Solid-state circuits parley turns to the medical field

PHILADELPHIA—For the first time in the 18-year history of the International Solid-State Circuits Conference, technical sessions on the impact of integrated circuits in biomedicine were presented here together with papers in another new field—optoelectronics.

In the biomedicine session, led by Dr. J. Stephen Brugler, research associate at Stanford University, implantable devices were emphasized.

One paper, "A Catheter-Type Semiconductor Radiation Detector for Medical Applications," was given by six representatives of Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan. It described the development of a semiconductor detector and associated electronics for beta-ray counting in tissue and body cavities during tracer investigations.

A problem in biomedical electronics is short battery life for implanted devices. One solution was described in "A Unique Hybrid Transformerless DC-to-DC Converter for Long-Term Nuclear Power." Presented by N. Poirier, B. L. Cochrun and M. J. Riccio of Northeastern University, Boston, the paper gave details on a miniaturized solid-state converter, built with hybrid techniques. The device steps up the output of a 0.4-V nuclear cell to 1.35 V, thus producing an equivalent mercury cell that is rated in mA years rather than mA hours.

The session on optoelectronics, dealing with the design and application of all-solid-state imaging systems, was led by R. D. Stewart, consultant to the General Electric Electronics Laboratory, Syracuse, N. Y. The basic problem with these solid-state imaging arrays, which have thousands of tiny sensors and scanning circuits on the same chip, lies in the development of low-noise scanning and interrogating circuits that can select the sensitive areas and detect the signal at that point.

Papers discussing such circuit development included "New Solid-State Imaging Array with Reduced Switching Noise," presented by E. Arnold, M. H. Crowell, R. Geyer and D. P. Mathur of Phillips Laboratories, Briarcliff Manor, N. Y., and "Advanced Solid-State Light Detector Image Array," by H. B. Kurtz and M. B. Barron of General Electric Co., Schnectady, N. Y.

Federal R&D budget up, with new fields to study

Across-the-board increases in the Federal budget for science and technology in fiscal 1971-72 indicate that there will be more marriages between engineering and other disciplines, such as the social sciences.

With the exception of the Dept. of Defense, new R&D will be aimed at solving society's problems—health, environmental pollution, power shortages, crime and transportation.

While federal support of the National Science Foundation is still the smallest segment of Government-sponsored R&D, that organization got a higher percentage increase than any other—up 22%, from $507-million to $622-million.

The total federal R&D budget is up 7.6%, from $15.5-billion to $16.7-billion.

People transponders proposed to fight crime

A crime-deterrent system designed by a Defense Dept. engineer would require parolees and defendants out on bail to wear radio transponders that would report the wearer's identification and whereabouts to a receiving center and computer. Consenting to wearing the transponder would be the condition on which the individual would be released.

The computer would update the position of each wearer and control the surveillance process. If a transponder should "disappear," the system would execute an intensive search. If the wearer were not located quickly, the police would automatically be notified.

Published in the January, 1971, issue of "IEEE Transactions on Aerospace and Electronics Systems," the report was prepared by J. A. Meyer.

Calculators are in chips; Next: Minicomputers?

Two days after Mostek announced its development of a calculator on a chip (see p. 34), another Dallas-based company, Texas Instruments, said that it, too, was completing development of a one-chip calculator that would be available "off-the-shelf" by June.

And it was only last December that C. Lester Hogan, president of Fairchild Camera and Instrument Corp.—predicted that his company would be supplying the electronics for an entire desk-top calculator on a single chip to a Japanese company by the middle of this year (see "Super LSI predicted" News Scope, ED 25, Dec. 6, 1970, p. 21).

The Texas Instruments chip, containing "all the logic necessary to implement an eight-digit, full-floating (decimal point) calculator," will cost initially $15 per unit in quantities of 25,000. TI says it has already received "large commitments" from several customers.

Cloyd E. Marvin, vice president of Four Phase Systems, Inc., Cupertino, Calif., reports that "our designers had single-chip calculators four or five years ago." But they were not developed because, according to Marvin, "there's more money to be made elsewhere."

Four Phase Systems will be marketing its all-LSI computer System IV/70 this spring. The IV/70, which the company says is equivalent to an IBM 360/30, has