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PROGRAM DESCRIPTION I

Program Title XFUNCTION STAR TREK

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Program Description, Equations, Variables This Star Trek game is played on a galaxy represented by a 4 by 4 grid of quadrants. Each quadrant is composed of a 10 by 10 grid of sectors. The Enterprise and all other ships each occupy one of these sectors at a time.

Individual quadrants are displayed by using the short range scanner which shows the 10 by 10 grid one line at a time with each Klingon shown as a letter "K", each base by a letter "B", and the Enterprise as an "E".

The object of the game is to destroy all of the Klingons in the smallest number of moves without being destroyed. This is accomplished by moving the Enterprise to each quadrant occupied by Klingons and then destroying them with your photon torpedoes or phasers.

Discussion continued on next page

Necessary Accessories Quad Memory and Extended Functions modules.

Operating Limits and Warnings This program changes the status of flags 28 and 29. These are maintained by constant memory and cause changes in the display format.

Reference(s)

At the start of the game you are given 5000 units of energy and 10 photon torpedoes. Firing phasers at one Klingon requires 500 units of energy to destroy it. Firing one photon torpedo at a Klingon uses no energy but they only have a 60% chance of succesfully destroying the Klingon.

When you run low on energy and torpedoes you must find a base and dock adjacent to it in order to resupply your energy and torpedoes. You will lose the game if you allow your energy to go to zero. The three things which use energy are moving, firing phasers, and being hit by enemy fire. Shields reduce the effect of enemy fire but they increase the energy used in moving. In order for shields to be effective you must have them on before entering a quadrant containing Klingons because the Klingons will fire before you have a chance to raise your shields. The only exception to this rule is in the event that a Klingon uses his tractor beam to pull you to his quadrant. In this case, if your shields are down, you will be given the prompt "RAISE SH?". At this moment you will have two seconds to press any digit key other than 0 in order to raise your shields. Klingons can only use their tractor beams when you change your position.

Klingons are unable to move from quadrant to quadrant but they will move within their quadrant when the Enterprise is not present there so don't expect them to be in the same sectors if you return to the quadrant.

Sample short range scan:

```
*:0123456789
0:--------K--
1:----------
2:B---------
3:-E--------
4:-----K-----
5:----------
6:----------K
7:----------
8:----------
9:----------K
```

The Klingons are shown as "K"'s and their sectors are read as follows starting at the top: 07; 44; 69; and 99. The Enterprise at sector 31 is shown docked adjacent to the base at sector 20. Note: It is possible for more than one ship to be in one sector but this does not happen often. If the Enterprise is in the same sector as a Klingon then only the Enterprise will be shown. If a base is in the same sector as a Klingon then only the base will be shown. Firing at this sector will not damage the base.

Sample chart of the galaxy:

```
1:0- 4,8 0- 4-
2:0- 0- 0- 0-
3:0- 0- 4- 0-
4:0- 6B 6- 5-
```

The first number in each row indicates the row number. In row 1 the 1 is followed by a colon and then a "0" and a "-". The "0" and the "-" represent quadrant 1 where the "0" is the number of Klingons in that quadrant and the "-" indicates that no base

is present. The next quadrant to the right is quadrant 2. It contains 4 Klingons and a base but also there is a comma separating the "4" and the "B". This indicates that the Enterprise is in this quadrant. This is the quadrant shown in the above sample short range scan. The rest of the quadrants are numbered 3 through 16. Row 2 contains quadrants 5, 6, 7, and 8; row 3 contains 9, 10, 11, and 12; etc.

When the program is started it will initially show the chart of the galaxy one row at a time. Then it will check to see if there are any Klingons in your quadrant and if there are then they will fire at you causing a "BOOM" to be displayed along with a tone. Next there will be a different tone and "COMMAND?" will be displayed. At this point you have ten seconds to press one of the following keys: [$\sqrt{x}$]=Fire photon torpedoes; [LOG]=Display chart of galaxy; [LN]=Dock; [SIN]=Shields; [COS]=Fire phasers; [TAN]=Move; [STO]=Status; [RCL]=Short range scan. If one of these keys is pressed less than about ten seconds after "COMMAND?" comes on, then the corresponding operation will be executed. If no key is pressed then the Klingons will fire at you again if you are in their quadrant. Otherwise, the "COMMAND?" display will appear again and again until you press a key. If you accidentally press any key other than those listed above then the "COMMAND?" display will reappear. This includes [ON] [USER] [PRGM], and [ALPHA]. If you want to stop the program at this point then you should press [R/S] twice. This situation occurs because I used the [GETKEY] function instead of [PROMPT]. The advantage to [GETKEY] is that it doesn't need key assignments. There is therefore no need to assign anything to any of your keys for this game and any of your current key assignments will not be effective when "COMMAND?" is in the display during program execution.

If you press the [TAN] key when "COMMAND?" is in the display then "DELTA X?" will next appear as a prompt. At this point you will key in a number of format q.s where "q" is the number of quadrants you wish to move and "s" is the number of sectors. If the number is positive then the Enterprise will move to the right. If it is negative then you will go left. After you enter this number "DELTA Y?" will appear. Enter the amount you wish to move vertically in the same manner as delta x. A positive number will cause the Enterprise to move up and a negative number will cause it to move down. After entering this number, if there are any Klingons in your quadrant (flag annunciator 0 is set), then they will fire at you and if you survive then the Enterprise will move to the appropriate position unless the Enterprise is caught in a tractor beam. The amount of energy used in moving is represented by the equation $E=\sqrt{((q.s)_x^2+(q.s)_y^2)}\cdot C$ where C is 100 if the shields are down and 300 if they are up.

If you press the [COS] key then, if flag 0 is set, the display will prompt with "KLINGON AT:ss" where "ss" is the sector position of one of the klingons. At this point you should enter 500 if you want to destroy the klingon or 0 if you do not.

If you press the [√X] key then the display will prompt with "HOW MANY?". You will then give the number of torpedoes you wish to fire. You can enter 0 if you didn't intend to fire torpedoes. Otherwise the display will prompt next with "DELTA X1?". Enter the horizontal distance from the Enterprise to the Klingon with the format .s where "s" is the number of sectors. Then the display will show "DELTA Y1?" and you should use the same procedure for the vertical distance. Remember that positive is to the right or up and negative is left or down. This will be repeated for each torpedo and then the torpedoes will fire and the results will be displayed. If any Klingons remain they will fire back at you.

Pressing the [LN] key when "COMMAND?" is in the display will cause the Enterprise to be docked if it is adjacent to a base. You will then have 5000 units of energy again as well as 10 torpedoes.

Pressing the [SIN] key will result in the prompt "ON=1, OFF=2". Enter a 1 if you want to raise the shields and 2 if you want to lower them. Flag 1 is set when the shields are on and cleared when the shields are off.

Pressing the [STO] key will cause the status of the Enterprise to be displayed. First it will show "Q:qq S:ss" where "qq" is the quadrant of the Enterprise and "ss" is the sector. Then the amount of energy will show followed by the status of the shields and the number of torpedoes left.

Pressing [RCL] will cause the short range scan to be displayed; and pressing [LOG] will show the chart of the galaxy.

If you use a printer with this game it will print only the chart of the galaxy and the short range scan in order to save paper. If you would like everything to be printed out then use the modifications shown on page 11. However, you should change it back to the original state if you want to run it without the printer. The procedure for this is on page 12.

PROGRAM DESCRIPTION II

Sample Problem (Sketch if Desired)

The following sample run shows all of the operations of the game in action but there is one detail which is not covered by this example and needs explaining: When shooting phasers at Klingons while docked at a base your energy will still go down so be sure you dock again after destroying the Klingons.

Also, before running the program for the first time make sure you have 19 registers of unused memory in your extended memory module. The program will create an ASCII file of this size which it uses for the short range scan. If you want to purge this file when the program is not being used then press the following keys: ALPHA ST ALPHA XEQ ALPHA PURFL ALPHA.

SOLUTION:

Display	Input	Function	Comments
		XEQ "ST"	
SEED?	7	RUN	Initialize random no. gen.
1:0- 0- 6- 6-		RUN	Chart of galaxy. Enterprise
2:0- 0B 4,- 5-		RUN	is shown in quadrant 7.
3:0- 0- 0- 5-		RUN	
4:0- 4- 6B 0-		RUN	
BOOM			Enemies attack.
COMMAND?		COS	Firing phasers.
KLINGON AT:56	500	RUN	
KLINGON AT:43	500	RUN	
KLINGON AT:65	500	RUN	
KLINGON AT:54	500	RUN	
4 KLINGONS			
DESTROYED			
COMMAND?		TAN	Moving to base.
DELTA X?	-1	RUN	
DELTA Y?	0	RUN	
ENT. QUAD. 6			Entering quadrant 6.
COMMAND?		RCL	Scanning for location of
*:0123456789		RUN	the base.
0:---B---E--		RUN	
1:----------		RUN	
2:----------		RUN	
3:----------		RUN	
4:----------		RUN	
5:----------		RUN	
6:----------		RUN	
7:----------		RUN	
8:----------		RUN	
9:----------		RUN	
COMMAND?		TAN	Moving adjacent to base.
DELTA X?	-.3	RUN	
DELTA Y?	0	RUN	

Display	Input	Function	Comments
COMMAND?		LN	Docking.
DOCKED			
COMMAND?		SIN	Raising shields.
ON=1, OFF=2	1	RUN	
SH. RAISED			
COMMAND?		TAN	Moving to quadrant 3.
DELTA X?	1	RUN	
DELTA Y?	1	RUN	
TRACTOR BEAM			Klingons have engaged a tractor beam.
ENT. QUAD. 3			
BOOM			Enemies attack.
COMMAND?		RCL	Scanning quadrant 3.
*:0123456789		RUN	Note: It is only co-
0:----E-----		RUN	incidence that the tractor
1:---------K		RUN	beam pulled the Enterprise
2:---K--K---		RUN	to its intended destination.
3:----------		RUN	If you aren't using a printer
4:K-K------K		RUN	then write down the position
5:----------		RUN	of each Klingon as they appear
6:----------		RUN	if you intend to use photons.
7:----------		RUN	
8:----------		RUN	
9:----------		RUN	
COMMAND?		$\sqrt{x}$	Firing photon torpedoes.
HOW MANY?	10	RUN	This is the maximum.
DELTA X1?	.5	RUN	
DELTA Y1?	-.1	RUN	If you pay attention to the
DELTA X2?	-.1	RUN	goose in the display after
DELTA Y2?	-.2	RUN	entering each delta y value,
DELTA X3?	.2	RUN	then you can determine the
DELTA Y3?	-.2	RUN	success of each shot. If the
DELTA X4?	-.4	RUN	goose flies rapidly across
DELTA Y4?	-.4	RUN	the display without pausing
DELTA X5?	-.2	RUN	then there was no Klingon in
DELTA Y5?	-.4	RUN	that sector. If the goose
DELTA X6?	.5	RUN	pauses for about a half sec-
DELTA Y6?	-.4	RUN	ond then there is a Klingon
DELTA X7?	.5	RUN	in that sector but the photon
DELTA Y7?	-.4	RUN	failed to destroy him. If the
DELTA X8?		RUN	goose pauses for more than
DELTA Y8?		RUN	one second then you destroyed
DELTA X9?		RUN	that Klingon. This only works
DELTA Y9?		RUN	when the program is compiled.
DELTA X10?		RUN	
DELTA Y10?		RUN	
6 KLINGONS			
DESTROYED			

Display	Input	Function	Comments
COMMAND?		TAN	Moving to quadrant 6.
DELTA X?	-1	RUN	
DELTA Y?	-1	RUN	
TRACTOR BEAM			Tractor beam pulls the
ENT. QUAD. 4			Enterprise to quadrant 4.
BOOM			Enemies attack.
COMMAND?		TAN	Try moving again.
DELTA X?	-2	RUN	
DELTA Y?	-1	RUN	
TRACTOR BEAM			
ENT. QUAD. 4			
BOOM			
COMMAND?		TAN	One more attempt.
DELTA X?	-2	RUN	
DELTA Y?	-1	RUN	
BOOM			
ENT. QUAD. 6			Made it this time.
COMMAND?		LN	Docking.
DOCKED			
COMMAND?		TAN	Moving to quadrant 8.
DELTA X?	2	RUN	
DELTA Y?	0	RUN	
ENT. QUAD. 8			
BOOM			Enemies attack.
COMMAND?		RCL	Scanning their positions.
*:0123456789		RUN	
0:---KE--K--		RUN	
1:----------		RUN	
2:----------		RUN	
3:----------		RUN	
4:----------		RUN	
5:-------K--		RUN	
6:----------		RUN	
7:------K---		RUN	
8:----------		RUN	
9:-K--------		RUN	
COMMAND?		$\sqrt{x}$	Firing photon torpedoes.
HOW MANY?	5	RUN	
DELTA X1?	-.1	RUN	
DELTA Y1?	0	RUN	
DELTA X2?	.3	RUN	
DELTA Y2?	0	RUN	
DELTA X3?	.3	RUN	
DELTA Y3?	-.5	RUN	
DELTA X4?	.2	RUN	
DELTA Y4?	-.7	RUN	
DELTA X5?	-.3	RUN	
DELTA Y5?	-.9	RUN	

Display	Input	Function	Comments
3 KLINGONS DESTROYED			I missed 2 of them.
BOOM			Enemies attack.
COMMAND?		COS	Firing phasers.
KLINGON AT:7	500	RUN	
KLINGON AT:3	500	RUN	
2 KLINGONS DESTROYED			
COMMAND?		TAN	Moving to quadrant 6.
DELTA X?	-2	RUN	
DELTA Y?	0	RUN	
ENT. QUAD. 6			
COMMAND?		LN	Docking.
DOCKED			
COMMAND?		TAN	Moving to quadrant 4.
DELTA X?	2	RUN	
DELTA Y?	1	RUN	
ENT. QUAD. 4			
BOOM			Enemies attack.
COMMAND?		RCL	Scanning their positions.
*:0123456789		RUN	
0:----E-----		RUN	
1:----------		RUN	
2:---K------		RUN	
3:----------		RUN	
4:--------KK		RUN	
5:------K---		RUN	
6:----------		RUN	
7:----------		RUN	
8:-----K----		RUN	
9:--------K-		RUN	
COMMAND?		$\sqrt{x}$	Firing photons.
HOW MANY?	6	RUN	
DELTA X1?	-.1	RUN	
DELTA Y1?	-.2	RUN	
DELTA X2?	.4	RUN	
DELTA Y2?	-.4	RUN	
DELTA X3?	.5	RUN	
DELTA Y3?	-.4	RUN	
DELTA X4?	.2	RUN	
DELTA Y4?	-.5	RUN	
DELTA X5?	.1	RUN	
DELTA Y5?	-.8	RUN	
DELTA X6?	.4	RUN	
DELTA Y6?	-.9	RUN	
2 KLINGONS DESTROYED			Missed 4 of them.
BOOM			They attack.

Display	Input	Function	Comments
COMMAND?		$\sqrt{x}$	Firing photons again.
HOW MANY?	4	RUN	
DELTA X1?	.4	RUN	
DELTA Y1?	-.9	RUN	
DELTA X2?	.1	RUN	
DELTA Y2?	-.8	RUN	
DELTA X3?	.2	RUN	
DELTA Y3?	-.5	RUN	
DELTA X4?	.5	RUN	
DELTA Y4?	-.4	RUN	
3 KLINGONS DESTROYED			Still missed one.
BOOM			Enemy attacks.
COMMAND?		STO	Checking out my status.
Q:4 S:4			Quadrant 4, sector 04
ENERGY=2679			
SHIELDS ON			
0 TORPEDOES			
COMMAND?		COS	Firing phasers.
KLINGON AT:49	500	RUN	
1 KLINGONS DESTROYED			
COMMAND?		TAN	Moving to quadrant 6.
DELTA X?	-2	RUN	
DELTA Y?	-1	RUN	
ENT. QUAD. 6			
COMMAND?		LN	Docking.
DOCKED			
COMMAND?		TAN	Moving to quadrant 15.
DELTA X?	1	RUN	
DELTA Y?	-2	RUN	
ENT. QUAD. 15			
BOOM			Enemies attack.
COMMAND?		RCL	Scanning for the base.
*:0123456789		RUN	
0:----E-----		RUN	
1:-B--------		RUN	
2:----------		RUN	
3:----------		RUN	
4:----------		RUN	
5:---------K		RUN	
6:--K-------		RUN	
7:------K---		RUN	
8:-----KKK--		RUN	
9:----------		RUN	

Display	Input	Function	Comments
COMMAND?		TAN	Moving to sector 02.
DELTA X?	-.2	RUN	
DELTA Y?	0	RUN	
BOOM			Enemies attack.
COMMAND?		LN	Docking.
DOCKED			
COMMAND?		COS	Firing phasers.
KLINGON AT:62	500	RUN	
KLINGON AT:59	500	RUN	
KLINGON AT:87	500	RUN	
KLINGON AT:85	500	RUN	
KLINGON AT:86	500	RUN	
KLINGON AT:76	500	RUN	
6 KLINGONS DESTROYED			
COMMAND?		LN	Docking.
DOCKED			
COMMAND?		TAN	Moving to quadrant 14.
DELTA X?	-1	RUN	
DELTA Y?	0	RUN	
ENT. QUAD. 14			
BOOM			Enemies attack.
COMMAND?		COS	Firing phasers.
KLINGON AT:35	500	RUN	
KLINGON AT:26	500	RUN	
KLINGON AT:9	500	RUN	
KLINGON AT:23	500	RUN	
4 KLINGONS DESTROYED			
COMMAND?		TAN	Moving to quadrant 15.
DELTA X?	1	RUN	
DELTA Y?	0	RUN	
ENT. QUAD. 15			
COMMAND?		LN	Docking.
DOCKED			
COMMAND?		TAN	Moving to quadrant 12
DELTA X?	1	RUN	
DELTA Y?	1	RUN	
ENT. QUAD. 12			
BOOM			Enemies attack.
COMMAND?		COS	Firing phasers.
KLINGON AT:7	500	RUN	
KLINGON AT:5	500	RUN	
KLINGON AT:14	500	RUN	
KLINGON AT:10	500	RUN	
KLINGON AT:19	500	RUN	
5 KLINGONS DESTROYED			
YOU WON			
SCORE=3785			

SIZE: (HP-41C) 039

STEP	INSTRUCTIONS	INPUT	FUNCTION	DISPLAY
1	Enter the program.			
2	Begin program.		XEQ "ST"	SEED?
3	Enter any number greater than zero.	R	RUN	
	Next, chart of galaxy is shown. N			1:N- N- N- N-
			RUN	2:N- NB N,- N-
	indicates the no. of Klingons, B		RUN	3:N- N- N- N-
			RUN	4:N- N- NB N-
	indicates a base is present there,		RUN	
	and a comma indicates the location			
	of your ship.			
	If Klingons are present in your			
	quadrant then they attack.			BOOM
4	Execute one of the following options:			COMMAND?
	A. To fire phasers -->		COS	KLINGON AT:( )
	Enter 500 to destroy the Klingon	500	RUN	KLINGON AT:( )
	ship or 0 to save energy.	0	RUN	
		:	:	:
	The number of Klingons destroyed			( ) KLINGONS
	is displayed.			DESTROYED
	If any Klingons remain in the quad-			
	drant, they attack.			BOOM
	If all Klingon ships have been			
	destroyed then the game ends and			
	your score is shown. Otherwise,			
	the program returns to step 4.			
	B. To fire photon torpedoes -->		$\sqrt{x}$	HOW MANY?
	Enter the number of photons you			
	wish to fire.	N	RUN	

Step	Instructions	Input	Function	Display
	Give the horizontal distance for			DELTA X1?
	for the first torpedo.	X	RUN	
	Give the vertical distance for			DELTA Y1?
	the first torpedo.	Y	RUN	
	Next, the number of Klingons destroyed is shown, the remaining Klingons attack, and the game ends if all are destroyed or execution returns to step 4 if not.			
	C. To show the chart of the galaxy -->		LOG	1:N- N- N- N-
			RUN	2:N- NB N,- N-
			RUN	3:N- N- N- N-
			RUN	4:N- N- NB N-
			RUN	
	D. To scan your quadrant -->		RCL	*:0123456789
			RUN	0:-------K--
			RUN	1:--E-------
			RUN	:
			:	
	E. To dock with a base -->		LN	DOCKED
	F. To raise or lower shields -->		SIN	ON=1, OFF=2
	Enter 1 to raise shields	1	RUN	SH. RAISED
	or			
	Enter 2 to lower shields	2	RUN	SH. OFF

Step	Instructions	Input	Function	Display
	G. To move your ship -->		TAN	DELTA X?
	Enter the horizontal distance you	X	RUN	
	wish to move.			DELTA Y?
	Enter the vertical distance.	Y	RUN	
	At this point there is a 17% chance			
	of a tractor beam grabbing your ship.			TRACTOR BEAM
	If your shields are down, this is			RAISE SH.?
	your chance to raise them.	1	RUN	
	If you don't get hit by a tractor			
	beam but there are Klingons in the			
	quadrant you are leaving, then they			
	will attack. This will also occur			BOOM
	if you stay in the same quadrant.			
	Now, if you leave your quadrant, the			
	display will show your new quadrant #.			ENT. QUAD. ( )
	If you enter a quadrant with Klingons,			
	then they attack.			BOOM
	If your energy level drops to zero			
	then the game ends at that point.			NO ENERGY
	This can happen any time a "BOOM"			
	appears in the display or if you move			
	too far or if you exhaust your energy			
	while firing phasers.			

Step	Instructions	Input	Function	Display
H.	To show your status -->		STO	Q:( ) S:( ) ENERGY=( ) SHIELDS (ON or OFF ( ) TORPEDOES

5. To have all displays printed when using a printer make the following modifications:

```
SHIFT GTO "ST"
PRGM
SHIFT GTO .015 ←
SHIFT GTO .090 ←
SHIFT GTO .140 ←
SHIFT GTO .143 ←
SHIFT GTO .288 ←
SHIFT GTO .302 ←
PRGM
XEQ ALPHA PACK ALPHA
```

To change the program back to its original form you can rerecord it from magnetic cards or use the following modifications:

```
SHIFT GTO "ST"
PRGM
SHIFT GTO .014 SHIFT CF 21
SHIFT GTO .090 SHIFT SF 21
SHIFT GTO .141 SHIFT CF 21
SHIFT GTO .145 SHIFT CF 21
SHIFT GTO .291 SHIFT SF 21
SHIFT GTO .306 SHIFT CF 21
PRGM
XEQ ALPHA PACK ALPHA
```

PROGRAM LISTING

☐ 67 ☐ 97 ☒ 41C

STEP/ LINE	KEY ENTRY	KEY CODE (67/97 only)	COMMENTS
01	◆LBL "ST"		
02	SIZE?		Changing size if
03	39		necessary.
04	X>Y?		
05	PSIZE		
06	SF 25		
07	19		
08	"SC"		Creating an ASCII
09	CRFLAS		file if necessary.
10	CF 25		
11	"SEED?"		Getting a seed for
12	PROMPT		the random number
13	STO 00		generator.
14	CF 29		Eliminate decimal.
15	CF 21		Disable printer.
16	FIX 0		
17	0		Clear #of Klingons
18	STO 37		destroyed and # of
19	STO 38		moves.
20	X<>F		Clear flags.
21	SF 02		
22	XEQ 98		Random sector for
23	INT		Enterprise.
24	STO 01		
25	XEQ 98		Random sector for
26	INT		base 1.
27	STO 29		
28	XEQ 98		Random sector for
29	INT		base 2.
30	STO 30		
31	XEQ 98		Random quadrant for
32	.16		Enterprise.
33	*		
34	3		
35	+		
36	INT		
37	STO 02		
38	3.018		Loop counter.
39	STO 19		
40	◆LBL 06		
41	RCL 19		
42	0		Clearing # of Klingons
43	STO IND Y		in each quadrant.
44	ISG 19		
45	GTO 06		
46	6 E-3		Loop counter.
47	STO 19		
48	◆LBL 02		
49	XEQ 98		Randomly choosing
50	.16		7 quadrants to each
51	*		contain a random
52	3		number of Klingons.
53	+		
54	INT		
55	STO 20		
56	RCL IND 20		
57	X≠0?		
58	GTO 02		
59	XEQ 98		Number of Klingons
60	.03		in each quadrant is
61	*		less than 7 and more
62	4		than 3 if not equal
63	+		to 0.
64	INT		
65	STO IND 20		
66	ISG 19		
67	GTO 02		
68	5 E3		5000 units of energy
69	STO 23		for the Enterprise.
70	10		10 photon torpedoes.
71	STO 24		
72	XEQ 98		Random quadrant
73	.16		for base 1.
74	*		
75	3		
76	+		
77	INT		
78	STO 27		
79	◆LBL 11		
80	XEQ 98		Random quadrant
81	.16		for base 2.
82	*		
83	3		
84	+		
85	INT		
86	STO 28		
87	RCL 27		
88	X=Y?		If true, then try
89	GTO 11		again.
90	◆LBL 14		Chart of galaxy.
91	SF 21		Enable printer.
92	CF 12		Normal width.
93	1.004		Loop counter.

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
94	STO 19		
95	◆LBL 09		
96	CLA		
97	ARCL 19		Row number.
98	"⊢:"		
99	2.006		Loop counter.
100	STO 25		
101	◆LBL 10		
102	ISG 25		
103	GTO 04		
104	GTO 05		
105	◆LBL 04		
106	RCL 19		Row number.
107	1		
108	−		
109	4		
110	*		
111	RCL 25		Column number.
112	+		
113	INT		
114	STO 26		Quadrant number.
115	RCL 02		Entrpse quadrant.
116	X=Y?		If equal then place
117	SF 29		comma at radix.
118	CF 28		
119	ARCL IND 26		# of Klingons.
120	CF 29		
121	SF 28		
122	RCL 27		
123	RCL 26		
124	X=Y?		Base 1 at this
125	GTO 12		quadrant?
126	RCL 28		
127	X=Y?		Base 2 at this
128	GTO 12		quadrant?
129	"⊢− "		If not insert "−"
130	GTO 10		
131	◆LBL 12		
132	"⊢B "		If so insert "B"
133	GTO 10		
134	◆LBL 05		
135	−1		Eliminating last
136	AROT		" " to fit into
137	ATOX		display.
138	AVIEW		
139	ISG 19		
140	GTO 09		
141	ADV		
142	CF 21		Disable printer.
143	FS?C 02		Skip "COMMAND?" if
144	GTO 90		first time through.
145	◆LBL C		
146	CF 21		Disable printer.
147	TONE 8		
148	CF 29		Eliminate decimal.
149	FIX 0		
150	"COMMAND ?"		
151	AVIEW		
152	GETKEY		Prompt for command.
153	CLD		
154	X=0?		If true then no key
155	GTO 03		was pressed.
156	10		Checking for impro-
157	%		per input.
158	FRC		
159	.3		
160	X>Y?		
161	GTO C		
162	X<> Z		
163	34		
164	X<Y?		
165	GTO C		
166	X<>Y		
167	5		
168	X>Y?		
169	GTO C		
170	X<>Y		
171	1		Increment the num-
172	ST+ 37		ber of moves.
173	GTO IND Y		Going to specified subroutine.
174	◆LBL 03		Checking for pre-
175	FS? 00		sence of Klingons.
176	XEQ 42		If true, they shoot.
177	GTO C		
178	◆LBL 99		Develop short range
179	"ENT. QUAD. "		scan for new quad.
180	RCL 02		Entrpse quadrant.
181	2		
182	−		
183	ARCL X		
184	AVIEW		
185	◆LBL 90		

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
186	CF 00		
187	-1		0 is a sector so -1
188	STO 31		is used to initialize
189	STO 32		sectors of Klingons.
190	STO 33		
191	STO 34		
192	STO 35		
193	STO 36		
194	RCL IND 02		Number of Klingons in this quadrant.
195	1 E3		
196	/		
197	30.03		
198	+		
199	STO 19		Loop counter.
200	◆LBL 00		
201	ISG 19		
202	GTO 16		
203	GTO 18		
204	◆LBL 16		
205	RCL 01		
206	XEQ 98		Random sector for
207	INT		Klingon.
208	X=Y?		If same as Entrpse
209	GTO 16		then try again.
210	STO IND 19		
211	GTO 00		
212	◆LBL 18		
213	9 E-3		
214	STO 19		Loop counter.
215	"SC"		Clear file "SC"
216	CLFL		for new quadrant.
217	◆LBL 07		
218	CLA		
219	RCL 19		Row number.
220	INT		
221	ARCL X		
222	"├:----- -----"		Blank line to be changed later.
223	APPREC		
224	CLA		
225	ISG 19		
226	GTO 07		
227	GTO 27		
228	◆LBL 30		Subroutine for
229	10		inserting letters
230	%		into short rng. scn.
231	INT		Developing number
232	X<>Y		for record and
233	10		character pointers.
234	/		
235	FRC		
236	1 E2		
237	/		
238	+		
239	2 E-3		
240	+		
241	SEEKPT		
242	CLA		
243	1		
244	DELCHR		
245	ARCL Z		Appropriate letter
246	INSCHR		is inserted in the
247	RTN		place of a "-".
248	◆LBL 27		
249	RCL 01		
250	"E"		An "E" is placed at
251	ASTO Y		the appropriate
252	XEQ 30		sector in the short
253	RCL IND 02		range scan.
254	1 E3		
255	/		
256	30.03		
257	+		
258	STO 25		Loop counter.
259	◆LBL 31		
260	ISG 25		
261	GTO 32		
262	GTO 01		
263	◆LBL 32		
264	RCL IND 25		
265	"K"		A "K" is placed at
266	ASTO Y		the appropriate
267	SF 00		sector in the short
268	XEQ 30		range scan.
269	GTO 31		
270	◆LBL 01		
271	FS? 00		If Klingons are pre-
272	XEQ 42		sent, they shoot.
273	RCL 02		If base 1 is present
274	RCL 27		then a "B" is placed
275	X≠Y?		in the short range
276	GTO 08		scan.

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STEP	KEY ENTRY	COMMENTS
277	RCL 29	
278	"B"	
279	ASTO Y	
280	XEQ 30	
281	◆LBL 08	
282	RCL 02	
283	RCL 28	
284	X≠Y?	If base 2 is present
285	GTO C	then a "B" is placed
286	RCL 30	in the appropriate
287	"B"	sector in the short
288	ASTO Y	range scan.
289	XEQ 30	
290	GTO C	
291	◆LBL 34	Display short range
292	SF 21	scan. Enable printer.
293	SF 12	Double wide print
294	"*:01234 56789"	
295	AVIEW	
296	0	
297	"SC"	Set pointers to 0.
298	SEEKPTA	
299	9 E-3	
300	STO 20	
301	◆LBL 37	
302	GETREC	Each record contains
303	AVIEW	one row of the scan.
304	ISG 20	
305	GTO 37	
306	ADV	
307	CF 21	Disable printer.
308	CF 12	Normal width.
309	GTO C	
310	◆LBL 25	Moving your ship.
311	RCL 01	
312	"-"	A "-" is placed at
313	ASTO Y	your old position
314	XEQ 30	in the s. r. scan.
315	"DELTA X?"	Course changes are given.
316	PROMPT	
317	STO 19	
318	"DELTA Y?"	
319	PROMPT	
320	STO 20	
321	XEQ 98	

STEP	KEY ENTRY	COMMENTS
322	83	
323	X<Y?	If true then
324	GTO 97	tractor beam.
325	◆LBL 78	
326	FS? 00	If Klingons are
327	XEQ 42	present, they shoot.
328	RCL 02	Quad. of Enterprise.
329	STO 25	
330	1 E2	If shields are up,
331	FS? 01	300 units of energy
332	3 E2	are used to move 1
333	RCL 20	quad., else 100.
334	RCL 19	
335	R-P	Distance moved.
336	RCL Z	
337	*	Energy used is sub-
338	ST- 23	tracted from energy
339	GTO 45	available.
340	◆LBL 98	Random number
341	RCL 00	generator.
342	R-D	
343	FRC	
344	STO 00	
345	1 E2	
346	*	
347	RTN	
348	◆LBL 42	Klingons shoot.
349	275	If shields are on then
350	FS? 01	energy drain is 150 per
351	150	Klingon, else 275.
352	RCL IND 02	
353	*	
354	ST- 23	
355	RCL 23	
356	"BOOM"	
357	AVIEW	
358	TONE 3	
359	X<0?	If energy available is
360	GTO 96	now less than 0 then game
361	RTN	is ended.
362	◆LBL 45	
363	CLD	
364	RCL 23	
365	X<0?	If energy available is
366	GTO 96	now less than 0 then
367	RCL 19	game is ended.
368	INT	

STEP	KEY ENTRY	COMMENTS
369	ST+ 02	New coordinates are
370	RCL 19	calculated using the
371	FRC	delta x and delta y
372	10	values.
373	*	
374	STO 19	Delta x sectors.
375	RCL 01	Sect. of Enterprise.
376	10	
377	/	
378	FRC	
379	10	
380	*	
381	+	
382	X<0?	If true then ship is
383	GTO 53	leaving quadrant.
384	9	
385	X<>Y	
386	X<=Y?	If false then ship is
387	GTO 54	leaving quadrant.
388	1	
389	ST+ 02	
390	RCL 19	
391	10	
392	-	
393	ST+ 01	
394	GTO 55	
395◆	LBL 53	
396	1	
397	ST- 02	
398	RCL 19	
399	10	
400	+	
401	ST+ 01	
402	GTO 55	
403◆	LBL 54	
404	RCL 19	
405	ST+ 01	
406◆	LBL 55	
407	RCL 20	Delta y.
408	INT	
409	4	
410	*	Delta y quadrants.
411	ST- 02	
412	RCL 20	
413	CHS	
414	FRC	
415	10	
416	*	
417	STO 20	Delta y sectors.
418	RCL 01	
419	10	
420	/	
421	INT	
422	+	
423	X<0?	If true then ship is
424	GTO 56	leaving quadrant.
425	9	
426	X<>Y	
427	X<=Y?	If false then ship is
428	GTO 57	leaving quadrant.
429	4	
430	ST+ 02	
431	RCL 20	
432	10	
433	-	
434	10	
435	*	
436	ST+ 01	
437	GTO 58	
438◆	LBL 56	
439	4	
440	ST- 02	
441	RCL 20	
442	10	
443	+	
444	10	
445	*	
446	ST+ 01	
447	GTO 58	
448◆	LBL 57	
449	RCL 20	
450	10	
451	*	
452	ST+ 01	
453◆	LBL 58	
454	RCL 02	
455	3	If new quad. is less than
456	X>Y?	3 then make it equal to
457	STO 02	3.
458	X<>Y	
459	18	If it is greater than
460	X<Y?	18, make it 18.
461	STO 02	
462	RCL 02	
463	RCL 25	
464	X≠Y?	

STEP	KEY ENTRY	COMMENTS
465	GTO 99	
466	RCL 01	
467	"E"	Placing an "E" in
468	ASTO Y	new sector.
469	XEQ 30	
470	GTO C	
471	◆LBL 69	This subroutine
472	RCL IND 19	determines if the Enterprise is adjacent to a base.
473	RCL 02	
474	X≠Y?	Register 19 deter-
475	RTN	mines which base is
476	2	being checked.
477	ST+ 19	
478	RCL IND 19	Sector of base.
479	RCL 01	Sector of Enterprise.
480	1	
481	+	
482	X=Y?	If true then dock.
483	GTO 61	
484	10	
485	+	
486	X=Y?	If true then dock.
487	GTO 61	
488	20	
489	-	
490	X=Y?	If true then dock.
491	GTO 61	
492	2	
493	-	
494	X=Y?	If true then dock.
495	GTO 61	
496	10	
497	+	
498	X=Y?	If true then dock.
499	GTO 61	
500	10	
501	+	
502	X=Y?	If true then dock.
503	GTO 61	
504	1	
505	+	
506	X=Y?	If true then dock.
507	GTO 61	
508	20	
509	-	
510	X=Y?	If true then dock.
511	GTO 61	
512	RTN	
513	◆LBL 15	Beginning of "DOCK".
514	27	# of register which
515	STO 19	contains sect. of
516	XEQ 69	base 1.
517	28	# of register which
518	STO 19	contains sect. of
519	XEQ 69	base 2.
520	"NO BASE"	Enterprise is not adjacent to base.
521	AVIEW	
522	TONE 7	
523	GTO C	
524	◆LBL 61	Docking is successful.
525	"DOCKED"	
526	AVIEW	
527	5 E3	Energy is replenished.
528	STO 23	
529	10	Photons are replenished.
530	STO 24	
531	GTO C	
532	◆LBL 24	Fire Phasers.
533	RCL IND 02	
534	STO 26	
535	30.036	
536	STO 20	Loop counter.
537	◆LBL 62	
538	ISG 20	
539	GTO 64	
540	GTO 65	
541	◆LBL 64	
542	RCL IND 20	Sect. of Klingon.
543	X<0?	If true then no Klingons.
544	GTO 62	
545	"KLINGON AT:"	
546	ARCL IND 20	
547	PROMPT	Energy to fire at Klingon.
548	ST- 23	
549	RCL 23	
550	X<0?	If true then no energy
551	GTO 96	is left and game ends.
552	RDN	
553	5 E2	

STEP	KEY ENTRY	COMMENTS
554	X<>Y	
555	X<Y?	If true then Klingon
556	GTO 62	was not destroyed.
557	RCL IND	Else, Klingon was
20		destroyed and a "-"
558	"-"	is inserted in the
559	ASTO Y	place of the "K".
560	XEQ 30	
561	1	Decrement no. of
562	ST- IND	Klingons in quadrant.
02		
563	ST+ 38	Increment no. of
564	-1	Klingons hit.
565	STO IND	
20		
566	RCL IND	
02		
567	X=0?	If true, no Klingons
568	CF 00	remain in quadrant.
569	GTO 62	
570	LBL 65	
571	RCL 26	
572	RCL IND	
02		
573	-	
574	X=0?	If true, no Klingons
575	GTO 66	were hit.
576	STO 26	# of Klingons hit.
577	LBL 89	
578	CLA	
579	ARCL 26	
580	"⊢ KLING	
ONS"		
581	AVIEW	
582	PSE	
583	"DESTROY	
ED"		
584	AVIEW	
585	3.018	Loop counter.
586	STO 19	
587	LBL 75	
588	RCL IND	
19		
589	X>0?	If false for each
590	GTO 74	iteration of the
591	ISG 19	loop, then you won.
592	GTO 75	
593	"YOU WON"	
594	AVIEW	
595	PSE	
596	0	
597	GTO 95	
598	LBL 66	
599	"NONE HI	
T"		
600	AVIEW	
601	PSE	
602	LBL 74	
603	FS? 00	If true, remaining
604	XEQ 42	Klingons shoot.
605	GTO C	
606	LBL 33	Status report.
607	"Q:"	
608	RCL 02	Quad. of Enterprise.
609	2	Note: there is a
610	-	difference between the
611	ARCL X	actual quad. no. and the
612	"⊢ S:"	displayed no.
613	ARCL 01	Sect. of Enterprise.
614	AVIEW	
615	PSE	
616	PSE	
617	"ENERGY=	
"		
618	ARCL 23	
619	AVIEW	
620	PSE	
621	PSE	
622	"SHIELDS	
0"		
623	FS? 01	
624	GTO 70	
625	"⊢FF"	
626	GTO 71	
627	LBL 70	
628	"⊢N"	
629	LBL 71	
630	AVIEW	
631	PSE	
632	CLA	
633	ARCL 24	
634	"⊢ TORPE	
DOES"		
635	AVIEW	
636	PSE	
637	GTO C	

STEP	KEY ENTRY	COMMENTS
638	◆LBL 23	Raise or lower
639	"ON=1, OFF=2"	shields.
640	PROMPT	
641	1	
642	X≠Y?	If true, shields
643	GTO 73	are lowered, else
644	"SH. RAISED"	shields are raised.
645	AVIEW	
646	SF 01	Raise shields.
647	PSE	
648	GTO C	
649	◆LBL 73	
650	"SH. OFF"	
651	AVIEW	
652	CF 01	Lower shields.
653	PSE	
654	GTO C	
655	◆LBL 97	Tractor beam subroutine.
656	TONE 5	
657	"TRACTOR BEAM"	
658	AVIEW	
659	FS? 01	If shields are down,
660	GTO 79	this allows them to be
661	PSE	raised.
662	CLX	
663	"RAISE SH?"	
664	AVIEW	
665	PSE	
666	PSE	
667	X>0?	
668	SF 01	Raise shields.
669	◆LBL 79	This subroutine
670	XEQ 98	randomly chooses a
671	.16	quadrant with Klingons
672	*	and moves the Enterprise
673	INT	to that quadrant.
674	1	
675	+	
676	STO 20	
677	2.018	
678	STO 19	Loop counter.
679	◆LBL 80	
680	ISG 19	
681	GTO 59	
682	GTO 99	
683	◆LBL 59	
684	RCL 20	Random quadrant.
685	RCL 19	No. between 2 and 19.
686	+	
687	19	
688	X<Y?	If true, no. is not
689	GTO 43	valid quadrant.
690	RDN	
691	◆LBL 17	
692	RCL IND X	No. of Klingons in quad. specified by x.
693	X=0?	If true, no Klingons,
694	GTO 80	else, move Enterprise
695	RDN	to this quadrant.
696	INT	
697	STO 02	New quad. for Enterprise.
698	GTO 99	
699	◆LBL 43	
700	RDN	
701	16	
702	-	
703	GTO 17	
704	◆LBL 13	Fire Photons.
705	RCL IND 02	No. of Klingons.
706	STO 26	
707	"HOW MANY?"	
708	PROMPT	No. of torpedoes to fire.
709	X=0?	
710	GTO C	
711	ST- 24	
712	RCL 24	No. of remaining
713	X<0?	torpedoes.
714	GTO 84	
715	RDN	
716	.1	
717	%	
718	STO 20	Loop counter.
719	◆LBL 81	
720	ISG 20	
721	GTO 82	
722	GTO 83	
723	◆LBL 84	Not enough torpedoes.
724	+	Original no. of torps.
725	STO 24	is returned to reg. 24.

STEP	KEY ENTRY	COMMENTS
726	CLA	
727	ARCL 24	
728	"⊢ LEFT"	
729	AVIEW	
730	PSE	
731	GTO 13	
732	◆LBL 82	
733	"DELTA X"	Course for torp. is entered.
734	ARCL 20	
735	"⊢?"	
736	PROMPT	
737	STO 19	Horizontal distance.
738	"DELTA Y"	
739	ARCL 20	
740	"⊢?"	
741	PROMPT	
742	STO 25	Vertical distance.
743	RCL 01	
744	RCL 19	
745	10	
746	*	
747	+	
748	RCL 25	
749	1 E2	
750	*	
751	-	
752	STO 25	Target point.
753	30.036	
754	STO 21	Loop counter.
755	◆LBL 86	
756	ISG 21	This loop compares
757	GTO 87	the sectors of all
758	GTO 81	Klingons in this quad
759	◆LBL 87	with the target point.
760	RCL IND 21	
761	RCL 25	
762	X≠Y?	If true, torpedo mis-
763	GTO 86	sed.
764	XEQ 98	Else, random number
765	60	determines if Klingon
766	X<Y?	is destroyed.
767	GTO 81	
768	1	
769	ST- IND 02	Decrement no. of Klingons in quadrant.
770	ST+ 38	
771	RCL IND 21	
772	STO 19	
773	"-"	The "K" in the s.r.
774	ASTO 22	scan is replaced with
775	XEQ 30	a "-".
776	-1	
777	STO IND 21	
778	GTO 81	
779	◆LBL 83	
780	RCL 26	
781	RCL IND 02	
782	-	
783	STO 26	No. of Klingons hit.
784	X=0?	
785	GTO 66	
786	RCL IND 02	No. of Klingons re- maining.
787	X=0?	
788	CF 00	
789	GTO 89	
790	◆LBL 96	
791	"NO ENERGY"	
792	AVIEW	
793	PSE	
794	-2 E2	Penalty for losing.
795	◆LBL 95	
796	"SCORE="	
797	RCL 38	No. of Klingons hit.
798	RCL 37	No. of moves.
799	/	
800	200	
801	*	
802	+	
803	RCL 38	No. of Klingons hit.
804	100	
805	*	
806	+	
807	ARCL X	Total score.
808	AVIEW	
809	STOP	
810	GTO "ST"	
811	END	

027620

REGISTERS, STATUS, FLAGS, ASSIGNMENTS

DATA REGISTERS

00 Random numbers
01 Enterprise sect.
02 Enterprise quad.
03 Klingons in quad. 1
04 Klingons in quad. 2
05 Klingons in quad. 3
06 " " " 4
07 " " " 5
08 " " " 6
09 " " " 7
10 " " " 8
11 " " " 9
12 " " " 10
13 " " " 11
14 " " " 12
15 " " " 13
16 " " " 14
17 " " " 15
18 " " " 16
19 Various values
20 Various values
21 Various values
22 Various alpha characters
23 Energy in Enterprise
24 No. of torpedoes
25 Various values
26 Various values
27 Quad. of base 1
28 Quad. of base 2
29 Sect. of base 1
30 Sect. of base 2
31 Sect. of Klingon 1
32 Sect. of Klingon 2
33 Sect. of Klingon 3
34 Sect. of Klingon 4
35 Sect. of Klingon 5
36 Sect. of Klingon 6
37 # of moves
38 # of Klingons hit

STATUS

SIZE 039 TOT. REG. 289 USER MODE
ENG FIX 0 SCI ON OFF X
DEG RAD GRAD

FLAGS

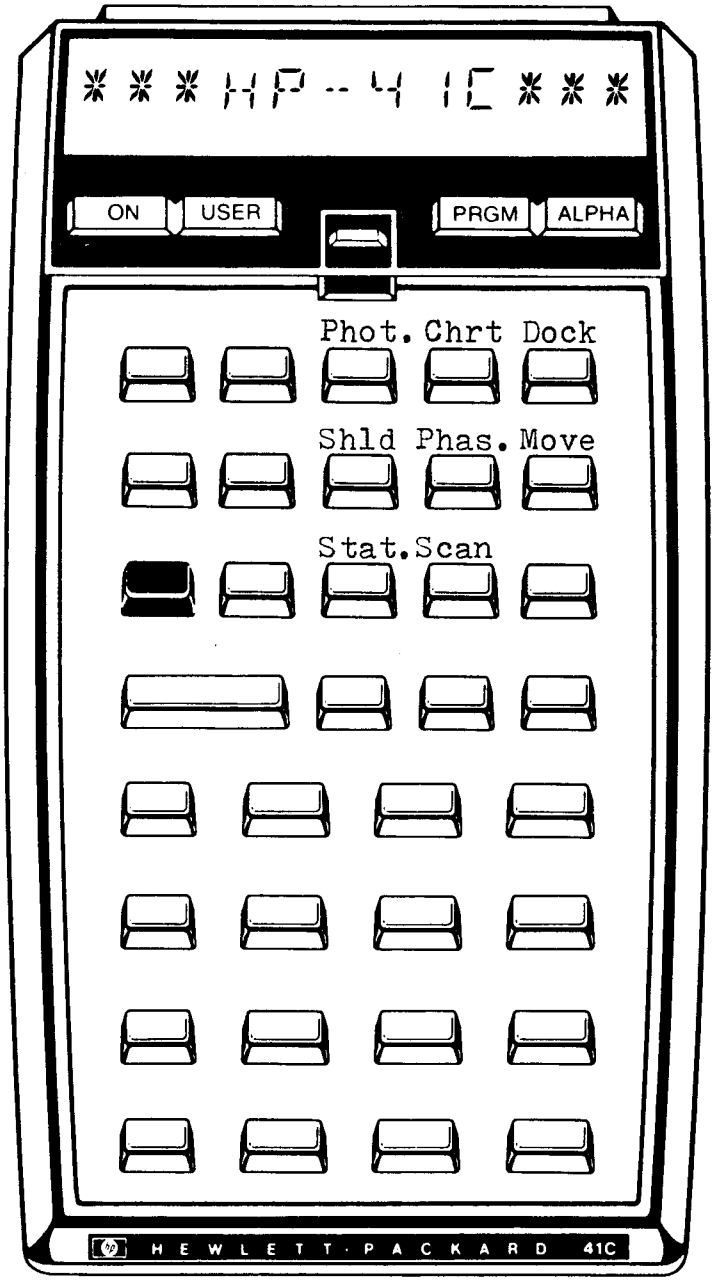
#	INIT S/C	SET INDICATES	CLEAR INDICATES
00	C	Klingons near	No Klingons
01	C	Shields on	Shields off
02	S	Initializing	Not initializing
12	C	Print double wide	Normal print
21	C	Printer enabled	Disabled
28	S	Decimal point	Comma radix
29	C	Radix appears	No radix

ASSIGNMENTS

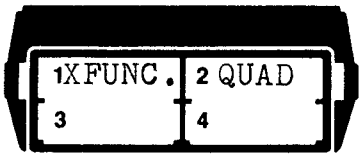
FUNCTION	KEY	FUNCTION	KEY

KEYBOARD CARD LABELING

KEYBOARD



SYSTEM CONFIGURATION



CARD

PROGRAM REGISTERS NEEDED: 248

ROW 1 (1 : 5)

ROW 2 (6 : 11)

ROW 3 (11 : 17)

ROW 4 (18 : 24)

ROW 5 (25 : 31)

ROW 6 (31 : 38)

ROW 7 (38 : 45)

ROW 8 (45 : 50)

ROW 9 (50 : 59)

ROW 10 (59 : 66)

ROW 11 (67 : 72)

ROW 12 (72 : 80)

ROW 13 (80 : 88)

ROW 14 (89 : 94)

ROW 15 (94 : 99)

ROW 16 (100 : 107)

ROW 17 (108 : 117)

ROW 18 (118 : 124)

ROW 19 (125 : 130)

ROW 20 (131 : 137)

ROW 21 (137 : 144)

ROW 22 (144 : 150)

ROW 23 (150 : 155)

ROW 24 (155 : 162)

ROW 25 (163 : 170)

ROW 26 (171 : 177)

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ROW 47 (294 : 300)

ROW 48 (300 : 307)

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ROW 51 (317 : 320)

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ROW 61 (384 : 391)

ROW 62 (392 : 398)

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ROW 66 (424 : 431)

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ROW 68 (438 : 446)

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ROW 72 (470 : 477)

ROW 73 (478 : 486)

ROW 74 (487 : 494)

ROW 75 (495 : 501)

ROW 76 (502 : 509)

ROW 77 (510 : 516)

ROW 78 (516 : 520)

ROW 79 (520 : 525)

ROW 80 (525 : 529)

ROW 81 (530 : 535)

ROW 82 (535 : 539)

ROW 83 (540 : 545)

ROW 84 (545 : 547)

ROW 85 (548 : 554)

ROW 86 (555 : 560)

ROW 87 (561 : 568)

ROW 88 (568 : 575)

ROW 89 (575 : 580)

ROW 90 (580 : 583)

ROW 91 (583 : 586)

ROW 92 (586 : 592)

ROW 93 (592 : 597)

ROW 94 (597 : 599)

ROW 95 (600 : 606)

ROW 96 (606 : 612)

ROW 97 (612 : 617)

ROW 98 (617 : 622)

ROW 99 (622 : 626)

ROW 100 (626 : 633)

ROW 101 (633 : 634)

ROW 102 (635 : 639)

ROW 103 (639 : 644)

ROW 104 (644 : 646)

ROW 105 (647 : 650)

ROW 106 (650 : 657)

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ROW 110 (670 : 677)

ROW 111 (677 : 682)

ROW 112 (682 : 689)

ROW 113 (689 : 696)

ROW 114 (697 : 703)

ROW 115 (704 : 707)

ROW 116 (707 : 714)

ROW 117 (714 : 721)

ROW 118 (721 : 727)

ROW 119 (728 : 732)

ROW 120 (733 : 735)

ROW 121 (736 : 739)

ROW 122 (740 : 747)

ROW 123 (748 : 753)

ROW 124 (753 : 758)

ROW 125 (758 : 764)

ROW 126 (764 : 771)

ROW 127 (771 : 777)

ROW 128 (777 : 783)

ROW 129 (784 : 790)

ROW 130 (790 : 793)

ROW 131 (794 : 796)

ROW 132 (797 : 804)

ROW 133 (804 : 811)

ROW 134 (811 : 811)