

DTIC FILE COPY

AD-A228 495

2

ARL-STRUC-TM- 567

AR-006-116



**DEPARTMENT OF DEFENCE
DEFENCE SCIENCE AND TECHNOLOGY ORGANISATION
AERONAUTICAL RESEARCH LABORATORY
MELBOURNE, VICTORIA**

Aircraft Structures Technical Memorandum 567

**CREATING POSTSCRIPT FILES
ON VAX COMPUTERS**

by

Petra M. Cox

DTIC
ELECTE
NOV 08 1990
S B D

Approved for public release

(C) COMMONWEALTH OF AUSTRALIA 1990

JULY 1990

90 1 0 0 0 3

AR-006-116

**DEPARTMENT OF DEFENCE
DEFENCE SCIENCE AND TECHNOLOGY ORGANISATION
AERONAUTICAL RESEARCH LABORATORY**

Aircraft Structures Technical Memorandum 567

**CREATING POSTSCRIPT FILES
ON VAX COMPUTERS**

by

Petra M. Cox

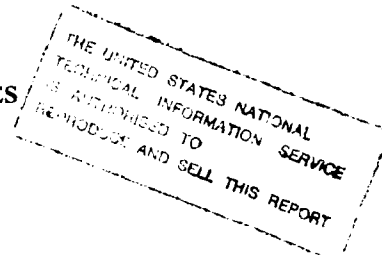
SUMMARY

Digital Standard Runoff is a utility provided by DEC for use on VAX computers. This utility creates formatted ascii text files of various simple lay-outs. However, it does not generate PostScript files or permit the inclusion of figures or algebraic expressions and equations. The present report describes a program which will permit the extension of RUNOFF to include these features. It also includes subroutines for the generation of PostScript graphic files, which can be included in the text files.



(C) COMMONWEALTH OF AUSTRALIA 1990

**POSTAL ADDRESS: Director, Aeronautical Research Laboratory,
P.O. Box 4331, Melbourne, Victoria, 3001, Australia**



CONTENTS

1	TEXT FILES	1
1.1	LPL Command	1
1.2	LPL Parameters	1
1.2.1	Norun	1
1.2.2	Nocon	1
1.2.3	Noprt	1
1.3	Input File	2
1.4	DSR Commands	2
1.5	PMC Commands	2
1.5.1	^@ (ascii Character 0)	2
1.5.2	^A (ascii Character 1)	3
1.5.3	^B (ascii Character 2)	3
1.5.4	^C (ascii Character 3)	3
1.5.5	^D (ascii Character 4)	3
1.5.6	^E (ascii Character 5)	3
1.5.7	^F (ascii Character 6)	3
1.5.8	^G (ascii Character 7)	3
1.5.9	^H (ascii Character 8)	3
1.5.10	^N (ascii Character 14)	3
1.5.10.1	Format For ^N Variables	4
1.5.11	^O (ascii Character 15)	5
1.5.12	^P (ascii Character 16)	5
1.5.13	^Q (ascii Character 17)	5
1.5.14	^R (ascii Character 18)	5
1.6	Examples Using Various PMC Commands	6
1.7	Mathematical Symbols	7
1.8	Letterhead	8
2	PLOT FILES	9
2.1	Subroutines	9
2.1.1	AXES	9
2.1.2	ENDPAGE	10
2.1.3	INITPLT	10
2.1.4	LABEL	10
2.1.4.1	LABEL	11
2.1.4.2	CPLABEL	11
2.1.4.3	ELABEL	11
2.1.4.4	MLABEL	11
2.1.5	LINE	11
2.1.6	NEWORIGIN	11
2.1.7	NEWPAGE	12
2.1.8	SCALE	12
2.1.9	SYMBOL	12

APPENDIX A	TABLE OF MATHEMATICAL SYMBOLS
APPENDIX B	SAMPLE PROGRAM
APPENDIX C	CHARACTER FONTS
APPENDIX D	SYMBOLS

Distribution/	
Availability Codes	
Dist	Avail and/or Special
A-1	

1 TEXT FILES

1.1 LPL Command

LPL is a command procedure that creates formatted PostScript files from input files consisting of text, DSR commands, DSR flags and PMC commands, and sends the output file to the LN03R printer.

Format: LPL *filename*

It initially runs the DCL command RUNOFF with the qualifier /DEVICE=LN03, then runs the program CONVTPS to convert the RUNOFF output file from ascii to PostScript, and finally sends the PostScript file to the PostScript printer queue LN03R_P. The two output files created are *filename*.DAT which is the output file from RUNOFF, and *filename*.PS which is the PostScript file.

1.2 LPL Parameters

Three parameters are available.

1. norun - do not run RUNOFF.
2. nocon - do not run CONVTPS.
3. noprt - do not print output file.

1.2.1 Norun

Converts an existing RUNOFF output file to a PostScript file which it then sends to the printer.

Format: LPL *filename* norun

1.2.2 Nocon

Runs only the DCL command RUNOFF. The noprt parameter is automatically set.

Format: LPL *filename* nocon

1.2.3 Noprt

The PostScript output file is not sent to the printer.

Format: LPL *filename* noprt

NOTE : The ***filename*** must be the **FIRST** variable but the other three can be in any order.

1.3 Input File

The input file must have a file type of .RNO and the first line must be

.req "lpreq"

1.4 DSR Commands

For information on the DSR commands and flags see the *MicroVMS User's Manual*.

1.5 PMC Commands

The PMC commands are inserted into the text by using the special insert key in edit and the ascii character code.

The PMC commands are:-

1. ^@ associated with the insertion of a figure into text.
2. ^A associated with the use of subscripts.
3. ^B associated with the use of subscripts/superscripts.
4. ^C associated with the use of superscripts.
5. ^D associated with the use of subscripts/superscripts.
6. ^E associated with the use of subscripts/superscripts.
7. ^F associated with the use of numerators.
8. ^G associated with the use of numerators/denominators.
9. ^H associated with the use of denominators.
10. ^N associated with the generation of tables.
11. ^O associated with the generation of tables.
12. ^P associated with the generation of tables.
13. ^Q associated with the generation of tables.
14. ^R associated with the generation of equation numbers.

1.5.1 ^@ (ascii Character 0)

^@ (which must be preceded by an underscore (_) in the filename.RNO file) is followed by the name of a PostScript graphics file to be included at the current position. This flag and filename must be *THE ONLY TEXT ON THE LINE* in the output file from RUNOFF (use the DSR command .BREAK (.BR)).

Ensure that there is enough space for the graphics by using the DSR command .FIGURE (.FG) on the line **BEFORE** this command. If the DSR command .FIGURE DEFERRED (.FGD) is used the allocated space and the ^@ command may not be on the same page. Therefore it is advisable to check the filename.DAT file to make sure the allocated space and the ^@

command are on the same page before proceeding with the conversion to PostScript.

Position the graph in the LOWER LEFT-HAND CORNER of the page in the graphics PostScript file. The file must *NOT* include the PostScript command "showpage".

1.5.2 ^A (ascii Character 1)

^A writes the text that follows as a subscript until a ^B flag.

1.5.3 ^B (ascii Character 2)

^B marks the end of superscript or subscript text.

1.5.4 ^C (ascii Character 3)

^C writes the text that follows as a superscript until a ^B flag.

1.5.5 ^D (ascii Character 4)

^D marks the position where both superscript and subscript text are required.

1.5.6 ^E (ascii Character 5)

^E marks the end of superscript and subscript text.

1.5.7 ^F (ascii Character 6)

^F marks the start of the numerator text.

1.5.8 ^G (ascii Character 7)

^G marks the end of the numerator text and the start of the denominator text.

1.5.9 ^H (ascii Character 8)

^H marks the end of the denominator text.

1.5.10 ^N (ascii Character 14)

^N marks the start of a table and is followed by the number of rows, number of columns, width of each column, the start-stop position of each

horizontal line and then start-stop position of each vertical line.

This flag and the number of rows etc. are best on one line of the output file from RUNOFF. However, if this is not possible use the DSR command .BREAK (.BR), in the *filename.RNO* file, to replace a COMMA to continue the variables on the next line. The text for each row of the table must follow on separate lines of the output file from RUNOFF (use the DSR command .BREAK (.BR)). It is wise to use the DSR command .TEST PAGE (.TP) and/or check the *filename.DAT* file to make sure the command line and all of the table lines are on the same page.

1.5.10.1 Format For ^N Variables -

Rows and Columns

The number of rows and the number of columns must be followed by a comma.

Column Width

The width of the columns is given by character spaces. If each column is of a different size, separate the values with commas. However if two or more consecutive columns are of the same size, type the number of such columns followed by an asterisk (which must be preceded by an underscore () in the *filename.RNO* file) and the width followed by a comma; or if column widths are repeated over a number of columns, type the number of repeats then the column widths separated by commas enclosed in brackets followed by a comma.

Horizontal and Vertical Lines

The total number of horizontal lines is one more than the number of rows and the total number of vertical lines is one more than the number of columns. Start and stop values are separated by a minus sign. For the drawing of horizontal lines, the left-hand edge of the *n*th column is *n*-1 and the right-hand edge of the *n*th column is *n*. Thus to draw a line the full width of a table five columns wide type 0-5. For the drawing of vertical lines, the top edge of the *n*th row is *n*-1 and the lower edge of the *n*th row is *n*. Therefore the full length of a table of four lines would be 0-4. For lines of varying length the start-stop values are separated by a comma. If two or more consecutive lines are of the same length, type the number of such lines followed by the start-stop values enclosed in brackets then a comma. However if line lengths are repeated over a number of lines, type the number of repeats then the start-stop values separated by commas enclosed in brackets followed by a comma. If no line is required, make the start and stop values equal. For broken lines see PMC command ^Q.

1.5.11 ^O (ascii Character 15)

^O is used to separate text into the columns of the table.

Each line of the table must start and end with ^O and be on a single line in the RUNOFF output file (use the DSR command .BREAK (.BR)). For table entries where no text is required type ^O^O.

The text is centred about the middle of the column. To move the text one way or the other pad the appropriate end of the text with spaces by using the DSR flag # in the *filename.RNO* file. The text of each table entry has to be of the same style ie. all normal, all bold, all italic, all bold-italic or all special symbols.

1.5.12 ^P (ascii Character 16)

^P is used to indicate that text is to span more than one column of the table and is followed by the number of columns then by a comma.

1.5.13 ^Q (ascii Character 17)

^Q is used to indicate that a horizontal or vertical line is to be broken into a number of segments.

Follow ^Q with the number of segments required and a comma then the start-stop values for each segment.

1.5.14 ^R (ascii Character 18)

^R is used to indicate that an equation number is to be written at the end of this line. It is best to place this flag at the start of the line.

The equations are numbered sequentially starting at one. For equations in an appendix the equation number is appended to the appendix title.

1.6 Examples Using Various PMC Commands.

- 1) to include a PostScript file "a.ps" containing a figure, table, etc. which will occupy a space equivalent to 10 lines of text

type

```
the text before the figure
.fg 10
_@a.ps
.br;the text after the figure
```

(Note : "a.ps" must have the figure, table, etc. at the lower left-hand corner of the page.)

- 2) to produce

$$S = \sum_{i=1}^N (\omega_{i_e} - \omega_{i_o})^2$$

type

$$S = \sum^D A_i = 1^B C N^E (\omega^{A_i} A_e^B - \omega^{A_i} A_o^B)^{C2^B}$$

- 3) to produce

$$t(s) = \frac{as^2 + bs + c}{ds + e}$$

type

$$t(s) = ^Fas^{C2^B} + bs + c^{Gds} + e^H$$

4) to produce this table

Case	Method 1	Method 2	Method 3	Method 4
1	1.0	1.1	.9	1.2
2	10.1	9.9	not measured	
3	37.5	37.0	37.3	37.4

type

```
.i 11;^N4,5,6,4_*10,5(0-5),4(0-4),^Q2,0-2,3-4,0-4
.br;^OCASE^OMETHOD 1^OMETHOD 2^OMETHOD 3^OMETHOD 4^O
.br;^O1^O#1.0^O#1.1^O##.9^O1.2^O
.br;^O2^O10.1^O#9.9^O#P2,not measured^O
.br;^O3^O37.5^O37.0^O37.3^O37.4^O
```

(Note : The DSR command .INDENT (.i) is used here to centralise the table between the left and right margins.)

5) to number the equations in examples 2) and 3) above.

$$S = \sum_{i=1}^N (\omega_{i_e} - \omega_{i_o})^2 \quad (1)$$

$$t(s) = \frac{as^2 + bs + c}{ds + e} \quad (2)$$

type

```
^RS=^D^Ai=1^B^CN^E(omega^Ai^Ae^B-omega^Ai^Ao^B)^C2^B
.b 1
^Rt(s) = ^Fas^C2^B+bs+c^Gds+e^H
```

1.7 Mathematical Symbols

Mathematical symbols may be obtained by using the special insert key in edit and the decimal value from the table in appendix A.

1.8 Letterhead

The letterheads available are :

1. use `_@head1` to obtain



AIRCRAFT STRUCTURES DIVISION
AERONAUTICAL RESEARCH LABORATORY
Defence Science & Technology Organisation Australia

506 Lorimer Street
Fishermans Bend Vic 3207

PO Box 4331 Melbourne Vic 3001
Phone : (03) 647 7626

Telex : AA39391
Fax : (03) 646 6771

2. use `_@head2` to obtain



AIRCRAFT STRUCTURES DIVISION
AERONAUTICAL RESEARCH LABORATORY

MINUTE PAPER

3. use `_@head3` to obtain



Vibration and Aeroelasticity Group
AIRCRAFT STRUCTURES DIVISION
AERONAUTICAL RESEARCH LABORATORY

MINUTE PAPER

A letterhead can be inserted by using the `PMC` command `10` and the required name as the first line of the page. If you do not use the `DSR` command `.FIGURE (.FG)` the letterhead will be positioned at the top of the page.

2 PLOT FILES

Following is a detailed user guide to the available PostScript graphic subroutines. A sample program showing the use of these subroutines is in appendix B.

2.1 Subroutines

Subroutines used to create PostScript plot files.

AXES	draws x-y axes and defines a new origin.
ENDPAGE	closes plot page.
INITPLT	defines plot parameters.
LABEL	writes a character string.
LINE	draws a line with or without symbols.
NEWORIGIN	sets a new origin
NEWPAGE	defines a new plot page.
SCALE	calculates a scale factor for a vector to be plotted.
SYMBOL	plots a symbol.

NOTE

A common block /PLT/LU,SFX,SFY is required for these subroutines.

where

LU	is the logical unit number for plot output file.
SFX	is the scale factor for the x-axis. i.e. the number of x units to be plotted per inch.
SFY	is the scale factor for the y-axis. i.e. the number of y units to be plotted per inch.

2.1.1 AXES

draws x-y axes and defines a new origin.

CALL AXES(XO,YO,SX,ORGX,TMAJX,LABX,NOCX,NDECX,
SY,ORGY,TMAJY,LABY,NOCY,NDECY,BRD)

where

XO,YO	are the coordinates in inches of the lower left-hand corner of the desired plotting area relative to the lower left-hand corner of the page.
SX	is the length of the x-axis in inches. (minus for no line)
ORGX	is the minimum value of x.
TMAJX	is the distance in inches for tic marks on the x-axis border.

(minus for tic and numbers on actual axis)

LABX is the label for the x-axis.

NOCX is the number of characters in LABX. (NOCX=0 for no label)

NDECX is the number of decimal places after the decimal point for numbers on the x-axis.

SY is the length of the y-axis in inches. (minus for no line)

ORGY is the minimum value of y.

TMAJY is the distance in inches for tic marks on the y-axis border.
(minus for tic and numbers on actual axis)

LABY is the label for the y-axis.

NOCY is the number of characters in LABY. (NOCY=0 for no label)

NDECY is the number of decimal places after the decimal point for numbers on the y-axis.

BRD is a logical*1 value to control the drawing of a border around the graph. .TRUE. draws a border

2.1.2 ENDPAGE

closes plot page.

CALL ENDPAGE

2.1.3 INITPLT

defines plot parameters.

CALL INITPLT

2.1.4 LABEL

writes a character string.

There are four versions of LABEL

- ♦ LABEL
- ♦ CPLABEL
- ♦ ELABEL
- ♦ MLABEL

all have the same calling format.

CALL LABEL(X,Y,NOZ,STR,ICF,HEIGHT,THETA,NOX)

where

X,Y are the coordinates that specify where the string is to be written. (see below)

NOZ =0 if X and Y are in inches relative to the lower left-hand

corner of the page.
 = 1 if X and Y are in current units relative to the current origin.
 STR is the character string.
 ICF is the character font to be used (see appendix C).
 HEIGHT is the height in inches of the printed characters.
 THETA is the angle at which the characters will be printed.
 NOC is the number of characters in STR.

2.1.4.1 LABEL - The coordinates specify the lower left-hand corner of the first character in the string.

2.1.4.2 CPLABEL - The coordinates specify the lower edge of the centre of the string.

2.1.4.3 ELABEL - The coordinates specify the lower right-hand corner of the last character in the string.

2.1.4.4 MLABEL - The coordinates specify the centre of the string.

2.1.5 LINE

draws a line with or without symbols.

CALL LINE(X,Y,N,ISYM)

where

X is the vector of x values to be plotted.
 Y is the vector of y values to be plotted.
 N is the number of points to be plotted.
 ISYM is the number of the symbol (see appendix D).
 (ISYM=0 draw line only)

2.1.6 NEWORIGIN

sets a new origin

CALL NEWORIGIN(X,Y)

where

X,Y are the coordinates in inches relative to the lower left-hand corner of the page. (Default origin is at the lower left-hand corner of the page.)

2.1.7 NEWPAGE

defines a new plot page.

CALL NEWPAGE

2.1.8 SCALE

calculates a scale factor for a vector to be plotted.

CALL SCALE(VEC,ALEN,NPT,ORG,SF)

where

VEC is the vector of data values.
ALEN is the length over which the data are to be plotted.
NPT is the number of data values.
ORG is the adjusted minimum. (returned)
SF is the scale factor. (returned)

2.1.9 SYMBOL

plots a symbol.

CALL SYMBOL(X,Y,ISYM)

where

X,Y are the coordinates of the centre of symbol.
ISYM is the number of the symbol. (see appendix D).

APPENDIX A
TABLE OF MATHEMATICAL SYMBOLS

symbol	dec	symbol	dec	symbol	dec	symbol	dec	symbol	dec
$\forall$	128	Σ	154	π	180	$\circ$	206	$\supset$	231
#	129	T	155	θ	181	$\pm$	207	$\supseteq$	232
$\exists$	130	Y	156	ρ	182	$\sim$	208	α	233
%	131	ς	157	σ	183	$\simeq$	209	$\subset$	234
&	132	Ω	158	τ	184	$\times$	210	$\subseteq$	235
$\circ$	133	Ξ	159	υ	185	λ	211	$\in$	236
*	134	Ψ	160	$\wp$	186	∂	212	ϵ	237
$\equiv$	135	Z	161	ω	187	$\bullet$	213	$\angle$	238
A	136	$\therefore$	162	ξ	188	+	214	∇	239
B	137	$\perp$	163	ψ	189	$\neq$	215	Π	240
X	138	$_$	164	ζ	190	$\equiv$	216	$\sqrt{}$	241
Δ	139	α	165	Υ	191	$\equiv$	217	$\cdot$	242
E	140	β	166	$'$	192	$\vdots$	218	$\neg$	243
Φ	141	χ	167	$\leq$	193	$—$	219	$\wedge$	244
Γ	142	δ	168	$/$	194	$\neg$	220	$\vee$	245
H	143	ϵ	169	∞	195	$\neg$	221	$\Rightarrow$	246
I	144	ϕ	170	f	196	$\neg$	222	$\Leftarrow$	247
$\emptyset$	145	γ	171	$\clubsuit$	197	$\neg$	223	$\Uparrow$	248
K	146	η	172	$\diamond$	198	$\neg$	224	$\Rightarrow$	249
Λ	147	ι	173	$\heartsuit$	199	$\neg$	225	$\Downarrow$	250
M	148	ϕ	174	$\spadesuit$	200	$\otimes$	226	$\circ$	251
N	149	κ	175	$\neg$	201	$\oplus$	227	$<$	252
O	150	λ	176	$\neg$	202	$\otimes$	228	Σ	253
Π	151	μ	177	$\neg$	203	$\otimes$	229	$>$	254
Θ	152	v	178	$\rightarrow$	204	$\otimes$	230	$\int$	255
P	153	o	179	$\downarrow$	205				

APPENDIX B

SAMPLE PROGRAM

```
program example
dimension x(1000),y(1000),y1(10),y2(10),y3(10),x1(10)
character title1*45,title2*36
common /plt/lu,sfx,sfy
data y1/.5,.3,.75,.8,.8,.7,.6,.5,.6,.8/
data y2/.2,.25,.3,.3,.35,.4,.45,.5,.5,.4/
data y3/.4,.45,.6,.6,.55,.6,.8,.9,.95,.8/
data x1/1.,2.,3.,4.,5.,6.,7.,8.,9.,10./
lu=1
open(unit=lu,file='example.plt',status='new')
call initplt
npts=1000
r=0.0
dr=0.01
th=0.0
dth=1.0
x(1)=0.0
y(1)=0.0
do i=2,npts
  r=r+dr
  th=th+1.0
  x(i)=r*cosd(th)
  y(i)=r*sind(th)
end do
xlen=5.0
ylen=5.0
call scale(x,xlen,npts,xorg,sfx)
call scale(y,ylen,npts,yorg,sfy)
call axes(2.,4.,xlen,xorg,1.,'pressure coefficient',20,1,ylen,yorg,1.,
*'density factor',14,1,.true.)
```

SAMPLE PROGRAM

```

title1='Figure 3. Effect of Inverse Temperature Ratio'
call cplabel(4.5,3.0,0,title1,5,.2,0.0,45)
call line(x,y,npts,0)
call endpage
call newpage
sfx=2.0
sfy=0.2
title2='Figure 4a. Results for Specimen Four'
call axes(2.,4.,xlen,0.,.5,'spanwise position',17,0,ylen,0.,1.,'crack
*tip velocity',18,1,.true.)
call cplabel(4.5,3.0,0,title2,5,.2,0.0,36)
call line(x1,y1,10,7)
call line(x1,y2,10,8)
call line(x1,y3,10,9)
call endpage
stop
end

```

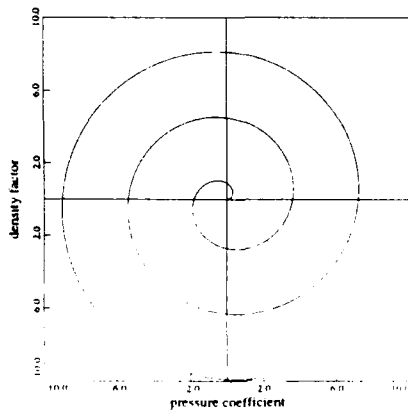


Figure 3 Effect of Inverse Temperature Ratio

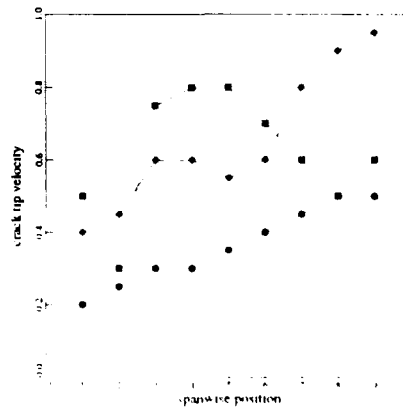


Figure 4a. Results for Specimen Four

APPENDIX C

CHARACTER FONTS

1	Times-Roman
2	<i>Times-Italic</i>
3	Times-Bold
4	<i>Times-BoldItalic</i>
5	Helvetica
6	<i>Helvetica-Oblique</i>
7	Helvetica-Bold
8	<i>Helvetica-BoldOblique</i>
9	Courier
10	<i>Courier-Oblique</i>
11	Courier-Bold
12	<i>Courier-BoldOblique</i>
13	AvantGarde-Book
14	<i>AvantGarde-BookOblique</i>
15	AvantGarde-Demi
16	<i>AvantGarde-DemiOblique</i>
17	LubalinGraph-Book
18	<i>LubalinGraph-BookOblique</i>
19	LubalinGraph-Demi
20	<i>LubalinGraph-DemiOblique</i>
21	NewCenturySchlbk-Roman
22	<i>NewCenturySchlbk-Italic</i>
23	NewCenturySchlbk-Bold
24	<i>NewCenturySchlbk-BoldItalic</i>
25	Souvenir-Light
26	<i>Souvenir-LightItalic</i>
27	Souvenir-Demi
28	<i>Souvenir-DemiItalic</i>

APPENDIX D

SYMBOLS

ISYM	SYMBOL
1	.
2	.
3	.
4	□
5	○
6	◇
7	■
8	●
9	◆
10	.

INDEX

- ^@, 2, 6, 8
 - examples, 6
- ^A, 2 to 3, 6 to 7
 - examples, 6 to 7
- AXES, 9, B-1 to B-2
 - format, 9
- ^B, 2 to 3, 6 to 7
 - examples, 6 to 7
- ^C, 2 to 3, 6 to 7
 - examples, 6 to 7
- character fonts, C-1
- commands
 - DSR, 2
 - LPL, 1
 - format, 1
 - input file, 2
 - output files, 1
 - parameters, 1
 - nocon, 1
 - format, 1
 - nopr, 1
 - format, 1
 - norun, 1
 - format, 1
 - PMC, 2
 - ^@, 2, 8
 - ^A, 2 to 3, 6 to 7
 - examples, 6 to 7
 - ^B, 2 to 3, 6 to 7
 - examples, 6 to 7
 - ^C, 2 to 3, 6 to 7
 - examples, 6 to 7
 - ^D, 2 to 3, 6 to 7
 - examples, 6 to 7
 - denominator, 2 to 3, 6 to 7
 - examples, 6 to 7
 - ^E, 2 to 3, 6 to 7
 - examples, 6 to 7
- commands (cont)
 - PMC (cont)
 - equation numbers, 2, 5, 7
 - examples, 6 to 7
 - ^@, 6
 - include file, 6
 - ^N, 7
 - ^O, 7
 - ^P, 7
 - ^Q, 7
 - ^F, 2 to 3, 6 to 7
 - examples, 6 to 7
 - ^G, 2 to 3, 6 to 7
 - examples, 6 to 7
 - ^H, 2 to 3, 6 to 7
 - examples, 6 to 7
 - include file, 2, 8
 - format, 3
 - ^N, 2 to 3, 7
 - example, 7
 - numerator, 2 to 3, 6 to 7
 - examples, 6 to 7
 - ^O, 2, 5, 7
 - example, 7
 - ^P, 2, 5, 7
 - example, 7
 - ^Q, 2, 5, 7
 - example, 7
 - ^R, 2, 5, 7
 - subscript, 2 to 3, 6 to 7
 - examples, 6 to 7
 - superscript, 2 to 3, 6 to 7
 - examples, 6 to 7
 - tables, 2 to 3, 7
 - example, 7
 - format, 4
 - column width, 4
 - columns, 4
 - horizontal lines, 4 to 5
 - rows, 4
 - vertical lines, 4 to 5

commands (cont)	format (cont)
PMC (cont)	LABEL, 10
tables (cont)	LINE, 11
text, 5	LPL command, 1
common block, 9	NEWORIGIN, 11
CPLABEL, 10 to 11, B-2	NEWPAGE, 12
^D, 2 to 3, 6 to 7	nocon, 1
examples, 6 to 7	noprt, 1
denominator, 2 to 3, 6 to 7	norun, 1
examples, 6 to 7	SCALE, 12
DSR commands, 2	SYMBOL, 12
^E, 2 to 3, 6 to 7	tables, 4
examples, 6 to 7	column width, 4
ELABEL, 10 to 11	columns, 4
ENDPAGE, 9 to 10, B-2	horizontal lines, 4 to 5
format, 10	rows, 4
equation numbers, 2, 5, 7	vertical lines, 4 to 5
example	^G, 2 to 3, 6 to 7
output, B-2	examples, 6 to 7
program, B-1	^H, 2 to 3, 6 to 7
examples, 6 to 7	examples, 6 to 7
^@, 6	include file, 2, 6, 8
include file, 6	example, 6
^N, 7	format, 3
^O, 7	INITPLT, 9 to 10, B-1
^P, 7	format, 10
PMC commands, 6 to 7	input file, 2
^@, 6	LABEL, 9 to 11
include file, 6	CPLABEL, 10 to 11
^N, 7	ELABEL, 10 to 11
^O, 7	format, 10
^P, 7	MLABEL, 10 to 11
^Q, 7	letterhead, 8
^F, 2 to 3, 6 to 7	LINE, 9, 11, B-2
examples, 6 to 7	format, 11
format	LPL command, 1 to 2
AXES, 9	format, 1
common block, 9	input file, 2
ENDPAGE, 10	output files, 1
include file, 3	parameters, 1
INITPLT, 10	

LPL command (cont)
 parameters (cont)
 nocon, 1
 format, 1
 noprt, 1
 format, 1
 norun, 1
 format, 1
 mathematical symbols, 7, A-1
 MLABEL, 10 to 11

 ^N, 2 to 3, 7
 example, 7
 NEWORIGIN, 9, 11
 format, 11
 NEWPAGE, 9, 12, B-2
 format, 12
 nocon, 1
 format, 1
 noprt, 1
 format, 1
 norun, 1
 format, 1
 numerator, 2 to 3, 6 to 7
 examples, 6 to 7

 ^O, 2, 5, 7
 example, 7
 output, B-2

 ^P, 2, 5, 7
 example, 7
 Plot Files, 9 to 12, B-1 to B-2,
 C-1, D-1
 character fonts, C-1
 common block, 9
 format, 9
 example, B-1 to B-2
 output, B-2
 program, B-1
 format, 9
 subroutines, 9 to 12, B-1 to
 B-2
 AXES, 9, B-1 to B-2
 format, 9

Plot Files (cont)
 subroutines (cont)
 CPLABEL, 10 to 11, B-2
 ELABEL, 10 to 11
 ENDPAGE, 9 to 10, B-2
 format, 10
 format, 10
 INITPLT, 9 to 10, B-1
 format, 10
 LABEL, 9 to 11
 CPLABEL, 10 to 11
 ELABEL, 10 to 11
 format, 10
 MLABEL, 10 to 11
 LINE, 9, 11, B-2
 format, 11
 MLABEL, 10 to 11
 NEWORIGIN, 9, 11
 format, 11
 NEWPAGE, 9, 12, B-2
 format, 12
 SCALE, 9, 12, B-1
 format, 12
 SYMBOL, 9, 12
 format, 12
 symbols, D-1
 PMC commands, 2 to 8
 ^@, 2, 8
 ^A, 2 to 3, 6 to 7
 examples, 6 to 7
 ^B, 2 to 3, 6 to 7
 examples, 6 to 7
 ^C, 2 to 3, 6 to 7
 examples, 6 to 7
 ^D, 2 to 3, 6 to 7
 examples, 6 to 7
 denominator, 2 to 3, 6 to 7
 examples, 6 to 7
 ^E, 2 to 3, 6 to 7
 examples, 6 to 7
 equation numbers, 2, 5, 7
 examples, 6 to 7
 ^@, 6
 include file, 6
 ^N, 7

PMC commands (cont)

examples (cont)

$\wedge$ O, 7
 $\wedge$ P, 7
 $\wedge$ Q, 7
 $\wedge$ F, 2 to 3, 6 to 7
 examples, 6 to 7
 $\wedge$ G, 2 to 3, 6 to 7
 examples, 6 to 7
 $\wedge$ H, 2 to 3, 6 to 7
 examples, 6 to 7
 include file, 2, 8
 format, 3
 $\wedge$ N, 2 to 3, 7
 example, 7
 numerator, 2 to 3, 6 to 7
 examples, 6 to 7
 $\wedge$ O, 2, 5, 7
 example, 7
 $\wedge$ P, 2, 5, 7
 example, 7
 $\wedge$ Q, 2, 5, 7
 example, 7
 $\wedge$ R, 2, 5, 7
 subscript, 2 to 3, 6 to 7
 examples, 6 to 7
 superscript, 2 to 3, 6 to 7
 examples, 6 to 7
 tables, 2 to 3, 7
 example, 7
 format, 4
 column width, 4
 columns, 4
 horizontal lines, 4 to 5
 rows, 4
 vertical lines, 4 to 5
 text, 5
 $\wedge$ Q, 2, 5, 7
 example, 7
 $\wedge$ R, 2, 5, 7
 SCALE, 9, 12, B-1
 format, 12

subroutines, 9

AXES, 9, B-1 to B-2
 format, 9
 CPLABEL, 10 to 11, B-2
 ELABEL, 10 to 11
 ENDPAGE, 9 to 10, B-2
 format, 10
 format, 10
 INITPLT, 9 to 10, B-1
 format, 10
 LABEL, 9 to 11
 CPLABEL, 10 to 11
 ELABEL, 10 to 11
 format, 10
 MLABEL, 10 to 11
 LINE, 9, 11, B-2
 format, 11
 MLABEL, 10 to 11
 NEWORIGIN, 9, 11
 format, 11
 NEWPAGE, 9, 12, B-2
 format, 12
 SCALE, 9, 12, B-1
 format, 12
 SYMBOL, 9, 12
 format, 12
 subscript, 2 to 3, 6 to 7
 examples, 6 to 7
 superscript, 2 to 3, 6 to 7
 examples, 6 to 7
 SYMBOL, 9, 12
 format, 12
 symbols, D-1
 tables, 2 to 3, 7
 example, 7
 format, 4
 column width, 4
 columns, 4
 horizontal lines, 4 to 5
 rows, 4
 vertical lines, 4 to 5
 text, 5
 Text Files, 1 to 8, A-1
 commands

Text Files (cont)

commands (cont)

DSR, 2

LPL, 1

format, 1

input file, 2

output files, 1

parameters, 1

nocon, 1

format, 1

noprt, 1

format, 1

norun, 1

format, 1

PMC, 2

 $\wedge$ @, 2, 8 $\wedge$ A, 2 to 3, 6 to 7

examples, 6 to 7

 $\wedge$ B, 2 to 3, 6 to 7

examples, 6 to 7

 $\wedge$ C, 2 to 3, 6 to 7

examples, 6 to 7

 $\wedge$ D, 2 to 3, 6 to 7

examples, 6 to 7

denominator, 2 to 3, 6 to 7

examples, 6 to 7

 $\wedge$ E, 2 to 3, 6 to 7

examples, 6 to 7

equation numbers, 2, 5, 7

examples, 6 to 7

 $\wedge$ @, 6

include file, 6

 $\wedge$ N, 7 $\wedge$ O, 7 $\wedge$ P, 7 $\wedge$ Q, 7 $\wedge$ F, 2 to 3, 6 to 7

examples, 6 to 7

 $\wedge$ G, 2 to 3, 6 to 7

examples, 6 to 7

 $\wedge$ H, 2 to 3, 6 to 7

examples, 6 to 7

include file, 2, 8

format, 3

 $\wedge$ N, 2 to 3, 7

Text Files (cont)

commands (cont)

PMC (cont)

 $\wedge$ N (cont)

example, 7

numerator, 2 to 3, 6 to 7

examples, 6 to 7

 $\wedge$ O, 2, 5, 7

example, 7

 $\wedge$ P, 2, 5, 7

example, 7

 $\wedge$ Q, 2, 5, 7

example, 7

 $\wedge$ R, 2, 5, 7

subscript, 2 to 3, 6 to 7

examples, 6 to 7

superscript, 2 to 3, 6 to 7

examples, 6 to 7

tables, 2 to 3, 7

example, 7

format, 4

column width, 4

columns, 4

horizontal lines, 4 to

5

rows, 4

vertical lines, 4 to 5

text, 5

DSR commands, 2

letterhead, 8

LPL command, 1

format, 1

input file, 2

output files, 1

parameters, 1

format, 1

nocon, 1

format, 1

noprt, 1

format, 1

norun, 1

format, 1

mathematical symbols, 7, A-1

PMC commands, 2

 $\wedge$ @, 2, 8

Text Files (cont)

PMC commands (cont)

- $\wedge$ A, 2 to 3, 6 to 7
 - examples, 6 to 7
- $\wedge$ B, 2 to 3, 6 to 7
 - examples, 6 to 7
- $\wedge$ C, 2 to 3, 6 to 7
 - examples, 6 to 7
- $\wedge$ D, 2 to 3, 6 to 7
 - examples, 6 to 7
- denominator, 2 to 3, 6 to 7
 - examples, 6 to 7
- $\wedge$ E, 2 to 3, 6 to 7
 - examples, 6 to 7
- equation numbers, 2, 5, 7
- examples, 6 to 7
 - $\wedge$ @, 6
 - include file, 6
 - $\wedge$ N, 7
 - $\wedge$ O, 7
 - $\wedge$ P, 7
 - $\wedge$ Q, 7
- $\wedge$ F, 2 to 3, 6 to 7
 - examples, 6 to 7
- $\wedge$ G, 2 to 3, 6 to 7
 - examples, 6 to 7
- $\wedge$ H, 2 to 3, 6 to 7
 - examples, 6 to 7

Text Files (cont)

PMC commands (cont)

- include file, 2, 8
- format, 3
- $\wedge$ N, 2 to 3, 7
 - example, 7
- numerator, 2 to 3, 6 to 7
 - examples, 6 to 7
- $\wedge$ O, 2, 5, 7
 - example, 7
- $\wedge$ P, 2, 5, 7
 - example, 7
- $\wedge$ Q, 2, 5, 7
 - example, 7
- $\wedge$ R, 2, 5, 7
- subscript, 2 to 3, 6 to 7
 - examples, 6 to 7
- superscript, 2 to 3, 6 to 7
 - examples, 6 to 7
- tables, 2 to 3, 7
 - example, 7
 - format, 4
 - column width, 4
 - columns, 4
 - horizontal lines, 4 to 5
 - rows, 4
 - vertical lines, 4 to 5

DISTRIBUTION

AUSTRALIA

Department of Defence

Defence Central

Chief Defence Scientist
AS, Science Corporate Management (shared copy)
FAS Science Policy (shared copy)
Director, Departmental Publications
Counsellor, Defence Science, London (Doc Data Sheet Only)
Counsellor, Defence Science, Washington (Doc Data Sheet Only)
S.A. to Thailand MRD (Doc Data Sheet Only)
S.A. to the DRC (Kuala Lumpur) (Doc Data Sheet Only)
OIC TRS, Defence Central Library
Document Exchange Centre, DSTIC (18 copies)
Joint Intelligence Organisation
Librarian H Block, Victoria Barracks, Melbourne
Director General - Army Development (NSO) (4 copies)

Aeronautical Research Laboratory

Director
Library
Chief, Aircraft Structures
Divisional File, Aircraft Structures
Chief, Flight Mechanics and Propulsion
Head, Flight Mechanics Branch
Head, Propulsion Branch
Chief, Aircraft Materials
Chief, Aircraft Systems
Principal Engineer, Engineering Facilities
Head, Computing Services
Author: Petra M. Cox
P.A. Farrell

Materials Research Laboratory

Director/Library

Defence Science & Technology Organisation - Salisbury

Library

Navy Office

Navy Scientific Adviser (3 copies Doc Data sheet)

Army Office

Scientific Adviser - Army (Doc Data sheet only)

Air Force Office

Air Force Scientific Adviser (Doc Data sheet only)
Aircraft Research and Development Unit
Scientific Flight Group
Library

Universities and Colleges

Newcastle
Library
Professor R. Telfer, Institute of Aviation

NSW
Library, Australian Defence Force Academy

RMIT
Library
Mr M.L. Scott, Aerospace Engineering

SPARES (10 COPIES)

TOTAL (59 COPIES)

DOCUMENT CONTROL DATA

PAGE CLASSIFICATION
UNCLASSIFIED

PRIVACY MARKING

1a. AR NUMBER AR-006-116	1b. ESTABLISHMENT NUMBER ARL-STRUC-TM-567	2. DOCUMENT DATE JULY 1990	3. TASK NUMBER DST 90/033
4. TITLE CREATING POSTSCRIPT FILES ON VAX COMPUTERS		5. SECURITY CLASSIFICATION (PLACE APPROPRIATE CLASSIFICATION IN BOX(S) IE. SECRET (S), CONF. (C) RESTRICTED (R), UNCLASSIFIED (U)). U U U DOCUMENT TITLE ABSTRACT	6. NO. PAGES 25 7. NO. REFS
8. AUTHOR(S) Petra M. Cox		9. DOWNGRADING/DELIMITING INSTRUCTIONS Not applicable	
10. CORPORATE AUTHOR AND ADDRESS AERONAUTICAL RESEARCH LABORATORY P.O. BOX 4331, MELBOURNE VIC 3001		11. OFFICE/POSITION RESPONSIBLE FOR: SPONSOR <u>DSTO</u> SECURITY _____ DOWNGRADING _____ APPROVAL <u>CSTD</u>	
12. SECONDARY DISTRIBUTION (OF THIS DOCUMENT) Approved for public release OVERSEAS ENQUIRIES OUTSIDE STATED LIMITATIONS SHOULD BE REFERRED THROUGH DSTIC, ADMINISTRATIVE SERVICES BRANCH, DEPARTMENT OF DEFENCE, ANZAC PARK WEST OFFICES, ACT 2601			
13a. THIS DOCUMENT MAY BE ANNOUNCED IN CATALOGUES AND AWARENESS SERVICES AVAILABLE TO... No limitations			
13b. CITATION FOR OTHER PURPOSES (IE. CASUAL ANNOUNCEMENT) MAY BE ☒ UNRESTRICTED OR ☐ AS FOR 13a.			
14. DESCRIPTORS VAX computers PostScript (Computer program) Desktop publishing Laser printers Text processing			15. DISCAT SUBJECT CATEGORIES 1205
16. ABSTRACT <i>Digital Standard Runoff is a utility provided by DEC for use on VAX computers. This utility creates formatted ascii text files of various simple lay-outs. However, it does not generate PostScript files or permit the inclusion of figures or algebraic expressions and equations. The present report describes a program which will permit the extension of RUNOFF to include these features. It also includes subroutines for the generation of PostScript graphic files, which can be included in the text files.</i>			

PAGE CLASSIFICATION
UNCLASSIFIED

PRIVACY MARKING

THIS PAGE IS TO BE USED TO RECORD INFORMATION WHICH IS REQUIRED BY THE ESTABLISHMENT FOR ITS OWN USE BUT WHICH WILL NOT BE ADDED TO THE DISIS DATA UNLESS SPECIFICALLY REQUESTED.

16. ABSTRACT (CONT).

17. IMPRINT

AERONAUTICAL RESEARCH LABORATORY, MELBOURNE

18. DOCUMENT SERIES AND NUMBER

Aircraft Structures Technical
Memorandum 567

19. COST CODE

23 2110

20. TYPE OF REPORT AND PERIOD COVERED

21. COMPUTER PROGRAMS USED

22. ESTABLISHMENT FILE REF(S)

23. ADDITIONAL INFORMATION (AS REQUIRED)