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MODIFICATION TO ECP II SHELVING PROCESSOR
Analysts International Corporation

TECHNICAL REPORT NO. RADC-TR-68-229
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MODIFICATION TO ECP II SHELVING PROCESSOR

Analysts International Corporation

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FOREWORD

This document was submitted in October 1967 by Analysts International Corporation, 5454 Wisconsin Avenue, Washington, D.C., as the Final Report under Contract F30602-68-C-0039, Project 5581, with Rome Air Development Center, Griffiss Air Force Base, New York. Mr. Neil Stillman, EMIIO, was the RADC Project Engineer.

This technical report has been reviewed and is approved.



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Chief, Info Procs Branch



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FOR THE COMMANDER:



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ABSTRACT

This report describes modification of the Shelving Processor portion of ECP II to successfully accomplish the shelving and re-loading of job programs under multi-console operations on the Univac ML218 Computer.

The Shelving Processor portion of ECP II was modified to successfully accomplish the shelving and reloading of job programs under multi-console operations in accordance with RFQ Numbered F30602-67-Q-0410 and satisfies the terms and conditions of the above-named contract.

Several sub-programs were designed and implemented to test various portions of the ECP II Shelving Processor. Modifications were made to said processor as required. Instruction listings for the test sub-routines and program modifications are included as part of this report.

A comparison was made between an up-to-date listing of the Shelving Processor and a core dump. No discrepancies were found. Because of the ample core storage available on the M555, the ECP II was modified to run on the M555 so that various diagnostic program patches could be inserted. (See attached listings.) It was found that by changing the disc addresses of some of the shelving areas in the MAP, the Shelving Processor would run without getting checksum errors on reloading floats from the shelving areas. This indicated that the problem was a hardware problem associated with writing and reading certain areas on the disc file.

It was further determined that if these disc addresses were read immediately after being written, no error would be detected. But after the heads had been moved, any succeeding read from these same addresses would result in consistent checksum errors.

The Shelving Processor, although not incorrect, does not possess the proper error recovery techniques that should be a part of any program using disc I/O. Two of these techniques are now described. The first is to perform rereads of blocks with checksum errors. The second is to detect any failure of the disc file handler to properly complete a read/write operation.

In the case of the Shelving Processor, the checksum of each float shelved consists of the arithmetic sum of all 512 words of the float. The seven checksum words for each interlace position are kept in the float containing part of bank zero and that interlace's Job Core Primary Table.

Mention should be made of an additional check which should be incorporated into each checksum word to assure that the correct block was transferred from the disc. This check, which was suggested by John McLean of RADC, consists of adding to the arithmetic checksum the disc address where the block is to be written. Then, when that block is read, the disc address, when added to the calculated arithmetic checksum, should equal the checksum written on the disc for that block.

When the disc file handler cannot properly complete an I/O request, it sets bit 12 of the IORF (I/O request flag). The Shelving Processor should look for this bit and if set should either request the operation again or abort the program on the shelf.

The M1218 ECP II would require a significant amount of re-arrangement to accomplish these techniques due to core limitations.

COMPARE TWO COPIES OF THE EXEC FOR DISCREPANCIES
IN THE SHELVING PROCESSOR

<u>ADDR</u>	<u>OCTAL INSTR.</u>	<u>ASSEM. NOTATION</u>
3000	463070	STRAU. M1218
3001	443072	STRAL. M555
3002	507201	ENTICR. 1
3003	360030	ENTBK. 30
3004	507202	START ENTICR. 2
3005	363000	ENTBK. 3000
3006	414000	CLB. 4000
3007	733006	BJP.*-1
3010	501107	IN. 7
3011	004776	004776
3012	004000	004000
3013	501307	501307
3014	003072	0. M1218+2
3015	003070	0. M1218
3016	502400	WTFI
3017	501107	IN. 7
3020	006776	006776
3021	006000	006000
3022	501307	EXF. 7
3023	003074	0. M555+2
3024	003072	0. M555
3025	502400	WTFI
3026	136000	GO ENTALB. 6000
3027	114000	ENTaub. 4000
3030	063074	CMSK. 777777

3031	613052	JPEQ. X
3032	505001	SKP. 01
3033	343041	JP. Y
3034	505640	Z STCP. 40
3035	423075	STRB. B
3036	123075	ENTAL. B
3037	343103	JP. 3103
3040	343052	JP. X
3041	123076	Y ENTAL. SR
3042	063077	CMSK. 777700
3043	613106	JPEQ. 3106
3044	136000	ENTALB. 6000
3045	343034	JP. Z
3046	505601	W STOP. 01
3047	423075	STRB. B
3050	123075	ENTAL. B
3051	505601	STOP. 01
3052	563100	X BSK. 000777
3053	343026	JP. GO
3054	507201	ENTICR. 1
3055	733057	BJP. *+2
3056	505677	STCP. 77
3057	123072	ENTAL. M555
3060	103101	ENTAU. M77
3061	710002	ADDALK. 2
3062	063102	CMSK. M54
3063	673065	JPMGR. *+2
3064	710024	ADDALK. 24
3065	743072	STRADR. M555
3066	743070	STRADR. M1218

3067	343004		JP. START
3070	000000	M1218	0.0
3071	017003		017003
3072	000000	M555	0.0
3073	017003		017003
3074	777777	777777	777777
3075	000000	B	0.0
3076	507300	SR	507300
3077	777700	777700	777700
3100	000777	000777	000777
3101	000077	M77	000077
3102	000054	M54	000054
3103	103072		ENTAU. M555
3104	505640		STOP. 40
3105	343040		JP. 3040
3106	136000		ENTALB. 6000
3107	523077		SLCL. 777700
3110	063077		CMSK. 777700
3111	613046		JPEQ. W
3112	343044		JP. 3044

TEST DISC FILE READ AND WRITE OPERATIONS

<u>ADDR</u>	<u>OCTAL INSTR.</u>
10000	440620
10010	440630
10020	460640
10030	460660
10040	503000
10050	120040
10060	507340
10070	440116
10100	507300
10110	501207
10120	030000
10130	020000
10140	340730
10150	000000
10160	000000
10170	570620
10200	340100
10210	120630
10220	440620
10230	320700
10240	507343
10250	410000
10260	730250
10270	501107
10300	037760
10310	030000
10320	501307

10330	010660
10340	010640
10350	502400
10360	360000
10370	507343
10400	130000
10410	507342
10420	030000
10430	610540
10440	110000
10450	507300
10460	420710
10470	501302
10500	010730
10510	010710
10520	502702
10530	505640
10540	560700
10550	340370
10560	700000
10570	240000
10600	505620
10610	340100
10620	000000
10630	000000
10640	000000
10650	017003
10660	000000
10670	017007
10700	007770

10710	000000
10720	000000
10730	501307
10740	010700
10750	010660
10760	502400
10770	340170

PATCH TO READ AFTER WRITE WHEN SHELVING

<u>ADDR</u>	<u>OCTAL INSTR.</u>	<u>ASSEM. NOTATION</u>
100001	751121	STRSR. SRS
100011	421201	STRB. B
100021	461161	STRAL. CS
100031	461211	STRAU. DISC
100041	101211	GO ENTAU. DISC
100051	121161	ENTAL. CS
100061	507345	ENTSR. 45
100071	446151	STRAL. RWDISC+3
100101	700031	ENTALK. 31
100101	446131	STRAL. RWDISC+1
100121	700200	ENTALK. DISCOP
100131	301151	IRJP. RDW
100141	507300	ENTSR. 0
100151	610201	JPALZ. GO1
100161	505601	STOP. 1
100171	340041	JP. GO
100201	321251	GO1 ENTB. M007770
100211	507351	ENTSR. 51
100221	410001	CLB. 0001
100231	730221	BJP. *-1
100241	507300	ENTSR. 0
100251	101211	ENTAU. DISC
100261	121171	ENTAL. BANK II
100271	507345	ENTSR. 45
100301	446151	STRAL. RWDISC+3
100311	700021	ENTALK. 21
100321	446131	STRAL. RWDISC+1

100331	700200		ENTALK. DISCCP
100341	301151		IRJP. RDW
100351	507300		ENTSR. 0
100361	610411		IPALZ. GO2
100371	505602		STOP. 2
100401	340201		JP. GO1
100411	321161	GO2	ENTB. CS
100421	700777		ENTALK. 777
100431	441221		STRAL. CT
100441	700001		ENTALK. 1
100451	740511		STRADR. INS
100461	704700		ENTALK. 4700
100471	740701		STRADR. SKP
100501	507351	GO3	ENTSR. 51
100511	120001	INS	ENTAL. 0001
100521	507340		ENTSR. 40
100531	030000		CMALB. 0
100541	610611		JPEQ. GO4
100551	110000		ENTaub. 0
100561	505604		STOP. 4
100571	705040		ENTALK. 5040
100601	740701		STRADR. SKP
100611	370010	GO4	ENTBxB. 1
100621	507300		ENTSR. 0
100631	120511		ENTAL. INS
100641	710010		ADDAIX. 1
100651	440511		STRAL. INS
100661	571221		ISK. CT
100671	340501		JP. GO3
100701	505000	SKP	SKP. 0
100711	341031		JP. RETRN

100721	571231		ISK. KT
100731	340751		JP. STOP
100741	340041		JP. GO
100751	101261	STOP	ENTAU. T
100761	121271		ENTAL. S
100771	505640		STOP. 10
101001	121241		ENTAL. KTT
101011	441231		STRAL. KT
101021	340041		JP. GO
101031	121241	RETRN	ENTAL. KTT
101041	441231		STRAL. KT
101051	507345		ENTSR. 45
101061	125671		ENTAL. DOWRITE
101071	507300		ENTSR. 0
101101	441141		STRAL. IJP+1
101111	321201		ENTB. B
101121	507300	SRS	ENTSR. 0
101131	551141	IJP	IJP. *+1
101141	060000		0. 0
101151	055761	RDW	0. READWRITE
101161	000000	CS	0. 0
101171	110001	BANKII	110001
101201	000000	B	0. 0
101211	000000	DISC	0. 0
101221	000000	CT	0. 0
101231	001000	KT	001000
101241	001000	KTT	001000
101251	007770	M007770	007770
101261	722220	T	722220
101271	747170	S	747170

THIS PATCH CHANGES THE LOADER ROUTINE
WHEN LOADING FROM THE SHELF

<u>ADDR.</u>	<u>OCTAL INSTR.</u>
116001	507344
116011	020001
116021	616051
116031	556041
116041	043471
116051	507300
116061	700000
116071	504722
116101	700000
116111	505640
116121	626151
116131	556141
116141	056171
116151	466221
116161	326221
116171	507340
116201	450000
116211	556141
116221	000000

ROUTINE TO READ AND WRITE ECP II PROGRAM ON DISC
FILE. ALSO ROUTINE TO DUMP ECP II ON PRINTER

INSTRUCTIONS FOR USING ECP LOADER AND PRINTER DUMP
ROUTINE.

INITIALIZE PROCEDURE:

1. STOP
2. MASTER CLEAR
3. SET COMPUTER TO "M" MODE
4. SET EPR=7, PMR=3

TO READ THE ECP:

1. INITIALIZE
2. SET AU=DISC FILE ADDRESS OF ECP. IF AU=0, THE
ECP LOADER WILL USE THE ADDRESS CONTAINED IN
LOCATION 77017.
3. SET P=70007
4. START

TO WRITE THE ECP:

1. FOLLOW STEPS 1. AND 2. FOR READING THE ECP.
2. SET P = 70017
3. START

TO USE PRINTER DUMP:

1. INITIALIZE
2. SET AU=INITIAL ADDRESS
SET AL=TERMINAL ADDRESS
3. SET P=75007
4. START

USE OF STOP KEYS AND SKIP KEYS:

STOP KEY 0

WILL STOP AT P=71047 IF CHECKSUM ERROR IN CHECKSUM BLOCK. AU=CHECKSUM ON DISC, AL=CALCULATED CHECKSUM. WILL STOP AT P=71367 IF CHECKSUM ERROR IN READING AN ECP BLOCK. AU=CHECKSUM ON DISC, AL=CALCULATED CHECKSUM. IF SKIP KEY 0 IS NOT SET THE LOADER WILL REREAD THE BLOCK. IF KEY 0 IS SET THE LOADER WILL CONTINUE TO READ THE NEXT BLOCK.

STOP KEY 1

WILL STOP AT P=74167 IF A BLOCK JUST WRITTEN DOES NOT COMPARE WITH ITSELF AFTER BEING READ. AU=WORD IN BLOCK READ, AL=WORD SUPPOSED TO HAVE BEEN WRITTEN. IF SKIP KEY 1 IS NOT SET THE LOADER WILL REWRITE THE BLOCK AND READ IT AGAIN. IF KEY 1 IS SET THE LOADER WILL CONTINUE TO WRITE THE NEXT BLOCK.

STOP KEY 2

WILL STOP AT P=74547 IF THERE IS AN ERROR IN THE BUFFER COMPLETE STATUS INTERRUPT WORDS. AU= MOST SIGNIFICANT HALF (115), AL=LEAST SIGNIFICANT HALF (117). IF SKIP KEY 2 IS NOT SET THE LOADER WILL REPEAT THE CURRENT OPERATION. IF KEY 2 IS SET THE LOADER WILL PROCEED TO THE NEXT BLOCK.

STOP KEY 3

WILL STOP AT P=72727 IF THERE IS AN ERROR IN THE CLEAR AND ALLOCATION REQUEST STATUS INTERRUPT WORDS. AU=MOST SIGNIFICANT HALF (115), AL=LEAST SIGNIFICANT HALF (117). SKIP KEY 3 IS NOT USED.

STOP KEY 4

WILL STOP AT P=72017 JUST BEFORE EXITING TO THE
ECP. NORMALLY, KEY 4 WILL BE DOWN. SKIP KEY 4
IS NOT USED.

5 STOP AT P=74727 IF THE DISC IS LOCKED OUT. WILL ONLY
STOP IF WRITING, NOT READING.

5 STOP AT P=76537 IF INTERRUPT FROM DFCU NOT RECEIVED
IN TIME.

5 STOP AT P=75047 AT END OF PRINT. WILL RECYCLE.

<u>ADDR</u>	<u>OCTAL INSTR.</u>	<u>ASSEM. NOTATION</u>
70007	340637	JP. RD
70017	341427	JP. WRT
70027	000000	CKS RESERV. 61
70637	406137	RD CL. FLAG
70647	762027	RJP. INIT
70657	763077	RD1 RJP. READ
70667	360600	ENTBX. 60
70677	700000	ENTALK. 0
70707	507316	RD2 ENTSR. 16
70717	110027	ENTAU. CKS
70727	150027	ADDALB. CKS
70737	507300	ENTSR. 0
70747	470027	STRAUB. CKS
70757	730707	BJP. RD2
70767	160627	SUBAL. CKS+60
70777	146147	ADDAL. DISCADDR
71007	020627	CMAL. CKS+60
71017	611067	JPEQ. RL
71027	100627	ENTAU. CKS+60
71037	505601	STOP. 01
71047	505001	SKP. 01
71057	340657	JP. RD1
71067	325057	RL ENTB. B
71077	425057	RL1 STRB. B
71107	137127	ENTALB. ADDR
71117	443137	STRAL. INB+1
71127	146747	ADDAL. M007760

71137	443127	STRAL.INB
71147	766617	RJP.INCR
71157	763077	RL2 RJP.READ
71167	425657	STRB.BB
71177	325057	ENTB.B
71207	766207	RJP.CKSUM
71217	446207	STRAL.CKSUM
71227	137127	ENTALB.ADDR
71237	717530	ADDALK.-247
71247	611277	JPALZ.RL3
71257	126207	ENTAL.CKSUM
71267	341327	JP.RL4
71277	126207	RL3 ENTAL.CKSUM
71307	715760	ADDALK.-2017
71317	145657	ADDAL.BB
71327	030027	RL4 CMALB.CKS
71337	611407	JPEQ.RL5
71347	110027	ENTAUB.CKS
71357	505601	STOP.01
71367	505001	SKP.01
71377	341157	JP.RL2
71407	731077	RL5 BJP.RL1
71417	342007	JP.EXIT
71427	726137	WRT STRICR.FLAG
71437	762027	RJP.INIT
71447	425057	WL STRB.B
71457	137127	ENTALB.ADDR
71467	443407	STRAL.WOUT+1
71477	146757	ADDAL.M007770
71507	443377	STRAL.WOUT

71517	766617	RJP. INCR
71527	766207	RJP. CKSUM
71537	450027	STRALB. CKS
71547	123407	ENTAL. WOUT+1
71557	717530	ADDALK. -247
71567	631637	JPALNZ. WL1
71577	705760	ENTALK. -2017
71607	145657	ADDAL. B3
71617	150027	ADDALB. CKS
71627	450027	STRALB. CKS
71637	130027	WL1 ENTALB. CKS
71647	140627	ADDAL. CKS+60
71657	440627	STRAL. CKS+60
71667	763337	RJP. RITE
71677	325057	ENTB. B
71707	731447	BJP. WL
71717	126777	ENTAL. BANK7
71727	443407	STRAL. WOUT+1
71737	146757	ADDAL. M007770
71747	443377	STRAL. WOUT
71757	126147	ENTAL. DISCADDR
71767	446167	STRAL. DISC
71777	763337	RJP. RITE
72007	505620	EXIT STOP. 20
72017	557007	IJP. EXEC
72027	000000	INIT 0. 0
72037	507201	ENTICR. 1
72047	700007	ENTALK. 7
72057	506600	ENTJAR
72067	425657	STRB. BB

72077	622117
72107	107017
72117	466147
72127	460627
72137	466167
72147	700200
72157	742237
72167	127027
72177	107037
72207	361770
72217	507310
72227	572237
72237	400000
72247	732227
72257	440116
72267	460114
72277	507300
72307	126767
72317	443137
72327	146747
72337	443127
72347	360570
72357	410027
72367	732357
72377	762437
72407	360340
72417	425057
72427	552027

JPAUNZ. INITA
 ENTAU. D16
 INITA STRAU. DISCADDR
 STRAU. CKS+60
 STRAU. DISC
 ENTALK. 200
 STRADR. INITC
 ENTAL. IRJP
 ENTAU. DINTA
 ENTBX. 177
 ENTSR. 10
 INITB ISK. INITC
 INITC CL: 0
 BJP. INITB
 STRAL. C116
 STRAU. C114
 ENTSR. 0
 ENTAL. BANK6
 STRAL. INB+1
 ADDAL. M007760
 STRAL. INB
 ENTBX. 57
 INITD CLB. CKS
 BJP. INITD
 RIP. SELCL
 ENTBX. 34
 STRB. B
 IJP. INIT

72437	000000	SELCL 0.0
72447	726617	SEL1 STRICR.INTWRD
72457	507300	ENTSR.0
72467	127047	ENTAL.WTCT
72477	501307	EXF.7
72507	077107	0.SA+2
72517	077067	0.SA
72527	502707	EXFOV.7
72537	766447	RJP.WTFI
72547	342447	JP.SELI
72557	507310	ENTSR.10
72567	120115	ENTAL.C115
72577	717377	ADDALK.-400
72607	632677	JPALNZ.SEL3
72617	120117	ENTAL.C117
72627	504612	LSHAL.12
72637	360060	ENTBX.6
72647	504601	SEL2 LSHAL.1
72657	672737	JPALNG.SEL4
72667	732647	BJP.SEL2
72677	100115	SEL3 ENTAU.C115
72707	120117	ENTAL.C117
72717	505610	STOP.13
72727	342447	JP.SEL1
72737	122017	SEL4 ENTAL.BBOX
72747	504606	LSHAL.6
72757	507300	ENTSR.0
72767	711010	ADDALK.1010

72777	446037		STRAL. BUFCOM
73007	147057		ADDAL. M010000
73017	106137		ENTAU. FLAG
73027	623047		JPAUNZ. SEL5
73037	717773		ADDALK. -4
73047	717776	SEL5	ADDALK. -1
73057	446177		STRAL. EXFWRD
73067	552437		IJP. SELCL
73077	000000	READ	0.0
73107	343167		JP. CLBUF
73117	501107	READ1	IN. 7
73127	000000	INB	0.0
73137	000000		0.0
73147	764307		RJP. EXF
73157	553077		IJP. READ
73167	507300	CLBUF	ENTSR. 0
73177	426617		STRB. INCR
73207	323137		ENTB. INB+1
73217	507310		ENTSR. 10
73227	420115	CL1	STRB. C115
73237	410000		CLB. 0
73247	320115		ENTB. C115
73257	563127		ESK. INB
73267	343227		JP. CL1
73277	410010		CLB. 1
73307	507300		ENTSR. 0
73317	326617		ENTB. INCR
73327	343117		JP. READ1
73337	000000	RITE	0.0
73347	507300	DOAG	ENTSR. 0

73357	325657	ENTB. BB
73367	501207	OUT. 7
73377	000000	WOUT 0.0
73407	000000	0.0
73417	764307	RJP. EXF
73427	406137	CL. FLAG
73437	126177	ENTAL. EXFWRD
73447	717773	ADDALK. -4
73457	446177	STRAL. EXFWRD
73467	763077	RJP. READ
73477	123407	ENTAL. WOUT+1
73507	166777	SUBAL. BANK7
73517	614067	JPALZ. W4
73527	700777	ENTALK. 777
73537	446617	STRAL. INCR
73547	325057	ENTB. B
73557	117127	ENTAUB. ADDR
73567	126767	ENTAL. BANK6
73577	507310	ENTSR. 10
73607	460115	STRAU. C115
73617	440117	STRAL. C117
73627	320115	W2 ENTB. C115
73637	130000	ENTALB. 0
73647	370010	ENTBxB. 1
73657	504722	LSHA. 22
73667	120115	ENTAL. C115
73677	420115	STRB. C115
73707	715760	ADDALK. -2017
73717	633757	JPALNZ. W3
73727	507300	ENTSR. 0

73737	105657	ENTAU.BB
73747	507310	ENTSR.10
73757	504722	W3 LSHA.22
73767	320117	ENTB.C117
73777	030000	CMALB.0
74007	634247	JPNOT.W9
74017	370010	ENTBXB.1
74027	420117	STRB.C117
74037	576617	ISK.INCR
74047	343627	JP.W2
74057	344207	JP.W7
74067	360600	W4 ENTBX.60
74077	507300	W5 ENTSR.0
74107	130027	ENTALB.CKS
74117	507316	ENTSR.16
74127	030027	CMALB.CKS
74137	614227	JPEQ.W8
74147	110027	ENTAUB.CKS
74157	505602	W6 STOP.02
74167	505002	SKP.02
74177	344267	JP.AGA
74207	766357	W7 RJP.RESTOR
74217	553337	IJP.RITE
74227	734077	W8 BJP.W5
74237	344207	JP.W7
74247	110000	W9 ENTAUB.0
74257	344157	JP.W6
74267	766357	AGA RJP.RESTOR
74277	343347	JP.DOAG
74307	000000	EXF 0.0
74317	507300	ENTSR.0

74327	726617	STRICR.INTWRD
74337	127047	ENTAL.WTCT
74347	501307	EXF.7
74357	076207	0.DISC+2
74367	076167	0.DISC
74377	766447	RJP.WTFI
74407	344577	JP.E1
74417	507310	ENTSR.10
74427	120115	ENTAL.C115
74437	100117	ENTAU.C117
74447	507300	ENTSR.0
74457	166037	SUBAL.BUFCOM
74467	614647	JPALZ.E3
74477	507310	ENTSR.10
74507	120115	ENTAL.C115
74517	504722	LSHA.22
74527	507300	ENTSR.0
74537	505604	STOP.04
74547	505004	SKP.04
74557	344577	JP.E1
74567	344637	JP.E2
74577	762437	E1 RJP.SELCL
74607	324307	ENTB.EXF
74617	377727	ENTBxB.-5
74627	424307	STRB.EXF
74637	554307	E2 IJP.EXF
74647	126137	E3 ENTAL.FLAG
74657	614637	JPALZ.E2
74667	604637	JPAUZ.E2
74677	107107	ENTAU.LOCK

74707	127117	ENTAL. HOUT
74717	505640	STOP. 40
74727	344577	JP. E1
74737	000000	DINT 0. 0
74747	754767	STRSR. DINTSR
74757	406617	CL. INTWRD
74767	507300	DINTSR ENTSR. 0
74777	544737	IJPEI. DINT
75007	765057	PRINT RJP. BASE
75017	700000	ENTALK. 0
75027	106167	ENTAU. SC
75037	505640	STOP. 40
75047	345007	JP. PRINT
75057	000000	(B)BASE 0. 0
75067	466137	STRAU. IA
75077	446147	STRAL. TA
75107	701777	ENTALK. 1777
75117	026137	CMAL. IA
75127	655637	JPMLEQ. LC
75137	700010	ENTALK. 10
75147	745437	MU STRADR. PC
75157	501201	OUT. 1
75167	076137	0. EN+1
75177	076127	0. EN
75207	502201	WE SKPOIN. 1
75217	345207	JP. WE
75227	361170	DO ENTBK. 1170
75237	700060	ENTALK. 60
75247	507316	ENTSR. 16
75257	450007	CH STRALB. PS

75267	735257	BJP. CH
75277	507300	ENTSR. 0
75307	406177	CL. BI
75317	106137	ENTAU. IA
75327	700005	ENTALK. 5
75337	765657	RJP. PY
75347	326137	BU ENTB. IA
75357	507310	ENTSR. 10
75367	110000	ENTAUB. 0
75377	507300	ENTSR. 0
75407	700005	ENTALK. 5
75417	765657	RJP. PY
75427	126137	ENTAL. IA
75437	710000	PO ADDALK. 0
75447	446137	STRAL. IA
75457	166147	SUBAL. TA
75467	717776	ADDALK. -1
75477	65557	JPALP. TB
75507	126177	ENTAL. BI
75517	026157	CMAL. WTO
75527	675347	JPMGR. BU
75537	766037	RJP. PR
75547	345227	JP. DO
75557	700077	TB ENTALK. 77
75567	507316	ENTSR. 16
75577	441167	STRAL. P5+116
75607	507300	ENTSR. 0
75617	766037	RJP. PR
75627	555057	IJP. BASE
75637	700001	LC ENTALK. 1

75647	345147		JP. MU
75657	000000	(BB) PY	0.0
75667	446167		STRAL. SC
75677	326177		ENTB. BI
75707	507316		ENTSR. 16
75717	700000	ME	ENTALK. 0
75727	504703		LSHA. 3
75737	450007		STRALB. PS
75747	370010		ENTBKB. 10
75757	576167		ISK. SC
75767	345717		JP. ME
75777	370030		ENTBKB. 30
76007	507300		ENTSR. 0
76017	426177		STRB. BI
76027	555657		IJP. PY
76037	000000	(BUFCOM) PR	0.0
76047	501201		OUT. 1
76057	061207		0. PS+120
76067	060007		0. PS
76077	502201	WT	SKPOIN. 1
76107	346077		JP. WT
76117	556037		IJP. PR
76127		EN	000076
76137		(FLAG) IA	0.0
76147		(DISCADDR) TA	0.0
76157		WTWO	001210
76167		(DISC) SC	0.0
76177		(EXFWRD) BI	0.0
76207	000000	CKSUM	0.0
76217	700777		ENTALK. 777
76227	446617		STRAL. INCR

76237	337127		ENTBB. ADDR
76247	126167		ENTAL. DISC
76257	507310		ENTSR. 10
76267	150000	C1	ADDALB. 0
76277	370010		ENTBXB. 1
76307	576617		ISK. INCR
76317	346267		JP. C1
76327	507300		ENTSR. 0
76337	325057		ENTB. B
76347	556207		IJP. CKSUM
76357	000000	RESTOR	0. 0
76367	507300		ENTSR. 0
76377	726137		STRICR. FLAG
76407	126177		ENTAL. EXFWRD
76417	710004		ADDALK. 4
76427	446177		STRAL. EXFWRD
76437	556357		IJP. RESTOR
76447	000000	WTFI	0. 0
76457	756537		STRSR. WTFISR
76467	106617	WTFIA	ENTAU. INTWRD
76477	606557		JPAUZ. WTFIB
76507	717776		ADDALK. -1
76517	636467		JPALNZ. WTFIA
76527	505640		STOP. 40
76537	507300	WTFISR	ENTSR. 0
76547	556447		IJP. WTFI
76557	126447	WTFIB	ENTAL. WTFI
76567	710010		ADDALK. 1
76577	446447		STRAL. WTFI
76607	346537		JP. WTFISR
76617	000000	(INTWRD)INCR	0. 0

76627	126167
76637	710002
76647	106727
76657	066737
76667	676707
76677	710024
76707	446167
76717	556617
76727	000077
76737	000054
76747	007760
76757	007770
76767	060007
76777	070007
77007	000240
77017	160020
77027	300114
77037	074737
77047	020000
77057	010000
77067	000000
77077	000420
77107	444470
77117	755570
77127	000240
77137	000241
77147	000242
77157	000243
77167	000244
77177	000245
77207	000246

ENTAL. DISC
ADDALK. 2
ENTAU. M000077
CMSK. M000054
JPMGR. INCR1
ADDALK. 24
INCR1 STRAL. DISC
IJP. INCR
M000077 000077
M000054 000054
M007760 007760
M007770 007770
BANK6 060007
BANK7 070007
EXEC 000240
DI6 160020
IRJP IRJP. C114
DINTA 0. DINT
WTCT 020000
M010000 010000
SA 000000
000420
LOCK 444470
HOUT 755570
ADDR 000240
000241
000242
000243
000244
000245
000246

77217	000247
77227	010000
77237	020000
77247	030000
77257	040000
77267	050000
77277	060000
77307	070000
77317	010001
77327	020001
77337	030001
77347	040001
77357	050001
77367	060001
77377	070001
77407	010002
77417	020002
77427	030002
77437	040002
77447	050002
77457	060002
77467	070002
77477	010003
77507	020003
77517	030003
77527	040003
77537	050003
77547	060003
77557	070003
77567	010004
77577	020004
77607	030004

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020006
030006
040006

THE FOLLOWING PATCHES WERE MADE
TO THE M555 VERSION OF ECP II

<u>ADDR</u>	<u>OLD</u>	<u>NEW</u>
036461	036341	556471
036471	637741	101301
043451	020001	553461
043461	613541	116001
055711	700031	555721
055721	446131	100001

THE FOLLOWING PATCH IS FOR READING FROM THE
SHELF IN EVENT OF A CHECKSUM ERROR

<u>ADDR</u>	<u>PATCH</u>
101301	507343
101311	036341
101321	631361
101331	507300
101341	551351
101351	036501
101361	341431
101371	507300
101401	700200
101411	551421
101421	063251
101431	505620
101441	505001
101451	341371
101461	341331

CRC DISC ADDRESS - PREFIX 160

0	314	316	320	322	324	326	330	332	334	336	340	342	344	346	350	352
23	1	33	65	117	151	203	235	267	321	353	405	437	471	523	555	607
46	2	34	66	120	152	204	236	270	322	354	406	440	472	524	556	610
71	3	35	67	121	153	205	237	271	323	355	407	441	473	525	557	611
114	4	36	70	122	154	206	240	272	324	356	410	442	474	526	560	612
137	5	37	61	123	155	207	241	273	325	357	411	443	475	527	561	613
162	6	40	72	124	156	210	242	274	326	360	412	444	476	530	562	614
205	7	41	73	125	157	211	243	275	327	361	413	445	477	531	563	615
230	10	42	74	126	160	212	244	276	330	362	414	446	500	532	564	616
253	11	43	75	127	161	213	245	277	331	363	415	447	501	533	565	617
276	12	44	76	130	162	214	246	300	332	364	416	450	502	534	566	620
321	13	45	77	131	163	215	247	301	333	365	417	451	503	535	567	621
344	14	46	100	132	164	216	250	302	334	366	420	452	504	536	570	622
367	15	47	101	133	165	217	251	303	335	367	421	453	505	537	571	623
412	16	50	102	134	166	220	252	304	336	370	422	454	506	540	572	624
435	17	51	103	135	167	221	253	305	337	371	423	455	507	541	573	625
460	20	52	104	136	170	222	254	306	340	372	424	456	510	542	574	626
503	21	53	105	137	171	223	255	307	341	373	425	457	511	543	575	627
526	22	54	106	140	172	224	256	310	342	374	426	460	512	544	576	630
551	23	55	107	141	173	225	257	311	343	375	427	461	513	545	577	631
574	24	56	110	142	174	226	260	312	344	376	430	462	514	546	600	632
617	25	57	111	143	175	227	261	313	345	377	431	463	515	547	601	633
642	26	60	112	144	176	230	262	314	346	400	432	464	516	550	602	634
665	27	61	113	145	177	231	263	315	347	401	433	465	517	551	603	635
710	30	62	114	146	200	232	264	316	350	402	434	466	520	552	604	636
733	31	63	115	147	201	233	265	317	351	403	435	467	521	553	605	637
	32	64	116	150	202	234	266	320	352	404	436	470	522	554	606	640

JOB IDS

551
thru
640

RESERVED
FOR
SHELVING

↑
INCR.
TO
BLOCK

UNCLASSIFIED

Security Classification

DOCUMENT CONTROL DATA - R & D

(Security classification of title, body of abstract and indexing annotation must be entered when the overall report is classified)

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13. ABSTRACT This report describes modification of the Shelving Processor portion of ECP II to successfully accomplish the shelving and reloading of job programs under multi-console operations on the Univac M1218 Computer. <i>17</i> ↑			

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