

Computer and Endgame Studies

Briefly About The “End Game Table Bases (EGTB)”

by Iuri Akobia, Georgia

It is well-known among expert chess players and study composers that there exist special tables (EGTB – End Game Table Bases), representing a database which stores all possible positions with certain material balances and their analysis.

Having in a computer a full set of EGTB and the special chess program (for example, **Chess Base 8**), you can find the solution (full analysis) of any position with 4–6 men (and some with 7 men) in several seconds. How is it possible? There is no necessity to analyse. The truth is that these tables contain all already calculated analyses of any position, and if we give a position to the computer, it instantly displays results. The computer does not analyse, it takes the data from the specified base. Without use of EGTB, the most powerful computer can spend ten minutes, or ten hours, for analyses. And if we use the special program, for example **Deep Fritz 8**, we can analyse more effectively positions with more than 6 men. This is achieved with active support of EGTB analysis. As you can see, this system can give a huge help to practical players, study composers, etc.

Such EGTB tables for 4–5 men were generated by K. Thompson already in 90s. Then tables for 6 men appeared. The author of this generation of tables is E. Nalimov. It is necessary to note that it wasn't easy to generate tables for 6 men. These tables (EGTB) occupy a huge amount of computer memory (approximately 1500 GB). In the case of EGTB for 4–5 men, it was only 7–8 MB. Recently, EGTB were generated for some groups of positions with 7 men. It is necessary to note that space on a hard disk (HD) of around 160–200 GB is required (in many personal computers this would be the complete volume of the hard disk). Certainly, these EGTB are not in practice accessible to the owner of an ordinary personal computer.

As we see, it is very difficult to store such an amount of information in a computer. In practice only EGTB for 4–5 men are accessible. But composers who wish to use EGTB for the analysis of a position with 6 men, can do it successfully on the Internet in Online mode

<http://www.k4it.de/index.php?topic=egtb&lang=de>.

There is a very interesting, freely accessible, chess program **Wilhelm**

http://www.geocities.com/rba_schach2000,

that allows the user to generate and analyse some special positions from Nalimov EGTB. The tables of mutual zugzwang positions are the most important. Such positions are often used to compose studies (we shall discuss this matter somewhat later).

Complete information about the **Nalimov EGTB** can be found on the site of the well known Czech composer **Emil Vlasak**

<http://web.quick.cz/EVCOMP/tablebase.htm>.

There you can find links to all necessary sites. We shall note that downloading the EGTB with 4–5 men demands only the standard connection to the Internet, while 6 men tables require high-speed connections (ADSL, DSL). Even then the downloading of one table can take hours. Now it is possible to get the complete set of 4–5 men EGTB and the 6 men on DVD form from the following site <http://www.chesscentral.com/software/turbo-endgame.htm>.

The Nalimov EGTB and Chess Study

In the world of chess composition there are many disputes regarding use of EGTB for study composing. Some problemists consider that a study using EGTB couldn't be

considered as an original work (let's call such problemist **Group "A"**). The majority of composers reject this opinion (**Group "B"**).

Group "A" treats all positions (initial or final in the study) containing 6 or less men as made by a computer and they use the expression "**a computer study**". The consequence of such a wrong attitude would be to abandon all ideas from the territory of EGTB (5–7) and to leave room for study-monsters (not that we are against heavy studies; all forms have the right to "live"). We often hear from members of **Group "A"** that some position **was taken** from EGTB. Such a statement is not adequate for the following reason. EGTB contain analyses of all the positions you could think of and give to a computer (but you cannot **take** a position out of it) for the analysis. The total number of these positions is difficult to name, because there are billions and billions. Instead of the description "**position is taken from EGTB**" it would be fairer to say: the data of this position **are** in the territory of EGTB, or: this position has all its **analyses in EGTB**.

As **Group "A"** present it, a composer chooses "a list of ready positions" from EGTB, finds an interesting idea, makes some analyses and the study is ready. Well, we shall try to work this way with the table **KRBPKQ** (about 13 GB on HD). In order to check all positions it would be necessary to use program **Wilhelm** (or similar), to put on a board all positions one after another and to look at their analyses on the screen (like catching "a golden fish"). Stop it, this is Utopia! Such an adventure could last many, many years. A work leading nowhere!

Let's go back "to the ground" and see how the **Nalimov EGTB** can really help a composer. As a rule, the composer begins with an idea (it is certain that the idea comes first), puts an approximate, rough position on the board (the scheme), and then he repeatedly changes the position to find the optimal realization of the idea. In doing this, he constantly follows results of all analyses from EGTB. This is the whole plan how to use the magnificent services of the **Nalimov EGTB**.

What do you think, do only study composers work this way? Certainly, not! All composers have such opportunities, and even better! Firstly, for all direct problems with up to 6 men **are** in the territory of EGTB, and secondly, all direct problems, no matter how many pieces are on the board, could be precisely analysed by computer programs (much more precisely than studies). We may conclude that the whole spectrum of chess problems is in the territory of computer help. However, we still don't hear from problem composers the expression – "computer problems". The truth is that problems are more "computer-made" than studies.

Group "B" doesn't restrict the composer in methods of creativity. Let him use any sources of positions for his study. The main criterion is how much the initial idea is upgraded with new nuances. These nuances could be: thematic tries, syntheses of several ideas, consecutive or parallel, etc.

No doubt it is much more difficult to find interesting ideas among many billions of positions in the territory of EGTB, than in the limited territory of published studies (for example, the **H. Heijden III** base contains 67000 studies). It is impossible to disagree with the opinion of **IGM John Nunn** who has devoted huge work to researching databases. Recently, he wrote: "**The composer who discovers something remarkable in a database deserves credit; the composer who repeats the discovery does not**".

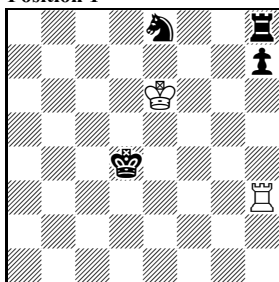
The "B" approach doesn't mean there are no areas in EGTB that demand a special approach by study composers. The lists of positions with mutual zugzwang, generated by program **Wilhelm** (or others), and published in different sources, belong to these special areas. Such positions call for another approach. The composer wouldn't abandon any ethical standard if he would develop the ideas from these lists. However, he should have in mind that used positions could be treated as partial anticipations. The relation is the same as with development of ideas from classical endgames.

Our experience tells that finding interesting ideas in these lists is not as easy as presented by **Group "A"**. It is even more difficult to develop these ideas. There are tens thousands of positions of mutual zz in some groups. To find an idea with chances of being well developed, a huge amount of effort and time is required. There is reason to believe that composers from Group "A" still haven't attempted this kind of search for the "ready endgames". The reason is that we can't find examples of "easily taken" endgames from EGTB in their composing. The most unacceptable action by Group "A" is their public demand from judges "to sink" the most economical studies. More than this, they try to incorporate such an attitude in the **PCCC Codex**. There even appeared judges who gave "0" points, without hesitating, to all such endgames competing for the **FIDE Album**. It is very sad that these persons do not feel the huge responsibility for the future of the Study Art.

Many will agree there are no absolutely original ideas in the chess world. All ideas exist in "darkness" till composers make them accessible for the audience. When these ideas come to the light, we call them "original" although there are always some old "bricks" intergrated in them.

I believe the next examples will give an impression about the (**Group "B"**) author's attitude towards the use of EGTB in study composing.

Position 1



BTM= 2+4
1... Ke4 2.Rxh7 Rxh7 stalemate.

Position 1 is taken from the list of mutual zz **KRNPKR**, (the list contains about 4000 positions) and it is zugzwang with black to

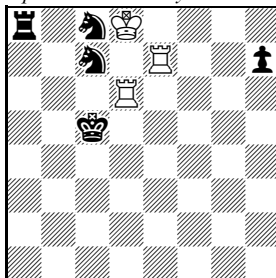
move. As you have noticed, the stalemate is not new. We should make it clear immediately that this position was generated by computer (it could have been created by a man also, but this would be impossible to prove).

Is it possible to compose an original endgame out of this simple position? My friend **Richard Becker** and I thought about it for a long time. We analysed all the details to reveal the possibilities. Huge energy and time was spent. It wasn't very clear what would come out. However, we managed to realise a synthesis of several stalemates in a position with 8 men (Position 1a).

Position 1a

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5.pr Československý Šah 2006



= 3+5

1. Rh6

Thematic try 1.Rc7+? Kxd6 2.Rd7+ Kc6! Ke6? 3.Rxh7 Se7+ 4.Kc7 Ra7+ 5.Kb8(Kd8) Sc6+ 6.Kc8 Rxh7 stalemate, or

2... Kc5? 3.Rxh7 Sd6+ 4.Kd7(Ke7) Ra7+ 5.Kd8 Sf7+ 6.Ke8 Sd6+ 7.Kd8 =

3.Rc7+ Kd5 4.Rxh7 Sd6+ (4... Sb6+? 5.Kc7 Ra7+ 6.Kb8 Rxh7 stalemate) 5.Kd7 Ra7+6.Kd8 Sf7+ Black avoid 6... Rxh7? 6th echo stalemate

7.Ke8 Ke6 8.Kf8 Kf6 9.Ke8 Re7+ 10.Kf8 Rd7 -+

A) 1... Sd5 2.Rc7+ Sxc7 3.Kxc7

A1) 3... Se7 4.Rxh7 Ra7+ 5.Kb8(Kd8) Sc6+ 6.Kc8 Rxh7 echo stalemate 1;

A2) 3... Sb6 4.Rxh7 Ra7+ 5.Kb8 Rxh7 echo stalemate 2.

B) 1...Sxe7+ 2.Kxe7

B1) 2... Ra7 3.Kf8 Kd5 4.Rxh7 Se6+
5.Ke8 Ra8+ 6.Ke7 Ra7+ 7.Ke8 Rxh7
echo stalemate 3;

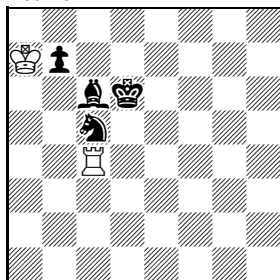
B2) 2... Rh8 3.Kf7(Kd7/Kf6) Se8 4.Ke6
Kd4 5.Rh3 zz BTM, Sg7+ 6.Kf6 Se8+
7.Ke6 Sc7+ 8.Kf7(Kf6) Se8 9.Ke6
With:

B2a) 9... Ke4 10.Rxh7 Rxh7 echo
stalemate 4, or

B2b) 9... h5 10.Rh4+ Ke3 11.Kf7
Sd6+ 12.Kg6 Rg8+ 13.Kh7 Rg5
14.Kh6 Sf7+ 15.Kh7 Kf3 16.Rf4+
Kg3 17.Rg4+Kf3 18.Rf4+ Kxf4
echo stalemate 5.

As you see, the Position 1 is only a fragment of the study 1a. If judges from Group "A" consider this as a "computer study", a dialogue with them would be hopeless.

Position 2



Position 2 is from the list with around 21000 positions with mutual zugzwang of the type **KBNPKR**. Here we see a mutual zz with black to move (BTM): 1... Nd7 2. Rb4 b5 3. Ka6 Kc5 4. Ka5 Ne5 5. Rxb5 + Bxb5 stalemate.

A careful analysis of the position revealed possibilities of adding introductory play. Some addition is necessary, as the stalemate is known and we shall not "sell" this as a study. In many cases such a position could be developed into quite long solutions. However, if we don't add a thematic content, such as a thematic try, a synthesis with another idea, etc, there is no sense in publishing a study. These

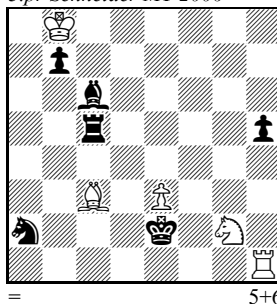
are the cases where the judge should be careful in estimating the contributions of the author and the computer that generated the initial position (we are talking about positions with mutual zz).

After long analysing and searching the author found it possible to unite three identical stalemates (Position 2a).

Position 2a

1.Akobia

3.pr Schneider MT 2006



1.Sf4+

1.Re1+!? Kf2 2.Sf4 Rxc3--

1... Kxe3 2.Bd4+!

2.Bd2+!? Kxd2 3.Rh2+ Kc3--;

2... Kxd4 3.Se6+ with:

A) 3... Kc4 4.Rh4+ Kb5 5.Sxc5 Kxc5
6.Rxh5+ Kc4 7.Rh4+ Kc5 8.Rh5+ Kb6
9.Rh7 Sb4 10.Rxb7+ Bxb7 - echo
stalemate 1;

B) 3... Ke5 4.Rxh5+ Kxe6 5.Rxc5 Kd6 6.Rc2
Sb4 7.Rc1 and two lines:

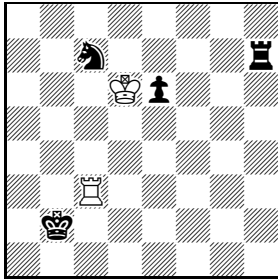
B1) 7... Sd5 8.Ka7 Kc7 9.Rb1 Se7
10.Rxb7+ Bxb7 echo stalemate 2;

B2) 7... Sa2 8.Rc2 Sb4 9.Rc1 Sa6+
10.Ka7 Sc5 11.Rc4 zz BTM Sd7
12.Rb4 b5 13.Ka6 Kc5 14.Ka5 Se5
15.Rxb5+ Bxb5 echo stalemate 3.

We cannot call the introductory play successful, but to synthesise three echo stalemates is not an easy job.

Here is another example of working with EGTB. In this position (**KRNPKR**) there is a mutual zugzwang with black to move, after the first move of white.

Position 3

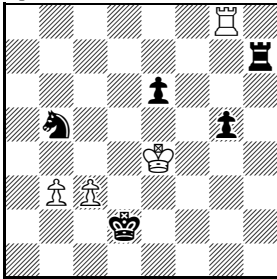


= 2+4
1.Rc4 zz BTM Kb1 2.Rc5 zz BTM =.

We had opportunities to lengthen the introductory play, but it did not satisfy us. It was necessary to search for synthesis of a parallel positional draw, or to change colours and search for interesting ideas for Black. Study 3a has two parallel main lines beginning with the second move of Black.

Position 3a

R. Becker & I. Akobia
1.pr Hildebrand MT 2007



= 4+5

1.Ke5! Kxc3 2.Rxg5 with:

A) 2... Rh6 3.Rg7! zz Kd3 4.Rg4!

Thematic try 4.Rg3+!? Kc2! zz 5.Re3 (5.Rg7 Kc3! zz 6.Rg3+ Kb4 -+) 5...Kd2 6.Rg3 Sa7 7.Kd6 Sc8+ 8.Kd7 Sb6+ 9.Kd6 Sd5 -+;

Thematic try 4.Rg1!? Sc7 5.Rd1+ Ke3 6.Re1+ Kd2 7.Re4 Se8 8.Rg4 Kc3 9.Rg8 Sc7-+

4... Kc2 5.Rg3 zz Sa7 6.Kd6

Thematic try 6.b4!? Sc6+ 7.Kd6 Sd4 8.Ke5 Sb3 9.b5 Sd2 zz 10.Kd4 Rh5 11.Rc3+ Kd1 12.Re3 Rd5+ 13.Kc3 e5 14.Kb4 Rd4+ 15.Kc5 Se4+ 16.Kc6 Kd2 17.Rh3 Rd6+ 18.Kc7 Rd3 19.Rh2+ Ke3 20.b6 Rc3+ 21.Kd7 Kd4 -+

6... Sb5+ 7.Ke5 Sa7 8.Kd6 Sc8+ 9.Kd7 Sb6+ 10.Kd6 Sd5 11.b4! Sc3 12.Re3 (Ke5) Sb5+ 13.Ke5 zz

13... Kd2 14.Rg3 zz Sa7 15.Kd6 Sc8+ 16.Ke5 Sa7 17.Kd6 Sb5+ 18.Ke5 Kc2 19.Re3! zz

19... Kd2 20.Rg3 Ke2 21.Re3+! Kd2 22.Rg3 positional draw, or 22... Ke2 23.Re3+ Kxe3 stalemate.

B) 2... Sc7 3.Kd6 Kb4 4.Re5 (waiting move) Thematic try 4.Rg1!? Kxb3 5.Rc1 Kb4 zz -+

4... Rg7 5.Re1!

Thematic try 5.Rh5!? Kxb3 6.Rc5 Rh7 zz 7.Rc1 Kb4 zz-+;

5... Kxb3 6.Rc1 Rf7 7.Rc6! Kb2 8.Rc5 Rg7 9.Rc6 Kb3 10.Rc1 Rf7 11.Rc6 Kb4 12.Rc2!

12... Kb5 13.Rc3 zz

Thematic try 13.Rc1!? Rg7 zz 14.Rc2 Rh7 15.Rb2+ Kc4 -+

13... Rg7 14.Rc1 zz Rh7 15.Rc2 zz Kb4 16.Rc1 zz Kb3 17.Rc5 zz Ka4 18.Rc6 zz Ka5 19.Rc4 zz Kb5 20.Rc2 Kb4 21.Rc1 Kb3 22.Rc5 Ka3 23.Rc3+ Kb2 24.Rc4 zz Kb1 25.Rc5 zz positional draw.

In two parallel variations the white Rook makes precise tempo moves. In line A, these moves are along the g-file and the third rank. In line B, along the fifth rank and the c-file.

These three examples should have served to present the opportunities given by **Nalimov EGTB** and a computer with modern programs. The fact that the computer is the main assistant of the modern composer is beyond doubt.

Whatever **Group "A"** would say, there is a deep belief that the future of study composing depends on the imagination, erudition and energy of the composer, while, certainly, the computer will always be a useful assistant.