SYSTEMS ENGINEERING LABORATORIES PROGRAM LIBRARY

SOFTWARE DESCRIPTION

CATALOG NO. 303006B

DOCUMENTATION REV_____ .___

DATE__June 15, 1970_____

PROGRAM TITLE: 810A/B Arithmetic Test (ADDO)

PURPOSE: This program exercises the adder using the
                            AMA, AMB and SMA instructions, RNA is also
                            tested. A random bit pattern generator is used
                            to generate operands. Memory is added to A
                            and B, the results are compared. Memory is
                            subtracted from A using the same operands, one
                            in A, one in memory, then vice-versa. The
                            differences are compared ignoring the signs.
                            RNA is tested by a software round A simulation.
                            Overflow is checked and an error condition will
                            be generated if the overflow latch is not set at
                            the proper time.

CONFIGURATION: Basic SYSTEMS 810A/B Computer

SOFTWARE: ENVIRONMENT: N/A

PROGRAM LANGUAGE: SYSTEMS 810A/B Assembly Language

SIZE: 2000_8 - 2751_8 TIMING: Approx. 400 microseconds/cycle

SYSTEMS 303006B

REASON FOR CHANGE:

Changes were made to allow this program to run with the KEYTRAN System and output all messages to the selectric typewriter by setting Sense Switch 13.

USE:

Start at location 2000_8, the program will run until manually halted.

When running under the KEYTRAN System the Diagnostic Number for this program is seven (7). The program will automatically be started at location 2000_8 and will continuously run until the Index Key is depressed on the selectric typewriter at which time control will be returned to the KEYTRAN Diagnostic Loader.

Sense Switch Settings:

    SSW 0 up - Errors are ignored.

    SSW 1 up - A halt will occur after an error type-out.

    SSW 2 up - No error type-out, a halt will occur.

    SSW 13 up - Indicates program being run with the KEYTRAN System and that
                all output will be via the selectric typewriter.

<div align="center">Note</div>

    With SSW 2 up a halt at location 2167_8 indicates an RNA error.
    An add error will cause a halt at 2251_8 and a subtract error
    halts at 2321_8.

Type-Out Formats:

    aaaaaa   bbbbbb
    A nnnnnn OVFL
    B mmmmmm OVFL

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Indicates add error:

aaaaaa = operand in A for AMA, in memory for AMB
bbbbbb = operand in memory for AMA, in B for AMB
nnnnnn = the AMA sum
mmmmmm = the AMB sum

Note

If both sums are the same and the letters OVFL (indicating over-
flow) are not typed next to both sums this indicates an overflow
error. The letters will not always be typed, only if an over-
flow occurred.

```
aaaaaa  bbbbbb
S  A  nnnnnn  OVFL
   B  mmmmmm  OVFL
```

Indicates an SMA error:

nnnnnn = difference of a-b
mmmmmm = difference of b-a

Note

Only the signs should be unlike. As in the add test overflow should
occur on both subtracts.

```
aaaaaa  bbbbbb
 R  nnnnnn  mmmmmm
```

Indicates an RNA error:

a's = A-Accumulator
b's = B-Accumulator
nnnnnn = software RNA
mmmmmm = hardware RNA