



Chess Tests: Basic Suite, Positions 16-20

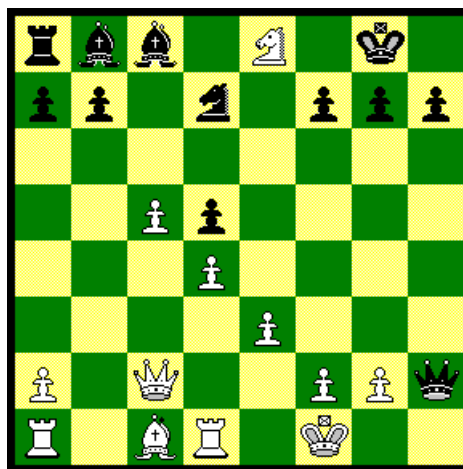
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Last update: 14/01/98

See the Notes on Problem Solving

16.- Z. Franco vs. J. Gil



FEN: rbb1N1k1/pp1n1ppp8/2Pp4/3P4/4P3/P1Q2PPq/R1BR1K2/ b

Black to play and win:

1. ... Nd7xc5 2. Qc5 Qh1+ 3. Ke2 Bg4+ 4. f3

Results

Program	CPU/Mhz	Hash table	Move	Value	Plys/Max	Time	Notes
Chess Genius 1.0	P100	320 Kb	Nd7xc5	+0.39	5/17	00:00:17	sees little value
Chess Genius 1.0	P100	320 Kb	Nd7xc5	+1.72	7/19	00:04:49	sees to 4. f3
KAI Crafty 12.6	Pentium Pro 200 MHz	24 Mb + 16 Mb	Nd7xc5	+2.14	10/19	00:01:20	seen at 14s
HYATT Crafty 13.3	P6	?	Nd7xc5	+1.181	11/17	00:01:46	see notes
KAI Chess Master 5500	Pentium Pro 200 Mhz	?	Nd7xc5	+2.46	9	00:03:05	
KAI MChess Pro 5.0	Pentium Pro 200 Mhz	10 Mb	Nd7xc5	+2.65	6	00:01:24	seen at 0:00, +0.00

Notes:

Using **Chess Genius 1.0**, both searches find the correct *Knight's sacrifice*.

The 5-ply one, however, does not see it's full value, while the 7-ply search, though 16 times slower, correctly predicts the next 6 plies of the actual game, finding the move nearly two pawns worth.

Crafty 12.6 finds the correct sacrifice too, though it needs to search to 10 ply, instead of the 7 plies required by CGI.0, but its better hardware makes for the shortest time.

Crafty 13.3 also finds the sacrifice, the first time when it looks at 8 plies in 9 seconds but with a low value. Once it reaches 11 plies, the gain improves substantially. See **Addendum** below for **Robert Hyatt's** opinions and full analysis listing.

Chess Master 5500 looks at one ply less than **Crafty**, but even so it's more than *2 times slower*, though it finds a similar result. **MChess Pro 5.0** on the other hand, looks at only 6 plies, but finds the correct move in almost the same excellent time as **Crafty**.

Addendum:

I sent an e-mail to **Robert Hyatt** with this comment:

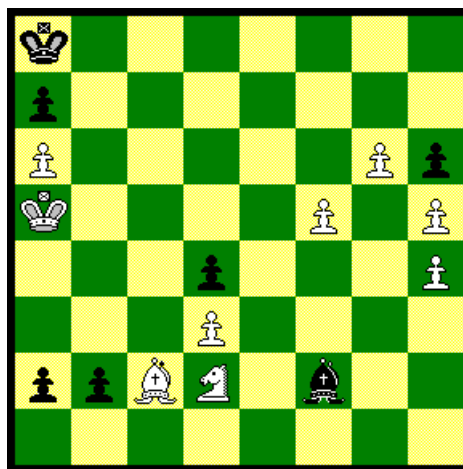
VA: " ... *Crafty finds the correct move, but it needs to look at 10 plies while CG1.0 just needs to look at 7. Why that difference ? If Crafty could do it with just 7, it's timing would be wonderful, I guess.*"

RH: "*On Test 16 [with Crafty 13.3], I get this ... so it found it here in 7 seconds... and the score is getting better each search ...*"

depth	time	score	variation (1)
7->	3.11	-0.655	Qh1+ Ke2 Qxg2 Nd6 Nb6 Nxc8 Nxc8 Qb3 Bg3 Qxb7 Qxf2+
8	4.82	-0.806	Qh1+ Ke2 Qxg2 Nd6 Nb6 Nxc8 Qg4+ f3 Qxc8 Kf1
8	7.47	++	Nxc5!!
8	8.91	-0.211	Nxc5 dxc5 Qh1+ Ke2 Bg4+ Kd2 Bxd1 Qxd1 Qxg2 Qe2
8->	10.88	-0.211	Nxc5 dxc5 Qh1+ Ke2 Bg4+ Kd2 Bxd1 Qxd1 Qxg2 Qe2
9	15.01	++	Nxc5!!
9	21.59	0.483	Nxc5 f4 Bh3 Qxc5 Qxg2+ Ke1 Bxf4 Nf6+ gxf6 exf4 Re8+ Be3 Rxe3#
9->	28.28	0.483	Nxc5 f4 Bh3 Qxc5 Qxg2+ Ke1 Bxf4 Nf6+ gxf6 exf4 Re8+ Be3 Rxe3#
10	42.10	++	Nxc5!!
10->	57.30	0.782	Nxc5 f4 Bh3 Qxc5 Qxg2+ Ke1 Bxf4 Nf6+ gxf6 exf4 Re8+ Be3 Rxe3#
11	1:20	++	Nxc5!!
11	1:46	1.181	Nxc5 dxc5 Qh1+ Ke2 Bg4+ Kd2 Qxg2 Nxg7 Bxd1 Qxd1 Qxf2+ Kd3 Be5 Rb1 Kxg7 Rxb7 Qxa2



17.- Study of V. Smyslov



FEN: k7/p7/P5Pp/K4P1P/3p3P/3P4/ppBN1b2/8/ w

White to play and win:

1. Bb1 a1=Q+
2. Kb5 Bg3
3. g7 Bb8
4. g8=B Bf4

Results

Program	CPU/Mhz	Hash table	Move	Value	Plys/Max	Time	Notes
Chess Genius 1.0	P100	320 Kb	Bc2-b1	+4.15	12/24	00:08:17	
KAI Crafty 12.6	Pentium Pro 200 MHz	24 Mb + 16 Mb	Bc2-b1	+0.00	12/15	00:01:56	doesn't see 4.g8=B

HYATT Crafty 13.3	P6	?	Bc2-b1	+0.000	12/19	00:01:43	see notes
KAI Chess Master 5500	Pentium Pro 200 Mhz	?	Bc2-b1	+3.61	8	00:00:01	
KAI Chess Master 5500	Pentium Pro 200 Mhz	?	Bc2-b1	+3.23	10/21	00:02:58	doesn't see 4.g8=B
KAI MChess Pro 5.0	Pentium Pro 200 Mhz	10 Mb	Bc2-b1	+5.68	9/13	00:05:02	seen at 0:02, +3.69

Notes:

In this complicated study of former World Chess Champion **Smyslov**, no less than 12 full plies (plus another 12 quiescence search plies) are necessary to find the winning move.

Chess Genius 1.0 looks thru all promotions and underpromotions, but it takes somewhat long. However, it does see the 4. g8=B underpromotion and the win.

Crafty 12.6, looking at 12/15 plies, finds the correct move, which, by the way, is almost forced to avoid immediate disaster, but fails to see the bishop's underpromotion at move 4, and does not recognize the win. It evaluates the move as a mere draw.

Robert Hyatt sent me results for **Crafty 13.3**, see **Addendum** below, but the analysis listing shows that it just sees a draw (+0.000) when looking at 12 plies, and the principal variation does *not* discover the *underpromotion to a bishop* in the fourth move.

Chess Master 5500 looks at 8 plies in almost no time and discovers the correct move, though it does not see the underpromotion. Even when looking at 10/21 plies, it still does not see it, though it doesn't take too long.

MChess 5.0 Pro also finds the correct move nearly instantly, with a good evaluation, but after a reasonable while, it looks at 9/13 plies and discovers the greatest gain of all programs tested. I find it somewhat peculiar that **MChess 5.0 Pro** always seems to need shallower searches than **Chess Master 5500** (9/13 vs. 10/21) to see more or less the same, though it usually takes as long or longer!

Addendum:

I sent an e-mail to **Robert Hyatt** with this comment:

VA: " ... In test 17, similar thing. Both look at 12 plies, but CG sees a > +4.15 where Crafty sees a +0.00. It would need more plies to see the +4.xx"

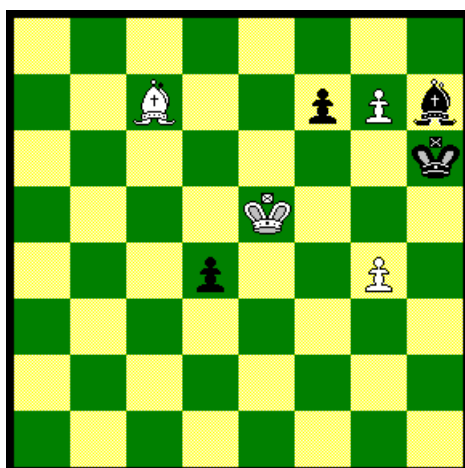
RH: "... here is output for position 17 (again **Crafty 13.3**) ..."

```

depth   time   score  variation (1)
  10     4.72    --    Bb1
  10     5.92  0.836  Bb1 a1=Q+ Kb5 Bg3 g7 Bb8 f6 Qa3 Nc4
  10     5.92  0.836  Qa1 f7 Qxb1 g8=Q Qc2 Qxb8+ Kxb8 f8=Q+
10->   14.46  0.836  Bb1 a1=Q+ Kb5 Bg3 g7 Bb8 f6 Qa3 Nc4
10->   14.46  0.836  Qa1 f7 Qxb1 g8=Q Qc2 Qxb8+ Kxb8 f8=Q+
  11    15.25    ++    Bb1!!
  11    16.51  1.856  Bb1 a1=Q+ Kb5 Bg3 g7 Bb8 f6 Qa3 Nc4
  11    16.51  1.856  Qa1 Kc5 Qxb1 g8=Q Qh1 Nxb2 Qxh4
11->   23.89  1.856  Bb1 a1=Q+ Kb5 Bg3 g7 Bb8 f6 Qa3 Nc4
11->   23.89  1.856  Qa1 Kc5 Qxb1 g8=Q Qh1 Nxb2 Qxh4
  12    30.93    --    Bb1
  12    47.64  0.000  Bb1 a1=Q+ Kb5 Bg3 g7 Bb8 f6 Qa3 Nc4
  12    47.64  0.000  Qb3+ Kc5 Qa4 f7 Qd7 g8=Q Qb5+ Kxd4
  12    47.64  0.000  Qe5+ Nxe5
12->   1:43   0.000  Bb1 a1=Q+ Kb5 Bg3 g7 Bb8 f6 Qa3 Nc4
12->   1:43   0.000  Qb3+ Kc5 Qa4 f7 Qd7 g8=Q Qb5+ Kxd4
12->   1:43   0.000  Qe5+ Nxe5
  13     1:48    ++    Bb1!!

```





FEN: 8/2B2pPb/7k/4K3/3p2P1/8/8/8/ w

White to play and win:

1. g8=N+ Bxg8 2. Kf6 Kh7 3. g5 d3

Results

Program	CPU/Mhz	Hash table	Move	Value	Plys/Max	Time	Notes
Chess Master 2175	P100	2 Mb	Ke5-f6	+0.77	19	02:38:21	can't see it
Chess Genius 1.0	P100	320 Kb	g7-g8=N+	+1.12	13/25	00:04:59	sees underprom.
PAÑEK Chess Genius 5.0	PII/266	16 Mb	g7-g8=N+	+1.56	13/25	00:02:44	sees underprom.
PAÑEK Chess Genius 5.0	PII/266	16 Mb	g7-g8=N+	+2.04	15/27	00:04:02	sees underprom.
NEW Comet-A.75	P100	13786 Kb	g7-g8=N+	+1.71	14	00:52:06	sees underprom.
NEW Rebel Decade 2.0	P100	512 Kb	Ke5-f6	+0.63	16	00:26:49	can't see it
Crafty 12.7	P100	12/5 Mb	Ke5-f6	+1.044	18	00:13:26	can't see it
KAI Crafty 12.6	Pentium Pro 200 MHz	24 Mb + 16 Mb	Ke5-f6	+1.04	17	00:04:02	can't see it
KAI Chess Master 5500	Pentium Pro 200 Mhz	?	g7-g8=N+	+0.21	12	00:07:07	sees underprom.
KAI MChess Pro 5.0	Pentium Pro 200 Mhz	10 Mb	g7-g8=N+	+1.45	9	00:03:02	seen at 1:00, +0.95

Notes:

Another difficult Smyslov's study. **Chess Master 2175** cannot find the amazing *underpromotion*, even looking at a full 19 plies, while **Chess Genius 1.0** does, with an only 13-ply full search, plus 12 extra plies for captures, promotions, and checks, and it does it more than *30 times faster*.

But **Chess Genius 5.0** does even better. It looks also at 13/25 plies, and thanks to its improved hardware, does it faster and with a slightly better evaluation, +1.56. Continuing the search for another two plies, 15/27, betters the evaluation to +2.04. The *Principal Variation* predicted is: *g7gn+, bxc8, kf6* and mate in 9 announced after that, at depth 24!

Crafty 12.7, using almost triple the time, goes to 18 plies, but fails to find the winning underpromotion.

Crafty 12.6 running in powerful hardware with a lot of memory goes to 17 plies, but does no better than its younger offspring, also failing to see the win.

Comet-A.75, also freeware, at least does find the correct underpromotion to a Knight, with a reasonable evaluation, but it needs to look at 14 plies, and it takes much longer than the other programs, *10 times longer* than CGL.0, for instance, despite the fact that it has a very large 13 Mb hash table. In that time, it evaluates *100.356.662 positions*.

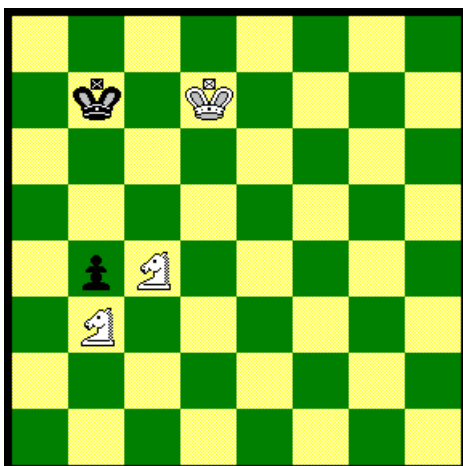
Rebel Decade 2.0 is freeware, too, but though it looks two plies deeper, 16 plies, taking nearly half an hour, it does not see the winning underpromotion. It evaluated *20.164.187 positions*, but couldn't see it.

Chess Master 5500 looks at much less plies than **Crafty 12** (vs 17/18), yet it does find the underpromotion, but with a very low evaluation. It's amazing that despite the better hardware and more modern engine, it takes almost *2 times longer* than venerable

Chess Genius 1.0, yet its evaluation is worse.

MChess 5.0 Pro does better, finding the correct move with a good evaluation in just a minute, then goes to 9 plies in *half the time* than Chess Master 5500 to further refine the value.

19.- Taken from "Knight Endings", pag. 216, diag. 132



FEN: 8/1k1K4/8/8/1pN5/1N6/8/8/ w

White to play and mate in 6: 1. Nb3-c5+

Results

Program	CPU/Mhz	Hash table	Move	Value	Plys/Max	Time	Notes
Psion Chess	486/25	No	Nb3-c5+	Mate6	11	00:01:01	level=mate6
Chess Master 2175	P100	2 Mb	Nc4-a5	+5.46	17	01:56:12	a bug ?
Chess Genius 1.0	P100	320 Kb	Nb3-c5+	Mate6	8/20	00:00:16	selec=12
Chess Genius 1.0	P100	320 Kb	Nb3-c5+	Mate6	10/10	00:00:29	selec=0
Chess Genius 1.0	P100	320 Kb	Nb3-c5+	Mate6	10/12	00:00:29	selec=2
Chess Genius 1.0	P100	320 Kb	Nb3-c5+	Mate6	8/12	00:00:13	selec=4
Chess Genius 1.0	P100	320 Kb	Nb3-c5+	Mate6	11/12	00:00:06	level=mate6
NEW Rebel Decade 2.0	P100	512 Kb	Nb3-c5+	Mate6	12	00:13:02	
KAI Chess Master 5500	Pentium Pro 200 Mhz	?	Nb3-c5+	Mate6	10	00:00:14	
KAI Chess Master 5500	Pentium Pro 200 Mhz	?	Nb3-c5+	Mate6	?	00:00:06	level=mate6
KAI MChess Pro 5.0	Pentium Pro 200 Mhz	10 Mb	Nb3-c5+	Mate6	8	00:00:32	

Notes:

A *paradoxical* example, where two Knights can deliver a mate to a lone King plus a Pawn, while they *couldn't* do it if the Pawn were missing !

Chess Master M2175 can't find it, even searching to 17 plies (11-ply would suffice), which surely reflects a *bug in the programming!*

Chess Genius 1.0 always finds the mate, though taking different times depending on the number of plies it searches. An 8-ply plus 4-ply for checks and captures gives the best time for the Indefinite level, but the Mate in 6 level does it 2 times faster.

Rebel Decade 2.0 suffers with this position, and though it does find the correct move evaluated as a mate in 6, it needs to look at 12 plies, examining 17.796.724 positions in the process, and taking much longer than the other programs tested.

Chess Master 5500 has no problem with this position, and it finds the correct move evaluated as a mate in 6 very fast. In its special "Mate in 6" level, the answer is found 2 times faster still.

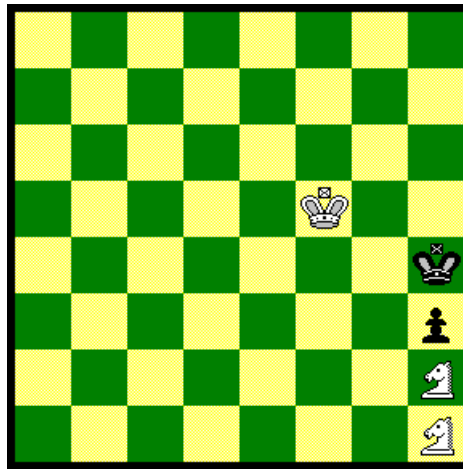
MChess Pro 5.0 also finds the correct mate and, as usual, needs less plies than **Chess Master 5500** (8 vs. 10), yet it takes longer, 2 times longer in this case.

Addendum:

Although he did not provide timings or selected move, **Kai Luebke** tested this position in **Crafty 12.6** on his Pentium Pro MMX at 200 Mhz, with 24 Mb for the main hash table, 16 Mb for the pawn hash table, and all 3-men and 4-men endgame tablebases, and reports that it did *not* find the mate, even when searching up to 12 plies !!

This I cannot understand. Looking at 12 plies it *should* find a mate in 6 (actually, just 11 plies would do), and more so if endgame tablebases are used. Kai advances that maybe it's a bug in **Crafty**. Could it be ?

20.- Taken from "Knight Endings" pag. 217, diag. 135



FEN: 8/8/8/5K2/7k/7p/7N/7N/ w

White to play and mate in 9: 1. Nh1-f2

Results

Program	CPU/Mhz	Hash table	Move	Value	Plys/Max	Time	Notes
Chess Master 2175	P100	2 Mb	Nh1-f2	Mate9	15	00:03:03	level=infinite
Chess Genius 1.0	P100	320 Kb	Nh1-f2	Mate9	12/24	00:02:15	selec=12
Chess Genius 1.0	P100	320 Kb	Nh1-f2	Mate9	8/14	00:00:03	selec=6
Chess Genius 1.0	P100	320 Kb	Nh1-f2	Mate9	13/14	00:00:04	level=Mate16
Chess Genius 1.0	P100	320 Kb	Nh1-f2	Mate9	11/12	00:00:01	level=Mate7
NEW Rebel Decade 2.0	P100	512 Kb	Nh1-f2	Mate6 !!	13	00:17:04	Bug !?
NEW Comet-A.75	P100	13786 Kb	Kf5-f6	+3.40	14	00:24:01	doesn't see mate
KAI Chess Master 5500	Pentium Pro 200 Mhz	?	Nh1-f2	Mate9	10	00:02:08	seen at 00:01:02
COOPER Hiarcs 6.0	Cyrix P166/48Mb	18 Mb	?	Mate11	13/30	00:03:10	

Notes:

Another example of two Knights administering mate to a lone King *plus* Pawn. Remember, *two Knights cannot mate a lone King*. The theory of these extremely rare mating situations was developed by the russian author **Troitzky**.

Here, **Chess Master 2175** finds the 9-move mate, but it has to search 15 full plies, and it takes very long.

Chess Genius 1.0 takes various times depending on how much extra plies it searches for captures and checks. In this position, to allow 12 extra plies is a *costly mistake*, because the two knights can give uncountable checks to the enemy king without really accomplishing *anything*, so, lowering the extra plies from 12 to 6 makes the search some *60 times faster* !

Amazingly, the special Mate in 7 level finds this Mate in 9 almost 3 times faster still, and almost *150 times faster* than CM2175, running on the same hardware !

Rebel Decade 2.0 finds this kind of positions very difficult. It could find the correct move, but it needs to look at 13 plies (17.571.631 positions examined), taking much longer than the other programs tested, and what's worse, it evaluates the move as a **mate in 6, wich it is n't !!**, and gives an incorrect *Principal Variation*. Another **bug ?**. See the **Addendum** below for details of RD2.0 predicted *Principal Variation* and the real one.

Also, there's another test position in this suite, **Test 11**, that further shows off the same bug.

Freeware **Comet-A.75** surprisingly *fails* to find the mate. Even searching to a depth of 14 plies, which is deeper than most other programs tested, and taking also much longer, it examines 42.691.251 positions yet it doesn't find any mate at all.

Mike Cooter sent this result for **Hiarcs 6.0**, which finds a mate in 11 while looking at 13/30 plies. It seems **Hiarcs** tends to use heavily very extended searches, but thus fails to deliver the shortest mates, in fact it usually finds *very* long ones. Mike also sent a result for **Fritz 5** which reportedly found a *mate in 8*, but that *can't be*. This position is a *mate in 9*, no less. Mike also said that he tried this position in **Fritz 3.10** and **Fritz 4.1** but they *couldn't solve it*. Mike, can you explain any of this, in particular why does **Fritz 5** find a *nonexistent* mate in 8 ?.

The newest **Chess Master 5500** finds the mate in 9 looking at just 10 plies, but does it more than 2 times slower than **Chess Genius** when looking at 12/24 plies, and some 40 times slower than when it looks at just 8/14 plies (selec=6), though no doubt this is mostly luck. Actually, the correct move is seen in just a minute, though it's still not evaluated as a mate in 9.

Addendum:

While he did not provide timings or selected move, **Kai Luebke** tested this position in **Crafty 12.6** on his Pentium Pro MMX at 200 Mhz, with 24 Mb for the main hash table, 16 Mb for the pawn hash table, and all 3-men and 4-men endgame tablebases, and reports that it did *not* find the mate, even when searching up to 14 plies.

In comparison, CG1.0 finds this mate in 9 when searching to as little as 8 plies, with another 6 plies for extensions. It seems **Crafty** finds these simple knight mates specially difficult for some unknown reason, see **Test 19** for another example.

NEW

Rebel Decade 2.0 incorrectly evaluates this position as a *mate in 6*, and gives this incorrect partial *Principal Variation*:

1. Nh1-f2 Kh4-g3; 2. Nf2-g4 Kg3-g2; 3. Kf5-f4 Kg2-g1

Curiously enough, **Rebel Decade 2.0** itself, when trying to solve this position using its special *Mate in 6* level, says "*No mate 6 found*" in 54 seconds !!

Just for fun, testing this position with **Mater 1.1**, confirms it's no mate in 6 in just 2 minutes. The correct *Principal Variation* is:

1. Nh1-f2 Kh4-g3; 2. Nf2-g4 Kg3-h4; 3. Kf5-g6 Kh4-g3; 4. Kg6-g5 Kg3-g2; 5. Kg5-f4 Kg2-h1;
6. Kf4-f3 Kh1-g1; 7. Kf3-g3 Kg1-h1; 8. Nh2-f3 h3-h2; 9. Ng4-f2++

