

NCR 315 Seminar

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The National Cash Register Company's large BCD EDP System, the NCR 315, was described and demonstrated at a two-day orientation session which I attended this April. The group, consisting primarily of NCR salesman and EDP consultants, met at the NCR data processing headquarters on Madison Avenue and 61st Street.



Some of the 315's most interesting features are its fixed 12-bit syllables within variable length words, its large assortment of peripheral equipment, including a magnetic 'Card Random Access Memory', and a 2000 card per minute photo-electric punched card reader. The 315's main core memory is expandable to 40K addressable syllables (called "slabs"). Instructions can treat slabs as two alphameric or as three numeric characters, and can deal with subsections of the slab individually. The computer uses an accumulator of up to eight slabs for data moves and arithmetic. Instead of using word marks in memory, the number of slabs actually involved are coded in the instruction. Most instructions have a single operand and are contained in two slabs of memory, although some, like COUNT, take four slabs.

COUNT, which is used in looping, increments a counter each time through the loop and compares it to a terminal value, setting a High, Low, or Equal flag which can then be interrogated. Other instructions include Edit, Binary Add, Shift Accumulator, Memory Scan for High, Low or Equal compare, and a demand linkage command for interrupt. Some commands like Add and Multiply can use numeric literals up to 999 in the actual instruction coding. Some of the terminology (e. g. 'Jump' rather than 'Branch') and instructions (e. g. Skip forward or backward a specified number of slabs) are reminiscent of Control Data Corporation's machines and, the NCR 310 computer, which was shown to us in a film, is in fact the CDC 160 painted brown! CDC has been closely connected with the National Cash Register, NCR providing outlets to the commercial market for CDC's scientifically oriented hardware.

The 'Card Random Access Memory' (CRAM) is one of NCR's innovations. A pack of 256 mylar cards, each 14" x 3 1/4", is placed in a cartridge and simply loaded into the CRAM unit. Eight rods then support the cards, until an eight-bit binary code is given causing rods to turn and one unique card to drop into a vacuum chamber and wrap around a rotating drum.

The card contains seven magnetic tracks, any one of which may be selected to be read or written on. The card can be kept on the drum as long as needed, after which it is shot back up to the pack. Each track accommodates 1550 slabs and the entire cartridge holds five and- one-half million alphanumeric characters. Data can be transferred to memory at the rate of 100K alphanumeric characters per second after the initial card drop time of 235 ms.

At the end of the two-day session, we were given a demonstration of the system. I was most impressed by the 2000 card a minute reader, which sucks the cards serially past photo-electric readers at a tremendous clip, without ever grabbing the cards as does our IBM 1402. The demonstration which most aroused the interest of the class was the check sorter. The instructor took a check, crumpled it, twisted it, tore it right through the magnetic character it was to be sorted on, blacked it in with pencil, and yet was able to sort it with no difficulty.

In our library we now have the programming manual for the NCR 315 (which is concise and clearly written), the Autocoder manual (NEAT), as well as write-ups on all peripheral equipment. NCR has also written a COBOL, which they say is working, and various executive programs for use with their system.