

8CL01A  
REAL TIME CLOCK AND TAPE OVERLAP TEST

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## REAL TIME CLOCK AND TAPE OVERLAP TEST

## I. PURPOSE OF TEST

To check that the clock can be read correctly while simultaneously reading or writing on tape.

## II. METHOD OF TEST

It is assumed that the 7080 CPU and channel operations are in good working order in all areas other than the one tested in this program. The test consists of only one routine. The Clock Rd operation is overlapped with first writing on and then reading from tape. Checks are then made to see that the Clock was read correctly and that RD and WR fields compared equal.

## A. Special Features

1. The clock reading is typed out whenever Manual Interrupt 251 button is pressed.
2. Alteration switch 912, normally used to loop in a routine, is not used in this program as the program only consists of one routine.
3. There are two error Sub Routines. The first Sub Routine, located in the Main Program, types out two successive clock readings if they differ by more than a thousandth of an hour. The program is such that if a not RDY condition occurs in between the two readings of the clock a transfer is made such that the first reading is taken again before a second reading is obtained. The second Sub Routine, located in the Interrupt Program, types out if tape RD and WR fields do not compare equal.
4. The Z typeout, indicating 100 pass in the program, is made in the Interrupt Program.

## III. AREA OF MACHINE REQUIRED

## 1. Units

- a. 7080 CPU
- b. 7621 TCU
- c. Tape Drive Unit with address 2001

## 2. Memory Locations

- |    |                |              |
|----|----------------|--------------|
| a. | 00000 to 01386 | 8CL01        |
| b. | 18200 to 18800 | Load Program |

## IV. LOADING PROCEDURE

## 1. Card

Use standard load program 8LD01 with cards in the following order:

8LD01	2 cards
8CL01	25 cards
8TR02	1 card
Blanks	3 cards

## 2. Tape

Use a tape generated by 8TR06. Refer to the 8TR06 write-up for complete details on generating and using this tape.

## V. PROGRAM CONTROL

1. Check switches - all in Automatic
2. Alteration Switches

911 ON - Bypass Error Typeouts and Halts  
 913 ON - Stop on Error  
 914 ON - Repeat the Test  
 912 - 915 - 916 - Not used

## 3. Other Switches

Non Stop - OFF  
 I/O Interpret - OFF  
 705 I/II - OFF  
 40K - OFF

## 4. Manual Control

None

## VI. NORMAL STOPS

1. Halt 0000. This stop occurs on program entry in the first pass only. Proceed per typeout and Start.

## VII. ERROR STOPS

- a. Halt 0001. This stop occurs if two successive readings of the clock differ by more than one thousandth of an hour with 913 ON. To continue hit start.
- b. Halt 0002. This stop occurs if RD-WR fields do not compare equal with 913 ON. To continue hit start.

## VIII. TYPEOUTS

### 1. Normal Typeouts

- a. "ALL CHECK SWS ON AUTO. 40K, 705 I/II, I/O INT AND NON STOP ALL OFF. TO LOOP PUT 914 ON."  
This occurs on program entry in the first pass only.
- b. XXXXX where X is a number. This is the reading of the clock which occurs on the first pass of the program or after Reset or after depressing Manual Interrupt 251 button.
- c. "Z" - This will be typed out after every 100 passes in the program.

### 2. Error Typeouts

- a. Two successive readings of the clock typed out in one line indicates error in clock read operation.  
Example: "12056 12058"  
This means that the two readings differed by more than one thousandth of an hour.
- b. "RD-WR UNEQUAL" This means that the RD-WR fields were not equal.
- c. "CHAN CHK ON WR"
- d. "CHAN CHK ON RD"

## IX. COMMENTS

Note that if the machine is in the Interrupt Program when INT. 251 button is depressed, the interrupt call cannot be serviced until the machine leaves the Interrupt Program. Hence, in such a case a short delay will occur in servicing INT. 251.

8CLO1A 9/15/61  
ALL CHECK SWITCHES ON AUTO.  
911 ON-BYPASS ERROR  
TYPEOUTS & HALTS.  
913 ON-HALT ON ERROR  
914 ON- LOOP IN PROGRAM.

```

00004 EEM 3 14 0000 06-0
00009 CHR 3 13 0000 06 0
00014 NOP A 0174
00019 SGN T 0010
00024 SEL 2 0500
00029 WR RRR 0050
00034 WR RRR 0072
00039 WR RRR 0118
00044 HLT J 0000
00049 TR 1 0144

```

INITIAL TYPEOUT ON  
READING THE PROGRAM IN

```

2 021 00070
2 001 00071
2 032 00103
2 013 00116
2 001 00117
2 019 00136
2 001 00137

```

CONSTANTS & WORK AREA  
ALL CHECK SWS ON AUTO.

40K , 705 I/II , I/Q INT. & NON  
STOP ALL OFF.  
TO LOOP PUT 914 ON.

HOUSEKEEPING

```

00144 SPC , 0000
00149 SEL 2 2001
00154 RWD 3 0002
00159 IOF 3 0000
00164 TRS 0 01 0174 01X4
00169 TR 1 01 0164
00174 SEL 2 0 0501
00179 TRS 0 01 0189 01Y9
00184 TR 1 01 0179
00189 RD Y 0890
00194 WR R 0890
00199 EIM , 06 0000 0 -0

```

REWIND TAPE 2001  
MAKE TAPE READY  
MAKE CLOCK READY  
RD CLOCK & T/O

```

00204 SPC , 2510
00209 LFC , 02 0274 02P4
00214 SPC , 2514
00219 LFC , 02 0279 02P9
00224 TR 1 0264

```

SET UP INT. WD 251

```

00229 EEM 3 14 0000 06-0
00234 SEL 2 0501
00239 TRS 0 01 0249 02U9
00244 TR 1 0239
00249 RD Y 0265
00254 WR R 0265
00259 LIP , 15 0009 06&9

```

MANUAL INT. 251 ROUTINE

```

00264 TR 1 0284

```

A02 TO NEXT PAGE

CONSTANTS & WORK AREA

```

2 005 00269
001 00270
2 005 00274
005 00279

```

```

0229 0229
-6-M

```

MAIN PROGRAM  
RD CLOCK & TIP

```

A01.....00284 SEL 2 0501
00289 TRS 0 01 0299 02Z9
00294 TR 1 0289
00299 RD Y 0890
00304 TIP 14 0464 0D04
00309 TR 1 0314

```

MAKE CLOCK RDY

B03 TRANSFER INT. PROGRAM

RD CLOCK ROUTINE

```

00314 SEL 2 0501
00319 TRS 0 01 0329 0359
00324 TR 1 0309
00329 RD Y 0890
00334 TRS 0 01 0344 03U4
00339 TR 1 0309
00344 RD Y 0900
00349 SPC B 0000
00354 SET B 02 0005 00-5
00359 LOD 8 02 0904 09-4
00364 CMP 4 02 0894 08R4
00369 TRE L 0449
00374 ADD G 02 1386 13Q6
00379 CMP 4 02 0894 08R4
00384 TRE L 0449

```

CMP TWO SUCCESSIVE READINGS OF THE CLOCK

```

00389 TRA I 01 0449 04U9
00394 SET B 02 0015 00J5
00399 LOD 8 02 0904 09-4
00404 UNL 7 02 19998 Z9R8
00409 RCV U 01 19989 Z989
00414 BLM $ 01 0005 00 5
00419 SEL 2 0500
00424 WR R 01 19984 Z9Y4
00429 TRA I 03 0439 04C9
00434 TR 1 0449
00439 HLT J 0001

```

ERROR ROUTINE FOR RD

CLOCK ROUTINE

```

00444 NOP A 0000
00449 SEL 2 0501
00454 TRS 0 01 0314 0374
00459 TR 1 0309

```

CLOCK NOT RDY, REPEAT MAIN PROGRAM. CLOCK RDY, LOOP IN RD CLOCK

INTERRUPT PROGRAM

WR TAPE  
END OF FILE - REWIND

DELAY FOR WRITE  
LIP TO RD CLOCK ROUTINE

BSP

IF INTERRUPT ON SECOND  
RD, DO CLOCK RD ROUTINE  
OVER AGAIN

RD

COMPARE ROUTINE

LOD RD FIELD

B02  
B04

```

#####
00464 SEL 2 2001
00469 TRS 0 0479
00474 TR 1 0489
00479 RWD 3 0002
00484 IOF 3 0000
00489 TRS 0 01 0499 04Z9
00494 TR 1 0489
00499 WR R 0930
00504 SPC , 0000
00509 SET B 8000
00514 SPC , 3700
00519 LFC , 02 0899 08R9
00524 LIP , 15 2000 2&60
#####

00529 SEL 2 2001
00534 TRS 0 02 0544 05M4
00539 TR 1 0559
00544 TRA I 01 0564 05W4
00549 SEL 2 0500
00554 WR R 1340
00559 SEL 2 2001
00564 BSP 3 0004
00569 SPC , 0000
00574 SET B 8000
00579 SPC , 3700
00584 SET B 0004
00589 CMP 4 0909
00594 TRE L 0604
00599 TR 1 0609
00604 LFC , 02 0899 08R9
00609 SPC , 3730
00614 LFC , 02 1384 13Q4
00619 LIP , 15 2000 2&60
#####

00624 SEL 2 2001
00629 RD Y 1135
00634 SPC , 0000
00639 SET B 8000
00644 SPC , 3700
00649 SET B 0004
00654 CMP 4 0909
00659 TRE L 0669
00664 TR 1 0674
00669 LFC , 02 0899 08R9
00674 SPC , 3730
00679 LFC , 02 1384 13Q4
00684 LIP , 15 2000 2&60
#####

00689 SPC , 0000
00694 SEL 2 2001
00699 TRS 0 02 0709 07-9
00704 TR 1 0724
00709 TRA I 01 0724 07S4
00714 SEL 2 0500
00719 WR R 1355
00724 SET B 0200
00729 LOD 8 1334
00734 CMP 4 1129
00739 SPC , 2000
00744 TRE L 0779
#####

```

C04

```

C03.....
00749 TRA I 01 0779 07X9
00754 SEL 2 0500
00759 WR R 0916
00764 TRA I 03 0774 07G4
00769 TR I 0779
00774 HLT J 0002
00779 TR 1 0784

```

ERROR ROUTINE FOR RD-WR

```

00784 NOP A 0000
00789 NOP A 0000
00794 SPC 0000
00799 SET B 0002
00804 LOD 8 0789
00809 ADD G 0913
00814 UNL 7 0789
00819 LOD 8 0911
00824 CMP 4 0789
00829 SPC 2000
00834 TRE L 0844
00839 TR I 0464
00844 SPC 0000
00849 LOD 8 0784
00854 UNL 7 0789
00859 SPC 2000
00864 SEL 2 0500
00869 WR I 0914
00874 TRA I 04 0464 0U64
00879 SPC 3700
00884 LFC 02 1339 13L9
00889 LIP 15 0009 0&&9

```

PASS COUNTER

TYPEOUT Z  
LOOP IF 914 IS ON

STEP COUNTER PLUS 1

RESET COUNTER

TYPEOUT Z  
914 ON LOOP

```

2 005 00894
2 001 00895
2 005 00899
2 001 00904
2 005 00905
2 001 00909
2 005 00914
2 001 00915
2 013 00928
2 001 00929
2 040 00969
2 040 01009
2 040 01049
2 040 01089
2 040 01129
2 005 01134
2 050 01184
2 050 01234
2 050 01284
2 050 01334
2 005 01339
2 014 01353
2 001 01354
2 014 01368
2 001 01369
2 005 01374
2 005 01379
2 005 01384
2 002 01386

```

CONSTANTS & WORK AREA

CLOCK READ AREA

```

0314 0314  RD CLOCK ROUTINE STARTING ADDRESS
              CLOCK READ AREA
0344 0344  ADDRESS OF 2ND RD IN RD CLOCK ROUTINE
              99AAZ
RD-WR UNEQUAL
ABCDEFGHIJ0123567894KLMNOPQRRSTUVWXYZ...
ABCDEFGHIJ0123567894KLMNOPQRRSTUVWXYZ...
ABCDEFGHIJ0123567894KLMNOPQRRSTUVWXYZ...
ABCDEFGHIJ0123567894KLMNOPQRRSTUVWXYZ...
ABCDEFGHIJ0123567894KLMNOPQRRSTUVWXYZ...
ABCDEFGHIJ0123567894KLMNOPQRRSTUVWXYZ...

Y219
CHAN CHK ON WR
CHAN CHK ON RD

00501
AJ

```