Participating Computer Bridge Software

for the

World Computer Bridge Championship

and the

History of these Software Programs

Summary of Participants at Computer Olympiads
See: Computer Olympiad

The following information has been mostly excerpted from the tremendous efforts and talents of **Mr. Al Levy**, who organized the World Computer Bridge Championship events, and from other sources, which have been named. The bridge community, the professional computer programmers, and sponsoring organizations are alike very grateful and thankful that Mr. Al Levy had the foresight to recognize the importance of the computer upon the game of bridge and the lasting effects the computer will wield as part of the game.

After becoming aware of the fact that a new phrase would be introduced into the English language and other languages, that of **online bridge** and an **online bridge community**, it seemed only fitting that there be also a World Computer Bridge Championship event, where such programs could be pitted not only against each other to increase the incentive to develop a better bridge computer software program, but also against human counterparts as part of the enjoyment and entertainment of the players.

Mr. Al Levy has succeeded on all counts and must be congratulated not only for his efforts and for coordinating of such events, but also for his meticulous recordings of such events.

These events have only been archived and stored on this site. For a full and more detailed description of these events, please visit the sites listed.

Acol Master or AcolMaster

Acol Master was developed by Mr. Paul Jones from the United Kingdom. Mr. Paul Jones originally wrote Acol Master to bid as the 'fourth guy' when playing bridge with friends. Eventually the ability to play was introduced.

Comments by: Mr. Paul Jones

Acol Master was written in Turbo Pascal with some 8086 assembly code to do the bits that needed faster processing on those old slow machines. It was originally designed to run in Microsoft DOS on a 286 processor with EGA graphics. This explains why it uses so few colours. It will run fine in a DOS environment under Windows 3.1, 95 and 98, provided that you're happy to dispense with the mouse. Actually, I dimly remember writing mouse support but it seems to be absent - perhaps if you tried mucking about with mouse drivers in the DOS environment, you might get it working again. Acol Master works best in full screen mode.

The program actually has a "back door" which allows you to change the way it bids.

Acol Master did not participate in any of the ACBL Computer Bridge World Championships. In the early years of computer bridge Acol Master participated in the predecessor of the Computer Bridge World Championships, which is known as the Computer Olympiad. In those days only 3-4 participants entered a competition of 10-12 boards and Acol Master was the winner of the first championship ever in 1989.

The program never competed again as the author went traveling soon after the championship. The author continued his career as a software designer for a bank. He was struck by Multiple Sclerosis and nowadays maintains a website about Multiple Sclerosis.

See: Computer Olympiad - 1989

Website: http://www.mult-sclerosis.org/AcolMasterBridge.html

Alpha Bridge

Alpha Bridge was developed by Mr. Alexander Lopatin from Russia.

Alpha Bridge did not participate in any of the ACBL Computer Bridge World Championships. In the early years of computer bridge Alpha Bridge participated in the predecessor of the Computer Bridge World Championships, known as the Computer Olympiad. Alpha Bridge finished 3rd in 1992.

Author Mr. Alexander Lopatin later joined the Bridge Baron team at Great Game Products. The ALPHA BRIDGE program used classical game tree search techniques more or less unmodified, with a 20-ply (5-trick) search.

See: Computer Olympiad - 1992

Note: The company that distributes the computer software program Jack and related Educational Bridge Software in the Netherlands is also called Alpha Bridge but has no relation to or with this program by Mr. Alexander Lopatin.

Website: None

Blue Chip Bridge

Blue Chip Bridge was developed by Mr. Ian Trackman and Mr. Mike Whittaker from the United Kingdom.

Comments by: Mr. Ian Trackman

My professional life started as a UK lawyer. After a few years in private practice and a short spell in banking, I became the in-house corporate lawyer for a group of companies in the entertainment and travel industry, eventually becoming a board director. As such, I needed to acquire a detailed understanding of computer systems and operation. I found this aspect of my work so interesting that I eventually decided to work full time in computer programming and consultancy.

I became Software Consultant to BBC Television's Computer Literacy Project, writing most of the software for "The Computer Programme", "Making the Most of the Micro" and "Computers in Control". I even appeared as a presenter in several of the programmes in the series.

In those early days before in-studio graphics systems, I produced computer graphics for a number of other BBC television programmes, including "Tomorrow's World", "Horizon", "Science Topics" and "Body Matters". I also produced animated graphics to illustrate medical lectures.

My wife Susan and I met as students and together learnt to play bridge. My interest in computer bridge started in the early 1980s as a hobby project. After a few years' intermittent work, I realised that if I wanted to produce a good program, the project would have to change from a hobby to a commercial project. As a fairly average bridge player, I would also need input from a seriously good player, which is when I teamed up with Mike Whittaker.

Comments by: Mr. Mike Whittaker

I began work spending a three-year period as an industrial development chemist in South Africa. Returning to the UK in the mid-eighties, I continued to work in the area of precious metals before leaving to spend a year driving around Africa with a couple of friends. Returning again to the UK, I started where I'd left off with the same company before leaving them again, this time for a few months in Greece with my partner, Denise. The same company re-employed me once more, but only for a month! Returning to South Africa a couple of years ago on holiday, I found that some of my work on trace element analysis was still used today.

Three friends and I taught ourselves bridge while at school. Playing cards at school was a bit frowned upon, but a sympathetic math teacher allowed us to practice in her classroom during the lunch break! Other junior players joined us and, with one or two more experienced players, our team was promoted up the East of Scotland leagues in successive years, eventually just losing the first division title to what was virtually a Scottish international team. I won the Scottish junior title with what (I think) remains a record score. Our team later went on to become British Universities champions, and lost the Scottish Men's Teams on a play-off. I was in the Scottish Junior squad twice before leaving the UK to work abroad. It was a good time for junior bridge in Scotland with players of the calibre of Les Steel and Dave Walker around, and I was lucky enough to be a member of a club with many strong players.

I've had a regular column in "Bridge Plus" magazine for some years. Two books, "Test Your Acol Bidding" and "Practise Your Acol Bidding", have appeared as a result of this. Since meeting Ian Trackman in 1995, almost all of my time has been spent developing Blue Chip Bridge. I also spend a day or two each week in the "Bridge Magazine" office in London.

Blue Chip Bridge participated in ACBL Computer Bridge World Championships where it reached the following positions:

1998	5th
1999	6th
2000	6th
2001	6th
2002	6th
2003	7th
2004	6th

Website: http://www.bluechipbridge.co.uk/

Bridge Baron

Origin of Bridge Baron

Bridge Baron is the result of over 42 years of research, passion, and intelligent collaboration with some of the brightest minds in the country. The game was originally created by Mr. Tom Throop. He has devoted more time to this subject than any other person in the world and has pioneered the development of computer bridge programs.

Mr. Tom Throop is a lifelong bridge and chess player, and also a Silver Life Master of the American Contract Bridge League. He has written the only book on bridge software, titled "Computer Bridge". In the chess world, Mr. Tom Throop has a draw against the one-time US Champion, Mr. Arnold Denker. Mr. Tom Throop also reached the rank of the 35th highest ranked postal chess player in the US.

Mr. Tom Throop knows a great deal about computers and has merged this with his passion for the game of bridge. In 1958, while working at a US Navy Lab in the District of Columbia, he programmed a Univac computer to play bridge. The machine, which had a 1,000-word memory, could play only one round before it ran out of computer power. Some years later, Mr. Tom Throop wrote some play routines using the GE time-sharing system.

Later, Mr. Tom Throop designed bridge software for Radio Shack, Apple, and Commodore computers. In the early 1980s, Mr. Tom Throop wrote the only book on bridge software, titled Computer Bridge published by Hayden Books. By 1982, Mr. Tom Throop had produced the first complete computer bridge program, BRIDGE BARON 1. Eventually, in 1985 he founded a company in Bethesda, Maryland called Great Game Products, Inc., that focused on selling his Bridge Baron software.

In 1982 Mr. Tom Throop completed the first version of Bridge Baron. In 1958 he had written a first computer bridge program, on a UNIVAC I computer at a US Navy lab in Washington, DC.

In 1983, Mr. Tom Throop published the book Computer Bridge. In 1985, he founded Great Game Products. In the present day the Bridge Baron team is formed by (among others) employees Mr. George Yanakiev and Mr. Stephen Smith from the United States. For a list of the Bridge Baron Team, please visit their website.

Bridge Baron was a participant in most of the ACBL Computer Bridge World Championships and scored as follows:

1997	1st
1998	4th
1999	7th
2000	5th
2001	5th
2002	No entry
2003	2nd
2004	2nd

In the early years of computer bridge Bridge Baron participated in the predecessor of the Computer Bridge World Championships. In those days only 3-4 participants entered a competition of 10-12 boards with Bridge Baron organizing some of the events. Bridge Baron finished

1989	4th
1990	1st
1991	1st
1992	2nd
1993	1st
1994	No competition: The very informal competition of 1994 (when several of the software programmers met privately at the Throop's residence was also won by Bridge Baron
1995	1st

In 2001, Mr. Tom Throop, Senior passed along the role of managing the company to his son, Mr. Thomas Throop, Junior. The passing of this role indicates the ongoing belief in the success of the company and its current and future products.

See: Computer Olympiad – 1990, 1991, 1992

Website: http://www.bridgebaron.com/home.html

Bridge Buff

Bridge Buff was developed by Mr. Doug Bennion from Canada.

Bridge Buff participated in ACBL Computer Bridge World Championships where it reached the following positions:

1999: 4th and also 7th in 2000

Bridge Buff did not enter the competition after 2000.

Website: http://www.bridgebuff.com/

Bridge Genii

Bridge Genii was developed by Mr. Rolf Wilson from the United States.

Bridge Genii participated in the 2nd Annual Computer Bridge World Championship sponsored by ACBL in 1998 and finished in the last position.

Website: None

Bridge King (Predecessor of Q-Plus)

In 1990 Mr. Hans Leber and Mr. Gero Scholz of Germany began developing a computer software program as a bridge training program, which they designated as Bridge King.

After several years of computer experimentation and development, Bridge King was renamed as Q-Plus Bridge, and Bridge King was discontinued.

See: Computer Olympiad – 1991, 1992

BridgeMate

BridgeMate was developed by Mr. Bob Richardson from the United States.

The software was mainly developed with the main objective to provide the user with a more experienced opponent, and Mr. Bob Richardson introduced the feature that BridgeMate peek at and view all other hands during the play of the hands.

Since this specific and particular feature of the software would not be a fair skill for a championship event, BridgeMate participated in the separate bidding contests only that were organized in the ACBL's 1997 and 1998 championships.

Note: Not to be confused with Bridgemate from
The Netherlands: http://www.bridgemate.nl/

Easy Bridge

Mr. Steven Han has developed a bridge program called Easy Bridge. The program is able to read PBN games, view PBN games, and to write PBN games (limited number of tags). It is a freeware program. This program is able to read PBN 2.0 files.

Website: http://www.easybridge.com/

Eindeloos Bridge

The firm Bridgesoft in The Netherlands has released a new version (EB6) of Eindeloos Bridge (in Dutch). This program is able to read several input formats including PBN.

Website: http://www.bridgesoft.com/

Gemini Bridge

Gemini Bridge was a program developed by Mr. Tony Guilfoyle from the United Kingdom. The designation at that time was known as Vtech.

Gemini Bridge participated only once, which was in the very first 1989 Computer Olympiad event. This software program achieved second place with another one-time entry known as AcolMaster, which placed first in the Computer Olympiad Championship.

See: Computer Olympiad - 1989

GIB – Ginsberg's Intelligent Bridgeplayer (or Goren In a Box)

GIB was developed by Mr. Matthew Ginsberg from the United States.

GIB participated in ACBL Computer Bridge World Championships where it reached the 4th position at its debut in 1997. GIB won the Championship in 1998 and 1999. GIB didn't participate in 2000 and 2001. In 2002 GIB withdrew with technical problems during the tournament after losing to both Jack and Micro Bridge in the Round Robin.

GIB's bidding is based on the data file that is distributed with Meadowlark Bridge. Unlike Meadowlark, however, GIB augments the basic bidding rules with a Borel simulation in order to provide judgment to the system.

Mr. Matthew Ginsberg was awarded his doctorate in mathematics from the University of Oxford in 1980, aged 24. He remained at Oxford for three years before moving onto Stanford, where he stayed for ten years. In 1992 he founded the Computational Intelligence Research Laboratory at the University of Oregon, a group that he led until 1996. The real test for the software program came as part of the Deep Green team, where two copies of GIB and two human players, Mr. Fred Gitelman and Mr. Brad Moss, played against four well-respected juniors in July 2000. Deep Green lost narrowly and its performance is further evidence of its continual improvement. Though it cannot yet match the top human players in a fully-fledged match most give it an 'expert' rating. Central to its success is Partition Search, a technique discovered at CIRL. Using this technique positions which have the same value in the game tree are stored together, allowing more nodes in the search space to be examined in the same amount of time and thus reducing the effect of bridge's huge branching factor. It is the only successful implementation of such brute force techniques in computer bridge. To suggest possible plays GIB uses a form of statistical analysis known as the Monte Carlo approach. This is a way of simulating a statistical process by sampling probabilities from randomly generated data. It is applied here therefore to analyze the results of card plays run as if GIB had all the information it needed. After the controversy surrounding the 2000 World Championships and Ginsberg's attempt to enter the 2001 event under a pseudonym the event is in trouble. Bridge itself is an aging game: the average age of the ACBL is now 66. Even so, Ginsberg said of GIB 'there are many straightforward additions that are likely to enhance its performance substantially'.

See: Hoogli and also Hoogli by Mr. Matt Ginsberg

Website: http://www.gibware.com/

Hoogli

Hoogli was discovered to be a copy of GIB that tried to enter the 2001 World Computer Bridge Championship. When the fraud was detected Hoogli withdrew before the event started.

Source: http://www.greatbridgelinks.com/GBLArchives/GBL010709.html

See: Hoogli and also Hoogli by Mr. Matt Ginsberg

Grand Slam Bridge

The first version of Grand Slam Bridge was developed by Electronic Arts from the United States.

Grand Slam Bridge did not participate in any of the ACBL Computer Bridge World Championships. In the early years of computer bridge Grand Slam Bridge participated in the 1993 predecessor of the Computer Bridge World Championships. At this only appearance Grand Slam Bridge finished second, with Bridge Baron taking the win.

This event did not "officially" occur or take place. The Computer Olympiad, the predecessor of the Computer Bridge World Championship, was discontinued between 1993 and 1999 since there was neither an official sponsor nor any sponsoring organization to conduct the event. It was presumably an informal event.

Advertised as:

1. Play over one billion hands of bridge with the ultimate partner.
2. Advance players will enjoy the wide range of bidding and playing skills.
3. Learning is easy with a full library of tutorial hands and hints features.
4. Flexible practice mode allows rebids, redeals replay of hands, and double dummy play.

Grand Slam Bridge
Skywaves, Inc
PO Box 364
Wyckoff, New Jersey 07481

Second Version

Grand Slam Bridge II
Electronic Arts
P.O. Box 7578
San Mateo, California 94403-7578

Conventions: 8 conventions.
Systems: 5-Card Majors & 4-card majors.
                   Hands can be viewed during play.

Website: None. Grand Slam Bridge has had 2 releases: in 1986 and the last one in 1992. Versions of the software program can be found for sale on Ebay. On the Electronic Arts website there is no reference to the program.

Website for Electronic Arts: http://www.classicgaming.com/gotcha/ea.htm

Jack

The software program Jack was developed by Mr. Hans Kuijf from the Netherlands. He began developing Jack in 2000 with objective in mind and that was to create the best computer bridge program in the world, both in bidding/play and in features.

The bridge skills of World Champion Mr. Berry Westra and Dutch top-player Mr. Wim Heemskerk resulted in a program that took the top from the start, and which is still continuously being improved and developed to meet new standards.

Jack participated in the ACBL Computer Bridge World Championships and it reached the semifinals at its debut in 2000 (placed 3rd).

After many new software features were added Jack won the title in 2001 at the 4th Annual World Computer Bridge Championship, sponsored by Microsoft Network Gaming Zone, held in Maastricht, The Netherlands, between September 1 and September 5, 2000, at the WBF's 2000 Bridge Olympiad.

The computer programming efforts and the resulting software has since retained the title of winner and has been victorious over the other computer software programs. Jack won the title in 2001, and retained the title in 2002, 2003, and 2004.

See: Computer Olympiad - 2002

Website: http://www.jackbridge.com/eindex.htm

Meadowlark Bridge

Meadowlark Bridge was written by Mr. Rodney Ludwig and Mr. David Walker from the United States.

Meadowlark Bridge participated in ACBL Computer Bridge World Championships and was the Champion in 2000. In other years it was less successful:

1997	4th
1998	6th
1999	8th
2000	1st
2001	No entry
2002	6th
2003	8th
2004	7th

Website: http://www.meadowlarksoftware.com/

Micro Bridge

Micro Bridge was developed by Tomio and Yumiko Uchida from Japan.

Micro Bridge participated in all the ACBL Computer Bridge World Championships. This software version participated in every event since it was originated and has consistently done well, never placing last except in the year 2000 nor placing first in any event, although the software achieved second place in 2001, losing to Jack.

1997	3rd
1998	3rd
1999	3rd
2000	9th
2001	2nd
2002	3rd
2003	3rd
2004	4th

Website: http://www.osk.3web.ne.jp/~mcbridge/

Oxford Bridge

Oxford Bridge was developed by Mr. Andrew Bracher from the United Kingdom.

Oxford Bridge participated in ACBL Computer Bridge World Championships only twice thus far with the results shown below:

2000   7th
2003   6th

In the early years of computer bridge Oxford Bridge participated in the predecessor of the Computer Bridge World Championships where it finished 3rd in the first championship in 1989. In 1990 Oxford Bridge had to leave the title with the only other competitor, Bridge Baron.

According to the developer: OXFORD BRIDGE has a unique Bidding Design System which allows the user to change any or all of the supplied bidding systems to meet the player's requirements. The player can even design entirely new systems from scratch! Bidding systems can be edited interactively, even while playing a hand, so the player can test out changes immediately. The powerful Bidding Commentary / Post Mortem tool can be used to trace differences between the bidding and the program's, to further refine an individual system. Opening lead style can also be defined.

Bid and Play Explanations: The program provides explanations for its bids and plays. It also tells the player what it has deduced from the bids. For each bid both a reason and a list of inferences are given. For the play, declarer's strategy is shown.

Thinking Games
Cedar Lodge, The Crescent
Pattishall, Northants, NN12 8NA
United Kingdom

Thinking Games has been working in collaboration with a new company AI Factory to bring full 3D graphics to the world of Bridge Software: http://www.aifactory.co.uk/

See: Computer Olympiad – 1989, 1990

Website: http://www.oxfordbridge.btinternet.co.uk/

Pupil

Pupil was developed by Mr. Joost Jacob from the Netherlands.

Pupil did not participate in any of the ACBL Computer Bridge World Championships commencing in 1997. In the early years of computer bridge software, a version of Pupil was entered and participated in the predecessor of the Computer Bridge World Championships designated as Computer Olympiad. Pupil entered the 1991 competition and finished 1st place together with Bridge Baron. Bridge Baron was then declared the winner, and Pupil finished second.

According to the author Mr. Joost Jacob, Pupil was simply developed for the enjoyment of being able to design the software and more or less as a hobby effort. The efforts necessary to develop Pupil caused Mr. Joost Jacob to become interested in Computer Science, which he later studied at the University in Amsterdam, The Netherlands. Mr. Joost Jacob then advanced to be a researcher in the computer science field.

See: Computer Olympiad - 1991

Website or Home Page of Joost Jacob: http://homepages.cwi.nl/~jacob/

Q-Plus Bridge

Q-Plus Bridge was developed by Mr. Hans Leber from Germany.

In the early years of computer bridge Bridge King (predecessor of Q-Plus) participated in the Computer Bridge World Championships where it finished according to the following list:

1991	3rd
1992	1st
1993	3rd

Q-Plus Bridge participated in ACBL Computer Bridge World Championships where it reached the following positions:

1997	2nd
1998	2nd
1999	5th
2000	2nd
2001	4th
2002	5th
2003	5th
2004	5th

Q-Plus Software GmbH
Heisenbergweg 44
85540 Haar/München
Germany

Website: http://www.q-plus.com/

Q-Plus Software also developed and markets Bridge Master, which is a computer program, by which the user can assume one compass direction and the computer plays all other three hands.

Website: http://www.q-plus.com/deut/brmaster/brmaster_f.htm

Q-Plus Software offers several other computer bridge software.
Website: http://www.q-plus.com/deut/overview/overview_f.htm

For example, in cooperation with Q-Plus Software GmbH, Mr. Marc Shomann, expert German bridge player and Manager of the Bridge Akademie, has developed the following two software programs:

Erfolgreich Reizen im Bridge (Successful Bidding in Bridge):
Website: http://www.q-plus.com/deut/mschomann/mschomann_f.htm

And Erfolg im Paarturnier (Success at Pair Tournaments):
Website: http://www.q-plus.com/deut/mschomann/mschomann_f.htm

Sabrina

Sabrina was developed by Mr. Pierre Cormault from France.

Sabrina made its debut in the 2003 ACBL Computer Bridge World Championships where it finished last. In 2004, the software program finished in 8th place.

Website: http://perso.wanadoo.fr/pierre.cormault/

SmartBridge

This software version was developed by Mr. Francesco Barcio. This program is able to load PBN files, and it has a nice user interface for saving PBN files. The PBN 2.0 feature ScoreTable has been implemented for comparing game results of the same deal. SmartBridge did not participate in any of the Computer Bridge World Championship events.

Copyrighted by: Smart Software - http://smartsoftware.netfirms.com/

Website: http://smartbridge.netfirms.com/index.htm

Tignum 2

A different approach was taken by Mr. Stephen Smith, Dana Nau (both of the University of Maryland) and Mr. Tom Throop (of Bridge Baron fame) in producing a program called Tignum 2. They had initially begun work on a program which they designated as Tignum in 1991, but abandoned it 'because it was poorly implemented'. Tignum 2 grew out of the remains of the original software version of Tignum. Both programs used techniques similar to Hierarchical Task Network (HTN) planning. This technique constructs strategies by 'Task Decomposition'; whereby tasks are broken down into smaller and smaller tasks until each task can be performed. Tasks are 'decomposed' using suitable methods, which are selected using an inbuilt knowledge base. Tignum 2 used this technique in declarer play; about one third of bridge itself. It was tested against the latest version of Bridge Baron, which at the time was the strongest computer bridge game and beat the program by 254 to 202 with 554 ties being dealt. Tignum 2 had never seen any of the deals before and so had had no prior training. Bridge Baron 8 then incorporated the features of Tignum 2 as its declarer play handler and entered this program in and won the 1997 World Computer Bridge Challenge in Albuquerque, New Mexico.

Comments according to the Developers
http://www.findarticles.com/p/articles/mi_m2483/is_n2_v19/ai_20914131/pg_2

Our Adaptation of Hierarchical Task Network Planning for Bridge

We built a computer program called TIGNUM 2, which uses an adaptation of HTN planning techniques to plan declarer play in Contract Bridge. To represent the various tactical schemes of card playing in Bridge, TIGNum 2 uses structures similar to HTN methods but modified to represent multiagency and uncertainty. TIGNum 2 uses state information sets to represent the locations of cards that the declarer is certain of and belief functions to represent the probabilities associated with the locations of cards that the declarer is not certain of.

Some methods refer to actions performed by the opponents. In TIGNUM 2, we allow these methods to make assumptions about the cards in the opponents' hands and design our methods so that most of the likely states of the world are each covered by at least one method. In any of our methods, the subtasks are totally ordered; that is, the order in which the subtasks are listed for a method is the order in which these subtasks must be completed. For example, figure 4 shows a portion of our task network for finessing in Bridge. Note that it refers to actions performed by each of the players in the game.

[Figure 4 ILLUSTRATION OMITTED]

To generate game trees, our planning algorithm uses a procedure similar to task decomposition to build up a game tree whose branches represent moves generated by these methods. It applies all methods applicable to a given state of the world to produce new states of the world and continues recursively until there are no applicable methods that have not already been applied to the appropriate state of the world.

Website: None
See: Bridge Baron

WBridge5

WBridge5 was developed by Mr. Yves Costel from France.

WBridge5 has been very close to the ACBL Computer Bridge World Championship title for a few times. Losing the final to Jack by 1 IMP in 2002, WBridge5 had one foot in the final of 2003 when Bridge Baron pulled a stunt and WBridge5 didn't make the final by just a few points.

1999	2nd
2000	4th
2001	3rd
2002	2nd
2003	3rd
2004	3rd

See: Computer Olympiad - 2002

Website: http://perso.chello.fr/users/y/yvescostel/

Vtech – See: Gemini Bridge

An early computer software program written by Mr. Tony Guilfoyle and entered in the 1st Computer Olympiad held at the Park Lane Hotel between August 9 – 15, 1989, in London, United Kingdom.

See: Computer Olympiad - 1989