PROGRAM DESCRIPTION I

Program Title ROW PLOT (HIGH RESOLUTION PLOT)

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Program Description, Equations, Variables Plot of single-valued function y=f(x). Plotting one point per row of printer output. Program to be compatable with printer plotting programs PRPLOT↔PLOTHR, PRPLOTP↔PLOTHP, REGPLOT↔REGHP. PROGRAMS PRPLOT & PLOTHR, PRPLOTP & PLOTHP appear same to user except for memory requirements. PLOTHR & PLOTHP use additional registers R12 to R19. REGHP functions as REGPLOT except that seven plot points are stored in R12, R13, R14, R15, R16, R17 and R18 in order of plot. In addition x increment value must be incremented by 4 from last plotted point of last call to first plotted point of next call.

Necessary Accessories Printer, 1 memory module

Operating Limits and Warnings

Reference(s) Owner's Handbook for HP-41C peripheral printer.

.AM DESCRIPTION II

Sample Problem (Sketch if Desired)

Plot of single-valued function y=f(x), e.g., y=sin.x. Use program "WIGGLE" on page 48 of Printer Owner's Handbook. Plot sin.x from x=0° to x=360° in increments of 1°.

SOLUTION:

Input	Function	Display	Comments
	XEQ PLOTHR	NAME	NAME of function to plot
WIGGLE	R/S	Y MIN	minimum y-axis value
-1	R/S	Y MAX	maximum y-axis value
1	R/S	AXIS	placement of x-axis
0	R/S	X MIN	minimum x value
0	R/S	X MAX	maximum x value
360	R/S	X INC	x increment value
1	R/S		

USER INSTRUCTIONS

SIZE: (HP-41C) 020

STEP	INSTRUCTIONS	INPUT	FUNCTION	DISPLAY
1	Load Program			
2	Execute appropriate plot		XEQ PLOTHR	
	program	function	name	NAME
	Input y-axis minimum value			Y MIN
	Input y-axis maximum value			Y MAX
	Input axis position			AXIS
	Input x minimum value			X MIN
	Input x maximum value			X MAX
	Input x increment value			X INC
	If executed from a program where interaction from keyboard			
	is not desired, XEQ PLOTHP, with values for above stored			
	as for PRPLOTP:			
	R00 - YMIN			
	R01 - YMAX			
	R04 - AXIS			
	R08 - XMIN			
	R09 - XMAX			
	R11 - NAME			
	NOTE: The tests for YMIN, YMAX, AXIS, XMIN and XMAX are			
	identical to those in PRPLOT & PRPLOTP. Also any alpha			
	entry for axis suppresses the axis.			
	Display set to fix 4 upon exit, flag 12 is cleared.			

PROGRAM LISTING

☐ 67 ☐ 97 ☒ 41C

STEP/ LINE	KEY ENTRY	KEY CODE (67/97 only)	COMMENTS
	01↑LBL "PLOTHR"		
	02 ADV		
	03 "NAME"		Enter function name
	04 PROMPT		
	05 AOFF		
	06 ASTO 11		
	07↑LBL 02		
	08 "Y MIN"		
	09 PROMPT		Enter Y-AXIS MIN, MAX
	10 STO 00		
	11 "Y MAX"		
	12 PROMPT		
	13 STO 01		
	14 X<=Y?		Check Y MAX
	15 GTO 02		
	16↑LBL 14		
	17 CF 23		
	18 "AXIS?"		Enter axis value
	19 PROMPT		
	20 STO 04		
	21 FS? 23		
	22 ASTO 04		Check axis value
	23 RCL 01		
	24 X<Y?		
	25 GTO 14		
	26 CLX		
	27 RCL 00		
	28 X>Y?		
	29 GTO 14		
	30↑LBL 03		
	31 "X MIN"		Enter X MIN, X MAX and X INC
	32 PROMPT		
	33 STO 08		
	34 "X MAX"		
	35 PROMPT		
	36 STO 09		
	37 X<=Y?		
	38 GTO 03		
	39↑LBL "NEW"		
	40 "X INC"		
	41 PROMPT		
	42 STO 10		
	43↑LBL "PLOTHP"		
	44 ADV		
	45 6		
	46 SKPCHR		
	47 "PLOT OF "		Print plot labels
	48 ARCL 11		
	49 ACA		
	50 PRBUF		
	51 FIX 1		
	52 4		
	53 SKPCHR		
	54 "X: "		
	55 ARCL 08		
	56 "⊢ TO "		
	57 ARCL 09		
	58 ACA		
	59 PRBUF		
	60 RCL 10		
	61 X>0?		
	62 GTO 12		Calculate X INC value
	63 RCL 09		
	64 RCL 08		
	65 -		
	66 RCL 10		
	67 ABS		
	68 /		
	69 STO 10		
	70↑LBL 12		
	71 FIX 3		
	72 4		
	73 SKPCHR		
	74 "STEPS OF "		
	75 ARCL 10		
	76 ACA		
	77 1		
	78 SKPCHR		
	79 7		
	80 ACCHR		
	81 PRBUF		
	82 168		
	83 STO 02		
	84 XROM "PRAXIS"		Call "PRAXIS" for Y-AXIS
	85 167		
	86 RCL 01		
	87 RCL 00		
	88 -		
	89 /		Calculate Y INC
	90 STO 03		
	91 RCL 08		
	92 STO 06		
	93 CF 12		
	94 CF 00		
	95↑LBL 00		
	96 FIX 0		
	97 RCL 02		
	98 X<0?		Suppress axis
	99 SF 00		
	100 12.018		

Note: Refer to "HP-41C OWNER'S HANDBOOK AND PROGRAMMING GUIDE" for specific information on keystrokes. The Function Index is found at the very back of the Handbook. Refer to Appendix E in 67 or 97 "OWNER'S HANDBOOK AND PROGRAMMING GUIDE" for exact keystrokes.

PROGRAM LISTING

☐ 67 ☐ 97 ☒ 41C

STEP/ LINE	KEY ENTRY	KEY CODE (67/97 only)	COMMENTS
101	STO 07		
102	RCL 06		
103	*LBL 01		
104	XEQ IND 11		Execute function
105	RCL 00		
106	-		
107	RCL 03		
108	*		Calculate plot value
109	1		
110	+		
111	RND		
112	168		
113	X<>Y		Check for over-flow or under-flow on plot
114	X>Y?		
115	X<>Y		
116	X<=0?		
117	CLX		
118	STO IND 07		
119	RCL 10		Increment X counter
120	ST+ 06		
121	RCL 09		
122	RCL 06		
123	X>Y?		
124	GTO 04		
125	ISG 07		
126	GTO 01		
127	XEQ 05		Plot seven points
128	4		
129	RCL 10		Increment X counter between lines
130	*		
131	ST+ 06		
132	RCL 06		
133	RCL 09		
134	X<Y?		
135	GTO 15		
136	GTO 00		
137	*LBL 04		
138	-1		Label rows not plotted
139	STO IND 07		
140	ISG 07		
141	GTO 04		
142	*LBL 05		
143	12.018		
144	STO 05		
145	.001		
146	*LBL 13		Add row value to plot values
147	ST+ IND 05		
148	2		
149	+		
150	15G 05		

STEP/ LINE	KEY ENTRY	KEY CODE (67/97 only)	COMMENTS
151	GTO 13		
152	13.018		
153	STO 05		
154	*LBL 06		
155	RCL 05		Sort plot values into ascending order
156	STO 19		
157	1		
158	-		
159	RCL IND X		
160	*LBL 07		
161	RCL IND 19		
162	X<Y?		
163	X<>Y		
164	STO IND 19		
165	RDN		
166	ISG 19		
167	GTO 07		
168	STO IND Y		
169	ISG 05		
170	GTO 06		
171	12.017		
172	STO 19		
173	12.018		
174	STO 05		
175	*LBL 08		
176	ISG 05		
177	RCL IND 05		
178	X<0?		Check for un-plotted rows
179	GTO 09		
180	INT		
181	RCL IND 19		
182	X<0?		Check for un-plotted rows
183	GTO 09		
184	INT		
185	X≠Y?		
186	GTO 09		
187	LASTX		Accumulate vertical points
188	FRC		
189	ST+ IND 05		
190	CLX		
191	STO IND 19		
192	*LBL 09		
193	ISG 19		
194	GTO 08		
195	12.018		
196	STO 19		
197	0		
198	STO 05		
199	*LBL 10		
200	RCL IND 19		

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PROGRAM LISTING

☐ 67 ☐ 97 ☒ 41C

STEP/ LINE	KEY ENTRY	KEY CODE (67/97 only)	COMMENTS
201	X<=0?		Check for un-
202	GTO 11		plotted rows
203	INT		
204	RCL 02		
205	FS? 00		Check axis
206	GTO 12		location if
207	FRC		plotted
208	1 E3		
209	*		
210	X>Y?		
211	GTO 12		
212	X<Y?		
213	XEQ 22		
214	X=Y?		
215	SF 00		
216	LBL 12		
217	RDN		
218	ENTER↑		
219	X<> 05		
220	-		Calculate number
221	1		of columns
222	-		between plotted
223	X>0?		points and skip
224	SKPCOL		
225	X<0?		
226	ST- 05		
227	RCL IND 19		
228	FRC		
229	1 E3		
230	*		
231	ACCOL		Accumulate plot
232	LBL 11		point
233	ISG 19		
234	GTO 10		
235	RCL 02		
236	FRC		
237	1 E3		
238	*		Check for axis
239	FC? 00		
240	XEQ 22		
241	PRBUF		Print plot line
242	LBL 15		
243	CF 00		
244	FIX 4		
245	RTN		
246	LBL 22		Insert axis mark
247	ENTER↑		
248	X<> 05		
249	-		
250	1		

STEP/ LINE	KEY ENTRY	KEY CODE (67/97 only)	COMMENTS
251	-		
252	SKPCOL		
253	119		
254	ACCOL		
255	RDN		
256	SF 00		
257	RTN		
258	LBL "REGHP"		Register plot of
259	167		seven points
260	RCL 01		
261	RCL 00		
262	-		Calculate Y INC
263	/		
264	STO 03		
265	FIX 0		
266	CF 12		
267	CF 00		
268	RCL 02		
269	X<0?		Check for axis
270	SF 00		plot
271	12.018		
272	STO 05		
273	LBL 16		
274	RCL IND 05		Convert plot point
275	RCL 00		values into
276	-		appropriate
277	RCL 03		column value
278	*		
279	1		
280	+		
281	RND		
282	168		
283	X<>Y		
284	X>Y?		
285	X<>Y		
286	X<=0?		
287	CLX		
288	STO IND 05		
289	ISG 05		
290	GTO 16		
291	XEQ 05		
292	END		

00		

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REGISTERS, STATUS, FLAGS, ASSIGNMENTS

DATA REGISTERS

R00= "Y MIN"
R01= "Y MAX"
R02= "NNN.HH"
R03= "Y INC"
R04= "AXIS"
R05= "CNTR"
R06= "C XVAL"
R07= "CNTR"
R08= "X MIN"
R09= "X MAX"
R10= "X INC"
R11= "NAME"
R12= "SCRTCH"
R13= "SCRTCH"
R14= "SCRTCH"
R15= "SCRTCH"
R16= "SCRTCH"
R17= "SCRTCH"
R18= "SCRTCH"
R19= "CNTR"

STATUS

SIZE 020 TOT. REG. 79 USER MODE
ENG ____ FIX ____ SCI ____ ON ____ OFF ____
DEG ____ RAD ____ GRAD ____

FLAGS

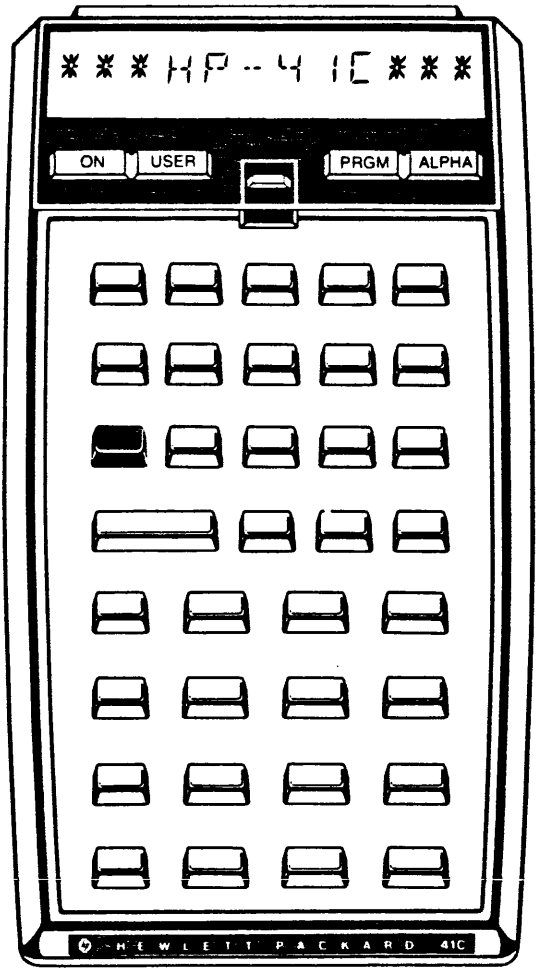
#	INIT S/C	SET INDICATES	CLEAR INDICATES
00		Used internally for axis placement cleared upon exit	

ASSIGNMENTS

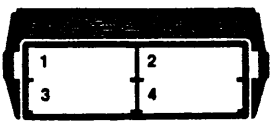
FUNCTION	KEY	FUNCTION	KEY

KEYBOARD CARD LABELING

KEYBOARD



SYSTEM CONFIGURATION



CARD

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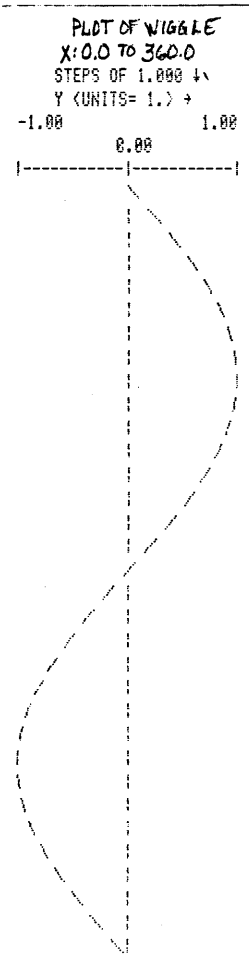

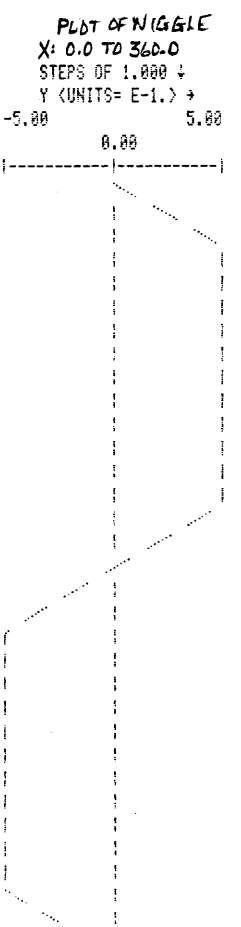

ROW 1 (1 : 3)

ROW 2 (3 : 8)

ROW 3 (8 : 15)

ROW 4 (15 : 21)

ROW 5 (21 : 30)

ROW 6 (31 : 34)

ROW 7 (34 : 39)

ROW 8 (40 : 43)

ROW 9 (43 : 47)

ROW 10 (47 : 51)

ROW 11 (52 : 56)

ROW 12 (56 : 63)

ROW 13 (64 : 74)

ROW 14 (74 : 76)

ROW 15 (77 : 84)

ROW 16 (84 : 93)

ROW 17 (94 : 100)

ROW 18 (100 : 110)

ROW 19 (111 : 120)

ROW 20 (120 : 127)

ROW 21 (128 : 136)

ROW 22 (137 : 143)

ROW 23 (143 : 149)

ROW 24 (150 : 155)

ROW 25 (156 : 164)

ROW 26 (165 : 171)

ROW 27 (171 : 174)

ROW 28 (175 : 183)

ROW 29 (183 : 192)

ROW 30 (193 : 197)

ROW 31 (198 : 206)

ROW 32 (207 : 214)

ROW 33 (215 : 224)

ROW 34 (225 : 232)

ROW 35 (233 : 240)

ROW 36 (240 : 246)

ROW 37 (247 : 254)

ROW 38 (255 : 258)

ROW 39 (259 : 267)

ROW 40 (267 : 273)

ROW 41 (273 : 282)

ROW 42 (283 : 291)

ROW 43 (291 : 292)