

.NLIST SEQ
.REM&

IDENTIFICATION

PRODUCT CODE: AC-E670F-MC
PRODUCT NAME: CXLPAFO LP11 MODULE
PRODUCT DATE: SEPTEMBER 1978
MAINTAINER: DEC/X11 SUPPORT GROUP

THE INFORMATION IN THIS DOCUMENT IS SUBJECT TO CHANGE WITHOUT NOTICE AND SHOULD NOT BE CONSTRUED AS A COMMITMENT BY DIGITAL EQUIPMENT CORPORATION. DIGITAL EQUIPMENT CORPORATION ASSUMES NO RESPONSIBILITY FOR ANY ERRORS THAT MAY APPEAR IN THIS MANUAL.

THE SOFTWARE DESCRIBED IN THIS DOCUMENT IS FURNISHED TO THE PURCHASER UNDER A LICENSE FOR USE ON A SINGLE COMPUTER SYSTEM AND CAN BE COPIED (WITH INCLUSION OF DIGITALS COPYRIGHT NOTICE) ONLY FOR USE IN SUCH SYSTEM, EXCEPT AS MAY OTHERWISE BE PROVIDED IN WRITING BY DIGITAL.

DIGITAL EQUIPMENT CORPORATION ASSUMES NO RESPONSIBILITY FOR THE USE OR RELIABILITY OF ITS SOFTWARE ON EQUIPMENT THAT IS NOT SUPPLIED BY DIGITAL.

COPYRIGHT (C) 1973,1978 DIGITAL EQUIPMENT CORPORATION

1. ABSTRACT

LPA EXERCISES ANY LP11 PRINTER HAVING A STANDARD PARALLEL INTERFACE. THE BASIC TEST PRINTS AN INCREMENTAL TEST PATTERN UTILIZING ALL POSSIBLE PRINTING CHARACTERS AND THE SPACE. A CHOICE OF 80 OR 132 COLUMNS AND A CHOICE OF 64 OR 96 CHARACTER PRINT SET EXISTS. ALSO OPTIONAL IS A PAPER SAVING "PAUSE" FEATURE, WHICH ALLOWS ONLY A PORTION OF THE TOTAL LINES DESIRED TO ACTUALLY BE PRINTED. DURING A "PAUSE", NON-PRINTABLE CODES ARE TRANSMITTED IN LIEU OF PRINTERGRAPHICS THEREBY CONTINUING THE EXERCISE OF THE INTERFACE AND PRINTER ELECTRONICS, BUT NOT CONSUMING PAPER.
NOTE: NO PAUSE IS ALLOWED ON THE LP04 PRINTER. SEE SECTION 8C. FOR SETUP.

2. REQUIREMENTS

HARDWARE: LP11 LINE PRINTER CONTROL AND ONE LP11 LINE PRINTER.
STORAGE: LPA REQUIRES:
1. DECIMAL WORDS: 429
2. OCTAL WORDS: 0655
3. OCTAL BYTES: 1532

3. PASS DEFINITION

ONE PASS OF THIS MODULE WILL PRINT AN INCREMENTAL TEST PATTERN, THE # OF LINES PRINTED BEING DETERMINED BY THE OPERATOR. REFER TO "OPERATOR OPTIONS" BELOW FOR SETUP INSTRUCTIONS.

4. CONFIGURATION REQUIREMENTS

DEFAULT PARAMETERS:
DEVADR: 177514, VECTOR: 200, BRI: 4, DEVCNT: 1, SR1: 0

5. DEVICE SETUP

A. LOAD PAPER
B. SWITCH ON-LINE

6. OPERATION OPTIONS

A. SET SR2 = NON ZERO TO ELIMINATE ANY PAUSE FUNCTIONS
(SR2 MUST BE NON ZERO IF PRINTER IS LP04)
B. THE 16 SR1 BITS HAVE THE FOLLOWING FUNCTIONS:

X PPP PPP PPP XXX AAA

AAA = (0) FOR 80 COLUMNS, 64 CHARACTERS
(1) FOR 80 COLUMNS, 96 CHARACTERS
(2) FOR 132 COLUMNS, 64 CHARACTERS
(3) FOR 132 COLUMNS, 96 CHARACTERS

PPP PPP PPP = RELATIVE PAUSE SIZE PER PASS, IE.
(000) = SPECIAL DEFAULT SITUATION
(400) = MAXIMUM PAUSE

X = UNUSED BIT

THE PAUSE DURATION WILL ALSO BE AFFECTED BY THE CPU TYPE AND BY
THE SIZE OF THE OVERALL EXERCISER CONFIGURED.

AS EACH BIT OF THE RELATIVE PAUSE SIZE (PPP PPP PPP) IS
SET IN SR1 FROM LEAST TO MOST SIGNIFICANT, THE # OF LINES
TO BE PRINTED IS REDUCED BY ONE HALF. FOR EXAMPLE:

ICONT=200

PPP PPP PPP = (000) = ALL LINES PRINTED (IF SR2 = NON-ZERO)
PPP PPP PPP = (001) = 100(8) LINES PRINTED
PPP PPP PPP = (002) = 040(8) LINES PRINTED
PPP PPP PPP = (004) = 020(8) LINES PRINTED
PPP PPP PPP = (010) = 010(8) LINES PRINTED
PPP PPP PPP = (020) = 004(8) LINES PRINTED
PPP PPP PPP = (040) = 002(8) LINES PRINTED
PPP PPP PPP = (100) = 001(8) LINES PRINTED

NOTE: IF THE PAUSE IS SET UP SUCH THAT MORE THAN
ONE BIT IS A "ONE", ONLY THE MOST
SIGNIFICANT BIT WILL BE USED FOR SETUP OF
LINES TO BE PRINTED.

EXAMPLE: ICONT=200
PPP PPP PPP = (003)
(2 BITS = "1")
RESULTS IN 40(8) LINES WILL BE PRINTED
SETTING PPP PPP PPP TO 002 WOULD PRINT
THE SAME AMOUNT OF LINES (40).

IF PPP PPP PPP IS SET UP SUCH THAT THE # OF LINES TO
BE PRINTED IS ZERO, IT WILL BE DEFAULTED TO ONE LINE
PRINTED. SO EACH PASS OF LPA WILL PRINT AT LEAST ONE
LINE.

C. LOCATION "TOFCNT" MAY BE CHANGED TO MODIFY THE # OF
PASSES PER TOP OF FORM. IF ANY PAUSE IS SELECTED
LPA WILL DO 40(8) (DEFAULT) PASSES BEFORE A TOP OF FORM
OCCURS.
DEFAULT FOR NO PAUSE (PRINT ALL LINES) IS 1
TOP OF FORM PER PASS.

7. NON STANDARD PRINTOUT

A SPECIAL PRINTOUT OCCURS IF THE LINE PRINTER IS
SWITCHED "OFF LINE" AND AGAIN WHEN IT IS SWITCHED BACK "ON LINE".
8. GENERAL

A. A TOP OF FORM COMMAND DOES NOT RESTART THE CHARACTER
SET FROM THE "SPACE" CHARACTER. THE FIRST LINE AFTER A
TOP OF FORM CONTINUES WHERE THE PREVIOUS LINE LEFT OFF.

B. FOR LONG RUNS THE RECOMMENDED SETUP IS:

ICONT=2700(8) - (DEFAULT)
TOFCNT=40(8) - (DEFAULT)
SR1 = 00000Y (SEE SECTION 6 ABOVE FOR "Y" SETUP)
SR2 = 0 (DEFAULT)

THIS RESULTS IN A RUN TIME OF APPROXIMATELY 30 SECONDS PER PASS.
THE OPERATOR SHOULD VERIFY THE TOP OF FORM
AFTER A RUN IS COMPLETE.

C. TO CONTINUOUSLY PRINT(MANDATORY IF LP04), THE RECOMMENDED SETUP IS:

ICONT=200 (ICONT IS LOC. 36)
TOFCNT = 1
SR1 = 00000Y (SEE ABOVE FOR Y SETUP)
SR2 = 000001

D. AS A FURTHER PAPER SAVING ACTION, THIS
MODULE MAY BE DESELECTED(WITHOUT STOPPING THE RUN) AND
THE PAPER CONSUMED THUS FAR CAN BE TURNED OVER AND RE-USED.
THE MODULE MAY BE AGAIN SELECTED.

```
000000
000000
000000 050114 043101 040
000005 000
000006 177514
000010 000200
000012 200
000013 000
000014 000001
000016 000000
000020 000000
000022 000000
000024 000000
000026 140000
000030 000302
000032 000224
000034 000000
000036 002700
000040 000000
000042 000000
000044 000000
000046 000000
000050 000000
000052 000000
000054 000000
000056 000000
000060 000000
000062 000000
000064 000000
000066 000000
000070 000000
000072 000000
000074 000000
000076 000000
000100 000000
000102 000000
000104 000000
000106 000000
000110 000000
000112 000542
000114 000000
000116 000000
000120 000000
000122 000003
000040

&
IDMOD <LPAF > 177514,200,4,0,0,2700,3
MODULE 140000,LPAF 177514,200,4,0,0,2700,3
; .TITLE LPAF DEC/X11 SYSTEM EXERCISER MODULE
DDXCOM VERSION 6 23-MAY-78
.LIST BIN
*****
BEGIN:
MODNAM: .ASCII /LPAF / ;MODULE NAME.
XFLAG: .BYTE OPEN ;USED TO KEEP TRACK OF WBUFF USAGE
ADDR: 177514+0 ;1ST DEVICE ADDR.
VECTOR: 200+0 ;1ST DEVICE VECTOR.
BR1: .BYTE PRTY4+0 ;1ST BR LEVEL.
BR2: .BYTE PRTY0+0 ;2ND BR LEVEL.
DVID1: 0+1 ;DEVICE INDICATOR 1.
SR1: OPEN ;SWITCH REGISTER 1
SR2: OPEN ;SWITCH REGISTER 2
SR3: OPEN ;SWITCH REGISTER 3
SR4: OPEN ;SWITCH REGISTER 4
*****
STAT: 140000 ;STATUS WORD.
INIT: START ;MODULE START ADDR.
SPOINT: MODSP ;MODULE STACK POINTER.
PASCNT: 0 ;PASS COUNTER.
ICONT: 2700 ;# OF ITERATIONS PER PASS=2700
ICOUNT: 0 ;LOC TO COUNT ITERATIONS
SOFcnt: 0 ;LOC TO SAVE TOTAL SOFT ERRORS
HRDCNT: 0 ;LOC TO SAVE TOTAL HARD ERRORS
SOFPAS: 0 ;LOC TO SAVE SOFT ERRORS PER PASS
HRDPAS: 0 ;LOC TO SAVE HARD ERRORS PER PASS
SYSCNT: 0 ;# OF SYS ERRORS ACCUMULATED
RANNUM: 0 ;HOLDS RANDOM # WHEN RAND MACRO IS CALLED
CONFIG:
RES1: 0 ;RESERVED FOR MONITOR USE
RES2: 0 ;RESERVED FOR MONITOR USE
SVR0: OPEN ;LOC TO SAVE R0.
SVR1: OPEN ;LOC TO SAVE R1.
SVR2: OPEN ;LOC TO SAVE R2.
SVR3: OPEN ;LOC TO SAVE R3.
SVR4: OPEN ;LOC TO SAVE R4.
SVR5: OPEN ;LOC TO SAVE R5.
SVR6: OPEN ;LOC TO SAVE R6.
CSRA: OPEN ;ADDR OF CURRENT CSR.
SBADR: ;ADDR OF GOOD DATA, OR
ACSR: OPEN ;CONTENTS OF CSR.
WASADR: ;ADDR OF BAD DATA, OR
ASTAT: OPEN ;STATUS REG CONTENTS.
ERRTYP: ;TYPE OF ERROR
ASB: OPEN ;EXPECTED DATA.
AWAS: OPEN ;ACTUAL DATA.
RSIRT: RESTRT ;RESTART ADDRESS AFTER END OF PASS
WDTO: OPEN ;WORDS TO MEMORY PER ITERATION
WDFR: OPEN ;WORDS FROM MEMORY PER ITERATION
INTR: OPEN ;# OF INTERRUPTS PER ITERATION
IDNUM: 3 ;MODULE IDENTIFICATION NUMBER=3
.REPT SPSIZ ;MODULE STACK STARTS HERE.
```

LPAF DEC/X11 SYSTEM EXERCISER MODULE
XLPAF0.P11 12-OCT-78 12:08

MACY11 30A(1052) 12-OCT-78 16:49 PAGE 7

SEQ 0006

000224

.NLIST
.WORD 0
.LIST
.ENDR

MODSP:
;*****

266	000224	000000		LPSA:	0	;LINE PRINTER STATUS ADDRESS
267	000226	000000		LPBA:	0	;LINE PRINTER BUFFER ADDRESS
268	000230	000000		NEXT:	0	;CONTAINS NEXT ENTRV POINT
269	000232	000000		CHACNT:	0	;CONTAINS NUMBER OF CHARACTERS PRINTED
270	000234	000000		CHAR:	0	;CONTAINS CHARACTER TO BE PRINTED
271	000236	000000		FRST:	0	;1ST CHARACTER OF LINE TO BE PRINTED
272	000240	000000		COLUMN:	0	;NUMBER OF COLUMNS TO BE PRINTED
273	000242	000000		TOP:	0	;LAST CHARACTER TO BE PRINTED
274	000244	000000		TOP1:	0	;LAST CHARACTER TO BE PRINTED
275	000246	000000		PSCNTR:	0	;RELATIVE PAUSE SIZE COUNTER
276	000250	000000		OFTIM:	0	;OFFLINE TIMER
277	000252	000000		PRTLIN:	OPEN	;LINES LEFT TO BE PRINTED
278	000254	000000		NPCODE:	0	;NON-PRINTABLE CODE (USED DURING PAUSE)
279	000256	000012		NPRCMD:	12	;NORMAL PRINT COMMAND
280	000260	000015		PPRCMD:	15	;PAUSE PRINT COMMAND
281	000262	000000		CPRCMD:	OPEN	;CURRENT PRINT COMMAND
282	000264	000014		TOPFC:	14	;TOP-OF-FORM NORMAL COMMAND
283	000266	000015		TOPPC:	15	;TOP-OF-FORM (WHEN PAUSING) COMMAND
284	000270	000000		CTOPC:	OPEN	;CURRENT TOP-OF-FORM COMMAND
285	000272	000000		LINPRT:	OPEN	;LINES TO BE PRINTED
286	000274	000040		TOPCNT:	40	;# OF PASSES/TOP IF PAUSE IS ENABLED
287	000276	000000		TEMP:	-WORD	0
288	000300	000000		FLG:	-WORD	0

289	000302	016700	177500	START:	MOV	ADDR,R0	;GET PRINTER STATUS REGISTER ADDRESS
290	000306	018067	177566		MOV	R0,CSRA	;SAVE FOR POSSIBLE ERROR TYPEOUT
291	000312	010067	177706		MOV	R0,LPBA	;SAVE LPS ADDRESS
292	000316	005720			TST	(R0)+	;TRAP IF NO ANSWER AT NUMBER
293							;ELSE ADDRESS PRINTER DATA BUFFER
294	000320	010067	177702		MOV	R0,LPBA	;SAVE PRINTER BUFFER ADDRESS
295							
296							
297	000324	012767	000120	177706	MOV	#80,COLUMN	;SET UP FOR 80 COLUMNS
298	000332	012767	000121	177556	MOV	#81,WDFR	;81 WORDS FR MEM TO LPT
299	000340	012767	000121	177552	MOV	#81,INTR	;81 INTERRUPTS PER ITERATION
300	000346	012767	000140	177666	MOV	#14,TOP	;AND
301	000354	012767	000137	177662	MOV	#137,TOP1	;64 CHARACTER SET.
302							
303	000362	032767	000001	177426	BIT	#1,SR1	;96 CHARACTER SET??
304	000370	001406			BEQ	IS	;NO BRANCH
305	000372	012767	000176	177644	MOV	#176,TOP1	;YES, FIX LIMITS
306	000400	012767	000177	177634	MOV	#177,TOP	;FOR 96 CHARACTER SET.
307							
308	000406	032767	000002	177402	1S:	BIT	#2,SR1
309	000414	001411			BEQ	IS	;NO BRANCH
310	000416	012767	000204	177614	MOV	#132,COLUMN	;YES, FIX LIMIT.
311	000424	012767	000205	177464	MOV	#133,WDFR	;CHANGE DEFAULT 80 TO 133(# WORDS FROM MEM)
312	000432	012767	000205	177460	MOV	#133,INTR	;CHANGE DEFAULT 80 TO 133(# INTERRUPTS)
313							
314	000440	012767	000036	177570	2S:	MOV	#36,FRST
315	000446	012767	177364	177616	PAUTST:	MOV	ICONT,LINPRT
316	000454	005767	177340			MOV	SR2
317	000460	001030				BNE	RESTR
318	000462	016701	177330			MOV	SR1,R1
319	000466	042701	100077			BIC	#100077,R1
320	000472	001002				BNE	IS
321	000474	012701	010000			MOV	#10000,R1
322	000500	016767	177570			MOV	TOPCNT,PSCNTR
323	000506	012702	000006	177540	4S:	MOV	#6,R2
324	000512	006201			1S:	ASR	R1
325	000514	005302				DEC	R2
326	000516	001375				BNE	IS
327	000520	006267				LINPRT	IS
328	000524	001403	177546		2S:	MOV	ASR
329	000526	006201				BEQ	IS
330	000530	001373				MOV	R1
331	000532	000403				BNE	IS
332						BR	RESTR
333							;DONE ? NO BR IF NOT
334							;REDUCE LINES TO BE PRINTED BY 1/2
335	000534	012767	000001	177530	3S:	MOV	#1,LINPRT
							;IF ZERO, GO SET TO 1
							;SHIFT THE BITS
							;BR IF NOT AT ZERO
							;DONE - LINPRT IS NOW FRACTIONAL
							;PART OF ICONT - IT CONTAINS THE
							;# OF LINES THAT WILL BE PRINTED
							;PER PASS
							;ONLY ONE LINE TO BE PRINTED/PASS

```
336 000542* RESTRT: MOV VECTOR,RO ;GET INTERRUPT VECTOR ADDRESS
337 000542* 016700 177242 MOV #INSERV,(RO)+ ;PLACE IT INTO VECTOR AREA
338 000546* 012720 000720* MOV BRL,(RO) ;AND PSM ALSO.
339 000552* 116710 177234 ;VECTOR STUFF DONE HERE BECAUSE HE MAY
40 ;HAVE RUN THE MODULE,DESELECTED IT,
41 ;TURNED ON THE LP DRIVER (LPON COMMAND)
42 ;AND THEN SHUT IT OFF(LP OFF) AND RE-
43 ;ENABLED THE MODULE. SO WE'D NEED THE
44 ;VECTOR INTO THIS MODULE AGAIN
45
46 000556* 016767 177474 177476 MOV NPRCMD,CPRCMD ;ENABLE LINE FEEDS
47 000564* 042777 000100 177432 BIC #100,@LPBA ;DISABLE INTERRUPTS
48 000572* 016767 177474 177452 MOV LINPRT,PRTLIN ;SAVE # OF ACTUAL LINES TO BE PRINTED
49 000600* 026767 177232 177464 CMP ICNT,LINPRT ;IS A PAUSE DESIRED?
50 000606* 001004 BNE 18 ;YES BRANCH
51 000619* 016767 177450 177452 MOV TOPFNC,CTOFC ;NO - SET UP NORMAL TOF
52 000616* 000426 BR DOPASS ;GO TO WORK
53 000620* 005767 177422 1$: TST PSCNTR ;IS IT ZERO?
54 000624* 001412 BEQ 28 ;YES - GO RESTORE COUNT
55 000626* 026767 177442 177412 CMP TOPFCNT,PSCNTR ;NO - BUT IS IT TIME FOR NORMAL TOF?
56 000634* 001012 BNE 35 ;NO - BRANCH
57 000636* 016767 177422 177424 MOV TOPFNC,CTOFC ;YES - SET UP NORMAL TOF
58 000644* 005367 177376 DEC PSCNTR ;DECREASE COUNT
59 000650* 000411 BR 18 ;GO TO WORK
60 000652* 016767 177416 177366 2$: MOV TOPFCNT,PSCNTR ;RESTORE COUNT OF PASSES
61 000660* 000405 BR DOPASS ;GO TO WORK
62 000662* 016767 177400 177400 3$: MOV TOPFC,CTOFC ;SET UP PAUSE TOF
63 000670* 005367 177352 DEC PSCNTR ;DECREASE PSCNTR
64
```

```
365 000674* 005067 177332 DOPASS: CLR CHACNT ;CLEAR CHARACTER COUNTER
366 000700* 012767 000740* 177322 MOV #PAGE,NEXT ;ADJUST POINTER
367 000706* 052777 000100 177310 BIS #100,@LPBA ;SET INTERRUPT ENABLE
368 000714* 104400 000000* EXITS,BEGIN ;EXIT TO MONITOR. MODULE WAIT FOR INTERRUPT.
369
370 000720* INSERV:
371
372 000720* 005777 177300 PROCED: TST @LPBA ;ERROR BIT??
373 000724* 100003 BPL 15 ;NO, SO BRANCH
374
375 000726* 000004 000000* 001244* ;-----
376 ;PIRQ$,BEGIN,WAIT ; QUEUE UP TO CONTINUE AT WAIT AND RTI
377 ;-----
378 000734* 000177 177270 1$: JMP @NEXT ;FOLLOW POINTER TO NEXT ENTRY.
379
380 000740* 012767 000756* 177262 PAGE: MOV #LINE,NEXT ;ADJUST POINTER
381 000746* 016777 177316 177252 MOV CTOFC,@LPBA ;ISSUE TOP-OF-FORM CODE
382 000754* 000002 RTI
383
384 000756* 005267 177316 LINE: INC FLG ;WE ARE GOING TO PIRQ - SET FLG
385 ;-----
386 ;PIRQ$,BEGIN,3$ ; QUEUE UP TO CONTINUE AT 3$ AND RTI
387 ;-----
388 000770* 3$:
389 000770* 104413 000000* ENDT$,BEGIN ;SIGNAL END OF ITERATION.
390 ;MONITOR SHALL TEST END OF PASS
391 000774* 005767 177252 TST PRTLIN ;PRINTING?
392 001000* 001414 BEQ 28 ;YES SKIP INCREMENTING FRST
393 001002* 005267 177230 177222 INC FRST ;GET STARTING CHARACTER
394 001006* 026767 177232 177222 CMP TOP1,FRST ;TOP OF CHARACTER SET REACHED??
395 001014* 001003 BNE 15 ;NO CONTINUE
396 001016* 012767 000037 177212 MOV #37,FRST ;YES, START SET OVER
397 001024* 016767 177206 177202 1$: MOV FRST,CHAR ;GET NEW FIRST CHARACTER
398 001032* 012767 001040 177170 2$: MOV #PRNT,NEXT ;ADJUST POINTER
399
400 001040* 026767 177166 177172 PRNT: CMP CHACNT,COLUMN ;DONE THIS LINE?
401 001046* 001446 BEQ DUN ;YES, GO TO DUN
402 001050* 005267 177156 INC CHACNT ;NO, READY ANOTHER CHARACTER
403 001054* 005267 177154 INC CHAR ;FORM NEXT CHARACTER TO BE PRINTED
404 001060* 026767 177156 177146 CMP TOP,CHAR ;TOP OF CHARACTER SET?
405 001066* 001003 BNE 15 ;NO CONTINUE
406 001070* 012767 000040 177136 MOV #40,CHAR ;YES START OVER WITH A SPACE CHARACTER
407 001076* 005767 177150 1$: TST PRTLIN ;ARE WE THROUGH PRINTING?
408 001102* 001404 BEQ 28 ;IF THROUGH PRINTING BR TO NON
409 001104* 016767 177124 177164 MOV CHAR,TEMP ;SAVE WHAT WE'RE DOING
410 001112* 000406 BR 35 ;GO SEE IF WE PIRQ'ED
411 001114* 016767 177140 177140 2$: MOV NPRCMD,CPRCMD ;INHIB LINE FEED
412 001122* 016767 177126 177146 MOV NPCODE,TEMP ;SAVE NON-PRINT CODE
413 001130* 005767 177144 177144 3$: TST FLG ;HAVE WE PIRQ'ED?
414 001134* 001407 BNE 45 ;NO - BRANCH
415 001136* 005067 177136 177056 CLR FLG ;YES - CLR FLG
416 001142* 016777 177130 MOV TEMP,@LPBA ;AND MOVE TEMP TO LP
417 001150* 104400 000000* EXITS,BEGIN ;EXIT TO MONITOR. MODULE WAIT FOR INTERRUPT.
418
419
420 001154* 016777 177116 177044 4$: MOV TEMP,@LPBA ;NO - WE HAVENT PIRQ'ED - MOVE
```

421 001162' 000002 RTI ;TEMP IN TO LP AND RTI
422
423

424 001164' 005767 177062 DUN: TST PRTLIN ;ARE WE STILL PRINTING ?
425 001170' 001402 BEQ IS ;NO - SO BRANCH
426 001172' 005367 177054 DEC PRTLIN ;DEC # LINES LEFT TO BE PRINTED
427 001176' 012767 000756' 177024 1S: MOV #LINE,NEXT ;SET POINTER FOR A NEW LINE
428 001204' 005067 177022 CLR CHACNT ;CLEAR CHARACTER COUNTER
429 001210' 005767 177064 TST FLG ;HAVE WE PIRQ'ED ?
430 001214' 001407 BEQ IS ;NO - BRANCH
431 001216' 005067 177056 CLR FLG ;YES - CLR FLG
432 001222' 016777 177034 MOV CPRCMD,@LPBA ;XMIT PRINT COMMAND
433 001230' 104400 000000' EXITS,BEGIN ;EXIT TO MONITOR. MODULE WAIT FOR INTERRUPT.
434
435 001234' 016777 177022 176764 4S: MOV CPRCMD,@LPBA ;NO - HAVE NOT PIRQ'ED - MOVE PRINT
436 001242' 000002 RTI ;COMMAND IN AND RTI
437
438
439
440 001244' 042777 000100 176752 WAIT: BIC #100,@LPBA ;CLEAR INTERRUPT ENABLE
441 001252' 016767 176746 176620 MOV LPSA,CSRA ;PROVIDE STATUS REGISTER ADDRESS
442 001260' 017767 176740 176614 MOV @LPSA,ACSR ;AND CONTENTS
443 ;FOR ERROR TYPEOUT.
444 MOV #ERRTYP ;OFF LINE ERROR CODE
445 ;*****
446 001274' 104405 000000' 000000 HRDERS,BEGIN,NULL ;PRINTER HAS GONE OFFLINE...WAITING
447 ;*****
448 001302' 104403 000000' 001424' MSGNS,BEGIN,M4 ;ASCII MESSAGE CALL WITH COMMON HEADER
449 001310' 005067 176734 CLR OFFTIM ;READY TIMER.
450 1S: BREAKS,BEGIN ;TEMPORARY RETURN TO MONITOR....
451 001314' 104407 000000' BREAKS,BEGIN ;THEN CONTINUE AT NEXT INSTRUCTION.
452 001320' 104407 000000' BREAKS,BEGIN ;TEMPORARY RETURN TO MONITOR....
453 001324' 104407 000000' BREAKS,BEGIN ;THEN CONTINUE AT NEXT INSTRUCTION.
454 001330' 104407 000000' TST @LPSA ;ERROR STILL SET??
455 001334' 005777 176664 BPL PICKUP ;NO, GO CONTINUE EXERCISE
456 001340' 100017 MOV OFFTIM ;YES, STEP TIMER
457 001346' 005367 176702 BEQ IS ;BRANCH IF TIMEOUT
458 001348' 001401 BR IS ;BREAK, THEN CHECK AGAIN
459 001350' 000761 MOV LPSA,CSRA ;TIME'S UP, ISSUE FINAL
460 001352' 016767 176646 176520 2S: MOV @LPSA,ACSR ;ERROR MESSAGE...
461 001360' 017767 176640 176514 ;*****
462 001366' 104405 000000' 000000 HRDERS,BEGIN,NULL ;PRINTER STILL NOT ONLINE, DROPPING MODULE
463 ;*****
464 001374' 104410 000000' ENDS,BEGIN ;
465
466 PICKUP: MSGNS,BEGIN,M3 ;ASCII MESSAGE CALL WITH COMMON HEADER
467 001400' 104403 000000' 001420' BIS #100,@LPSA ;RE-ENABLE INTERRUPT AND CONTINUE
468 001406' 052777 000100 176610 EXITS,BEGIN ;EXIT TO MONITOR. MODULE WAIT FOR INTERRUPT.
469 001414' 104400 000000'
470
471
472
473 001420' 001430' M3: MM3 ;POINTER FOR MESSAGE #3
474 001422' 177777 177777
475 001424' 001476' M4: MM4 ;POINTER FOR MESSAGE #4
476 001426' 177777 177777

```

477 001430* 050045 044522 052116 MM3: .ASCIZ "%PRINTER ONLINE, CONTINUING EXERCISE%"
478 001436* 051105 047440 046116
479 001444* 047111 026105 041440
480 001452* 047111 044524 052516
481 001460* 047111 020107 054105
482 001466* 051105 044503 042523
483 001474* 000045
484 001476* 050045 044522 052116 MM4: .ASCIZ "%PRINTER ERROR, ...WAITING%"
485 001504* 051105 042440 051122
486 001512* 051117 020054 027056
487 001520* 053456 044501 044824
488 001526* 043516 000045
489 .EVEN
490 000001 .END
  
```

```

ACSR 000102R 248# 442* 461*
ADDR 000006R 214# 289
ADDR22= 001000 266#
ASB 000106R 252#
ASST 000104R 253#
AWAS 000108R 253#
BEGIN 000000R 211# 368 376 386 389 418 433 446 448 451 452 453 454
      463 465 468 470
BIT0 = 000001 266#
BIT1 = 000002 266#
BIT10 = 002000 266#
BIT11 = 004000 266#
BIT12 = 010000 266#
BIT13 = 020000 266#
BIT14 = 040000 266#
BIT15 = 100000 266#
BIT2 = 000004 266#
BIT3 = 000010 266#
BIT4 = 000020 266#
BIT5 = 000040 266#
BIT6 = 000100 266#
BIT7 = 000200 266#
BIT8 = 000400 266#
BIT9 = 001000 266#
BREAKS = 104407 266# 451 452 453 454
BR1 = 000012R 216# 339
BR2 = 000013R 217#
BTODS = 104421 266#
CDATS = 104412 266#
CHACT = 000232R 266# 365* 401 403* 428*
CHAR = 000234R 270# 397* 404* 405 407* 410
COLUMN = 000240R 272# 297* 310* 401
CNFIG = 000256R 286# 346* 412* 432 435
CPCMD = 000252R 286# 290* 441* 460*
CSR = 000100R 246# 290* 441* 460*
CTDFC = 000270R 284# 351* 357* 381
DATCS = 104411 266#
DATERS = 104404 266#
DOPASS = 000674R 352 359 361 365#
DUN = 001164R 402 424#
DVID1 = 000014R 266#
ENDITS = 104413 266# 389
ENDS = 104410 266# 465
ERRITP = 000106R 251# 444*
EXIT$ = 104400 266# 368
FLG = 000300R 288# 384* 418 433 470
FRST = 000236R 271# 314* 393* 394 429 431*
GETPAS = 104415 266#
GMBUF$ = 104414 266#
HRDCNT = 000044R 231#
HRDERS = 104405 266# 446 463
HRDPAS = 000050R 233#
ICONT = 000036R 228# 315 349
ICOUNT = 000040R 229#
IDNUM = 000122R 258#
INIT = 000030R 225#
  
```

INSERV	000720R	338	371#																	
INTR	000120R	357#	399*	312*																
LINE	000756R	380	384#	427*																
LINEPT	000272R	283#	304*	381*	335*	348	349													
LPA	000276R	266#	291*	347*	417*	420*	432*	435*												
LPSA	000224R	266#			367*	373	440*	441	442	455	460	461	469*							
MAP22\$	104416	266#																		
MM3	001430R	472	477#																	
MM4	001476R	472	484#																	
MODNAM	000000R	212#																		
MODSP	000224R	226	264#																	
MSGNS	104403	266#	448	468																
MSG\$	104402	266#																		
MSG\$	104401	266#																		
M3	001420R	468	473#																	
M4	001244R	448	475#																	
NEXT	000224R	266#	378	380*	398*	427*														
NPCODE	000254R	278	413																	
NPRCMD	000256R	279	346																	
NUL	000000R	266#	446	463																
OFFTIM	000250R	276	457*																	
OPEN	000000	213	219	220	221	222	239	240	241	242	243	244	245	246						
		248	250	252	253	255	256	257	266#	277	281	284	285							
OTOAS	104420	266#																		
PAGE	000740R	366	380#																	
PASCNT	000034R	327#																		
PAUTST	000446R	315																		
PICKUP	001400R	456	467#	386																
PTRCS	000000	266#	376																	
POPS	005726	266#																		
POPS2	022626	266#																		
PPRCMD	000260R	280	412																	
PRNT	001040R	316	401#																	
PROCED	000720R	373	348*	391	408	424	426*													
PRTLIN	000252R	277																		
PRTY	000000	266#																		
PRTY0	000000	266#																		
PRTY1	000040	266#																		
PRTY2	000100	266#																		
PRTY3	000140	266#																		
PRTY4	000160	266#																		
PRTY5	000240	266#	266#																	
PRTY6	000300	266#																		
PRTY7	000340	266#																		
PS	17076	266#																		
PSCNT	000248R	295	322*	353	355	358*	360*	363*												
PSW	177776	266#																		
PUSH	005746	266#																		
PUSH2	025746	266#																		
RANDS	104417	266#																		
RANNUM	000054R	235																		
RES	000542R	254	317	331	336#															
RES2	000066R	238																		
RES3	000060R	238																		
RSTRT	000112R	254																		
SBADR	000102R	247																		

SOPCNT	000042R	230#																		
SOPERS	104406	256																		
SOPIS	000406	226																		
SPOINT	000032R	226																		
SPSIZ	000040	219	259	308	318															
SR1	000016R	219	316																	
SR2	000020R	221																		
SR3	000022R	222																		
SR4	000024R	222																		
START	000302R	223	289#																	
SAT	000026R	223																		
SVR0	000062R	223																		
SVR1	000064R	240																		
SVR2	000066R	241																		
SVR3	000070R	241																		
SVR4	000072R	243																		
SVR5	000074R	244																		
SVR6	000076R	245																		
SVSCNT	000052R	244																		
TEMP	000276R	287	410*	413*	417	420														
TOPCNT	000274R	286	322	335	360															
TOPNC	000264R	282	351	357																
TOPPC	000266R	282	362																	
TDP	000242R	274	300*	306*	405															
TDP1	000244R	274	301*	305*	394															
TRPDFD	000022	266#																		
VECTOR	000010R	215	337																	
WAIT	001244R	376	440#																	
WASADR	000104R	249																		
WDFR	000116R	256	298*	311*																
WDTO	000114R	256																		
XFLAG	000005R	213																		

ABS. 000000 000
 001532 001

ERRORS DETECTED: 0
 DEFAULT GLOBALS GENERATED: 0
 XLPAP0,XLPAP0/SOL/CRF:SYM=DDXCOM,XLPAP0
 RUN-TIME: 2 SECONDS
 RUN-TIME RATIO: 2/3=72
 CORE USED: 7K (15 PAGES)