

HARDWARE ARITHMETIC TEST - INSTRUCTIONS FOR USE
NUS-204

Load the binary tape and begin executing at location zero. If all is well, the following messages should be typed:

TRANSFER OK
BIT-INVERT OK
MULTIPLY OK
DIVIDE OK

If an error occurs, one of the following messages will be typed:

- 1) TRANSFER FAILED
SOFTWARE XXXXXXXX HARDWARE XXXXXXXX
This signifies that either a TACMQ or a TMQAC failed in its operation. The Software # is what the program tried to load into the MQ and the Hardware # is what came out.
- 2) BIT-INVERT FAILED
SOFTWARE XXXXXXXX HARDWARE XXXXXXXX UNINVERTED XXXXXXXX
This signifies an error in the bit interchanges; 19-0, 18-1, etc. The Software number is the simulated software result, the Hardware number is the hardware result and the Uninverted number is the initial operand.
- 3) NO SKIP
The contents of memory location following a MULT or DIVIDE instruction should be executed. This error message signifies failure of the computer to skip execution of these memory locations.
- 4) MULTIPLY FAILED
SOFTWARE XXXXXXXX * XXXXXXXX = XXXXXXXX, XXXXXXXX
HARDWARE XXXXXXXX * XXXXXXXX = XXXXXXXX, XXXXXXXX
This signifies a failure in the operation of the MULT instruction. If the second Software operand differs from the Hardware operand it means the hardware failed to restore it to memory. If the Hardware product is greater than the Software product by one, then the hardware failed to clear the accumulator prior to multiplication. All other differences signify other hardware failures.
- 5) DIVIDE FAILED
SOFTWARE XXXXXXXX, XXXXXXXX / XXXXXXXX = XXXXXXXX R XXXXXXXX
HARDWARE XXXXXXXX, XXXXXXXX / XXXXXXXX = XXXXXXXX R XXXXXXXX
This signifies a hardware failure in the DIVIDE instruction.

ASTROTEST - INSTRUCTIONS FOR USE
NUS-248

Abstract

Astrotest is a simple, minimum length program for testing, and diagnosing faults in core memory.

Loading

Astrotest starts at location 0 and is only 150₈ instructions long. The block of memory to be tested is determined by two memory locations which must be accessed through the 291.

Location 46	size of block
Location 47	first address of block

Theory of Operation

Each location in the block of memory to be tested is set to a known state. Then the block of memory is read out and a comparison is made to determine if there was an error. The states are: 0, 3777777, 1, 2, 10, 20, 40, 100, 200, 400, 1000, 2000, 4000, 10,000, 20,000, 40,000, 100,000, and 200,000 followed by the compliment of these states. The entire sequence is repeated 40 times after which the program restarts itself.

If an error is detected, astrotest will print the address, the state the location should be set to, and the erred state. It does not restart after an error, but rather it continues from where the error was found.

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SWAP
NIC-04-11210

Introduction

SWAP is a very simple program allowing users having only low speed equipment to utilize their 1080 systems more effectively. It swaps the contents of the lowest 4K, excluding the loaders (locations 0 - 7577) with the 2nd 4K of data memory (locations 110000 - 117577).

The main advantage of SWAP is in saving a copy of the rather lengthy FFT program, while still having the program memory and 4K of data memory available for other programs, such as the Assembler. Since the Assembler utilizes only the first 4K of data memory (locations 100000 - 107777) for text storage, it can be used without destroying the copied FFT. When the user is done with the Assembler, he can simply run SWAP again to restore the FFT. As long as data is not acquired in the 2nd 4K of data memory, the Assembler also remains intact and can be recalled by running SWAP. However, since the Assembler is much shorter than the FFT program, it is not nearly as inconvenient to reload it as to reload the FFT.

Storage

SWAP is stored in unused locations reserved for the Binary Loaders, and occupies locations 7600 - 7625. Since no other NIC-supplied program utilizes this area, SWAP should be permanently resident once loaded, unless wiped out by experimental software. The minimum hardware required is a NIC 1083 computer and low speed reader.

Loading and Use

SWAP is loaded using the standard Binary Loader. The exchange of the contents of locations 0 - 7577 and 110000 - 117777 occurs each time it is run.

SWAP is run by starting the computer at 7600. Briefly, this is accomplished as follows:

- a) Press STOP
- b) Depress LOAD PC
- c) Set the switch register to 0007600
- d) Press Execute
- e) Depress CONTINUE
- f) Press Execute

The entire execution of SWAP requires approximately 0.19 seconds. The computer will halt with the PC set to 7620 when SWAP is finished. Then proceed to operate the just-swapped program as usual.

