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To: VLBA Memo List
From: Martin Ewing   Date: 19 August 1985
Subject: Macintosh Workstations for VLBA - Functional Overview

I want to present two workstation concepts that may be useful to the VLBA project. These grow out of VLBA Memo 439. One is for a "VMS Workstation", which is essentially a generalized terminal emulator running on the Macintosh. Multiple text windows, graphics windows, "meters," and "controls" may exist on the screen. The keyboard may be "attached" to a window and used for input, or the mouse/trackball can be used to control operations in the "point and click" style.

With a straightforward VAX program on the host machine, the VMS Workstation would be useful for engineering monitoring of Array operations, for general program development, etc. It could even function as the operator's main control terminal, especially if a remote large-screen monitor is connected. The advantage of the Macintosh approach is that the unit cost of the workstations is very low, $1500, contrasted with the VAXstation II, for example, at $30,000.

The second Macintosh application is as a general controller, exercisor, and monitor for the Monitor and Control Bus. With relatively simple programming (even as simple as Basic) the Macintosh can be set up to interact nicely with the MCB. Of course, this is true of most other microcomputers, as well. The "Mac," however, has a very good physical form factor and very good graphics capabilities, which would make it useful as a portable monitor to be carried about the antenna, for example. The mouse is easily replaced with a trackball for areas that have no desk space.

A. VMS WORKSTATION

Receive:

Text Mode: Display text lines within a window like a standard VT100.

Graphics Mode: Display graphics data within a graphics window according to a standard protocol (Tektronix 4014?).

Smart Graphics Mode: Use meters and controls.   Numerical input parameter sets meter reading.

Command Mode: Create/Delete graphics or text windows.   Switch active windows for display or keyboard.   Create/delete menus for standard commands.   Create/delete meters and controls.

Transmit:

Keyboard behaves as standard VT100 keyboard attached to one of many possible displayed "windows".

Mouse (or trackball) may select menu-defined standard commands, which are sent to host. Mouse or keyboard may be used to change a "control" setting, which sends a command sequence to host.

Mouse also selects local commands, such as moving or resizing windows, loading programs, etc.

VMS Software support: Subroutine library to support multiple windows and distribute keyboard input.

B. MONITOR/CONTROL BUS WORKSTATION

Monitor Mode: Watch traffic on MCB.   Trigger like a logic analyzer on specified data or address. Show data before, after, or centered on trigger.

Basic Exercisor Mode: Interpret keyboard commands and send stimulus to equipment under test. Display response. Simple looping and branching.

<u>Smart Exercisor Mode</u>: According to stored personalities for various MCB units, allow tests in convenient engineering or scientific units, e.g. volts, db, etc. Standard procedures for go/no-go tests.

C. COMMON FEATURES

<u>Macintosh software development</u> - Using a standalone development system, like Consulair, Megamax, or Hippo C systems, or MacForth or Neon, develop application program based on Macintosh Toolbox routines. MCB Monitor application may be implemented in MS Basic.

<u>Line Interface</u>: RS 232 / RS 422 up to 38.4 kb/s asynchronous.

<u>Physical</u>: Highly portable Macintosh box plus keyboard and mouse. For use where desk space is unavailable, a trackball can replace the mouse.

<u>Hardware Cost</u>: Approximately $1,500 for standard 128K system.