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/1 SUITE : P.C.B. LAYOUT
/2 PROGRAM TITLE : REDAL23 MARK2
/3 ROUTINE TITLE :

/4 AUTHOR :
/5 DATE :

/6 PURPOSE :

/7 CALLING SEQUENCE AND DESCRIPTION OF ARGUMENTS :

/8 I/O DEVICES AND FUNCTIONS :

/9 REGISTERS USED :

/10 EXTERNAL COMMON AREAS :

/11 INTERNAL COMMON AREAS :

/12 EXTERNAL GLOBALS :

/13 INTERNAL GLOBALS :

/14 CONDITIONAL ASSEMBLY PARAMETERS :

/15 METHOD :

/16 AMENDMENTS :

MODIFIED TO FIT INTO RL3

H BERGKVIST

.GLOBL ~~DELPH~~ TREE, READRT, .DA, RUTCHK, SINGRT, STATE

.GLOBL SUBNOD, MESS1, ~~BUTTON~~, ~~BRANCE~~, RECTOL

00000 R 000000 A

XN1 .CBD EOROUT 1

00001 R 000000 A

XN2 .CBD EOCONN 1

00002 R 000000 A

XN4 .CBD EOCOMP 1

00003 R 000000 A

TRAKS .CBD TRAKS 1

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53 00004 R 000000 A PADS .CBD PADS 1
54 00005 R 000000 A DRILL .CBD DRILL 1
55 00006 R 000000 A LAYER .CBD LAYER 1
56 00007 R 000000 A PUSBY .CBD PUSBY 1
57 00010 R 000000 A .XXMON .CBD .XX 1
58
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66 00011 R 000000 A STP 0
67 00012 R 750030 A CLAIAC A 4
68 00013 R 065614 E DAC* STATE
69
70 00014 R 735000 A
71 00015 R 205620 R
72 00016 R 722000 A
73 00017 R 230010 R LUP
74 00020 R 055531 R
75 00021 R 725001 A
76 00022 R 600017 R
77 00023 R 220007 R
78 00024 R 045537 R LAC* PUSBY
79 00025 R 220003 R DAC MESS
80 00026 R 045540 R LAC* TRAKS
81 00027 R 220004 R DAC TRAKAD
82 00030 R 045541 R LAC* PADS
83 00031 R 220005 R DAC PADAD
84 00032 R 045543 R LAC* DRILL
85 00033 R 220006 R DAC DRILAD
86 00034 R 045542 R LAC* LAYER
87
88 00035 R 220000 R LAC* XN1
89 00036 R 040572 R DAC ARG2
90 00037 R 041215 R DAC ARG22
91 00040 R 220001 R LAC* XN2
92 00041 R 045457 R DAC EOCONN
93 00042 R 040576 R DAC ARG4
94 00043 R 041221 R DAC ARG44
95 00044 R 220002 R LAC* XN4
96 00045 R 045560 R DAC EOCOMP*
97 00046 R 205534 R LAC CONNAD
98 00047 R 345457 R TAD EOCONN
99 00050 R 723777 A AAC -1
100 00051 R 045553 R DAC CONEND*
101
102 00052 R 205545 R
103 00053 R 740200 A
104 00054 R 600073 R JMP RND98

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SUBROUTINE SETUP

SUBROUTINE SETS UP FOR BOTH SINGLE ROUTE
CHECKING AND FOR ALL ROUTE CHECKING

SET UP ARRAY STARTS ETC.

CLX
LAC (6
PAL
LAC* .XXMON,X
DAC COPPER,X
AXS 1
JMP LUP
~~LAC* PUSBY~~
~~DAC MESS~~
LAC* TRAKS
DAC TRAKAD
LAC* PADS
DAC PADAD
LAC* DRILL
DAC DRILAD
LAC* LAYER
DAC LAYNO

LAC* XN1
DAC ARG2
DAC ARG22
LAC* XN2
DAC EOCONN
DAC ARG4
DAC ARG44
LAC* XN4
DAC EOCOMP*
LAC CONNAD
TAD EOCONN
AAC -1
DAC CONEND*

SET UP EXTRA SIZE REQUIRED AROUND RECTANGLES

LAC ALSING
SZA
JMP RND98

PAGE	3	SINGRT	SRC	SINGRT	751127
105	00055	R	145413	R	DZM PTHHS
106	00056	R	205621	R	LAC (22
107	00057	R	045460	R	DAC STR1
108	00060	R	104261	R	RND97 JMS GETPTH /GET EDGE CONNECTOR LENGTH
109	00061	R	205622	R	LAC (0
110	00062	R	205460	R	LAC STR1
111	00063	R	235543	R	LAC* DRILAD,X
112	00064	R	445460	R	ISZ STR1
113	00065	R	205460	R	LAC STR1
114	00066	R	545623	R	SAD (40
115	00067	R	741000	A	SKP
116	00070	R	600060	R	JMP RND97
117	00071	R	205413	R	LAC PTHHSZ
118	00072	R	045555	R	DAC EDGESZ*
119	00073	R	145413	R	RND98 DZM PTHHSZ
120	00074	R	104261	R	JMS GETPTH /FIND SPACE
121	00075	R	205624	R	LAC (10
122	00076	R	205624	R	LAC (10
123	00077	R	235540	R	LAC* TRAKAD,X
124	00100	R	205413	R	LAC PTHHSZ
125	00101	R	045364	R	DAC STR
126	00102	R	145413	R	DZM PTHHSZ
127	00103	R	145460	R	DZM STR1
128	00104	R	104261	R	RND21 JMS GETPTH /GET PTH OR PAD SIZE
129	00105	R	205625	R	LAC (37
130	00106	R	205460	R	LAC STR1
131	00107	R	235541	R	LAC* PADAD,X
132	00110	R	445460	R	ISZ STR1 /NEXT PAD CODE
133	00111	R	205460	R	LAC STR1
134	00112	R	545623	R	SAD (40 /END OF PAD CODES?
135	00113	R	741000	A	SKP /YES
136	00114	R	600104	R	JMP RND21 /NO
137	00115	R	145460	R	DZM STR1
138	00116	R	445460	R	ISZ STR1
139	00117	R	104261	R	RND25 JMS GETPTH /GET DRILL SIZE
140	00120	R	205622	R	LAC (0
141	00121	R	205460	R	LAC STR1
142	00122	R	235543	R	LAC* DRILAD,X
143	00123	R	445460	R	ISZ STR1 /NEXT DRILL CODE
144	00124	R	205460	R	LAC STR1
145	00125	R	545626	R	SAD (26 /END OF DRILL CODES?
146	00126	R	741000	A	SKP /YES
147	00127	R	600117	R	JMP RND25 /NO
148	00130	R	145460	R	DZM STR1
149	00131	R	445460	R	ISZ STR1
150	00132	R	104261	R	RND23 JMS GETPTH /GET TRACK WIDTH
151	00133	R	205624	R	LAC (10
152	00134	R	205460	R	LAC STR1
153	00135	R	235540	R	LAC* TRAKAD,X
154	00136	R	445460	R	ISZ STR1 /NEXT TRACK CODE
155	00137	R	205460	R	LAC STR1
156	00140	R	545627	R	SAD (11 /ALL CODES DONE?

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157 00141 R 741000 A SKP /YES
158 00142 R 600132 R JMP RND23 /NO
159 00143 R 205364 R LAC STR
160 00144 R 744020 A CLLIRAR
161 00145 R 740030 A IAC
162 00146 R 345413 R TAD PTHHSZ
163 00147 R 744020 A CLLIRAR
164 00150 R 741400 A SZL
165 00151 R 740030 A IAC
166 00152 R 045413 R DAC PTHHSZ
167 00153 R 620011 R JMP* STP

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-----/
/          SUBROUTINE ALLRUT          /
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/ THIS SUBROUTINE IMPLEMENTS THE CHECK ALL /
/ FACILITY.                               /
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174 00154 R 145545 R ALLRUT DZM ALSING*
175 00155 R 445545 R ISZ ALSING
176 00156 R 100011 R JMS STP
177 00157 R 205534 R LAC CONNAD
178 00160 R 040205 R DAC CONPTR
180 00161 R 220205 R AGN LAC* CONPTR
181 00162 R 505630 R AND (???)
182 00163 R 740031 A TCA
183 00164 R 040206 R DAC CONNO /-(NO OF CONS ON COMP)
184 00165 R 220205 R LAC* CONPTR
185 00166 R 742030 A SWHA
186 00167 R 505630 R AND (???)
187 00170 R 045370 R DAC PTR1 /POINTER TO COMPONENT
188 00171 R 440205 R ISZ CONPTR /BUMP POINTER TO FIRST CONN. INF.
189 00172 R 200205 R AGN1 LAC CONPTR
190 00173 R 045372 R DAC CONN1 /CONN1 POINTS TO CONN INF.
191 00174 R 100460 R JMS CONRUT /CHECK ROUTE
192 00175 R 200205 R LAC CONPTR
193 00176 R 723003 A AAC 3
194 00177 R 040205 R DAC CONPTR /POINT TO NEXT CONN
195 00200 R 545553 R SAD CONEND
196 00201 R 620215 R JMP* SINGRT /ALL CONS DONE
197 00202 R 440206 R ISZ CONNO /END OF CONS ON COMP?
198 00203 R 600172 R JMP AGN1 /NO
199 00204 R 600161 R JMP AGN /YES
200 00205 R 000000 A CONPTR
201 00206 R 000000 A CONNO
202 00207 R 001750 A BUSY 1750
203 00210 R 000000 A 0
204 00211 R 412532 A .ASCII /BUSY /

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SUBROUTINE SINGRT

THIS SUBROUTINE IMPLEMENTS THE CHECK ONE
FACILITY.

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00215 R 000000 A
00216 R 741100 A
00217 R 600154 R
00220 R 741300 A
00221 R 600225 R
00222 R 200215 R
00223 R 040343 R
00224 R 600344 R
00225 R 145545 R
00226 R 100011 R
00227 R 165537 R
00230 R 205537 R
00231 R 652000 A
00232 R 205631 R
00233 R 125611 E
00234 R 125607 E
00235 R 600237 R
00236 R 005632 R
00237 R 741100 A
00240 R 620215 R
00241 R 045461 R
00242 R 165537 R
00243 R 205537 R
00244 R 652000 A
00245 R 205633 R
00246 R 125611 E
00247 R 225461 R
00250 R 723776 A
00251 R 045372 R
00252 R 225372 R
00253 R 742030 A
00254 R 505630 R
00255 R 045367 R
00256 R 744010 A
00257 R 345367 R
00260 R 744010 A
00261 R 721000 A
00262 R 235535 R
00263 R 723002 A
00264 R 721000 A
00265 R 235534 R
00266 R 505634 R
00267 R 545461 R
00270 R 600273 R
00271 R 737003 A

SINGRT 0
SPA
JMP ALLRUT /ACC -VE FOR ALLRUT
SRAISNA
JMP SING2 /ACC ZERO FOR SINGRT
LAC SINGRT
DAC PADPAD
JMP PADPAD+1
SING2 DFM ALSING
JMS STP
~~DZM* MESS~~
~~LAC MESS~~
~~LMQ~~
~~LAC (YYY2~~
~~JMS* MESS1~~
~~JMS* DFLPK~~
~~JMP~~
~~DSA (4 /LOOK FOR ROUTE~~
~~SPA~~
~~JMP* SINGRT /EDGE OF PICTURE~~
~~DAC STR2 /DF ADDRESS~~
~~DZM* MESS~~
~~LAC MESS~~
~~LMQ~~
~~LAC (BUGY~~
~~JMS* MESS1~~
~~LAC* STR2~~
~~AAC -2~~
~~DAC CONN1~~
~~LAC* CONN1~~
~~SWHA~~
~~AND (777~~
~~DAC PTR2~~
~~RCL /FIND PTR1 BY SCAN OF CONNECTIONS ARRAY.~~
~~TAD PTR2~~
~~RCL /AC NOW=PTR2*6~~
~~PAX~~
~~LAC* COMPAD,X /LOAD RELATIVE POINTER TO CONNECTIONS~~
~~AAC 2~~
~~PAX~~
~~RND LAC* CONNAD,X /LOAD D.F. WORD OF CONS. ARRAY~~
~~AND (77777 /GET D.F. ADDRESS~~
~~SAD STR2 /EQUALS D.F. ADDRESS OF ROUTE SEEN?~~
~~JMP .+3 /YES~~
~~AXR 3 /NO. LOOK AT NEXT CONNECTION.~~

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258 00272 R 600265 R JMP RND
259 00273 R 737776 A AXR -2 /STEP BACK TO COMP POINTER WORD
260 00274 R 235534 R LAC* CONNAD,X //GET
261 00275 R 742030 A SWHA //COMPONENT
262 00276 R 505630 R AND (777 //POINTER
263 00277 R 045370 R DAC PTR1
264 00300 R 100460 R JMS CONRUT /CHECK ROUTE
265 00301 R 750000 A CLA
266 00302 R 125610 E JMS* DRALCP
267 00303 R 204763 R LAC VALMRK
268 00304 R 741200 A SNA
269 00305 R 620215 R JMP* SINGRT
270 00306 R 165537 R DZM* MESS
271 00307 R 205537 R LAC MESS
272 00310 R 652000 A LMQ
273 00311 R 205635 R LAC (FAILURE
274 00312 R 125611 E JMS* MESS1
275 00313 R 125606 E JMS* BUTTON
276 00314 R 620215 R JMP* SINGRT
277 00315 R 001750 A FAILURE 1750
278 00316 R 000000 A 0
279 00317 R 202451 A .ASCII / ROUTE INVALID, SELECT BUTTON
00320 R 752650 A
00321 R 425011 A
00322 R 147254 A
00323 R 406311 A
00324 R 142130 A
00325 R 202470 A
00326 R 546212 A
00327 R 416504 A
00330 R 041252 A
00331 R 522511 A
00332 R 747276 A
280 00333 R 001750 A /V2 1750
281 00334 R 000000 A 0
282 00335 R 202470 A .ASCII / SELECT ROUTE
00336 R 546212 A
00337 R 416505 A
00340 R 420244 A
00341 R 476532 A
00342 R 442676 A

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283 -----/
284 /
285 / SUBROUTINE PADPAD /
286 / /
287 / THIS ROUTINE CHECKS A PAD AGAINST A PAD. /
288 / IF THE PADS ARE INVALID NORMAL EXIT IS MADE. /
289 / VALID PADS EXIT TO ONE WORD AFTER THE NORMAL /
290 / EXIT. /
291 / /
292 / THE CALL IS- /
293 / CALL PADAD(PT1,CDE1,LIBR1,PT2,CDE2, /

```

LIBR2)

PT1,PT2 ARE THE REFERENCE POINTS OF THE PADS
CDE1,CDE2 GIVE THE PAD CODES
LIBR1,LIBR2 CONTAIN THE LIBRARY WORDS

294				
295				
296				
297				
298				
299				
300				
301	00343	R	000000	A
302	00344	R	125617	E
303	00345	R	600354	R
304	00346	R	000000	A
305	00347	R	000000	A
306	00350	R	000000	A
307	00351	R	000000	A
308	00352	R	000000	A
309	00353	R	000000	A
310	00354	R	100011	R
311	00355	R	750030	A
312	00356	R	045572	R
313	00357	R	045573	R
314	00360	R	145545	R
315	00361	R	721000	A
316	00362	R	220346	R
317	00363	R	104700	R
318	00364	R	045427	R
319	00365	R	230346	R
320	00366	R	104700	R
321	00367	R	045431	R
322	00370	R	220347	R
323	00371	R	045475	R
324	00372	R	045477	R
325	00373	R	740031	A
326	00374	R	045366	R
327	00375	R	104623	R
328	00376	R	600403	R
329	00377	R	005427	R
330	00400	R	005430	R
331	00401	R	005475	R
332	00402	R	400350	R
333	00403	R	220350	R
334	00404	R	742030	A
335	00405	R	505636	R
336	00406	R	545637	R
337	00407	R	225542	R
338	00410	R	045506	R
339	00411	R	045510	R
340	00412	R	045414	R
341	00413	R	220351	R
342	00414	R	104700	R
343	00415	R	045433	R
344	00416	R	735000	A
345	00417	R	737001	A

PADPAD 0
JMS* .DA
JMP .+7
PT1S
CDE1
LIBR1
PT2S
CDE2
LIBR2
JMS STP
CLA IAC
DAC PADPAS /SET UP FLAGS
DAC PADPS1
DZM ALSING
PAX
LAC* PT1S
JMS DSTTOU
DAC X1
LAC* PT1S,X
JMS DSTTOU
DAC Y1
LAC* CDE1
DAC END1
DAC END2
TCA
DAC WIDTH1
JMS ORI
JMP .+5
.DSA X1
.DSA X2
.DSA END1
.DSA LIBR1:400000
FNDSDE LAC* LIBR1
SWHA
AND (3
SAD (2
LAC* LAYNO
DAC NLAY1
DAC NLAY2
DAC SIDE1
LAC* PT2S
JMS DSTTOU
DAC X11
CLX
AXR 1

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346 00420 R 230351 R LAC* PT2S.X
347 00421 R 104700 R JMS DSTTOU
348 00422 R 045435 R DAC Y11
349 00423 R 220352 R LAC* CDE2
350 00424 R 045501 R DAC END11
351 00425 R 045503 R DAC END22
352 00426 R 740031 A TCA
353 00427 R 044757 R DAC WIDTH2
354 00430 R 104623 R JMS ORI
355 00431 R 600436 R JMP .+5
356 00432 R 005433 R .DSA X11
357 00433 R 005434 R .DSA X22
358 00434 R 005501 R .DSA END11
359 00435 R 400353 R .DSA LIBR2!400000
360 00436 R 220353 R FNDSD2 LAC* LIBR2
361 00437 R 742030 A SWHA
362 00440 R 505636 R AND (3
363 00441 R 545637 R SAD (2
364 00442 R 225542 R LAC* LAYNO
365 00443 R 045512 R DAC NLAY11
366 00444 R 045514 R DAC NLAY22
367 00445 R 045416 R DAC ZIDE1
368 00446 R 104431 R JMS RECTGT
369 00447 R 600452 R JMP .+3
370 00450 R 005433 R .DSA X11
371 00451 R 005400 R .DSA RECT2
372 00452 R 102161 R JMS SEGSEG
373 00453 R 600456 R JMP .+3
374 00454 R 750000 A CLA
375 00455 R 620343 R JMP* PADPAD
376 00456 R 750030 A CLAIAC
377 00457 R 620343 R JMP* PADPAD
378 /-----/
379 /
380 / SUBROUTINE CONRUT /
381 /
382 / SUBROUTINE TO CHECK A ROUTE. REQUIRES /
383 / CONN1 POINTING TO FIRST WORD OF THE CONNECTIONS /
384 / INFORMATION, AND PTR1 ALREADY UNPACKED. /
385 /
386 /-----/
387 00460 R 000000 A CONRUT 0
388 00461 R 100615 R JMS UNPCK
389 00462 R 777400 A LAW -400
390 00463 R 045364 R DAC STR
391 00464 R 205535 R LAC COMPAD
392 00465 R 040477 R DAC TARG1
393 00466 R 205540 R LAC TRAKAD
394 00467 R 040504 R DAC TARG3
395 00470 R 205534 R LAC CONNAD
396 00471 R 040500 R DAC TARG2
397 00472 R 345457 R TAD EOCONN

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PAGE	9	SINGRT SRC	SINGRT	751127
398	00473	R 723777	A	
399	00474	R 045556	R	
400	00475	R 125616	E	
401	00476	R 600505	R	
402	00477	R 000000	A	
403	00500	R 000000	A	
404	00501	R 004764	R	
405	00502	R 005622	R	
406	00503	R 005364	R	
407	00504	R 000000	A	
408	00505	R 205534	R	
409	00506	R 045460	R	
410	00507	R 205364	R	
411	00510	R 740031	A	
412	00511	R 045547	R	
413	00512	R 045574	R	
414	00513	R 225460	R	
415	00514	R 505630	R	
416	00515	R 740031	A	
417	00516	R 045564	R	
418	00517	R 225460	R	
419	00520	R 505640	R	
420	00521	R 652000	A	
421	00522	R 445460	R	
422	00523	R 225460	R	
423	00524	R 505641	R	
424	00525	R 640002	A	
425	00526	R 045603	R	
426	00527	R 445460	R	
427	00530	R 445460	R	
428	00531	R 205547	R	
429	00532	R 045554	R	
430	00533	R 205642	R	
431	00534	R 065624	R	
432	00535	R 225460	R	
433	00536	R 505643	R	
434	00537	R 065460	R	
435	00540	R 220010	A	
436	00541	R 545603	R	
437	00542	R 600554	R	
438	00543	R 445554	R	
439	00544	R 600540	R	
440	00545	R 445564	R	
441	00546	R 600522	R	
442	00547	R 445460	R	
443	00550	R 205460	R	
444	00551	R 545556	R	
445	00552	R 600560	R	
446	00553	R 600513	R	
447	00554	R 225460	R	
448	00555	R 345644	R	
449	00556	R 065460	R	

Label	Value	Description
JMS*	TREE	/GET LIST OF NODES IN TREE
JMP	+.7	
TARG1	0	/ADDRESS COMPS ARRAY
TARG2	0	/ADDRESS CONNS ARRAY
.DSA	PP	
.DSA	(0	
.DSA	STR	
TARG3	0	/ADDRESS TRAKS
LAC	CONNAD	
DAC	STR1	
LAC	STR	
TCA		
DAC	CNTR*	/-(NO OF WORDS IN PP ARRAY)
DAC	PPNO*	
CCCLUP	LAC* STR1	
AND	(???)	
TCA		
DAC	NOFCNS*	
LAC*	STR1	
AND	(???)	
LMQ	/COMP PTR STORED IN MQ	
LUPCCC	ISZ STR1	
LAC*	STR1	
AND	(??) /PAD NO	
OMQ	/PACK WORD	
DAC	TEMP	
ISZ	STR1	
ISZ	STR1	/PTS AT DF WORD
LAC	CNTR	
DAC	COUNT*	/LOCAL COUNTER
LAC	(PP-1	
DAC*	(10	
LAC*	STR1	
AND	(6???)	/CLEAR INDICATOR BIT
DAC*	STR1	
SSLOOP	LAC* 10	
SAD	TEMP*	
JMP	MARK	
ISZ	COUNT	
JMP	SSLOOP	
MARKED	ISZ NOFCNS	
JMP	LUPCCC	
ISZ	STR1	
LAC	STR1	
SAD	ENDCO*	
JMP	ALLMKD	/ALL CONNECTIONS MARKED
JMP	CCCLUP	/NEXT COMPONENT
MARK	LAC* STR1	
TAD	(100000	/STORE MARKING BIT
DAC*	STR1	

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450 00557 R 600545 R JMP MARKED /RETURN
451 00560 R 205371 R ALLMKD LAC PNTR1
452 00561 R 345536 R TAD ROUTAD
453 00562 R 723777 A AAC -1
454 00563 R 045546 R DAC ARG100*
455 00564 R 205534 R LAC CONNAD
456 00565 R 040575 R DAC ARG3
457 00566 R 125612 E JMS* READRT /UNPACK ROUTE
458 00567 R 600577 R JMP .+1+7
459 00570 R 005546 R ARG1 .DSA ARG100 /ROUTES (PNTR) ADDRESS
460 00571 R 004765 R .DSA BUFF1 /BUFFER
461 00572 R 000000 A ARG2 0 /EOROUT ADDRESS
462 00573 R 005645 R .DSA (1 /INDICATOR
463 00574 R 005371 R .DSA PNTR1 /POINTER
464 00575 R 000000 A ARG3 0 /CONNEX (1) ADDRESS
465 00576 R 000000 A ARG4 0 /EOCONN ADDRESS
466 00577 R 744010 A RCL
467 00600 R 205545 R LAC ALSING
468 00601 R 740600 A SNLISZA
469 00602 R 620460 R JMP* CONRUT
470 00603 R 750030 A CLA! IAC
471 00604 R 740400 A SNL
472 00605 R 750000 A CLA
473 00606 R 045364 R DAC STR
474 00607 R 205545 R LAC ALSING
475 00610 R 740031 A TCA
476 00611 R 741200 A SNA /ALL ROUTES CHECK?
477 00612 R 205364 R LAC STR /NO
478 00613 R 100670 R JMS CHKRT
479 00614 R 620460 R JMP* CONRUT
480 /
481 /
482 00615 R 000000 A UNPCK 0 /UNPACK ROUTE INFORMATION
483 00616 R 225372 R LAC* CONN1
484 00617 R 505641 R AND (??
485 00620 R 045365 R DAC PAD1
486 00621 R 225372 R LAC* CONN1
487 00622 R 742020 A RTR
488 00623 R 742020 A RTR
489 00624 R 742020 A RTR
490 00625 R 505646 R AND (7
491 00626 R 045366 R DAC WIDTH1
492 00627 R 045604 R DAC WIDSTR*
493 00630 R 225372 R LAC* CONN1
494 00631 R 505640 R AND (777000
495 00632 R 652000 A LMQ /SAVE FOR TREE PARAMETER
496 00633 R 742030 A SWHA
497 00634 R 045367 R DAC PTR2
498 00635 R 445372 R ISZ CONN1
499 00636 R 225372 R LAC* CONN1
500 00637 R 505641 R AND (??
501 00640 R 045373 R DAC PAD2

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502	00641	R	640002	A	LMQ	/GET POINTER TO COMP AND PAD NO IN SAME WORD
503	00642	R	044764	R	DAC	PP /STORE FOR ACCESS TO TREE
504	00643	R	225372	R	LAC*	CONN1
505	00644	R	652000	A	LMQ	
506	00645	R	445372	R	ISZ	CONN1
507	00646	R	225372	R	LAC*	CONN1
508	00647	R	744010	A	RCL	
509	00650	R	742010	A	RTL	
510	00651	R	640614	A	LLS	14
511	00652	R	505647	R	AND	(37777
512	00653	R	045371	R	DAC	PNTR1
513	00654	R	205545	R	LAC	ALSING
514	00655	R	741200	A	SNA	/ALL ROUTES CHECK?
515	00656	R	620615	R	JMP*	UNPCK /NO
516	00657	R	205370	R	LAC	PTR1
517	00660	R	740031	A	TCA	
518	00661	R	345367	R	TAD	PTR2
519	00662	R	741100	A	SPA	/SECOND ENTRY OF ROUTE?
520	00663	R	620460	R	JMP*	CONRUT /YES
521	00664	R	205371	R	LAC	PNTR1
522	00665	R	741200	A	SNA	/CONNECTION UNROUTED?
523	00666	R	620460	R	JMP*	CONRUT /YES
524	00667	R	620615	R	JMP*	UNPCK
525					.EJECT	

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00670 R 000000 A
00671 R 145557 R
00672 R 044752 R
00673 R 145572 R
00674 R 145573 R
00675 R 205535 R
00676 R 040707 R
00677 R 040723 R
00700 R 205533 R
00701 R 040710 R
00702 R 040724 R
00703 R 125615 E
00704 R 600713 R
00705 R 005527 R
00706 R 005530 R
00707 R 000000 A
00710 R 000000 A
00711 R 005367 R
00712 R 005373 R
00713 R 225650 R
00714 R 045571 R
00715 R 225651 R
00716 R 045472 R
00717 R 125615 E
00720 R 600727 R
00721 R 005525 R
00722 R 005526 R
00723 R 000000 A
00724 R 000000 A
00725 R 005370 R
00726 R 005365 R
00727 R 225650 R
00730 R 045570 R
00731 R 225651 R
00732 R 045471 R
00733 R 205525 R
00734 R 544766 R
00735 R 741000 A
00736 R 600742 R
00737 R 205526 R
00740 R 544767 R

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/
/               SUBROUTINE  CHKRT
/
/   THIS SUBROUTINE CHECKS A ROUTE UNPACKED IN BUFF1.
/   ON ENTRY ACC CONTAINS 1 IF ENTERED DURING SINGLE ROUTE CHECK OF
/   INVALID ROUTE, 0 FOR SINGLE ROUTE CHECK OF VALID ROUTE, -1 FOR
/   ALL ROUTES CHECK.
/
/-----
CHKRT  0
DZM  ENDSEG*  /MARKES ERROR DUE TO END OF SEG ON WRONG LAYER
DAC  ENTFLG  /SAVE ENTRY FLAG
DZM  PADPAS*
DZM  PADPS1*
      LAC COMPAD
      DAC HAR1
      DAC HAR11
      LAC LIBAD
      DAC HAR2
      DAC HAR22
JMS*  SUBNOD  /GET PAD CODE FOR END OF ROUTE
JMP  .+7
.DSA  XTWO
.DSA  YTWO
HAR1  0          /COMPS ARRAY
HAR2  0          /LIB ARRAY
.DSA  PTR2
.DSA  PAD2
LAC*  (17
DAC  PADED2  /STORE PAD CODE
LAC*  (16
DAC  LIB2
JMS*  SUBNOD
JMP  .+7
.DSA  XONE
.DSA  YONE
HAR11  0
HAR22  0
.DSA  PTR1
.DSA  PAD1
LAC*  (17
DAC  PADED1  /STORE PAD CODE
LAC*  (16
DAC  LIB1
LAC  XONE  /CHECK ASSUMED ENDS ARE CORRECT.
SAD  BUFF1+1
SKP
JMP  CHANGE  /ENDS IN WRONG ORDER.  CHANGE PAD CODES ROUND.
LAC  YONE
SAD  BUFF1+2

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578	00741	R	601005	R	JMP	CHKCOM	/ENDS CORRECT
579	00742	R	205527	R	CHANGE	LAC	(XTWO /ENDS WRONG. CHECK ROUTE ENDS ON PAD.
580	00743	R	544766	R	SAD	BUFF1	
581	00744	R	741000	A	SKP		
582	00745	R	601016	R	JMP	CKCOM1	/END NOT ON PAD
583	00746	R	205530	R	LAC	YTWO	
584	00747	R	544767	R	SAD	BUFF1+2	
585	00750	R	741000	A	SKP		
586	00751	R	601016	R	JMP	CKCOM1	/END NOT ON PAD
587	00752	R	204765	R	LAC	BUFF1	/END ON PAD. CHECK OTHER END.
588	00753	R	744010	A	RCL		
589	00754	R	344765	R	TAD	BUFF1	
590	00755	R	345652	R	TAD	(BUFF1	
591	00756	R	723776	A	AAC	-2	
592	00757	R	045364	R	DAC	STR	
593	00760	R	225364	R	LAC*	STR	
594	00761	R	545525	R	SAD	XONE	
595	00762	R	741000	A	SKP		
596	00763	R	601016	R	JMP	CKCOM1	/END NOT ON PAD.
597	00764	R	445364	R	ISZ	STR	
598	00765	R	225364	R	LAC*	STR	
599	00766	R	545526	R	SAD	YONE	
600	00767	R	741000	A	SKP		
601	00770	R	601016	R	JMP	CKCOM1	/END NOT ON PAD.
602	00771	R	205571	R	LAC	PADED2*	/ENDS ON PADS, BUT ENDS NEED SWAPPING.
603	00772	R	045364	R	DAC	STR	
604	00773	R	205570	R	LAC	PADED1*	
605	00774	R	045571	R	DAC	PADED2	
606	00775	R	205364	R	LAC	STR	
607	00776	R	045570	R	DAC	PADED1	
608	00777	R	205471	R	LAC	LIB1	
609	01000	R	045364	R	DAC	STR	
610	01001	R	205472	R	LAC	LIB2	
611	01002	R	045471	R	DAC	LIB1	
612	01003	R	205364	R	LAC	STR	
613	01004	R	045472	R	DAC	LIB2	
614	01005	R	205471	R	CHKCOM	LAC	LIB1
615	01006	R	742030	A	SWHA		
616	01007	R	505636	R	AND	(3	
617	01010	R	741200	A	SNA		
618	01011	R	601023	R	JMP	OTHEND	
619	01012	R	545637	R	SAD	(2	
620	01013	R	225542	R	LAC*	LAYNO	
621	01014	R	544770	R	SAD	BUFF1+3	
622	01015	R	601023	R	JMP	OTHEND	
623	01016	R	145466	R	CKCOM1	DZM	SEG1
624	01017	R	445466	R	ISZ	SEG1	
625	01020	R	777777	A	LAW	-1	
626	01021	R	045557	R	DAC	ENDSEG	
627	01022	R	601224	R	JMP	BADER	
628	01023	R	204765	R	OTHEND	LAC	BUFF1
629	01024	R	744010	A	RCL		

630	01025 R 344765 R	TAD	BUFF1	
631	01026 R 345652 R	TAD	(BUFF1	
632	01027 R 723775 A	AAC	-3	
633	01030 R 045364 R	DAC	STR	
634	01031 R 205472 R	LAC	LIB2	
635	01032 R 742030 A	SWHA		
636	01033 R 505636 R	AND	(3	
637	01034 R 741200 A	SNA		
638	01035 R 601050 R	JMP	CHKRT2	
639	01036 R 545637 R	SAD	(2	
640	01037 R 225542 R	LAC*	LAYNO	
641	01040 R 565364 R	SAD*	STR	
642	01041 R 601050 R	JMP	CHKRT2	
643	01042 R 204765 R	LAC	BUFF1	
644	01043 R 723777 A	AAC	-1	
645	01044 R 045466 R	DAC	SEG1	
646	01045 R 777777 A	LAW	-1	
647	01046 R 045557 R	DAC	ENDSEG	
648	01047 R 601224 R	JMP	BADER	
649	01050 R 104314 R	CHKRT2	JMS RECTSZ	/GET RECTANGLE ROUND ROUTE 1
650	01051 R 601054 R	JMP	.+3	
651	01052 R 004765 R	.DSA	BUFF1	
652	01053 R 005374 R	.DSA	RECT1	
653	01054 R 205545 R	LAC	ALSING	
654	01055 R 740200 A	SZA		
655	01056 R 601105 R	JMP	ADD2	
656	01057 R 205570 R	LAC	PADED1	
657	01060 R 723752 A	AAC	-26	
658	01061 R 740100 A	SMA	/EDGE CONN?	
659	01062 R 601067 R	JMP	ADD /YES	
660	01063 R 205571 R	LAC	PADED2	
661	01064 R 723752 A	AAC	-26	
662	01065 R 741100 A	SPA		
663	01066 R 601105 R	JMP	ADD2 /NO	
664	01067 R 205555 R	ADD	LAC EDGESZ	
665	01070 R 740031 A	TCA		
666	01071 R 345374 R	TAD	RECT1	
667	01072 R 045374 R	DAC	RECT1	
668	01073 R 205555 R	LAC	EDGESZ	
669	01074 R 740031 A	TCA		
670	01075 R 345376 R	TAD	RECT1+2	
671	01076 R 045376 R	DAC	RECT1+2	
672	01077 R 205555 R	LAC	EDGESZ	
673	01100 R 345375 R	TAD	RECT1+1	
674	01101 R 045375 R	DAC	RECT1+1	
675	01102 R 205555 R	LAC	EDGESZ	
676	01103 R 345377 R	TAD	RECT1+3	
677	01104 R 045377 R	DAC	RECT1+3	
678	01105 R 205534 R	ADD2	LAC CONNAD	
679	01106 R 044753 R	DAC	CONN2 /INITIALISE POINTER TO CONNS ARRAY	
680	01107 R 144763 R	DZM	VALMRK	
681	01110 R 224753 R	GOON3	LAC* CONN2	

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682 01111 R 505630 R (???)
683 01112 R 740031 A TCA
684 01113 R 044754 R DAC NOCON2 /NUMBER OF CONNECTIONS ON COMP
685 01114 R 224753 R LAC* CONN2
686 01115 R 742030 A SWHA
687 01116 R 505630 R AND (???)
688 01117 R 044755 R DAC PTR11 /POINTER BACK TO COMP
689 01120 R 444753 R ISZ CONN2
690 01121 R 224753 R GOON2 LAC* CONN2
691 01122 R 505641 R AND (??)
692 01123 R 044756 R DAC PAD11 /PAD ON THIS COMP
693 01124 R 224753 R LAC* CONN2
694 01125 R 742020 A RTR
695 01126 R 742020 A RTR
696 01127 R 742020 A RTR
697 01130 R 505646 R AND (??)
698 01131 R 044757 R DAC WIDTH2 /ROUTE WIDTH
699 01132 R 224753 R LAC* CONN2
700 01133 R 742030 A SWHA
701 01134 R 505630 R AND (???)
702 01135 R 044760 R DAC PTR22 /POINTER TO OTHER COMP.
703 01136 R 444753 R ISZ CONN2
704 01137 R 204755 R LAC PTR11
705 01140 R 740031 A TCA
706 01141 R 344760 R TAD PTR22
707 01142 R 741100 A SPA
708 01143 R 601255 R JMP NEXRT2 /SECOND ENTRY OF ROUTE. NOT OF INTEREST.
709 01144 R 224753 R LAC* CONN2
710 01145 R 505641 R AND (??)
711 01146 R 044761 R DAC PAD22 /PAD ON OTHER COMP
712 01147 R 224753 R LAC* CONN2
713 01150 R 652000 A LMQ
714 01151 R 444753 R ISZ CONN2
715 01152 R 224753 R LAC* CONN2
716 01153 R 505644 R AND (100000)
717 01154 R 740200 A SZA /CONN ON SAME TREE AS FIRST CONN?
718 01155 R 601256 R JMP NEXRT2+1 /YES
719 01156 R 224753 R LAC* CONN2
720 01157 R 744010 A RCL
721 01160 R 742010 A RTL
722 01161 R 640614 A LLS 14
723 01162 R 505647 R AND (37777)
724 01163 R 044762 R DAC PNTR2 /REL POINTER TO ROUTES ARRAY
725 01164 R 545371 R SAD PNTR1
726 01165 R 601256 R JMP NEXRT2+1 /AVOID CHECKING ROUTE AGAINST ITSELF.
727 01166 R 741200 A SNA
728 01167 R 601256 R JMP NEXRT2+1 /UNROUTED CONNECTION
729 01170 R 777777 A LAW -1
730 01171 R 104163 R JMS RTVAL /CHECK ROUTE FOR VALIDITY
731 01172 R 204762 R LAC PNTR2
732 01173 R 740010 A RAL /SET LINK IF ROUTE INVALID
733 01174 R 204752 R LAC ENTFLG

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734 01175 R 740300 A SMAISZA
735 01176 R 601203 R JMP CHECK /ENTRY FLAG=1
736 01177 R 740200 A SZA
737 01200 R 601252 R JMP ONEMIN /ENTRY FLAG=-1
738 01201 R 740400 A SNL
739 01202 R 601256 R JMP NEXRT2+1 /ROUTE VALID
740 01203 R 204762 R CHECK LAC PNTR2
741 01204 R 345536 R TAD ROUTAD
742 01205 R 723777 A AAC -1
743 01206 R 045546 R DAC ARG100
744 01207 R 205534 R LAC CONNAD
745 01210 R 041220 R DAC ARG33
746 01211 R 125612 E JMS* READRT
747 01212 R 601222 R JMP .+1+7
748 01213 R 005546 R ARG11 .DSA ARG100
749 01214 R 005131 R .DSA BUFF2
750 01215 R 000000 A ARG22 0
751 01216 R 005645 R .DSA (1
752 01217 R 004762 R .DSA PNTR2
753 01220 R 000000 A ARG33 0
754 01221 R 000000 A ARG44 0
755 01222 R 101277 R JMS RUTCHK
756 01223 R 601256 R JMP NEXRT2+1 /ROUTE O.K. GET NEXT ONE.
757 01224 R 205573 R BADER LAC PADPS1 /PAD CHECKING?
758 01225 R 741200 A SNA
759 01226 R 601231 R JMP .+3 /NO
760 01227 R 442161 R ISZ SEGSEG
761 01230 R 622161 R JMP* SEGSEG
762 01231 R 444763 R ISZ VALMRK
763 01232 R 205466 R LAC SEG1 /SET ROUTE 1 INVALID
764 01233 R 104163 R JMS RTVAL
765 01234 R 205371 R LAC PNTR1
766 01235 R 205572 R LAC PADPAS
767 01236 R 740200 A SZA
768 01237 R 620670 R JMP* CHKRT
769 01240 R 204752 R LAC ENTFLG
770 01241 R 741100 A SPA
771 01242 R 620670 R JMP* CHKRT
772 01243 R 205557 R LAC ENDSEG
773 01244 R 741100 A SPA
774 01245 R 620670 R JMP* CHKRT
775 01246 R 205467 R LAC SEG2 /SET ROUTE 2 INVALID
776 01247 R 104163 R JMS RTVAL
777 01250 R 204762 R LAC PNTR2
778 01251 R 601256 R JMP NEXRT2+1 /ENTRY FLAG 0 OR 1. CARRY ON CHECKING.
779 /
780 /
781 01252 R 740400 A ONEMIN SNL /ENTRY FLAG=-1
782 01253 R 601203 R JMP CHECK /ROUTE VALID
783 01254 R 601256 R JMP NEXRT2+1 /ROUTE INVALID
784 /
785 /

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786 01255 R 444753 R      IS2 CONN2 /INCREMENT TO NEXT CONNECTION
787 01256 R 444753 R      IS2 CONN2 /
788 01257 R 444754 R      IS2 NOCON2 /CHECK NO OF CONNECTIONS
789 01260 R 601121 R      JMP GOON2
790 01261 R 204753 R      LAC CONN2
791 01262 R 545553 R      SAD CONEND
792 01263 R 741000 A      SKP
793 01264 R 601110 R      JMP GOON3 /GET CONNECTIONS TO NEXT COMPONENT
794 01265 R 445572 R      IS2 PADPAS
795 01266 R 601511 R      JMP NOWPAD
796 01267 R 145572 R      FINI DZM PADPAS
797 01270 R 204763 R      LAC VALMRK
798 01271 R 740200 A      SZA
799 01272 R 620670 R      JMP* CHKRT
800 01273 R 750000 A      CLA
801 01274 R 104163 R      JMS RTVAL /SET ROUTE VALID
802 01275 R 205371 R      LAC PNTR1
803 01276 R 620670 R      JMP* CHKRT
804 /
805 /
806 /
807 .EJECT
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008 01277 R 000000 A RUTCHK 0
009 01300 R 104314 R JMS RECTS2 /FIND RECTANGLE OF SECOND ROUTE
010 01301 R 601304 R JMP .+3
011 01302 R 005131 R .DSA BUFF2
012 01303 R 005400 R .DSA RECT2
013 01304 R 125613 E JMS* RECTOL /CHECK FOR RECTANGLES OVERLAP.
014 01305 R 601310 R JMP .+3
015 01306 R 005374 R .DSA RECT1
016 01307 R 005400 R .DSA RECT2
017 01310 R 741200 A SNA /OVERLAP
018 01311 R 621277 R JMP* RUTCHK /NO OVERLAP
019 / OVERLAP. UNPACK AND CHECK ROUTE 2 SEGMENT BY SEGMENT.
020 01312 R 145467 R DZM SEG2
021 01313 R 205653 R LAC (BUFF2
022 01314 R 723777 A AAC -1
023 01315 R 065624 R DAC* (10
024 01316 R 220010 A LAC* 10
025 01317 R 740031 A TCA
026 01320 R 045411 R DAC CNT2 /NO OF POINTS
027 01321 R 220010 A LAC* 10 /GET FIRST POINT
028 01322 R 045433 R DAC X11
029 01323 R 220010 A LAC* 10
030 01324 R 045435 R DAC Y11
031 01325 R 220010 A LAC* 10
032 01326 R 045416 R DAC ZIDE1
033 01327 R 045512 R DAC NLAY11
034 01330 R 045514 R DAC NLAY22
035 01331 R 045504 R DAC LAY22
036 01332 R 445411 R ISZ CNT2
037 01333 R 445467 R ISZ SEG2
038 01334 R 205535 R LAC COMPAD
039 01335 R 041346 R DAC HA1
040 01336 R 041362 R DAC HA11
041 01337 R 205533 R LAC LIBAD
042 01340 R 041347 R DAC HA2
043 01341 R 041363 R DAC HA22
044 01342 R 125615 E JMS* SUBNOD /FIND PAD CODE FOR END OF ROUTE
045 01343 R 601352 R JMP .+7
046 01344 R 005437 R .DSA XY1
047 01345 R 005441 R .DSA YY1
048 01346 R 000000 A HA1 0
049 01347 R 000000 A HA2 0
050 01350 R 004760 R .DSA PTR22
051 01351 R 004761 R .DSA PAD22
052 01352 R 225650 R LAC* (17
053 01353 R 045567 R DAC PADD22*
054 01354 R 225651 R LAC* (16
055 01355 R 045474 R DAC LIB22
056 01356 R 125615 E JMS* SUBNOD /GET PAD CODE AND POSITION FOR BEGINNING OF ROUTE
057 01357 R 601366 R JMP .+7
058 01360 R 005437 R .DSA XY1
059 01361 R 005441 R .DSA YY1

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860	01362 R 000000 A	HALT 0
861	01363 R 000000 A	HALT 0
862	01364 R 004755 R	.DSA PTR11
863	01365 R 004756 R	.DSA PAD11
864	01366 R 225650 R	LAC* (17
865	01367 R 045501 R	DAC END11 /STORE PAD CODE
866	01370 R 225651 R	LAC* (16
867	01371 R 045473 R	DAC LIB11
868	01372 R 205437 R	LAC XY1 /CHECK ASSUMED BEGINNING OF ROUTE IS ACTUAL BEGINNING
869	01373 R 545433 R	SAD X11
870	01374 R 741000 A	SKP
871	01375 R 601401 R	JMP CHANG1 /NO. ALTER END CODES
872	01376 R 205445 R	LAC YY11
873	01377 R 545431 R	SAD Y1
874	01400 R 601415 R	JMP ONON /ENDS CORRECT
875	01401 R 205501 R	CHANG1 LAC END11 /ENDS WRONG. SWAP
876	01402 R 045364 R	DAC STR
877	01403 R 205567 R	LAC PADD22
878	01404 R 045501 R	DAC END11
879	01405 R 205364 R	LAC STR
880	01406 R 045567 R	DAC PADD22
881	01407 R 205473 R	LAC LIB11
882	01410 R 045364 R	DAC STR
883	01411 R 205474 R	LAC LIB22
884	01412 R 045473 R	DAC LIB11
885	01413 R 205364 R	LAC STR
886	01414 R 045474 R	DAC LIB22
887	01415 R 205433 R	ONON LAC X11
888	01416 R 104700 R	JMS DSTTOU
889	01417 R 045433 R	DAC X11
890	01420 R 205435 R	LAC Y11
891	01421 R 104700 R	JMS DSTTOU
892	01422 R 045435 R	DAC Y11
893	01423 R 205473 R	LAC LIB11
894	01424 R 742030 A	SWHA
895	01425 R 505636 R	AND (3
896	01426 R 545637 R	SAD (2
897	01427 R 225542 R	LAC* LAYNO
898	01430 R 045502 R	DAC LAY11
899	01431 R 601453 R	JMP ON1
900	01432 R 445467 R	NEXSEG ISZ SEG2
901	01433 R 445411 R	ISZ CNT2
902	01434 R 741000 A	SKP
903	01435 R 621277 R	JMP* RUTCHK
904	01436 R 205434 R	LAC X22
905	01437 R 045433 R	DAC X11
906	01440 R 205436 R	LAC Y22
907	01441 R 045435 R	DAC Y11
908	01442 R 205504 R	LAC LAY22
909	01443 R 045502 R	DAC LAY11
910	01444 R 205417 R	LAC ZIDE2
911	01445 R 045416 R	DAC ZIDE1

912	01446 R 045512 R	DAC	NLAY11	
913	01447 R 045514 R	DAC	NLAY22	
914	01450 R 045504 R	DAC	LAY22	
915	01451 R 205503 R	LAC	END22	
916	01452 R 045501 R	DAC	END11	
917	01453 R 220010 A	ON1 LAC* 10	/GET NEXT POINT	
918	01454 R 104700 R	JMS	DSTTOU	
919	01455 R 045434 R	DAC	X22	
920	01456 R 220010 A	LAC*	10	
921	01457 R 104700 R	JMS	DSTTOU	
922	01460 R 045436 R	DAC	Y22	
923	01461 R 204757 R	LAC	WIDTH2	
924	01462 R 740031 A	TCA		
925	01463 R 045503 R	DAC	END22	
926	01464 R 220010 A	LAC*	10	
927	01465 R 045417 R	DAC	ZIDE2	
928	01466 R 545416 R	SAD	ZIDE1	
929	01467 R 601472 R	JMP	.+3	
930	01470 R 145503 R	DZM	END22	
931	01471 R 145504 R	DZM	LAY22	
932	01472 R 205411 R	LAC	CNT2	
933	01473 R 545654 R	SAD (-1	/END OF ROUTE?	
934	01474 R 741000 A	SKP	/YES	
935	01475 R 601506 R	JMP	LETSEA	
936	01476 R 205567 R	LAC	PADD22	
937	01477 R 045503 R	DAC	END22	
938	01500 R 205474 R	LAC	LIB22	
939	01501 R 742030 A	SWHA		
940	01502 R 505636 R	AND (3		
941	01503 R 545637 R	SAD (2		
942	01504 R 225542 R	LAC*	LAYNO	
943	01505 R 045504 R	DAC	LAY22	
944	01506 R 101665 R	LETSEA JMS	UNPCK1	
945	01507 R 601432 R	JMP	NEXSEG	
946		/		
947	01510 R 601224 R	BAD JMP	BADER	
948		.EJECT		

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01511 R 205535 R
01512 R 045551 R
01513 R 345560 R
01514 R 723777 A
01515 R 045550 R
01516 R 205551 R
01517 R 723003 A
01520 R 045551 R
01521 R 225551 R
01522 R 505630 R
01523 R 345533 R
01524 R 723777 A
01525 R 045364 R
01526 R 225364 R
01527 R 723774 A
01530 R 652000 A
01531 R 754000 A
01532 R 640323 A
01533 R 000004 A
01534 R 045364 R
01535 R 641002 A
01536 R 673122 A
01537 R 000003 A
01540 R 641002 A
01541 R 345364 R
01542 R 045565 R
01543 R 741200 A
01544 R 601657 R
01545 R 205535 R
01546 R 740031 A
01547 R 345551 R
01550 R 723776 A
01551 R 652000 A
01552 R 754000 A
01553 R 640323 A
01554 R 000006 A
01555 R 641002 A
01556 R 045552 R
01557 R 205535 R
01560 R 041567 R
01561 R 205533 R
01562 R 041570 R
01563 R 125615 E
01564 R 601573 R

PART OF SUBROUTINE CHKRT

THIS LUMP OF CODE SETS THINGS UP FOR THE CHECKING
OF PADS AGAINST THE ROUTE

NOWPAD LAC COMPAD
DAC COMPCT*
TAD EOCOMP
AAC -1
DAC COMEND*
AGAIN LAC COMPCT
AAC 3
DAC COMPCT /POINT TO LIBRARY WORD
LAC* COMPCT /LIBRARY WORD
AND (??? /REL POINTER TO LIBRARY
TAD LIBAD
AAC -1
DAC STR
LAC* STR /FIRST WORD IN LIBRARY ENTRY
AAC -4
LMQ
CLL!CLA
DIV
4
DAC STR /SAVE REMAINDER
LACQ
MUL160000 /ACC POSITIVE SO 660000 CLEARS LINK
3
LACQ
TAD STR
DAC NOPADS* /NO OF PADS ON COMPONENT
SNA
JMP NEXCOM /NO PADS ON COMP
LAC COMPAD
TCA
TAD COMPCT
AAC -2
LMQ
CLL!CLA
DIV
6
LACQ
DAC COMREL* /REL. PTR. TO COMP.
NOWPAD LAC COMPAD
DAC HAA1
LAC LIBAD
DAC HAA2
JMS* SUBNOD
JMP .+?

PAGE	02	SINGRT SRC	SINGRT	751127
1001	01565	R 005433	R	.DSA X11
1002	01566	R 005435	R	.DSA Y11
1003	01567	R 000000	A	HAA1 0
1004	01570	R 000000	A	HAA2 0
1005	01571	R 005552	R	.DSA COMREL
1006	01572	R 005565	R	.DSA NOPADS
1007	01573	R 205433	R	LAC X11
1008	01574	R 545525	R	SAD XONE /X COORD OF END1 OF ROUTE
1009	01575	R 741000	A	SKP
1010	01576	R 601602	R	JMP ENDTWO
1011	01577	R 205435	R	LAC Y11
1012	01600	R 545526	R	SAD YONE /Y COORD OF END 1 OF ROUTE
1013	01601	R 601651	R	JMP NPAD /PAD IS ON END 1 OF ROUTE
1014	01602	R 205433	R	ENDTWO LAC X11
1015	01603	R 545527	R	SAD XTWO /X COORD OF END 2 OF ROUTE
1016	01604	R 741000	A	SKP
1017	01605	R 601611	R	JMP ENDTRE
1018	01606	R 205435	R	LAC Y11
1019	01607	R 545530	R	SAD YTWO /Y COORD OF END 2 OF ROUTE
1020	01610	R 601651	R	JMP NPAD /PAD ON END 2 OF ROUTE
1021	01611	R 205433	R	ENDTRE LAC X11
1022	01612	R 104700	R	JMS DSTTOU
1023	01613	R 045433	R	DAC X11
1024	01614	R 205435	R	LAC Y11
1025	01615	R 104700	R	JMS DSTTOU
1026	01616	R 045435	R	DAC Y11
1027	01617	R 225651	R	LAC* (16 /LIBRARY WORD
1028	01620	R 742030	A	SWHA
1029	01621	R 505636	R	AND (3
1030	01622	R 545637	R	SAD (2
1031	01623	R 225542	R	LAC* LAYNO
1032	01624	R 045416	R	DAC ZIDE1 /STORE PAD SIDE
1033	01625	R 045502	R	DAC LAY11
1034	01626	R 045504	R	DAC LAY22
1035	01627	R 045512	R	DAC NLAY11
1036	01630	R 045514	R	DAC NLAY22
1037	01631	R 225650	R	LAC* (17 /PAD TYPE
1038	01632	R 045501	R	DAC END11
1039	01633	R 045503	R	DAC END22
1040	01634	R 740031	A	TCA
1041	01635	R 044757	R	DAC WIDTH2
1042	01636	R 741200	A	SNA /CODE OF PAD A ZERO?
1043	01637	R 601651	R	JMP NPAD /YES
1044	01640	R 225651	R	LAC* (16 /GET PAD ORIENTATION
1045	01641	R 045566	R	DAC ORISZ*
1046	01642	R 104623	R	JMS ORI
1047	01643	R 601650	R	JMP .+5
1048	01644	R 005433	R	.DSA X11
1049	01645	R 005434	R	.DSA X22
1050	01646	R 005501	R	.DSA END11
1051	01647	R 005566	R	.DSA ORISZ
1052	01650	R 101665	R	ORFIN JMS UNPCK1

1053	01651	R	205565	R	LAC	NOPADS	/SET UP FOR NEXT PAD
1054	01652	R	723777	A	RAC	-1	
1055	01653	R	045565	R	DAC	NOPADS	
1056	01654	R	741200	A	SNA	/END OF PADS?	
1057	01655	R	601657	R	JMP	NEXCOM	/YES
1058	01656	R	601557	R	JMP	NEWPAD	/NO
1059	01657	R	205551	R	NEXCOM	LAC	COMPCT
1060	01660	R	723003	A	RAC	3	
1061	01661	R	045551	R	DAC	COMPCT	/POINT TO FIRST WORD OF NEXT COMP
1062	01662	R	545550	R	SAD	COMEND	/ALL COMPS DONE?
1063	01663	R	601267	R	JMP	FINI	/YES
1064	01664	R	601516	R	JMP	AGAIN	/NO
1065						.EJECT	

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01665 R 000000 A	UNPCK1 0	
01666 R 104431 R	JMS RECTGT	/GET RECTANGLE
01667 R 601672 R	JMP .+3	
01670 R 005433 R	.DSA X11	
01671 R 005400 R	.DSA RECT2	
01672 R 125613 E	JMS* RECTOL	/CHECK FOR OVERLAP. WHOLE OF ROUTE1 AGAINST /SEGMENT OF ROUTE 2
01673 R 601676 R	JMP .+3	
01674 R 005374 R	.DSA RECT1	
01675 R 005400 R	.DSA RECT2	
01676 R 741200 A	SNA /OVERLAP?	
01677 R 621665 R	JMP* UNPCK1	
01700 R 145466 R	/OVERLAP. UNPACK AND CHECK ROUTE 1 SEGMENT BY SEGMENT	
01701 R 205652 R	DZM SEG1	
01702 R 723777 A	LAC (BUFF1	
01703 R 065627 R	AAC -1	
01704 R 220011 A	DAC* (11	
01705 R 740031 A	LAC* 11	
01706 R 045410 R	TCA	
01707 R 220011 A	DAC CNT1	
01710 R 104700 R	LAC* 11	/GET FIRST POINT
01711 R 045427 R	JMS DSTTOU	
01712 R 220011 A	DAC X1	
01713 R 104700 R	LAC* 11	
01714 R 045431 R	JMS DSTTOU	
01715 R 220011 A	DAC Y1	
01716 R 045414 R	LAC* 11	
01717 R 045601 R	DAC SIDE1	
01720 R 045506 R	DAC STRSDE*	
01721 R 045510 R	DAC NLAY1	
01722 R 045500 R	DAC NLAY2	
01723 R 205570 R	DAC LAY2	
01724 R 740031 A	LAC PADED1	
01725 R 741200 A	TCA	
01726 R 205366 R	SNA /ZERO PAD CODE?	
01727 R 740031 A	LAC WIDTH1	/YES
01730 R 045475 R	TCA	
01731 R 205471 R	DAC END1	
01732 R 742030 A	LAC LIB1	
01733 R 505636 R	SWHA	
01734 R 545637 R	AND (3	
01735 R 225542 R	SAD (2	
01736 R 045476 R	LAC* LAYNO	
	DAC LAY1	

1118	01737	R	445466	R	162	SEG1
1119	01740	R	445410	R	162	CNT1
1120	01741	R	205475	R	162	END
1121	01742	R	723752	A	162	-26
1122	01743	R	740000	A	162	NOP
1123	01744	R	602077	R	162	JMP ON2
1124	01745	R	205572	R	162	LAC PADPAS
1125	01746	R	741000	A	162	SKP
1126	01747	R	601753	R	162	JMP DOPADS
1127	01750	R	205545	R	162	LAC ALSING
1128	01751	R	740200	A	162	SZA
1129	01752	R	602077	R	162	JMP ON2
1130	01753	R	104623	R	162	DOPADS JMS ORI
1131	01754	R	601761	R	162	JMP .+5
1132	01755	R	005427	R	162	.DSA X1
1133	01756	R	005430	R	162	.DSA X2
1134	01757	R	005475	R	162	.DSA END1
1135	01760	R	005471	R	162	.DSA LIB1
1136	01761	R	205475	R	162	LAC END1
1137	01762	R	045477	R	162	DAC END2
1138	01763	R	740031	A	162	TCA
1139	01764	R	045366	R	162	DAC WIDTH1
1140	01765	R	205476	R	162	LAC LAY1
1141	01766	R	045414	R	162	DAC SIDE1
1142	01767	R	045510	R	162	DAC NLAY2
1143	01770	R	045506	R	162	DAC NLAY1
1144	01771	R	045500	R	162	DAC LAY2
1145	01772	R	445573	R	162	ISZ PADPS1
1146	01773	R	102161	R	162	JMS SEGSEG
1147	01774	R	445573	R	162	ISZ PADPS1
1148	01775	R	205604	R	162	LAC WIDSTR
1149	01776	R	045366	R	162	DAC WIDTH1
1150	01777	R	205573	R	162	LAC PADPS1
1151	02000	R	545645	R	162	SAD (1
1152	02001	R	602004	R	162	JMP .+3
1153	02002	R	145573	R	162	DZM PADPS1
1154	02003	R	601224	R	162	JMP BADER
1155	02004	R	145573	R	162	DZM PADPS1
1156	02005	R	205601	R	162	LAC STRSDE
1157	02006	R	045506	R	162	DAC NLAY1
1158	02007	R	045510	R	162	DAC NLAY2
1159	02010	R	045500	R	162	DAC LAY2
1160	02011	R	602077	R	162	JMP ON2
1161	02012	R	445410	R	162	NSEG ISZ CNT1
1162	02013	R	602061	R	162	JMP NSEG21
1163	02014	R	205572	R	162	LAC PADPAS
1164	02015	R	740200	A	162	SZA
1165	02016	R	602022	R	162	JMP DOPAD2
1166	02017	R	205545	R	162	LAC ALSING
1167	02020	R	740200	A	162	SZA
1168	02021	R	621665	R	162	JMP* UNPCK1
1169	02022	R	621665	R	162	DOPAD2 JMP* UNPCK1

1170	02023 R 723752 A	AAC -26
1171	02024 R 741100 A	SPA
1172	02025 R 621665 R	JMP* UNPCK1
1173	02026 R 723026 A	AAC 26
1174	02027 R 045475 R	DAC END1
1175	02030 R 740031 A	TCA
1176	02031 R 045366 R	DAC WIDTH1
1177	02032 R 104623 R	JMS ORI
1178	02033 R 602040 R	JMP .+5
1179	02034 R 005430 R	.DSA X2
1180	02035 R 005427 R	.DSA X1
1181	02036 R 005475 R	.DSA END1
1182	02037 R 005472 R	.DSA LIB2
1183	02040 R 205500 R	LAC LAY2
1184	02041 R 045476 R	DAC LAY1
1185	02042 R 045506 R	DAC NLAY1
1186	02043 R 045510 R	DAC NLAY2
1187	02044 R 045414 R	DAC SIDE1
1188	02045 R 445573 R	ISZ PADPS1
1189	02046 R 102161 R	JMS SEGSEG
1190	02047 R 445573 R	ISZ PADPS1
1191	02050 R 205604 R	LAC WIDSTR
1192	02051 R 045366 R	DAC WIDTH1
1193	02052 R 205572 R	LAC PADPAS1
1194	02053 R 545645 R	SAD (1
1195	02054 R 602057 R	JMP .+3
1196	02055 R 145573 R	DZM PADPS1
1197	02056 R 601224 R	JMP BADER
1198	02057 R 145573 R	DZM PADPS1
1199	02060 R 621665 R	JMP* UNPCK1
1200	02061 R 205430 R	NSEG21 LAC X2
1201	02062 R 045427 R	DAC X1
1202	02063 R 205432 R	LAC Y2
1203	02064 R 045431 R	DAC Y1
1204	02065 R 205500 R	LAC LAY2
1205	02066 R 045476 R	DAC LAY1
1206	02067 R 205415 R	LAC SIDE2
1207	02070 R 045414 R	DAC SIDE1
1208	02071 R 045506 R	DAC NLAY1
1209	02072 R 045510 R	DAC NLAY2
1210	02073 R 045500 R	DAC LAY2
1211	02074 R 445466 R	ISZ SEG1
1212	02075 R 205477 R	LAC END2
1213	02076 R 045475 R	DAC END1
1214	02077 R 220011 A	ON2 LAC* 11 /GET NEXT POINT
1215	02100 R 104700 R	JMS DSTTOU
1216	02101 R 045430 R	DAC X2
1217	02102 R 220011 A	LAC* 11
1218	02103 R 104700 R	JMS DSTTOU
1219	02104 R 045432 R	DAC Y2
1220	02105 R 205366 R	LAC WIDTH1
1221	02106 R 740031 A	TCA

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1222 02107 R 045477 R END2
1223 02110 R 220011 A LAC* 11
1224 02111 R 045415 R DAC SIDE2
1225 02112 R 545414 R SAD SIDE1
1226 02113 R 602116 R JMP .+3
1227 02114 R 145477 R DZM END2
1228 02115 R 145500 R DZM LAY2
1229 02116 R 205410 R LAC CNT1
1230 02117 R 545654 R SAD (-1
1231 02120 R 741000 A SKP
1232 02121 R 602137 R JMP LETSEE
1233 02122 R 205571 R LAC PADED2
1234 02123 R 740031 A TCA
1235 02124 R 741200 A SNA /ZERO PAD CODE
1236 02125 R 205366 R LAC WIDTH1 /YES
1237 02126 R 740031 A TCA
1238 02127 R 045477 R DAC END2
1239 02130 R 205472 R LAC LIB2
1240 02131 R 742030 A SWHA
1241 02132 R 505636 R AND (3
1242 02133 R 545637 R SAD (2
1243 02134 R 225542 R LAC* LAYNO
1244 02135 R 045500 R DAC LAY2
1245 02136 R 602157 R JMP CHEKON
1246 02137 R 205411 R LETSEE LAC CNT2
1247 02140 R 545654 R SAD (-1
1248 02141 R 602157 R JMP CHEKON
1249 02142 R 205572 R LAC PADPAS
1250 02143 R 740200 A SZA
1251 02144 R 602157 R JMP CHEKON
1252 02145 R 205475 R LAC END1
1253 02146 R 740100 A SMA
1254 02147 R 602157 R JMP CHEKON
1255 02150 R 205501 R LAC END11
1256 02151 R 740100 A SMA
1257 02152 R 602157 R JMP CHEKON /PTH OR PAD
1258 02153 R 205414 R LAC SIDE1
1259 02154 R 545416 R SAD ZIDE1
1260 02155 R 602157 R JMP CHEKON
1261 02156 R 602012 R JMP NSEG /DIFFERENT SIDES
1262 02157 R 102161 R CHEKON JMS SEGSEG
1263 02160 R 602012 R JMP NSEG

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1264 /
1265 /
1266 /-----/
1267 /
1268 / SUBROUTINE SEGSEG /
1269 / /
1270 / CHECKS SEGMENT AGAINST SEGMENT /
1271 / EXPECTS THE RECTANGLE FOR XII ETC TO BE UNPACKED /
1272 / IN RECT2. /
1273 / THE FOLLOWING FLAGS ARE RELEVANT!- /

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1274      / ALBING SET IF AN ALL ROUTE CHECK      /
1275      / PADPAS SET IF X11 ETC REPRESENTS A PAD  /
1276      / PADPS1 SET IF X1 ETC REPRESENTS A PAD   /
1277      /-----/
1278
1279      02161 R 000000 A SEGSEG 0
1280      02162 R 104431 R JMS RECTGT
1281      02163 R 602166 R JMP .+3
1282      02164 R 005427 R .DSA X1
1283      02165 R 005404 R .DSA RECT3
1284      02166 R 125613 E JMS* RECTOL
1285      02167 R 602172 R JMP .+3
1286      02170 R 005404 R .DSA RECT3
1287      02171 R 005400 R .DSA RECT2
1288      02172 R 741200 A SNA /OVERLAP?
1289      02173 R 622161 R JMP* SEGSEG
1290      / SET UP OFFSET ENDS OF SEGMENT
1291      /
1292      /
1293      02174 R 205624 R LAC (10
1294      02175 R 722000 A PAL
1295      02176 R 735000 A CLX
1296      02177 R 235523 R LAC* ND1AD,X
1297      02200 R 075524 R DAC* NND1AD,X
1298      02201 R 725002 A AXS 2
1299      02202 R 602177 R JMP .-3
1300      02203 R 205505 R LAC NEND1
1301      02204 R 740200 A SZA /THRO' HOLE?
1302      02205 R 602211 R JMP L1000 /NO
1303      02206 R 205366 R LAC WIDTH1
1304      02207 R 740031 A TCA
1305      02210 R 045505 R DAC NEND1 /SET END1 TO TRACK CODE
1306      02211 R 205511 R L1000 LAC NEND11
1307      02212 R 740200 A SZA /THRO' HOLE
1308      02213 R 602217 R JMP L2000 /NO
1309      02214 R 204757 R LAC WIDTH2
1310      02215 R 740031 A TCA
1311      02216 R 045511 R DAC NEND11 /SET END11 TO TRACK CODE
1312      02217 R 735000 A L2000 CLX
1313      02220 R 205655 R LAC (X1
1314      02221 R 045460 R DAC STR1
1315      02222 R 205656 R LAC (XY1
1316      02223 R 045461 R DAC STR2
1317      02224 R 205657 R LAC (XNEW1
1318      02225 R 045602 R DAC STR3*
1319      02226 R 235460 R GOING LAC* STR1,X
1320      02227 R 075461 R DAC* STR2,X
1321      02230 R 075602 R DAC* STR3,X
1322      02231 R 725001 A AXS 1
1323      02232 R 602226 R JMP GOING
1324      02233 R 205573 R LAC PADPS1
1325      02234 R 740200 A SZA /PAD IN X1 ETC?

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PAGE	29	SINGRT SRC	SINGRT	751127
1326	02235 R 602276 R	NOTE2 /YES		
1327	02236 R 205475 R	END1 /END CODE		
1328	02237 R 741300 A	SPA SNA /PAD CODE?		
1329	02240 R 602256 R	JMP NOTE1 /NO		
1330	02241 R 723752 A	AAC -26 /YES		
1331	02242 R 740100 A	SMA /EDGE CONNECTOR?		
1332	02243 R 602256 R	JMP NOTE1 /YES		
1333	02244 R 104006 R	JMS OFFSET /DO OFFSET		
1334	02245 R 602253 R	JMP .+6		
1335	02246 R 005440 R	.DSA XY2		
1336	02247 R 005437 R	.DSA XY1		
1337	02250 R 005447 R	.DSA XNEW1		
1338	02251 R 005366 R	.DSA WIDTH1		
1339	02252 R 005414 R	.DSA SIDE1		
1340	02253 R 205366 R	LAC WIDTH1		
1341	02254 R 740031 A	TCA		
1342	02255 R 045505 R	DAC NEND1		
1343	02256 R 205477 R	NOTE1 LAC END2		
1344	02257 R 741300 A	SPA SNA		
1345	02260 R 602276 R	JMP NOTE2		
1346	02261 R 723752 A	AAC -26		
1347	02262 R 740100 A	SMA		
1348	02263 R 602276 R	JMP NOTE2		
1349	02264 R 104006 R	JMS OFFSET		
1350	02265 R 602273 R	JMP .+6		
1351	02266 R 005437 R	.DSA XY1		
1352	02267 R 005440 R	.DSA XY2		
1353	02270 R 005450 R	.DSA XNEW2		
1354	02271 R 005366 R	.DSA WIDTH1		
1355	02272 R 005414 R	.DSA SIDE1		
1356	02273 R 205366 R	LAC WIDTH1		
1357	02274 R 740031 A	TCA		
1358	02275 R 045507 R	DAC NEND2		
1359	02276 R 205572 R	NOTE2 LAC PADPAS		
1360	02277 R 740200 A	SZA /PAD CHECKING?		
1361	02300 R 602341 R	JMP NOTE4 /YES		
1362	02301 R 205501 R	LAC END11		
1363	02302 R 741300 A	SPA SNA		
1364	02303 R 602321 R	JMP NOTE3		
1365	02304 R 723752 A	AAC -26		
1366	02305 R 740100 A	SMA		
1367	02306 R 602321 R	JMP NOTE3		
1368	02307 R 104006 R	JMS OFFSET		
1369	02310 R 602316 R	JMP .+6		
1370	02311 R 005444 R	.DSA XY22		
1371	02312 R 005443 R	.DSA XY11		
1372	02313 R 005453 R	.DSA XNEW11		
1373	02314 R 004757 R	.DSA WIDTH2		
1374	02315 R 005416 R	.DSA ZIDE1		
1375	02316 R 204757 R	LAC WIDTH2		
1376	02317 R 740031 A	TCA		
1377	02320 R 045511 R	DAC NEND11		

1378	02321 R 205503 R	NOTE3 LAC END22
1379	02322 R 741300 A	SPA1SNA
1380	02323 R 602341 R	JMP NOTE4
1381	02324 R 723752 A	AAC -26
1382	02325 R 740100 A	SMA
1383	02326 R 602341 R	JMP NOTE4
1384	02327 R 104006 R	JMS OFFSET
1385	02330 R 602336 R	JMP .+6
1386	02331 R 005443 R	.DSA XY11
1387	02332 R 005444 R	.DSA XY22
1388	02333 R 005454 R	.DSA XNEW22
1389	02334 R 004757 R	.DSA WIDTH2
1390	02335 R 005416 R	.DSA ZIDE1
1391	02336 R 204757 R	LAC WIDTH2
1392	02337 R 740031 A	TCA
1393	02340 R 045513 R	DAC NEND22
1394	02341 R 205632 R	NOTE4 LAC (4
1395	02342 R 721000 A	PAX
1396	02343 R 722000 A	PAL
1397	02344 R 205572 R	LAC PADPAS /PAD CHECKING?
1398	02345 R 740200 A	SZA
1399	02346 R 205624 R	LAC (10 /YES
1400	02347 R 740200 A	SZA
1401	02350 R 722000 A	PAL /YES
1402	02351 R 205573 R	LAC PADPS1 /X1 A PAD?
1403	02352 R 740200 A	SZA
1404	02353 R 735000 A	CLX /YES
1405	02354 R 205545 R	LAC ALSING /ALL ROUTES CHECK?
1406	02355 R 741200 A	SNA
1407	02356 R 602362 R	JMP .+4 /NO
1408	02357 R 735000 A	CLX
1409	02360 R 205624 R	LAC (10
1410	02361 R 722000 A	PAL
1411	02362 R 725000 A	AXS 0
1412	02363 R 741000 A	SKP
1413	02364 R 602373 R	JMP PADSTO
1414	02365 R 235523 R	LAC* NDIAD,X
1415	02366 R 740300 A	SZA1SMA /PAD?
1416	02367 R 235524 R	LAC* NNDIAD,X /YES. LOAD ALTERNATIVE END CODE.
1417	02370 R 075523 R	DAC* NDIAD,X
1418	02371 R 725002 A	AXS 2
1419	02372 R 602365 R	JMP .-5
1420	02373 R 103130 R	PADSTO JMS CHKEND
1421	02374 R 602403 R	JMP .+7
1422	02375 R 005453 R	.DSA XNEW11
1423	02376 R 005447 R	.DSA XNEW1
1424	02377 R 005450 R	.DSA XNEW2
1425	02400 R 005366 R	.DSA WIDTH1
1426	02401 R 005414 R	.DSA SIDE1
1427	02402 R 005511 R	.DSA NEND11
1428	02403 R 102544 R	JMS ENDOF2
1429	02404 R 602410 R	JMP .+4

1430	02405	R	005453	R	.DSA	XNEW1
1431	02406	R	005511	R	.DSA	NEND11
1432	02407	R	005424	R	.DSA	MODST
1433	02410	R	205501	R	LAC	END11
1434	02411	R	545511	R	SAD	NEND11
1435	02412	R	602430	R	JMP	POINTR
1436	02413	R	103130	R	PADSKP	JMS CHKEND
1437	02414	R	602423	R	JMP	.+7
1438	02415	R	005443	R	.DSA	XY11
1439	02416	R	005447	R	.DSA	XNEW1
1440	02417	R	005450	R	.DSA	XNEW2
1441	02420	R	005366	R	.DSA	WIDTH1
1442	02421	R	005414	R	.DSA	SIDE1
1443	02422	R	005501	R	.DSA	END11
1444	02423	R	102544	R	JMS	ENDOF2
1445	02424	R	602430	R	JMP	.+4
1446	02425	R	005443	R	.DSA	XY11
1447	02426	R	005501	R	.DSA	END11
1448	02427	R	005424	R	.DSA	MODST
1449	02430	R	103130	R	POINTR	JMS CHKEND
1450	02431	R	602440	R	JMP	.+7
1451	02432	R	005454	R	.DSA	XNEW22
1452	02433	R	005447	R	.DSA	XNEW1
1453	02434	R	005450	R	.DSA	XNEW2
1454	02435	R	005366	R	.DSA	WIDTH1
1455	02436	R	005414	R	.DSA	SIDE1
1456	02437	R	005513	R	.DSA	NEND22
1457	02440	R	102544	R	JMS	ENDOF2
1458	02441	R	602445	R	JMP	.+4
1459	02442	R	005454	R	.DSA	XNEW22
1460	02443	R	005513	R	.DSA	NEND22
1461	02444	R	005424	R	.DSA	MODST
1462	02445	R	205503	R	LAC	END22
1463	02446	R	545513	R	SAD	NEND22
1464	02447	R	602465	R	JMP	POINR2
1465	02450	R	103130	R	PADSK1	JMS CHKEND
1466	02451	R	602460	R	JMP	.+7
1467	02452	R	005444	R	.DSA	XY22
1468	02453	R	005447	R	.DSA	XNEW1
1469	02454	R	005450	R	.DSA	XNEW2
1470	02455	R	005366	R	.DSA	WIDTH1
1471	02456	R	005414	R	.DSA	SIDE1
1472	02457	R	005503	R	.DSA	END22
1473	02460	R	102544	R	JMS	ENDOF2
1474	02461	R	602465	R	JMP	.+4
1475	02462	R	005444	R	.DSA	XY22
1476	02463	R	005503	R	.DSA	END22
1477	02464	R	005424	R	.DSA	MODST
1478	02465	R	103130	R	POINR2	JMS CHKEND
1479	02466	R	602475	R	JMP	.+7
1480	02467	R	005447	R	.DSA	XNEW1
1481	02470	R	005453	R	.DSA	XNEW11

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1482 02471 R 005454 R .DSA XNEW22
1483 02472 R 004757 R .DSA WIDTH2
1484 02473 R 005416 R .DSA ZIDE1
1485 02474 R 005505 R .DSA NEND1
1486 02475 R 205475 R LAC END1
1487 02476 R 545505 R SAD NEND1
1488 02477 R 602510 R JMP POINR3
1489 02500 R 103130 R JMS CHKEND
1490 02501 R 602510 R JMP .+7
1491 02502 R 005437 R .DSA XY1
1492 02503 R 005453 R .DSA XNEW11
1493 02504 R 005454 R .DSA XNEW22
1494 02505 R 004757 R .DSA WIDTH2
1495 02506 R 005416 R .DSA ZIDE1
1496 02507 R 005475 R .DSA END1
1497 02510 R 103130 R POINR3 JMS CHKEND
1498 02511 R 602520 R JMP .+7
1499 02512 R 005450 R .DSA XNEW2
1500 02513 R 005453 R .DSA XNEW11
1501 02514 R 005454 R .DSA XNEW22
1502 02515 R 004757 R .DSA WIDTH2
1503 02516 R 005416 R .DSA ZIDE1
1504 02517 R 005507 R .DSA NEND2
1505 02520 R 205477 R LAC END2
1506 02521 R 545507 R SAD NEND2
1507 02522 R 602533 R JMP POINRT
1508 02523 R 103130 R JMS CHKEND
1509 02524 R 602533 R JMP .+7
1510 02525 R 005440 R .DSA XY2
1511 02526 R 005453 R .DSA XNEW11
1512 02527 R 005454 R .DSA XNEW22
1513 02530 R 004757 R .DSA WIDTH2
1514 02531 R 005416 R .DSA ZIDE1
1515 02532 R 005477 R .DSA END2
1516 02533 R 205416 R POINRT LAC ZIDE1
1517 02534 R 741200 A SNA
1518 02535 R 602542 R JMP X/ER
1519 02536 R 205414 R LAC SIDE1
1520 02537 R 741200 A SNA
1521 02540 R 602542 R JMP X/ER
1522 02541 R 545416 R SAD ZIDE1
1523 02542 R 103604 R X/ER JMS XOVER
1524 02543 R 622161 R JMP* SEGSEG
1525 .EJECT

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02544 R 000000 A
02545 R 125617 E
02546 R 602552 R
02547 R 000000 A
02550 R 000000 A
02551 R 000000 A
02552 R 222551 R
02553 R 545637 R
02554 R 602611 R
02555 R 740100 A
02556 R 602562 R
02557 R 205475 R
02560 R 741100 A
02561 R 602574 R
02562 R 102651 R
02563 R 602572 R
02564 R 402550 R
02565 R 005505 R
02566 R 005416 R
02567 R 005414 R
02570 R 402547 R
02571 R 005447 R
02572 R 741200 A
02573 R 601510 R
02574 R 205475 R
02575 R 545505 R
02576 R 602611 R
02577 R 102651 R
02600 R 602607 R
02601 R 402550 R
02602 R 005475 R
02603 R 005416 R
02604 R 005414 R

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/-----/
/               SUBROUTINE END0F2              /
/               CALL END0F2(X,END,MODE)         /
/               X IS END POINT OF SEGMENT OF ROUTE 2
/               END IS END CODE AT THAT END POINT
/               MODE IS ENTRY MODE
/
/               THE SUBROUTINE CHECKS AN END OF A SEGMENT OF
/               ROUTE 2 AGAINST ENDS (OFFSET OR OTHERWISE) OF
/               A SEGMENT OF ROUTE 1. IF MODE=1 ONLY THE
/               FIRST END OF SEG 1 IS TESTED. IF MODE=2
/               END2 OF SEG 1 ONLY IS TESTED. IF MODE=-1
/               THE END IS TESTED AGAINST ALL ENDS WHICH ARE
/               NOT TRACK ENDS
/-----/
END0F2  0
JMS*   .DA
JMP    .+4
PTAD
ENDCOD
MOD
LAC*   MOD
SAD    (2 /END 2 ONLY?
JMP    NOOFF /YES
SMA
JMP    NOOFF2
LAC    END1
SPA
JMP    NOOFF1
NOOFF2 JMS  SCAN
JMP    .+7
.DSA  ENDCOD1400000
.DSA  NEND1
.DSA  ZIDE1
.DSA  SIDE1
.DSA  PTAD1400000
.DSA  XNEW1
SNA
JMP    BAD
NOOFF1 LAC  END1
SAD    NEND1
JMP    NOOFF
ALL1 JMS  SCAN
JMP    .+7
.DSA  ENDCOD1400000
.DSA  END1
.DSA  ZIDE1
.DSA  SIDE1

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1578 02605 R 402547 R .DSA PTAD1400000
1579 02606 R 005437 R .DSA XY1
1580 02607 R 741200 A SNA
1581 02610 R 601510 R JMP BAD
1582 02611 R 222551 R NOOFF LAC* MOD
1583 02612 R 545645 R SAD (1 /END 1 ONLY?
1584 02613 R 622544 R JMP* END0F2 /YES
1585 02614 R 740100 A SNA
1586 02615 R 602621 R JMP NOOFF4
1587 02616 R 205477 R LAC END2
1588 02617 R 741100 A SPA
1589 02620 R 602633 R JMP NOOFF3
1590 02621 R 102651 R NOOFF4 JMS SCAN
1591 02622 R 602631 R JMP .+7
1592 02623 R 402550 R .DSA ENDCOD1400000
1593 02624 R 005507 R .DSA NEND2
1594 02625 R 005416 R .DSA ZIDE1
1595 02626 R 005414 R .DSA SIDE1
1596 02627 R 402547 R .DSA PTAD1400000
1597 02630 R 005450 R .DSA XNEW2
1598 02631 R 741200 A SNA
1599 02632 R 601510 R JMP BAD
1600 02633 R 205503 R NOOFF3 LAC END22
1601 02634 R 545507 R SAD NEND2
1602 02635 R 622544 R JMP* END0F2
1603 02636 R 102651 R ALL2 JMS SCAN
1604 02637 R 602646 R JMP .+7
1605 02640 R 402550 R .DSA ENDCOD1400000
1606 02641 R 005477 R .DSA END2
1607 02642 R 005416 R .DSA ZIDE1
1608 02643 R 005414 R .DSA SIDE1
1609 02644 R 402547 R .DSA PTAD1400000
1610 02645 R 005440 R .DSA XY2
1611 02646 R 741200 A SNA
1612 02647 R 601510 R JMP BAD
1613 02650 R 622544 R JMP* END0F2

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SUBROUTINE SCAN
CALL IS JMS SCAN
JMP .+7
.DSA CODE OF END 1
.DSA CODE OF END 2
.DSA LAYER NO OF SEGMENT 1
.DSA LAYER NO OF SEGMENT 2
.DSA FIRST X VALUE
.DSA SECOND X VALUE
ON EXIT ACC IS CLEAR IF VIOLATION. SET
IF O.K.

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1630          02651 R 000000 A      SCAN 0
1631          02652 R 125617 E      JMS* .DA
1632          02653 R 002662 R      JMP .+6+1
1633          02654 R 000000 A      ND1      /CODE OF END 1
1634          02655 R 000000 A      ND2      /CODE OF END 2
1635          02656 R 000000 A      SID1     /LAYER OF SEG 1
1636          02657 R 000000 A      SID2     /LAYER OF SEG 2
1637          02660 R 000000 A      X1AD     /FIRST X ADDRESS
1638          02661 R 000000 A      X2AD     /SECOND X ADDRESS
1639          02662 R 222656 R      SAMSID LAC* SID1
1640          02663 R 042656 R      DAC SID1
1641          02664 R 222657 R      LAC* SID2
1642          02665 R 042657 R      DAC SID2
1643          02666 R 222660 R      LAC* X1AD      /FIRST X VALUE
1644          02667 R 740031 A      TCA
1645          02670 R 362661 R      TAD* X2AD     /SECOND X VALUE
1646          02671 R 741100 A      SPA
1647          02672 R 740031 A      TCA
1648          02673 R 744000 A      CLL
1649          02674 R 042676 R      DAC .+2
1650          02675 R 653122 A      MUL      /SQUARE
1651          02676 R 740000 A      NOP
1652          02677 R 045516 R      DAC TOP1      /STORE
1653          02700 R 641002 A      LACQ
1654          02701 R 045515 R      DAC BOT1
1655          02702 R 205637 R      LAC (2
1656          02703 R 721000 A      PAX
1657          02704 R 232660 R      LAC* X1AD,X    /FIRST Y VALUE
1658          02705 R 740031 A      TCA
1659          02706 R 372661 R      TAD* X2AD,X    /SECOND Y VALUE
1660          02707 R 741100 A      SPA
1661          02710 R 740031 A      TCA
1662          02711 R 744000 A      CLL
1663          02712 R 042714 R      DAC .+2
1664          02713 R 653122 A      MUL      /SQUARE
1665          02714 R 740000 A      NOP
1666          02715 R 345516 R      TAD TOP1      /ADD MOST SIG BITS OF
1667          02716 R 045516 R      DAC TOP1      /(X1-X2)**2+(Y1-Y2)**2
1668          02717 R 641002 A      LACQ
1669          02720 R 744000 A      CLL
1670          02721 R 345515 R      TAD BOT1      /ADD LEAST SIG BITS
1671          02722 R 745400 A      SZL|CLL      /OVERFLOW FROM LEAST SIG BITS
1672          02723 R 445516 R      IS2 TOP1      /YES
1673          02724 R 740000 A      NOP
1674          02725 R 740031 A      TCA /NEGATE
1675          02726 R 045515 R      DAC BOT1
1676          02727 R 205516 R      LAC TOP1
1677          02730 R 740001 A      CMA
1678          02731 R 741400 A      SZL
1679          02732 R 740030 A      IAC
1680          02733 R 045516 R      DAC TOP1
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PAGE	36	SINGRT SRC	SINGRT	751127
1682	02734	R 145412	R DZM CNT	
1683	02735	R 145576	R DZM SINGL*	
1684	02736	R 222654	R LAC* ND1	/CODE OF FIRST END
1685	02737	R 740100	A SMA	/PTH OR PAD ?
1686	02740	R 602756	R JMP CONT1	/YES
1687	02741	R 740031	A TCA	
1688	02742	R 045521	R DAC SIZ1	
1689	02743	R 104120	R JMS SIZER	/GET TRACK WIDTH
1690	02744	R 602751	R JMP .+5	
1691	02745	R 005540	R .DSA TRAKAD	
1692	02746	R 005624	R .DSA (10	
1693	02747	R 002656	R .DSA SID1	
1694	02750	R 005521	R .DSA SIZ1	
1695	02751	R 045521	R DAC SIZ1	/STORE WIDTH
1696	02752	R 202656	R LAC SID1	
1697	02753	R 045412	R CONTM1 DAC CNT	
1698	02754	R 445576	R ISZ SINGL	
1699	02755	R 602765	R JMP CONTUE	
1700	02756	R 735000	A CONT1 CLX	
1701	02757	R 737001	A AXR 1	
1702	02760	R 232654	R LAC* ND1,X	
1703	02761	R 741200	A SNA	
1704	02762	R 602765	R JMP CONTUE	
1705	02763	R 042656	R DAC SID1	
1706	02764	R 602753	R JMP CONTM1	
1707	02765	R 222655	R CONTM1 LAC* ND2	/CODE OF SECOND END
1708	02766	R 740100	A SMA	/PTH OR PAD ?
1709	02767	R 603005	R JMP CONT2	/YES
1710	02770	R 740031	A TCA	
1711	02771	R 045522	R DAC SIZ2	
1712	02772	R 104120	R JMS SIZER	/GET TRACK WIDTH
1713	02773	R 603000	R JMP .+5	
1714	02774	R 005540	R .DSA TRAKAD	
1715	02775	R 005624	R .DSA (10	
1716	02776	R 002657	R .DSA SID2	
1717	02777	R 005522	R .DSA SIZ2	
1718	03000	R 045522	R DAC SIZ2	/STORE WIDTH
1719	03001	R 202657	R LAC SID2	
1720	03002	R 045412	R CONTM2 DAC CNT	
1721	03003	R 445576	R ISZ SINGL	
1722	03004	R 603012	R JMP CONTEU	
1723	03005	R 735000	A CONT2 CLX	
1724	03006	R 737001	A AXR 1	
1725	03007	R 232655	R LAC* ND2,X	
1726	03010	R 740200	A SZA	
1727	03011	R 603002	R JMP CONTM2	
1728	03012	R 205576	R CONTEU LAC SINGL	
1729	03013	R 741200	A SNA	
1730	03014	R 445412	R ISZ CNT	
1731	03015	R 545637	R SAD (2	
1732	03016	R 741000	A SKP	
1733	03017	R 603024	R JMP .+5	

1734	03020	R	205412	R	LAC	CNT
1735	03021	R	542656	R	SAD	SID1
1736	03022	R	741000	A	JMP	
1737	03023	R	622651	R	JMP*	SCAD1
1738	03024	R	205660	R	LAC	(37777)
1739	03025	R	045563	R	DAC	MAXDST*
1740	03026	R	222654	R	LUP22	LAC* ND1
1741	03027	R	741100	A	SPA	/PTH OR PAD ?
1742	03030	R	603037	R	JMP	CONT3 /NO
1743	03031	R	045521	R	DAC	SIZ1
1744	03032	R	104706	R	JMS	PADSIZ /GET PAD DIAMETER
1745	03033	R	603037	R	JMP	.+4
1746	03034	R	402654	R	.DSA	ND1 400000
1747	03035	R	005412	R	.DSA	CNT
1748	03036	R	005521	R	.DSA	SIZ1
1749	03037	R	222655	R	CONT3	LAC* ND2
1750	03040	R	741100	A	SPA	/PTH OR PAD ?
1751	03041	R	603050	R	JMP	CONT4 /NO
1752	03042	R	045522	R	DAC	SIZ2
1753	03043	R	104706	R	JMS	PADSIZ /GET PAD 2 DIAMETER
1754	03044	R	603050	R	JMP	.+4
1755	03045	R	402655	R	.DSA	ND2 400000
1756	03046	R	005412	R	.DSA	CNT
1757	03047	R	005522	R	.DSA	SIZ2
1758	03050	R	104120	R	CONT4	JMS SIZER /FIND SPACE*2
1759	03051	R	603056	R	JMP	.+5
1760	03052	R	005540	R	.DSA	TRAKAD
1761	03053	R	005624	R	.DSA	(10
1762	03054	R	005412	R	.DSA	CNT
1763	03055	R	005624	R	.DSA	(10
1764	03056	R	345521	R	TAD	SIZ1
1765	03057	R	345522	R	TAD	SIZ2
1766	03060	R	740031	A	TCA	
1767	03061	R	345563	R	TAD	MAXDST
1768	03062	R	741300	A	SPA	SNA
1769	03063	R	603067	R	JMP	GOOD1
1770	03064	R	740031	A	TCA	
1771	03065	R	345563	R	TAD	MAXDST
1772	03066	R	045563	R	DAC	MAXDST
1773	03067	R	205412	R	GOOD1	LAC CNT
1774	03070	R	565542	R	SAD*	LAYNO /ALL LAYERS CHECKED?
1775	03071	R	603077	R	JMP	GOOD3 /YES
1776	03072	R	445412	R	ISZ	CNT /BUMP TO NEXT LAYER
1777	03073	R	205576	R	LAC	SINGL
1778	03074	R	740200	A	SZA	/SINGLE LAYER?
1779	03075	R	603077	R	JMP	GOOD3 /YES
1780	03076	R	603026	R	JMP	LUP22
1781	03077	R	205563	R	GOOD3	LAC MAXDST
1782	03100	R	744020	A	RAR	ICLL
1783	03101	R	745400	A	SZL	ICLL
1784	03102	R	740030	A	IAC	
1785	03103	R	043105	R	DAC	.+2

1786	03104	R	653122	A	MUL	
1787	03105	R	740000	A	NOP	
1788	03106	R	345516	R	TAD	TOP1
1789	03107	R	045520	R	DAC	TOP2
1790	03110	R	641002	A	LACQ	
1791	03111	R	744000	A	CLL	
1792	03112	R	345515	R	TAD	BOT1
1793	03113	R	652000	A	LMQ	
1794	03114	R	205520	R	LAC	TOP2
1795	03115	R	741400	A	SZL	
1796	03116	R	740030	A	IAC	
1797	03117	R	741100	A	SPA	
1798	03120	R	603126	R	JMP	GOOD2
1799	03121	R	750200	A	SZA CLA	
1800	03122	R	622651	R	JMP*	SCAN
1801	03123	R	641002	A	LACQ	
1802	03124	R	750200	A	SZA CLA	
1803	03125	R	622651	R	JMP*	SCAN
1804	03126	R	750030	A	GOOD2	CLA IAC
1805	03127	R	622651	R	JMP*	SCAN
1806					.EJECT	

/FORM PERMISSABLE DISTANCE SQUARED

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03130 R 000000 A	CHKEND 0
03131 R 125617 E	JMS* .DA
03132 R 603141 R	JMP .+7
03133 R 000000 A	ONEPT
03134 R 000000 A	TWOPT
03135 R 000000 A	TWOPT2
03136 R 000000 A	TRAKWD
03137 R 000000 A	SID
03140 R 000000 A	ENDCD
03141 R 777777 A	LAW -1
03142 R 045424 R	DAC MODST /SET DEFAULT MODE FOR END OF 2
	/ REFER TO DOCUMENTATION FOR DEFINITIONS OF A.C.B ETC.
	/ FIND A SQUARED
	ENDSRT LAC (2
03143 R 205637 R	PAX
03144 R 721000 A	LAC* TWOPT2
03145 R 223135 R	TCA
03146 R 740031 A	TAD* ONEPT
03147 R 363133 R	DAC CHX
03150 R 045420 R	LAC* TWOPT2.X
03151 R 233135 R	TCA
03152 R 740031 A	TAD* ONEPT.X
03153 R 373133 R	DAC CHY
03154 R 045421 R	JMS LENGTH
03155 R 103555 R	JMP .+2
03156 R 603160 R	.DSA CHX
03157 R 005420 R	CMA /NEGATE AND STORE
03160 R 740001 A	DAC TOP2
03161 R 045520 R	LACQ
03162 R 641002 A	CLL
03163 R 744000 A	TCA
03164 R 740031 A	DAC BOT2
03165 R 045517 R	SZL
03166 R 741400 A	ISZ TOP2
03167 R 445520 R	NOP
03170 R 740000 A	

SUBROUTINE CHKEND

CALL CHKEND(END, SEGEND1, SEGEND2, TRAKWD, SID, ENDCOD)

END GIVES THE COORDINATES OF THE END BEING CHECKED

SEGEND1 AND 2 GIVE THE ENDS OF THE SEGMENT AGAINST WHICH THE END IS BEING CHECKED

TRAKWD IS THE CODE OF THE TRACK WIDTH

SID IS THE LAYER CONTAINING THE TRACK

ENDCODE GIVES THE END CODE ASSOCIATED WITH THE POINT BEING CHECKED

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1859      / MOVE ORIGIN TO TWOPT. NEW COORDS OF POINT GO INTO
1860      / (CHX,CHY). OTHER END OF LINE GOES INTO (LINX,LINY)
1861      03171 R 205637 R LAC (2
1862      03172 R 721000 A PAX
1863      03173 R 223134 R LAC* TWOPT
1864      03174 R 740031 A TCA
1865      03175 R 045364 R DAC STR
1866      03176 R 363133 R TAD* ONEPT
1867      03177 R 045420 R DAC CHX
1868      03200 R 205364 R LAC STR
1869      03201 R 363135 R TAD* TWOPT2
1870      03202 R 045422 R DAC LINX
1871      03203 R 233134 R LAC* TWOPT,X
1872      03204 R 740031 A TCA
1873      03205 R 045364 R DAC STR
1874      03206 R 373133 R TAD* ONEPT,X
1875      03207 R 045421 R DAC CHY
1876      03210 R 205364 R LAC STR
1877      03211 R 373135 R TAD* TWOPT2,X
1878      03212 R 045423 R DAC LINY
1879      03213 R 740200 A SZA
1880      03214 R 603220 R JMP .+4
1881      03215 R 205422 R LAC LINX
1882      03216 R 741200 A SNA
1883      03217 R 623130 R JMP* CHKEND /LINE ZERO LENGTH
1884      / FIND B SQUARED
1885      03220 R 103555 R JMS LENGTH
1886      03221 R 603223 R JMP .+2
1887      03222 R 005420 R .DSA CHX
1888      03223 R 345520 R TAD TOP2 /ADD -A*A AND STORE
1889      03224 R 045520 R DAC TOP2 /IN TOP2,BOT2
1890      03225 R 641002 A LACQ
1891      03226 R 744000 A CLL
1892      03227 R 345517 R TAD BOT2
1893      03230 R 045517 R DAC BOT2
1894      03231 R 741400 A SZL
1895      03232 R 445520 R ISZ TOP2
1896      03233 R 740000 A NOP
1897      / FIND C SQUARED
1898      03234 R 103555 R JMS LENGTH
1899      03235 R 603237 R JMP .+2
1900      03236 R 005422 R .DSA LINX
1901      03237 R 045425 R DAC CTOP /FORM (-A*A+B*B)+C*C AND STORE C*C
1902      03240 R 345520 R TAD TOP2
1903      03241 R 045516 R DAC TOP1
1904      03242 R 641002 A LACQ
1905      03243 R 045426 R DAC CBOT
1906      03244 R 744000 A CLL
1907      03245 R 345517 R TAD BOT2
1908      03246 R 741400 A SZL
1909      03247 R 445516 R ISZ TOP1
1910      03250 R 740000 A NOP

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1911 03251 R 205516 R TOP1
1912 03252 R 741100 A SPA /POINT OFF END ONE OF SEG?
1913 03253 R 603547 R JMP ENDOUT /YES
1914 03254 R 205517 R LAC BOT2 /FORM  $-(-A*A+B*B)+C*C$ 
1915 03255 R 744000 A CLL
1916 03256 R 740031 A TCA
1917 03257 R 741400 A SZL
1918 03260 R 445425 R ISZ CTOP
1919 03261 R 740000 A NOP
1920 03262 R 744000 A CLL
1921 03263 R 345426 R TAD CBOT
1922 03264 R 741400 A SZL
1923 03265 R 445425 R ISZ CTOP
1924 03266 R 740000 A NOP
1925 03267 R 205520 R LAC TOP2
1926 03270 R 740001 A CMA
1927 03271 R 345425 R TAD CTOP
1928 03272 R 741100 A SPA /POINT OFF END TWO OF SEGMENT?
1929 03273 R 603552 R JMP END2OT /YES
1930 / DISTANCE FROM (X,Y) TO LINE  $AX+BY+C=0$  IS
1931 /  $AX+BY+C/\sqrt{A*A+B*B}$ . NOW FORM TOP PART
1932 / WHICH TAKES THE FORM  $LIN Y*CKX-LIN X*CKY$ 
1933 03274 R 103660 R JMS DISTPL /FORM  $LIN Y*CHX-LIN X*CHY$ 
1934 03275 R 205423 R LAC LINY
1935 03276 R 205420 R LAC CHX
1936 03277 R 205422 R LAC LINX
1937 03300 R 205421 R LAC CHY
1938 03301 R 045520 R DAC TOP2
1939 03302 R 641002 A LACQ
1940 03303 R 045517 R DAC BOT2
1941 03304 R 205520 R LAC TOP2 /TAKE MODULUS
1942 03305 R 740100 A SMA
1943 03306 R 603320 R JMP RBRB
1944 03307 R 740001 A CMA
1945 03310 R 045520 R DAC TOP2
1946 03311 R 205517 R LAC BOT2
1947 03312 R 744000 A CLL
1948 03313 R 740031 A TCA
1949 03314 R 045517 R DAC BOT2
1950 03315 R 741400 A SZL
1951 03316 R 445520 R ISZ TOP2
1952 03317 R 740000 A NOP
1953 / FORM THE RESULT JUST FOUND DIVIDED BY THE
1954 / PERMISSIBLE DISTANCE.
1955 03320 R 750030 A RBRB CLAIAC
1956 03321 R 721000 A PAX
1957 03322 R 145561 R DZM LAY*
1958 03323 R 145577 R DZM SINGSD*
1959 03324 R 223137 R LAC* SID
1960 03325 R 741200 A SNA /ALL SIDES?
1961 03326 R 603331 R JMP .+3 /YES
1962 03327 R 445577 R ISZ SINGSD

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1963	03330	R	045561	R	DAC	LAY
1964	03331	R	233140	R	LAC*	ENDCD,X
1965	03332	R	741200	A	SNA	/ALL SIDES?
1966	03333	R	603336	R	JMP	.+3 /YES
1967	03334	R	445577	R	ISZ	SINGSD
1968	03335	R	045561	R	DAC	LAY
1969	03336	R	205577	R	LAC	SINGSD
1970	03337	R	741200	A	SNA	/ALL SIDES?
1971	03340	R	445561	R	ISZ	LAY /YES
1972	03341	R	545637	R	SAD	(2 /BOTH SINGLE SIDES?
1973	03342	R	741000	A	SKP	/YES
1974	03343	R	603350	R	JMP	.+5 /NO
1975	03344	R	205561	R	LAC	LAY
1976	03345	R	563137	R	SAD*	SID /TWO SINGLE SIDES DIFFERENT?
1977	03346	R	741000	A	SKP	/NO
1978	03347	R	623130	R	JMP*	CHKEND /YES
1979	03350	R	205660	R	LAC	(377777
1980	03351	R	043466	R	DAC	DISTER
1981	03352	R	143515	R	PQR	DZM DIST
1982	03353	R	223136	R	LAC*	TRAKWD
1983	03354	R	741100	A	SPA	
1984	03355	R	603365	R	JMP	PQRS
1985	03356	R	104120	R	JMS	SIZER /FIND TRACK WIDTH
1986	03357	R	603364	R	JMP	.+5
1987	03360	R	005540	R	.DSA	TRAKAD
1988	03361	R	005624	R	.DSA	(10
1989	03362	R	005561	R	.DSA	LAY
1990	03363	R	403136	R	.DSA	TRAKWD1400000
1991	03364	R	043515	R	DAC	DIST /SAVE TRACK WIDTH
1992	03365	R	104120	R	PQRS	JMS SIZER /FIND SPACE
1993	03366	R	603373	R	JMP	.+5
1994	03367	R	005540	R	.DSA	TRAKAD
1995	03370	R	005624	R	.DSA	(10
1996	03371	R	005561	R	.DSA	LAY
1997	03372	R	005624	R	.DSA	(10
1998	03373	R	343515	R	TAD	DIST /ADD TRACK WIDTH
1999	03374	R	043515	R	DAC	DIST /SAVE TRACK WIDTH PLUS SPACE
2000	03375	R	777776	A	LAW	-2
2001	03376	R	045460	R	DAC	STR1
2002	03377	R	223140	R	LAC*	ENDCD
2003	03400	R	045461	R	DAC	STR2
2004	03401	R	741100	A	SPA	/PAD?
2005	03402	R	603412	R	JMP	TRAKND /TRACK END
2006	03403	R	104706	R	RST	JMS PADSIZ /GET PAD SIZE
2007	03404	R	603410	R	JMP	.+4
2008	03405	R	005461	R	.DSA	STR2
2009	03406	R	005561	R	.DSA	LAY
2010	03407	R	005364	R	.DSA	STR
2011	03410	R	205364	R	LAC	STR
2012	03411	R	603422	R	JMP	PAD
2013	03412	R	740031	A	TRAKND	TCA
2014	03413	R	045364	R	DAC	STR

2015	03414	R	104120	R	SIZE GET TRACK WIDTH
2016	03415	R	603422	R	.+5
2017	03416	R	005540	R	.DSA TRAKAD
2018	03417	R	005624	R	.DSA (10
2019	03420	R	005561	R	.DSA LAY
2020	03421	R	005364	R	.DSA STR
2021	03422	R	343515	R	PAD TAD DIST /ADD REST OF SEPERATION
2022	03423	R	043515	R	DAC DIST
2023	03424	R	445460	R	ISZ STR1
2024	03425	R	741000	A	SKP
2025	03426	R	603434	R	JMP .+6
2026	03427	R	223136	R	LAC* TRAKWD
2027	03430	R	740031	A	TCA
2028	03431	R	045461	R	DAC STR2
2029	03432	R	740300	A	SMAISZA
2030	03433	R	603403	R	JMP RST
2031	03434	R	203515	R	LAC DIST
2032	03435	R	744020	A	CLLIRAR /FIND SEPERATION
2033	03436	R	741400	A	SZL
2034	03437	R	740030	A	IAC /ROUND UP IF NECESSARY
2035	03440	R	740031	A	TCA
2036	03441	R	343466	R	TAD DISTER
2037	03442	R	741300	A	SPAISNA
2038	03443	R	603447	R	JMP .+4
2039	03444	R	740031	A	TCA
2040	03445	R	343466	R	TAD DISTER
2041	03446	R	043466	R	DAC DISTER
2042	03447	R	205577	R	LAC SINGSD
2043	03450	R	740200	A	SZA /SINGLE SIDE?
2044	03451	R	603457	R	JMP CARRY /YES
2045	03452	R	205561	R	LAC LAY
2046	03453	R	565542	R	SAD* LAYNO /FINAL LAYER?
2047	03454	R	603457	R	JMP CARRY
2048	03455	R	445561	R	ISZ LAY
2049	03456	R	603352	R	JMP PQR
2050	03457	R	203466	R	CARRY LAC DISTER
2051	03460	R	043515	R	DAC DIST
2052	03461	R	205517	R	LAC BOT2
2053	03462	R	652000	A	LMQ
2054	03463	R	205520	R	LAC TOP2
2055	03464	R	744000	A	CLL
2056	03465	R	640323	A	DIV
2057	03466	R	000000	A	DISTER
2058	03467	R	741400	A	SZL /OVERFLOW?
2059	03470	R	603546	R	JMP XYZ /YES
2060	03471	R	045575	R	DAC REMDER /STORE REMAINDER
2061	03472	R	641002	A	LACQ
2062	03473	R	741100	A	SPA
2063	03474	R	603546	R	JMP XYZ
2064	03475	R	043512	R	DAC RESLT /STORE QUOTIENT
2065	03476	R	043501	R	DAC .+3
2066	03477	R	744000	A	CLL

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03500 R 653122 A      MUL  /FORM RESULT SQUARED
03501 R 740000 A      NOP
03502 R 045516 R      DAC  TOP1
03503 R 641002 A      LACQ
03504 R 045515 R      DAC  BOT1
03505 R 205575 R      LAC  REMDER*
03506 R 744000 A      CLL
03507 R 740010 A      RAL
03510 R 744000 A      CLL
03511 R 653122 A      MUL  /FORM RESULT*REMAINDER
03512 R 000000 A      RESLT
03513 R 744000 A      CLL
03514 R 640323 A      DIV
03515 R 000000 A      DIST
03516 R 750000 A      CLA
03517 R 103742 R      JMS  ADDER  /ADD RESULT SQUARED
03520 R 740001 A      CMA  /NEGATE AND STORE
03521 R 045520 R      DAC  TOP2
03522 R 744000 A      CLL
03523 R 641002 A      LACQ
03524 R 740031 A      TCA
03525 R 045517 R      DAC  BOT2
03526 R 741400 A      SZL
03527 R 445520 R      ISZ  TOP2
03530 R 740000 A      NOP
03531 R 103555 R      JMS  LENGTH
03532 R 603534 R      JMP  .+2
03533 R 005422 R      .DSA  LINX
03534 R 345520 R      TAD  TOP2
03535 R 045516 R      DAC  TOP1
03536 R 641002 A      LACQ
03537 R 744000 A      CLL
03540 R 345517 R      TAD  BOT2
03541 R 205516 R      LAC  TOP1
03542 R 741400 A      SZL
03543 R 740030 A      IAC
03544 R 740100 A      SMA
03545 R 601510 R      JMP  BAD
03546 R 623130 R      XYZ  JMP*  CHKEND
03547 R 205645 R      ENDOUT LAC  (1  /SET MODE FOR END OF 2
03550 R 045424 R      DAC  MODST
03551 R 623130 R      JMP*  CHKEND
03552 R 205637 R      END2OT LAC  (2  /SET MODE FOR END OF 2
03553 R 045424 R      DAC  MODST
03554 R 623130 R      JMP*  CHKEND

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SUBROUTINE LENGTH

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2119          FINDS THE LENGTH OF A LINE FROM THE ORIGIN /
2120          TO X1. /
2121          CALL IS CALL LENGTH(X1) /
2122          RESULT IN AC,MQ /
2123          /
2124          -----
2125          03555 R 000000 A LENGTH 0
2126          03556 R 125617 E JMS* .DA
2127          03557 R 603561 R JMP .+2
2128          03560 R 000000 A PT111
2129          03561 R 735000 A CLX
2130          03562 R 205637 R LAC (2
2131          03563 R 722000 A PAL
2132          03564 R 233560 R BACK LAC* PT111,X
2133          03565 R 741100 A SPA
2134          03566 R 740031 A TCA
2135          03567 R 744000 A CLL
2136          03570 R 043572 R DAC .+2
2137          03571 R 653122 A MUL /SQUARE
2138          03572 R 740000 A NOP
2139          03573 R 725001 A AXS 1 /FINISHED?
2140          03574 R 741000 A SKP /NO
2141          03575 R 603602 R JMP ENDON /YES
2142          03576 R 045516 R DAC TOP1
2143          03577 R 641002 A LACQ
2144          03600 R 045515 R DAC BOT1
2145          03601 R 603564 R JMP BACK /GO AND GET Y'S CONTRIBUTION
2146          03602 R 103742 R ENDON JMS ADDER /ADD Y'S BIT TO X'S BIT
2147          03603 R 623555 R JMP* LENGTH
2148          .EJECT

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/
/      SUBROUTINE XOVER
/
/ THE SUBROUTINE CHECKS THE LINES IN XY1,XY2 ETC. FOR CROSS /
/ OVERS. IF THERE IS CROSS OVER EXIT IS
/ MADE TO LABEL BAD IN SUBROUTINE RUTCHK.
/ NORMAL EXIT OTHERWISE.
/ THE ORIGIN OF THE POINTS IS SHIFTED BY THE
/ SUBROUTINE.
/
-----
XOVER  0
INST  LAC  XY11  /SET UP FOR CALL OF SHIFT
      TCA
      DAC  STR
      LAC  YY11
      TCA
      DAC  STR1
      JMS  SHIFT  /SHIFT ORIGIN TO (X11,Y11)
      JMS  DISTPL  /FIND DISTANCE FROM LINE TO (X1,Y1)
      LAC  XY22
      LAC  YY1
      LAC  XY1
      LAC  YY22
      DAC  X1DST*  /STORE DISTANCE
      JMS  DISTPL  /FIND DISTANCE FROM LINE TO (X2,Y2)
      LAC  XY22
      LAC  YY2
      LAC  XY2
      LAC  YY22
      XOR  X1DST
      SMA
      JMP*  XOVER  /POINTS ON SAME SIDE- NO CROSSOVER
      LAC  XY1  /SET UP FOR CALL OF SHIFT
      TCA
      DAC  STR
      LAC  YY1
      TCA
      DAC  STR1
      JMS  SHIFT  /REDUCE ORIGIN TO (X1,Y1)
      JMS  DISTPL  /FIND DISTANCE FROM LINE TO (X11,Y11)
      LAC  XY2
      LAC  YY11
      LAC  XY11
      LAC  YY2
      DAC  X1DST  /STORE DISTANCE
      JMS  DISTPL  /FIND DISTANCE FROM LINE TO (X22,Y22)
      LAC  XY2
      LAC  YY22
      LAC  XY22
      LAC  YY2

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03604 R 000000 A
03605 R 205443 R
03606 R 740031 A
03607 R 045364 R
03610 R 205445 R
03611 R 740031 A
03612 R 045460 R
03613 R 103755 R
03614 R 103660 R
03615 R 205444 R
03616 R 205441 R
03617 R 205437 R
03620 R 205446 R
03621 R 045605 R
03622 R 103660 R
03623 R 205444 R
03624 R 205442 R
03625 R 205440 R
03626 R 205446 R
03627 R 245605 R
03630 R 740100 A
03631 R 623604 R
03632 R 205437 R
03633 R 740031 A
03634 R 045364 R
03635 R 205441 R
03636 R 740031 A
03637 R 045460 R
03640 R 103755 R
03641 R 103660 R
03642 R 205440 R
03643 R 205445 R
03644 R 205443 R
03645 R 205442 R
03646 R 045605 R
03647 R 103660 R
03650 R 205440 R
03651 R 205446 R
03652 R 205444 R
03653 R 205442 R

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2201 03654 R 245605 R    OR X1DS1
2202 03655 R 741100 A    SPA
2203 03656 R 601510 R    JMP BAD /CROSS OVER
2204 03657 R 623604 R    MOCROS JMP* XOVER

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2205 /
2206 /
2207 /
2208 -----/
2209 /
2210 /      MACRO MULMAC
2211 /
2212 / THE MACRO MULTIPLIES THE NEXT TWO
2213 / PARAMETERS OF DISTPL, TAKING DUE REGARD
2214 / OF SIGN. THE PARAMETER ALLOWS THE
2215 / RESULT TO BE NEGATED IF REQUIRED.
2216 / THE RESULT IS LEFT IN THE AC, MQ
2217 /
2218 -----/

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```

2219 .DEFIN MULMAC, PAR
2220 XCT* DISTPL
2221 ISZ DISTPL /BUMP PAST FIRST PARAM
2222 PAR
2223 SPA
2224 AAC -1 /CONVERT TO ONES COMPLEMENT
2225 GSM /STORE SIGN IN LINK AND CONVERT
2226 DAC .+6 /STORE ABS VALUE
2227 XCT* DISTPL
2228 ISZ DISTPL /BUMP PAST PARAMATER
2229 SPA
2230 AAC -1 /CONVERT TO ONES COMPLEMENT
2231 MULS
2232 NOP
2233 SMA|CLL
2234 JMP .+10 /POSITIVE RESULT
2235 DAC .-3 /CONVERT NEG RES TO TWOS COMPLEMENT
2236 LACQ
2237 IAC
2238 LMQ
2239 LAC .-7
2240 SZL
2241 IAC /OVERFLOW FROM LEAST SIG END
2242 .ENDM

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2243 /
2244 /
2245 /
2246 -----/
2247 /
2248 /      SUBROUTINE DISTPL
2249 / FIND AX+BY C PART OF DISTANCE FROM POINT TO
2250 / A LINE. IN THIS CASE C=0. A AND B ARE
2251 / DEFINED BY THE END POINTS OF THE LINE.
2252 /

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2253 03660 R 000000 A -----/
2254          DISTPL 0
2255          MULMAC < TCA>
03661 R 423660 R *G XCT* DISTPL
03662 R 443660 R *G ISZ DISTPL
03663 R 740031 A *G TCA
03664 R 741100 A *G SPA
03665 R 723777 A *G AAC -1
03666 R 664000 A *G GSM
03667 R 043675 R *G DAC .+6
03670 R 423660 R *G XCT* DISTPL
03671 R 443660 R *G ISZ DISTPL
03672 R 741100 A *G SPA
03673 R 723777 A *G AAC -1
03674 R 657122 A *G MULS
03675 R 740000 A *G NOP
03676 R 744100 A *G SMA|CLL
03677 R 603707 R *G JMP .+10
03700 R 043675 R *G DAC .-3
03701 R 641002 A *G LACQ
03702 R 740030 A *G IAC
03703 R 652000 A *G LMQ
03704 R 203675 R *G LAC .-7
03705 R 741400 A *G SZL
03706 R 740030 A *G IAC
2256 03707 R 045516 R DAC TOP1 /STORE -X2*Y1
2257 03710 R 641002 A LACQ
2258 03711 R 045515 R DAC BOT1
2259          MULMAC < NOP> /FORM X1*Y2
03712 R 423660 R *G XCT* DISTPL
03713 R 443660 R *G ISZ DISTPL
03714 R 740000 A *G NOP
03715 R 741100 A *G SPA
03716 R 723777 A *G AAC -1
03717 R 664000 A *G GSM
03720 R 043726 R *G DAC .+6
03721 R 423660 R *G XCT* DISTPL
03722 R 443660 R *G ISZ DISTPL
03723 R 741100 A *G SPA
03724 R 723777 A *G AAC -1
03725 R 657122 A *G MULS
03726 R 740000 A *G NOP
03727 R 744100 A *G SMA|CLL
03730 R 603740 R *G JMP .+10
03731 R 043726 R *G DAC .-3
03732 R 641002 A *G LACQ
03733 R 740030 A *G IAC
03734 R 652000 A *G LMQ
03735 R 203726 R *G LAC .-7
03736 R 741400 A *G SZL
03737 R 740030 A *G IAC
2260 03740 R 103742 R JMS ADDER /FORM X1*Y2-X2*Y1

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2261 03741 R 623660 R JMP* DIS
2262
2263 / SUBROUTINE ADDER /
2264 / ADDS DOUBLE LENGTH NOS. IN TOP1, BOT1 AND /
2265 / AC, MQ. RESULT IN AC, MQ. TOP1 OVERWRITTEN. /
2266 /
2267 /
2268 03742 R 000000 A ADDER 0
2269 03743 R 345516 R TAD TOP1 /ADD MOST SIG PARTS-
2270 03744 R 045516 R DAC TOP1 /STORE
2271 03745 R 744000 A CLL
2272 03746 R 641002 A LACQ /LOAD LEAST SIG PART
2273 03747 R 345515 R TAD BOT1 /ADD
2274 03750 R 652000 A LMQ
2275 03751 R 205516 R LAC TOP1 /LOAD MOST SIG PART
2276 03752 R 741400 A SZL
2277 03753 R 740030 A IAC /CARRY FROM LEAST SIG BITS
2278 03754 R 623742 R JMP* ADDER
2279 /
2280 /
2281 / SUBROUTINE SHIFT /
2282 / MOVES ORIGIN TO (-STR, -STR1) /
2283 /
2284 /
2285 /
2286 03755 R 000000 A SHIFT 0
2287 03756 R 735000 A CLX
2288 03757 R 205636 R LAC (3
2289 03760 R 722000 A PAL
2290 03761 R 234002 R BEGAN LAC* XY1AD,X
2291 03762 R 345364 R TAD STR
2292 03763 R 074002 R DAC* XY1AD,X
2293 03764 R 234003 R LAC* XY2AD,X
2294 03765 R 345364 R TAD STR
2295 03766 R 074003 R DAC* XY2AD,X
2296 03767 R 234004 R LAC* XY11AD,X
2297 03770 R 345364 R TAD STR
2298 03771 R 074004 R DAC* XY11AD,X
2299 03772 R 234005 R LAC* XY22AD,X
2300 03773 R 345364 R TAD STR
2301 03774 R 074005 R DAC* XY22AD,X
2302 03775 R 205460 R LAC STR1
2303 03776 R 045364 R DAC STR
2304 03777 R 725002 A AXS 2
2305 04000 R 603761 R JMP BEGAN
2306 04001 R 623755 R JMP* SHIFT
2307 04002 R 005437 R XY1AD .DSA XY1
2308 04003 R 005440 R XY2AD .DSA XY2
2309 04004 R 005443 R XY11AD .DSA XY11
2310 04005 R 005444 R XY22AD .DSA XY22
2311 .EJECT

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2312 /-----/
2313 /
2314 /          SUBROUTINE OFFSET
2315 /
2316 /    CALL OFFSET(PT1,PT2,PTN,CODE,LAYER)
2317 /
2318 /    PT1 IS END POINT OF SEGMENT
2319 /    PT2 IS END POINT TO BE OFFSET
2320 /    PTN HOLDS RESULTANT POINT
2321 /    CODE IS TRACK CODE
2322 /    LAYER IS SEGMENT LAYER
2323 /
2324 /    THE SUBROUTINE OFFSETS ONE END OF A SEGMENT OF
2325 /    TRACK BY HALF THE TRACK WIDTH
2326 /-----/
2327 /
2328 04006 R 000000 A OFFSET 0
2329 04007 R 125617 E JMS* .DA
2330 04010 R 604016 R JMP .+6
2331 04011 R 000000 A PT1 /FIRST POINT
2332 04012 R 000000 A PT2 /POINT TO BE OFFSET
2333 04013 R 000000 A PTN /RESULT
2334 04014 R 000000 A CODE /TRACK CODE
2335 04015 R 000000 A LAUR /LAYER OF TRACK SEGMENT
2336 04016 R 104120 R JMS SIZER /FIND TRACK WIDTH
2337 04017 R 604024 R JMP .+5
2338 04020 R 005540 R .DSA TRAKAD
2339 04021 R 005624 R .DSA (10
2340 04022 R 404015 R .DSA LAUR!400000
2341 04023 R 404014 R .DSA CODE!400000
2342 04024 R 744020 A RARICLL /FIND HALF TRACK WIDTH
2343 04025 R 044102 R DAC DISTST
2344 04026 R 224011 R LAC* PT1
2345 04027 R 740031 A TCA
2346 04030 R 364012 R TAD* PT2 /X2-X1
2347 04031 R 745100 A SPAICLL /SET POSITIVE
2348 04032 R 740031 A TCA
2349 04033 R 044035 R DAC .+2
2350 04034 R 653122 A MUL /SQUARE
2351 04035 R 740000 A NOP
2352 04036 R 045516 R DAC TOP1
2353 04037 R 641002 A LACQ
2354 04040 R 045515 R DAC BOT1
2355 04041 R 205637 R LAC (2
2356 04042 R 721000 A PAX
2357 04043 R 234011 R LAC* PT1,X
2358 04044 R 740031 A TCA
2359 04045 R 374012 R TAD* PT2,X /Y2-Y1
2360 04046 R 745100 A SPAICLL /SET POSITIVE
2361 04047 R 740031 A TCA
2362 04050 R 044052 R DAC .+2
2363 04051 R 653122 A MUL /SQUARE

```

2364	04052 R 740000 A	NOP
2365	04053 R 345516 R	TAD TOP1 /ADD (X2-X1)*2
2366	04054 R 045516 R	LAC TOP1
2367	04055 R 641002 A	LACQ
2368	04056 R 744000 A	CLL
2369	04057 R 345515 R	TAD BOT1
2370	04060 R 652000 A	LMQ
2371	04061 R 205516 R	LAC TOP1
2372	04062 R 741400 A	SZL /CARRY FROM LEAST SIG BIT
2373	04063 R 740030 A	IAC /YES
2374	04064 R 104553 R	JMS SQRT /FIND SQUARE ROOT
2375	04065 R 044105 R	DAC STORER
2376	04066 R 735000 A	CLX
2377	04067 R 205636 R	LAC (3
2378	04070 R 722000 A	PAL
2379	04071 R 234012 R	GETY LAC* PT2,X
2380	04072 R 740031 A	TCA
2381	04073 R 374011 R	TAD* PT1,X /FORM (X1-X2) OR (Y1-Y2)
2382	04074 R 145364 R	DZM STR /SET STR= SIGN BIT AND MAKE AC POSITIVE
2383	04075 R 741100 A	SPA
2384	04076 R 445364 R	ISZ STR
2385	04077 R 745100 A	SPA CLL
2386	04100 R 740031 A	TCA
2387	04101 R 653122 A	MUL
2388	04102 R 000000 A	DISTST 0
2389	04103 R 744000 A	CLL
2390	04104 R 640323 A	DIV
2391	04105 R 000000 A	STORER 0
2392	04106 R 205364 R	LAC STR
2393	04107 R 740020 A	RAR /SET LINK IF RESULT IS TO BE NEGATIVE
2394	04110 R 641002 A	LACQ
2395	04111 R 741400 A	SZL
2396	04112 R 740031 A	TCA
2397	04113 R 374012 R	TAD* PT2,X
2398	04114 R 074013 R	DAC* PTN,X
2399	04115 R 725002 A	AXS 2
2400	04116 R 604071 R	JMP GETY /DO Y OFFSET
2401	04117 R 624006 R	JMP* OFFSET

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/-----/
/
/      SUBROUTINE  SIZER
/
/  CALL  IS
/
/          JMS  SIZER
/          JMP  .+5
/          .DSA  ARRAY ADDRESS
/          .DSA  LENGTH OF PERMENANT PART OF ARRAY
/          .DSA  LAYER NUMBER
/          .DSA  CODE
/  ON EXIT THE ACC CONTAINS SIZE UNPACKED
/  FROM TRACKS OR PADS ARRAY
/
/

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2416 /-----/
2417 04120 R 000000 A SIZER 0
2418 04121 R 125617 E JMS* .DA
2419 04122 R 604127 R JMP .+4+1
2420 04123 R 000000 A ADR /ARRAY ADDRESS
2421 04124 R 000000 A XLN /INITIAL ARRAY LENGTH
2422 04125 R 000000 A LAYR /LAYER NO BEING CONSIDERED
2423 04126 R 000000 A CODE21
2424 04127 R 224126 R LAC* CODE21
2425 04130 R 721000 A PAX
2426 04131 R 224123 R LAC* ADR
2427 04132 R 044123 R DAC ADR
2428 04133 R 234123 R LAC* ADR,X
2429 04134 R 505630 R AND (???)
2430 04135 R 045600 R DAC STRLOC* /SAVE SIZE
2431 04136 R 234123 R EXC LAC* ADR,X
2432 04137 R 505661 R AND (760000)
2433 04140 R 741200 A SNA /EXCEPTIONS ?
2434 04141 R 604161 R JMP END /NO
2435 04142 R 742030 A SWHA
2436 04143 R 744000 A CLL
2437 04144 R 742020 A RTR
2438 04145 R 742020 A RTR
2439 04146 R 364124 R TAD* XLN
2440 04147 R 721000 A PAX
2441 04150 R 234123 R LAC* ADR,X /LOAD EXCEPTION WORD
2442 04151 R 742030 A SWHA
2443 04152 R 505650 R AND (17)
2444 04153 R 564125 R SAD* LAYR /LAYER REQUIRED ?
2445 04154 R 741000 A SKP /YES
2446 04155 R 604136 R JMP EXC /NO, LOOK FOR MORE EXCEPTIONS
2447 04156 R 234123 R LAC* ADR,X
2448 04157 R 505630 R AND (???)
2449 04160 R 741000 A SKP
2450 04161 R 205600 R END LAC STRLOC
2451 04162 R 624120 R JMP* SIZER
2452 /-----/
2453 /
2454 / SUBROUTINE RTVAL
2455 /IF AC -VE ON ENTRY. CHECKS ROUTE VALIDITY. EXITS WITH AC 0 IF VALID
2456 / -1 IF INVALID.
2457 /IF AC +VE ON ENTRY. SETS THAT SEG NO INVALID (CLEARS VALIDITY FIRST)
2458 /IF AC 0 ON ENTRY SETS WHOLE ROUTE VALID
2459 /WORD AFTER CALL IS LAC RPTR (RELATIVE POINTER TO ROUTE)
2460 /USES AIR 10,11
2461 /
2462 /-----/
2463 04163 R 740040 A RTVAL XX
2464 04164 R 044256 R DAC MODE /STORE MODE ON ENTRY
2465 04165 R 744100 A SMAICLL
2466 04166 R 744002 A STL /LINK CLEAR IF CHECK MODE
2467 04167 R 424163 R XCT* RTVAL /GET ROUTE POINTER

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2468 04170 R 345536 R ROUTE
2469 04171 R 723776 A AAC -2 ABSOLUTE ADDRESS OF WORD BEFORE ROUTE
2470 04172 R 065624 R DAC* (10
2471 04173 R 065627 R DAC* (11 SET AIR'S FOR SCANNING
2472 04174 R 220010 A LAC* 10
2473 04175 R 740100 A SMA /NO
2474 04176 R 604202 R JMP VALD /YES, GO BUMP AIR11
2475 04177 R 740400 A SNL /CHECK MODE?
2476 04200 R 604253 R JMP INVAL /YES, SET AC AND EXIT
2477 04201 R 505660 R AND (377777 /CLEAR VALIDITY BIT
2478 04202 R 060011 A VALD DAC* 11 /AND SET ROUTE VALID
2479 04203 R 220010 A LAC* 10 /2ND WORD OF ROUTE
2480 04204 R 060011 A DAC* 11 /BUMP AIR 11
2481 04205 R 742030 A SWHA
2482 04206 R 740020 A RAR /NO OF WORDS
2483 04207 R 505662 R AND (377
2484 04210 R 723776 A AAC -2
2485 04211 R 740031 A TCA
2486 04212 R 044260 R DAC NWDS /-(NO OF WRDS-2) FOR SCAN COUNT
2487 04213 R 204256 R LAC MODE /CHECK MODE?
2488 04214 R 741100 A SPA /NO, SET SEGMENT
2489 04215 R 604244 R JMP CHEKVL
2490 04216 R 740031 A TCA
2491 04217 R 044257 R DAC SEGNO /-(SEGMENT TO BE SET)
2492 04220 R 220010 A SLUP LAC* 10 /NEXT SEGMENT
2493 04221 R 045364 R DAC STR /SAVE TO CHECK FOR ANGLED SEGMENT
2494 04222 R 505660 R AND (377777 /SET VALID
2495 04223 R 444257 R ISZ SEGNO /SKIP IF THIS SEG TO BE SET
2496 04224 R 741000 A SKP /ELSE LEAVE CLEAR
2497 04225 R 345663 R TAD (400000 /SET VALIDITY BIT
2498 04226 R 060011 A DAC* 11
2499 04227 R 444260 R ISZ NWDS /SKIP IF ALL SEGS DONE
2500 04230 R 741000 A SKP
2501 04231 R 604254 R JMP EXVAL /ALL SEGS DONE
2502 04232 R 205364 R LAC STR
2503 04233 R 505664 R AND (6000 /GET SEG TYPE BITS
2504 04234 R 545664 R SAD (6000 /ANGLED?
2505 04235 R 741000 A SKP /YES
2506 04236 R 604220 R JMP SLUP /NO
2507 04237 R 220010 A LAC* 10 /BUMP AIR'S PAST SECOND WORD OF ANGLED SEG.
2508 04240 R 060011 A DAC* 11
2509 04241 R 444260 R ISZ NWDS /BUMP SCAN COUNT
2510 04242 R 604220 R JMP SLUP
2511 04243 R 604254 R JMP EXVAL
2512 /
2513 04244 R 220010 A CHEKVL LAC* 10 /NEXT SEG.
2514 04245 R 741100 A SPA
2515 04246 R 604253 R JMP INVAL /FOUND INVALID SEG
2516 04247 R 444260 R ISZ NWDS /SKIP IF ALL SEGS TESTED
2517 04250 R 604244 R JMP CHEKVL
2518 04251 R 750000 A CLA /ACC 0 FOR VALID ROUTE
2519 04252 R 741000 A SKP

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2520      04253 R 750001 A      INVAL CLC /AC=-1 FOR INVALID
2521      04254 R 444163 R      EXVAL ISZ RTVAL /BUMP EXIT PTR PAST PARAM
2522      04255 R 624163 R      JMP* RTVAL
2523      04256 R 000000 A      MODE
2524      04257 R 000000 A      SEGNO
2525      04260 R 000000 A      NWDS
2526      /
2527      /
2528      /
2529      04261 R 000000 A      GETPTH 0 /GETS MAX SIZE IN A LAYER
2530      /FIRST PARAMETER IS LAC LENGTH OF INITIAL PART OF ARRAY
2531      /SECOND PARAMETER IS LAC ARRAYAD,X
2532      04262 R 424261 R      XCT* GETPTH
2533      04263 R 045544 R      DAC ADDSTR*
2534      04264 R 444261 R      ISZ GETPTH
2535      04265 R 424261 R      XCT* GETPTH /LOAD WIDTH CODE
2536      04266 R 444261 R      ISZ GETPTH
2537      04267 R 721000 A      ROUND PAX
2538      04270 R 424261 R      XCT* GETPTH /LAC* TRACKAD,X
2539      04271 R 505630 R      AND (???)
2540      04272 R 740031 A      TCA
2541      04273 R 345413 R      TAD PTHHSZ
2542      04274 R 740100 A      SMA
2543      04275 R 604301 R      JMP .+4 /NOT NEW LARGEST
2544      04276 R 740031 A      TCA /STORE NEW LARGEST VALUE
2545      04277 R 345413 R      TAD PTHHSZ
2546      04300 R 045413 R      DAC PTHHSZ
2547      04301 R 424261 R      XCT* GETPTH /CHECK FOR MORE EXCEPTIONS
2548      04302 R 742030 A      SWHA
2549      04303 R 742020 A      RTR
2550      04304 R 742020 A      RTR
2551      04305 R 505625 R      AND (37
2552      04306 R 741200 A      SNA /ZERO IF NO EXCEPTION
2553      04307 R 444261 R      ISZ GETPTH
2554      04310 R 741200 A      SNA
2555      04311 R 624261 R      JMP* GETPTH
2556      04312 R 345544 R      TAD ADDSTR
2557      04313 R 604267 R      JMP ROUND
2558      /
2559      /
2560      /
2561      / FIND HIGHEST AND LOWEST X AND Y VALUES ON ROUTE.
2562      / ADD ON AMOUNT TO TAKE CARE OF THRO HOLES, TRACK WIDTH, ETC.
2563      04314 R 000000 A      RECTSZ 0
2564      04315 R 125617 E      JMS* .DA
2565      04316 R 604321 R      JMP .+3
2566      04317 R 000000 A      BUFFAD /CONTAINS UNPACKED ROUTE
2567      04320 R 000000 A      RECTAD /DEFINES RECTANGLE
2568      04321 R 224317 R      LAC* BUFFAD
2569      04322 R 740031 A      TCA
2570      04323 R 045412 R      DAC CNT
2571      04324 R 204317 R      LAC BUFFAD

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PAGE	55	SINGRT SRC	SINGRT	751127
2572	04325	R 065665	R LAC* (12	
2573	04326	R 220012	A LAC* 12	SET UP INITIAL ESTIMATES
2574	04327	R 045462	R DAC XLOW	
2575	04330	R 045463	R DAC XHGH	
2576	04331	R 220012	A LAC* 12	
2577	04332	R 045464	R DAC YLOW	
2578	04333	R 045465	R DAC YHGH	
2579	04334	R 220012	A LAC* 12	
2580	04335	R 445412	R ISZ CNT	
2581	04336	R 220012	A LUP1 LAC* 12	
2582	04337	R 045364	R DAC STR	
2583	04340	R 740031	A TCA	
2584	04341	R 345462	R TAD XLOW	
2585	04342	R 740100	A SMA	
2586	04343	R 604354	R JMP XL	/X LOW.
2587	04344	R 205364	R LAC STR	
2588	04345	R 740031	A TCA	
2589	04346	R 345463	R TAD XHGH	
2590	04347	R 740100	A SMA	
2591	04350	R 604356	R JMP YS	
2592	04351	R 205364	R LAC STR	
2593	04352	R 045463	R DAC XHGH	
2594	04353	R 604356	R JMP YS	
2595	04354	R 205364	R XL LAC STR	
2596	04355	R 045462	R DAC XLOW	
2597	04356	R 220012	A YS LAC* 12	
2598	04357	R 045364	R DAC STR	
2599	04360	R 740031	A TCA	
2600	04361	R 345464	R TAD YLOW	
2601	04362	R 740100	A SMA	
2602	04363	R 604374	R JMP YL	
2603	04364	R 205364	R LAC STR	
2604	04365	R 740031	A TCA	
2605	04366	R 345465	R TAD YHGH	
2606	04367	R 740100	A SMA	
2607	04370	R 604376	R JMP EOFL	
2608	04371	R 205364	R LAC STR	
2609	04372	R 045465	R DAC YHGH	
2610	04373	R 604376	R JMP EOFL	
2611	04374	R 205364	R YL LAC STR	
2612	04375	R 045464	R DAC YLOW	
2613	04376	R 220012	A EOFL LAC* 12	
2614	04377	R 445412	R ISZ CNT	
2615	04400	R 604336	R JMP LUP1	
2616	04401	R 205462	R LAC XLOW	
2617	04402	R 104700	R JMS DSTTOU	
2618	04403	R 740031	A TCA	
2619	04404	R 345413	R TAD PTHHSZ	
2620	04405	R 740031	A TCA	
2621	04406	R 064320	R DAC* RECTAD	
2622	04407	R 444320	R ISZ RECTAD	
2623	04410	R 205463	R LAC XHGH	

2624	04411 R 104700 R	JMS DSTTOU
2625	04412 R 345413 R	TAD PTHHSZ
2626	04413 R 064320 R	DAC* RECTAD
2627	04414 R 444320 R	ISZ RECTAD
2628	04415 R 205464 R	LAC YLOW
2629	04416 R 104700 R	JMS DSTTOU
2630	04417 R 740031 A	TCA
2631	04420 R 345413 R	TAD PTHHSZ
2632	04421 R 740031 A	TCA
2633	04422 R 064320 R	DAC* RECTAD
2634	04423 R 444320 R	ISZ RECTAD
2635	04424 R 205465 R	LAC YHGH
2636	04425 R 104700 R	JMS DSTTOU
2637	04426 R 345413 R	TAD PTHHSZ
2638	04427 R 064320 R	DAC* RECTAD
2639	04430 R 624314 R	JMP* RECTSZ

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04431 R 000000 A
04432 R 125617 E
04433 R 604436 R
04434 R 000000 A
04435 R 000000 A
04436 R 777776 A
04437 R 045470 R
04440 R 204434 R
04441 R 723777 A
04442 R 065665 R
04443 R 220012 A
04444 R 044475 R
04445 R 220012 A
04446 R 044476 R
04447 R 740031 A
04450 R 344475 R
04451 R 741100 A
04452 R 604457 R
04453 R 204476 R
04454 R 044475 R
04455 R 224434 R
04456 R 044476 R
04457 R 444434 R
04460 R 444434 R
04461 R 205413 R
04462 R 740031 A
04463 R 344475 R
04464 R 064435 R
04465 R 444435 R
04466 R 204476 R
04467 R 345413 R

/

/

/

/ SORTS COORDS IN FROM AND USES THEM TO DEFINE RECTANGLE

/

RECTGT 0
JMS* .DA
JMP .+3
FROM
TO
LAW -2
DAC PASS
LAC FROM
AAC -1
DAC* (12
RECTLP LAC* 12
DAC STRLOW
LAC* 12
DAC STRHGH
TCA
TAD STRLOW
SPA
JMP XEND
LAC STRHGH
DAC STRLOW
LAC* FROM
DAC STRHGH
XEND ISZ FROM /STORE HIGH AND LOW VALUES
ISZ FROM
LAC PTHHSZ
TCA
TAD STRLOW
DAC* TO
ISZ TO
LAC STRHGH
TAD PTHHSZ

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2676 04470 R 064435 R ISZ* TO
2677 04471 R 444435 R ISZ TO
2678 04472 R 445470 R ISZ PASS
2679 04473 R 604443 R JMP RECTLP
2680 04474 R 624431 R JMP* RECTGT
2681 04475 R 000000 A STRLOW
2682 04476 R 000000 A STRHGH

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/-----/
/ SUBROUTINE PADCOD /
/ CALL IS:- /
/ JMS PADCOD /
/ TAD COMPONENT POINTER /
/ LAC PAD NUMBER /
/
/ THIS SUBROUTINE FINDS THE PAD WIDTH CODE, /
/ WHICH IS RETURNED IN THE ACCUMULATOR. /
/-----/

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2694 04477 R 000000 A PADCOD 0 /FIND PAD CODE
2695 04500 R 750000 A CLA
2696 04501 R 424477 R XCT* PADCOD /TAD COMP PTR
2697 04502 R 744010 A RALICLL /*2
2698 04503 R 424477 R XCT* PADCOD /*3
2699 04504 R 444477 R ISZ PADCOD
2700 04505 R 744010 A RALICLL /*6
2701 04506 R 345535 R TAD COMPAD
2702 04507 R 723003 A AAC 3
2703 04510 R 045364 R DAC STR
2704 04511 R 225364 R LAC* STR
2705 04512 R 505630 R AND (777 /GET POINTER TO LIBRARY ARRAY
2706 04513 R 345533 R TAD LIBAD
2707 04514 R 045461 R DAC STR2
2708 04515 R 424477 R XCT* PADCOD /LAC PAD NO
2709 04516 R 444477 R ISZ PADCOD
2710 04517 R 652000 A LMQ
2711 04520 R 754000 A CLALICLL
2712 04521 R 640323 A DIV
2713 04522 R 000003 A 3
2714 04523 R 045460 R DAC STR1
2715 04524 R 641002 A LACQ
2716 04525 R 754000 A CLALICLL
2717 04526 R 653122 A MUL
2718 04527 R 000004 A 4
2719 04530 R 723003 A AAC 3
2720 04531 R 721000 A PAX /POSITION IN LIB. INF.
2721 04532 R 205666 R LAC (JMP LABEL
2722 04533 R 345460 R TAD STR1
2723 04534 R 044536 R DAC .+2
2724 04535 R 235461 R LAC* STR2.X
2725 04536 R 000000 A 0 /JUMP
2726 04537 R 604542 R LABEL JMP CODE1

```

```

2728 04540 R 604546 R JMP CODE2
2729 04541 R 604551 R JMP CODE3
2730 04542 R 742030 A CODE1 SWHA
2731 04543 R 740020 A RAR
2732 04544 R 742020 A RTR
2733 04545 R 604551 R JMP CODE3
2734 04546 R 742020 A CODE2 RTR
2735 04547 R 742020 A RTR
2736 04550 R 742020 A RTR
2737 04551 R 505641 R CODE3 AND (??
2738 04552 R 624477 R JMP* PADCOD

```

```

/-----/
/
/          SUBROUTINE SQRT
/

```

```

/ FINDS THE SQUARE ROOT OF A NUMBER IN THE AC, MQ
/ AND RETURNS THE RESULT IN THE AC.
/ METHOD USED IS THE WELL KNOWN ONE WHERE TWO
/ DIGITS AT A TIME ARE SHIFTED INTO THE REMAINDER
/ AND THE NEXT DIGIT DETERMINED. THIS DIGIT IS
/ THEN ADDED TWICE INTO THE DIVISOR
/-----/

```

```

2750
2751 04553 R 000000 A SQRT 0
2752 04554 R 044747 R DAC RES
2753 04555 R 641002 A LACQ
2754 04556 R 045562 R DAC LESSIG*
2755 04557 R 204747 R LAC RES
2756 04560 R 652000 A LMQ
2757 04561 R 777776 A LAW -2
2758 04562 R 044751 R DAC TWOCNT
2759 04563 R 144747 R DZM RES /RESULT
2760 04564 R 144746 R DZM DIV /'DIVISOR'
2761 04565 R 144745 R DZM REM /REMAINDER AT EACH STAGE
2762 04566 R 777767 A ON3 LAW -11
2763 04567 R 044750 R DAC NINCNT /COUNTS SHIFTS THROUGH EACH WORD
2764 04570 R 204746 R ON5 LAC DIV /SHIFT DIVISOR FOR NEXT STAGE
2765 04571 R 744010 A RCL
2766 04572 R 044746 R DAC DIV
2767 04573 R 204747 R LAC RES /SHIFT RESULT FOR NEXT BIT
2768 04574 R 744010 A RCL
2769 04575 R 044747 R DAC RES
2770 04576 R 204745 R LAC REM /GET REMAINDER + NEXT TWO BITS IN AC
2771 04577 R 640602 A LLS 2
2772 04600 R 044745 R DAC REM /STORE NEW REMAINDER
2773 04601 R 740031 A TCA
2774 04602 R 344746 R TAD DIV
2775 04603 R 723001 A AAC 1
2776 04604 R 740300 A SMA!SZA /NEW BIT IN RESULT 0 OR 1?
2777 04605 R 604613 R JMP GOON /0
2778 04606 R 444746 R ISZ DIV /1
2779 04607 R 444746 R ISZ DIV /UPDATE 'DIVISOR'

```

2780	04610 R 444747 R	ISZ RES	ADD BIT INTO RESULT
2781	04611 R 748031 A	LCA	
2782	04612 R 044745 R	DAC	REM /STORE NEW REMAINDER
2783	04613 R 444750 R	GOON ISZ NINCNT	/FIRST WORD FINISHED?
2784	04614 R 604570 R	JMP ON5	/NO
2785	04615 R 205562 R	LAC LESSIG	/YES, SET UP FOR LEAST SIG BIT
2786	04616 R 652000 A	LMQ	
2787	04617 R 444751 R	ISZ TWOCNT	/SKIP IF BOTH WORDS DONE
2788	04620 R 604566 R	JMP ON3	
2789	04621 R 204747 R	LAC RES	
2790	04622 R 624553 R	JMP*	SQRT
2791		-----	
2792		/	
2793		/ SUBROUTINE ORI	
2794		/	
2795		/ TAKES COORDS OF REFERENCE POINT OF	
2796		/ EDGE CONNECTOR (FRM) AND FINDS THE	
2797		/ COORDINATES OF THE CENTRE OF THE OTHER	
2798		/ END(TOO). THE ORIENTATION IS SUPPLIED IN	
2799		/ ORIENT AND THE PAD CODE IN CDE	
2800		/	
2801		/-----	
2802	04623 R 000000 A	ORI 0	
2803	04624 R 125617 E	JMS* .DA	
2804	04625 R 604632 R	JMP .+5	
2805	04626 R 000000 A	FRM	
2806	04627 R 000000 A	TOO	
2807	04630 R 000000 A	CDE	
2808	04631 R 000000 A	LIBWRD	
2809	04632 R 735000 A	CLX	
2810	04633 R 737002 A	AXR 2	
2811	04634 R 224626 R	LAC* FRM	
2812	04635 R 064627 R	DAC* TOO	
2813	04636 R 234626 R	LAC* FRM, X	
2814	04637 R 074627 R	DAC* TOO, X	
2815	04640 R 224630 R	LAC* CDE	
2816	04641 R 723752 A	AAC -26	
2817	04642 R 741100 A	SPA /EDGE CONNECTOR?	
2818	04643 R 624623 R	JMP* ORI	/NO
2819	04644 R 104120 R	JMS SIZER	/GET EDGE CONNECTOR MOVEMENT.
2820	04645 R 604652 R	JMP .+5	
2821	04646 R 005543 R	.DSA DRILAD	
2822	04647 R 005622 R	.DSA (0	
2823	04650 R 005622 R	.DSA (0	
2824	04651 R 404630 R	.DSA CDE1400000	
2825	04652 R 045364 R	DAC STR	/STORE EDGE CONNECTOR MOVEMENT.
2826	04653 R 735000 A	CLX	
2827	04654 R 737002 A	AXR 2	
2828	04655 R 224631 R	LAC* LIBWRD	
2829	04656 R 742010 A	RTL	
2830	04657 R 740010 A	RAL	
2831	04660 R 505636 R	AND (3	

```

2832 04661 R 345667 R TAD (JMP OR0
2833 04662 R 044664 R DAC .+2
2834 04663 R 205364 R LAC STR
2835 04664 R 740000 A NOP /PLUGGED WITH JUMP AT RUN TIME.
2836 04665 R 604674 R OR0 JMP OR00
2837 04666 R 604671 R JMP OR11
2838 04667 R 604675 R JMP OR22
2839 04670 R 740031 A TCA /ORIENTATION 3
2840 04671 R 364626 R OR11 TAD* FRM /ORIENTATION 1
2841 04672 R 064627 R DAC* TOO
2842 04673 R 624623 R JMP* ORI
2843 04674 R 740031 A OR00 TCA /ORIENTATION0
2844 04675 R 374626 R OR22 TAD* FRM.X
2845 04676 R 074627 R DAC* TOO.X
2846 04677 R 624623 R JMP* ORI

```

```

/-----/
/          SUBROUTINE DSTTOU          /
/

```

```

/ ENTER WITH DISTANCE IN DATA STRUCTURE UNITS IN /
/ THE AC.  EXITS WITH THE DISTANCE IN THOUS. /
/-----/

```

```

2854 04700 R 000000 A DSTTOU 0
2855 04701 R 744000 A CLL
2856 04702 R 653122 A MUL
2857 04703 R 000031 A 31
2858 04704 R 641002 A LACQ
2859 04705 R 624700 R JMP* DSTTOU

```

```

/-----/
/          SUBROUTINE PADSIZ          /
/

```

```

/ SUBROUTINE TO FIND MAX DIAMETER OF /
/ PAD AND HOLE.  HOLE IS IGNORED FOR EDGE /
/ CONNECTORS. /

```

```

/ CALL IS:- /
/   CALL PADSIZ(NDCD,LAYR,DIAM) /
/
/ NDCD IS PAD CODE /
/ LAYR IS THE LAYER ON WHICH DIAM. IS /
/ DIAM RETURNS THE DIAMETER /
/-----/

```

```

2878 04706 R 000000 A PADSIZ 0
2879 04707 R 125617 E JMS* .DA
2880 04710 R 604714 R JMP .+4
2881 04711 R 000000 A NDCD
2882 04712 R 000000 A LAYR12
2883 04713 R 000000 A DIAM

```

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2884 04714 R 104120 R JMS SIZER /GET PAD DIAMETER
2885 04715 R 604722 R JMP .+5
2886 04716 R 005541 R .DSA PADAD
2887 04717 R 005625 R .DSA (37
2888 04720 R 404712 R .DSA LAYR12!400000
2889 04721 R 404711 R .DSA NDCD!400000
2890 04722 R 064713 R DAC* DIAM /STORE PAD DIAMETER
2891 04723 R 224711 R LAC* NDCD
2892 04724 R 723752 A AAC -26
2893 04725 R 740100 A SMA /EDGE CONNECTOR?
2894 04726 R 624706 R JMP* PADSIZ /YES
2895 04727 R 104120 R JMS SIZER /GET DRILL SIZE
2896 04730 R 604735 R JMP .+5
2897 04731 R 005543 R .DSA DRILAD
2898 04732 R 005622 R .DSA (0
2899 04733 R 404712 R .DSA LAYR12!400000
2900 04734 R 404711 R .DSA NDCD!400000
2901 04735 R 740031 A TCA
2902 04736 R 364713 R TAD* DIAM
2903 04737 R 740100 A SMA /DRILL SIZE GREATER THAN PAD?
2904 04740 R 624706 R JMP* PADSIZ
2905 04741 R 740031 A TCA
2906 04742 R 364713 R TAD* DIAM
2907 04743 R 064713 R DAC* DIAM
2908 04744 R 624706 R JMP* PADSIZ
2909 04745 R 000000 A REM
2910 04746 R 000000 A DIV
2911 04747 R 000000 A RES
2912 04750 R 000000 A NINCNT
2913 04751 R 000000 A TWOCNT
2914 04752 R 000000 A ENTFLG /STORES ENTRY FLAG
2915 04753 R 000000 A CONN2 /STEPS THRO' CONNECTIONS ARRAY
2916 04754 R 000000 A NOCON2 /NO OF CONNECTIONS TO COMPONENT
2917 04755 R 000000 A PTR11 /POINTER BACK TO COMPONENT
2918 04756 R 000000 A PAD11 /PAD NO ON THIS COMPONENT
2919 04757 R 000000 A WIDTH2 /WIDTH OF ROUTE
2920 04760 R 000000 A PTR22 /POINTER TO OTHER COMPONENT
2921 04761 R 000000 A PAD22 /PAD NO ON OTHER COMPONENT
2922 04762 R 000000 A PNTR2 /RELATIVE POINTER TO ROUTES ARRAY
2923 04763 R 000000 A VALMRK /SET ZERO IF ROUTE VALID
2924 04764 R 000000 A PP /HOLDS NODES IN TREE OF ROUTE BEING CHECKED
2925 04765 R 000000 A BUFF1 .BLOCK 144 /HOLDS UNPACKED ROUTE 1
2926 05131 R 000000 A BUFF2 .BLOCK 144 /HOLDS UNPACKED ROUTE 2
2927 05275 R 000000 A PPCONT .BLOCK 67 /REST OF PP
2928 05364 R 000000 A STR
2929 05365 R 000000 A PAD1
2930 05366 R 000000 A WIDTH1
2931 05367 R 000000 A PTR2
2932 05370 R 000000 A PTR1
2933 05371 R 000000 A PNTR1
2934 05372 R 000000 A CONN1
2935 05373 R 000000 A PAD2

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PAGE	62	SINGRT SRC	SINGRT	751127
2936		05374 R	A	RECT1 .BLOCK 4 /RECTANGLE FOR ROUTE1
2937		05400 R	A	RECT2 .BLOCK 4 /RECTANGLE FOR ALL OR SEG OF ROUTE2
2938		05404 R	A	RECT3 .BLOCK 4 /RECTANGLE FOR SEG OF ROUTE1
2939		05410 R 000000	A	CNT1 /ROUTE 1 COUNTER
2940		05411 R 000000	A	CNT2 /ROUTE 2 COUNTER
2941		05412 R 000000	A	CNT /LOCAL COUNTER, GENERALLY AVAILABLE
2942		05413 R 000000	A	PTHMS2 /APPROX HALF SIZE OF PLATED THRO' HOLE.
2943		05414 R 000000	A	SIDE1 /ROUTE 1 SEG. SIDE
2944		05415 R 000000	A	SIDE2 /ROUTE 1 NEXT SEG. SIDE
2945		05416 R 000000	A	SIDE1 /ROUTE 2 SEG. SIDE
2946		05417 R 000000	A	SIDE2 /ROUTE 2 NEXT SEG. SIDE
2947				/ORDER CRITICAL FROM HERE DOWN
2948		05420 R 000000	A	CHX /EXPLAINED IN CHKEND
2949		05421 R 000000	A	CHY
2950		05422 R 000000	A	LINX /EXPLAINED IN CHKEND
2951		05423 R 000000	A	LINY
2952		05424 R 000000	A	MODST /STORES ENTRY MODE FOR ENDOF2
2953		05425 R 000000	A	CTOP /EXPLAINED IN CHKEND
2954		05426 R 000000	A	CBOT
2955		05427 R 000000	A	X1 /ENDS OF CURRENT SEGMENTS
2956		05430 R 000000	A	X2
2957		05431 R 000000	A	Y1
2958		05432 R 000000	A	Y2
2959		05433 R 000000	A	X11
2960		05434 R 000000	A	X22
2961		05435 R 000000	A	Y11
2962		05436 R 000000	A	Y22
2963		05437 R 000000	A	XY1 /ENDS OF CURRENT SEGS IN THOUS
2964		05440 R 000000	A	XY2
2965		05441 R 000000	A	YY1
2966		05442 R 000000	A	YY2
2967		05443 R 000000	A	XY11
2968		05444 R 000000	A	XY22
2969		05445 R 000000	A	YY11
2970		05446 R 000000	A	YY22
2971		05447 R 000000	A	XNEW1 /OFFSET ENDS OF CURRENT SEGMENT
2972		05450 R 000000	A	XNEW2
2973		05451 R 000000	A	YNEW1
2974		05452 R 000000	A	YNEW2
2975		05453 R 000000	A	XNEW11
2976		05454 R 000000	A	XNEW22
2977		05455 R 000000	A	YNEW11
2978		05456 R 000000	A	YNEW22
2979		05457 R 000000	A	EOCONN /END OF CONNECTIONS ARRAY
2980				/ORDER NO LONGER CRITICAL
2981		05460 R 000000	A	STR1 /WORK SPACE
2982		05461 R 000000	A	STR2 /WORK SPACE
2983		05462 R 000000	A	XLOW
2984		05463 R 000000	A	XHIGH
2985		05464 R 000000	A	YLOW
2986		05465 R 000000	A	YHIGH
2987		05466 R 000000	A	SEG1 /SEGMENT ON ROUTE 1

2988	05467	R	000000	A	SEG2	/SEGMENT ON ROUTE 2
2989	05470	R	000000	A	PASS	
2990	05471	R	000000	A	LIB1	
2991	05472	R	000000	A	LIB2	
2992	05473	R	000000	A	LIB11	
2993	05474	R	000000	A	LIB22	
2994	05475	R	000000	A	END1	/CODE FOR END OF ROUTE 1
2995	05476	R	000000	A	LAY1	
2996	05477	R	000000	A	END2	/CODE FOR SECOND END OF ROUTE 1
2997	05500	R	000000	A	LAY2	
2998	05501	R	000000	A	END11	/AS ABOVE FOR ROUTE 2
2999	05502	R	000000	A	LAY11	
3000	05503	R	000000	A	END22	/HOLDS PAD CODE, OR 0 FOR PTH, OR -(TRACK WIDTH CODE)
3001						/AS APPROPRIATE
3002	05504	R	000000	A	LAY22	
3003	05505	R	000000	A	NEND1	/AS THE ENDS BUT FOR THE OFFSET TRACK
3004	05506	R	000000	A	NLAY1	
3005	05507	R	000000	A	NEND2	
3006	05510	R	000000	A	NLAY2	
3007	05511	R	000000	A	NEND11	
3008	05512	R	000000	A	NLAY11	
3009	05513	R	000000	A	NEND22	
3010	05514	R	000000	A	NLAY22	
3011	05515	R	000000	A	BOT1	/DOUBLE LENGTH WORKSPACE
3012	05516	R	000000	A	TOP1	
3013	05517	R	000000	A	BOT2	/MORE DOUBLE LENGTH WORKSPACE
3014	05520	R	000000	A	TOP2	
3015	05521	R	000000	A	SIZ1	/USED IN SCAN TO HOLD SIZES OF SEGMENT ENDS.
3016	05522	R	000000	A	SIZ2	/AS SIZ1 FOR OTHER END BEING CONSIDERED IN SCAN ETC.
3017	05523	R	005475	R	ND1AD	.DSA END1
3018	05524	R	005505	R	NND1AD	.DSA NEND1
3019	05525	R	000000	A	XONE	/STORES ENDS OF ROUTE
3020	05526	R	000000	A	YONE	
3021	05527	R	000000	A	XTWO	
3022	05530	R	000000	A	YTWO	
3023					/	
3024					/	
3025	05531	R	000000	A	COPPER	
3026	05532	R	000000	A	BOARD	
3027	05533	R	000000	A	LIBAD	/LIBRY
3028	05534	R	000000	A	CONNAD	/CONNX
3029	05535	R	000000	A	COMPAD	/COMPS
3030	05536	R	000000	A	ROUTAD	/ROUTES
3031	05537	R	740040	A	MESS	XX
3032	05540	R	740040	A	TRAKAD	XX
3033	05541	R	740040	A	PADAD	XX
3034	05542	R	740040	A	LAYNO	XX
3035	05543	R	740040	A	DRILAD	XX
3036					.END	
	05606	R	005606	E	*E	
	05607	R	005607	E	*E	
	05610	R	005610	E	*E	

05611 R 005611 E *E
05612 R 005612 E *E
05613 R 005613 E *E
05614 R 005614 E *E
05615 R 005615 E *E
05616 R 005616 E *E
05617 R 005617 E *E
05620 R 000006 A *L
05621 R 000022 A *L
05622 R 000000 A *L
05623 R 000040 A *L
05624 R 000010 A *L
05625 R 000037 A *L
05626 R 000026 A *L
05627 R 000011 A *L
05630 R 000777 A *L
05631 R 000333 A *L
05632 R 000004 A *L
05633 R 000207 A *L
05634 R 077777 A *L
05635 R 000315 A *L
05636 R 000003 A *L
05637 R 000002 A *L
05640 R 777000 A *L
05641 R 000077 A *L
05642 R 004763 A *L
05643 R 677777 A *L
05644 R 100000 A *L
~~05645 R 000001 A *L~~
~~05646 R 000007 A *L~~
~~05647 R 037777 A *L~~
~~05650 R 000017 A *L~~
~~05651 R 000016 A *L~~
~~05652 R 004763 A *L~~
~~05653 R 005131 A *L~~
~~05654 R 777777 A *L~~
~~05655 R 005487 A *L~~
~~05656 R 005437 A *L~~
05657 R 005447 A *L
05660 R 377777 A *L
~~05661 R 760000 A *L~~
~~05662 R 000000 A *L~~
05663 R 400000 A *L
05664 R 006000 A *L
05665 R 000012 A *L
05666 R 604537 A *L
05667 R 604665 A *L
SIZE=05672 NO ERROR LINES

ADD	01067	659	664*						
ADDER	03742	2082	2146	2260	2268*	2278			
ADDSTR	05544	2533	2556						
ADD2	01105	655	663	678*					
ADR	04123	2420*	2426	2427	2428	2431	2441	2447	
AGAIN	01516	962*	1064						
AGN	00161	180*	199						
AGN1	00172	189*	198						
ALLMKD	00560	445	451*						
ALLRUT	00154	175*	215						
ALL1	02577	1572*							
ALL2	02636	1603*							
ALSING	05545	102	175	176	221	314	467	474	513
		653	1127	1166	1405				
ARG1	00570	459*							
ARG100	05546	454	459	743	748				
ARG11	01213	748*							
ARG2	00572	89	461*						
ARG22	01215	90	750*						
ARG3	00575	456	464*						
ARG33	01220	745	753*						
ARG4	00576	93	465*						
ARG44	01221	94	754*						
BACK	03564	2132*	2145						
BAD	01510	947*	1568	1581	1599	1612	2104	2203	
BADER	01224	627	648	757*	947	1154	1197		
BEGAN	03761	2290*	2305						
BOARD	05532	3026*							
BOT1	05515	1655	1671	1676	1792	2071	2144	2258	2273
		2354	2369	3011*					
BOT2	05517	1855	1892	1893	1907	1914	1940	1946	1949
		2052	2088	2099	3013*				
BUFFAD	04317	2566*	2568	2571					
BUFF1	04765	460	573	577	580	584	587	589	590
		621	628	630	631	643	651	1088	2925*
BUFF2	05131	749	811	821	2926*				
BUSY	00207	202*	237						
BUTTON	05606	48	275						
CARRY	03457	2044	2047	2050*					
CBOT	05426	1905	1921	2954*					
CCCLUP	00513	414*	446						
CDE	04630	2807*	2815	2824					
CDE1	00347	305*	322						
CDE2	00352	308*	349						
CHANGE	00742	575	579*						
CHANG1	01401	871	875*						
CHECK	01203	735	740*	782					
CHEKON	02157	1245	1248	1251	1254	1257	1260	1262*	
CHEKVL	04244	2489	2513*	2517					
CHKCOM	01005	578	614*						
CHKEND	03130	1420	1436	1449	1465	1478	1489	1497	1508
		1824*	1883	1978	2105	2108	2111		
CHKRT	00670	478	537*	768	771	774	799	803	

CHKRT2	01050	638	642	649*					
CHX	05420	1842	1849	1867	1887	1935	2948*		
CHY	05421	1846	1875	1937	2949*				
CKCOM1	01016	582	586	596	601	623*			
CNT	05412	1682	1697	1720	1730	1734	1747	1756	1762
		1773	1776	2570	2580	2614	2941*		
CNTR	05547	412	428						
CNT1	05410	1093	1119	1161	1229	2939*			
CNT2	05411	826	836	901	932	1246	2940*		
CODE	04014	2334*	2341						
CODE1	04542	2727	2730*						
CODE2	04546	2728	2734*						
CODE21	04126	2423*	2424						
CODE3	04551	2729	2733	2737*					
COMEND	05550	961	1062						
COMPAD	05535	250	391	542	838	957	985	995	2702
		3029*							
COMPCT	05551	958	962	964	965	987	1059	1061	
COMREL	05552	994	1005						
CONEND	05553	100	195	791					
CONNAD	05534	97	178	253	260	395	408	455	678
		744	3028*						
CONNO	00206	183	197	201*					
CONN1	05372	190	241	242	483	486	493	498	499
		504	506	507	2934*				
CONN2	04753	679	681	685	689	690	693	699	703
		709	712	714	715	719	786	787	790
		2915*							
CONPTR	00205	179	180	184	188	189	192	194	200*
CONRUT	00460	191	264	387*	469	479	520	523	
CONTEU	03012	1722	1728*						
CONTM1	02753	1697*	1706						
CONTM2	03002	1720*	1727						
CONTUE	02765	1699	1704	1707*					
CONT1	02756	1686	1700*						
CONT2	03005	1709	1723*						
CONT3	03037	1742	1749*						
CONT4	03050	1751	1758*						
COPPER	05531	74	3025*						
COUNT	05554	429	438						
CTOP	05425	1901	1918	1923	1927	2953*			
DFLPK	05607	47	228						
DIAM	04713	2083*	2090	2902	2906	2907			
DIST	03515	1981	1991	1998	1999	2021	2022	2031	2051
		2080*							
DISTER	03466	1980	2036	2040	2041	2050	2057*		
DISTPL	03660	1933	2169	2175	2190	2196	2220	2221	2227
		2228	2254*	2261					
DISTST	04102	2343	2388*						
DIV	04746	974	991	2056	2079	2390	2713	2760	2764
		2766	2774	2778	2779	2910*			
DOPADS	01753	1126	1130*						
DOPAD2	02022	1165	1169*						

DRAWCP	05610	48	266						
DRILAD	05543	84	111	142	2821	2857	3035*		
DRILL	00005	54*	54	83					
DSTTOU	04700	317	320	342	347	888	891	918	921
		1022	1025	1095	1098	1215	1218	2617	2624
		2629	2636	2855*	2860				
EDGESZ	05555	118	664	668	672	675			
END	04161	2434	2450*						
ENDCD	03140	1832*	1964	2002					
ENDCO	05556	399	444						
ENDCOD	02550	1549*	1561	1574	1592	1605			
ENDOF2	02544	1428	1444	1457	1473	1545*	1584	1602	1613
ENDON	03602	2141	2146*						
ENDOUT	03547	1913	2106*						
ENDSEG	05557	538	626	647	772				
ENDSRT	03143	1837*							
ENDTRE	01611	1017	1021*						
ENDTWO	01602	1010	1014*						
END1	05475	323	331	1111	1120	1134	1136	1174	1181
		1213	1252	1327	1486	1496	1556	1569	1575
		2994*	3017						
END11	05501	350	358	865	875	878	916	1038	1050
		1255	1362	1433	1443	1447	2998*		
END2	05477	324	1137	1212	1222	1227	1238	1343	1505
		1515	1587	1606	2996*				
END2OT	03552	1929	2109*						
END22	05503	351	915	925	930	937	1039	1378	1462
		1472	1476	1600	3000*				
ENTFLG	04752	539	733	769	2914*				
EOCOMP	05560	51	96	959					
EOCONN	05457	50	92	98	397	2979*			
EOFL	04376	2607	2610	2613*					
EXC	04136	2431*	2446						
EXVAL	04254	2501	2511	2521*					
FAILUE	00315	273	277*						
FINI	01267	796*	1063						
FNDSD	00403	333*							
FNDSD2	00436	360*							
FRM	04626	2805*	2811	2813	2840	2844			
FROM	04434	2648*	2652	2665	2667	2668			
GETPTH	04261	108	120	128	139	150	2529*	2532	2534
		2535	2536	2538	2547	2553	2555		
GETY	04071	2379*	2400						
GOING	02226	1319*	1323						
GOOD1	03067	1769	1773*						
GOOD2	03126	1798	1804*						
GOOD3	03077	1775	1779	1781*					
GOON	04613	2777	2783*						
GOON2	01121	690*	789						
GOON3	01110	681*	793						
HAA1	01567	996	1003*						
HAA2	01570	998	1004*						
HAR1	00707	543	552*						

HAR11	00723	544	564*						
HAR2	00710	546	553*						
HAR22	00724	547	565*						
HA1	01346	839	848*						
HA11	01362	840	860*						
HA2	01347	842	849*						
HA22	01363	843	861*						
INST	03605	2162*							
INVAL	04253	2476	2515	2520*					
LABEL	04537	2722	2727*						
LAUR	04015	2335*	2340						
LAY	05561	1957	1963	1968	1971	1975	1989	1996	2009
		2019	2045	2048					
LAYER	00006	55*	55	85					
LAYNO	05542	86	337	364	620	640	897	942	1031
		1116	1243	1774	2046	3034*			
LAYR	04125	2422*	2444						
LAYR12	04712	2082*	2088	2099					
LAY1	05476	1117	1140	1184	1205	2995*			
LAY11	05502	898	909	1033	2999*				
LAY2	05500	1105	1144	1159	1183	1204	1210	1228	1244
		2997*							
LAY22	05504	835	908	914	931	943	1034	3002*	
LENGTH	03555	1847	1885	1898	2092	2125*	2147		
LESSIG	05562	2754	2785						
LETSEA	01506	935	944*						
LETSEE	02137	1232	1246*						
LIBAD	05533	545	841	967	997	2707	3027*		
LIBR1	00350	306*	332	333					
LIBR2	00353	309*	359	360					
LIBWRD	04631	2008*	2020						
LIB1	05471	571	608	611	614	1112	1135	2990*	
LIB11	05473	867	881	884	893	2992*			
LIB2	05472	559	610	613	634	1182	1239	2991*	
LIB22	05474	855	883	886	938	2993*			
LINX	05422	1870	1881	1900	1936	2094	2950*		
LINY	05423	1878	1934	2951*					
LUP	00017	73*	76						
LUPCCC	00522	421*	441						
LUP1	04336	2581*	2615						
LUP22	03026	1740*	1780						
L1000	02211	1302	1306*						
L2000	02217	1308	1312*						
MARK	00554	437	447*						
MARKED	00545	440*	450						
MAXDST	05563	1739	1767	1771	1772	1781			
MESS	05537	78	223	224	234	235	270	271	3031*
MESS1	05611	48	227	238	274				
MOD	02551	1550*	1551	1582					
MODE	04256	2464	2487	2523*					
MODST	05424	1432	1448	1461	1477	1834	2107	2110	2952*
MULMAC	MACRO	2219	2255	2259					
NDCD	04711	2881*	2889	2891	2900				

ND1	02654	1634*	1684	1702	1740				
ND1AD	05523	1296	1414	1417	3017*				
ND2	02655	1635*	1707	1725	1749	1755			
NEND1	05505	1300	1305	1342	1485	1487	1562	1570	3003*
		3018							
NEND11	05511	1306	1311	1377	1427	1431	1434	3007*	
NEND2	05507	1358	1504	1506	1593	1601	3005*		
NEND22	05513	1393	1456	1460	1463	3009*			
NEWPAD	01557	995*	1058						
NEXCOM	01657	984	1057	1059*					
NEXRT2	01255	708	718	726	728	739	756	778	783
		786*							
NEXSEG	01432	900*	945						
NINCNT	04750	2763	2783	2912*					
NLAY1	05506	338	1103	1143	1157	1185	1208	3004*	
NLAY11	05512	365	833	912	1035	3008*			
NLAY2	05510	339	1104	1142	1158	1186	1209	3006*	
NLAY22	05514	366	834	913	1036	3010*			
NND1AD	05524	1297	1416	3018*					
NOCON2	04754	684	788	2916*					
NOCROS	03657	2204*							
NOFCNS	05564	417	440						
NOOFF	02611	1553	1571	1582*					
NOOFF1	02574	1558	1569*						
NOOFF2	02562	1555	1559*						
NOOFF3	02633	1589	1600*						
NOOFF4	02621	1586	1590*						
NOPADS	05565	982	1006	1053	1055				
NOTE1	02256	1329	1332	1343*					
NOTE2	02276	1326	1345	1348	1359*				
NOTE3	02321	1364	1367	1378*					
NOTE4	02341	1361	1380	1383	1394*				
NOWPAD	01511	795	957*						
NPAD	01651	1013	1020	1043	1053*				
NSEG	02012	1161*	1261	1263					
NSEG21	02061	1162	1200*						
NWDS	04260	2486	2499	2509	2516	2525*			
OFFSET	04006	1333	1349	1368	1384	2328*	2401		
ONEMIN	01252	737	781*						
ONEPT	03133	1827*	1841	1845	1866	1874			
ONON	01415	874	887*						
ON1	01453	899	917*						
ON2	02077	1123	1129	1160	1214*				
ON3	04566	2762*	2788						
ON5	04570	2764*	2784						
ORFIN	01650	1052*							
ORI	04623	327	354	1046	1130	1177	2802*	2818	2842
		2846							
ORISZ	05566	1045	1051						
OR0	04665	2832	2836*						
OR00	04674	2836	2843*						
OR11	04671	2837	2840*						
OR22	04675	2838	2844*						

OTHEND	01023	618	622	628*					
PAD	03422	2012	2021*						
PADAD	05541	82	131	2886	3033*				
PADCOD	04477	2695*	2697	2699	2700	2709	2710	2738	
PADD22	05567	853	877	880	936				
PADED1	05570	569	604	607	656	1106			
PADED2	05571	557	602	605	660	1233			
PADPAD	00343	219	220	301*	375	377			
PADPAS	05572	312	540	766	794	796	1124	1163	1193
		1249	1359	1397					
PADPS1	05573	313	541	757	1145	1147	1150	1153	1155
		1188	1190	1196	1198	1324	1402		
PADS	00004	53*	53	81					
PADS1Z	04706	1744	1753	2006	2878*	2894	2904	2908	
PADSKP	02413	1436*							
PADSK1	02450	1465*							
PADSTO	02373	1413	1420*						
PAD1	05365	485	567	2929*					
PAD11	04756	692	863	2918*					
PAD2	05373	501	555	2935*					
PAD22	04761	711	851	2921*					
PASS	05470	2651	2678	2989*					
PNTR1	05371	451	463	512	521	725	765	802	2933*
PNTR2	04762	724	731	740	752	777	2922*		
POINRT	02533	1507	1516*						
POINR2	02465	1464	1478*						
POINR3	02510	1488	1497*						
POINTR	02430	1435	1449*						
PP	04764	404	430	503	2924*				
PPCONT	05275	2927*							
PPNO	05574	413							
PQR	03352	1981*	2049						
PQRS	03365	1984	1992*						
PTAD	02547	1548*	1565	1578	1596	1609			
PTHHSZ	05413	105	117	119	124	126	162	166	2541
		2545	2546	2619	2625	2631	2637	2669	2675
		2942*							
PTN	04013	2333*	2398						
PTR1	05370	187	263	516	566	2932*			
PTR11	04755	688	704	862	2917*				
PTR2	05367	245	247	497	518	554	2931*		
PTR22	04760	702	706	850	2920*				
PT1	04011	2331*	2344	2357	2381				
PT1S	00346	304*	316	319					
PT111	03560	2128*	2132						
PT2	04012	2332*	2346	2359	2379	2397			
PT2S	00351	307*	341	346					
PUSBY	00007	56*	77						
RBRB	03320	1943	1955*						
READRT	05612	47	457	746					
RECTAD	04320	2567*	2621	2622	2626	2627	2633	2634	2638
RECTGT	04431	368	1075	1280	2645*	2680			
RECTLP	04443	2655*	2679						

RECTOL	05613	48	813	1079	1284				
RECTSZ	04314	649	809	2563*	2639				
RECT1	05374	652	666	667	670	671	673	674	676
		677	815	1082	2936*				
RECT2	05400	371	812	816	1078	1083	1287	2937*	
RECT3	05404	1283	1286	2938*					
REM	04745	2761	2770	2772	2782	2909*			
RENDER	05575	2060	2072						
RES	04747	2752	2755	2759	2767	2769	2780	2789	2911*
RESLT	03512	2064	2077*						
RND	00265	253*	258						
RND21	00104	128*	136						
RND23	00132	150*	158						
RND25	00117	139*	147						
RND97	00060	108*	116						
RND98	00073	104	119*						
ROUND	04267	2537*	2557						
ROUTAD	05536	452	741	2468	3030*				
RST	03403	2006*	2030						
RTVAL	04163	730	764	776	801	2463*	2467	2521	2522
RUTCHK	01277	47	755	808*	818	903			
SAMSID	02662	1640*							
SCAN	02651	1559	1572	1590	1603	1631*	1737	1800	1803
		1805							
SEGNO	04257	2491	2495	2524*					
SEGSEG	02161	372	760	761	1146	1189	1262	1279*	1289
		1524							
SEG1	05466	623	624	645	763	1087	1118	1211	2987*
SEG2	05467	775	820	837	900	2988*			
SHIFT	03755	2168	2189	2286*	2306				
SID	03137	1831*	1959	1976					
SIDE1	05414	340	1101	1141	1187	1207	1225	1258	1339
		1355	1426	1442	1455	1471	1519	1564	1577
		1595	1608	2943*					
SIDE2	05415	1206	1224	2944*					
SID1	02656	1636*	1640	1641	1693	1696	1705	1735	
SID2	02657	1637*	1642	1643	1716	1719			
SINGL	05576	1683	1698	1721	1728	1777			
SINGRT	00215	1	47	196	213*	218	232	269	276
SINGSD	05577	1958	1962	1967	1969	2042			
SING2	00225	217	221*						
SIZER	04120	1689	1712	1758	1985	1992	2015	2336	2417*
		2451	2819	2884	2895				
SIZ1	05521	1688	1694	1695	1743	1748	1764	3015*	
SIZ2	05522	1711	1717	1718	1752	1757	1765	3016*	
SLUP	04220	2492*	2506	2510					
SQRT	04553	2374	2751*	2790					
SSLOOP	00540	435*	439						
STATE	05614	47	68						
STORER	04105	2375	2391*						
STP	00011	66*	167	177	222	310			
STR	05364	125	159	390	406	410	473	477	592
		593	597	598	603	606	609	612	633

		641	876	879	882	885	969	970	976
		981	1865	1868	1873	1876	2010	2011	2014
		2020	2164	2185	2291	2294	2297	2300	2303
		2382	2384	2392	2493	2502	2582	2587	2592
		2595	2598	2603	2608	2611	2704	2705	2825
		2834	2928*						
STRHSH	04476	2658	2663	2666	2674	2682*			
STRLOC	05600	2430	2450						
STRLOW	04475	2656	2660	2664	2671	2681*			
STRSDE	05601	1102	1156						
STR1	05460	107	110	112	113	127	130	132	133
		137	138	141	143	144	148	149	152
		154	155	409	414	418	421	422	426
		427	432	434	442	443	447	449	1314
		1319	2001	2023	2167	2188	2302	2715	2723
		2981*							
STR2	05461	233	239	255	1316	1320	2003	2008	2028
		2708	2725	2982*					
STR3	05602	1318	1321						
SUBNON	05615	48	548	560	844	856	999		
TARG1	00477	392	402*						
TARG2	00500	396	403*						
TARG3	00504	394	407*						
TEMP	05603	425	436						
TO	04435	2649*	2672	2673	2676	2677			
TOO	04627	2806*	2812	2814	2841	2845			
TOP1	05516	1653	1667	1668	1673	1677	1681	1788	1903
		1909	1911	2069	2096	2100	2142	2256	2269
		2270	2275	2352	2365	2366	2371	3012*	
TOP2	05520	1789	1794	1851	1857	1888	1889	1895	1902
		1925	1938	1941	1945	1951	2054	2084	2090
		2095	3014*						
TRAKAD	05540	80	123	153	393	1691	1714	1760	1987
		1994	2017	2338	3032*				
TRAKND	03412	2005	2013*						
TRAKS	00003	52*	52	79					
TRAKWD	03136	1830*	1982	1990	2026				
TREE	05616	47	400						
TWOCNT	04751	2758	2787	2913*					
TWOPT	03134	1828*	1863	1871					
TWOPT2	03135	1829*	1839	1843	1869	1877			
UNPCK	00615	388	482*	515	524				
UNPCK1	01665	944	1052	1074*	1085	1168	1169	1172	1199
VALD	04202	2474	2478*						
VALMRK	04763	267	680	762	797	2923*			
WIDSTR	05604	492	1148	1191					
WIDTH1	05366	326	491	1109	1139	1149	1176	1192	1220
		1236	1303	1338	1340	1354	1356	1425	1441
		1454	1470	2930*					
WIDTH2	04757	353	698	923	1041	1309	1373	1375	1389
		1391	1483	1494	1502	1513	2919*		
XEND	04457	2662	2667*						
XHGH	05463	2575	2589	2593	2623	2984*			

XL	04354	2586	2595*						
XLN	04124	2421*	2439						
XLOW	05462	2574	2584	2596	2616	2983*			
XNEW1	05447	1317	1337	1423	1439	1452	1468	1480	1566
		2971*							
XNEW11	05453	1372	1422	1430	1481	1492	1500	1511	2975*
XNEW2	05450	1353	1424	1440	1453	1469	1499	1597	2972*
XNEW22	05454	1368	1451	1459	1482	1493	1501	1512	2976*
XN1	00000	49*	88						
XN2	00001	50*	91						
XN4	00002	51*	95						
XONE	05525	562	572	594	1008	3019*			
XOVER	03604	1523	2161*	2182	2204				
XTWO	05527	550	579	1015	3021*				
XVER	02542	1518	1521	1523*					
XYZ	03546	2059	2063	2105*					
XY1	05437	846	858	868	1315	1336	1351	1491	1579
		2172	2183	2307	2963*				
XY1AD	04002	2290	2292	2307*					
XY11	05443	1371	1386	1438	1446	2162	2193	2309	2967*
XY11AD	04004	2296	2298	2309*					
XY2	05440	1335	1352	1510	1610	2178	2191	2197	2308
		2964*							
XY2AD	04003	2293	2295	2308*					
XY22	05444	1370	1387	1467	1475	2170	2176	2199	2310
		2968*							
XY22AD	04005	2299	2301	2310*					
X1	05427	318	329	1096	1132	1180	1201	1282	1313
		2955*							
X1AD	02660	1638*	1644	1658					
X1DST	05605	2174	2180	2195	2201				
X11	05433	343	356	370	828	869	887	889	905
		1001	1007	1014	1021	1023	1048	1077	2959*
		330	1133	1179	1200	1216	2956*		
X2	05430	330	1133	1179	1200	1216	2956*		
X2AD	02661	1639*	1646	1660					
X22	05434	357	904	919	1049	2960*			
YHGH	05465	2578	2605	2609	2635	2986*			
YL	04374	2602	2611*						
YLOW	05464	2577	2600	2612	2628	2985*			
YNEW1	05451	2973*							
YNEW11	05455	2977*							
YNEW2	05452	2974*							
YNEW22	05456	2978*							
YONE	05526	563	576	599	1012	3020*			
YS	04356	2591	2594	2597*					
YTWO	05530	551	583	1019	3022*				
YYY2	00333	226	280*						
YY1	05441	847	859	2171	2186	2965*			
YY11	05445	872	2165	2192	2969*				
YY2	05442	2177	2194	2200	2966*				
YY22	05446	2173	2179	2198	2970*				
Y1	05431	321	873	1099	1203	2957*			
Y11	05435	348	830	890	892	907	1002	1011	1018

		1024	1026	2961*					
Y2	05432	1202	1219	2950*					
Y22	05436	906	922	2962*					
ZIDE1	05416	367	832	911	928	1032	1259	1374	1390
		1484	1495	1503	1514	1516	1522	1563	1576
		1594	1607	2945*					
ZIDE2	05417	910	927	2946*					
.DA	05617	47	302	1546	1632	1825	2126	2329	2418
		2564	2646	2803	2879				
.XXMON	00010	57*	73						