

Introduction and summary

The situation in competitive chess today is critical, in that it has become easy for a dishonest player to receive illegal computer assistance during a game. This has in fact occurred in a number of instances, many of which have not received wide-spread publicity.

FIDE must be seen to address the problem, which will not go away if it is ignored. In fact we feel that players must currently get the impression that, since nobody seems to acknowledge the problem, it is okay for them to become inventive and use computer assistance. The danger is two-fold:

1. As new cases of cheating become public, players will start to believe that “everybody is doing it, so why shouldn’t I?”
2. The chess public will become sensitive to the subject and cease to believe any brilliant game, saying “Okay, how did they get the moves from the computer?”

This must not be allowed to happen if chess is not to suffer a similar fate to cycle racing, where the above mechanisms were rampant and interest has now waned to the point that sponsors and TV stations have retracted their support.

FIDE should address the problem vigorously and be seen to be doing so by the general chess public. A few initial measures, suggested on the following pages, are sufficient as a first step. They do not eliminate the problem completely – they just make it much harder to cheat.

The measures being proposed, in summary, are:

1. No electronic devices should be allowed in the playing hall at top-level tournaments. There must be clear penalties for transporting electronic devices, even if they are obviously not intended for illegal purposes.
2. Seconds and associates of the competing player should not be allowed to be present in the playing hall; or they must be adequately sequestered from the players.
3. Most importantly: the transmission of moves outside the playing hall must be delayed by a certain period of time (15 minutes for classical games).
4. Rest rooms during matches are only arranged if both players agree to it. Common toilet facilities must be used.
5. There must be serious, predefined penalties for players caught cheating.

The problem

The fact that players at all levels of chess can profit from computer assistance during a game is a new development and a serious problem for chess. Top grandmasters understand all too well how computers can affect the outcome of a game. Unlike an amateur who is playing 600 points above his true strength, for whom the computer must dictate practically every move of the game, a strong grandmaster requires only occasional assistance to improve his performance decisively.

Naturally the temptation is great to have computer assistance available in critical situations during a game. The problem is made more acute by the fact that only very little information needs to be passed on very few occasions. It becomes more serious the higher you go up the Elo scale. Sometimes all a player needs is one bit of information: “Yes!” Not a complete move, simply “There is a win” or “There is a certain draw”.

Not only do the players need progressively less information, they also stand to gain progressively more from cheating with the computer. Whereas in big national opens players can win maybe a thousand dollars by cheating, the sum increases to tens of thousands in top international tournaments, or even up to a million dollars in the case of a world championship.

It should be noted that cheating at higher levels can only occur with the help of computers. Normally no human is able to reliably assist a top grandmaster who is immersed in a game and understands it better than any onlookers.

No clear solution

When the first cases of computer assistance surfaced, a number of other top players turned to us for advice on how to counter cheating in chess. The assumption was that since ChessBase makes the software that is used for clandestine computer assistance, it is we who would know how to counter such attempts. This was unfortunately not the case – there was no special expertise in our company with regard to electronic intelligence and counter-intelligence techniques.

During the past years, however, we were able to gather a lot of information on the subject. The main source was, of course, the Internet, where there is a profusion of sites explaining the technology at every level of detail (not to mention retailers offering to sell you every form of legal and illegal devices). We also discussed with experts the kind of information that needs to be passed on and how this would be best provided by an assistant working with a fast chess engine like Fritz or Rybka. Finally we received some invaluable information from a US government employee who is in charge of security at US embassies abroad – and is a contact magician and programmer in his free time. Apart from describing advanced electronic methods he described a frightening array of *non-electronic* ways in which information can be passed – especially in the miniscule amounts needed for cheating in chess.

This brings us to a general problem: one notes that lay persons can become fairly knowledgeable on the subject in a relatively short period. It is frightening to think what a real expert with criminal intent and a substantial budget could come up with in the same time.

We have discussed the problem of cheating in chess with a number of other experts and spoken extensively with around 35 strong chess players, including many of the top 20. We have also discussed the following proposals with a fair sample of second-category professional players to ascertain what their reactions would be.

Here are some of our conclusions:

1. It would seem to be a general rule that the cost of installing electronic cheating mechanisms is far lower than the cost of the equipment and infrastructure required to detect them. The factor appears to be about ten to one. You can start cheating on a budget of around \$100, and it would cost the tournament direction around \$1000 to reliably prevent this method of cheating from being used. If the perpetrator spends \$1000 in electronic equipment then the other side must invest around \$10,000 in order to thwart the attempt.
2. Airport-style detectors will not pick up some of the electronic equipment that could be used to receive information during a chess game. There are devices on the market that use a very small amount of metal – in fact they have been specifically designed to elude detection by the usual methods. Apart from that there are many ways in which a player could pass through a security detector without the receiver and obtain this later on during the game. A whole set of additional measures, many extremely restrictive, need to be implemented to prevent this from happening.
3. Electronic receivers can be very cleverly concealed in many different parts of the body, and detecting them would require unacceptably intrusive searches. Remember that the signal does not have to be acoustic or verbal – you can easily transmit chess moves or yes/no information using a buzz, click, vibration or pulse. It is very difficult to detect a receiver that may be smaller than some of the dental appendages the user is wearing – or may in fact be part of such an appendage. Certainly this cannot be achieved using a standard airport metal detector.
4. The detection of the microwave signal used to cheat is a similarly daunting task. It is important to remember that, at the higher levels of chess, we are dealing with just a few very short bursts of information, occurring within a five to seven-hour period. The transfer can take place at one of many different frequencies, and the signal may be more or less defused. Making the whole task even more daunting is the fact that any normal location in the civilised world is filled with electronic signals, from cell phones, cell phone towers, radio, TV, and many other sources. It is very difficult to find the exact frequency which is being used to (very occasionally and for very short periods of time) transmit the chess information.
5. Detecting the receiving device itself by its tell-tale electronic emissions is possible, but also exceedingly difficult, especially if the perpetrator is using modern spy equipment that is designed specifically to avoid exactly such detection. Any spy shop will stock such devices.
6. It has been suggested that future matches must be held in Faraday cages (i.e. that the playing site would be shielded from all radio signals passing in or out by wire mesh covering the walls, floor and ceiling). There are a number of problems here as well. It may be feasible to put two players into an electronically shielded room, but how do you do this for an entire tournament with many players on different boards? Even with a two-player match special arrangements would have to be made for the participants leaving the table for refreshments, exercise or other human needs. If a player may step out of the electronically shielded area whenever he pleases then there is hardly any point in making it secure in the first place.

7. Another unfortunate aspect is that the information required for cheating at a higher level of chess can be transmitted in a variety of non-electronic ways.¹ Visual methods are already quite well-known, and for many years in world championship matches there have been arrangements to restrict the visual contact between the players and their seconds. But of course it is quite easy to use an unknown person to transmit signals. If the players can see any persons in the audience then there are countless methods in which someone can pass him game-decisive information. If it is done in a sophisticated way a single glance is enough to read the message. In fact the player doesn't even have to look directly at the messenger, but can rely on peripheral vision, so that detection becomes even more difficult. The only reliable way to prevent this is to make sure that the players have absolutely no visual or acoustic contact with the audience at all.

7. If countermeasures are put into place to prevent all of the above there is still no absolute guarantee that a player is not receiving outside assistance. The simple reason is that there are other, even more subtle methods that can be employed. Since there is no known precedence for their use in chess we will not open a new can of worms and start a discussion of the subject here.

The conclusion of our studies is that from a technical point of view it is extremely difficult to guarantee that there will be no cheating in chess by the clandestine use of a computer at decisive points in the game. The closest one could get to absolute certainty would be by implementing very radical controls: one would have to introduce rigorous body checks, isolate the players completely from the outside world during the games, perhaps even keep the playing sites a secret until immediately before each game.

The most effective practical method is to broadcast the moves of a game with a certain delay, as we have been vigorously proposing to FIDE since October 16, 2005 in San Luis. We have submitted this proposal a number of times and are attaching it as a separate document. There are a number of other measures that need to be taken, but just delaying the transmission makes the task much more simple and the other measures far less rigorous.

It is important to remember that the whole matter of computer assistance becomes much simpler for the cheater if the moves of a game are being provided (by the organisers and by chess servers) in real time to spectators anywhere in the world. A team of analysts, who do not need to be very strong players, can search for decisive continuations during a game and, when one is found, transmit the moves by any of a number of existing channels (cell phone call, SMS, instant messenger, Skype, email, etc.) to a person at the playing site, who then relays it to the player.

If nobody outside the playing site has instant access to the moves while they are being played, it becomes very difficult to provide assistance by any of the methods discussed above.

¹ A well-known example is Victor Korchnoi's complaint during the world championship match in 1978 in Bagio City regarding yoghurt that was brought to his opponent Karpov during the game. Korchnoi feared that there might be messages encoded in the flavour of yoghurt being served (strawberry for a queenside attack, peach for the kingside). It is true that the simply placing of refreshments – yoghurt, mineral water, a cup of coffee – allows one to pass on relevant chess information, encoded in the choice of refreshment and how it is actually served (e.g. the position of the spoon, where the glass is placed, etc.).

Proposal to FIDE

We are proposing a simple and easily implemented mechanism that will make computer-assisted cheating very difficult for the cheater – not completely impossible, but much more complicated and dangerous. The method blocks one channel of communication, making the other almost impossible to maintain.

The anti-cheating mechanism we are proposing requires that the moves of a game do not leave the playing hall for a certain period of time, typically for 15 minutes after they have been played.

This is done by building a relay loop in the transmission of the moves to the press room and to the Internet. If a sensor board is being used it can display the current board position inside the playing hall, but a delay module (software) will pass it on to the outside world after the given amount of time has passed. There the moves appear at exactly the tempo in which they were played – just 15 minutes later. Naturally this is completely unnoticeable for the world-wide Internet audience.

Implementing this mechanism means that any outside assistance to the players is gravely hampered. Even if the cheater is equipped with a very sophisticated reception device, his accomplices have the problem of receiving the moves from the playing venue in time to analyse the position and pass on the results to the cheater.

Naturally the organisers of important tournaments must make sure that there is no person inside the playing hall broadcasting the moves to the outside world. This can be accomplished in the following way:

1. No kind of electronic devices are allowed to enter the playing hall, and offenders are heavily penalised.
2. Make it a breach of etiquette for spectators to enter and leave the playing hall repeatedly. Anyone who leaves the hall is not allowed to go to the press or other communications rooms immediately, or to inform other persons of what has just been played. The playing hall should be treated as a VIP area, where people go to watch the games for a certain period of time, and not jump in and out dozens of times during a game. It should have the atmosphere of an opera or movie theatre where this is also not possible.
3. The visitors in the playing hall can be treated to very special GM commentary using infrared earphones (not affected by radio suppression devices). If the same commentary needs to be made available to people outside the playing hall this is done using a delay-loop device that is synchronised with the move transmission.

Note that the technical implementation of the above delay mechanisms is not at all difficult and can be accomplished purely with PC software (no additional electronics required). The delay time can be set to anything, e.g. five minutes, 15 minutes, 30 minutes or a full hour. The Dutch company DGT has already developed the necessary programs.

We would like to mention that our proposal in the form presented above is tailored to big matches or match tournaments, like the World Championships in Elista and Mexico City. It can also be applied more or less to some other tournaments, like Linares or Morelia. There are

of course events where the playing conditions make it impossible, e.g. Wijk aan Zee. But still, preventing cheating (or making it much more difficult) in a number of major chess events is an important step that needs to be taken.

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Summary of urgent measures

The following catalogue is intended for top-level chess tournaments and matches, especially when they are conducted at classical time controls. Some of the measures proposed may not be suitable for lower-category events.

1. FIDE must announce that it is taking measures to prevent any suspicion of cheating, and that there will be stern penalties for anyone caught using outside assistance during a game.
2. Players are advised that they are not allowed to take any electronic devices whatsoever to the playing site. If a player needs a specific electronic device, e.g. a hearing aid, this must be registered with the arbiter and organiser in advance.
3. If a player is caught transporting any form of electronic device to the playing location he immediately forfeits the game, irrespective of whether the device can be used to communicate moves or not (i.e. a switched-off cell phone or an iPod).
4. The seconds and associates of a player are not allowed to enter the playing hall. This measure can be implemented for all categories of tournaments.
5. The audience at the event are advised that they may not take any electronic devices into the playing hall. Cell phones must be switched off, and any spectator caught operating a cell phone in the playing hall will be subject to expulsion and a stiff fine.
6. *In top-level classical chess games the moves must not leave the playing hall for a certain period of time, typically for 15 minutes after they have been played. In rapid chess games that are being broadcast the delay can be reduced to five minutes.*
7. The playing hall should be designed to prevent visual contact between the players and the audience. This is done by lighting up the stage brightly and keeping the audience area dark (as in a theatre). A glass wall may also be necessary.
8. The players in matches can only have private rest rooms if both players agree in advance to this arrangement. The toilets should be common for both players.
9. FIDE should define standard penalties for players caught cheating, e.g. a three-year ban from tournament play for first-time offenders, a life-long ban for the second time.
10. FIDE should aim at reaching a situation where top-level tournaments (later all tournaments) must install a basic catalogue of anti-cheating measures in order to receive recognition by FIDE.

There are a number of further measures that can and in the future will need to be implemented, but the above are sufficient to make cheating much harder and, quite importantly, signal to the chess world that FIDE is taking measures to improve the current situation and will not allow the game to be destroyed by dishonest players.