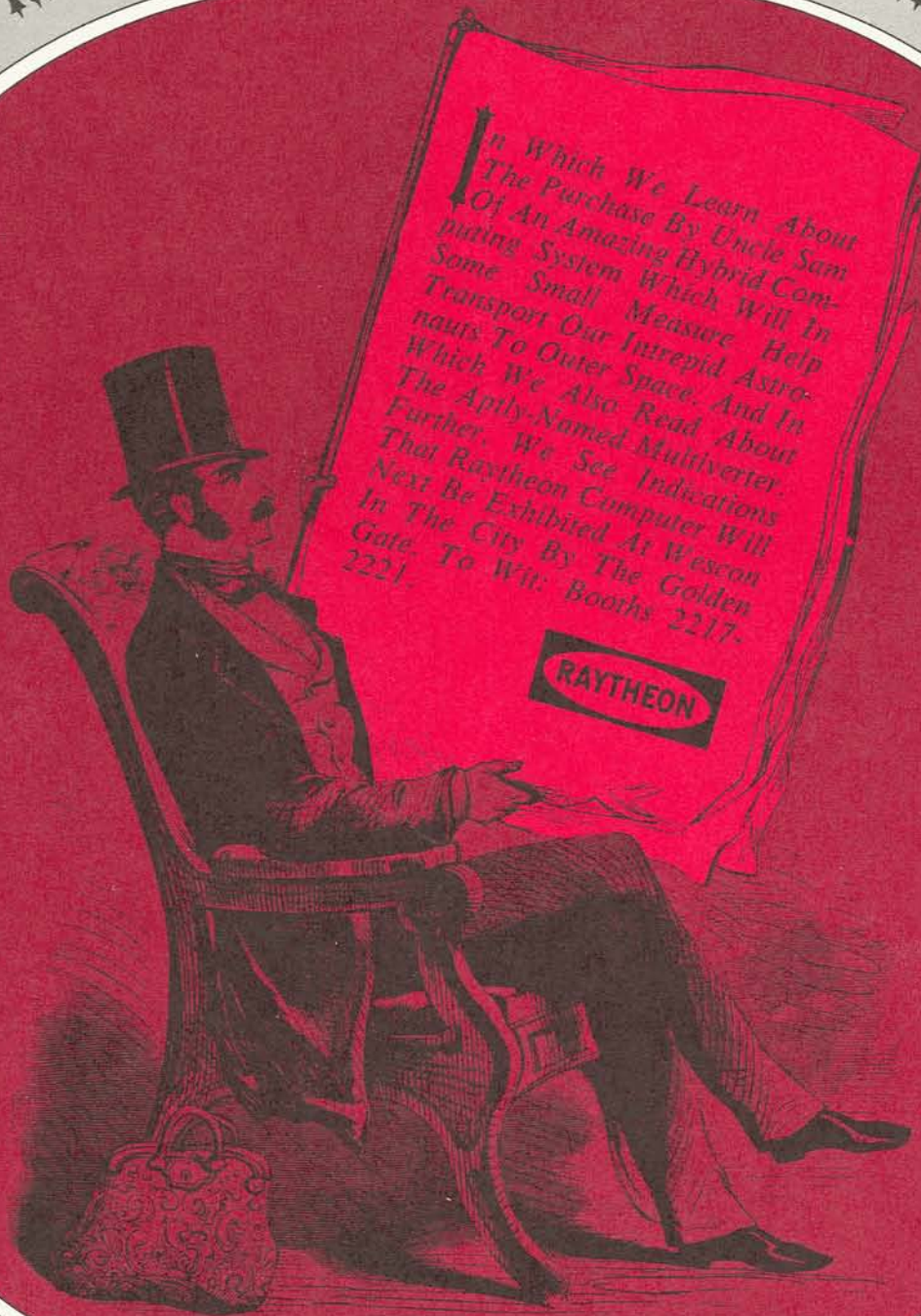


THE RAYTHEON COMPUTER ARMCHAIR SHOPPER



In Which We Learn About
The Purchase By Uncle Sam
Of An Amazing Hybrid Com-
puting System Which Will In-
Some Small Measure Help
Transport Our Intrepid Astro-
nauts To Outer Space. And In
Which We Also Read About
The Aptly-Named Multiverter.
Further, We See Indications
That Raytheon Computer Will
Next Be Exhibited At Wescon
In The City By The Golden
Gate. To Wit: Booths 2217-
2221.

RAYTHEON

How do you turn an ordinary analog computer into a state-of-the-art hybrid system?

NASA is doing it with Raytheon Computer's new 520 System and high-speed Multiverter®.



NASA will have new state-of-the-art simulation capabilities this fall when Raytheon Computer connects a 520 digital computing system and an advanced analog/digital linkage system to an existing analog computer. At Marshall Space Flight Center's Slidell, Louisiana facility, the hybrid system will be used for space vehicle control

system and structure and fluid thrust coupling simulation, trajectory optimization and lateral-load and wind-profile studies.

The new 520 System offers substantial speed advantages in scientific and data systems computing. For example, multiply for 12-bit data executes in 3.5 μ secs. Floating point operations include 24-bit mantissa addition in 21-36 μ secs and 24-bit mantissa multiply in 25-28 μ secs. The 520 is the only computer in its class that can be optionally equipped with a 200 nanosecond access non-destructive readout memory for function generation, table lookup and subroutine storage.

520 software includes a new compiler-assembler with capability oriented toward hybrid computation. Called FLEXTRAN, it includes such instructions as: SET POT, READ POT SETTING, READ ANALOG ELEMENT, ANALOG COMPUTER MODE SELECT, READ ANALOG CHANNEL AND SCALE, CONVERT TO ENGINEERING UNITS.

Heart of Raytheon Computer's linkage system is the new Multiverter, which combines up to 96 channels of 0.01% multiplexing, a 0.01% 100 nanosecond sample and hold unit and an 0.01% 12-bit or 15-bit analog/digital converter in a single 5 $\frac{1}{4}$ " drawer.

More information on the 520 System, the Multiverter and Raytheon Computer's ability to provide you with state-of-the-art hybrid computing is in Data File H-113J. Write today. Raytheon Computer, 2700 So. Fairview Street, Santa Ana, California 92704.

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RAYTHEON 520 SYSTEM

Hardware

45 one-microsecond instructions.
Variable length fixed point multiply (12-bits, 3.5 microseconds; 14-bits, 4.5 microseconds).

Floating Add (24-bit mantissa, 21-36 microseconds with NDR0 memory).

Floating Multiply (24-bit mantissa, 25-28 microseconds with NDR0 memory).

Seven programmable registers with register-to-register operations.

560 kc character i/o rate.

200 nanosecond access NDR0 memory for function generation, table look up and subroutine storage.

2 microsecond effective main memory cycle.

Software

520 FORTRAN with hybrid option including analog computer control and readout capability and high-speed data transfer.

Symbolic Assembler with problem oriented macro capability (FLEXTRAN Compiler-Assembler).

BOSS Operating System.

1620 Simulator.

ANALOG/DIGITAL LINKAGE SYSTEM

Raytheon Multiverter in 5 $\frac{1}{4}$ " drawer including multiplexer, sample and hold amplifier, and analog/digital converter

0.01%, 250 kc, 1000 megohm integrated circuit multiplexer.

100 nanosec aperture, 4 μ sec settling time to 0.01% accuracy sample & hold (single or simultaneous on all channels).

0.01%, 15-bit, 30 kc A/D conversion.

Digital-to-Analog Converters

\pm 100 volt output, 15-bit D/A converters with 10 millivolt noise peak-to-peak.

What's a Multiverter®?

An integrated circuit multiplexer, sample & hold amplifier and analog-to-digital converter in a single unit.

You can pick one up at Raytheon Computer. And nowhere else.

A significant advance in the state-of-the art, Raytheon Computer's Multiverter is a complete analog front-end for data acquisition and processing systems in a single 5¼" drawer. There are no sub-systems to combine, no cables to connect. And all the benefits of integrated circuitry are there. You can count on twice the data handling capacity at a substantial cost savings over conventional equipment.

A fully-expanded Multiverter with 96 multiplex channels, a high-speed sample and hold amplifier and a 12-bit converter can provide 50 KC data throughput. Any one of six standard Raytheon converters (10 to 17 bits, 14 to 76 KC, 0.01% accuracy) can be included. Timing, sequencing and control logic are included; no additional engineering



or wiring time is required.

The Multiverter's input impedance for selected or unselected channels is 1000 megohms; overall accuracy is 0.02%; standard input voltage ranges from ± 1 to ± 128 volts; and aperture time is under 50 nanoseconds. The Multiverter operates in sequential or random address modes; other mode control switches permit calibration and dynamic testing.

If you are linking analog and digital computers for hybrid computing or implementing high-speed data-acquisition systems, Raytheon Computer's Multiverter will simplify your engineering, improve your performance and stretch your budget. Write for details. They are all in Data File E-112B. Raytheon Computer, 2700 South Fairview Street, Santa Ana, California.

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THE SHOW MUST GO ON



and maybe it's the one you're going to miss. If that's the case, we have plenty of fresh, up-to-date information on the 520 System and other Raytheon Computer products. Ready to go. Just check the appropriate boxes for the product data you'd like to receive. We'll send it by return mail.

I would like more information about:

- 520 System
- Trice/520 Hybrid Computing System
- 250 Computer
- Germanium 200KC, 1MC and 5MC Digital Circuit Modules
- Silicon 1MC Digital Circuit Modules
- Module Breadboard Kit

A — D Converters

- Multiverter
- Sample and Hold Units
- BIAX Memory Products

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Late, Late Data on IC Modules.

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Please place the following individual on your mailing list so that he may receive future Raytheon Computer mailings.



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Electronic Manufacturers Representative

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4341 W. Commonwealth Ave.

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