AccessionIndex: TCD-SCSS-T.20251006.002
Accession Date: 6-Oct-2025
Accession By: Dr.Brian Coghlan
Object name: National Semiconductor's SC/MP microprocessors
Vintage: 1976
Synopsis: NatSemi's earliest 8-bit microprocessors.

Description:
The National Semiconductor's 8-bit SC/MP (*Simple Cost-effective MicroProcessor, or Scamp*) was introduced in April 1976 [1]. It was designed to allow systems to be implemented with the minimum number of additional support chips. There were three generations: the pMOS SC/MP-1 [2], which is very rare as it was quickly superceded by the nMOS SC/MP-2 (INS8060) [3], and later by the nMOS SC/MP-3 (INS8070) [4]. Signetics acted as a second source supplier. Commercially, the SC/MP was far less successful than its competitors.

Internally the SC/MP has been said to have used a bit-serial ALU, as it performed poorly relative to other contemporary 8-bit designs, but the cycle counts of the instructions contradict this, and the micrographs show too large an ALU. It adopted a 16 x 4kB paged/segmented memory address space, somewhat like a PDP-8. On the other hand, up to three SC/MP devices (e.g. CPU, DMA controller, or other bus master) could arbitrate over a daisy-chain to access a shared memory. Moreover, it did have index registers, auto-indexed addressing, did automatically handle interrupts, included an internal R/C clock oscillator (1MHz on SC/MP-1, 4MHz on SC/MP-2 & SC/MP-3), and included serial input/output (SC/MP-1 & SC/MP-2 but not SC/MP-3) to avoid a separate UART [5][6][7].

The SC/MP-2 (ISP-8A/600) was available in a plastic or a ceramic package, fully compatible with the SC/MP-1 in pinout, object code and software, and with a slight modification of clock frequency, fully compatible with all the SC/MP-1 support equipment. A very inexpensive SC/MP-2 Retrofit Kit (ISP-8K/205) included an INS8060, a 2-MHz crystal, all resistors, capacitors, wires, etc, and all necessary documentation, enabling evaluation by prior and new SC/MP users [8][9].

As far as is known, there were no specific SC/MP support chips. The DMA arbitration protocol was similar to that on the Z80 microprocessor, so it is possible that DMA controllers compatible with the Z80, e.g. Zilog's Z8410, Intel's 8237, AMD's 9517, etc, could with some additional logic act as an SC/MP bus master.

Many thanks to Brian Coghlan for donating these items.

The homepage for this catalog is at: https://www.scss.tcd.ie/SCSSTreasuresCatalog/
Click *'Accession Index'* (1st column listed) for related folder, or *'About'* for further guidance.
Some of the items below may be more properly part of other categories of this catalog,
but are listed here for convenience.

Accession Index	Object with Identification
TCD-SCSS-T.20251006.002	National Semiconductor's SC/MP microprocessors. NatSemi's earliest 8-bit microprocessors. 1976.
TCD-SCSS-T.20251006.002.01	NatSemi SC/MP-2 INS8060N ISP-8A/600N microprocessor.
TCD-SCSS-T.20251006.002.02	NatSemi SC/MP-3 INS8070N microprocessor.
TCD-SCSS-T.20251216.010	Arduino shield for National Semiconductor SC/MP. A board that enables execution of software by the SC/MP, NatSemi's earliest 8-bit microprocessors, 2025.
TCD-SCSS-X.20250916.001	Dr.Brian Coghlan's Collection of Early Microprocessors. An extensive and nearly complete set of unused 1970s microprocessor chips, most accompanied with documentation, some with demonstration boards. 1971.

References:

1. Wikipedia, *National Semiconductor SC/MP*, see:
   https://en.wikipedia.org/wiki/National_Semiconductor_SC/MP
   Last browsed to on 6-Oct-2025.

2. National Semiconductor, *SC/MP-1 ISP-8A/500D Datasheet*, see:
   https://www.scss.tcd.ie/SCSSTreasuresCatalog/hardware/TCD-SCSS-T.20251006.002/NatSemi-SCMP1-ISP8A500-datasheet.pdf
   Last browsed to on 6-Oct-2025.

3. National Semiconductor, *SC/MP-2 INS8060 Datasheet*, 1978, see:
   https://www.scss.tcd.ie/SCSSTreasuresCatalog/hardware/TCD-SCSS-T.20251006.002/NatSemi-SCMP2-INS8060-datasheet-1978.pdf
   Last browsed to on 6-Oct-2025.

4. National Semiconductor, *SC/MP-3 INS8070 Datasheet*, 1980, see:
   https://www.scss.tcd.ie/SCSSTreasuresCatalog/hardware/TCD-SCSS-T.20251006.002/NatSemi-SCMP3-INS8070-datasheet-1980.pdf
   Last browsed to on 6-Oct-2025.

5. National Semiconductor, *SC/MP Technical Description*, January 1976, see:
   https://www.scss.tcd.ie/SCSSTreasuresCatalog/hardware/TCD-SCSS-T.20251006.002/NatSemi-SCMP-TechnicalDescription-Jan76.pdf
   Last browsed to on 6-Oct-2025.

6. National Semiconductor, *SC/MP Applications Handbook*, February, 1977, see:
   https://www.scss.tcd.ie/SCSSTreasuresCatalog/hardware/TCD-SCSS-T.20251006.002/NatSemi-SCMP-MicroprocessorApplicationsHandbook-Feb1977.pdf
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7. National Semiconductor, *SC/MP Programming and Assembler Manual*, February, 1976, see:
https://www.scss.tcd.ie/SCSSTreasuresCatalog/hardware/TCD-SCSS-T.20251006.002/NatSemi-SCMP-Programming-and-Assembler-Manual-Feb1976.pdf
Last browsed to on 6-Oct-2025.

8. Compute Newsletter, *SC/MP-II*, and, *SC/MP Homebrew Computer System*, p.1 and pp.11-14, Vol.3, No.4, April, 1977, see:
https://www.scss.tcd.ie/SCSSTreasuresCatalog/hardware/TCD-SCSS-T.20251006.002/ComputeNewsletter-Vol3-No4-Apr77.pdf
Last browsed to on 6-Oct-2025.

9. Personal Computer World, *Beefing up the Mk.14*, pp.63-66, April, 1980, see:
https://www.scss.tcd.ie/SCSSTreasuresCatalog/hardware/TCD-SCSS-T.20251006.002/PCW-1980-04-S-OCR.pdf
Last browsed to on 6-Oct-2025.

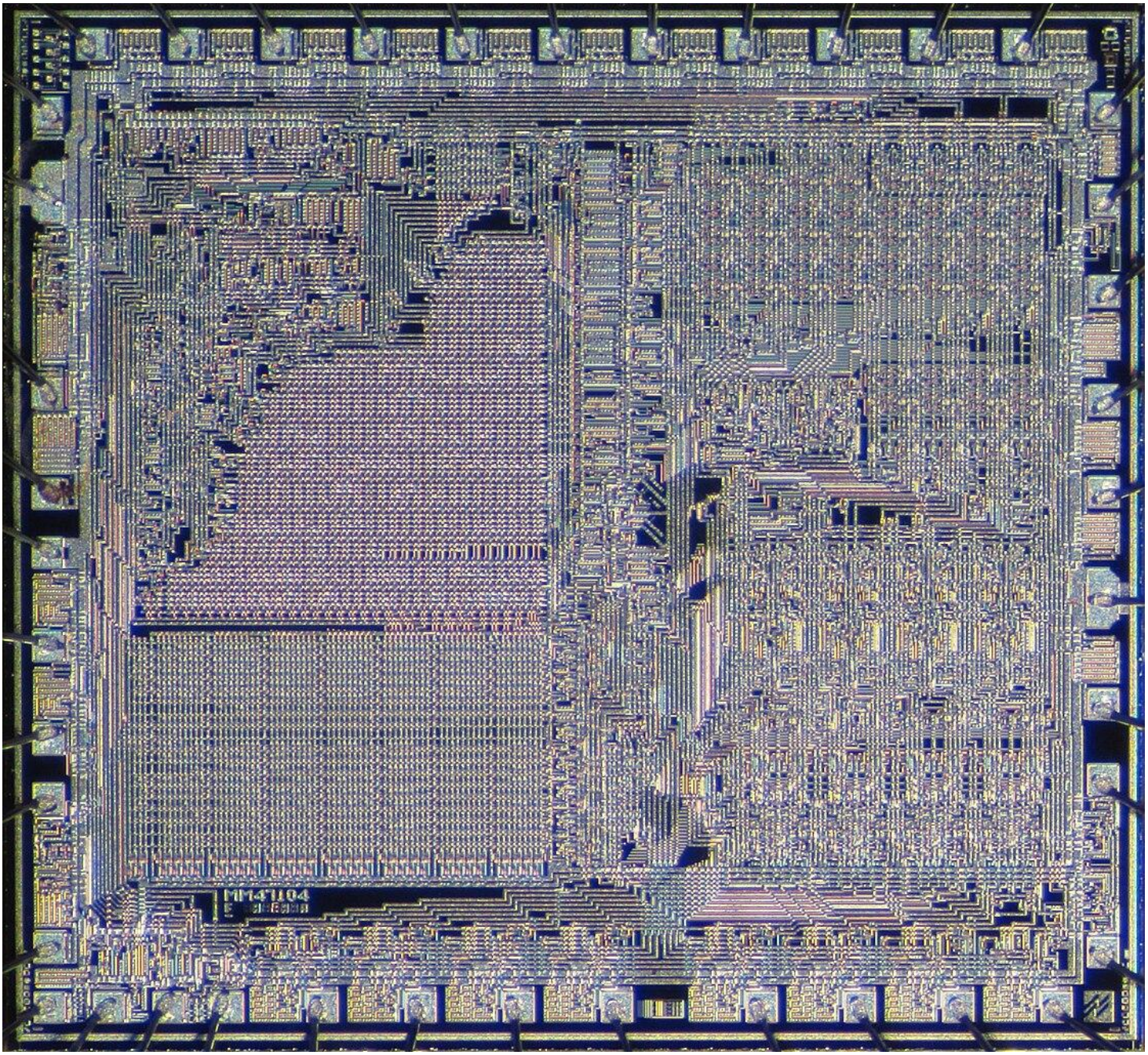

Figure 1: National Semiconductor SC/MP-2 (INS8060) micrograph (from Wikipedia).

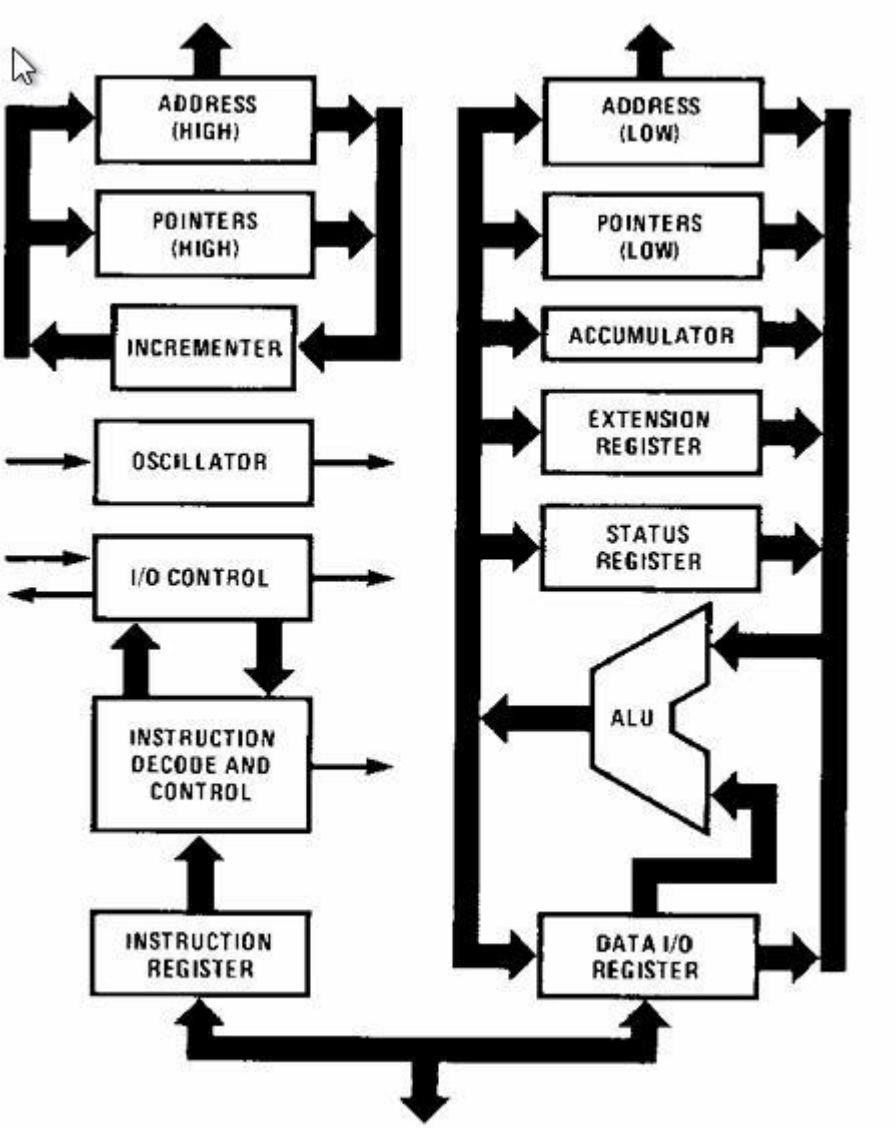

Figure 2: National Semiconductor SC/MP architecture (from datasheet).

NS SC/MP registers

$^{1}_{5}$ . . . $^{0}_{7}$ . . . $^{0}_{0}$ *(bit position)*	
Main registers	
AC	**A**ccumulator
E	**E**xtension
Pointer registers	
PC/P0	**P**rogram **C**ounter
P1	**P**ointer 1
P2	**P**ointer 2
P3	**P**ointer 3
Program Status Register	
7 6 5 4 3 2 1 0 *(bit position)*	
CY OV SB SA IE F2 F1 F0	Status

Figure 3: National Semiconductor SC/MP registers (from Wikipedia).

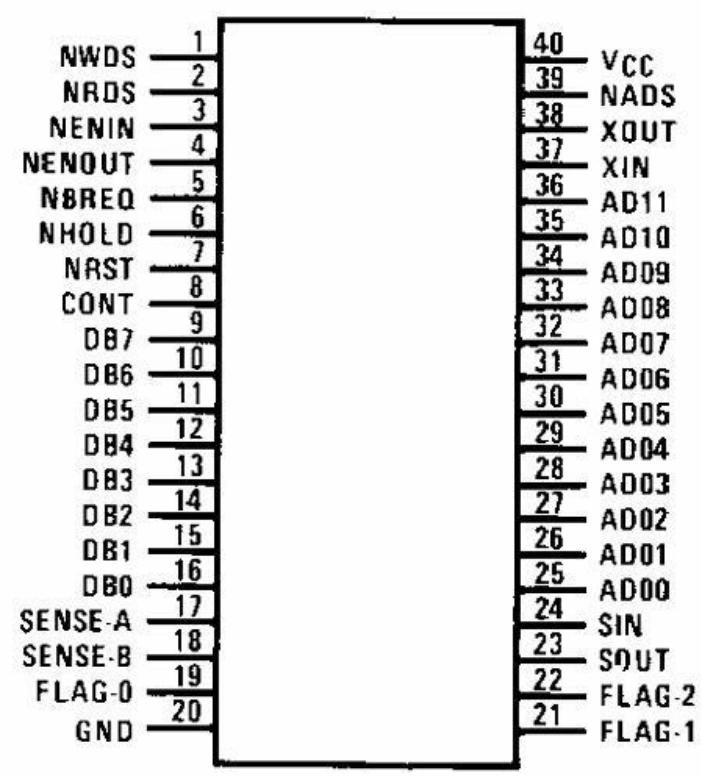

Figure 4: National Semiconductor SC/MP pinout (from datasheet).

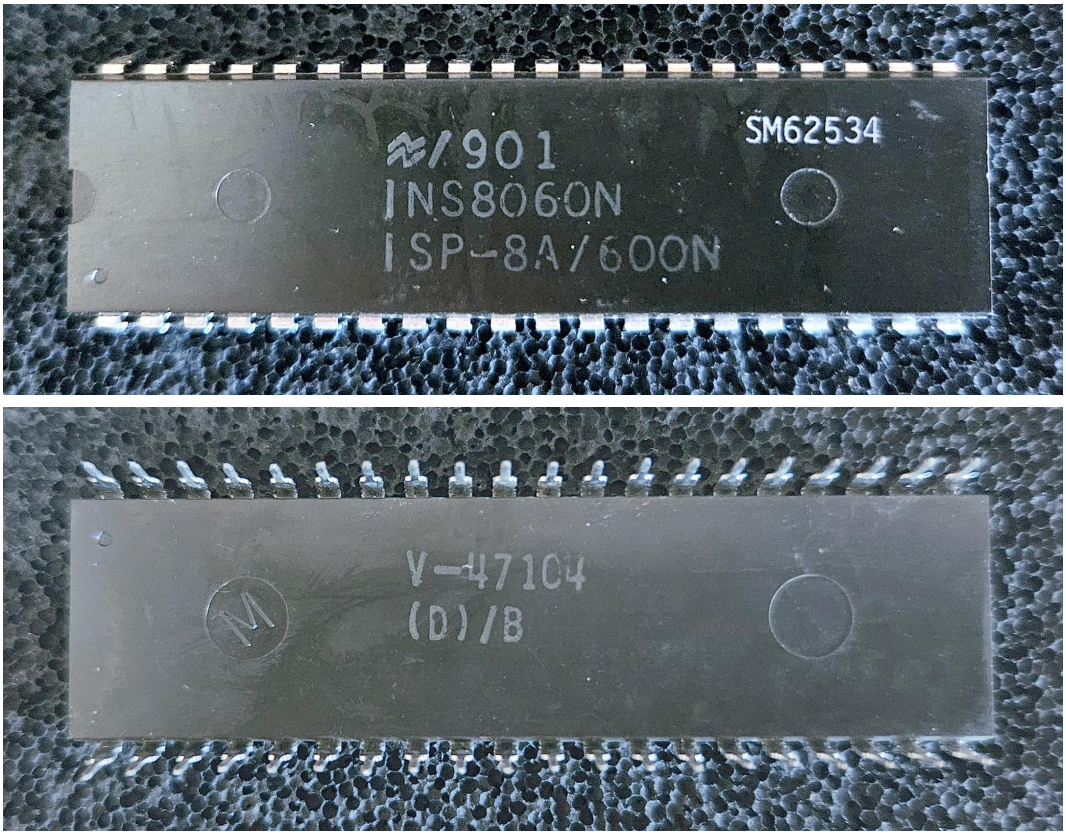

Figure 5: National Semiconductor SC/MP-2 INS8060N / ISP-8A/600N front and rear views.

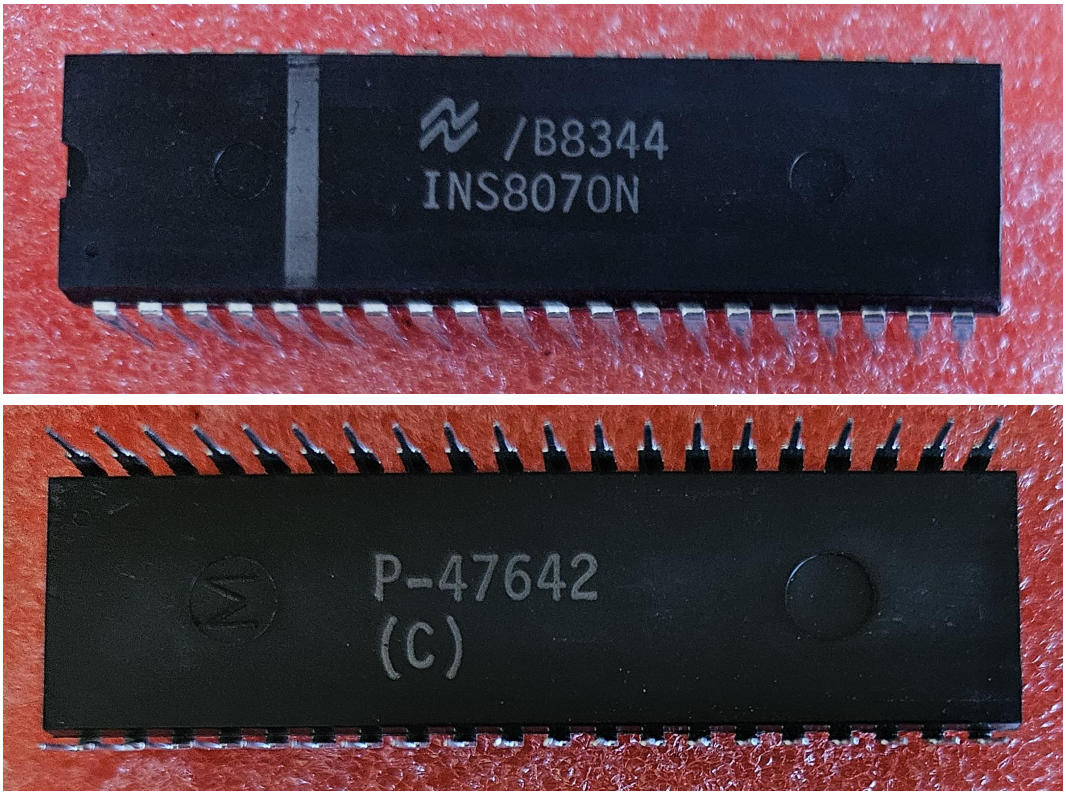

Figure 6: National Semiconductor SC/MP-3 INS8070N front and rear views.