This replacement was possible because it is approximately five times faster in processing speed, and approximately two times larger memory of the T5A41 when considering with the difference of bit length. Fig.12 shows a comparison of the processing time of the two microcomputers. This 16-bit application also eliminates the need for mutual data transmission and the master-slave monitoring function, a simplified program can provide more capacity for the addition of new controls in the future. Furthermore, this architecture greatly increases control precision. We illustrate this by two examples.

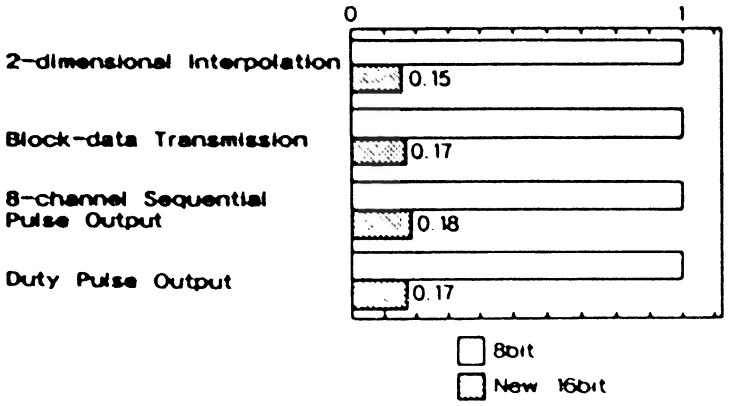


Fig. 12 Comparison of Processing Time

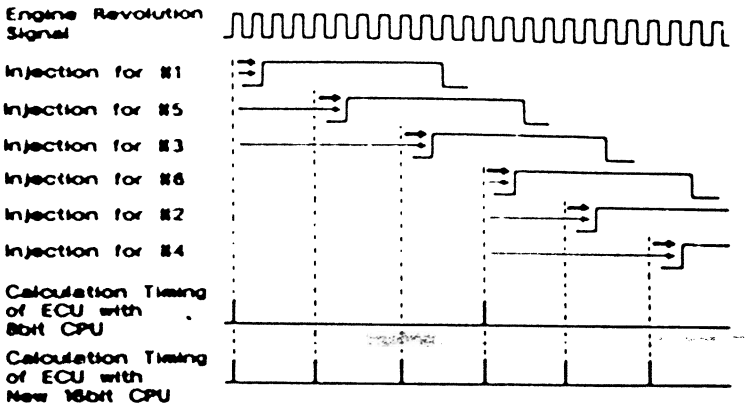


Fig. 13 Comparison of Calculation Timing between 2CPUs

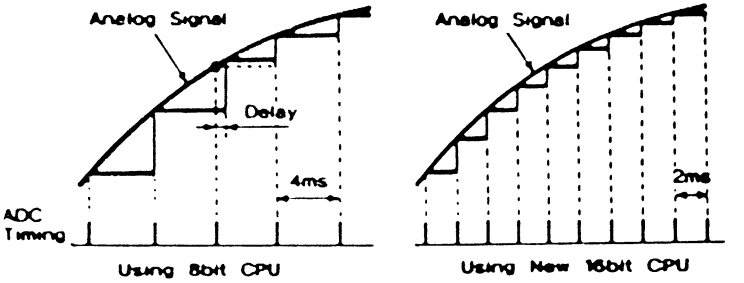


Fig. 14 Comparison of ADC Timing between 2CPUs

The first concerns fuel injection control. The new 16-bit microcomputer can perform more frequent calculations of the amount of fuel to be injected and thus achieve a higher degree of precision. Fig.13 shows a time chart for an engine speed of 6,000 rpm. The ECU using the 8-bit microcomputer calculated fuel injection quantities at intervals of approximately 10

Next, A/D conversion is performed more frequently, and this has increased the responsiveness to changes of analog data. Fig.14 shows A/D conversion when intake manifold pressure is in a state of transition. An ECU using the 8-bit microcomputer performs A/D conversion on a 4 msec timer interrupt processing basis in order to maintain a balance with