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TITLE	DECIMAL TO FLOATING POINT CONVERSION
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SOURCE LANGUAGE	PAL III

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[The following text is extremely faint and illegible due to the low contrast of the scan. It appears to be a multi-column document, possibly a report or a list of items.]

DECIMAL TO FLOATING POINT CONVERSION

Abstract

If a lot of data in floating point format are required, this program can be used to generate a complete source tape of the data in floating point format after they have been typed in decimal form. The generated tape can be assembled independent of the main program.

Description

After a starting address has been specified to indicate the memory buffer in which the data are going to be stored, all the data that are needed in floating point format are typed in decimal form.

The program converts the typed numbers to floating point format and punches/prints them as groups of three octal numbers, separated by a semicolon. For control purpose the decimal number is printed too. To make the tape complete, leader and trailer tape is punched as well as an asterisk in front of the starting address. A dollar sign is punched at the end.

The program runs together with floating point package 1 or 2. With package 1 the decimal numbers are printed in floating point format, with package 2 they are printed as integers with max. 6 digits. (Caution: Floating Point Package 2 DEC-08-YQ2B-PB 4/17/70 needs a correction: change the contents of location 7207 from 7200 to 1055.)

Restriction

The program works only with the low speed punch.

Storage Requirements

20 - 37

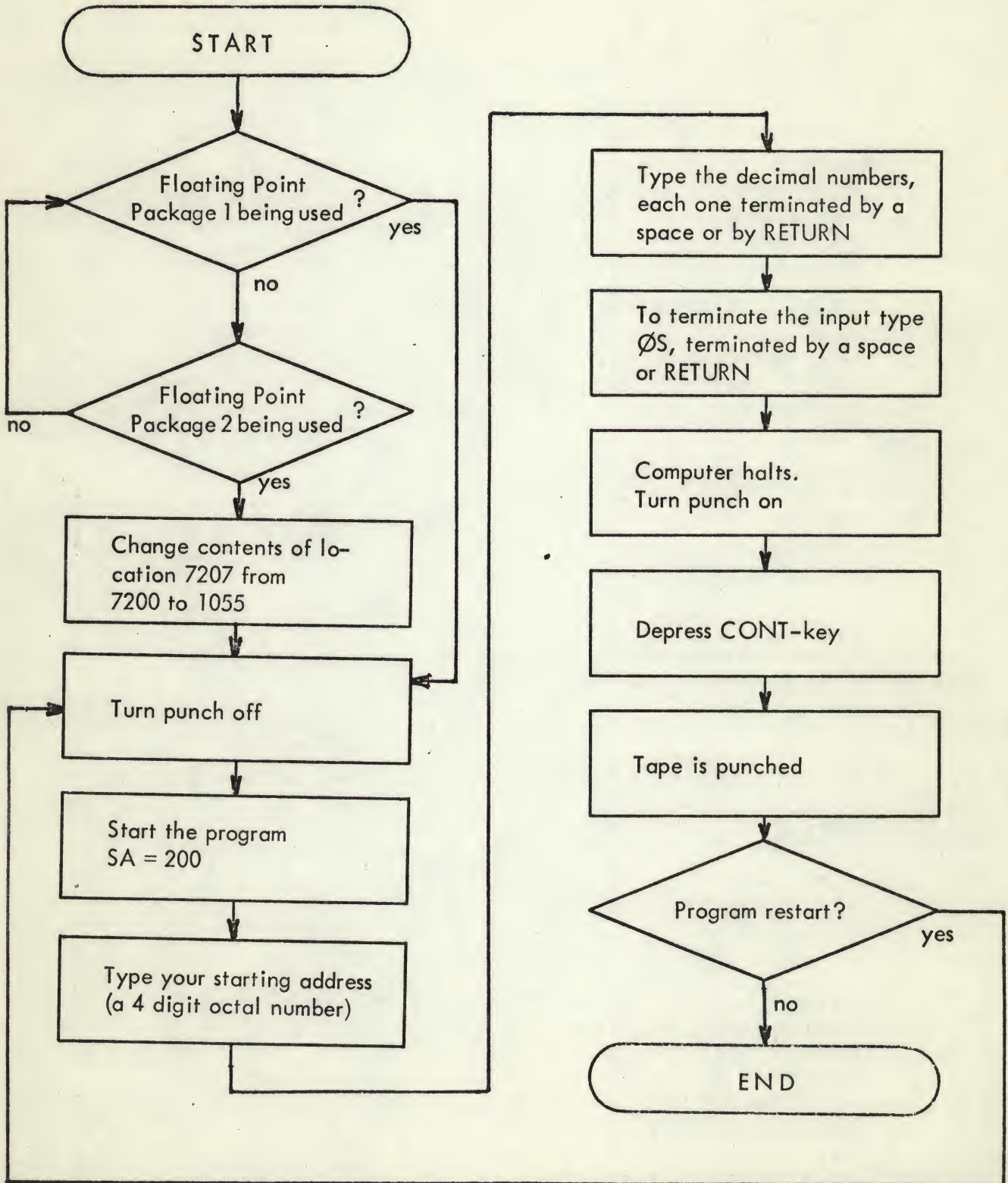
63 - 71

101 - 444

From 445 3 locations are used for each typed decimal number.

In addition, the floating point package 1 or 2 must be in core.

Instructions



Example with Floating Point Package 1

START. ADDRESS: 7005

DATA:

45 78 97
-23 -563 -3
0.645 0.000856 -0.0004527
0S

*7005
0006;2640;0000 /+0.450000E+02
0007;2340;0000 /+0.780000E+02
0007;3020;0000 /+0.970000E+02
0005;5100;0000 /-0.230000E+02
0012;5632;0000 /-0.563000E+03
0002;5000;0000 /-0.300000E+01
0000;2450;7534 /+0.645000E+00
7766;3403;1230 /+0.856000E-03
7765;4225;1724 /-0.452700E-03
\$

Example with Floating Point Package 2

START. ADDRESS: 0645

DATA:

1 -3 45 -78 97
-7564 86734 -756354
0S

*0645
0001;2000;0000 /+ 1
0002;5000;0000 /- 3
0006;2640;0000 /+ 45
0007;5440;0000 /- 78
0007;3020;0000 /+ 97
0015;4235;0000 /- 7564
0021;2513;1600 /+ 86734
0024;5072;5760 /-756354
\$

DECIMAL TO FLOATING POINT CONVERSION

Program Listing

```

*5
0005  7400      7400
0006  7200      7200
0007  5600      5600

*62
0062  0006      6
0063  0355      OCTALB

*200
/INITIALIZE
0200  7300      CLA CLL
0201  6032      KCC
0202  6046      TLS
0203  1137      TAD 137      /S
0204  7041      CIA
0205  3020      DCA MINS
0206  4101      JMS CRLF
0207  4101      JMS CRLF
0210  1021      TAD M4      /-4
0211  3022      DCA COUNT4
0212  1023      TAD C72      /SET POINTER FOR STARTING ADDRESS
0213  3037      DCA STADDR
0214  1024      TAD C445     /LOCATION FOR DATA
0215  3026      DCA LOCDAT   /POINTER FOR DATA
0216  3027      DCA COUNTD   /COUNTER FOR DATA

/READ STARTING ADDRESS
0217  1137      TAD 137      /S
0220  4107      JMS PRINT
0221  1140      TAD 140      /T
0222  4107      JMS PRINT
0223  1115      TAD 115      /A
0224  4107      JMS PRINT
0225  1136      TAD 136      /R
0226  4107      JMS PRINT
0227  1140      TAD 140      /T
0230  4107      JMS PRINT
0231  1165      TAD 165      /.
0232  4107      JMS PRINT
0233  1175      TAD 175      /SPACE
0234  4107      JMS PRINT

```

0235	1115	TAD 115	/A
0236	4107	JMS PRINT	
0237	1120	TAD 120	/D
0240	4107	JMS PRINT	
0241	1120	TAD 120	/D
0242	4107	JMS PRINT	
0243	1136	TAD 136	/R
0244	4107	JMS PRINT	
0245	1121	TAD 121	/E
0246	4107	JMS PRINT	
0247	1137	TAD 137	/S
0250	4107	JMS PRINT	
0251	1137	TAD 137	/S
0252	4107	JMS PRINT	
0253	1167	TAD 167	/:
0254	4107	JMS PRINT	
0255	1175	TAD 175	/SPACE
0256	4107	JMS PRINT	
0257	4065	JMS READ	/READ 1 DIGIT
0260	3437	DCA I STADDR	
0261	1437	TAD I STADDR	/PRINT IT
0262	4107	JMS PRINT	
0263	2037	ISZ STADDR	
0264	2022	ISZ COUNT4	/ALL 4 DIGITS READ ?
0265	5257	JMP .-6	/NO
0266	4101	JMS CRLF	/YES
0267	4101	JMS CRLF	

/READ DATA

0270	1120	TAD 120	/D
0271	4107	JMS PRINT	
0272	1115	TAD 115	/A
0273	4107	JMS PRINT	
0274	1140	TAD 140	/T
0275	4107	JMS PRINT	
0276	1115	TAD 115	/A
0277	4107	JMS PRINT	
0300	1167	TAD 167	/:
0301	4107	JMS PRINT	
0302	4101	JMS CRLF	
0303	4101	JMS CRLF	
0304	4405	DATA, JMS I 5	
0305	4425	JMS I ADDONE	
0306	4407	JMS I 7	
0307	6426	FPUT I LOCDAT	
0310	0000	FEXT	
0311	2027	ISZ COUNTD	
0312	2026	ISZ LOCDAT	
0313	2026	ISZ LOCDAT	
0314	2026	ISZ LOCDAT	
0315	5304	JMP DATA	

0316	1024	PREPPU,	TAD C445	/RESET POINTER FOR DATA
0317	3026		DCA LOCDAT	
0320	1027		TAD COUNTD	
0321	7041		CIA	
0322	3027		DCA COJNTD	/NEG. NUMBER OF DATA
0323	1023		TAD C72	/RESET POINTER FOR STARTING ADDRESS
0324	3037		DCA STADDR	
0325	1021		TAD M4	
0326	3022		DCA COUNT4	/RESET COUNTER FOR STARTING ADDRESS
0327	4101		JMS CRLF	
0330	4101		JMS CRLF	
0331	4101		JMS CRLF	
0332	7402		HLT	/TURN PUNCHER ON

/PUNCH LEADER

0333	1030		TAD M20
0334	3031		DCA COUNTL
0335	4107		JMS PRINT
0336	2031		ISZ COUNTL
0337	5335		JMP .-2

/PUNCH STARTING ADDRESS

0340	1176		TAD 176	/*
0341	4107		JMS PRINT	
0342	1437		TAD I STADDR	
0343	4107		JMS PRINT	/PUNCH 1 DIGIT
0344	2037		ISZ STADDR	
0345	2022		ISZ COUNT4	
0346	5342		JMP .-4	
0347	4101		JMS CRLF	

/CONVERT DATA TO OCTAL AND PUNCH

0350	4407	OCTALA,	JMS I 7	
0351	5426		FGET I LOCDAT	
0352	0000		FEXT	
0353	1035		TAD M3	
0354	3036		DCA COUNT3	
0355	3032	OCTALB,	DCA STORE	
0356	1021		TAD M4	/SET DIGIT COUNTER
0357	3022		DCA COUNT4	
0360	1426		TAD I LOCDAT	/GET NUMBER
0361	7004		RAL	
0362	1032	UNPACK,	TAD STORE	
0363	7004		RAL	
0364	7006		RTL	
0365	3032		DCA STORE	/STORE ROTATED NUMBER
0366	1032		TAD STORE	
0367	0033		AND MASK7	/1ST 3 BITS OF NUMBER
0370	1034		TAD C260	/ADD 260
0371	4107		JMS PRINT	
0372	2022		ISZ COUNT4	
0373	5362		JMP UNPACK	
0374	5775		JMP I .+1	
0375	0400		400	

*400

0400	2026	ISZ	LOC0AT	
0401	2036	ISZ	COUNT3	
0402	5204	JMP	..+2	
0403	5207	JMP	..+4	
0404	1172	TAD	172	/;
0405	4107	JMS	PRINT	
0406	5463	JMP	I 63	
0407	1175	TAD	175	/2 SPACES
0410	4107	JMS	PRINT	
0411	1175	TAD	175	
0412	4107	JMS	PRINT	
0413	1166	TAD	166	//
0414	4107	JMS	PRINT	
0415	4406	JMS	I 6	
0416	2027	ISZ	COUNTD	
0417	5620	JMP	I ..+1	
0420	0350	OCTALA		

/PUNCH "\$"

0421	1177	TAD	177	/S
0422	4107	JMS	PRINT	
0423	4101	JMS	CRLF	

/PUNCH TRAILER

0424	1030	TAD	M20	
0425	3031	DCA	COUNTL	
0426	4107	JMS	PRINT	
0427	2031	ISZ	COUNTL	
0430	5226	JMP	..-2	
0431	7402	HLT		/END

/SUBROUTINES

/VALID INPUT? ALL DATA IN?

0432	0000	DONE,	0	
0433	1063		TAD 60	/VALID INPUT?
0434	7650		SNA CLA	
0435	5643		JMP I RET	/NO
0436	1057		TAD 57	/YES
0437	1020		TAD MINS	/ALL DATA IN?
0440	7640		SZA CLA	
0441	5632		JMP I DONE	/NO
0442	5644		JMP I CONT	/YES
0443	0304	RET,	DATA	
0444	0316	CONT,	PREPPU	

*65

/READ

0065	0000	READ,	0	
0066	6031		KSF	
0067	5066		JMP .-1	
0070	6036		KRB	
0071	5465		JMP I READ	

*20

/DEFINITIONS

0020	0000	MINS,	0	
0021	7774	M4,	7774	/-4
0022	0000	COUNT4,	0	
0023	0072	C72,	72	
0024	0445	C445,	445	
0025	0432	ADDONE,	DONE	
0026	0000	LOC DAT,	0	
0027	0000	COUNTD,	0	
0030	7754	M20,	7754	/-20
0031	0000	COUNTL,	0	
0032	0000	STORE,	0	
0033	0007	MASK7,	7	
0034	0260	C260,	260	
0035	7775	M3,	7775	/-3
0036	0000	COUNT3,	0	
0037	0000	STADDR,	0	

PAUSE

		*101	
0101	0000	CRLF,	0
0102	1173		TAD 173
0103	4107		JMS PRINT
0104	1174		TAD 174
0105	4107		JMS PRINT
0106	5501		JMP I CRLF
0107	0000	PRINT,	0
0110	6041		TSF
0111	5110		JMP --1
0112	6046		TLS
0113	7200		CLA
0114	5507		JMP I PRINT
0115	0301		301 /A
0116	0302		302 /B
0117	0303		303 /C
0120	0304		304 /D
0121	0305		305 /E
0122	0306		306 /F
0123	0307		307 /G
0124	0310		310 /H
0125	0311		311 /I
0126	0312		312 /J
0127	0313		313 /K
0130	0314		314 /L
0131	0315		315 /M
0132	0316		316 /N
0133	0317		317 /O
0134	0320		320 /P
0135	0321		321 /Q
0136	0322		322 /R
0137	0323		323 /S
0140	0324		324 /T
0141	0325		325 /U
0142	0326		326 /V
0143	0327		327 /W
0144	0330		330 /X
0145	0331		331 /Y
0146	0332		332 /Z
0147	0260		260 /0
0150	0261		261 /1
0151	0262		262 /2
0152	0263		263 /3
0153	0264		264 /4
0154	0265		265 /5
0155	0266		266 /6
0156	0267		267 /7
0157	0270		270 /8
0160	0271		271 /9

0161	0241	241	/!
0162	0253	253	/+
0163	0254	254	/,
0164	0255	255	/-
0165	0256	256	/.
0166	0257	257	//
0167	0272	272	/:
0170	0275	275	/=
0171	0277	277	/?
0172	0273	273	/;
0173	0215	215	/CR
0174	0212	212	/LF
0175	0240	240	/SPACE
0176	0252	252	/*
0177	0244	244	/\$

ADDONE	0025
CONT	0444
COUNTD	0027
COUNTL	0031
COUNT3	0036
COUNT4	0022
CRLF	0101
C260	0034
C445	0024
C72	0023
DATA	0304
DONE	0432
LOCDAT	0026
MASK7	0033
MINS	0020
M20	0030
M3	0035
M4	0021
OCTALA	0350
OCTALB	0355
PREPPU	0316
PRINT	0107
READ	0065
RET	0443
STADDR	0037
STORE	0032
UNPACK	0362

