

## CPU

The CPU core of the new microcomputer is based on the MC68000, which is widely used in 16-bit control applications. A number of revisions have been effected to adapt this product for use in a real-time control systems in automobiles.

- A clock generator has been added to permit use as a single-chip microcomputer.
- With the use of a 16 MHz crystal oscillator, minimum instruction execution time is as fast as 250 nsec.
- A 32-bit internal data bus has been applied between the register set and internal RAM, doubling register stacking speed.
- A context switch function based on addition of another register bank has been added to accomplish high-speed interrupt processing.
- Dedicated hardware for multiplication and division has been added for table interpolation processing frequently used in engine control. With this hardware, multiply and divide processing speed has become approximately three times as fast as a Micro000 operating at the same clock frequency.

## Fast Timed Input Port (FTI)

FTI is a highly functional and intelligent input port, designed to reduce the load on the CPU during high speed pulse input. All that is necessary with FTI is to write a command into the command memory; a search is then made for a leading or trailing edge on the designated channel, and the time is measured. It is further possible to measure pulse width, and frequency or phase difference. A block diagram and examples of input are shown in Fig 3.

FTI is a function that is indispensable for the signal processing of such parameters as engine speed and vehicle speed. It reduces CPU interrupt processing

## Fast-Timed Output Port (FTO)

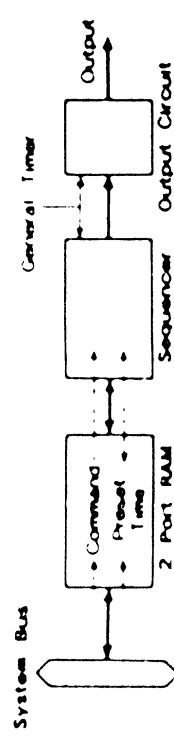
FTO is a highly functional and intelligent output port, designed to reduce the load on the CPU during high speed pulse output. Similar to FTI, when the FTO commands are written into the command memory, a designated pattern can be output at a designated time in response to a designated channel.

Furthermore, output can be inverted at designated time intervals, and it is able to set the frequency and generate outputs that will effect duty ratio changes. A block diagram and examples of output are shown in Fig. 4.

FTO permits the generation of high-precision reliable output signals for sequential injection and ignition controls. Furthermore, duty ratio output for linear solenoids and the like can be obtained without imposing additional loads on the CPU.

## Direct Memory Access Controller (DMAC)

DMAC is used for high speed, high-volume transmission of data between single-chip microcomputers without any additional load on the CPU. The DMAC has three independent channels, and controls direct memory address transfer between the serial memory and the RAM. A block diagram is shown in Fig. 5.



ex.1 Change Output at Preset Time (t)

Constant