

52206 Program Description I

Program Title A CHESS GAME

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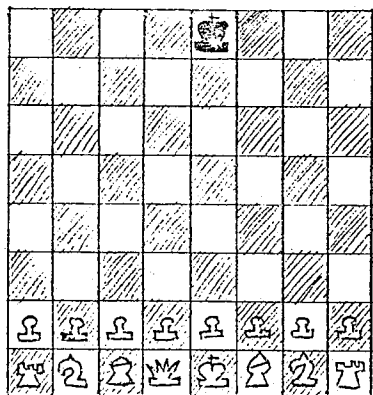
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Program Description, Equations, Variables THIS GAME PROGRAM WILL ALLOW YOU TO PLAY CHESS AGAINST ANY HP-67/97. HERE THE CALCULATOR PLAYS THE 16 WHITE PIECES, AND YOU HAVE ONLY THE BLACK KING. THE INITIAL POSITION IS THE STANDARD ONE GIVEN BELOW. CALCULATOR WILL TRY TO CHECKMATE IN SIX MOVES OR LESS; IF IT SUCCEEDS, IT WILL BE CONSIDERED THE WINNER. OF COURSE,



YOUR GOAL IS TO PLAY IN SUCH A WAY AS TO MAKE A CHECKMATE WITHIN 6 MOVES (OR LESS) IMPOSSIBLE. ALSO, YOU CAN TRY TO FORCE A STALEMATED POSITION, THIS IS, A POSITION IN WHICH YOU ARE NEITHER IN CHECK NOR ABLE TO MAKE ANY LEGAL MOVE; IN THIS CASE YOU WILL BE THE WINNER TOO.

GAME CONVENTIONS

A) WHITE (HP) : OUTPUT OF WHITE'S MOVES IS PERFORMED ACCORDINGLY TO THE FOLLOWING CONVENTION :

PIECE	CODE	PIECE	CODE	YOU WILL EASILY REMEM-
KING, K	6	B, BISHOP	3	BER THIS, BECAUSE THE
QUEEN, Q	5	Kt, KNIGHT	2	CODE IS STRONGLY RELATED
ROOK, R	4	P, PAWN	1	TO THE VALUE OF THE PIECE

- OUTPUT IS OF THE FORM XYZ.N, WHERE

X= CODE OF THE PIECE THAT WHITE HAS JUST MOVED

Y= CODE OF THE PIECE IN WHOSE COLUMN LAYS NOW THE MOVED PIECE

(IT MAY HAVE UP TO 2 DIGITS; THE FIRST ONE THEN SPECIFIES IF IT IS

Operating Limits and Warnings

A KING SIDE OR QUEEN SIDE PIECE)

Z= INDICATES IN WHICH SQUARE OF THE COLUMN REST THE MOVED PIECE, COUNTING UPWARDS FROM THE BOTTOM OF THE COLUMN.

N= NUMBER OF WHITE (HP) MOVES ALREADY PERFORMED

- SOME EXAMPLES WILL MAKE THIS CLEAR :

1) SHOULD WHITE MOVE PAWN TO KING'S BISHOP 4 ON ITS 2nd MOVE, THE OUTPUT WOULD BE:

1634.2 (= P-KB 4 ON THE 2nd MOVE)

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IF THERE WAS NO AMBIGUITY BETWEEN KING'S BISHOP AND QUEEN'S BISHOP, THE OUTPUT WOULD BE:

134.2 (= P-B4 ON THE 2nd MOVE)

2) IF THE OUTPUT WERE 5627.4, THIS WOULD BE DECODED LIKE THIS:

$X \equiv 5$ STANDS FOR QUEEN, Q
 $Y \equiv 6; 6$ STANDS FOR KING, K, AND 2 STANDS FOR KNIGHT, Kt
 $Z \equiv 7$ STANDS FOR 7th SQUARE OF A COLUMN
 $N \equiv 4$, REPRESENTS THE FOURTH MOVE OF WHITE

} THUS, THIS

WOULD MEAN THAT WHITE PLAYS ITS QUEEN (5) TO THE 7th SQUARE (7) OF ITS KING (6) SIDE KNIGHT COLUMN ON ITS 4th MOVE (4).

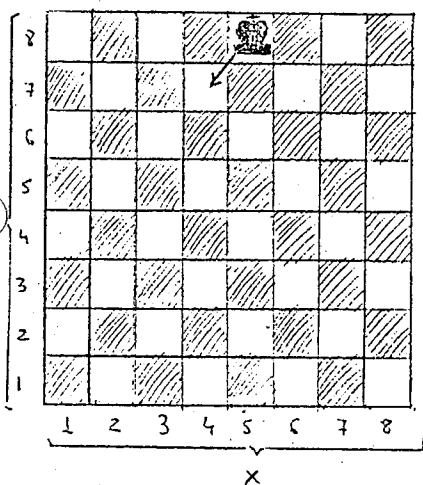
3) SIMILARLY, IF THE OUTPUT WERE 164.1, PROCEEDING LIKE BEFORE, WE WOULD DECODE IT SO: WHITE HAS PLAYED ITS PAWN TO THE FOURTH SQUARE OF ITS KING'S COLUMN ON ITS FIRST MOVE.

AND SO ON.

~ THERE ARE THREE KINDS OF OUTPUT:

- NORMAL OUTPUT IS OF THE FORM XYZ.N, IN DSP 1
- CHECK OUTPUT IS OF THE FORM -XYZ.N, IN DSP 1
- CHECKMATE OUTPUT IS OF THE FORM -XYZ.00000N, IN DSP 9

6) BLACK



BLACK MOVES (YOUR MOVES), ARE INPUT IN QUITE A DIFFERENT WAY. TO MOVE YOUR BLACK KING, YOU MUST INPUT THE XY NUMBER OF THE SQUARE IT MOVES TO, FOLLOWING THE X-Y NOTATION INDICATED IN THE FIGURE.

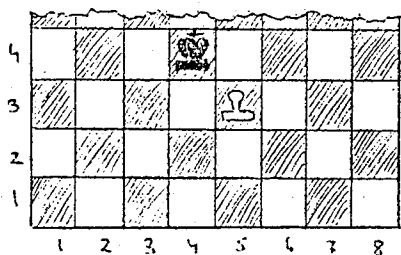
FOR INSTANCE, IN THE INITIAL POSITION YOUR KING IS IN 58; TO MOVE YOUR KING TO THE LOCATION INDICATED BY THE ARROW, YOU MUST INPUT

47 R/S

IF YOUR KING TAKES A WHITE PIECE ON ITS MOVE, THE PROCEDURE IS THE SAME AS BEFORE, BUT YOU MUST CHANGE THE SIGN; FOR INSTANCE, TO CAPTURE THE WHITE PAWN (SEE THE GRAPHIC), YOU MUST INPUT

- 53 R/S

TO RUN THE PROGRAM, YOU WILL NEED A DATA CARD, WITH THE FOLLOWING DATA STORED:



PRIMARY REGISTER	0	1	2	3	4	5	6	7	8	9	A	B
CONTENTS	164	524	527	154	557	525	3634	537	155	336	1523	322

PRIMARY REGISTER	C	D	E	I
CONTENTS	334	10	0.8	0

SECONDARY REGISTER	0	1	2	3	4	5	6	7	8	9
CONTENTS	3525	5527	565	325	0	346	3534	567	5627	353

REMARKS

- DATA CARD IS NEEDED ONLY WHEN LOADING THE PROGRAM
- HP-97 OWNERS, SWITCH TO "NORMAL" POSITION IF YOU WANT TO HAVE THE MOVES PRINTED
- PROGRAM DOES NOT ALWAYS INDICATE CHECK STATUS
- BE EXTREMELY CAREFUL NOT TO MAKE ANY ILLEGAL MOVE, BECAUSE THAT WILL RUIN THE GAME: HP HAS NO WAY OF RECOGNISE AN ILLEGAL MOVE, AND WILL MAKE NONSENSICAL MOVES.

2) ANOTHER GAME. PERHAPS I HAVE IMPROVED MY PLAYING STYLE.

- IS ASSUMED THAT YOU HAVE RUN THE PREVIOUS EXAMPLE

- START THE GAME: $\Lambda \rightarrow 164.1 \equiv 1. P-K4$

- MY MOVE : 57 $[P/S] \rightarrow 524.2 \equiv 2. Q-Kt4$

- I ANSWER : 46 $[R/S] \rightarrow 527.3 \equiv 3. Q-Kt7$

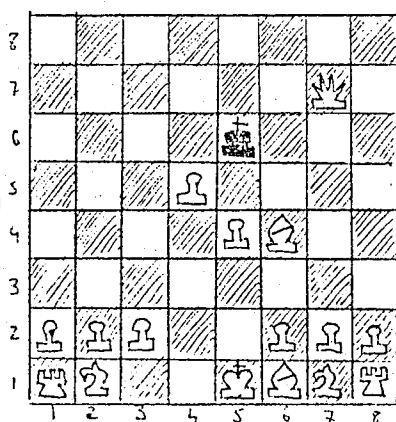
- IT'S MY TURN : 56 $[P/S] \rightarrow 154.4 \equiv 4. P-Q4$

- I MOVE : 46 $[R/S] \rightarrow -3634.5 \equiv 5. B-KB4, \text{check}$

- LET'S TRY 56: 56 $[R/S] \rightarrow -155.0000004 \equiv 6. P-Q5, \text{CHECKMATE}$

THE CALCULATOR HAS CHECKMATED MY KING ONCE MORE ; AS IT SEEMS, I CONTINUE BEING AS BAD A CHESSPLAYER AS I WAS . IT IS DIFFICULT TO ME TO WIN THE CALCULATOR , AND I WONDER IF YOU WILL PERFORM THE FEAT.

THE CHECKMATE POSITION IS:



Sketch(es)

POSITION

AFTER 4. P-G kt 3

CHECKMATE POSITION

Sample Problem(s) 1) LET US HAVE A LITTLE STRUGGLE WITH THE CALCULATOR:

- LOAD THE DATA CARD, BOTH SIDES

- LOAD PROGRAM CARD, BOTH SIDES

- START THE GAME $\boxed{A} \rightarrow 164.1 \equiv P-K4 \equiv 1 = P-K4$

- I DECIDE TO MOVE TO 68 : 68 $\boxed{R/S}$ $\rightarrow$ 524.2 $\equiv$ 27 Q-Kt 4

- MY ANSWER, 67 : 67 $\boxed{R/S}$ $\Rightarrow$ 557.3 $\approx$ 3- Q-Q7

NOTE THAT MY KING IS IN CHECK, BUT THAT IS NOT INDICATED

- I ANSWER 68 : 68 $\frac{1R/S}{\text{}} \rightarrow 1523.4 \approx 4.7 \text{ p- Q kt3}$

(WE HAVE REACHED THE POSITION SHOWN ABOVE , IN THE 1st GRAPHIC)

- I MOVE TO 78 : 78 $\boxed{R/S}$ $\rightarrow$ -334.5 $\equiv$ 57 8-B4, check

(THIS TIME CHECK STATUS WAS INDICATED)

- I TRY 88 : 88 R7S → -322.0000006 ≡ 6.7 B-Kt 2, CHECKMATE

THIS IS FINISHED = HP-67/97 HAS WON. THE POSITION REACHED IS SHOWN IN THE 2nd GRAPHIC

5. REMARKS ABOVE . MY PLAYING STYLE WAS VERY POOR.

THERE IS ANOTHER EXAMPLE IN THE OTHER

SIDE OF THIS PAGE

Reference(s).

A CHESS GAME

START

[illegible]



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Program Listing I

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STEP	KEY ENTRY	KEY CODE	COMMENTS	STEP	KEY ENTRY	KEY CODE	COMMENTS
001	*LBL A	31 25 11	START ROUTINE		RCL 8	34 08	
	DSP 1	23 01			GTO 9	22 04	
	0	00			*LBL 0	31 25 00	
	ST I	35 33		060	GSR 6	31 22 06	
	RCL 0	34 00			X#Y	32 61	
	GSR 2	31 22 02			GTO 0	22 00	
	RCL 1	34 01			PZ S	31 42	
	GSR 7	31 22 07			RCL 0	34 00	
	INT	31 83			PZ S	31 42	
010	G	06			GSR 2	31 22 02	
	X=Y	32 51			*LBL 4	31 25 04	
	GTO C	22 13			RCL 4	34 04	
	RCL 2	34 02			GTO 9	22 04	
	GSR 7	31 22 07		070	*LBL 0	31 25 00	
	FRAC	32 83			RCL	35 53	
	RCL E	34 15			I	01	
	X=Y	32 51			5	05	
	GTO D	22 14			X#Y	32 61	
	RCL 3	34 03			GTO 0	22 00	
020	GSR 2	31 22 02			PZ S	31 42	
	2	02	CHECKMATE ROUTINE		RCL 1	34 01	CHECK
	G	06			PZ S	31 42	
	X#Y	32 61			GTO 8	22 08	
	GTO 0	22 00		080	*LBL 0	31 25 00	
	RCL 4	34 04			PZ S	31 42	
	*LBL 8	31 25 08			RCL 2	34 02	
	GSR 2	31 22 02			PZ S	31 42	
	RCL 5	34 05			GTO 8	22 08	
	*LBL 9	31 25 09			*LBL D	31 25 14	
	CHS	42			PZ S	31 42	
	DSP 9	23 09			RCL 3	34 03	
	ISZ	31 34			PZ S	31 42	
	RCL I	35 34			GSR 2	31 22 02	
	EEX	43		090	I	01	
	7	07			8	08	
	÷	81			X#Y	32 61	
	-	51			GTO 0	22 00	
	RTN	35 22			RCL 9	34 09	
	*LBL 0	31 25 00			CHS	42	
040	GSR 6	31 22 06	CHECKMATE ROUTINE		GTO 3	22 03	CHECK
	X#Y	32 61			*LBL 0	31 25 00	
	GTO 0	22 00			GSR 6	31 22 06	
	RCL 6	34 06			X#Y	32 61	
	GSR 2	31 22 02		100	GTO 0	22 00	
	GTO 5	22 05			PZ S	31 42	
	*LBL 0	31 25 00			RCL 5	34 05	
	GSR 6	31 22 06			PZ S	31 42	
	X#Y	32 61			GTO 3	22 03	
	GTO 0	22 00			*LBL 0	31 25 00	
050	RCL 6	34 06			GSR 6	31 22 06	
	CHS	42			X#Y	32 61	
	GSR 2	31 22 02			GTO 4	22 04	
	5	05			RCL 9	34 09	
	G	06		110	GSR 2	31 22 02	
	X#Y	32 61			2	02	
	GTO 5	22 05			8	08	

REGISTERS

0 164	1 524	2 527	3 184	4 557	5 525	6 3634	7 537	8 155	9 336
S0 3525	S1 5527	S2 565	S3 325	S4 0	S5 346	S6 3534	S7 567	S8 5627	S9 353
A 1523	B 322	C 334	D 10	E 0.8	F 0				



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STEP

NEW ENTRY

KEY CODE

COMMENTS

STEP

KEY ENTRY

KEY CODE

COMMENTS

	X#Y	32	61		X#Y	32	61	
	GTO 4	22	04	170	GTO 0	22	00	
	RCL 2	34	02		RCL C	34	13	
	GTO 9	22	09		CHS		42	CHECK
	*LBL C	31	25	13	GSR Z	31	22	02
	RCL 4	34	04		G		06	
	GSR F	31	22	07	8		08	
120	PPAC	32	83		X=Y	32	51	
	RCL E	34	15		GTO 5	22	05	
	X=Y	32	51		RCL B	34	12	
	GTO B	22	12		GTO 9	22	09	
	RCL 3	34	03	180	*LBL 0	31	25	00
	GSR 2	31	22	02	RCL B	34	12	
	G		06		CHS		42	CHECK
	G		06		*LBL 3	31	25	03
	X#Y	32	61		GSR 2	31	22	02
	GTO 0	22	00		RCL 2	34	02	
130	PZ S	31	42		GTO 9	22	09	
	RCL 6	34	06		*LBL 6	31	25	06
	PZ S	31	42		RCL D	34	14	AUXILIAR
	GSR Z	31	22	02	+		61	SUBROUTINE I
	*LBL 5	31	25	05	190	RTN	35	22
	RCL 7	34	07		*LBL 7	31	25	07
	GTO 9	22	09		GSR Z	31	22	02
	*LBL 0	31	25	00	RCL D	34	14	SUBROUTINE II
	GSR G	31	22	06	÷		81	
	X#Y	32	61		RTN	35	22	
140	GTO 0	22	00		*LBL 2	31	25	02
	PZ S	31	42		X<0	31	71	DISPLAYS HP MOVE
	RCL 7	34	07		SF 2	35	51	02
	PZ S	31	42		ABS	35	64	
	GTO 8	22	08		200	ISB	31	34
	*LBL 0	31	25	00	RCL	35	34	DISPLAYS XYZ.N
	R↓	35	53		RCL D	34	14	
	X>0	31	81		÷		81	
	GTO 0	22	00		+		61	
	PZ S	31	42		FZ?	35	71	02
150	RCL 9	34	09		CHS		42	CHECK?
	PZ S	31	42		R/S		84	YES= -XYZ.N
	GTO 9	22	09		RTN	35	22	INPUT YOUR MOVE
	*LBL 0	31	25	00				
	PZ S	31	42					
	RCL 8	34	08					
	PZ S	31	42					
	GTO 8	22	08					
	*LBL B	31	25	12				
	RCL A	34	11					
160	GSR 2	31	22	02				
	G		06					
	8		08					
	X#Y	32	61					
	GTO 0	22	00					
	RCL B	34	12					
	GTO 3	22	03					
	*LBL 0	31	25	00				
	GSR G	31	22	06				

LABELS					FLAGS	SET STATUS			
A	B	C	D	E		ON OFF		TRIG	DISP
START	USED	USED	USED		0				
a	b	c	d	e	1	0	☐ ☒	DEG ☒	FIX ☒
						1	☐ ☒	GRAD ☐	SCI ☐
0 USED	1	2 USED	3 USED	4 USED	2 USED	2	☐ ☒	RAD ☐	ENG ☐
5 USED	6 USED	7 USED	8 USED	9 USED	3	3	☐ ☒		n <u>1</u>