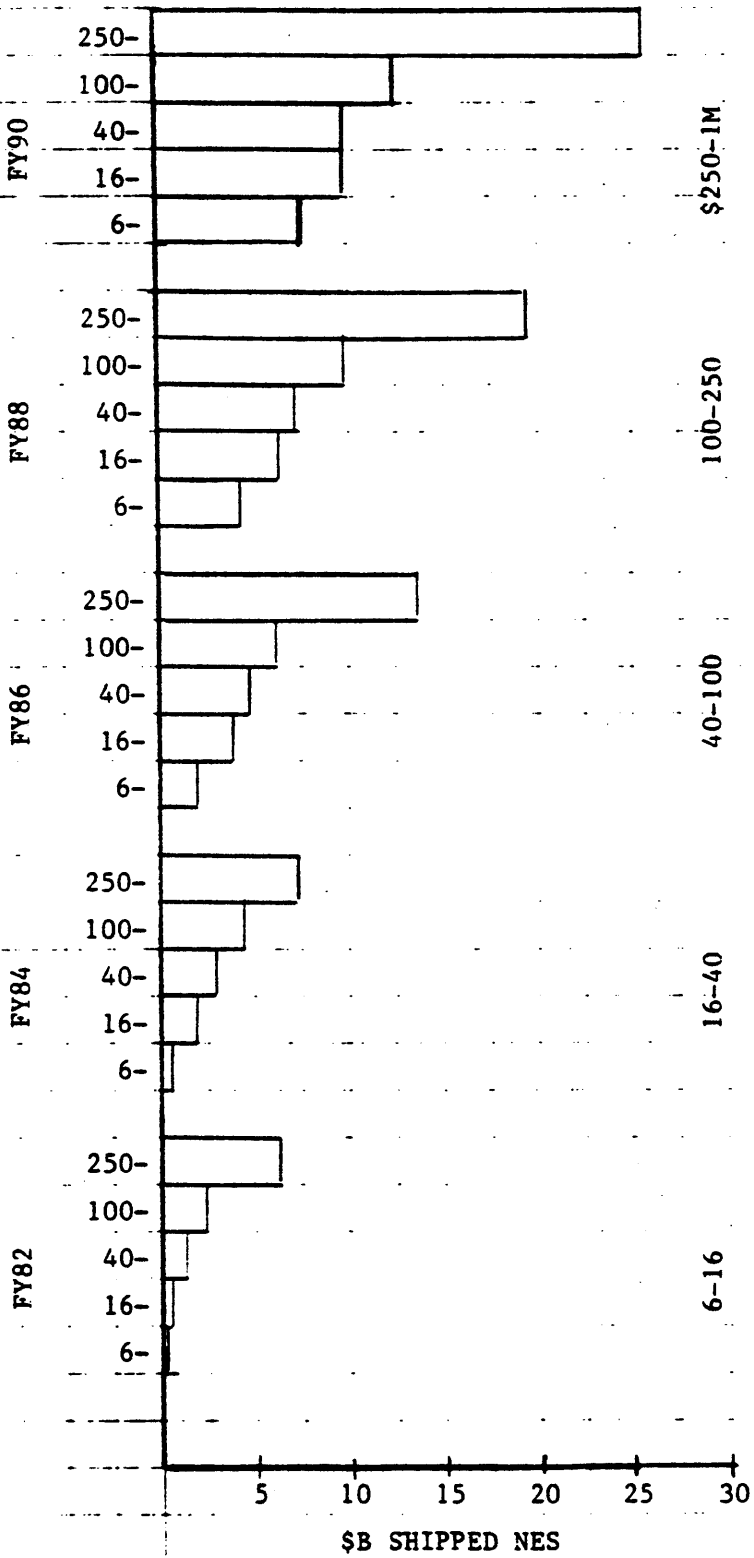
(W/O DESKTOP)



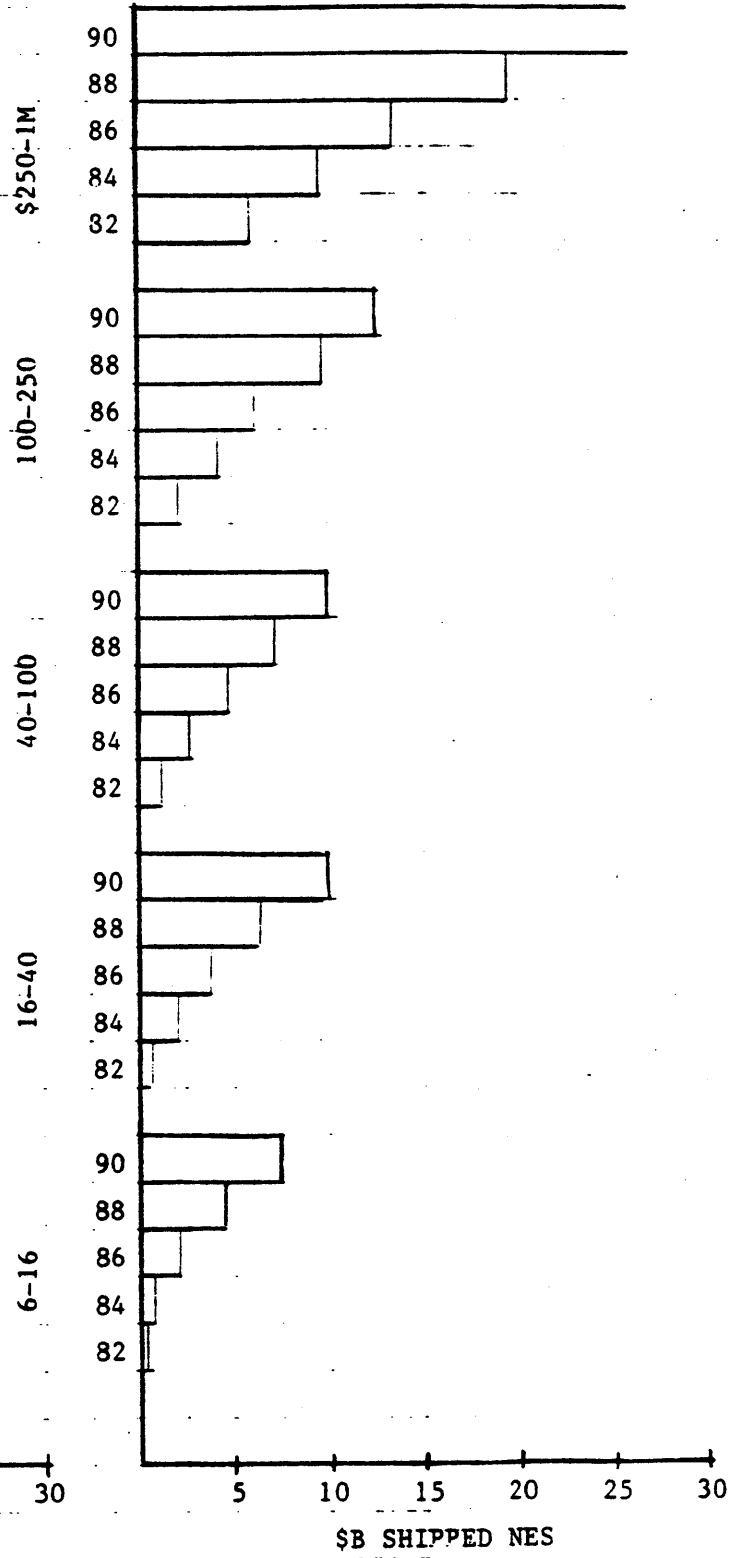
41-D
Fig. D

32 BIT MARKET* PROJECTION

BY YEAR



BY PRICEBAND



* excludes Desktop

Market Orientation:

VAX-11/730 will focus on the traditional low-end PDP-11 high-volume systems and CPU box markets which are:

- Iron
- Scientific Computation
- Real Time
- Personal Computing
- Communications
- Education
- Transaction Processing
- General Purpose Commercial
- Distributed Processing

The VAX-11/730 is intended for the new or emerging technical and commercial markets based on the set of scientific and commercial software offerings of the VAX/VMS operating system and its layered products.

As the smallest, lowest-priced 32-bit VAX in the early 1980's, marketed complete in a small 10.5" high box, the VAX-11/730 is seen as the trail blazing engine to a host of new high-performance systems built by OEM's or assembled by systems houses, in much the same way as the 11/34 and 11/20 were used in the life cycles of the PDP-11 family. Hence, the VAX-11/730 is seen as the new OEM/Systems industry-standard starting in 1982.

Given the size and the complement of commercial software in and planned for VAX/VMS Version 3.0, the VAX-11/730 is also envisioned as the new, 32-bit based, entry-level commercial systems standard for DIGITAL and the industry no later than Q1FY83.

This Business Plan will be supported by VAX-11/730 Marketing Plans from each of the major Product Groups that are providing forecasts. These plans will be developed by the Product Group representatives on the Marketing Task Force listed here and approved by the appropriate P/L Marketing Manager. Additionally, their plans today are found in the VAX Family Product Guide under "P/L Position Statements".

Marketing Groups

COEM	Joyce Znamierowski
CSI	Jim Alosi
MDC	Toni Lee Rudnicki
TIG	Alan Belancik
PBI	Ken Walker
TVG	Ron Sutherland
ESG	Abbot Gilman
ECS	Bill Clark
LDP	Hap Prindle
GSG	Dave Walker
MSG	Jeff Levitt
IEG	Duane Lashua
CSS	?

1.2.2.2 Relationship to Other DIGITAL Products

- The VAX-11/730 is lower in cost and in performance than the VAX-11/780. By lower cost, we mean 20% of VAX-11/780 CPU costs. By lower performance, we currently estimate 25% to 30% the VAX-11/780 performance.
- When compared to the VAX-11/750, the VAX-11/730 is estimated at 40% of its performance and at 50% less in CPU costs. The VAX-11/750 is a Massbus and Unibus system; the VAX-11/730 is a Unibus system only. Accordingly, Unibus peripherals are shared under VAX/VMS support. Unlike the VAX-11/750 and VAX-11/780, the VAX-11/730 implements at FCS the "G and H" floating point extensions in both microcode and FPA accelerator.
- The VAX-11/730 is configured as the smallest VAX 32-bit package in the early 1980's: a 10.5" high, 12-slot product for OEM's and integrators. The smallest VAX before the VAX-11/730 is defined as the 31" high VAX-11/751 "OEM Rack".
- In general, the VAX-11/730 should dominate the VAX systems sales in the \$40K-\$100K range; and the VAX box sales in the \$25K range and over.
- In terms of the PDP-11 culture, the VAX-11/730 is targeted to be equal to or greater in performance than the PDP11/34 with cache; it will be less in 16-bit integer performance than the 11/44, although offering 32-bit hardware and software functionalities. The VAX-11/730 obviously offers significant performance advantages over the PDP-11 family for large address space program solutions.
- The Floating Point Accelerator is expected to surpass both the 11/44 FPA and 11/34 FP11-A processors. Moreover, the VAX-11/730 offers a "warm" floating point instruction set as standard, while the 11/34 does not. The VAX-11/730's Floating Point offers the extended precision and range formats (known as G and H) not available on any PDP-11 member.
- The VAX-11/730 will affect the PDP-11/44 in direct relation to (1) VAX-11/730's actual integer, commercial, and FP performance measurements versus the 11/44; (2) VAX-11/730's overall system/peripheral packaging; and (3) VAX-11/730's 32-bit cost/performance ratio versus the 16-bit 11/44 for new users and applications. (Performance test analyses are scheduled and extensive. The "Performance Section" of the VAX Family Product Guide carries the results.
- The VAX-11/730 is not expected to impact the 11/44 in those areas where the 11/44 can offer PDP-11 operating systems, hardware, purchasing flexibility, P/L products, and PDP-11 culture.

1.2.2.3 Risks and Alternatives

1.2.2.4 FCC and VDE Regulations and Compliance

Through exhaustive, standard EMI/RFI testing, the VAX-11/730 Packaged Systems #1 and #2 were judged in full "Class A" adherence to the FCC regulations governing new commercial computer products. The VAX-11/730 Box was judged as a "Qualified Subassembly for Rack Mounting".

In terms of the European VDE testing, again the VAX-11/730 Packaged Systems #1 and #2 passed with a Class A rating.

Separate reports on these testing programs are available upon request from the FCC, 32-Bit Program Office in Tewksbury.

1.2.2.5 Customer Installability:

The objectives of Customer Installability are two-fold: (1) to reduce overall installation and support costs; and (2) to promote the design, development, and manufacture of quality products. The VAX-11/730 Program Team is in agreement with these objectives; additionally, the team recognizes that "customer installability" remains an unresolved issue at this date. Consider what has happened:

VAX-11/730 Engineering was worked with the CSSE groups to set-up a customer installable "field testing" of a standard VAX-11/730 System. This testing or investigation was conducted by an inter-discipline Digital team in early February 1982. It consisted of having personnel of varying office and technical skill levels, but not familiar with the VAX-11/730, actually install (or attempt to install) the VAX-11/730 System. The test team issued their findings and has attempted to resolve the outstanding/surfaced action items. This report is available upon request.

Our goal remains to achieve full VAX-11/730 customer installability. Nevertheless, we recognize that this was not an original design goal and that the technology and implementation of the CPU, disks, and comm may prevent us from achieving 100% VAX-11/730 customer installability. Further attempts to achieve Customer Installability will be made with Packaged System #3.

1.2.3 Competitive Analysis (Update)

The VAX-11/730 is expected to meet a host of competitive systems in the marketplace during 1982 through 1987. Specifically, the VAX-11/730 will encounter 16-bit, 32-bit, and other competitors, in systems and OEM configurations, depending on the market, application, and financial circumstances existing during its lifetime. Those competitors and their systems that are understood to exist today (1981-1982) are listed here. The list is representative, not comprehensive. The charts that follow are taken from a 32-Bit Program Office Review of the VAX-11/730 pricing process as a model for future PPC pricing proposals. They include competitive assessments made at the time the 730 was priced (January through April 1982).

<u>Competitor</u>	<u>System Entry</u>	<u>Family</u>	<u>Primary Focus</u>
IBM	\$200K +	43XX 81XX	Commercial/Technical
HP	\$30K +	250-300 1000\3000- 44	Commercial/Technical
Prime	\$40K +	2250	Commercial/Technical
Wang	\$30K +	VS Series	Commercial
SEL	\$25K +	Series 32	Technical
Interdata	\$30K +	3210	Commercial/Technical
Harris	\$20K +	Slash Series	Commercial/Technical
Data General	\$20K +	NOVA Eclipse 32-bit	Technical/Commercial
HIS	\$30K +	DPS/6	Technical/Commercial
TI	\$25K +	990	Commercial
Apollo	\$29K +	Domain	Technical/Commercial
Microprocessor Manufacturers	\$10K +		Technical/Commercial
- National			
- Intel			
- Motorola			
Non US Vendors	\$10K +		Technical/Commercial
- Japanese			
- European			

COMPETITIVE POSITIONING FOR 11/730 PRICINGCompetitive PositioningAssumptions

Commercial Configurations Minus

- Terminals
- Printers
- Tapes
- Datatrieve or Equivalent

IBM 4300 Series can compete with a 20% Price Premium

IBM System 38 RPG III Competes With Cobol From Others

For IBM Comparison Software Includes 36 Months of Support

For Other Competitor Software Includes Installation and 3 Months Support

IBM Systems are Overconfigured for Disk Space Based on OS Requirements

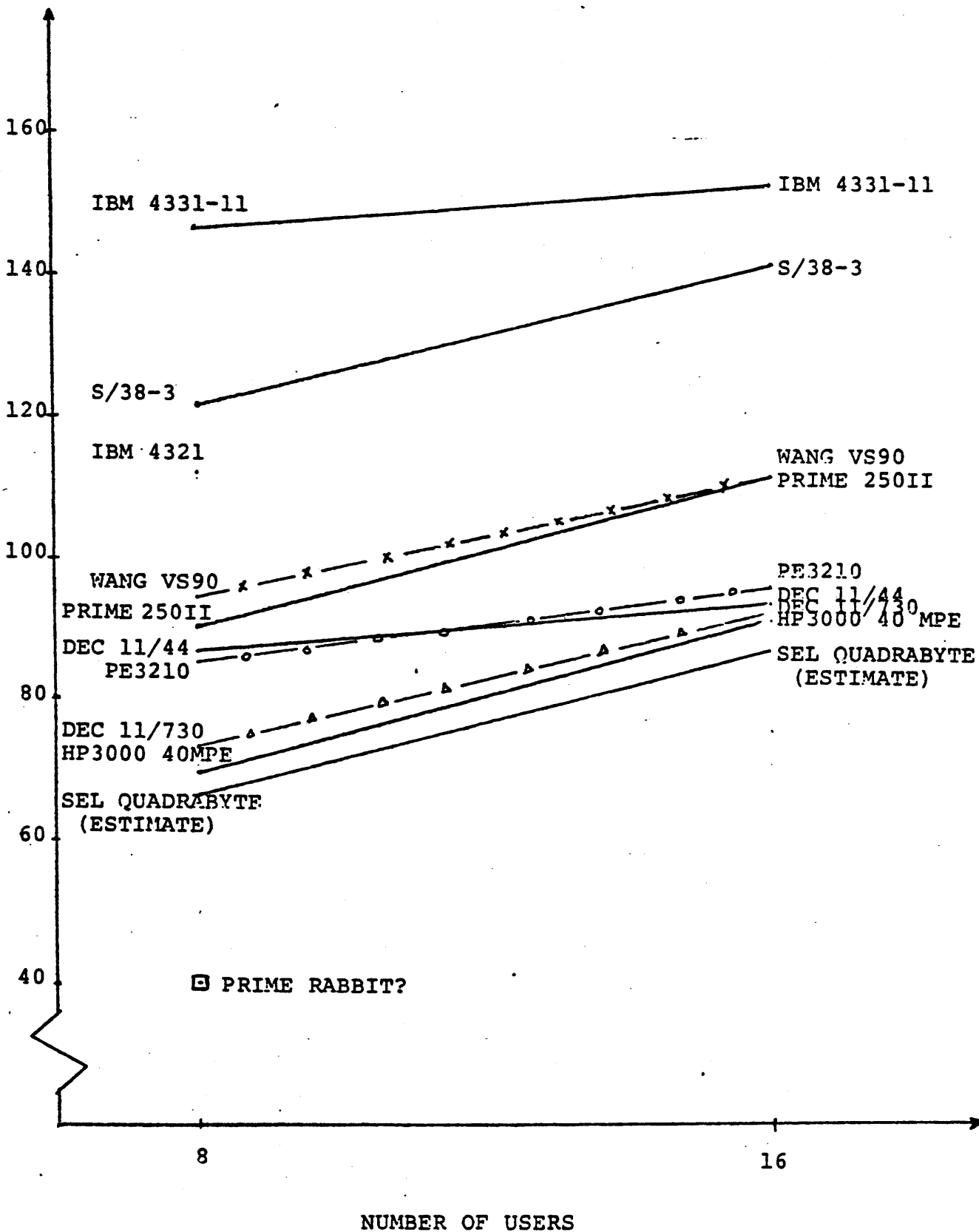
VAX-11/730 COMPETITIVE PRICE BAND CHART

System Price Band	FY81	FY82	FY83	FY84	FY85	FY86
100-250K	IBM 4300 IBM S/38 -4&5 PE3230	IBM 4300 IBM S/38 -4&5 PE3230	IBM 4300 IBM S/38 -4&5&7 PE3230	IBM 4300 IBM S/38 -4&5&7 PE3230	IBM CATLIN 2&3 IBM S/38 -4&5&7	
40-100K	IBM S/38-3 SEL 32/27 PRIME 150/250	IBM S/38-3 SEL 32/27 PE 3210 PRIME 150/250	IBM S/38-3 SEL 32/27 NEW PE 3210 DG MV3000 PRIME 150/250	IBM S/38-3X SEL 32/27 NEW PE 3210 DG MV3000 FASTER PRIME 150/250	IBM S/38-3X CATLIN-1 (4300 TYPE) SEL 32/27 NEW PE 3230 NEW DG MV3000 FASTER PRIME 150/250	
6-40K			PRIME RABBIT	PRIME RABBIT	PRIME RABBIT PE 3210 NEW	

47-B

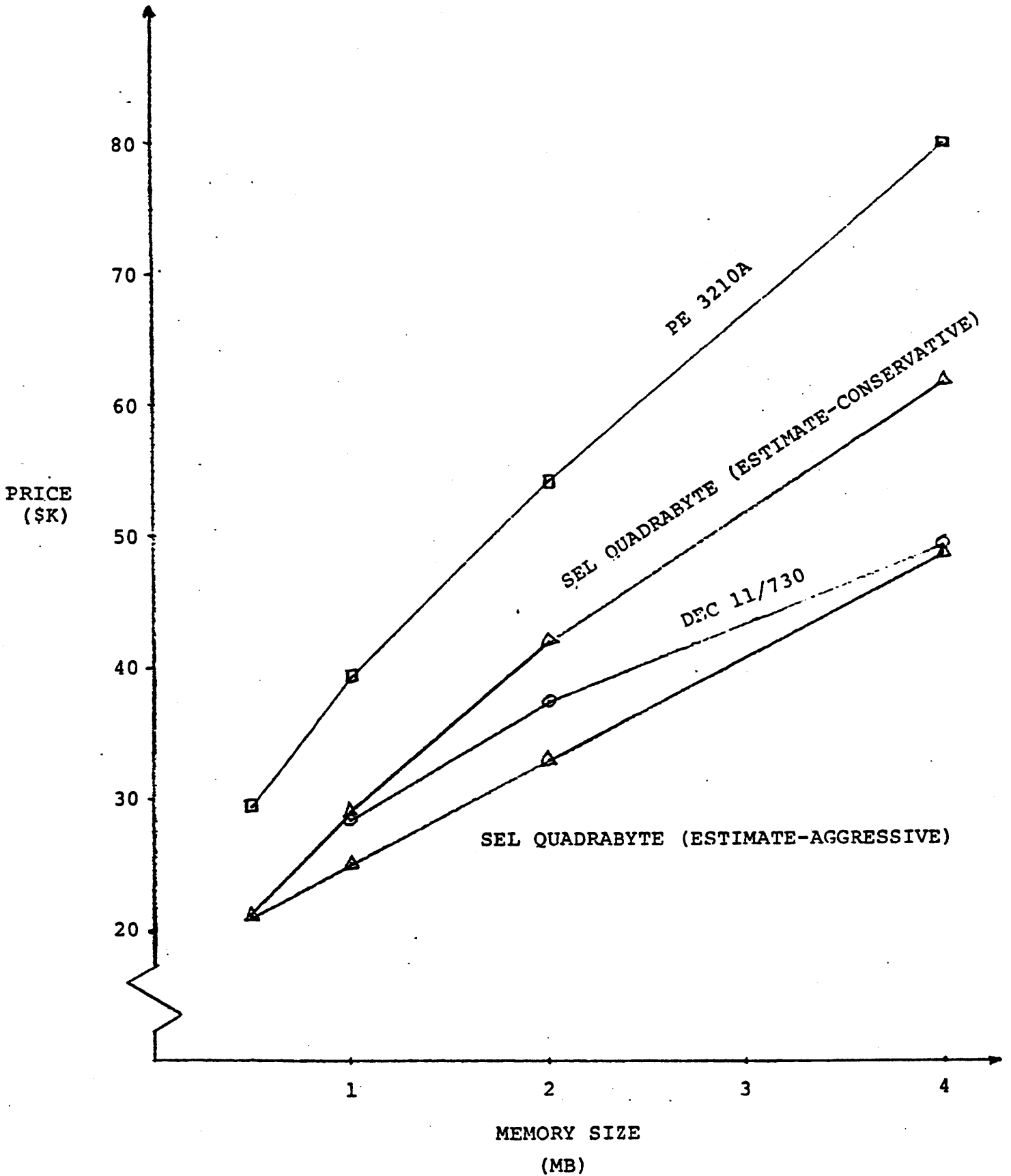
11/730 COMPETITIVE COMPARISON
(MULTI-USER COBOL) ..

47-C



11/730 BOX COMPETITION
SYSTEMS VENDORS

47-D



1.2.4 Service Plan

Field Service support policies for the VAX-11/730 will be similar to VAX's and to those of other small PDP-11's with emphasis on remote diagnosis, except for those systems to be installed by the customer.

Primary methodology will be module replacement, with the goal of identifying logic string failures to aid European/GIA chip level repair as needed; this will also be used in such critical situations where spares are unavailable or bad.

Training will be oriented towards branch level expertise with a support level course available in the VAX tradition. The training will be lecture/lab, and is expected to be about one and two weeks in duration.

The VAX-11/730 box support policies include (1) OEM customer maintenance; (2) third-party maintenance arrangements; (3) DIGITAL time-and-materials contract; and (4) the DIGITAL module mailer procedures.

The VAX-11/730 Packaged Systems service plans include all the standard DIGITAL maintenance contractual services.

With reference to the Product Support goals listed on Page 6, the author wishes to add these brief guideline statements:

- The DMT MTBF of 3600 hours for the VAX-11/730 covers the CPU, FPA, one memory array, backplane, console, fans, two TU58's and LEM power supply only. The COMBO and IDC are not included.

These reliability predictions are based on MIL217C1 standards, favored by improved LSI component rates as demonstrated by industry and DEC experience.

- The MTTR is determined from RAMP and diagnostic capabilities and is measured against field experience on similar products. It represents isolation, correction, and verification, but does not include travel time, response time, nor support efforts.

The MTTR is the "mean" of all expected repair actions; it does not indicate a typical call length.

- A market-driven BMC entry of \$95/month for the basic BA11-Z box contents, (3-board CPU, backplane, LEM, two TU58's, 3 DC fans, console front panel, with one memory array) is a very aggressive price. Actually, the BMC is established to attain specific service and revenue goals, only after considerable research into actual expenses, product characteristics, levels of service, and competitive offerings.

1.2.4.1 NEBULA Diagnostic Plan

The diagnostic system planned for the VAX-11/730 is an extension of the existing 11/780 and 11/750 systems. It is composed of new development in the area of CPU repair and Quick Verify tests, and modification to existing programs in the area of VAX CPU Cluster Exerciser and the Diagnostic Supervisor. New development is required also for the IDC and COMBO modules; existing I/O diagnostic programs (for Unibus peripherals) will be tested to verify transportability between VAX systems.

The diagnostic system for NEBULA will include the following programs:

1. VAX SYSTEM EXERCISER
2. VAX/NEBULA I/O DIAGNOSTICS
3. VAX/NEBULA CPU CLUSTER EXERCISER
4. VAX/NEBULA DIAGNOSTIC SUPERVISOR
5. NEBULA CPU CLUSTER MICRO DIAGNOSTIC PACKAGE

For complete details, consult the NEBULA Diagnostic Project Plan, October 1979.

1.2.4.2 SOFTWARE SUPPORT PLAN

The VAX-11/730 Software Support Plan must be consistent with the overall VAX/VMS Software Support Plan. Any plan for VAX-11/730, however, must incorporate unique features to account for the projected high volume and desired low system cost.

The high shipment volume of this product may well place a strain on support organizations in terms of manpower and, therefore, on their support capabilities. On the other hand, for this product to be competitive it must have a low system cost which necessitates lower support costs. Several solutions have been proposed. Among them are a customer installable VAX-11/730, placing strict bounds on both the hardware and the software configurations, and a limited or reduced warranty period. As of this writing, these are all open issues which will have a profound effect on the final support plan.

VAX/VMS Ver.2.0 was supported by software specialists located in local offices worldwide. These specialists provided presales, warranty, post-warranty and consulting services to both sales prospects and the existing customer base. A steady stream of new specialists provided through a thorough training curriculum met current requirements. This will not change for VAX/VMS Ver.3.0. Any VAX-11/730 specific training will be provided for in the VAX/VMS curriculum.

One recent change which will enhance the support of VAX/VMS by keeping specialists up to date is the introduction of the VAX System Dispatch during Q4 FY81. This Dispatch will include useful information on known problems, work-arounds, and helpful hints. No patches will be included. This publication will begin as a bimonthly but can be expected to become monthly as the range of subject matter grows.

A. Sales Support

Due to the high volume and desired low system cost of this product, Software Services should be expected to assume a more limited role in pre-sales situations. Any level beyond preliminary sales support may be limited to cases involving multiple systems, communications, or add-ons.

B. Installation Support

Making VAX-11/730 customer installable is currently under investigation by CSSE and Mid-Range Systems Product Management. Customer installability is a means to lower manpower requirements for support, thus, lowering support and system costs. Maintaining customer satisfaction must also be a parallel goal. It is not expected that every customer will be able to install their system without problem. Therefore, an Installation Hotline and optional customer training seminars may be required. Additionally, Digital Installation will probably be offered as an option.

C. Remedial Support

World-wide telephone support centers (TSC) will provide primary warranty services for the U. S., Canada, and parts of Europe and GIA. Following system delivery, customers will be given a telephone number they can call during initial installation and warranty to receive support for remedial problems. These telephone support centers will also provide support to those customers with contracts for post warranty services.

For those areas without a TSC, support from the local office will be provided.

D. Post-Warranty Services

Currently four levels of post-warranty services are being offered:

1. Software Product Updates consist of releases of software and documentation only. No services are included. The customer is able to order either updates or new versions of software and documentation at his option. This is not a contract; rather it is an offering of out-of-warranty update kits in the Master Price List.
2. Self Maintenance Service for software (formerly BPUS) provides all the tools required for self sufficient customers to maintain their own system software. This includes software and documentation updates, the VAX System Dispatch, and SPR service.
3. Basic Service for software provides a customer who requires some, but not total, support to maintain their software. This service includes all the elements of Self Maintenance Service plus telephone support for usage and remedial software questions.
4. DECsupport Service for software is the most comprehensive service and includes all the elements of Basic Service plus preventive maintenance (delivery and installation of software and documentation updates) and on-site remedial support for critical situations.

E. Support Plans Update

The current field service plan is to have the VAX-11/730 supported in every service branch in the company within approximately 15 months after first customer shipment. There are presently about 325 branches worldwide. The schedule of 15 months is probably the quickest introduction rate that field service can absorb.

Software support training for the VAX-11/730 is the same training that we have today for the 11/780. There appears to be sufficiently trained software personnel to support the increased VMS shipments in FY'83, resulting from the delivery of VAX-11/730's.

Sales training-USA conducted one train-the-trainer session starting on April 19th in MK with delegated, qualified representatives from all U.S. and Canadian regions/districts. Once trained, the trainers conducted two or more day sessions in their respective districts on the contents of the entire VAX/VMS Family Announcement.

Additionally, Sales training-USA held a VAX/VMS "Train" in the following major U.S. cities in Q1/Q2 FY'83 in support of all VAX/VMS products: Washington, D.C., Atlanta, Seattle, San Francisco, Los Angeles, Chicago, Dallas, New York, and Merrimack.

Sales training-Europe will hold VAX Family Road Show seminars in June of 1982. Sales training-GIA conducted a major city training tour started in late February 1982 after approaching PPC for approval of materials on unannounced products.

1.2.4.3 Field Test

The VAX-11/730 has undergone extensive Field Testing prior to Announcement, FCS, and Product Availability, as specified in the Corporate guidelines.

The specific VAX 11/730 Field Test Sites and the sponsoring Product Groups were as follows:

P/G	#	CUSTOMER	-	LOCATION
TVG	2	SSC	:	TULSA, OK
		FERRANTI'-CETEX	:	EDINBURGH, SCOTLAND
COEM	2	MDS	:	MA
		DIBOL GROUP	:	MK
TIG	1	BTL	:	MURRY HILL, NJ
CSI	1	SI	:	MA
GSG	2	GCHQ	:	BRISTOL, ENGLAND
		C.S.I.R.O.	:	CANBERRA, AUSTRALIA
IEG	1	G. BELL	:	MILL

NOTES:

1. Each Field Test system shipped with a complete set of spares.
2. All Field Test Systems except the last one were VAX-11/730 Systems #2. All had at least 1MB of 64K chip memory, one COMBO board, one IDC, one FPA, one BBU. All had one RL02 disk and one R80 (131MB disk total); except the IEG System which had at least two RL's (20MB).
3. Product Groups own the systems: all are to be returned at the termination of the Field Test period and replaced by full production systems.
4. A separate Field Test report is available from Carol Chisholm, CSSE.

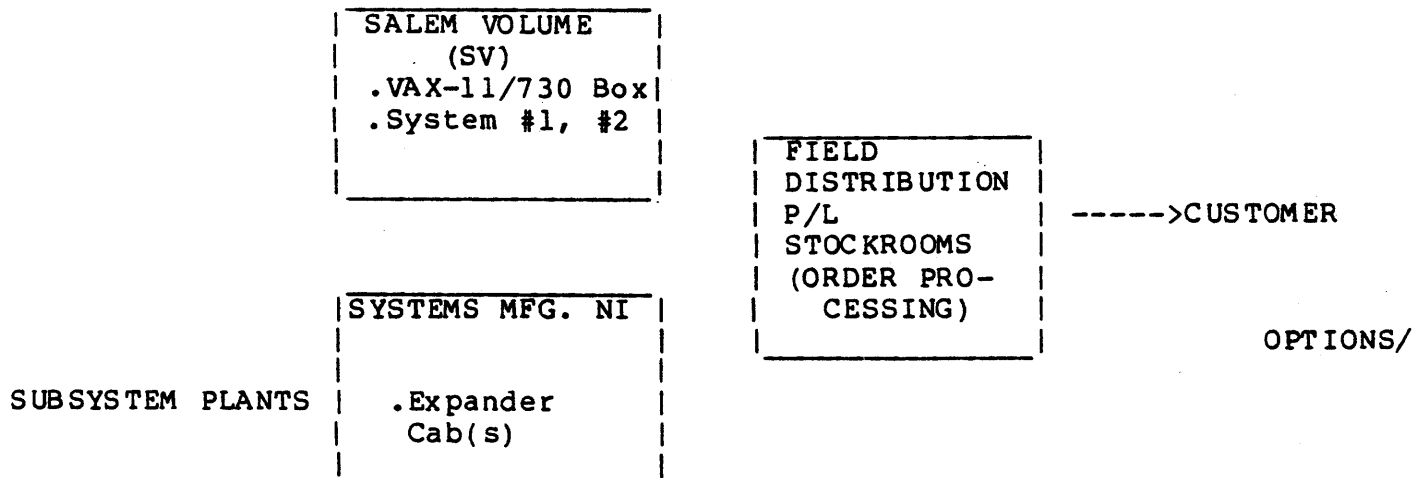
1.2.5 Manufacturing Plan

The VAX-11/730 Manufacturing Plan details the complete process. At this time, the preliminary plan for domestic manufacturing of NEBULA includes these major items:

- The primary domestic NEBULA box and systems Volume Plant is Salem Volume (SV) located in Salem, New Hampshire (formerly the J. M. Fields building on Rte. 28).
- The secondary plants are listed in Table 1-3. The larger ones include San German (boards); Aquadilla (Power Supply); Burlington (Modules and BBU); Colorado Springs (Disks); Marlboro (Memories).
- Salem Volume will build, test, and crate not only the Ball-Z box, but both System Cabs for Systems #1, #2, #3, and the 730 Kernal. The output is shipped to the Field Distribution Center(s) (FDC). There are no traditional FA&T processes involved in the building of the box and system cabs, although the testing, quality auditing, and producability aspects are incorporated into the Volume manufacturing process.
- The NI Systems Manufacturing plant (also in Salem, N. H.) will produce, test and crate the traditional Expander Cab(s). The Expander Cab(s) will also be shipped to the Field Distribution Center(s) Product Line Stockrooms for processing and shipment to customers.
- The Field Distribution Center(s) will process orders and ship VAX-11/730 Boxes, Packaged Systems, Expanders, Dock-Merged options, software, and respective documentation directly to customers. The diagram on the next page illustrates the major steps.
- Non-Domestic (Europe - GIA) manufacturing processes are under planning and review; they will be detailed in their respective plans.

OVERVIEW OF VAX-11/730 MANUFACTURING PLAN

SUBSYSTEM PLANTS



- PRODUCT CERTIFIED
VAX-11/730 OPTIONS
- .FPA
 - .MEMORY
 - .TS11
 - .Other

Advantages of VAX-11/730 Manufacturing Process

The major advantages to the VAX-11/730 two-stage manufacturing process (over the conventional three-stage process) are as follows:

- o Cost avoidances and reductions, including:
 - Lesser inventory carrying costs
 - Lesser FA&T conventional costs
 - Lower Costs for Space (Less space required)
 - Less time and fewer total personnel
- o Total throughput time reductions (from the traditional 39-week three-stage to a 22-week two-stage process).

1.2.5.1 Volume production - Salem SV

First Month - quantity : May '82 (Q4'82) TBD
Ramp up (qty. for six months) : TBD
Steady-State Volume : Oct. '82 (Q2'83) TBD
(Product Availability)

1.2.5.2 Volume Production - Galway

First Month - quantity : No later than 6 months
after Salem Volume
Ramp up (qty. for six months) : TBD
Steady-State Volume : No later than 6 months
after Salem Volume
(Product Availability)

1.2.5.3 Systems Integration (NI) - Salem, NH

First Month - quantity : May '82 (Q4'82) TBD
Ramp up (qty. for six months) : TBD
Steady-State Volume : Oct. '82 (Q2'83) TBD
(Product Availability)

1.2.5.4 Systems Integration - Westminster

First Month - quantity : No later than 9 months after NI
Ramp up (qty. for six months) : TBD
Steady-State Volume : TBD
(Product Availability)

1.2.5.5 Systems Integration - Ayr

First Month - quantity : No later than 9 months after NI
Ramp up (qty. for six months) : TBD
Steady-State Volume : TBD
(Product Availability)

1.2.5.6 Systems Integration - Kanata

First Month - quantity : No later than 9 months after NI
Ramp up (qty. for six months) : TBD
Steady-State Volume : TBD
(Product Availability)

Allocation of First 500 Production Units

Given the anticipated heavy demand and enthusiastic market response to the VAX-11/730, the Product Manager undertook to allocate the first 500 units engineering and manufacturing negotiated to produce in the first six months. (By the way, the highest ramp of a system of this price class in the history of Digital.) Using a series of metrics and weight factors to assure fairness and coverage, the first 500 were allocated as follows:

ALLOCATION OF FIRST 500 VAX-11/730s

	<u>Q4 '82</u>			<u>Q1 '83 + OCT.</u>	
	<u>#</u>	<u>%</u>		<u>#</u>	<u>%</u>
COEM	15	10	COEM	48	14
CSI	7	5	CSI	24	7
MDC	5	3	MDC	14	4
TIG	9	6	TIG	28	8
GA	0	0	GA	3	0
ECS	5	3	ECS	17	5
ESG	6	4	ESG	24	7
GSG	7	5	GSG	25	7
LDP	12	8	LDP	42	12
MSG	2	1	MSG	7	2
TOEM	25	17	TOEM	82	24
IEG	50	33	IEG	36	10
MANAGEMENT	7	5	MANAGEMENT	0	0
TOTALS	150	100%		350	100%

1.2.5.7 Standard Costs

PRODUCT/PERIOD	STANDARD FY '82	STANDARD FY '83	EXPECTED FY '84
1. 11/730-ZA* (BOX W/1MB)	\$ 8,734	\$ 5,951	\$ 5,206

2. Kernel #1* (2-RL02/IMB/COMBO)	\$14,180	\$11,123	\$10,875
LA120-DA + Cable	857	857	752**
QC001-DZ Cat D (One RL02 Pack)	<u>100 E</u>	<u>105 E</u>	<u>110 E</u>
System #1 total	\$15,137	\$12,085	\$11,737

3. Kernel #2* (RL02/R80/IMB, COMBO)	\$17,621	\$13,833	\$13,438
LA120-DA _ Cable	857	857	752**
QC001-DZ Cat. D	<u>100 E</u>	<u>106 E</u>	<u>110 E</u>
System #2 total	\$18,578	\$14,795	\$14,300

* From Salem Volume Manufacturing (SV) as of September 1982.
Source: Pam Verrill

** LA100-CA + cable transfer cost, FY'84
Source: Forecasters' Kit, July 1982

Assumptions That Governed the Estimated/Standard Costs

1. Costs assume module build will transfer to Puerto Rico in FY82.
2. Cost projections on the disk, memory array and IDC from FY84 are best guess only. Cost estimates are in then-year dollars.
3. Labor projections from FY83 out assume a 90% learning curve per year with a 7% increase in the cost of labor for a net decrease of 3%.
4. Overhead rate was held constant at 500%.
5. NOTE: In FY84 System 1 may become System 3 which is known as AZTEC.
6. These costs include a material acquisition amounts that has been added-on to cover costs unknown at this time.
7. Transfer Costs for the software (VAX/VMS) in Packaged Systems cover the distribution media only.

Other Manufacturing Transfer Cost Estimates

<u>Unit/Subsystem</u>	(First Volume Year)	T.C.	T.C.
		<u>FY83</u> (\$)	<u>FY84</u> (\$)
MS730-CA, 1MB		1,269	1,019
FP730 - FPA		602	571
DMF32-AA, COMBO		1,200	1,177
RB730, IDC		743	663
TU58, Dual		367	367
LA120-DA		978	TBD
LA100-CA		752	752
LEM Power Supply		588	561
H7231-A, BBU			TBD
874-D, Power Controller		140	
TS11, Tape & Controller		5,800	6,100
TU80, 100:ps, streamer; Controller		3,900	TBD
RUC25-CA/CB Dual Rack Mounted AZTEC (100MB) w/Controller		5,144	TBD
RA60; 205MB, R		3,000	TBD
RA80-AA, 121MB, F		4,269	TBD
RA81, 456MB, F		4,800	TBD
UDA-50,		1,200	TBD
H9642-DH, FCC U- Expander CAB		1,800	TBD
DZ32		839	TBD

1.2.6 Worldwide Shipment Forecast

1.2.6.1 Product Manager's Predictions and Assumptions (Q1FY'83 Pass)

Fiscal Year	W. W. Ships
1982	104
1983	4,600
1984	10,030
1985	13,970
1986	12,000
1987	9,400
TOTAL	50,104

o The Product Manager's Predictions above are based on previous Product Line Forecasters' Input, the Request/Commit Inputs, and previously-generated manufacturing numbers.

1.2.6.2 Volume Manufacturing Build (Salem SV only) to be supplied.

Salem Volume Shipments to Date:

	1982					
	May	July	August	September	October	TOTAL
	June					
Actual Shipments:	104	50	41	155	TBS	
Cum:		154	195	350		TBS

1.2.6.3 Volume Manufacturing Build (Non-Domestic) to be supplied.

VAX-11/730 REQUESTS/PLANNED SHIPMENTS

61-A

.... FROM C.O.P.I.S.

WORLD WIDE	FY'83		FY'84	
	PG REQ.	PG SHIPMENTS	PG REQ.	PG SHIPMENTS
BOX	435	747	3908	3774
RL/RL	431	377	267	299
R80/RL	3378	2685	4198	4288
TOTALS	4244	3809	8373	8361
MANUFACTURING CAPICITY W.W. UNITS:	6200		10,000	

MANUFACTURING CAPACITY: FY'83

VAX-11/730 UNITS

SALEM VOLUME	:	TO 4200
GALWAY	:	TO 1500
KANATA	:	TO 500
TOTAL	:	TO 6200

1.2.6.4 Mix Assumptions by Year (by Product Manager)

<u>Total VAX-11/730</u>			<u>FY83</u>	<u>FY84</u>	<u>FY85</u>	<u>FY86</u>	<u>FY87</u>	<u>TOTALS</u>
<u>Shipments:</u>								
Boxes #			600	2,000	3,000	2,600	1,800	10,000
Boxes %								20%
#1: RL/RL02	: #		410	800	300	--	--	1,510
	: %							3%
#2: R80/RL02	: #		3,440	4,000	2,400	1,500	700	12,040
	: %							24%
#3: RC25/RC25	: #		--	1,050	3,050	3,200	2,800	10,100
	: %							20%
Kernel + 2 x RA60s	: #		30	800	1,820	2,000	1,800	6,450
	: %							12.9%
Kernel + RA81/RA60	: #		10	290	600	600	500	2,000
	: %							4%
Kernel + RA80/TU80	: #		10	290	200	100	--	600
	: %							1.2%
Kernel + RA81/TU81	: #		--	300	600	700	600	2,200
	: %							4.4%
VAX Stations and Future Systems	: #		100	500	2,000	1,300	1,200	5,100
	: %							10.2%
TOTALS			4,600	10,030	13,970	12,000	9,400	50,000

1.2.7 Financial Analysis

A thorough financial analysis was conducted under Carol Reid, 32-Bit Program Office Finance Manager, and was the work of William H. McDonald, the VAX-11/730 Financial Analyst. Performed in the November/December 1981 timeframe, in support of the Pricing Proposal, the analysis considered a total 5-year unit count of 45,000 shipments from FY'83 through FY'87. The summary is published here; the full Proprietary Report is available upon request.

FINANCIAL SUMMARY

11/730 SYSTEM LEVEL FINANCIAL ANALYSIS
SUMMARY OF PRO FORMA FINANCIAL STATEMENT

	<u>FY79 - FY87</u>
Total Shipments	45,000* <u>\$ M</u>
Total Revenue (Equipment and Service)	3466
Less: Cost of NOR	1345
Gross Margin	2121
Gross Margin as % of Total NOR	61%
Less: Development Expenses	58
Selling, Marketing, G & A	717
Profit before Tax	1346
PBT as % of Total NOR	39%
Profit after Tax	727
After Tax Net Cash Flow	727
After Tax Net Present Value @ 40%	40.3
After Tax Internal Rate of Return	71%
Breakeven Date = Q2FY85 (November 1984) = 10 Quarters after FRS	
Development/Total NOR = 1.7%	

*Shipments are from FY'83 to FY'87

This analysis was performed using the Business Review Program

1.2.8 P/L Position Statements

The Product Manager consulted with all the PL's interested in VAX-11/730 to gather and publish their position statements in the VAX Family Product Guide.

1.3 STRATEGY, TACTICS, AND SUPPORTING RATIONALE

- For the low-end of the VAX family, exploit VAX-11/730's complete VAX/VMS compatibility: VAX architecture, VMS software, and layered products.
- Extend the VAX/VMS family to the performance levels and price ranges of the low-end systems and box markets.
- Market two bounded, dock-merged packaged systems with separate expansion cab possibilities starting in late FY'82.
- Appeal to the traditional high-volume PDP11 customer with a VAX Unibus-based system and familiar peripherals but also with a set of migration functions.
- Push VAX 11/730's commercial instruction set and commercial software capabilities. Capitalize on the full VAX floating point set and the availability of the one-HEX FPA option (capable of handling the F, D, G, and H format) at FCS .
- Offer performance expansion capabilities to satisfy the specific criteria of select groups of customers as well as new users in new markets. (ex: FPA, DMF32 board, Expansion Cab, IDC, memory, DMR11, etc.)
- Utilize standard off-the-shelf subsystems, modules, and parts already in quality volume manufacture or dock-merged certified. (Ex: LA38, RL02's, R80, TU58's, TS11, VT100)
- Promote the extensive maintainability, microdiagnostic, and BMC ease-of-use features through remote diagnosis.
- Analyze the Packaged Systems customer installability requirements in Q3 FY81; obtain a Corporate decision on this issue in Q1 FY82.
- Produce the single cab system without redundant, conventional FA&T processes, in a volume plant.