

PROGRAM DESCRIPTION I

Program Title **BASEBALL FEVER**
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Program Description, Equations, Variables **FROM THE NATIONAL ANTHEM TO THE CHEERS OF THE FANS FOLLOWING THE FINAL OUT - IN EXTRA INNINGS IF NECESSARY - THIS UNBELIEVABLY COMPLETE, YET EASY-TO-PLAY GAME OF STRATEGY AND CHANCE INCLUDES BALLS, STRIKES, WALKS, STRIKEOUTS, SINGLES, DOUBLES, TRIPLES, HOME RUNS, GRAND SLAMS, FOUL BALLS, DOUBLE PLAYS, HIT-BATTERS, BUNT AND STEAL OPTIONS AND EVEN ERRORS. ANTICIPATING USER ERRORS, I INCLUDED IMPROPER-RESPONSE LOOPS TO ELIMINATE ANY USER DIFFICULTIES: FOR EXAMPLE, ATTEMPTING TO STEAL WITH BASES EMPTY GENERATES THE ERROR MESSAGE "RUNNER STAYS" AFTER WHICH THE "SWING?" PROMPT IS REPEATED.**

TWO PLAYERS PRESS KEYS TO PITCH, SWING, TAKE (A PITCH), BUNT, STEAL AND OBTAIN ADDITIONAL GAME-RELATED INFORMATION. AFTER EVERY HIT OR OUT, THE PROGRAM AUTOMATICALLY TELLS THE PLAYERS WHAT BASES
 (CONTINUED ON NEXT PAGE)

Necessary Accessories **4 MEMORY MODULES OR HP-41CV**

Operating Limits and Warnings **EXECUTE U (STEAL), O (BUNT), M (TAKE) OR N (SWING) ONLY WHEN YOU ARE PROMPTED WITH "SWING?". SINCE THE OPTIONAL KEYS Q (BASES), S (STATS), P (COUNT) AND SC (LAST INNING SCORE) RETURN**
 (CONTINUED ON NEXT PAGE)

Reference(s)

This program has been verified only with respect to the numerical example given in *Program Description II*. User accepts and uses this program material AT HIS OWN RISK, in reliance solely upon his own inspection of the program material and without reliance upon any representation or description concerning the program material.

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(CONTINUATION PAGE)

PROGRAM DESCRIPTION (CONT.)

ARE OCCUPIED. FOLLOWING EVERY BALL OR STRIKE, THE COUNT IS DISPLAYED. OPTIONAL KEYS MAY BE PRESSED TO OBTAIN THE OUTS AND THE NUMBER OF RUNS ACROSS SO FAR IN THE INNING. FURTHERMORE, THE COUNT, THE STATUS OF THE BASES OR THE LAST-INNING SCORE MAY BE OBTAINED FROM THE KEYBOARD. AFTER THE THIRD OUT, "SIDE RETIRED" SCROLLS ACROSS THE DISPLAY FOLLOWED BY THE MEN LEFT ON BASE, RUNS ACROSS IN THE HALF-INNING JUST COMPLETED, THE NUMBER OF INNINGS COMPLETED AND THE SCORE.

A SERIES OF RANDOM NUMBER GENERATORS MAKES THE GAME EXCITING, UNPREDICTABLE, AND MOST IMPORTANT - REALISTIC. STRATEGY IS ADDED TO CHANCE WHEN THE PLAYER BATTING MUST DECIDE WHETHER TO SWING, TAKE, SEND THE RUNNER, OR BUNT.

AMONG THE PROGRAM'S REALISTIC FEATURES, A TWO-STRIKE FOUL BALL WHILE BUNTING RESULTS IN A STRIKEOUT. FURTHERMORE, IF THE HOME TEAM (B) HAS THE LEAD AFTER 8.5 COMPLETE INNINGS, THE GAME IS OVER AND THE FINAL SCORE SCROLLS ACROSS THE DISPLAY. SIMILARLY, IN THE BOTTOM OF THE NINTH INNING OR THE BOTTOM OF ANY EXTRA INNING, THE GAME IS OVER AS SOON AS THE WINNING RUN CROSSES THE PLATE.

"BASEBALL FEVER" COMMUNICATES SO WELL WITH THE USERS THAT EVEN CHILDREN CAN ENJOY THE SOPHISTICATION OF THE GAME - INSTEAD OF FEELING LIKE THEY ARE OUT IN LEFT FIELD WHILE THE ADULTS HAVE ALL THE FUN.

THIS REALISTIC SIMULATION OF THE SEVENTH GAME OF THE WORLD SERIES PUTS ALL THE EXCITEMENT OF A CHAMPIONSHIP BASEBALL GAME AT YOUR FINGER-TIPS. HOT DOGS AND COLD BEVERAGES ARE NOT INCLUDED.

OPERATING LIMITS AND WARNINGS (CONT.)

EXECUTION TO THE "PITCH?" PROMPT, USE THEM WHEN "PITCH?" IS IN THE DISPLAY, PREFERABLY BEFORE A NEW PITCH IS MADE. PRESSING AN OPTIONAL KEY WHEN "SWING?" IS PROMPTED FOR ONLY IGNORES THE PITCH JUST DELIVERED AND PROMPTS FOR ANOTHER PITCH.

THE STEAL KEY (LBL U) CAN ONLY BE USED TO STEAL SECOND BASE, PROVIDED NOONE IS ON SECOND (NO DOUBLE STEALS). IF A MAN IS ON THIRD, HE STAYS THERE. OTHERWISE, A STEAL ATTEMPT WILL RESULT WITH THE ERROR MESSAGE "RUNNER STAYS" AND THE "SWING?" PROMPT IS REPEATED.

A SINGLE ALWAYS SCORES A MAN ON SECOND AND ADVANCES A MAN ON FIRST TO SECOND. A DOUBLE ADVANCES ALL RUNNERS TWO BASES. A BUNT SINGLE ALSO SCORES A MAN FROM SECOND BASE.

HOME RUNS ARE HIT ONLY OFF FASTBALLS.

LBL M (TAKE) GIVES THE PLAYER BATTING THE OPTION TO INTENTIONALLY NOT SWING AT THE PITCH. PRESSING LBL N CAUSES THE PROGRAM TO DECIDE WHETHER THE PLAYER BATTING WILL SWING OR TAKE THE PITCH.

PROGRAM DESCRIPTION II

Sample Problem (Sketch if Desired)

A. See "More about the Code..." on p. 8.
 B. See flowchart on p. 12.

SOLUTION: THIS IS A SAMPLE FIRST INNING OF "BASEBALL FEVER":

Input	Function	Display	Comments
	(USER) [XEQ] SIZE 015 [XEQ] BBF	****WORLD*** ***SERIES*** AND THE HOME OF THE... BRAVE. SEED?	Set USER mode Minimum size Flashes 3 times Words and melody Input seed for random number generator
.4	(R/S)	GAME 7... PLAYBALL	Note that flag 0 set indicates top of inning
	[XEQ] 'L'	PITCH? SLIDER SWING?	Press key to pitch
	[XEQ] 'N'	BALL: INSIDE COUNT: 1-0 PITCH?	Type of pitch
	[XEQ] 'L'	KNUCKLE BALL SWING?	Press key to swing, take, bunt or steal
	[XEQ] 'N'	BALL: INSIDE COUNT: 2-0 PITCH?	One ball and no strikes
	[XEQ] 'L'	KNUCKLE BALL SWING?	
	[XEQ] 'U'	RUNNER STAYS	
	[XEQ] 'U'	SWING?	Improper steal attempt (bases empty)
	[XEQ] 'N'	BALL: OUTSIDE COUNT: 3-0 PITCH?	
	[XEQ] 'L'	CURVE BALL SWING?	

(CONTINUATION PAGE)

Input	Function	Display	Comments
	[XEQ] 'M'	TAKE... BALL: OUTSIDE WALK MAN ON FIRST PITCH?	Take a pitch (don't swing)
	[XEQ] 'L'	KNUCKLE BALL SWING?	
	[XEQ] 'N'	CALLED STRIKE COUNT: 0-1 PITCH?	
	[XEQ] 'L'	CHANGE-UP SWING?	
	[XEQ] 'U'	RUNNER GOING SAFE MAN ON SECOND PITCH?	Attempt to steal Stolen base*
	[XEQ] 'L'	CURVE BALL SWING?	*If the batter had swung, he would hit a grounder forcing an out at second
	[XEQ] 'N'	BALL: INSIDE COUNT: 1-1 PITCH?	Strategy changes outcomes
	[XEQ] 'L'	KNUCKLE BALL SWING?	
	[XEQ] 'N'	BALL: INSIDE COUNT: 2-1 PITCH?	
	[XEQ] 'L'	SCREWBALL SWING?	
	[XEQ] 'N'	***SINGLE*** MAN ON FIRST PITCH?	Flashes 3 times Man on second scored
	[XEQ] 'S'	RUNS ACROSS: 1 OUTS: 0 PITCH?	Check stats
	[XEQ] 'L'	FASTBALL SWING?	
	[XEQ] 'N'	LINE DRIVE: CAUGHT MAN ON FIRST PITCH?	
	[XEQ] 'L' O	KNUCKLE BALL BUNT ATTEMPT GOOD SACRIFICE MAN ON SECOND PITCH?	Bunting Man advanced to second by sacrificing an out
	[XEQ] 'S'	RUNS ACROSS: 1 OUTS: 2 PITCH?	Check stats
	[XEQ] 'L'	KNUCKLE BALL SWING?	
	[XEQ] 'N'	BALL: OUTSIDE COUNT: 1-0 PITCH?	
	[XEQ] 'L'	KNUCKLE BALL SWING?	
	[XEQ] 'N'	BALL: OUTSIDE	

(CONTINUATION PAGE)

Input	Function	Display	Comments
[XEQ] 'L'		COUNT: 2-0 PITCH? FASTBALL	
[XEQ] 'N'		SWING? ***SINGLE*** MAN ON FIRST	Flashes 3 times Man on second scored
[XEQ] 'S'		PITCH? RUNS ACROSS: 2 OUTS: 2	Check stats
[XEQ] 'L'		PITCH? SLIDER	
[XEQ] 'N'		SWING? SWING AND MISS	
[XEQ] 'L'		COUNT: 0-1 PITCH? KNUCKLE BALL	
[XEQ] 'N'		SWING? BALL OUTSIDE	
[XEQ] 'Q'		COUNT: 1-1 PITCH? MAN ON FIRST	
[XEQ] 'L'		PITCH? SCREWBALL	Forgot status of bases
[XEQ] 'N'		SWING? CALLED STRIKE	
[XEQ] 'L'		COUNT: 1-2 PITCH? CURVE BALL	
[XEQ] 'N'		SWING? BALL: INSIDE	
[XEQ] 'L'		COUNT: 2-2 PITCH? SCREWBALL	
[XEQ] 'U'		SWING? RUNNER GOING OUT	Stealing
		SIDE RETIRED	Thrown out (3 outs)
		INNINGS COMPLETE	
		D: 0.5	
		LEFT ON BASE: BASES EMPTY	
		RUNS ACROSS: 2	
		TEAM A: 2	Visiting team score
		TEAM B: 0	Home team score
		PLAYBALL	Other team now at bat
[XEQ] 'L'		PITCH? SCREWBALL	Note flag 0 clear in bottom of any inning
[XEQ] 'N'		SWING? GROUNDOUT	
		BASES EMPTY	
		PITCH? SLIDER	
[XEQ] 'L'		SWING?	
[XEQ] 'N'		CALLED STRIKE	
		COUNT: 0-1	

(CONTINUATION PAGE)

Input	Function	Display	Comments
[XEQ] 'L'		PITCH? CHANGE-UP SWING?	
[XEQ] 'N'		FLYOUT BASES EMPTY	
[XEQ] 'S'		RUNS ACROSS: 0 OUTS: 2	
[XEQ] 'SC'		LAST INNING: TEAM A: 2 TEAM B: 0 PITCH?	Forgot score, so check it* *This score does not include runs scored during current at bat. For total score, XEQ (S) to get runs across in current half-inning and add to score from (SC).
[XEQ] 'L'		FASTBALL SWING?	
[XEQ] 'N'		BALL: INSIDE COUNT: 1-0 PITCH?	
[XEQ] 'L'		SCREWBALL SWING?	
[XEQ] 'N'		GROUNDOUT SIDE RETIRED INNINGS COMPLETED: 1.0 LEFT ON BASE: BASES EMPTY RUNS ACROSS: 0	That makes 3 outs Note that OUTS are skipped in LBL S since we know there are 3 to retire the side. (Change of team at bat)
		TEAM A: 2 TEAM B: 0 PLAYBALL PITCH? • • •	Note that flag 0 set indicates top of inning or Team A is at bat.

More about the Code...

The word "code" is computer jargon for the language that the computer understands in order to execute a program. This section will discuss some of the logic and reasoning I used when I wrote the code for "Baseball Fever".

Upon inspection, you will find that short form numeric labels are used wherever possible to conserve memory. Furthermore, utilizing the way the computer searches for a short form numeric label, I am able to use one particular short form numeric label many times.

However, I use global labels in the loops for the flashing messages such as single and double. If I use another label type, the first time this code is reached, the flashing message is stalled while the computer searches for the label at the beginning of the loop. After the first pass through, the computer records the jump; and the message continues to flash at even time intervals. To avoid this problem, I use one-letter global labels in these loops. Furthermore, global labels—rather than local alpha labels— are used for those subroutines to be assigned to the keyboard; this gives the user the option to change the key assignments. Unfortunately, to conserve memory and still be able to assign them to the keys, single letter global labels are used. Since these label names are not very descriptive, please refer to the user instructions for clarification.

Naturally, if two or more parts of the program use the

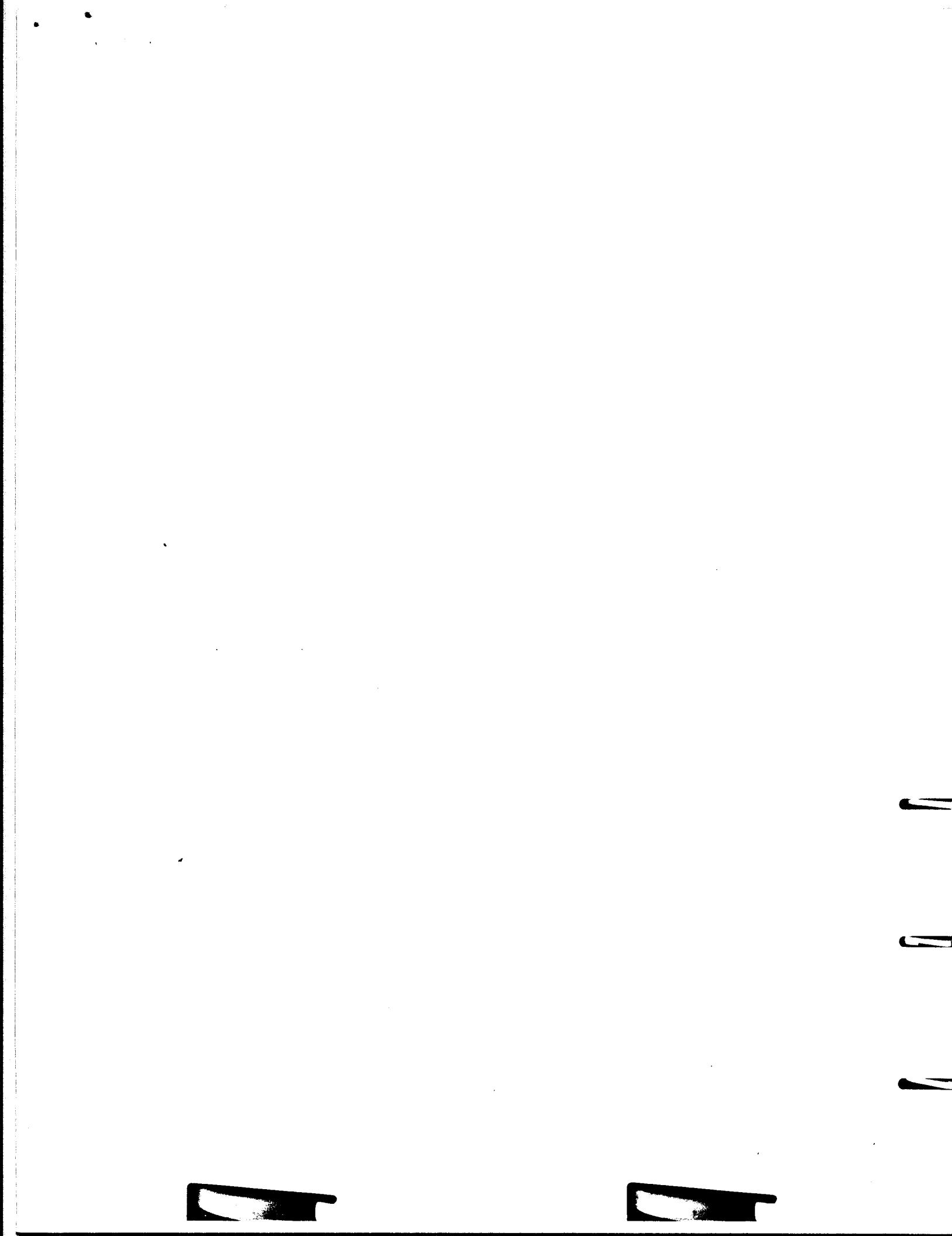
same code, subroutines are used. Different subroutines even share the same code: LBL 0 (bunt) uses a subset of the labels called by LBL N (swing or take). Since many subroutines ended with "XEQ Q GTO K", I combined these two steps into LBL 75; therefore, replacing this pair of steps with GTO 75 saves memory.

A faster-running, memory-conserving method is used in LBL L, LBL N, LBL O, and LBL M. Rather than search through a series of labels one by one to find a certain label, the label of interest is executed indirectly. Furthermore, note how LBL M uses a flag in order to share the code of LBL N.

How realistic the simulation of the game is depends on the statistics one uses to parameterize the outcome of a pitch, swing, take, bunt or steal.

Half of the parameterization used in LBL N (swing or take) is based on the probability of "rolling" a particular sum from two theoretical dice (done by a random number generator). When this total is 6, 7 or 8, the probability of "rolling" one of these totals is at least 5/36. See the table that follows:

<u>Two Dice Total</u>	<u>Combinations</u>	<u>No. of Combinations</u>
2	1 and 1	1
3	1 and 2, 2 and 1	2
4	1 and 3, 2 and 2, 3 and 1	3
5	1 and 4, 2 and 3, 3 and 2 4 and 1	4
6	1 and 5, 2 and 4, 3 and 3 4 and 2, 5 and 1	5
7	1 and 6, 2 and 5, 3 and 4	6
8	4 and 3, 5 and 2, 6 and 1 2 and 6, 3 and 5, 4 and 4 5 and 3, 6 and 2	6
9	•	4
•	•	•
12	6 and 6	1



IIIa. (1/2)
 1/5 A. On with an error
 1/5 B. Foul ball
 1/5 C.
 1/2 a. Ball: outside
 1/2 b. Called strike
 1/5 D. Line drive: caught
 1/5 E. Single

LBL O (BUNT)

IIIb. (1/2)
 A.
 a. If first is empty
 or a man on second,
 1/2 1. Ball: outside
 1/2 2. Called strike
 b. If already 2 outs,
 then groundout
 ELSE...
 1/2 c.
 1/2 1. Ball: outside
 1/2 2. Called strike
 1/2 d. Good sacrifice

IVa. (1/2)
 19/50A. Ball: inside
 2/5 B. Called strike
 1/50 C. Hit batter, take first
 1/5 D. Ball: outside

LBL M (TAKE)

IVb. (1/2)
 A.
 1/2 a. Ball: outside
 1/2 b. Called strike

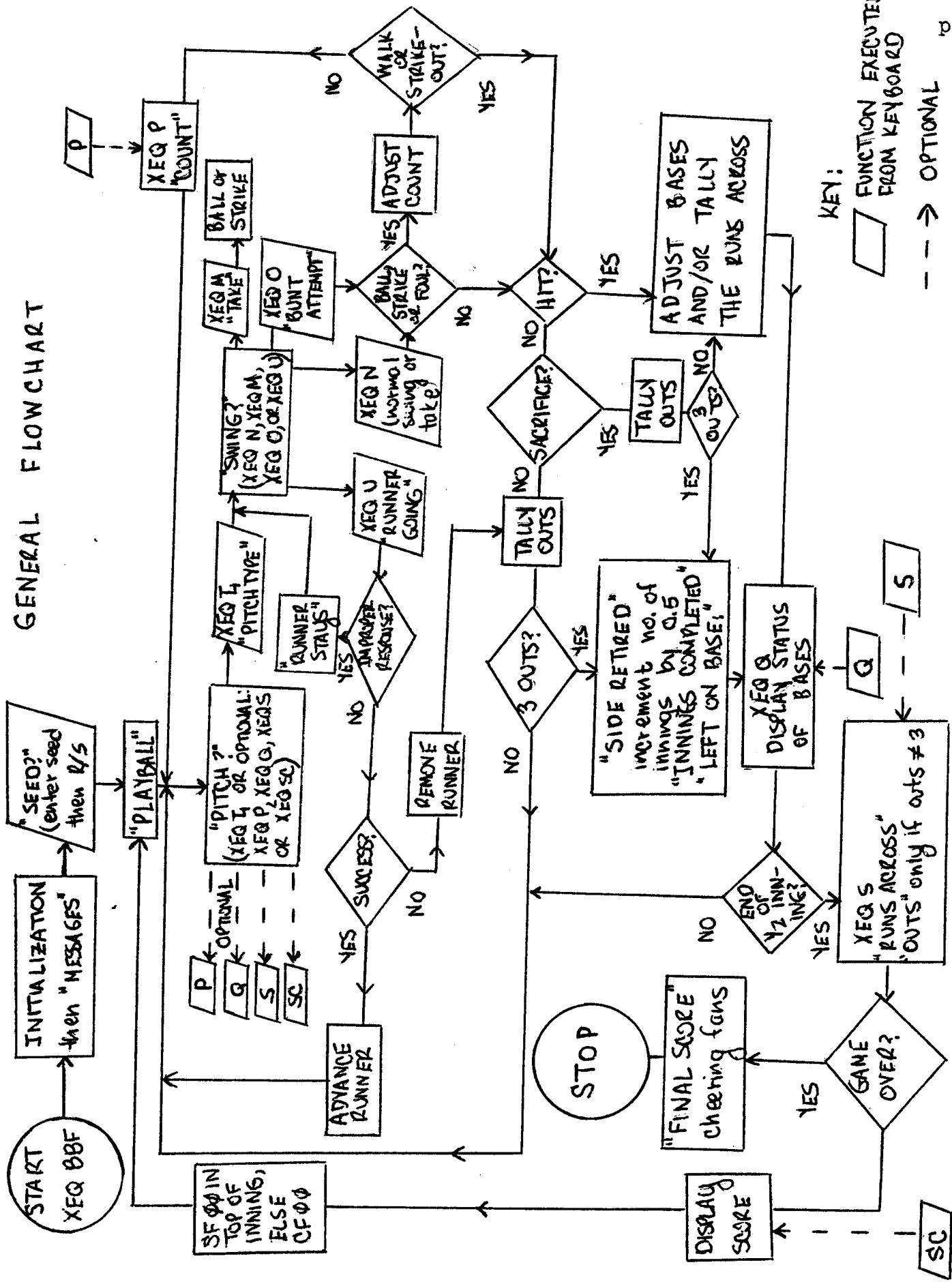
V. IF first is empty or a man is on second, "RUNNER STAYS"
 ELSE...
 1/4 A. Safe
 1/4 B. Out
 1/4 C. No throw: safe
 1/4 D. Rundown
 3/4 a. Tagged out
 1/4 b. Safe

LBL U (STEAL)

A general flowchart (see next page) may help you to understand the overall logic. Parallelograms are used to denote where a function must be executed from the keyboard by the users. The dashed lines represent the execution of the optional keys for additional game-related information.

Finally, since the search for global labels starts at the end of program memory and works forward, LBL X, the very important random number generator, is positioned last in program memory for quick access.

GENERAL FLOWCHART



USER INSTRUCTIONS

SIZE:
(HP-41C) 015

STEP	INSTRUCTIONS	INPUT	FUNCTION	DISPLAY
1	Set the size.		(XEQ) SIZE	(min. size)
2	Set USER mode if you want to use the default key assignments.		(USER)	
3	Load program (read in the cards) (If "NO ROOM", make sure the only key assignments are those used by this program)			
4	If you skipped step 2, refer to steps 8 and 9 for function label names for key assignments, then set USER mode.		(USER)	
5	Run program (All initialization of flags and registers is done by the program).		(XEQ) BBF	"WORLD SERIES"
6	Enter seed (a number between 0 and 1 for the random number generator, LBL X). (optional) To start game in the top of the nth inning for a shorter game duration time, when prompted "PITCH?":	number	(R/S)	SEED?
7	To pitch:	n - 1	(STO 06) (L)	n - 1 (pitch type)
8	To swing or take (computer decides outcome): OR To take a pitch (not swing): OR		(N) (M)	(outcome) "TAKE..."

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(continued)

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SIZE:
(HP-41C) 015

STEP	INSTRUCTIONS	INPUT	FUNCTION	DISPLAY
	To bunt: OR		(O)	"BUNT ATTEMPT"
	To steal second base: GO TO STEP 7 OR 9		(U)	"RUNNER GOING"
9	These are optional keys used to get additional game-related information: For status of bases: OR		(Q)	(men on base)
	For the count: OR		(P)	"COUNT: a-b"
	For the stats: OR		(S)	"RUNS ACROSS: c" "OUTS: d"
	For last inning score: OR		(SC)	(score)

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STEP/ LINE	KEY ENTRY	KEY CODE (67/97 only)	COMMENTS	STEP/ LINE	KEY ENTRY	KEY CODE (67/97 only)	COMMENTS
01+LBL	"BBF		Begin	42	PSE		
"				43+LBL	"K"		Program loops here after each batter
02	CF 21			44	CF 09		
03	3		Clear printer enable flag	45	CF 10		
04	STO 03			46	CF 15		
05+LBL	"V"			47	RCL 06		
06	"****WOR			48	FRC		
LD****				49	X=0?		
07	AVIEW		Flashes 3 times	50	SF 00		
08	"***SERI			51	RCL 06		
ES***				52	FRC		
09	AVIEW			53	X≠0?		
10	DSE 03			54	CF 00		
11	GTO "V"			55	"PITCH?"		
12	CF 03			56	PROMPT		
13	CF 05			57+LBL	"L"		
14	CF 06		Clear only those flags which must be cleared	58	6		
15	CF 07			59	XEQ "X"		Random no. gen.
16	CF 08			60	X=0?		
17	CF 29			61	6		
18	CLRG		Clears all registers	62	STO 03		
19	FIX 0			63	XEQ IND 03		Decide pitch type:
20	"AND THE HOME"		National Anthem: Words and melody	64+LBL	01		
21	AVIEW			65	"SCREWBA LL"		
22	TONE 0			66	AVIEW		
23	TONE 1			67	PSE		
24	TONE 2			68	GTO 07		
25	PSE			69+LBL	02		
26	"OF THE."			70	"CURVE B ALL"		
"				71	AVIEW		
27	AVIEW			72	PSE		
28	TONE 3			73	GTO 07		
29	TONE 1			74+LBL	03		
30	"BRAVE."			75	"SLIDER"		
31	AVIEW			76	AVIEW		
32	TONE 0			77	PSE		
33	PSE			78	GTO 07		
34	"SEED?"		Input seed for random number generator	79+LBL	04		
35	PROMPT			80	"CHANGE-UP"		
36	STO 00			81	AVIEW		
37	"GAME 7			82	PSE		
"				83	GTO 07		
38	AVIEW			84+LBL	05		
39	PSE			85	"KNUCKLE BALL"		
40	"PLAY BA						
LL							
41	AVIEW						

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STEP/ LINE	KEY ENTRY	KEY CODE (67/97 only)	COMMENTS	STEP/ LINE	KEY ENTRY	KEY CODE (67/97 only)	COMMENTS
86	AVIEW			132	+		Add 7 for
87	PSE			133	STO 03		label no.
88	GTO 07			134	2		
89	LBL 06			135	MOD		If even, go to
90	"FASTBAL			136	X=0?		good sacrifice
L	-			137	GTO 44		Else...
91	AVIEW			138	XEQ IND		Decide bunt
92	PSE			03			outcome
93	LBL 07			139	LBL 09		
94	"SWING?"		Prompt for	140	LBL 48		
95	PROMPT		swing, take,	141	"ON WITH		
96	LBL 44		bunt or steal	AN	ERRO"		
97	RCL 09			142	"I-R"		
98	1			143	AVIEW		
99	X=Y?		Man on second?	144	PSE		
100	GTO 13			145	RCL 10		
101	RCL 08			146	1		
102	X=0?		First base	147	X=Y?		Man on third?
103	GTO 13		empty?	148	XEQ 10		
104	2			149	GTO 49		
105	XEQ "X"			150	LBL 10		
106	X=0?			151	0		Man on third
107	GTO 13			152	STO 10		scores
108	RCL 12			153	1		Add 1 to runs
109	2			154	ST+ 11		across
110	X=Y?		Two outs?	155	RTN		
111	GTO 08			156	LBL "M"		(TAKE)
112	"GOOD SA			157	"TAKE..."		
CRIFICE"				158	AVIEW		
113	AVIEW			159	SF 10		To use code of
114	CF 07		Bases not full	160	GTO 00		LBL N (SWING
115	0		Advance man	161	LBL "N"		OR TAKE)
116	STO 08		from first to	162	6		
117	1		second base	163	XEQ "X"		Program
118	STO 09			164	X=0?		decides
119	GTO 47			165	6		
120	LBL "0"		Tally outs	166	RCL 03		Add swing in-
			(BUNT)	167	+		icator no. to
121	SF 09			168	STO 04		pitch indica-
122	"BUNT AT			169	LBL 00		tor number
TEMPT"				170	9		
123	AVIEW			171	XEQ "X"		
124	5			172	53		Add 53 for
125	XEQ "X"		Compute bunt	173	+		label number
126	X=0?		indicator no.	174	STO 03		
127	5			175	2		If even, go to
128	RCL 03			176	MOD		series of hit/
129	+		Add to pitch	177	X=0?		out labels
130	STO 04		indicator no.				
131	7						

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STEP/ LINE	KEY ENTRY	KEY CODE (67/97 only)	COMMENTS	STEP/ LINE	KEY ENTRY	KEY CODE (67/97 only)	COMMENTS
178	GTO	46		219	LBL	67	
179	XEQ IND		Decide result of pitch:	220	1		Increment balls by one
03				221	ST+	01	
180	LBL	53		222	RCL	01	
181	"BALL: I			223	4		
NSIDE"				224	X=Y?		Four balls?
182	AVIEW			225	GTO	74	
183	PSE			226	LBL	"P"	Walk
184	GTO	67		227	"COUNT:		
185	LBL	55			"		
186	FS?	10		228	RCL	01	To determine if full count:
187	GTO	59	If taking, called strike	229	3		
188	"SWING A			230	X=Y?		
ND MISS"				231	SF	05	
189	AVIEW			232	RCL	01	
190	PSE			233	RCL	02	
191	GTO	68		234	+		
192	LBL	57		235	5		
193	10			236	X=Y?		
194	XEQ "X"			237	GTO	00	
195	X≠0?			238	LBL	65	
196	GTO	53		239	ARCL	01	
197	"HIT BAT			240	"F-"		
TER, TAK"				241	ARCL	02	
198	"HE FIRS			242	AVIEW		Display count
T"				243	PSE		
199	AVIEW			244	GTO	"K"	
200	PSE			245	LBL	00	Loop back for
201	XEQ 66		Clear count	246	FS?	05	next batter
202	GTO 85		Similar in outcome to walk,	247	GTO	01	
203	LBL 59		so share code	248	GTO	65	
204	"CALLED			249	LBL	01	
STRIKE"				250	"FULL CO		
205	AVIEW			UNT"			
206	PSE			251	AVIEW		
207	LBL 68			252	PSE		
208	1		Increment strikes by one	253	GTO	"K"	Loop to PITCH?
209	ST+ 02			254	LBL	46	
210	RCL 02			255	FS?	10	Taking pitch?
211	3		Three strikes?	256	GTO	13	
212	X=Y?			257	RCL	04	
213	GTO 60		Strikeout	258	7		
214	GTO "P"		Show count	259	+		Add 7 for
215	LBL 61			260	STO 03		label number
216	"BALL: 0			261	XEQ IND		Decide outcome:
UTSIDE"				03			
217	AVIEW			262	LBL	09	
218	PSE			263	XEQ 66		
				264	3		Clear count

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STEP/ LINE	KEY ENTRY	KEY CODE (67/97 only)	COMMENTS	STEP/ LINE	KEY ENTRY	KEY CODE (67/97 only)	COMMENTS
265	STO 03			312	1		
266	♦LBL "W"			313	STO 09		
267	***TRIP			314	RTN		
LE***				315	♦LBL 11		
268	AVIEW		Flashes 3	316	"FOUL BA		
269	DSE 03		times	LL"			
270	GTO "W"			317	AVIEW		
271	CF 07		Bases not full	318	PSE		
272	RCL 08		Man on first,	319	RCL 02		
273	RCL 09		second,	320	2		
274	+			321	X=Y?		Two strikes?
275	RCL 10		and third	322	GTO 00		
276	+			323	1		Increment
277	ST+ 11		score.	324	ST+ 02		strikes
278	1			325	GTO "P"		Show count
279	STO 10		Put man on	326	♦LBL 00		
280	♦LBL 69		third base	327	FS? 09		Bunting?
281	0		Clear first	328	GTO 60		
282	STO 08		and second	329	GTO "P"		
283	STO 09		bases	330	♦LBL 12		
284	GTO 75		Show bases and	331	RCL 08		
285	♦LBL 10		loop back	332	1		
286	♦LBL 17			333	X=Y?		Man on first?
287	3			334	XEQ 56		
288	STO 03			335	GTO 08		
289	♦LBL "Y"			336	♦LBL 42		
290	***SING			337	"GROUNDE		
LE***				R"			
291	AVIEW		Flashes 3	338	AVIEW		
292	DSE 03		times	339	PSE		
293	GTO "Y"			340	2		
294	♦LBL 62			341	XEQ "X"		
295	CF 07		Bases not full	342	X=0?		
296	XEQ 66		Clear count	343	GTO 48		
297	RCL 10		Man on third	344	"OUT AT		
298	RCL 09		and second	345	SECOND"		
299	+			346	AVIEW		
300	ST+ 11		score.	347	PSE		
301	0			348	2		
302	STO 09		Clear second	349	STO 09		Second empty
303	STO 10		and third	350	CF 07		Bases not full
304	RCL 08		bases	351	GTO 47		Tally outs
305	1			352	♦LBL 08		
306	X=Y?		Man on first?	353	"GROUNDO		
307	XEQ 00			UT"			
308	1		Move to second	354	AVIEW		
309	STO 08		Else put man	355	PSE		
310	GTO 75		on first	356	GTO 47		Tally outs
311	♦LBL 00			357	♦LBL 13		

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STEP/ LINE	KEY ENTRY	KEY CODE (67/97 only)	COMMENTS	STEP/ LINE	KEY ENTRY	KEY CODE (67/97 only)	COMMENTS
357	2			404	XEQ	66	Clear count
358	XEQ "X"			405	FS?	07	Bases loaded?
359	X=0?			406	GTO	76	
360	GTO 61		Ball: outside	407	5		
361	GTO 59		Called strike	408	STO 03		
362	LBL 14			409	LBL "Z"		
363	LBL 16			410	***HOME		
364	"FLYOUT"			411	AVIEW		
365	AVIEW			412	DSE 03		Flashes 5
366	PSE			413	GTO "Z"		times
367	GTO 47		Tally outs	414	BEEP		
368	LBL 15			415	LBL 78		
369	"LINE DR			416	CF 07		Bases not full
IVE:	CAU"			417	RCL 08		
370	"FIGHT"			418	RCL 09		
371	AVIEW			419	+		
372	PSE			420	RCL 10		
373	GTO 47		Tally outs	421	+		
374	LBL 18			422	1		
375	XEQ 66		Clear count	423	+		
376	3			424	ST+ 11		Tally runs
377	STO 03			425	0		
378	LBL "R"			426	STO 10		Clear all of
379	***DOUB			427	GTO 69		the bases
LE***"				428	LBL 66		Clears count
380	AVIEW		Flashes 3	429	CF 05		for the next
381	DSE 03		times	430	0		batter
382	GTO "R"			431	STO 01		
383	CF 07			432	STO 02		
384	RCL 09		Bases not	433	RTN		
385	RCL 10		loaded anymore	434	LBL 76		
386	+			435	3		
387	ST+ 11		Tally runs	436	STO 03		
388	0			437	LBL 35		
389	STO 10			438	"*GRAND		
390	RCL 08			SLAM*"			
391	1			439	AVIEW		Flashes 3
392	X=Y?		Man on first?	440	DSE 03		times
393	XEQ 00		Move him to	441	GTO 35		
394	1		third	442	BEEP		
395	STO 09		Man on second	443	BEEP		
396	0			444	CF 07		
397	STO 08		First empty	445	GTO 78		Tally runs
398	GTO 75		Show bases and	446	LBL 60		
399	LBL 00		loop back	447	"STRIKEO		
400	1			UT"			
401	STO 10			448	AVIEW		
402	RTN			449	PSE		
403	LBL 19						

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STEP/ LINE	KEY ENTRY	KEY CODE (67/97 only)	COMMENTS	STEP/ LINE	KEY ENTRY	KEY CODE (67/97 only)	COMMENTS
450+LBL	47			498	TONE	3	
451 XEQ	66		Clear count	499	TONE	0	
452 FS?	04		Double play?	500	GTO	37	Tally outs
453 GTO	37			501+LBL	00		
454 1			Increment outs	502	2		
455 ST+	12		by one	503	XEQ	"X"	
456+LBL	38			504	X=0?		50/50 chance
457 RCL	12			505	SF	04	of double play
458 3				506	RTN		
459 X=Y?			Three outs?	507+LBL	"SC"		(SCORE)
460 SF	06		Half inning	508	"LAST IN		
461 FS?	06		completed?	NING:			
462 GTO	20		Loop back	509	AVIEW		
463 GTO	75			510	SF	15	To share code
464+LBL	37			511	GTO	95	of LBL 95
465 XEQ	66		Clear count	512+LBL	"S"		(STATS)
466 2			Increment outs	513	FIX	0	
467 ST+	12		by two	514	"RUNS AC		
468 RCL	09			ROSS:	"		Runs across in
469 1				515	ARCL	11	half-inning
470 X=Y?			Man on second?	516	AVIEW		(so far)
471 XEQ	01			517	PSE		
472 0			Clear first and	518	FS?	06	End of half-
473 STO	08		second bases	519	GTO	86	inning?
474 STO	09			520	"OUTS:	"	If it is, we
475 GTO	38			521	ARCL	12	know outs, so
476+LBL	01		Man on second	522	AVIEW		skip this code
477 1			went to third	523	PSE		
478 STO	10			524	GTO	"K"	Loop back
479 RTN				525+LBL	21		
480+LBL	56			526	13		R13, team A
481 RCL	10			527	STO	05	Indirect reg.
482 1				528	GTO	05	
483 X=Y?			Man on third?	529+LBL	20		
484 GTO	42			530	FS?	00	Top of inning?
485 RCL	12			531	GTO	21	
486 2				532	14		R14, team B
487 X>Y?			Outs less than	533	STO	05	Indirect reg.
488 XEQ	00		2?	534+LBL	05		
489 FS?	04		Double play?	535	"SIDE RE		
490 GTO	02			TIRED"			
491 RTN				536	AVIEW		
492+LBL	02			537	RCL	11	
493 CF	04			538	RCL	IND	
494 CF	07		Unload bases	05			
495 "DOUBLE				539	+		
PLAY"				540	STO	IND	
496 AVIEW				05			
497 PSE				541	FIX	1	

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STEP/ LINE	KEY ENTRY	KEY CODE (67/97 only)	COMMENTS	STEP/ LINE	KEY ENTRY	KEY CODE (67/97 only)	COMMENTS
542	.5		Increment inn-	587	STO	11	Clear the runs
543	ST+ 06		nings completed	588	STO	12	Clear the outs
544	"INNINGS		by .5 and dis-	589	GTO	"K"	Loop back
	COMPLET"		play:	590	LBL	31	Innings complete
545	"HED: "			591	SF	08	exceeds 8.5
546	ARCL 06			592	RCL	13	
547	AVIEW			593	RCL	14	
548	PSE			594	X>Y?		
549	FS? 06			595	GTO	91	
550	XEQ "Q"		Left on base?	596	GTO	95	
551	LBL 86			597	LBL	25	
552	FS?C 06			598	RCL	13	
553	CF 07		Unload bases	599	RCL	14	
554	RCL 06			600	X=Y?		Tie score?
555	8.5			601	GTO	99	
556	X=Y?		Innings complete	602	LBL	91	
557	GTO 31		equal 8.5?	603	FIX	0	
558	LBL 77			604	"FINAL	S	Display final
559	RCL 06				CORE:	"	score
560	9			605	AVIEW		
561	X=Y?		Innings complete	606	PSE		
562	GTO 25		equal 9.0?	607	"TEAM A:	"	
563	FIX 1			608	ARCL	13	
564	9			609	AVIEW		
565	RCL 06			610	PSE		
566	X>Y?		Extra innings?	611	"TEAM B:	"	
567	GTO 98			612	ARCL	14	
568	LBL 95			613	AVIEW		
569	FIX 0			614	PSE		
570	"TEAM A:			615	RCL	13	
	"			616	RCL	14	
571	ARCL 13			617	X>Y?		Team B win?
572	AVIEW		Display score	618	GTO	00	
573	PSE			619	"WORLD	C	Team A won:
574	"TEAM B:				HAMPIONS"		
	"			620	AVIEW		
575	ARCL 14			621	PSE		
576	AVIEW			622	"TEAM A"		
577	PSE			623	AVIEW		
578	FS? 15		Executed from	624	PSE		
579	GTO "K"		keyboard?	625	BEEP		
580	"PLAY BA		Team at bat has	626	GTO	01	
LL"			changed	627	LBL	00	
581	AVIEW			628	"WORLD	C	Team B won:
582	PSE				HAMPIONS"		
583	0		Clear the bases	629	AVIEW		
584	STO 08			630	PSF		
585	STO 09						
586	STO 10						

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STEP/ LINE	KEY ENTRY	KEY CODE (67/97 only)	COMMENTS	STEP/ LINE	KEY ENTRY	KEY CODE (67/97 only)	COMMENTS
631	"TEAM B"			677	GTO	00	
632	AVIEW			678	GTO	90	
633	PSE			679♦LBL	00		Greater than 8.5 complete?
634	BEEP			680	FS?	08	
635♦LBL	01			681	GTO	01	
636	5			682	GTO	90	
637	STO 03			683♦LBL	01		Put Team B's total score in R14
638♦LBL	"T"			684	RCL	07	
639	"*YEAH, TEAM*"		The fans are cheering:	685	STO	14	
640	AVIEW			686	GTO	91	
641	TONE 8			687♦LBL	90		
642	TONE 8			688	RCL	08	
643	DSE 03			689	RCL	09	
644	GTO "T"			690	+		
645	STOP		Program done	691	RCL	10	
646♦LBL	58			692	+		
647	"LEFT ON BASE: "			693	3		
648	AVIEW			694	X=Y?		Bases loaded?
649	RTN			695	SF 07		
650♦LBL	99			696	RCL Y		
651	"EXTRA I NNINGS"			697	3		
652	AVIEW			698	X=Y?		Bases not full?
653	PSE			699	CF 07		
654	GTO 95		Extra inn. sco.	700	FS? 07		Bases loaded?
655♦LBL	97			701	GTO 28		
656	FS? 00			702	RCL Y		
657	GTO 95		Top of inning? Display score	703	X=0?		Bases empty?
658	GTO 91			704	GTO 29		
659♦LBL	98			705	RCL 08		
660	RCL 13			706	1		
661	RCL 14			707	X=Y?		Man on first?
662	X=Y?		Score not tie?	708	XEQ 23		
663	GTO 97			709	RCL 09		
664	GTO 95			710	1		
665♦LBL	"Q"		(BASES)	711	X=Y?		On second?
666	FS? 06		End of half- inning?	712	XEQ 24		
667	XEQ 58			713	RCL 10		
668	FS? 00		Top of inning?	714	1		
669	GTO 90			715	X=Y?		On third?
670	RCL 11			716	XEQ 26		
671	RCL 14		In extra inn- ings, compute Team B's in- stantaneous score	717	GTO 41		
672	+			718♦LBL	23		
673	STO 07			719	"MAN ON FIRST"		
674	RCL 13		Is this score greater than Team A's?	720	AVIEW		
675	RCL 07			721	PSE		
676	X>Y?			722	RTN		

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STEP/ LINE	KEY ENTRY	KEY CODE (67/97 only)	COMMENTS	STEP/ LINE	KEY ENTRY	KEY CODE (67/97 only)	COMMENTS
725	AVIEW			768	"SAFE"		Stolen base
726	PSE			769	AVIEW		
727	RTN			770	PSE		
728♦LBL	26			771	0		Move man from
729	"MAN ON			772	STO 08		first to
THIRD"				773	1		second base:
730	AVIEW			774	STO 09		
731	PSE			775	GTO "Q"		Display bases
732	RTN			776♦LBL	80		Runner is out
733♦LBL	28			777	"OUT"		
734	"BASES L			778	AVIEW		
OADED"				779	PSE		
735	AVIEW			780	0		Remove him
736	PSE			781	STO 08		from base
737	GTO 41			782	GTO 47		Tally outs
738♦LBL	29		If end of half	783♦LBL	81		
739	"BASES E		inning show	784	"NO THRO		Easy stolen
MPTY"			stats, then	W:	"SAFE"		base
740	AVIEW		loop back	785	AVIEW		
741	PSE			786	PSE		
742♦LBL	41			787	0		Move runner
743	FS? 06			788	STO 08		from first to
744	XEQ "S"		Display stats	789	1		second base
745	GTO "K"			790	STO 09		
746♦LBL	"U"		Loop back	791	GTO "Q"		Display bases
747	RCL 08		(STEAL)	792♦LBL	82		
748	X=0?			793	"RUN-DOW		
749	GTO 00		First empty?	N...			Caught in a
750	RCL 09		Can't steal	794	AVIEW		run-down...
751	1			795	PSE		
752	X=Y?			796	4		
753	GTO 00		Man on second?	797	XEQ "X"		
754	"RUNNER		No double steal	798	X=0?		
GOING"				799	GTO 79		1/4 chance of
755	AVIEW			800	"TAGGED		safe at second
756	PSE			OUT"			3/4 chance of
757	4			801	AVIEW		tagged out
758	XEQ "X"			802	PSE		
759	79		Add 79 for	803	0		
760	+		label number:	804	STO 08		Remove him
761	STO 03			805	GTO 47		from base
762	XEQ IND		Stolen base?	806♦LBL	74		Tally outs
03				807	XEQ 66		
763♦LBL	00			808	"WALK"		
764	"RUNNER		Error message	809	AVIEW		
STAYS"				810	PSE		
765	AVIEW			811♦LBL	85		
766	GTO 07			812	FS? 07		Bases loaded?
767♦LBL	79		Loop to SWING?	813	GTO 02		

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STEP/ LINE	KEY ENTRY	KEY CODE (67/97 only)	COMMENTS	STEP/ LINE	KEY ENTRY	KEY CODE (67/97 only)	COMMENTS
814♦LBL	49				51		
815 RCL	08						
816 1							
817 X=Y?			Man on first?				
818 GTO	03						
819 1							
820 STO	08		Put man on first				
821 GTO	75		Show bases and loop back				
822♦LBL	02						
823 1			Increment runs by one		60		
824 ST+	11						
825 GTO	75						
826♦LBL	03						
827 RCL	09						
828 1							
829 X=Y?			Man on second?				
830 GTO	04						
831 1							
832 STO	09		Put men on first and second		70		
833 STO	08						
834 GTO	75						
835♦LBL	04						
836 1			Put men on all three bases:				
837 STO	10						
838 STO	09						
839 STO	08						
840♦LBL	75						
841 XEQ "Q"			Display bases				
842 GTO "K"			Loop back		80		
843♦LBL	93		This is the random number generator				
844 RCL	00		from the Games Pack				
845 9821							
846 *							
847 .211327							
848 +							
849 FRC							
850 STO	00						
851 RTN							
852♦LBL	"X"				90		
853 XEQ 93							
854 *							
855 INT							
856 RTN							
857 .END.							
				00			

REGISTERS, STATUS, FLAGS, ASSIGNMENTS

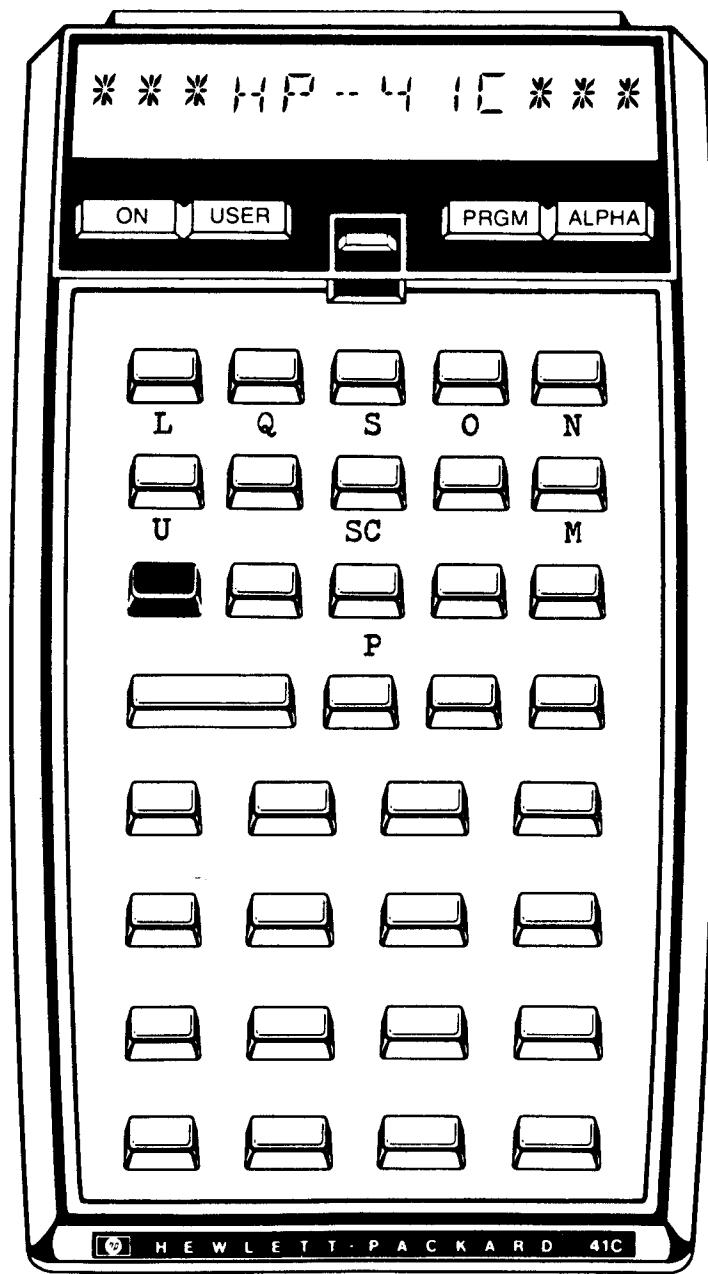
DATA REGISTERS		STATUS			
00	Random number generator seed	SIZE	015	TOT. REG.	317
01	No. of balls	ENG		FIX	SCI
02	No. of strikes	DEG		RAD	GRAD
03	General use	FLAGS			
04	General use	#	INIT S/C	SET INDICATES	CLEAR INDICATES
05	Indirect register for R13 or R14	00	C	Top of inning	Bottom of inn.
06	No. of innings completed	04	C	Double play	No double play
07	In extra innings, Team B's instantaneous score	05	C	Count has 3 balls (used to balls determine if full count)	Count not 3
08	1 if man on first base 0 if empty	06	C	End of half-inning (used in LBL Q)	Half inning not over
09	1 if man on second 0 if empty	07	C	Bases loaded	Bases not loaded
10	1 if man on third 0 if empty	08	C	At least 8.5 inn. completed	Less than 8.5 inn. completed
11	No. of runs in half inning	09	C	Bunting	Not bunting
12	No. of outs in half inning	10	C	Taking a pitch	Not taking
13	Team A runs	15	C	Score requested from keyboard	Score used automatically by program
14	Team B runs	ASSIGNMENTS			
		FUNCTION	KEY	FUNCTION	KEY
		L (PITCH)	$\Sigma+$		
		N (SWING)	LN		
		Q (BASES)	1/X		
		S (STATS)	\sqrt{X}		
		P (COUNT)	STO		
		O (BUNT)	LOG		
		M (TAKE)	TAN		
		U (STEAL)	X:Y		
		SC (LAST INN SCORE)	SIN		

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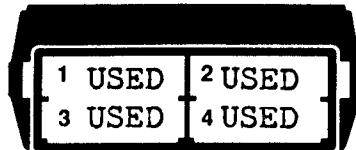
KEYBOARD CARD LABELING

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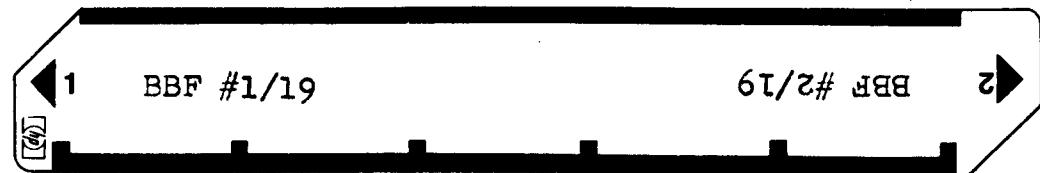
KEYBOARD



SYSTEM
CONFIGURATION



CARD



ROW 1 (1 : 5)



ROW 2 (5 : 6)



ROW 3 (6 : 8)



ROW 4 (8 : 13)



ROW 5 (13 : 20)



ROW 6 (20 : 21)



ROW 7 (22 : 26)



ROW 8 (26 : 30)



ROW 9 (30 : 34)



ROW 10 (35 : 37)



ROW 11 (38 : 41)



ROW 12 (42 : 47)



ROW 13 (48 : 55)



ROW 14 (55 : 59)



ROW 15 (60 : 65)



ROW 16 (65 : 70)



ROW 17 (70 : 75)



ROW 18 (75 : 80)



ROW 19 (80 : 85)



ROW 20 (85 : 86)



ROW 21 (87 : 90)



ROW 22 (91 : 96)



ROW 23 (97 : 105)



ROW 24 (106 : 112)



ROW 25 (112 : 114)



ROW 26 (115 : 121)



ROW 27 (121 : 122)



ROW 28 (122 : 132)



ROW 29 (133 : 141)



ROW 30 (141 : 141)



ROW 31 (141 : 148)



ROW 32 (149 : 156)



ROW 33 (156 : 159)



ROW 34 (160 : 165)



ROW 35 (166 : 175)



ROW 36 (176 : 181)



ROW 37 (181 : 184)



ROW 38 (184 : 188)



ROW 39 (188 : 191)



ROW 40 (191 : 196)



ROW 41 (197 : 197)



ROW 42 (197 : 199)



ROW 43 (200 : 204)



ROW 44 (204 : 207)



ROW 45 (207 : 214)



ROW 46 (215 : 216)



ROW 47 (216 : 224)



ROW 48 (225 : 227)



ROW 49 (227 : 236)



ROW 50 (237 : 243)



ROW 51 (244 : 250)



ROW 52 (250 : 253)



ROW 53 (253 : 261)



ROW 54 (261 : 267)



ROW 55 (267 : 268)



ROW 56 (269 : 277)



ROW 57 (277 : 286)



ROW 58 (286 : 290)



ROW 59 (290 : 293)



ROW 60 (293 : 300)



ROW 61 (301 : 310)



ROW 62 (310 : 316)



ROW 63 (316 : 324)



ROW 64 (325 : 330)



ROW 65 (331 : 337)



ROW 66 (337 : 342)



ROW 67 (343 : 344)



ROW 68 (344 : 350)



ROW 69 (351 : 354)



ROW 70 (355 : 361)



ROW 71 (361 : 365)



ROW 72 (366 : 369)



ROW 73 (369 : 370)



ROW 74 (370 : 377)



ROW 75 (378 : 379)



ROW 76 (379 : 383)



ROW 77 (384 : 393)



ROW 78 (394 : 403)



ROW 79 (404 : 409)



ROW 80 (409 : 410)



ROW 81 (410 : 416)



ROW 82 (417 : 427)



ROW 83 (427 : 436)



ROW 84 (437 : 438)



ROW 85 (438 : 445)



ROW 86 (445 : 447)



ROW 87 (447 : 453)



ROW 88 (454 : 462)



ROW 89 (462 : 467)



ROW 90 (468 : 476)



ROW 109 (569 : 572)



ROW 110 (573 : 576)



ROW 111 (577 : 580)



ROW 112 (580 : 589)



ROW 113 (589 : 596)



ROW 114 (596 : 603)



ROW 115 (604 : 604)



ROW 116 (604 : 608)



ROW 117 (608 : 612)



ROW 118 (612 : 619)



ROW 119 (619 : 621)



ROW 120 (622 : 627)



ROW 121 (628 : 628)



ROW 122 (628 : 632)



ROW 123 (633 : 639)



ROW 124 (639 : 641)



ROW 125 (642 : 647)



ROW 126 (647 : 649)



ROW 127 (650 : 651)



ROW 128 (651 : 657)



ROW 129 (657 : 663)



ROW 130 (664 : 667)



ROW 131 (668 : 677)



ROW 132 (677 : 683)



ROW 133 (684 : 693)



ROW 134 (694 : 701)



ROW 135 (701 : 708)



ROW 136 (709 : 717)



ROW 137 (717 : 719)



ROW 138 (719 : 724)



ROW 139 (724 : 727)



ROW 140 (728 : 729)



ROW 141 (729 : 734)



ROW 142 (734 : 738)



ROW 143 (738 : 739)



ROW 144 (740 : 746)



ROW 145 (746 : 753)



ROW 146 (754 : 754)



ROW 147 (755 : 763)



ROW 148 (764 : 764)



ROW 149 (765 : 771)



ROW 150 (772 : 778)



ROW 151 (779 : 784)



ROW 152 (784 : 787)



ROW 153 (788 : 793)



ROW 154 (793 : 797)



ROW 155 (798 : 800)



ROW 156 (800 : 807)



ROW 157 (807 : 813)



ROW 158 (813 : 821)



ROW 159 (822 : 830)



ROW 160 (831 : 840)



ROW 161 (841 : 845)



ROW 162 (846 : 852)



BASEBALL FEVER

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ROW 163 (852 : 857)

