

**DK8-EC crystal  
real time clock  
engineering drawings**

# MASTER DRAWING LIST

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DWG. NO.	REV. LET.	NO. OF SHEETS	TITLE
A-PL-DK8-E-0	A	1	Real Time Clock (PARTS LIST)
A-SP-DK8-EC-4		5	Engineering Specs
A-SP-DK8-EC-5	A	5	Test Procedure
E-CS-M8830-0-1	#	2	REAL TIME CLOCK (CRYSTAL)
A-SP-7665123-0-0	A	2	ACCEPTANCE PROCEDURE
LIBKIT-8E-DK8E	REF		LIBRARY KIT
A-AL-DK8-EC-6		1	ACCESSORY LIST

<b>REVISIONS</b>				DRN. <i>Ken Lubick</i>	DATE 2-25-71	<div style="display: flex; align-items: center;"> <div style="font-size: 2em; font-weight: bold; margin-right: 5px;">d</div> <div style="font-size: 2em; font-weight: bold; margin-right: 5px;">i</div> <div style="font-size: 2em; font-weight: bold; margin-right: 5px;">g</div> <div style="font-size: 2em; font-weight: bold; margin-right: 5px;">i</div> <div style="font-size: 2em; font-weight: bold; margin-right: 5px;">t</div> <div style="margin-left: 10px;">EQUIPMENT CORPORATION <small>MAYNARD, MASSACHUSETTS</small></div> </div>																				
REV.	DATE	CHG. NO.	APP'D.	CHK'D. <i>Ken Lubick</i>	DATE 2-25-71																					
A	03237	00001	A.D.	ENG. <i>Al Deduca</i>	DATE 2-25-71																					
B	12/71	00005	A.D.	PROJ. ENG. <i>Ken Vogdrang</i>	DATE 2-25-71																					
C	2/72	00006	A.D.	PROD.	DATE																					
D	2/72	DK8E-00007	A.D.																							
E	8/73	DK8E-8	A.D.																							
				FIRST USED ON <i>PDP8-E</i>		<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td colspan="2">TITLE</td> <td colspan="2">DK8-EC</td> </tr> <tr> <td colspan="4" style="text-align: center;">Real Time Clock (Crystal)</td> </tr> <tr> <td>SIZE</td> <td>CODE</td> <td>NUMBER</td> <td>REV.</td> </tr> <tr> <td>A</td> <td>ML</td> <td>DK8-EC</td> <td>E</td> </tr> <tr> <td colspan="2">SHEET 1 OF 1</td> <td>DIST.</td> <td></td> </tr> </table>	TITLE		DK8-EC		Real Time Clock (Crystal)				SIZE	CODE	NUMBER	REV.	A	ML	DK8-EC	E	SHEET 1 OF 1		DIST.	
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SHEET 1 OF 1		DIST.																								
				SCALE <i>1:1</i>																						

**DIGITAL EQUIPMENT CORPORATION**  
MAYNARD, MASSACHUSETTS  
**PARTS LIST**

QUANTITY / VARIATION

MADE BY K. GULICK	CHECKED K. RUSS	SECTION
DATE 3/23/71	DATE 3/23/71	1
ENG <i>Al DeJesus</i>	PROD <i>Teray Baylor</i>	ISSUED SECT.
DATE 4/6/71	DATE 4/7/71	1

ITEM NO.	DWG NO. / PART NO.	DESCRIPTION	DK8-EA	DK8-EC	QUANTITY / VARIATION												
1	E-CS-M882-0-1	REAL TIME CLOCK (LINE)	1	-													
2	E-CS-M8830-0-1	REAL TIME CLOCK (CRYSTAL)	-	1													
3	D-IA-7007128-D-0	28 VAC POWER CABLE	1	-													

TITLE	REAL TIME CLOCK DK8-E	ASSY NO.		SIZE	CODE	NUMBER	REV.	ECO NO.
				A	PL	DK8-E-0	A	DK8E-00005
		SHEET 1	OF 1	DIST.				

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**DIGITAL EQUIPMENT CORPORATION**  
**MAYNARD, MASSACHUSETTS**

**ENGINEERING SPECIFICATION**

DATE *10/13/71*

TITLE Engineering Specifications for DK8-EC M8830 Real Time Clock (crystal)

REVISIONS

REV	DESCRIPTION	CHG NO	ORIG	DATE	APPD BY	DATE

**ENGINEERING SPECIFICATION**

CONTINUATION SHEET

TITLE Engineering Specs for DK8-EC (M8830) Real Time Clock (crystal)

DK8-EC Real Time Clock (crystal)

1. General Description

1.1 The DK8-EC(M8830) counts intervals of time at any one of four different selectable rates 1 Hz, 50 Hz, 500 Hz and 5000 Hz. These rates are selected by adding jumpers on the M8830. The M8830 is shipped with a machine inserted jumper selecting the 1 Hz rate.

The DK8-EC plugs into the OMNIBUS of the PDP8-E processor. The frequency is determined by a 20 MHz crystal oscillator divided down through MSI decade counters.

1.1.1 The crystal oscillator, decade counter and the remaining logic is contained on one 8 1/2 inch quad module. All three IOT's for the DK8-EC are decoded on this module and are listed below:

MNEMONIC	CODE	OPERATION
CLEI	6131	Set Interrupt
CLDI	6132	Clear Interrupt
CLSK	6133	Skip on clock flag and clear flag

1.2 Operation

Refer to DK8-EC block diagram and timing diagram. 6132 or initialize will clear the interrupt request flag. The interrupt request line will be asserted if the slave clock flag is set from the master clock flag and will remain asserted until it is cleared by 6132, initialize or 6133. The master clock flag is set every time the frequency source goes high 1, 50, 500 or 5000 times a second.

ENG	A. DeLuca	APPD	<i>Luca</i>	SIZE	A	CODE	SP	NUMBER	DK8-EC-4	REV	
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SIZE	A	CODE	SP	NUMBER	DK8-EC-4	REV	
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TITLE Engineering Specs for DK8-EC M8830 Real Time Clock (crystal)

1.2

Operation (continued)

The skip line is pulled to ground, asserted, if the slave clock flag has been set and the IOT 6133 is issued. The skip line stays at ground for the duration of the IOT 6133. At the end of this IOT the master clock flag will be cleared. TP1 the start of any IOT will clear or set the slave flag depending upon the output state of the master flag. If the master flag has been cleared then the slave will be cleared. With both the master and slave cleared no skip can occur until the next clock pulse which will set the master flag and TP1 will set the slave.

It takes two IOT's to sync to the frequency source the first to clear the master clock flag and the second to skip the moment the master clock flag goes high which will be when the frequency source clock pulse goes high.

Sample Program:

```
6133
JMP.-1
6133
JMP.-1
```

2. Operating Conditions

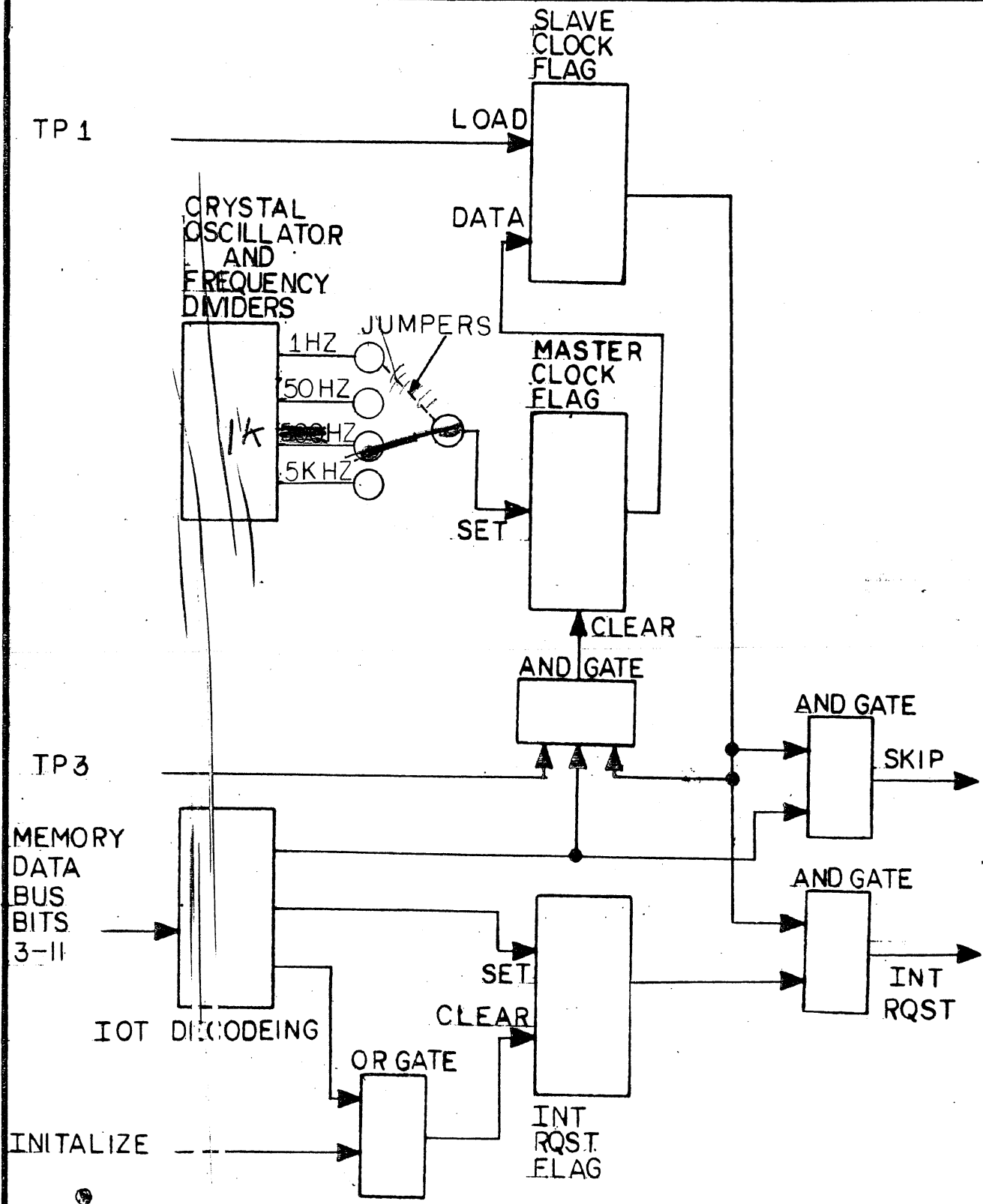
Temperature -30°F - 130°F  
 Humidity -10% - 90% non condensing  
 Power required +5 volts - 400 ma  
 Frequency stability = .01%

3. Software:

MAINDEC-8E-D8AA-D-(D) Write Up  
 MAINDEC-8E-D8AA-PB Tape

SIZE A	CODE SP	NUMBER DK8-EC-4	REV
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TITLE DK8-EC BLOCK DIAGRAM



SIZE A	CODE SP	NUMBER DK8-EC-4	REV
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