

East challenges West

The available data from U. S. microcomputer manufacturers does not precisely match that released by Toshiba. But if Toshiba is to compete in a world market with its microcomputer, it will likely be challenged by these U. S. chip sets:

- American Micro-systems Inc.'s AMI 7200 in final development. An 8-bit, byte-oriented, expandable machine with 32 stack and file registers and 12 general registers. Can be used as 16-bit computer. Is microprogramable and has 65-kilobyte memory capacity. Speed is described as one half to one third that of a minicomputer.
- Intel's MCS-4. Microprogramable 4-bit chip set. Adds two eight-digit numbers in 850 microseconds. Contains seven 8-bit registers, plus eight in address stack, up to 4,096 8-bit words in ROM, 5,120 bits in RAM.
- Fairchild's PPS-25. Microprogramable 4-bit chip set. Adds two eight-digit numbers in 240 microseconds. Contains seven 25-character registers. Takes up to 6,656 12-bit words in ROM and 1,280 data words in RAM. Also adds two data words, in BCD digits, in 62.5 microseconds.
- National's GPC/P 4-bit chip set. Microprogramable, expandable in 4-bit increments to 32 bits. (IMP 16 is 16-bit version.) Has seven general registers and a 16-word stack regardless of word length. Up to 65 kilowords in RAMs or ROMs. Typical macroinstruction time is 7 microseconds. An add takes five microinstructions of 1.4 microseconds each, plus two main-memory read cycles with 0.25-microsecond delay, which works out to 7.5 microseconds.

with dissipation margin for operation at high temperatures.

Toshiba claims that its processor is easier to use than previous types developed in the U.S. because many auxiliary circuits, including clock drive, are included on the single processor chip, making it complete in itself. The 12-bit parallel processing mode is said to be ideal for control computers. □

Computers

Copier is mated with computer

The marriage of technology by two divisions of the Xerox Corp., New York, has resulted in a new nonimpact printer called the model 1200, which combines the company's xerographic copying techniques with computer control. In essence, a computer or magnetic tape unit is used to drive a copying machine.

The project, developed by the Business Products Group in Rochester, N.Y. and the Information Services Group in El Segundo, Calif., has been three years in the making.

But it had a predecessor based on the company's LDX system developed in Rochester several years ago [*Electronics*, Sept. 18, 1967, p. 50], which connected a xerographic printer to a computer over long-distance telephone lines. That system, however, was never debugged and was abandoned.

Since then, Xerox Corp. bought Scientific Data Systems, Inc., and has presumably benefited from the experience of the people at SDS (which became Xerox Data Systems, and then the Information Services Group), and from their work with peripherals for the Sigma line of computers. And in the 1200 system ASCII characters are generated from either a Sigma mainframe and channel adaptor or a magnetic-tape unit, then are passed through a controller and an optical-character generator and finally are optically cast on the selenium drum of the xerographic printer. An output stacker is also included in the unit.

Versions. The 1200 is available in two versions: an off-line version that is compatible with any 800- or 1,600-bit-per-inch nine-track magnetic tape that is usable on IBM, Xerox, and most other computers, and an on-line version that is com-

patible only with Xerox Corp.'s Sigma 6, 7, and 9 computers.

The print rate is 4,000 lines per minute or about one page a second. Unsensitized 8½-by-11-inch paper is used, formatted to 66 lines of 132 columns each. The unit can print its own forms as it goes, or can use pre-printed paper stock; and it can print an unlimited number of copies—where impact printers are limited to six copies—which come out already decollated. But there's a tradeoff: an impact printer's six copies are made all at once with carbon paper, whereas the unlimited number of copies from the 1200 are made one at a time.

The magnetic-tape version will be available for lease in the last quarter of 1973, and the on-line unit will be available in the first quarter of 1974. Price for the off-line version will be \$2,600 per month minimum and for the on-line model, \$2,100 per month minimum. Both prices include \$1,100 in copy charges and 100,000 copies. □

Space electronics

Comsat technique ups station capacity

In tune with the communications industry's drive toward an all-digital world, Communications Satellite Corp. has come up with a new digital television transmission system called DITEC-1, which the company contends will produce "substantially reduced costs" by doubling earth-station capacity.

Developed by Comsat Laboratories at Clarksburg, Md., DITEC-1 makes use of frequency-interleaved sampling and of differential pulse-code modulation (or DPCM) with edge coding as its two key signal-processing techniques. Comsat's efforts produced a patent for the DPCM segment of the system last December, as well as a patent application covering the entire DITEC system, according to Leonard S. Golding, image processing department manager at Comsat Labs.