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ภาคผนวก

ผนวก ก

V-n diagram

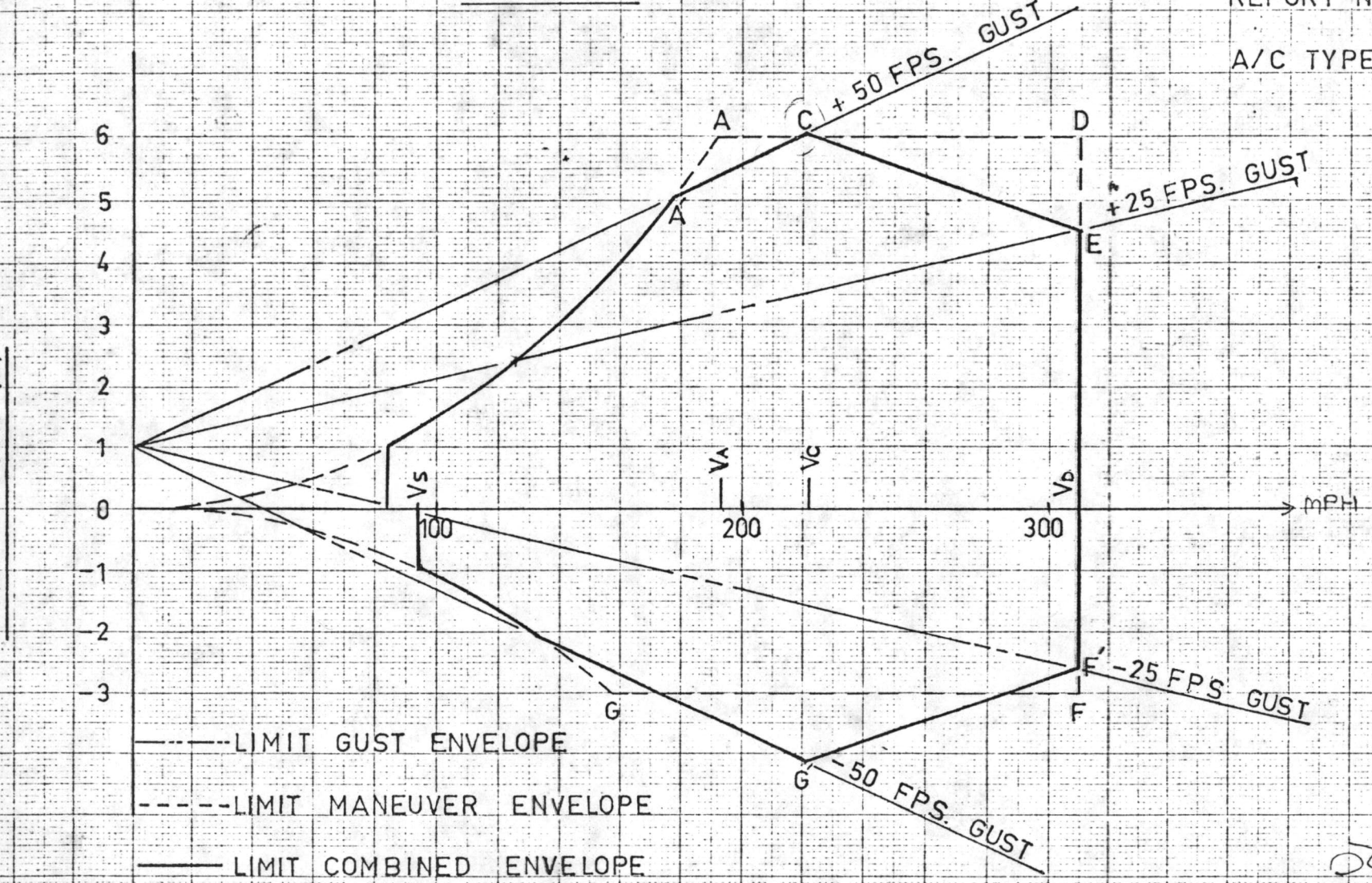
REPORT NO. 4

A/C TYPE R.T.A.F-5

V-n DIAGRAM

NORMAL GROSS WEIGHT

(3500 LBS)



ผนวก ข.

โปรแกรมและผลลัพธ์ของ shear, moment และ torsion

```
10 REM THESIS RTAF-5
20 DIM A(13),B(13),C(13),P(13),T(13),E(13),F(13),G(13),H(13)
21 DIM S(13),Q(13),R(13),U(13),V(13),X(13),TI(13),Y(13)
25 PRINT HEX$(0E);TAB(5);"AT POINT C (50 FPS. GUST)":PRINT
26 PRINT "STATION    SHEAR       MOMENT       TOSION    TORSION(DG)":PRINT
30 FOR I=2TO 13
40 READ A(I),C(I),B(I),T(I),P(I)
50 DATA 188.3,  56.85,  .3933,  4.56,  2.246
60 DATA 178.6,  57.13,  .5427,  4.57,  2.246
70 DATA 169.2,  57.9,  .7093,  4.63,  4.692
80 DATA 150.4,  59.3,  .9,  4.74,  9.37
90 DATA 131.6,  60.71,  .9984,  4.86,  9.37
100 DATA 112.8,  62.11,  1.0387,  4.97,  9.37
110 DATA 94,  63.51,  1.1059,  5.08,  9.37
120 DATA 75.2,  64.91,  1.1092,  5.19,  9.37
130 DATA 52.4,  65,  1.1539,  5.2,  9.39
140 DATA 37.60,  65,  1.1779,  5.2,  9.4
150 DATA 18.8,  65,  1.2027,  5.2,  9.4
160 DATA 0,  65,  1.2125,  5.2,  9.4
170 NEXT I
180 A(1)=188
190 C(1)=56.5
200 B(1)=0
210 E(1)=0
220 F(1)=0
230 S(1)=0
240 D=.8705
250 Q(1)=0
260 G(1)=0
270 P(1)=2.346
275 TI(1)=0
280 T(1)=4.52
290 V(1)=0
295 Y(1)=0
300 X(1)=0
310 REM CALCULATION PART
320 FOR I=2TO 13
330 E(I)=B(I)*C(I)*D
340 F(I)=.5*(E(I)+E(I-1))
350 G(I)=A(I-1)-A(I)
360 H(I)=F(I)*G(I)
370 S(I)=H(I)+H(I-1)
380 Q(I)=S(I-1)*G(I-1)
390 R(I)=H(I)*P(I-1)
400 TI(I)=Q(I)+R(I)+TI(I-1)
410 U(I)=.5*(T(I)+T(I-1))
420 V(I)=U(I)*H(I)
430 X(I)=X(I-1)+V(I)
435 Y(I)=1.5*X(I)
440 PRINT USING 445; A(I),S(I),TI(I),X(I),Y(I):PRINT
445 ###.#    ####.##    ######.##    ######.##    ######.##
450 NEXT I
460 END
```

AT POINT C (50 FPS. GUST)

STATION	SHEAR	MOMENT	TOSION	TORSION(SG)
183.3	46.43	108.94	210.82	316.23
178.5	156.29	573.94	712.34	1068.51
169.2	404.73	1970.84	2068.77	3103.16
150.4	1067.63	9401.17	5689.16	8533.74
131.6	1705.44	38212.04	10166.06	15249.09
112.8	1956.56	79868.17	15198.39	22797.59
94.0	2126.48	126982.99	20739.03	31108.54
75.2	2266.47	177866.28	26715.43	40073.15
52.4	2622.65	234144.89	34293.90	51440.85
37.6	2435.14	303109.41	39370.92	59056.38
18.8	2242.53	351051.74	45955.07	68932.60
0.0	2550.76	405286.45	52634.91	78952.37

```
10 REM THESIS RTAF-5
20 DIM A(13),B(13),C(13),P(13),T(13),E(13),F(13),G(13),H(13)
21 DIM S(13),Q(13),R(13),U(13),V(13),X(13),T1(13),Y(13)
25 PRINT HEAD(0E);TAB(5);"AT POINT G (-50 FPS. GUST)":PRINT
26 PRINT "STATION     SHEAR          MOMENT          TOSION     TORSION
30 FOR I=2TO 13
40 READ A(I),C(I),B(I),T(I),P(I)
50 DATA 188.3,  56.85,  -.2684,  4.56,  2.246
60 DATA 178.6,  57.13,  -.3687,  4.57,  2.246
70 DATA 169.2,  57.9,  -.4865,  4.63,  4.692
80 DATA 150.4,  59.3,  -.6299,  4.74,  9.37
90 DATA 131.6,  60.71,  -.7063,  4.86,  9.37
100 DATA 112.8,  62.11,  -.7320,  4.97,  9.37
110 DATA 94,  63.51,  -.7716,  5.08,  9.37
120 DATA 75.2,  64.91,  -.7367,  5.19,  9.37
130 DATA 52.4,  65,  -.7205,  5.2,  9.39
140 DATA 37.60,  65,  -.7034,  5.2,  9.4
150 DATA 18.8,  65,  -.6946,  5.2,  9.4
160 DATA 0,  65,  -.6893,  5.2,  9.4
170 NEXT I
180 A(1)=188
190 C(1)=56.5
200 B(1)=0
210 E(1)=0
220 F(1)=0
230 S(1)=0
240 D=.8705
250 Q(1)=0
260 G(1)=0
270 P(1)=2.346
275 T1(1)=0
280 T(1)=4.52
290 V(1)=0
295 Y(1)=0
300 X(1)=0
310 REM CALCULATION PART
320 FOR I=2TO 13
330 E(I)=B(I)*C(I)*D
340 F(I)=.5*(E(I)+E(I-1))
350 G(I)=A(I-1)-A(I)
360 H(I)=F(I)*G(I)
370 S(I)=H(I)+H(I-1)
380 Q(I)=S(I-1)*G(I-1)
390 R(I)=H(I)*P(I-1)
400 T1(I)=Q(I)+R(I)+T1(I-1)
410 U(I)=.5*(T(I)+T(I-1))
420 V(I)=U(I)*H(I)
430 X(I)=X(I-1)+V(I)
435 Y(I)=1.5*X(I)
440 PRINTUSING 445, A(I),S(I),T1(I),X(I),Y(I):PRINT
445 %####.#  -#####.##  -#######.##  -#######.##  -#######.##
450 NEXT I
460 END
```

AT POINT G'(-50 FPS, GUST)

STATION	SHEAR	MOMENT	TOSION	TORSION(-5G)
183.3	-31.21	-73.22	-141.71	-212.56
178.6	-105.51	-386.82	-480.90	-721.36
169.2	-275.72	-1335.15	-1407.46	-2111.20
150.4	-737.56	-6442.59	-3919.29	-5878.94
131.6	-1192.66	-26460.45	-7070.58	-10605.87
112.8	-1379.41	-55655.98	-10623.60	-15935.40
94.0	-1495.90	-88832.02	-14507.97	-21761.96
75.2	-1565.28	-124378.63	-18576.32	-27864.48
52.4	-1731.57	-162607.24	-23455.96	-35183.94
37.6	-1535.49	-207685.43	-26556.21	-39834.31
18.8	-1339.76	-237400.27	-30422.73	-45634.09
0.0	-1479.62	-269506.82	-34250.25	-51375.38

ผนวก ค.

โปรแกรมและผลลัพธ์ของ shear flow และ shearing stress

```
10 DIM A(30),L(80),T(50)
15 FOR I=1TO 30:READ A(I):NEXT I
16FOR J=1TO 80:READ L(J):NEXT J
17  FOR K=1TO 50:READ T(K):NEXT K
20 N=1:M=1:J=1
30 FOR I=1TO 10
40 B1=2*A(N)
50 B2=2*A(N+1)
60 B3=2*A(N+2)
70 X1=(L(M)/T(J)+L(M+3)/T(J+3))/A(N)
75 X2=L(M+3)/(A(N+1)*T(J+3))
76 B4=X1+X2
80 B5=-(L(M+3)/(A(N)*T(J+3)))
90 B6=L(M+4)/(A(N+1)*T(J+3))
100 B7=(L(M)/T(J)+L(M+3)/T(J+3))/A(N)
102 X3=L(M+4)/(A(N+2)*T(J+3))
103 X4=L(M+3)/(A(N)*T(J+3))
110 B8=L(M+4)/(A(N+2)*T(J+3))-L(M+3)/(A(N)*T(J+3))
112 X5=(L(M+1)/T(J+1)+L(M+2)/T(J+2))/A(N+1)
115 X6=(L(M+3)/T(J+3)+L(M+4)/T(J+4))/A(N+1)
120 L2=(L(M+1)/T(J+1)+L(M+2)/T(J+2)+L(M+3)/T(J+3)+L(N+4)/T(J+4))/A(N+1)
122 X7=L(M+4)/(A(N+2)*T(J+3))
125 X8=(L(M+5)+L(M+6)+L(M+7))/(A(N+2)*T(J+4))
130 L3=(L(M+4)/T(J+3)+(L(M+5)+L(M+6)+L(M+7))/T(J+4))/A(N+2)
140 PRINTUSING 150; I; B1; B2; B3; B4; B5; B6; B7; B8; L2; L3:PRINT
150### #### ## #### ## #### ## ### ## ### ## ## ## ### ## ## ##   ### ## ##
160 N=N+3
170 M=M+8
180 J=J+5
190 NEXT I
191 REM DATA FOR A
193 DATA 53, 71, 134, 72, 73, 36, 68, 26, 124, 1, 73, 36, 66, 22, 122, 56
198 DATA 73, 36, 62, 55, 113, 98, 73, 36, 61, 55, 112, 77, 73, 36, 58, 6
200 DATA 111, 11, 73, 36, 55, 16, 102, 31, 73, 36, 50, 88, 97, 99, 73, 36
202 DATA 50, 74, 99, 34, 73, 36, 47, 16, 135, 35, 73, 36
205 REM DATA FOR L
207 DATA 28, 24, 24, 8, 7, 38, 9, 5, 9, 5, 3, 5, 28, 24, 24, 8, 7, 38, 9, 5
209 DATA 9, 5, 3, 5, 28, 24, 24, 8, 7, 38, 9, 5, 9, 5, 3, 5, 28, 24, 24, 8
211 DATA 7, 38, 9, 5, 9, 5, 3, 5, 26, 5, 22, 5, 22, 5, 7, 5, 7, 8, 8, 5, 4, 26, 5
212 DATA 22, 5, 22, 5, 7, 5, 7, 5, 5, 5, 5, 5, 26, 5, 22, 5, 22, 5, 7, 5, 7
213 DATA 5, 5, 5, 5, 5, 5, 26, 5, 22, 5, 22, 5, 7, 5, 7, 5, 5, 5, 5, 5, 26, 5
214 DATA 22, 5, 22, 5, 7, 5, 7, 5, 5, 5, 5, 5, 24, 5, 21, 13, 21, 13, 6, 13
215 DATA 5, 75, 5, 5, 5, 5, 4, 75
217 REM DATA FOR T
218 DATA . 032, . 05, . 063, . 04, . 032, . 032, . 05, . 063, . 04, . 032, . 032
219 DATA . 05, . 063, . 04, . 032, . 032, . 05, . 063, . 04, . 032, . 032, . 032, . 04
221 DATA  . 04, . 032, . 032, . 032, . 04, . 04, . 025, . 025, . 025, . 032, . 04
222 DATA . 025, . 025, . 025, . 032, . 04, . 025, . 025, . 025, . 032, . 04, . 025
223 DATA . 025, . 025, . 032, . 04, . 025
```

1	127.42	269.44	146.72	18.35	- 3.13	1.36	16.87	- 0.62	9.58	12.09
2	136.52	248.20	146.72	17.36	- 2.92	1.48	15.74	- 0.41	9.43	12.09
3	132.44	245.12	146.72	17.86	- 3.02	1.50	16.23	- 0.50	14.77	12.09
4	125.10	239.96	146.72	18.85	- 3.19	1.53	17.18	- 0.68	11.31	12.09
5	123.10	225.54	146.72	18.16	- 3.04	1.55	16.50	- 0.66	20.64	11.11
6	117.20	222.22	146.72	19.01	- 3.19	1.57	17.33	- 0.81	15.95	11.38
7	110.32	204.62	146.72	24.44	- 3.39	1.71	22.61	- 1.01	21.21	11.38
8	101.76	193.38	146.72	26.43	- 3.68	1.78	24.51	- 1.29	28.07	11.38
9	101.48	198.68	146.72	26.47	- 3.69	1.76	24.58	- 1.30	20.99	11.38
10	94.32	270.70	146.72	25.16	- 3.24	1.06	24.02	- 1.29	13.28	10.54

```
5  DEFFN'0"MAT"
10 DIM B(3,3),C(3,1),D(3,3),X(3,1),A(10)
15 FOR I=1TO 10:READ A(I):NEXT I
20 DATA 271.79,265.72,262.64,255.89,247.68
30 DATA 243.07,230.83,222.23,223.44,255.87
40 DATA 127.42,269.44,146.72,18.35,-3.13,1.36,15.87,-0.62,0
50 DATA 31108.54,9.58,12.09,136.52,248.2,146.72,17.36,-2.92
60 DATA 1.48,15.74,-0.41,0,22795.59,9.43,12.09,132.44
70 DATA 245.12,146.72,17.86,-3.02,1.5,16.23,-.5,0,22797.59
80 DATA 14.77,12.09,125.1,239.96,146.72,18.85,-3.19,1.53,17.18
90 DATA -.58,0,22797.59,11.31,12.09,123.1,225.54,146.72,18.16
100 DATA -3.04,1.55,16.5,-.66,0,15249.09,20.64,11.11,117.2
110 DATA 222.2,146.72,19.01,-3.19,1.57,17.33,-.81,0,8533.74
120 DATA 15.95,11.38,110.32,204.62,146.72,24.44,-3.39,1.71
130 DATA 22.61,-1.01,0,8533.74,21.21,11.38,101.76,195.98,146.72
140 DATA 26.43,-3.86,1.78,24.51,-1.29,0,8533.74,28.07,11.38
150 DATA 101.48,198.68,146.72,26.47,-3.68,1.76,24.58,-1.3,0
160 DATA 8533.74,20.99,11.38,94.32,270.7,146.72,25.16,-3.24
170 DATA 1.96,24.02,-1.09,0,1068.51,13.28,10.54
172 PRINTUSING 173
173 % SIMPSON      01       02       03       02-01      03-02      SHEAR
174 PRINTUSING 175:PRINT
175 % OF MIB                                                    STRESS(PSI)
178 PRINT "**********************************************************************"
180 PRINT
190 FOR M=1TO 10
200 MAT READ B,C
210 MAT D=INV(B)
220 MAT X=D*C
230 Y1=X(2,1)-X(1,1)
240 Y2=X(3,1)-X(2,1)
270 S=C(1,1)/(0.8*A(M))
280 PRINTUSING 290,M,X(1,1),X(2,1),X(3,1),Y1,Y2,S:PRINT
290 %####      ###.##   ###.##   ###.##   ###.##   ###.##    ####.##
300 NEXT M
310 END
560X=0
```

STATION OF RIB	σ1	σ2	σ3	σ2-σ1	σ3-σ2	SHEAR STRESS(PSI)
1	2.85	58.25	102.56	55.39	44.30	143.07
2	1.97	46.49	74.88	44.51	28.39	107.23
3	2.16	45.95	76.64	43.79	30.69	108.50
4	2.59	47.77	75.03	45.18	27.25	111.36
5	1.95	31.97	53.14	30.01	21.17	76.95
6	1.51	18.36	29.13	16.85	10.76	43.88
7	1.35	18.96	30.69	17.61	11.73	46.21
8	1.33	17.74	33.48	16.34	15.74	48.00
9	1.50	19.68	30.46	18.18	10.77	47.74
10	0.49	1.26	4.62	0.77	3.35	5.21

ประวัติการศึกษา

ผู้เขียนวิทยานิพนธ์	นาวาอากาศโท ประสงค์ ปรีปาน
วุฒิการศึกษา	ปริญญาวิทยาศาสตร์บัณฑิต จากโรงเรียนนายเรืออากาศ พ.ศ. ๒๕๐๔
ตำแหน่งปัจจุบัน	อาจารย์ผู้ช่วย กองวิชาเทคนิค กองการศึกษา โรงเรียนนายเรืออากาศ