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IDENTIFICATION

PRODUCT CODE: AC-E727F-MC
PRODUCT NAME: CXLPBFO LPS-KW MODULE
PRODUCT DATE: SEPTEMBER 1978
MAINTAINER: DEC/X11 SUPPORT GROUP

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1. ABSTRACT:

LPB IS AN IOMOD THAT EXERCISES THE LPS-KW REAL TIME CLOCK CONTROL.
IT PERFORMS A CONFIDENCE TEST ON THE CLOCK PRESET BUFFER
AND THE CONTROL REGISTER. THE MAJOR PORTION OF THE MODULE
IS DEFERRED TO PRIORITY LEVEL 0 WITH ANY ERROR BEING RE-
PORTED ON THE CONSOLE TTY.

2. REQUIREMENTS:

HARDWARE: LPS-11 INTERFACE WITH A LPS-KW CLOCK CONTROL INSTALLED
STORAGE:: LPB REQUIRES:
 1. DECIMAL WORDS: 301
 2. OCTAL WORDS: 0455
 3. OCTAL BYTES: 1132

3. PASS DEFINITION:

ONE PASS OF THE LPB MODULE CONSISTS OF COUNTING THRU SIX SELECTABLE
CLOCK FREQUENCY (EXCEPT EXTERNAL CLOCK) 1024. TIMES
THIS COULD ALSO BE EXPRESSED AS 6144. INTERRUPTS.

4. EXECUTION TIME:

VARIABLES WITH LINE FREQ. BUT SHOULD TAKE AN AVERAGE OF ONE
MINUTE TO COMPLETE ONE PASS WHEN RUNNING ALONE.

5. CONFIGURATION PARAMETERS:

DEFAULT PARAMETERS:

DVA: 170404, VCT: 1, BR1: 6

REQUIRED PARAMETERS:

AT CONFIGURATION TIME THE USER MUST SPECIFY:

VCT: VECTOR ADDRESS OF LPS-KW

6. DEVICE OPTION SETUP:

NONE REQUIRED

7. MODULE OPERATION:

7.1 TEST SEQUENCE:

- A. START: USING THE DEVICE ADDRESS, THIS SECTION OF CODE DETERMINES THE CONTROL, BUFFER PRESET AND INTERRUPT ADDRESSES.
- B. TSTCLK: THIS SECTION OF CODE PERFORMS A CONFIDENCE REGISTER TEST OF THE PRESET BUFFER AND THE CONTROL REGISTERS.
- C. PRIME: IN THIS SECTION, THE CLOCK PRESET BUFFER AND CONTROL REGISTERS ARE LOADED. THE CLOCK IS ENABLED AND AN "EXIT" RETURN TO THE MONITOR.
- D. LPSKW: UPON A CLOCK INTERRUPT, THE PROGRAM WILL RETURN TO THIS CODE. ENTER DEFERRED SERVICE MODE AND TEST FOR A MODE FLAG. IF NO MODE FLAG, REPORT IT AS AN ERROR.
- F. LPSKWG: UPDATE THE CLOCK RATE LOCATION AND JUMP TO A NEW RATE SELECTION BY INDEXING THRU THE "DSPKW" TABLE.

F. LPSKWA: THRU LPSKWF: THESE SIX
PIECES OF CODE, SELECT A NEW
CLOCK COUNTING RATE AND
COUNTER PRESET BUFFER VALUE.

G. KWDONE: ENDIT CALL TO THE MONITOR TO SIGNAL END
OF ITERATION.

8. OPERATOR OPTIONS:

A. NONE

9. NON-STANDARD PRINTOUTS:

NONE: ALL PRINTOUTS HAVE THE STANDARD FORMAT.

```
158  
159 ;LPS-11 KW DEC/X11 EXERCISER MODULE  
160  
161 000000< IOMOD <LPBF > 170404 1 6 6 2000 46  
162 000000< MODULE 140000 LPBF 170404 1 6 6 2000 46  
163 .TITLE LPBF DEC/X11 SYSTEM EXERCISER MODULE  
164 ; DDICOM VERSION 6 23-MAY-78  
165 .LIST RIN  
166 *****  
167 000000< BEGIN:  
168 000000< MODNAM: .ASCII /LPBF / ;MODULE NAME  
169 000005< XFLAG: .BYTE OPEN ;USED TO KEEP TRACK OF WBUFF USAGE  
170 000006< ADDR: 170404+0 ;1ST DEVICE ADDR  
171 000010< VECTOR: 1+0 ;1ST DEVICE VECTOR.  
172 000012< BR1: .BYTE PRTY6+0 ;1ST BR LEVEL.  
173 000013< BR2: .BYTE PRTY+0 ;2ND BR LEVEL.  
174 000014< DYID1: +1 ;DEVICE INDICATOR 1.  
175 000016< SR1: OPEN ;SWITCH REGISTER 1  
176 000020< SR2: OPEN ;SWITCH REGISTER 2  
177 000022< SR3: OPEN ;SWITCH REGISTER 3  
178 000024< SR4: OPEN ;SWITCH REGISTER 4  
179 *****  
180 000026< 140000 STAT: 140000 ;STATUS WORD.  
181 000030< 000236 INIT: START ;MODULE START ADDR  
182 000032< 000224 SPOINT: MODSP ;MODULE STACK POINTEP.  
183 000034< 000000 PASCNT: 0 ;PASS COUNTER.  
184 000036< 002000 ICOUNT: 2000 ;# OF ITERATIONS PER PASS=2000  
185 000040< 000000 ICOMT: 0 ;LOC TO COUNT ITERATIONS  
186 000042< 000000 SOFCNT: 0 ;LOC TO SAVE TOTAL SOFT ERRORS  
187 000044< 000000 HRDCNT: 0 ;LOC TO SAVE TOTAL HARD ERRORS  
188 000046< 000000 SOPPAS: 0 ;LOC TO SAVE SOFT ERRORS PER PASS  
189 000050< 000000 HRDPAS: 0 ;LOC TO SAVE HARD ERRORS PER PASS  
190 000052< 000000 SYSCNT: 0 ;# OF SYS ERRORS ACCUMULATED  
191 000054< 000000 RANNUM: 0 ;HOLDS RANDOM # WHEN RAND MACRO IS CALLED  
192 000056< 000000 CONFIG: ;RESERVED FOR MONITOR USE  
193 000056< 000000 RES1: 0 ;RESERVED FOR MONITOR USE  
194 000060< 000000 RES2: 0 ;RESERVED FOR MONITOR USE  
195 000062< 000000 SVR0: OPEN ;LOC TO SAVE R0.  
196 000064< 000000 SVR1: OPEN ;LOC TO SAVE R1.  
197 000066< 000000 SVR2: OPEN ;LOC TO SAVE R2.  
198 000070< 000000 SVR3: OPEN ;LOC TO SAVE R3.  
199 000072< 000000 SVR4: OPEN ;LOC TO SAVE R4.  
200 000074< 000000 SVR5: OPEN ;LOC TO SAVE R5.  
201 000076< 000000 SVR6: OPEN ;LOC TO SAVE R6.  
202 000100< 000000 CSRA: OPEN ;ADDR OF CURRENT CSR.  
203 000102< 000000 SBADR: ;ADDR OF GOOD DATA, OR  
204 000102< 000000 ACSR: OPEN ;CONTENTS OF CSR.  
205 000104< 000000 WASADR: ;ADDR OF BAD DATA, OR  
206 000104< 000000 ASSTAT: OPEN ;STATUS REG CONTENTS.  
207 000106< 000000 ERRRTYP: ;TYPE OF ERROR  
208 000106< 000000 ASB: OPEN ;EXPECTED DATA.  
209 000110< 000000 AWAS: OPEN ;ACTUAL DATA.  
210 000112< 000310 RSTRT: RSTRT ;RESTART ADDRESS AFTER END OF PASS  
211 000114< 000000 WDT0: OPEN ;WCRTS TO MEMORY PER ITERATION  
212 000116< 000000 WDFR: OPEN ;WCRTS FROM MEMORY PER ITERATION  
213 000120< 000000 INTR: OPEN ;# OF INTERRUPTS PER ITERATION
```

```
214 000122< 000046 IDNUM: 46 ;MODULE IDENTIFICATION NUMBER=46  
215 000040 000040 ;MODULE STACK STARTS HERE.  
216 .REPT SPSIZ  
217 .NLST  
218 .WORD 0  
219 .LIST  
220 .ENDR  
221 MODSP:  
222 *****
```

```

223
224
225
226
227
228 000224* 000000      ;LPS-KW OPERATOR CHANGEABLE LOCATION
229                                KWRATE: 0          ;CLOCK RATE
230                                ;COMMON LPS-KW DEVICE ADDRESSES
231
232 000226* 170404      CSR: 170404          ;CLOCK STATUS
233 000230* 170406      CSB: 170406          ;CLOCK PRESET BUFFER
234
235                                ;COMMON LPS-KW DEVICE VECTOR
236
237
238 000232* 000304      CKV: 304            ;CLOCK VECTOR
239 000234* 000306      CKVS: 306
240
  
```

```

241
242
243
244                                ;NOW SET UP THE ADDRESS AND VECTOR DISPATCH LOC.
245
246 000236* 016767 177544 177762      START: MOV ADDR,CSR          ;LOAD DEVICE ADDRESSES
247 000244* 016767 177536 177756      MOV ADDR,CSB
248 000252* 062767 000002 177750      ADD #2,CSB
249 000260* 016767 177524 177744      MOV VECTOR,CKV
250 000266* 016767 177516 177740      MOV VECTOR,CKVS
251 000274* 062767 000002 177732      ADD #2,CKVS
252 000302* 012767 000006 177610      MOV #6,INTR          ;6 INTERRUPTS/ITERATION
253
254                                ;LOGIC TEST
255
256 000310* 005067 177710      RESTRT: CLR KWRATE          ;CLR RATE
257 000314* 005077 177706      CLR @CSR          ;CLEAR STATUS
258 000320* 005077 177704      CLR @CSB          ;CLEAR BUFFER
259 000324* 005177 177704      TST @CSB          ;TEST BUFFER
260 000330* 001066          BNE IS          ;BR IF ERROR
261
262 000332* 012777 125252 177670      MOV #125252,@CSB    ;LOAD PRESET BUFFER
263 000340* 012777 125252 177536      MOV #125252,ASTAT   ;LOAD EXPECTED
264 000346* 022777 125252 177654      CMP #125252,@CSB    ;TEST BUFFER
265 000354* 001054          BNE IS          ;BR IF ERROR
266
267 000356* 012777 052525 177644      MOV #52525,@CSB    ;LOAD PRESET BUFFER
268 000364* 012767 052525 177512      MOV #52525,ASTAT   ;LOAD EXPECTED
269 000372* 022777 052525 177630      CMP #52525,@CSB    ;TEST BUFFER
270 000400* 001042          BNE IS          ;BR IF ERROR
271
272 000402* 012777 041112 177616      MOV #41112,@CSR    ;LOAD CONTROL
273 000410* 012767 041112 177466      MOV #41112,ASTAT   ;LOAD EXPECTED
274 000416* 022777 041112 177602      CMP #41112,@CSR    ;TEST CONTROL
275 000424* 001050          BNE IS          ;BR IF ERROR
276
277 000426* 012777 000404 177572      MOV #404,@CSR      ;LOAD CONTROL
278 000434* 012767 000404 177442      MOV #404,ASTAT     ;LOAD EXPECTED
279 000442* 022777 000404 177556      CMP #404,@CSR      ;TEST CONTROL
280 000450* 001036          BNE IS          ;BR IF ERROR
281
282 000452* 005077 177550      CLR @CSR          ;CLEAR CONTROL
283 000456* 012777 100200 177542      MOV #100200,@CSR   ;LOAD CONTROL
284 000464* 012767 100200 177412      MOV #100200,ASTAT  ;LOAD EXPECTED
285 000472* 022777 100200 177526      CMP #100200,@CSR   ;TEST CONTROL
286 000500* 001022          BNE IS          ;BR IF NOT
287
288 000502* 000167 000100      JMP PRIME
  
```

```
288  
289  
290 000506 017767 177516 177366 1S: MOV @CSB,ACSR ;LOAD READ  
291 000514 016767 177510 177356 MOV CSB,CSRA ;LOAD ADDRESS  
292 000522 005077 177500 CLR @CSR ;CLEAR STATUS  
293 000526 012767 000025 177352 MOV #25,ERRTYP ;BIT STUCK IN REGISTER  
294 ;*****  
295 000534 104405 000000 000000 (RDERS,BEGIN,NULL ;BUFFER BIT IN ERROR  
296 ;*****  
297 000542 104410 000000 ENDS,BEGIN ;  
298  
299 000546 017767 177454 177326 2S: MOV @CSR,ACSR ;LOAD READ  
300 000554 016767 177446 177316 MOV CSR,CSRA ;LOAD ADDRESS  
301 000562 005077 177440 CLR @CSR ;CLEAR STATUS  
302 000566 012767 000025 177312 MOV #25,ERRTYP ;BIT STUCK IN REG  
303 ;*****  
304 000574 104405 000000 000000 (RDERS,BEGIN,NULL ;CONTROL/STATUS BIT ERROR  
305 ;*****  
306 000602 104410 000000 ENDS,BEGIN ;  
307  
308 ; PRIMER ROUTINE  
309  
310 000606 012777 000650 177416 PRIME: MOV #LPSKW,CKV ;SET UP LPSKW VECTOR  
311 000614 116777 177172 177412 MOVB B1,CKVS  
312 000622 016767 177400 MOV CSR,CSRA ;LOAD DEVICE ADDRESS  
313 000630 012777 050000 177372 MOV #5000,@CSR ;LOAD CLOCK PRESET  
314 000636 012777 000103 177362 MOV #103,@CSR ;START THE CLOCK AND INTERRUPT ENABLE  
315  
316 000644 104400 000000 EXITS,BEGIN ;EXIT TO MONITOR. MODULE WAIT FOR INTERRUPT.  
317  
318 ;LPS KW SUB-TEST  
319  
320 000650 LPSKW:  
321  
322 000650 000004 000000 000656 (IRQS,BEGIN,1S ;QUEUE UP TO CONTINUE AT 1S AND RTI  
323 ;-----  
324 000656 105777 177344 1S: (STB @CSR ;TEST FOR CLOCK DONE  
325 000662 109417 BMI LPSKWG  
326 000668 017767 177336 MOV @CSR,ACSR ;LOAD VALUE  
327 000672 005077 177330 CLR @CSR ;CLEAR STATUS  
328 000676 005067 177202 MOV #1,ASTAT ;ENSURE 0  
329 000702 012767 000011 177176 MOV #11,ERRTYP ;ILLEGAL INTERRUPT OR DONE NOT SET  
330 ;*****  
331 000710 104405 000000 000000 (RDERS,BEGIN,NULL ;NO CLOCK DONE (MODE FLAG)  
332 ;*****  
333 000716 104410 000000 ENDS,BEGIN ;
```

```
334  
335 000722 095267 177276 LPSKWG: INC KWRATE ;UPDATE RATE  
336 000726 016767 177272 MOV KWRATE,R0 ;LOAD R0  
337 000732 006300 ASL R0 ;*2  
338 000734 042700 177761 BIC #177761,R0 ;MASK BITS  
339 000740 000170 000744 JMP @DSPKW(R0) ;JUMP THERE  
340  
341 000744 000764 DSPKW: LPKWA ;1 MHZ.  
342 000746 001004 LPKWB ;100KHZ.  
343 000750 001024 LPKWC ;10KHZ.  
344 000752 001044 LPKWD ;1KHZ.  
345 000754 001064 LPKWE ;100HZ.  
346 000756 001104 LPKWF ;LINE FREQ.  
347 000760 000764 LPKWA ;1MHZ.  
348 000762 001124 KWDONE ;DCM.  
349  
350 000764 012777 174000 177236 LPKWA: MOV #-400,@CSR ;LOAD PRESET BUFFER  
351 000772 012777 000103 177226 MOV #103,@CSR ;LOAD RATE  
352 001000 104400 000000 EXITS,BEGIN ;EXIT TO MONITOR. MODULE WAIT FOR INTERRUPT.  
353  
354 001004 012777 177400 177216 LPKWB: MOV #-400,@CSB ;LOAD PRESET  
355 001012 012777 000105 177206 MOV #105,@CSR ;LOAD RATE  
356 001020 104400 000000 EXITS,BEGIN ;EXIT TO MONITOR. MODULE WAIT FOR INTERRUPT.  
357  
358 001024 012777 177740 177176 LPKWC: MOV #-40,@CSB ;LOAD PRESET  
359 001032 012777 000107 177166 MOV #107,@CSR ;LOAD RATE  
360 001040 104400 000000 EXITS,BEGIN ;EXIT TO MONITOR. MODULE WAIT FOR INTERRUPT.  
361  
362 001044 012777 177774 177156 LPKWD: MOV #-4,@CSB ;LOAD PRESET  
363 001052 012777 000111 177146 MOV #111,@CSR ;LOAD RATE  
364 001060 104400 000000 EXITS,BEGIN ;EXIT TO MONITOR. MODULE WAIT FOR INTERRUPT.  
365  
366 001064 012777 177777 177136 LPKWE: MOV #-1,@CSB ;LOAD PRESET  
367 001072 012777 000113 177126 MOV #113,@CSR ;LOAD RATE  
368 001100 104400 000000 EXITS,BEGIN ;EXIT TO MONITOR. MODULE WAIT FOR INTERRUPT.  
369  
370 001104 012777 177777 177116 LPKWF: MOV #-1,@CSR ;LOAD PRESET  
371 001112 012777 000117 177106 MOV #117,@CSR ;LOAD RATE  
372 001120 104400 000000 EXITS,BEGIN ;EXIT TO MONITOR. MODULE WAIT FOR INTERRUPT.  
373  
374 001124 KWDONE:  
375 001124 104413 000000 ENDS,BEGIN ;SIGNAL END OF ITERATION.  
376 BR LPKWA ;MONITOR SHALL TEST END OF PASS  
377 001130 000715 ;NO  
378 000001 .END
```


SVR1	000064R	196#		
SVR2	000066R	197#		
SVR3	000070R	198#		
SVR4	000072R	199#		
SVR5	000074R	200#		
SVR6	000076R	201#		
SYSCNT	000052R	190#		
TREDFE	000022	22#		
VECTOR	000010R	177#	248	249
WASADR	000104R	205#		
WDFR	000116R	212#		
WDT0	000148R	211#		
XPLAG	000005R	169#		

. ABS. 000000 000
001132 001

ERRORS DETECTED: 0
DEFAULT GLOBALS GENERATED: 0

XLPBF0,XLPBF0/SQL/CRF:SYN=DDXCOM,XLPBF0
RUN-TIME: 1 1 2 SECONDS
RUN-TIME RATIO: 25/2=8.5
CORE USED: 7K (13 PAGES)