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INSTRUMENTATION AWARD(U) MASSACHUSETTS INST OF TECH
CAMBRIDGE LAB FOR INFORMATION AND DECISION SYSTEMS
V KLEMA NOV 84 AFOSR-TR-84-1183 AFOSR-83-0305

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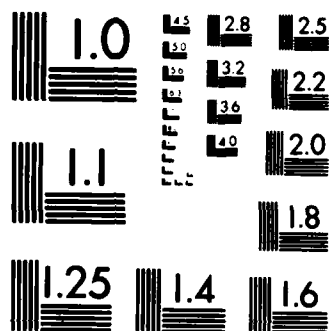
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MICROCOPY RESOLUTION TEST CHART
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Final Scientific Report for Instrumentation Award to principal investigator, Virginia Klema, Grant AFOSR-83-0305

Attn. of PKZB (Debbi Tyrrell) Department of the Air Force,
Air Force Office of Scientific Research, Bolling Air Force
Base, DC 20332

Nov 1984

The Instrumentation Award, Grant AFOSR-83-0305, to Virginia Klema permitted the fabrication of expanded concurrent computing equipment for research on numerical methods in a concurrent microprocessor based environment.

The VAX 11/730 acts as a file server for the microprocessor concurrent configuration. The Grant AFOSR-83-0305 permitted us to obtain the Intel 86/380 six processor configuration, one additional processor for the expanded 86/330 system, one additional processor for the 86/330 system, and the rom burner for the Intel development system. Rom chips, cables, and T-switches were obtained to complete this configuration. The configuration used for research on concurrent computing is shown in diagram form on the three succeeding pages of this report.

Our research concentrates on scientific applications, in particular signal processing and image processing. Experience with this flexible and configurable concurrent system provides the capability to devise new approaches to signal processing and image processing. Within the next year we expect to expand our research activity to problems in computational fluid dynamics. The concurrent computing environment permits research in operating systems and programming language constructs for numerical methods.

This microprocessor-based equipment is current state-of-science components. The key element in each processor is the Intel 8087 chip that has the binary standard, P754, for floating point arithmetic in hardware.

A key component of our future research will be the monitoring of performance in a concurrent environment. Furthermore, the tools for debugging in a concurrent environment must be designed and implemented.

The personnel presently associated with our research on concurrent computing are Elizabeth Ducot, George Cybenko, Virginia Klema, and two graduate students, Richard Kefs and Joseph Sebeny.

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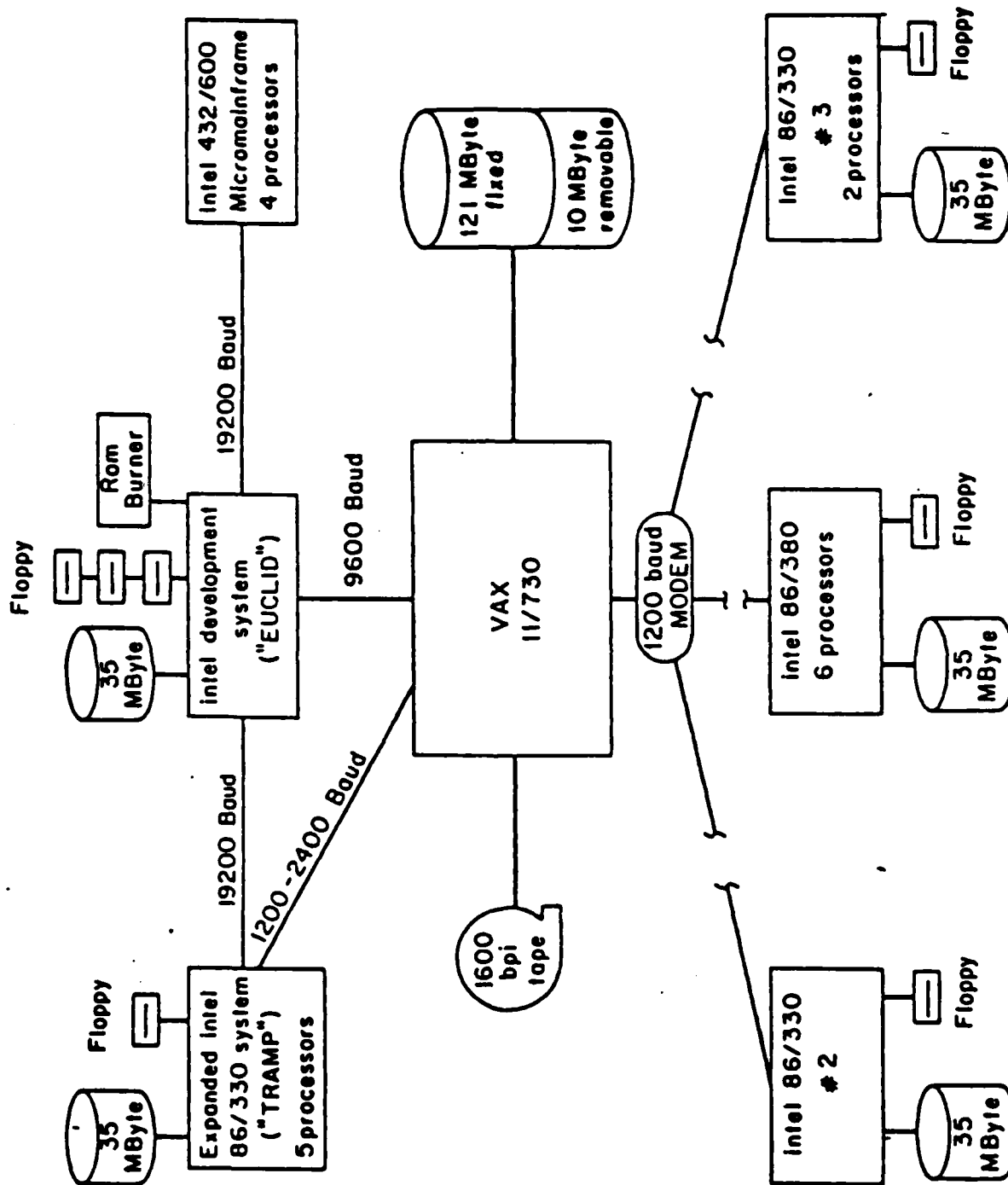
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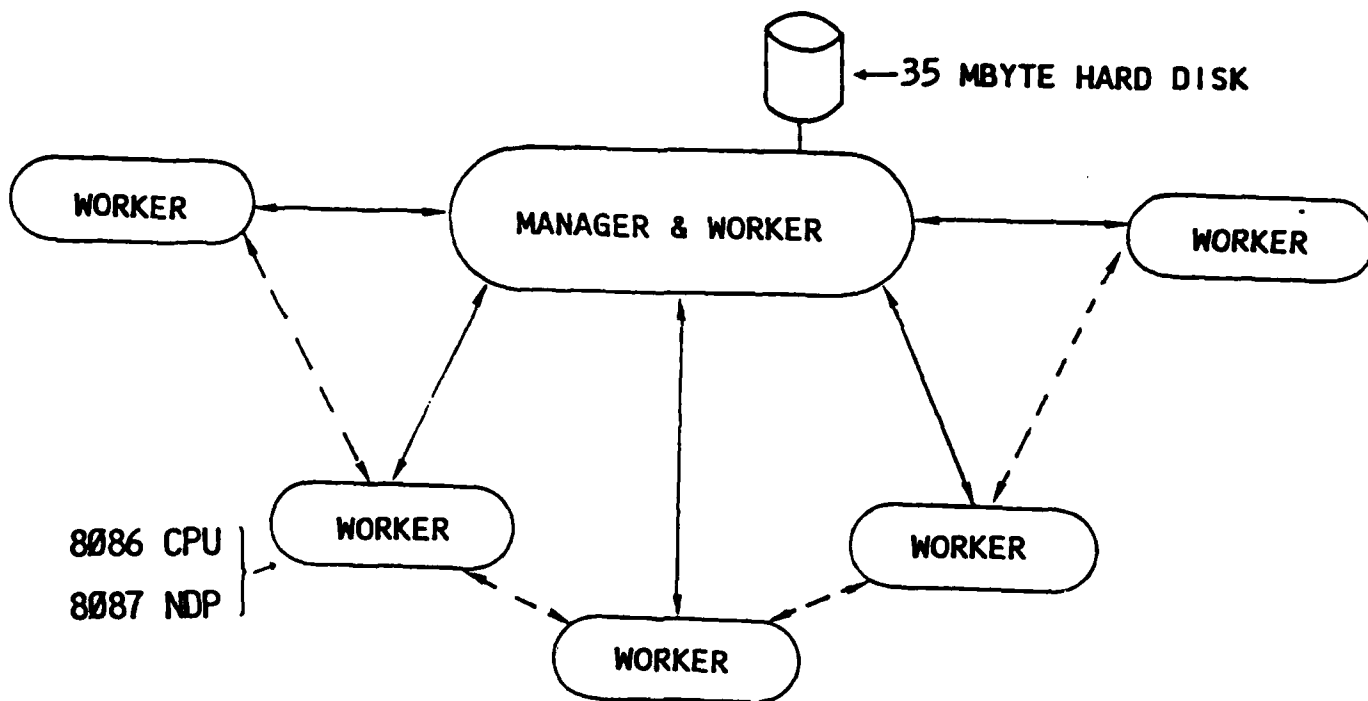
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CONCURRENT COMPUTING LABORATORY*



* Configuration as of 9/1/82. Terminals and printers(not shown) are attached in each system with the exception of the Intel 432/600.

ONE CONCURRENT WORKSTATION

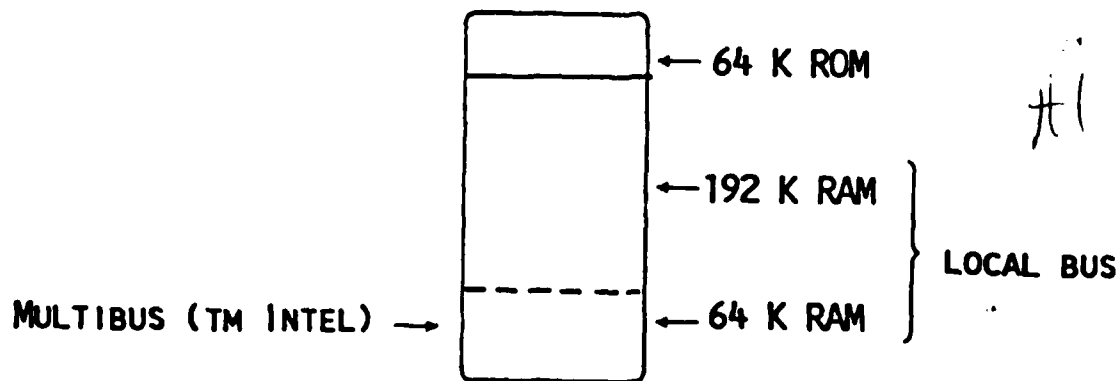


SOFTWARE TASKER

**LOCATES CODE AND DATA
MONITORS AND CONTROLS EXECUTION**

EACH WORKER

**ON-BOARD MEMORY
(PARTITION CONFIGURABLE)**



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CONCURRENT COMPUTING LABORATORY

SYSTEM	CPU	MEMORY	LANGUAGES	STORAGE	COMMUNICATION MEDIA	OPERATING SYSTEM
VAX 11/730	11/730 plus Floating point Accelerator	3 M Byte	BASIC FORTRAN 77 C APL LISP Ada* Cross Compiler	121 M Byte Winchester 10 M Byte Removable	1600 bpi tape Cartridge tape Terminal 1200 baud modem	Berkeley UNIX
INTELLEC SERIES III intel microcomputer development system ("EUCLID")	iSDC 8085 iSDC 8086/8087 pair	576 K Byte	FORTRAN 77 ASM-86 PLM-86	35 M Byte Winchester	Floppy Disks 512 KB (3) 8" single side/ double density Terminal	ISIS 11 (W)
Intel 86 330 (expanded) ("TRAMP")	5 iSDC 8086/8087 pairs	Configurable Initial: 896 K Multibus 768 K Private	FORTRAN 77 ASM-86 PLM-86	35 M Byte Winchester	Floppy Disk-IMB 8" Configurable Terminal	IRIX 86 Version 5
Intel 86 300	6 iSDC 8086/8087 pairs	Configurable Initial: 960 K Multibus 960 K Private	FORTRAN 77 ASM 86 PLM 86	35 M Byte Winchester	Floppy Disk-IMB 8" Configurable Terminal	IRIX 86 Version 5
Intel 86 330 22	iSDC 8086/8087 pair	960 K Byte	FORTRAN 77 ASM-86 PLM 86	35 M Byte Winchester	Floppy Disk-IMB 8" Configurable Terminal	IRIX 86 Version 5
Intel 86 330 23	2 iSDC 8086/8087 pairs	Configurable 640 896 K Multibus Up to 256 K Private	FORTRAN 77 ASM 86 PLM 86	35 M Byte Winchester	Floppy Disk-IMB 8" Configurable Terminal	IRIX 86 Version 5
Intel 937600 Microtransformation	4 iSDC 937600 processors	512 K Byte	Native Code from Ada* VAX Cross Compiler	N/A (linked to EUCLID)	N/A	IRIX

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