Ted Knowlton
July 3, 1984

S P I N O T E S F O R M I C R O J O U R N A L

The latest uPD7720 data sheet (which has a REV of 1-2-84 on the last sheet) has a revision in the paragraph which discusses the Sign Register (SGN). The new wording is correct, but by not mentioning the operation of Accumulator B, one might infer that the two accumulators operate the same. And that IS NOT correct. The data sheet should point out (and since it does not, we're doing it here) that:

> the SGN register is not affected by arithmetic operations tions on Accumulator B.

However, the flags SB1, SB0, CB, ZB, OVB1, and OVB0 are affected by Accumulator B arithmetic operations.

- -

Accumulators (ACCA/ACCB)

Associated with the ALU are a pair of 16-bit accumulators, each with its own set of flags, which are updated at the end of each arithmetic instruction (except NOP). In addition to Zero Result, Sign Carry, and Overflow Flags, the SPI incorporates auxiliary Overflow and Sign Flags (SA1, SB1, OVA1, OVB1). These flags enable the detection of an overflow condition and maintain the correct sign after as many as three successive additions or subtractions.

ACC A/B Flag Registers

Reg A	SA1	SA0	CA	ZA	OVA1	OVA0
Reg B	SB1	SB0	CB	ZB	OVB1	OVB0

Sign Register (SGN)

When OVA0 (or OVB1) is set, the SA1 (or SB1) bit will hold the corrected sign of the overflow. The SGN Register will use SA1 (SB1) to automatically generate saturation constants 7FFFH(–) or 8000H(–) to permit efficient limiting of a calculated value.

OLD VERSION

Accumulators (ACCA/ACCB)

Associated with the ALU are a pair of 16-bit accumulators, each with its own set of flags, which are updated at the end of each arithmetic instruction (except NOP). In addition to Zero Result, Sign Carry, and Overflow Flags, the SPI incorporates auxiliary Overflow and Sign Flags (SA1, SB1, OVA1, OVB1). These flags enable the detection of an overflow condition and maintain the correct sign after as many as three successive additions or subtractions.

ACC A, B Flag Registers

Reg A	SA1	SA0	CA	ZA	OVA1	OVA0
Reg B	SB1	SB0	CB	ZB	OVB1	OVB0

Sign Register (SGN)

When OVA1 is set, the SA1 bit will hold the corrected sign of the overflow. The SGN Register will use SA1 to automatically generate saturation constants 7FFFH(–) or 8000H(–) to permit efficient limiting of a calculated value.

NEW VERSION

Programming the uPD77P20:

Because NEC is gearing up to produce the 77P20 in larger quantities at a lower price, we have been investigating alternatives to programming the chip in the Evakit-7720. We have seen a demo of the "Omni-Programmer" by Varix of Dallas (214-620-0925). The device is a software driven programmer which does not require personality cards. By working with a SPI customer, the software already is available to program the uPD77P20. This customer has reported that he loves the "Omni-Programmer" (it programs most programmable devices including PAL's), and he loves the 7720 SPI, too.

- -

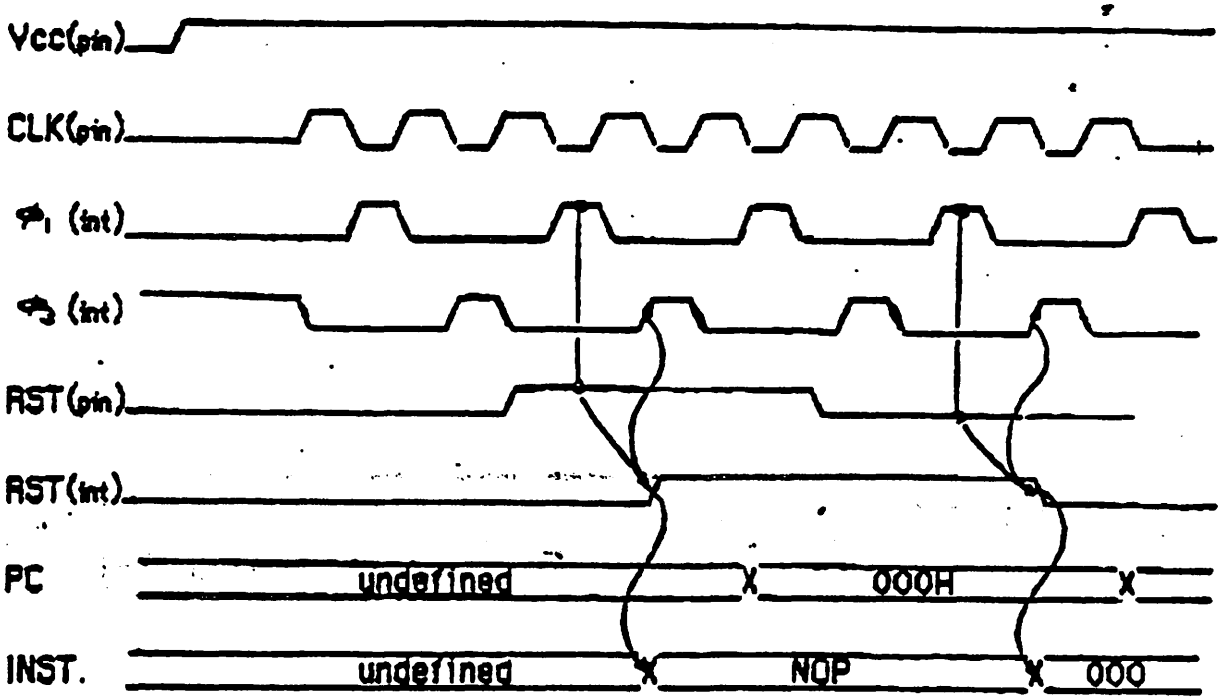
SPI Timing:

High speed SPI applications require critical timing. Present documentation does not fully explain internal timing. Recently, we received the timing diagrams shown on the next two pages. This information could be valuable to SPI customers, and this may serve as an interim data sheet update. As part of a project to upgrade the SPI documentation, we intend to incorporate these timing diagrams in a more thorough treatment of SPI timing.

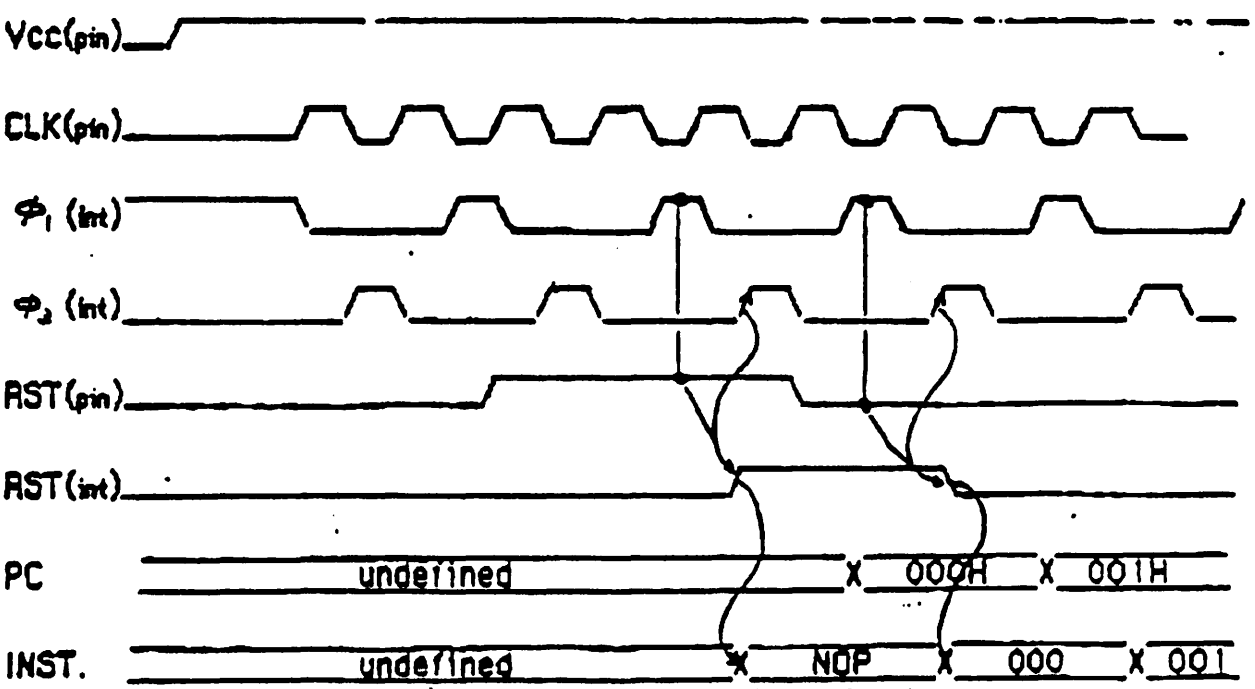
POWER ON ϕ_1, ϕ_2 TIMING

Internal clock phases are fixed by the condition of the internal flip-flop at the power-on.
So, there are two cases of timing waveforms as follow.

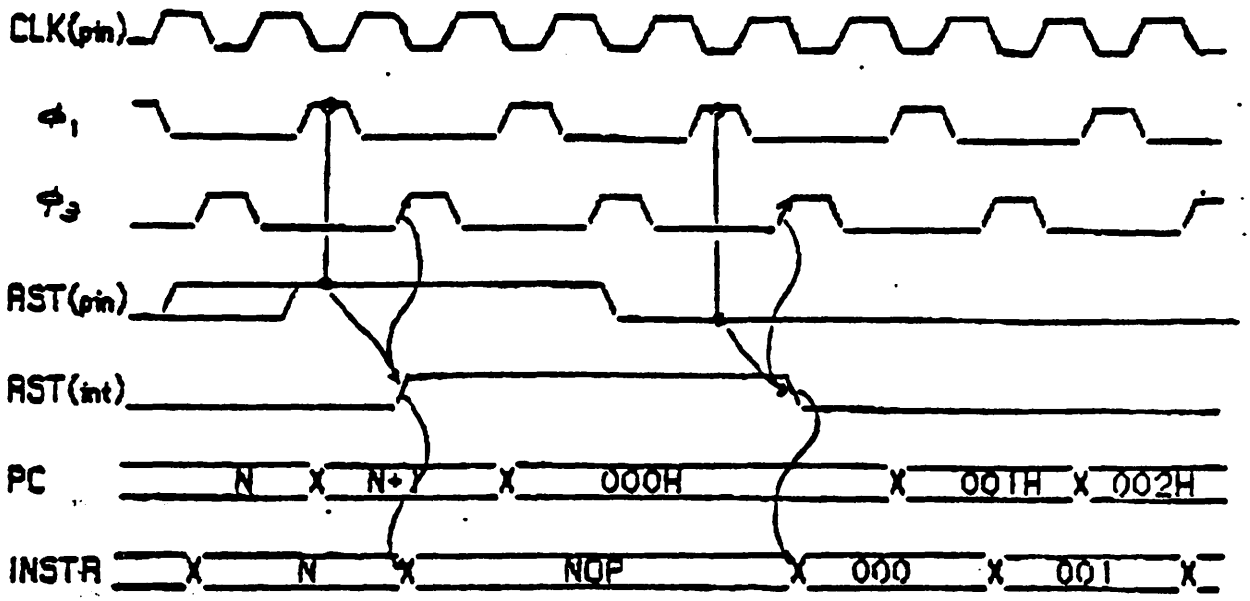
case-1



case-2



RESET TIMING



RELATION of ϕ_1, ϕ_3 to P1/P0 Output