

IDENTIFICATION

PRODUCT CODE: MAINDEC-15-DAUCB-A-D
PRODUCT NAME: DEC/V11 EXERCISER TTY OUTPUT MODULE (TTY11)
FOR PDP-15 SYSTEM EXERCISER
DATE: MARCH 10, 1973
MAINTAINER: DIAGNOSTIC GROUP
AUTHOR(S): R. CHRISTOPHER



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PDP-15
TTY
69

DESCRIPTION

THIS MODULE ACCEPTS (AND OUTPUTS ON THE PDP-15 CONSOLE TTY) MESSAGES FROM THE PDP-11'S DEC/X11 EXERCISER.

2. PROGRAM ACTION

THE MODULE MONITORS LOCATION TTYBUF FOR A NON ZERO CONDITION, WHICH WILL OCCUR WHEN THE DEC/X11 EXERCISER LOADS THAT LOCATION WITH A CHARACTER WHICH IT WISHES TO OUTPUT. THE MODULE WILL OUTPUT THAT CHARACTER AND CLEAR LOCATION TTYBUF TO INDICATE TO DEC/X11 THAT ANOTHER MAY BE LOADED.

3. IMPORTANT NOTES

THE PAPER TAPE BINARY (TTY11) MODULE MUST BE ADDED TO THE PDP-15 SYSTEM EXERCISER SYSTEM DEVICE USING THE ADD ("A") COMMAND.

THIS MODULE MUST BE LOADED INTO PDP-15/PDP-11 COMMON MEMORY.

PRIOR TO STARTING THE DEC/X11 EXERCISER, THIS MODULE MUST BE RUNNING AND HAVE OUTPUT THE MESSAGE "TTY11 000001", WHICH INDICATES THAT DEC/X11 MAY THEN (AND ONLY THEN) BE STARTED.

EACH TIME THIS MODULE IS LOADED FROM THE PDP-15 EXERCISER SYSTEM DEVICE, THE OPERATOR MUST START OR RESTART THE DEC/X11 EXERCISER (WHEN APPROPRIATE). THIS ACTION IS NECESSARY TO SYNC THE TWO EXERCISERS.

IF THE OPERATOR WISHES TO ISSUE A CTRL C ("C") TO BOTH EXERCISERS HE MUST DO SO IN THE FOLLOWING ORDER IF HE WISHES TO CONTINUE BOTH EXERCISERS AFTER INTERRUPTING THE RUN. FIRST ISSUE A CTRL C TO DEC/X11, AND WAIT FOR THE PDP-11 TO OUTPUT IT'S RUN SUMMARY AND HALT, THEN AND ONLY THEN ISSUE A CTRL C TO THE PDP-15 EX.. WHEN CONTINUING THE EXERCISERS AFTER DOING A CTRL C, THE PDP-15 EX. MUST BE ISSUED THE EXECUTE (X) COMMAND AND THIS MODULE MUST BE RUNNING BEFORE PRESSING CONTINUE ON THE PDP-11. BOTH EXERCISERS WILL AGAIN BE IN SYNC.

PDP-15 DECTAPE TIMING ERRORS MAY RESULT AFTER A DEC/X11 MESSAGE IS OUTPUT. THEY SHOULD BE IGNORED WHEN IMMEDIATELY FOLLOWING THE DEC/X11 MESSAGE.

PDP-15 SYSTEM EXERCISER OPTION SWITCHES 1-3 MUST BE EQUAL TO ZERO UNTIL AFTER THE TTY11 000001 MESSAGE IS TYPED.

THE READ/WRITE BUFFER AREA FOR DECX11 MODULES STARTS AT WBUF AND IS 1100 DECIMAL WORDS LONG.

4. ERRORS

ERROR CODE	DESCRIPTION
TTY11 000001	DOES NOT INDICATE AN ERROR! INDICATES THAT THE TTY11 MODULE IS NOW RUNNING AND THAT THE DEC/X11 EXERCISER MAY NOW BE STARTED.
TTY11 000002	DOES NOT NECESSARILY INDICATE AN ERROR! TYPE-OUT MAY BE DUE TO NUMBER OF EXERCISER MODULES BEING RUN. INDICATES THAT THE PDP-15 IS WAITING FOR THE PDP-11 TO SET THE TCBP ACCEPTED FLAG.
TTY11 000003	INDICATES THAT THE PDP-11 FAILED TO SEND AN END OF MESSAGE TERMINATOR TO THE PDP-15.

,TITLE * TTY11 OUTPUT MOD. * MAINDEC-15-DAUCB-A * MAY 25, 1973 *

/
,EBREL
/

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/*****

/IMPORTANT NOTES:

THIS MODULE MUST BE LOADED AND RUNNING IN

PDP-15/PDP-11 COMMON MEMORY,

EACH TIME THIS MODULE IS LOADED FROM DECTAPE,

THE DEC/X11 EXERCISER MUST BE RESTARTED AT

LOC 1000, HOWEVER BEFORE STARTING AT 1000, THIS MODULE

MUST HAVE OUTPUT "TTY 11 000001", EACH TIME

DEC/X11 IS RESTARTED AT 1000, THIS MODULE MUST BE

RELOADED FROM DECTAPE AND RUNNING,

PDP-15 DECTAPE TIMING ERRORS MAY RESULT

AFTER A PDP-11 TTY MESSAGE IS OUTPUT ON

THE PDP-15 TTY, THEY SHOULD BE IGNORED WHEN

THEY IMMEDIATELY FOLLOW THE 11 MESSAGE,

CTRL C (*C) MUST ALWAYS BE EXECUTED FIRST

ON THE PDP-11 TO ENABLE THE PDP-15 TO

OUTPUT ANY MESSAGES WHICH THE 11 MIGHT HAVE,

/*****

23 00000 R 400000 A
 24 00001 R 000000 A
 25 00002 R 000000 A
 26 00003 R 000000 A
 27 00004 R 000161 R
 28 00005 R 000034 R
 29 00006 R 242431 A
 00007 R 616140 A
 30 00010 R 000000 A
 31 00211 R A
 32 00020 R 000000 A
 33 00021 R 000000 A
 34 00022 R 000000 A
 35 00023 R 000000 A
 36 00024 R 000000 A
 37 00025 R 000000 A
 38 00026 R 000000 A
 39 00027 R 000000 A
 40 00030 R 000000 A

UODSW 400000

0

0

0

SERV

/SERVICE ENTRANCE

TTYIN

/INITIALIZATION ENTRANCE

,SIXBT 'TTY11 '

0

/MASK FOR CHAIN MODE

,BLOCK 7

SYSERR 0

ERWC 0

ERCODE 0

0

0

0

0

0

0

/

,EJECT

```

43 /THE DEFINITIONS OF ERROR MESSAGES FOR THIS MODULE FOLLOW:
44 /
45 /TTY11 WORD=1 WORD=2 WORD=3 WORD=4
46 /-----
47 /
48 / " 000001
49 /-----
50 / CODE #1 INDICATES THAT THE PDP-15 MODULE IS NOW RUNNING,
51 / AND THAT THE DEC/X11 EXERCISER MAY NOW BE STARTED,
52 /
53 / " 000002
54 /-----
55 / CODE #2 INDICATES THAT THE PDP-15 IS WAITING FOR THE PDP-11
56 / TO SET THE DR15 TCBP ACCEPTED FLAG,
57 /
58 / " 000003
59 /-----
60 / ERROR #3 INDICATES THAT THE PDP-11 FAILED TO SEND A TTY
61 / MESSAGE TERMINATOR TO THE PDP-15,
62 /
63 700401 A TSF=700401
64 700402 A TCF=700402
65 700406 A TLS=700406
66 /
67 00031 R 706001 A SIOA 706001 /SKIP ON I/O DATA ACCEPTED, SKIPS ON I/O DATA
68 /ACCEPTED FLAG WHICH IS SET WHEN 11 READS TCBP,
69 00032 R 706002 A CIOD 706002 /CLEAR I/O DATA ACCEPTED FLAG
70 00033 R 706004 A LIOR 706004 /LOAD I/O REG, LOADS AC INTO I/O REG (NEW TCBP)
71 /FLAG, LOADS AC INTO I/O REG (BECOMES NEW TCBP)
72 ,EJECT

```

74	00034	R	000000	A	TTYIN	0		
75	00035	R	200034	R	LAC	TTYIN		
76	00036	R	240161	R	DAC	SERV		
77	00037	R	140020	R	DZM	SYSERR		
78	00040	R	140021	R	DZM	ERWC		
79	00041	R	400032	R	XCT	CIOD		
82	00042	R	200126	R	LAC	IFLG		
81	00043	R	750200	A	SZA:CLA		/FIRST TIME THROUGH SINCE LOAD?	
82	00044	R	600103	R	JMP	UC,3	/NO	
83	00045	R	750000	A	CLA			
84	00046	R	400033	R	XCT	LIOR	/FOR SYNC	
85	00047	R	777776	A	LAW	-2		
86	00050	R	040020	R	DAC	SYSERR		
87	00051	R	777777	A	LAW	-1		
88	00052	R	040021	R	DAC	ERWC		
89	00053	R	202534	R	LAC	(1		
90	00054	R	040022	R	DAC	ERCODE		
91	00055	R	100170	R	JMS	BRKEX		
92	00056	R	100304	R	JMS	TCBPAC		
93	00057	R	202535	R	LAC	(TABLE		
94	00060	R	040122	R	DAC	BFPNT1		
95	00061	R	777736	A	LAW	=42		
96	00062	R	040110	R	DAC	CNTA		
97	00063	R	202536	R	LAC	(-1100		
98	00064	R	040113	R	DAC	CNT3		
99	00065	R	202537	R	LAC	(WBUF		
100	00066	R	040123	R	DAC	BFPNT2		
101	00067	R	750000	A	UC,2	CLA	/CLR BITS 0 & 1	
102	00070	R	100337	R	JMS	BBUF	/BUILD WBUF	
103	00071	R	202540	R	LAC	(600000	/SET BITS 0 & 1	
104	00072	R	100337	R	JMS	BBUF		
105	00073	R	202541	R	LAC	(200000	/SET BIT 1	
106	00074	R	100337	R	JMS	BBUF		
107	00075	R	202542	R	LAC	(400000	/SET BIT 0	
108	00076	R	100337	R	JMS	BBUF		
109	00077	R	600067	R	JMP	UC,2	/NO	
110	00100	R	202537	R	UC,2A	LAC	(WBUF	
111	00101	R	400033	R	XCT	LIOR	/SEND ADDRESS OF WBUF	
112	00102	R	100304	R	JMS	TCBPAC		
113	00103	R	140126	R	UC,3	DZM	IFLG	
114	00104	R	440126	R	ISB	IFLG		
115	00105	R	100207	R	JMS	TTY11		
116	00106	R	100170	R	JMS	BRKEX		
117	00107	R	600105	R	JMP	,=2		
118						.EJECT		

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119                                     /TEMPORARY STORAGE
120 00110 R 000000 A CNTA 0
121 00111 R 000000 A CNT1 0
122 00112 R 000000 A CNT2 0
123 00113 R 000000 A CNT3 0
124 00114 R 000000 A CNT4 0
125 00115 R 000000 A CNT5 0
126 00116 R 000000 A API 0
127 00117 R 000000 A ACSAV 0
128 00120 R 000000 A POINT 0
129 00121 R 000000 A PNT 0
130 00122 R 000000 A BFPNT1 0
131 00123 R 000000 A BFPNT2 0
132 00124 R 000000 A WDCNT 0
133 00125 R 000000 A ITYP 0
134 00126 R 000000 A IFLG 0
135                                     /TEMPORARY STORAGE FOR ERROR STATUS
136 00127 R A SAVBUF ,BLOCK 11
137                                     /RETRIEVE ERROR STATUS FOR MONITOR
138 00140 R 000000 A RESTAT 0
139 00141 R 777767 A LAW -11
140 00142 R 040111 R DAC CNT1 /INIT COUNT
141 00143 R 202543 R LAC (SYSERR
142 00144 R 040120 R DAC POINT /INIT POINTER
143 00145 R 202544 R LAC (SAVBUF
144 00146 R 040121 R DAC PNT /INIT POINTER
145 00147 R 220121 R LAC* PNT
146 00150 R 100155 R JMS STATUS /STORE A WORD
147 00151 R 440121 R ISZ PNT
148 00152 R 440111 R ISZ CNT1 /DONE?
149 00153 R 600147 R JMP ,=4 /NO
150 00154 R 620140 R JMP* RESTAT
151                                     /STORE STATUS
152 00155 R 000000 A STATUS 0
153 00156 R 060120 R DAC* POINT
154 00157 R 440120 R ISZ POINT
155 00160 R 620155 R JMP* STATUS
156                                     ,EJECT

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1          /SERVICE ROUTINE
158        00161 R 200000 A  SERV  2
159        00162 R 200020 R          LAC   SYSERR
160        00163 R 542545 R          SAD   (=5           /INT RESPONSE?
161        00164 R 741000 A          SKP                   /YES
162        00165 R 620224 R          JMP*  EXIT           /NO
163        00166 R 750001 A          CLC
164        00167 R 620161 R          JMP*  SERV           /IND INT WITH NO FLG SET,????
165
166        /BREAK EXIT TO THE MONITOR
167        00170 R 000000 A  BRKEX  0
168        00171 R 200020 R          LAC   SYSERR
169        00172 R 542545 R          SAD   (=5
170        00173 R 600202 R          JMP   BRK,1
171        00174 R 740200 A          SZA                   /PREVIOUS ERROR?
172        00175 R 600200 R          JMP   ,+3             /YES
173        00176 R 777773 A          LAW   =5             /INDICATE NORMAL BREAK
174        00177 R 741000 A          SKP
175        00200 R 777776 A          LAW   =2             /INDICATE MULTIPLE ERRORS
176        00201 R 040020 R          DAC   SYSERR
177        00202 R 100204 R  BRK,1  JMS   EXIT
178        00203 R 620170 R          JMP*  BRKEX
179        /EXIT TO THE MONITOR
180        00204 R 000000 A  EXIT  2
181        00205 R 750000 A          CLA
182        00206 R 620161 R          JMP*  SERV
          ,EJECT

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183 /ROUTINE TO DETECT AND OUTPUT PDP-11 TTY MESSAGES.
184 TTY11 0
185 00207 R 200000 A LAC I TYP
186 00210 R 200125 R DZM I TYP
187 00211 R 140125 R SNA /FIRST TIME THROUGH ROUTINE?
188 00212 R 741200 A DZM TTYBUF /YES, IND TO 11 OK TO SEND MESSAGES
189 00213 R 140417 R ISZ I TYP
190 00214 R 440125 R LAC TTYBUF
191 00215 R 200417 R SNA
192 00216 R 741200 A JMP* TTY11 /MESSAGE PENDING?
193 00217 R 620207 R TTY1,1 LAC* (2646 /NO
194 00220 R 222546 R SZA /LOC TEXT IN MONITOR
195 00221 R 740220 A JMP TTY1,2 /MONITOR TYPING?
196 00222 R 620227 R LAC (=77002 /YES
197 00223 R 2002547 R DAC WDCNT
198 00224 R 040124 R TSF /TTY FLG?
199 00225 R 700401 A JMP .+3 /NO
200 00226 R 600231 R TTY1,2 JMS BRKEX
201 00227 R 100170 R JMP TTY1,1 /YES, MONITOR IS TYPING,
202 00230 R 600220 R ISZ WDCNT /WAIT AWHILE,...
203 00231 R 440124 R JMP .-4 /.....
204 00232 R 600226 R TTY11A LAC TTYBUF
205 00233 R 200417 R DZM TTYBUF /IND TO 11 CODE ACCEPTED.
206 00234 R 140417 R SAO (377 /END OF MESS?
207 00235 R 542550 R JMP TTY11C /YES
208 00236 R 600274 R TLS
209 00237 R 700406 A TSF
210 00240 R 700401 A JMP .-1
211 00241 R 600240 R TCF
212 00242 R 700402 A CLA
213 00243 R 750000 A DZM CNT3
214 00244 R 140113 R LAW -3
215 00245 R 777775 A DAC CNT4
216 00246 R 040114 R TTY11B LAC TTYBUF
217 00247 R 200417 R SZA /CHARACTER PRESENT?
218 00250 R 740200 A JMP TTY11A /YES
219 00251 R 600233 R ISZ CNT3
220 00252 R 440113 R JMP TTY11B
221 00253 R 600247 R ISZ CNT4
222 00254 R 440114 R JMP TTY11B
223 00255 R 600247 R LAC (SAVBUF
224 00256 R 2002544 R DAC POINT
225 00257 R 040120 R LAW -2
226 00260 R 777776 A JMS STATUS
227 00261 R 100155 R LAW -1
228 00262 R 777777 A JMS STATUS
229 00263 R 100155 R LAC (3
230 00264 R 202551 R JMS STATUS
231 00265 R 100155 R LAC SYSERR
232 00266 R 200020 R SZA
233 00267 R 740200 A JMS BRKEX
234 00270 R 100170 R JMS RESTAT
235 00271 R 100140 R JMS BRKEX
236 00272 R 100170 R JMP* TTY11
237 00273 R 620207 R LAW -1000
237 00274 R 777000 A TTY11C

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238	00275 R 040113 R	DAC	CNT3	
239	00276 R 200417 R	LAC	TTYBUF	
240	00277 R 740200 A	SZA		/CHARACTER PRESENT?
241	00300 R 600233 R	JMP	TTY11A	/YES, START NEW MESSAGE,
242	00301 R 440113 R	ISZ	CNT3	
243	00302 R 600276 R	JMP	,=4	
244	00303 R 620207 R	JMP*	TTY11	
245		,EJECT		

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246
247      00304 R 000000 A      /
248      00305 R 777775 A      TCBPAC  2
249      00306 R 040115 R      LAW      -3
250      00307 R 140112 R      GAC      CNT5
251      00310 R 100170 R      DZM      CNT2
252      00311 R 400031 R      TCB,1   JMS     BRKEX
253      00312 R 600315 R      XCT     SIOA   /TCBP ACCEPTED?
254      00313 R 400032 R      JMP     TCB,2 /NO
255      00314 R 620304 R      XCT     CIOD   /YES
256      00315 R 440112 R      JMP*    TCBPAC
257      00316 R 600310 R      TCB,2   ISZ     CNT2   /TRY AGAIN?
258      00317 R 440115 R      JMP     TCB,1 /YES
259      00320 R 600310 R      ISZ     CNT5
260      00321 R 202544 R      JMP     TCB,1
261      00322 R 040120 R      LAC     (SAVBUF
262      00323 R 777776 A      DAC     POINT
263      00324 R 100155 R      LAW     -2
264      00325 R 777777 A      JMS     STATUS
265      00326 R 100155 R      LAW     -1
266      00327 R 202552 R      JMS     STATUS
267      00330 R 100155 R      LAC     (2
268      00331 R 200020 R      JMS     STATUS
269      00332 R 740200 A      LAC     SYSERR
270      00333 R 100170 R      SZA
271      00334 R 100140 R      JMS     BRKEX
272      00335 R 100170 R      JMS     RESTAT
273      00336 R 600305 R      JMS     BRKEX
274      00337 R 000000 A      JMP     TCBPAC+1
275      00340 R 360122 R      /
276      00341 R 060123 R      BBUF   0
277      00342 R 440122 R      TAD*   BFPNT1
278      00343 R 440123 R      DAC*   BFPNT2
279      00344 R 440110 R      ISZ    BFPNT1
280      00345 R 600352 R      ISZ    BFPNT2
281      00346 R 202535 R      ISZ    CNTA   /EXHAUST TABLE?
282      00347 R 040122 R      JMP    BBUF,1 /NO
283      00350 R 777736 A      LAC    (TABLE /YES
284      00351 R 040110 R      DAC    BFPNT1
285      00352 R 440113 R      LAW    -42
286      00353 R 620337 R      BBUF,1 ISZ    CNT3   /DONE BUILDING WBUF?
287      00354 R 600100 R      JMP*   BBUF   /NO
288      .EJECT
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29				/	
291	00355	R	100000	A	TABLE 100000
292	00356	R	040000	A	40000
293	00357	R	020000	A	20000
294	00360	R	010000	A	10000
295	00361	R	024000	A	4000
296	00362	R	022000	A	2000
297	00363	R	021000	A	1000
298	00364	R	000400	A	400
299	00365	R	000200	A	200
300	00366	R	000100	A	100
301	00367	R	200040	A	40
302	00370	R	000020	A	20
303	00371	R	000010	A	10
304	00372	R	000004	A	4
305	00373	R	000002	A	2
306	00374	R	000001	A	1
307	00375	R	000000	A	0
308	00376	R	077777	A	77777
309	00377	R	137777	A	137777
310	00400	R	157777	A	157777
311	00401	R	167777	A	167777
312	00402	R	173777	A	173777
313	00403	R	175777	A	175777
314	00404	R	176777	A	176777
315	00405	R	177377	A	177377
316	00406	R	177577	A	177577
317	00407	R	177677	A	177677
318	00410	R	177737	A	177737
319	00411	R	177757	A	177757
320	00412	R	177767	A	177767
321	00413	R	177773	A	177773
322	00414	R	177775	A	177775
323	00415	R	177776	A	177776
324	00416	R	177777	A	177777
325					EJECT

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00417 R 000377 A / TTYBUF 377
00420 R 000000 A / WBUF 0
02534 R .LOC WBUF+2114
                                /
                                .END UODSW
02534 R 000001 A *L
02535 R 000355 R *L
02536 R 776700 A *L
02537 R 000420 R *L
02540 R 600000 A *L
02541 R 200000 A *L
02542 R 400000 A *L
02543 R 000020 R *L
02544 R 000127 R *L
02545 R 777773 A *L
02546 R 002646 A *L
02547 R 700776 A *L
02550 R 000377 A *L
02551 R 000003 A *L
02552 R 000002 A *L
SIZE=02555 NO ERROR LINES
    
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/ASCII CODED CHARACTERS WILL BE
/ENTERED INTO THIS LOC BY PDP-11,
/THEY WILL BE ACKNOWLEDGED AND
/STORED IN SXBT IN THE BUFFER
/STARTING AT LOC SXBTBF, TTYBUF
/WILL BE CLEARED EACH TIME A
/CHARACTER IS RECEIVED, AS AN
/INDICATION TO THE 11 TO SEND
/ANOTHER, THE END OF A MESSAGE
/IS INDICATED WHEN THE 15 RE-
/CEIVES THE CODE 377.

/THIS BUFFER IS 1100 DECIMAL LOC'S
/LONG AND IS USED BY THE PDP-11
/AS A READ & WRITE BUFFER FOR IT'S
/DEVICES.
    
```

ACB	00117	127*								
AF	00116	126*								
BBUF	00337	102	104	106	108	275*	287			
BBUF.1	00352	281	286*							
BFPNT1	00122	94	130*	276	278	283				
BFPNT2	00123	100	131*	277	279					
BRKEX	00170	91	116	166*	177	220	233	235	251	270
		272								
BRK.1	00202	169	176*							
CIOD	00032	69*	79	254						
CNTA	00110	96	120*	280	285					
CNT1	00111	121*	140	148						
CNT2	00112	122*	250	256						
CNT3	00113	98	123*	213	219	238	242	286		
CNT4	00114	124*	215	221						
CNT5	00115	125*	249	258						
ERCODE	00022	34*	90							
ERWC	00021	33*	78	88						
EXIT	00204	162	176	179*						
IFLG	00126	80	113	114	134*					
ITYP	00125	133*	185	186	189					
LIOR	00033	70*	84	111						
PNT	00121	129*	144	145	147					
POINT	00120	128*	142	153	154	224	261			
RESTAT	00140	138*	150	234	271					
SAVBUF	00127	136*	143	223	260					
SERV	00161	27	76	158*	164	181				
SIOA	00031	67*	252							
STATUS	00155	146	152*	155	226	228	230	263	265	267
SYSERR	00020	52*	77	86	141	159	167	175	231	268
TABLE	00355	93	282	291*						
TCBPAC	00304	92	112	247*	255	273				
TCB.1	00310	251*	257	259						
TCB.2	00315	253	256*							
TCF	700402	64*	211							
TLS	700406	65*	208							
TSP	700401	63*	198	209						
TTYBUF	00417	188	190	204	205	216	239	327*		
TTYIN	00034	28	74*	75						
TTY1.1	00220	193*	201							
TTY1.2	00227	195	200*							
TTY11	00207	29	115	184*	192	236	244			
TTY11A	00233	204*	218	241						
TTY11B	00247	216*	220	222						
TTY11C	00274	207	237*							
UC.2	00067	101*	109							
UC.2A	00100	110*	288							
UC.3	00103	82	113*							
UODSW	00000	23*	344							
WBUF	00420	99	110	339*	340					
WDCNT	00124	132*	197	202						