CPG MEMO NO. 5

NATIONAL RADIO ASTRONOMY OBSERVATORY

MEMORANDUM

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To: Distribution

From: R. Fisher Rick

Subj: Data Acquisition System Comparisons

In the attached table is a quickly gathered summary of four possible data acquisition systems for laboratory use. This is offered as a focal point for the discussion of future laboratory computing needs on the 23rd.

JRF/cjd

Enclosure
Table

Distribution:

VLA:	Tucson:	CV:	GB:
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SYSTEM	BUS AND PROCESSOR	MEMORY SIZE	OPERATING SYSTEM	LANGUAGES	APPLICATION SOFTWARE	GRAPHICS DISPLAY	STOARGE MEDIA	INTERFACES	MAINFRAME INTERFACE	SUPPORTED PERIPHERALS	RELATIVE COMPUTING SPEED	LIST PRICE	REMARKS
DEC MINC 23	PDP 11/23 Unibus?	128 K 256 K max.	RSX-11M	BASIC FORTRAN	Considerable.	VT 125 768 x 240	2 - 8" Floppies 1 M Byte Upgrade to 10 MB	IEEE 488 RS 222 plus full analog complement	To other DEC	Hardcopy Printer Floating Point Q-Bus	BASIC 1 FORTRAN 50	$28,000	
HP 9816 9826 9836	68 000	Up to 1 MB	Possibly UNIX on 9816	BASIC, PASCAL (w/assy)	Statistics, Utilities, Graphic Commands VISICALC User Group	512 x 390 (9836)	5 1/4" 264 KB ea. 2 in 9836	IEEE 488 RS 232 16 Bit I/O BCD Input	To HP 1000	Graphics, Printers, Plotter, Graph Tablet DAC System	BASIC 5 PASCAL 15	$21,000 (9836 with Data Acquisition box + PASCAL)	18% GSA discount
IBM 9000	68 000 Versabus	128 K RAM 128 K ROM up to 1 M	IBM Custom	BASIC ASSEMBLER Plan FORTRAN 77, PASCAL	EDITOR Plan MATH/STAT Programs	768 x 480	5 1/4" & 8" Floppies up to 1 MB - 5 1/4", 5 MB or 10 MB Hard	IEEE 488 RS 232 8-Bit Parallel	Through IBM 3101 and 3270 Emulator	Printer		$12,000 (BASIC only)	No A/D, D/A in price
CROMEMCO 68000/ Z80	68 000 and Z80 IEEE 696 = S100	256 K up to 16 MB	CP/M (Z80) CROMIX ~ UNIX MULTIUSER	FORTRAN 77, PASCAL BASIC, C ASSEMBLER	Word Processor, Graphics package, User group?	754 x 482	5 1/4" 390 KB ea. or 8" 1.2 MB ea. Hard 5 MB	IEEE 488 RS 232 TTL Parallel 8 & 12 bit A/D, D/A	Do it yourself RS 232	Printer Tape Drives	BASIC 1 FORTRAN 20	~$15,000	

* See breakdown.

\+ Guesses. Higher numbers are faster.

DEC MINC 23 System

	List Price
2 Floppies, 256 KB, 4 RS232, IEEE 488, VT123	$17,500
MINC 12-bit, 16 ch. A/D	1,650
MINC Programmable Clock	1,100
FEP/RT-11 Fortran IV Single user package graphics, lab routines, scientific routines	6,300
Graphics Dot Matrix Printer	1,340
	$27,890

IBM 9000

	List Price
Basic unit (processor, keypad, CRT)	$ 5,695
Additional 25K RAM	1,095
2 - 5 1/4" drives (2-8" drives = $2470)..	1,445
Keyboard	270
Printer/Plotter	2,095
Sensor board "A" ?	850
BASIC and operating system	350
	$11,800

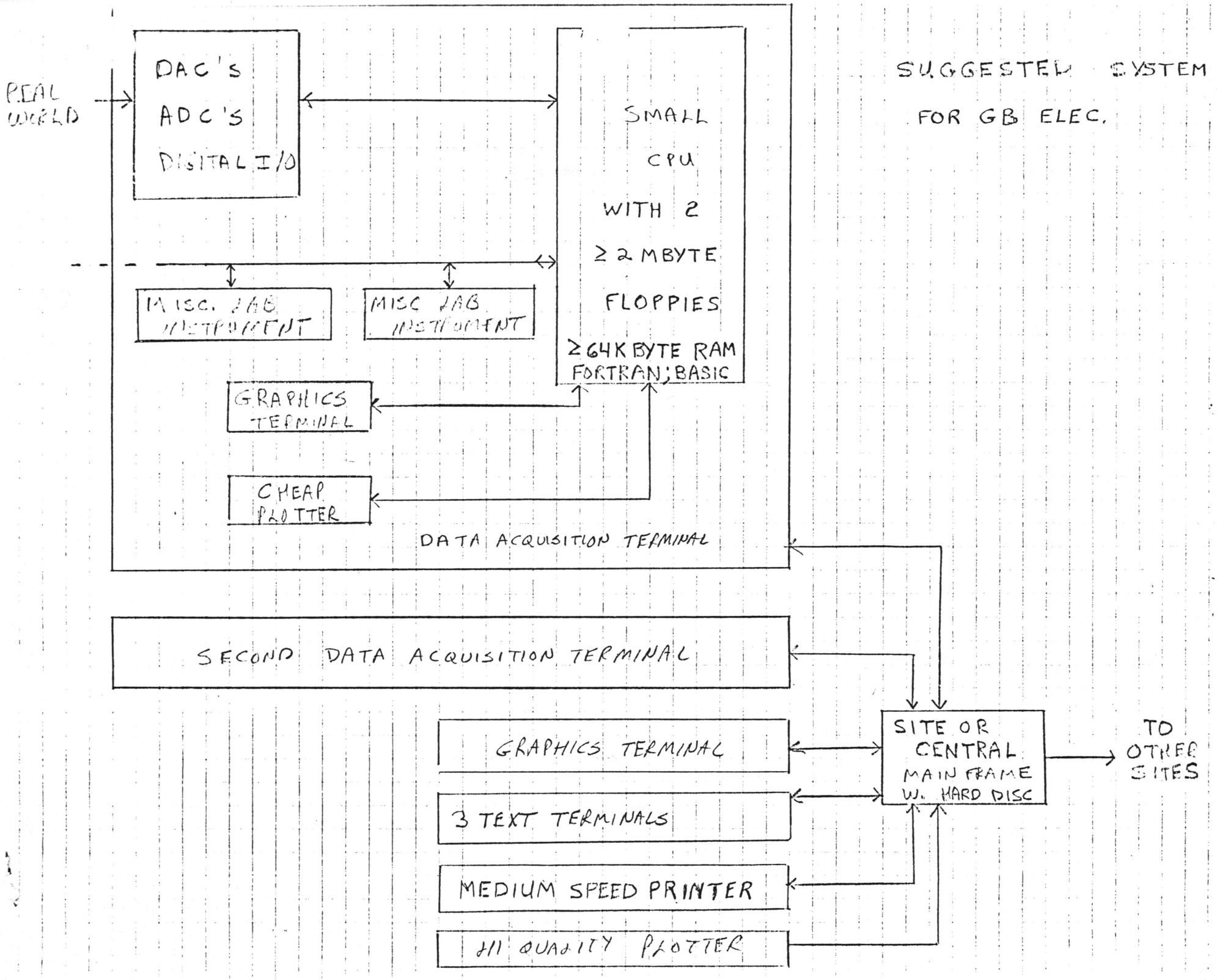
CROMEMCO 68000/Z80

	List Price
"System 2" Mainframe	$ 3,900
Dual processor & 250 K memory	2,000 ?
Graphics display hardware	2,400
7 - 8-bit D/A, A/D channels	250
12-bit D/A, A/D	500 ?
IEEE 488	500 ?
8-port TTL I/O	250
Terminal	~ 800
Dot matrix printer	~ 1,000
Software	~ 3,000
	$14,600

HP 9836A

	List Price
Main unit, display and 2 floppies, 512 KB, Pascal, BASIC, IEEE 488	~$15,750
16-bit I/O interface	350
Graphics Printer	1,300
Data acquisition system A/D, D/A, etc. ..	~ 4,000 ?
	$21,400

The 9826 has 400 x 300 pixel display on a much smaller screen and has only one disk drive. It is $3,000 less than the 9836. The 9816 has no internal disk drives but has larger display.


SUGGESTED SYSTEM
FOR GB ELEC.
REAL WORLD
DAC'S
ADC'S
DIGITAL I/O
SMALL CPU WITH 2 ≥ 2 MBYTE FLOPPIES
≥ 64K BYTE RAM
FORTRAN; BASIC
MISC. LAB INSTRUMENT
MISC LAB INSTRUMENT
GRAPHICS TERMINAL
CHEAP PLOTTER
DATA ACQUISITION TERMINAL
SECOND DATA ACQUISITION TERMINAL
GRAPHICS TERMINAL
3 TEXT TERMINALS
MEDIUM SPEED PRINTER
HI QUALITY PLOTTER
SITE OR CENTRAL MAIN FRAME W. HARD DISC
TO OTHER SITES