An Editorial
The Use of Semiconductor Technology

This is an interesting era — semiconductor manufacturers now have a great deal to say about the design of end products. For example, Intel and Texas Instruments are producing small central processors on a single chip.

There is every reason to believe that newer (and larger) versions of these single-chip processors will find wide application. However, when the system designer is faced with choosing from the available components, he'll have to keep in mind the equally important selection of memory, interface logic, power supplies, and cabinet. This can present problems; a few of the pitfalls and ways to avoid them are discussed in the following paragraphs.

Smooth Transitions
Careful selection of components with an eye to the product life cycle can make changes easier when necessary. When the user is ready to upgrade, it will be to the manufacturer's advantage if the newer products are in his product line and the costs of transition are minimized because of some level of compatibility. Therefore, chose today with the knowledge that you can and are prepared to live with your selections for many years. If you can't obsolete your own products with minimum transition costs, someone else will.

Your Friendly Applications Engineer
It appears that many semiconductor component selections are made without consulting with the applications engineers at the semiconductor house. For example, notice the wealth of information and the implications for the system designer in the chart prepared by T.I. Components Group. Each type of semiconductor has its best utilization. As a rule, each decade improvement in switching time approximately doubles the cost per gate. The manufacturers have large amounts of applications data available which, when properly used, can result in maximum cost-effectiveness.

Easy Changeover
Consider the need to introduce technological and/or design changes without having to undergo a major redesign of the equipment. For example, the use of a read-only memory (ROM) rather than a hard-wired decoder is a preferred way to implement a new character set. The use of wire-wrap is often feasible and permits rapid and inexpensive wiring changes without having to design a new printed-circuit board. The use of a small microprogrammed computer allows changes in the instruction set to optimize the computer to the application and/or provide compatibility across a line of computers (as well as across generations).

These are just a few ways the system designer can use semiconductor technology. Obviously there are many, many more and often an in-depth discussion with the semiconductor manufacturer can point the way to the optimum design solution.

Cecil R. Frost
New Products Editor
Non-Volatile Ram

Monolithic Memories has introduced the world's first non-volatile random access semiconductor memory. The MM6510 is a 256 bit bipolar RAM. If system power drops anywhere between five and two volts, the memory information is guaranteed intact. Moreover, if there is a complete 5 volt power failure, the memory will hold the information for 10 milliseconds, long enough to allow switching to small standby batteries.

The new memory consumes 6 micro-watts per bit in the power down standby mode and 0.9 milliwatts per bit at operational level. Because of this low power consumption, two D-cell batteries can be used for standby power to sustain a whole memory plane.

Power consumption of the MM6510 is controlled by an addressing technique via the enable line which activates the 6510 from the standby to the operational level. Therefore, the measure of its speed/performance is that of the enable access time which is 70 nanoseconds typical. The MM6510 is available from stock for $27.00 in lots of 100.

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Modem ICS

Texas Instruments has introduced a new dual line driver and quad line receiver, designated SN75150 and SN75154, respectively. Both meet EIA RS-232C specifications and are used in MODEM systems that transmit digital data over telephone lines.

A dual power supply is included in the SN75154 receiver, so that the IC can be operated from a +12 volt supply, normally used for telephone lines or a +5 volt supply that allows the IC to be used with TTL/DTL systems. No additional components are needed. Other features include a 3 to 7 kilohm input resistance over the RS-232C voltage range; built in hysteresis for increased noise immunity; and an active "pull-up" on output for more symmetrical switching speeds.

Outputs for the SN75150 driver are current-limited for short-circuit protection to ±25 volts. Output voltage levels are nominally ±6 volts and are designed to drive capacitive loads greater than 2500 picofarads. The two ICs are characterized for operation over the 0 to 70°C temperature range.

Major markets for TI's line drivers and receivers are time-sharing computer services, data processing equipment, and others where applications call for relatively short single-line point-to-point data transmission and for level translators. The SN75154 receiver can function as a schmitt-trigger IC in computer applications, as well. The line driver and receiver are available from TI stock with 3 weeks delivery after receipt of order.

CIRCLE 57 ON READER SERVICE CARD
Rugged Tape Recorder

Circuit Systems Corporation has announced a high performance Miniature Magnetic Tape Recorder for use in Avionics and Field Computer diagnostic systems. Designated the Model DTU-250, it is a totally sealed cartridge that maintains the magnetic tape in its own clean room. This eliminates contamination of the tape due to dust, dirt and other foreign matter normally encountered. This extends the useful life of the magnetic tape and greatly enhances the accuracy of the data. The Sealed Tape Cartridge plugs into a mating electronics housing and is held in place with two Quick-Release fasteners.

The DTU-250 is a compact, ruggedized unit designed to withstand the rigors of Avionics Systems subject to MIL-E-5400 environments. It is sealed against dust, sand, water and salt spray and will withstand the environments encountered in other vehicles such as torpedoes, submarines and mobile surface vehicles. In its basic form it is a digital computer memory capable of write only, read only or write/read. It is a bit-serial system that has a per track capacity of 2,400,000 data bits on 250 feet of heavy duty 1.5 mil base 1/4 inch computer grade magnetic tape. High packing density bit-serial of 3500 data bits per inch is an option that results in a per track storage in excess of 10,000,000 bits on 250 feet of tape.

Mini-Computer Cassette System

Canberra Industries has announced the Model 2020 Cassette Tape Transport System which provides the mini-computer user with three independent cassette loaded magnetic tape drives, a tape drive controller, a complete interface, and software support; all in a single package. The Transport features simultaneous reading and writing on separate decks, backspace record capability, and high speed bidirectional search for addressable files. Data is redundantly recorded on two data tracks using phase encoding for reliability. Philips cassettes are capstan driven using brushless motors. There are no pulleys, belts or clutches in the unit.

Interfacing is accomplished by changing a single circuit card and cable inside the unit. Several interfaces are available. Software support for each mini-computer includes cassette oriented Assembler, Editor, and Utility programs all of which recognize the Model 2020 as a source and destination for data. Software also includes a keyboard controlled Executive program for "hands off" system operation.

System data capacity is 900K eight bit characters, and read and write rates are 667 characters/second. The average search time is 20 seconds. Deliveries will begin in early July. The price is $6900 complete with cables. OEM and quantity discounts are available.

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