DATA GENERAL
CORPORATION
Southboro,
Massachusetts 01772
(617) 485-9100

PROGRAM

Instruction Timer

TAPES

Binary: 095-000008

ABSTRACT

Instruction Timer is a maintenance program designed to test the CPU clock logic. This program will print the instruction times of the basic NOVA instruction set.

Copyright (C) Data General Corp., 1969

097-000006-00

```
;                       INSTRUCTION TIMER
;1.      ABSTRACT
;                THE INSTRUCTION TIMER PROGRAM CHECKS THE
;                CPU CLOCK CIRCUTS BY TIMING THE INSTRUCTION
;                SET. THE 100MS TELETYPE CLOCK IS USED FOR
;                CALIBRATION AND IS ASSUMED ACCURATE.


;2.      MACHINE REQUIREMENTS
;2.1             STANDRED NOVA PROCESSOR
;2.2             A TYPE 33 OR 35 TELETYPE


;3.      SWITCH SETTINGS
;                STARTING ADDRESS=000002


;4.      OPERATING PROCEEDURE
;4.1             LOAD THE PROGRAM VIA THE BINARY LOADER
;4.2             SET SWITCHES TO 000002
;4.3             PRESS START


;5.      PROGRAM OUTPUT/ERROR DISCRIPTION
;5.1             THE PROGRAM WILL PRINT A LIST OF INSTRUCTIONS
;                AND THERE EXECUTION TIMES IN NANO SECONDS.
;                THE LIST WILL BE REPEATED UNTILL MANUALLY STOPED
;5.2             EACH... INSTRUCTIONS TIME SHOULD BE CHECKED
;                AGAINST THE THEORITICAL VALUE. ERRORS OF A FEW
;                NANO SECONDS ARE TO BE EXPECTED. ERRORS OF A
;                LARGER NATURE,SUCH AS A TIME OF 5900 BEING 5600
;                REQUIRE CORRECTIVE MAINTENCE.
;5.3             SAMPLE PRINTOUT:
;                        INSTRUCTION EXECUTION TIMES
;                        COM 0,0          5602
;                        NEG 0,0          5601
;                        MOV 0,0          5602
;                        INC 0,0          5601
;                        ADC 0,0          5901
;                        SUB 0,0          5901
;                        ADD 0,0          5901
;                        AND 0,0          5901
;                        NIOP 00          4403
;                        SKPBN 0          4403
;                        DIA 0,0          4403
;                        DOA 0,0          4703
;                        LDA 0,0          5202
;                        STA 0,0          5501
;                        ISZ 000          5201
;                        DSZ 000          5202
;                        JMP .+1          2607
;                        JSR .+1          3506
;                        LDA 000          7798
;                        LDA 0,0,2        5501
```

↑↑↑

```
;6.     PROGRAM DISCRIPTION
;               THE FOLLOWING PROCEEDURE IS USED TO CALCULATE
;               THE INSTRUCTION TIMES. THE TELETYPE IS COM-
;               MANDED TO PRINT A CHARACTOR. A "INC"
;               INSTRUCTION THEN RECORDES THE NUMBER OF TIMES
;               A SMALL LOOP IS ITERATED BEFORE THE TELETYPE
;               BUSY FLAG IS ZERO. THIS COUNT REPRESENTS 100
;               MILLISECONDS, AND IS USED FOR CALIBRATION.
;               A 1000 WORD BUFFER IS FILLED WITH THE INST-
;               RUCTION TO BE TIMED. A CHARACTOR IS AGAIN SENT
;               TO THE TELETYPE AND PROGRAM CONTROL IS TRANS-
;               FERED TO THE BUFFER. THE BUFFER IS EXECUTED 10
;               TIMES. WHEN THE INSTRUCTION IN QUESTION HAS
;               BEEN EXECUTED 10000 TIMES (1000*10) THE PRO-
;               GRAM THEN TIMES THE REMAINDER OF THE TELETYPE
;               BUSY FLAG. THE VALUE THUS RECORDED IS SUBTRACTED
;               FROM THE 100 MS CALIBRATION TIME. THE DIFFIRENCE
;               REPRESENTS THE TIME FOR 10000 INSTRUCTIONS
;               BEING EXECUTED. THE TIME FOR 10000 INSTRUCTIONS
;               IS MULTIPLIED BY 10000 AND DEVIDEV BY 100 MS.
;               THE RESULT REPRESENTS TIME IN NANO SECONDS.

;7.     LIMITATIONS/MISC
;               THIS PROGRAM WILL NOT FUNCTION PROPERLY WITH A
;               TYPE 37 TELETYPE.
```