The New Mexico High School Adventures in Supercomputing Challenge

AiS Challenge Handbook 2001 - 2002

2001 - 2002 AiS Challenge URL: http://www.challenge.nm.org

2001 - 2002 AiS Challenge Help: consult@challenge.nm.org

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Introduction to the AiS Challenge

Welcome to the 2001-2002 AiS Challenge! Team 23 from Albuquerque Academy submitted the logo shown on the jacket of this CD as their poster in the 2000–2001 Challenge program. "The Universe Will Never Be The Same" will be the official Ais Challenge logo for Tee Shirts, AiS Challenge Web Page, and all documents and publications of the 2001-2002 AiS Challenge. Their entry was chosen by a vote of last year's participants.

It's New and Improved!

This year, the Adventures in Supercomputing program formerly housed at Albuquerque High Performance Computing Center has merged with the former New Mexico High School Supercomputing Challenge to become the Adventures in Supercomputing Challenge. **While the goals and some events may be similar, this is a *new* Challenge.** This merger should result in a strong, focused program with free teacher pre-service and in-service workshops and summer institutes. Those of you who have participated in AiS or the Challenge in the past will note some changes that we believe will give better assessment feedback and recognition to all the participating teams.

Both AiS and the Challenge have discussed the merger of these two fine programs for the past several years. Last year, committees were formed to work out the details about how to handle the major differences. The staff of both groups thinks the result is the best of both programs. We look forward to your comments and suggestions for continued growth.

The Basics - What It's All About?

The main goal of the AiS Challenge is to direct students toward a greater understanding of the scientific process and to inspire career choices in mathematics, science, and engineering. The AiS Challenge is designed to provide high school students with an opportunity to solve a

scientific problem with a strong computational focus. Teams will practice the same strategies used by professional scientists working at our high tech businesses, national laboratories and universities. Throughout the program, scientists who work for Challenge organizers and sponsors provide help and support.

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Significant Dates.

There are several phases or milestones that you will work towards in the AiS Challenge. This handbook has sections that will explain the details of each one.

Each phase has a significant due date. These dates are very important. If your team doesn't complete its work by the milestone date, you will not be able to continue on with the rest of the AiS Challenge.

There will be more information about each milestone in this handbook. Remember, **YOU** are the person who is responsible for making sure that the necessary work has been completed by these dates.

The significant dates for the 2001-2002 AiS Challenge are listed below (5:00 PM New Mexico time is the actual deadline on each date unless otherwise indicated.):

Event – Milestone	**Due Date**
Online Registration	September 21, 2001
Team Entry Authorization Forms	September 28, 2001
Confirmation of enrollment and assignment to Glorieta Session	October 3, 2001
$20.00 Registration Fee	**October 12, 2001**
You have completed these milestones if you have made it to the Kickoff!	
Glorieta Kickoff – Session I (schools > 100 miles from Glorieta)	October 21, 22
Glorieta Kickoff – Session II (schools < 100 miles from Glorieta)	October 22, 23
School visits	November, 2001
Registration for Regional Workshops	December 7, 2001
Interim Reports Due	December 21, 2001
Regional Workshops	
Eastern NM University	January 8, 2002
NM State University	January 10, 2002
NM Tech	January 11, 2002
UNM	January 15, 2002
New Mexico Highlands University	January 16, 2002
San Juan College	January 18, 2002
Final Reports Due	April 3, 2002 at NOON
Deadline to Register to come to	

Event – Milestone (con't)	**Due Date**
Awards Day in Los Alamos	April 3, 2002
Regional Project Expos	
Las Cruces	TBA – April 13, 2002?
Albuquerque	TBA – April 20, 2002?
Final Judging, Los Alamos	April 23, 2002
Judging for Scholarships, Los Alamos	April 23, 2002
Awards Day, Los Alamos	April 24, 2002

Phases of the AiS Challenge

The AiS Challenge year **is divided into eight phases.** These brief descriptions give you an overview of the year.

Phase 1, Registration:

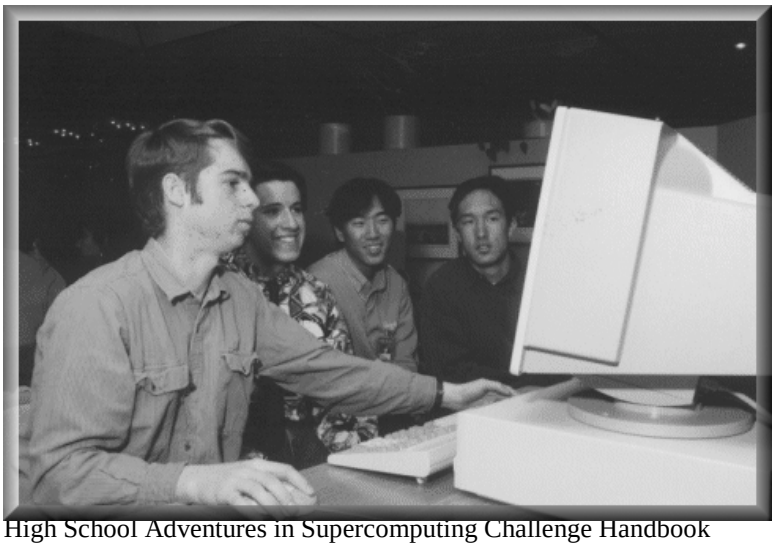
Electronic Registration is at http://www.challenge.nm.org/Glorieta. The Team Entry Authorization Form (TEAF) must be received at New Mexico Technet by 5:00 PM on Tuesday, October 3, 2001. Start preparing the abstract of your project.

See http://www.challenge.nm.org/Abstracts

Phase 2, Kickoff Conference, Glorieta, NM: October 21 - 22 or October 22 - 23.

At this two-day conference at the Glorieta Conference Center, workshops are provided that are geared to your level of experience. You will learn about searching the Internet, programming, managing your project, and how to successfully complete the AiS Challenge. Participants bring their Project Abstracts and will have opportunities to enter it electronically at the Kickoff.

***Note**: The first dates are for schools in communities more than 100 miles from Glorieta. The second dates are for those schools within 100 miles from Glorieta.*



Phase 3, School Visits: During November.

On request, AiS Challenge representatives will make a brief visit to your team at your school to help with computer lab problems and programming skills, or provide guidance with your project. Some schools may not need such visits if they have resources available locally. These visits are optional.

Phase 4, Project Refinement and Interim Reports: Friday, December 21.

Your team will submit electronically a short report that describes your project, tells about your progress to date, and states the expected results of your work.

Phase 5, Regional Workshops: one day, January 8 - January 18.

One-day workshops will be held at colleges and universities around the state. You can ask questions and get guidance on your project. See Significant Dates.

Phase 6, Final Reports and Scholarship Applications: deadline noon, April 3.

Before NOON on April 3 you will complete your project and submit a written final report. Team members who wish to submit scholarship applications must submit all requirements by this deadline.

Phase 7, Regional Expos: one day in Albuquerque, one day in Las Cruces, April 12 and 15.

Your team is expected to participate in a Regional Expo in either Las Cruces or Albuquerque. Your team will exhibit a project display board and will be interviewed by judges. Teams whose work is judged exceptional will give oral presentations to all judges as well as other teams and visitors. After these presentations, judges will select finalist teams who will be invited to compete in the Final Judging in Los Alamos for first, second, third and honorable mention awards. Certificates of Achievement and a variety of prizes for other project related competitions will be given at the Expos. In addition, Graphic and Technical Poster finalists will be selected. Greater detail is included in Project Expos that is linked from the Menu in this handbook.

Phase 8, Final Project and Scholarship Judging and Awarding of Prizes: April 23 - 24.

Based on the judges' evaluations of final reports and Expo presentations, a number of teams are selected as finalist teams. They are invited to come to Los Alamos on April 23, 2002, to describe their projects to the judges. During the 30-minute oral presentation, the judges question team members about project details.

All teams completing the AiS Challenge, will be invited to the April 24 Awards Day. You can choose to take tours of the Laboratory and talk to scientists about the many kinds of work going on at LANL and Sandia National Laboratories. You will vote on the Graphic Logo and Finalist Reports Cover Poster. You will attend the awards ceremony and celebrate at the reception buffet.

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Responsibilities

As an AiS Challenge participant, you do have responsibilities. We'll list them for you here. It's your job to read through this information and to contact us with any questions about them that your sponsoring teacher can't answer for you.

We hope you'll enjoy and benefit from all of the resources and experiences that the AiS Challenge provides. We, of course, expect you to be responsible and ethical throughout the AiS Challenge year. You must be ready to accept the consequences if you choose to act irresponsibly. Consequences for SERIOUS offenses will include your expulsion from the AiS Challenge program, immediate termination of your computer account, and a letters of explanation being sent to your principal and your parents. In addition, you might be subject to criminal prosecution or held accountable for the cost of any damages or misuse of resources that are involved.

Ethics and Behavior

We expect you to practice these AiS Challenge policies.

- Be completely honest and ethical in your letters of application, your research and programming, your references, your project reports, and any other AiS Challenge documents.

- Know and follow the rules of the AiS Challenge and of the various institutions hosting AiS Challenge functions.

- Obey all laws during AiS Challenge functions, especially those about drug and alcohol use.

- Make sure your team meets the **attendance requirements** for all AiS Challenge activities.

    - At least one teacher and one student from each team should attend the Kickoff at Glorieta.
    - Attend all your assigned classes at the Kickoff.
    - Your team must participate in your presentation to the judges at the Regional Expos.
    - If you are a finalist team, all team members will need to present the project to the judges at the Final Judging on April 23.

- If you need help, ask for it. Start with your sponsoring teacher, your team, and others at your school. Write to Consult, the Management Team for AiS Challenge. They read their mail almost 24/7 and will answer your message promptly. consult@challenge.nm.net
- Please read your AiS Challenge email at least once or twice a week. There will be Monday Morning Messages each week with reminders and hints. These will also be posted to the News Flashes on the AiS Challenge Home Page. You are **responsible** for knowing the information published in the Messages. You can forward your Challenge mail to an address you read regularly. Directions on forwarding your Challenge E-Mail can be found in the Challenge Technical Guide under Extras – E-mail.

Written Reports.

The written reports are your opportunity to organize and display your progress, your problem-solving methods, and your solution. While your research and modeling are the core of your AiS Challenge work, that aspect will be relatively useless if you don't accurately and thoroughly document your work so that others can understand it and learn from it. Even missteps and mistakes may be worth documenting if they end up answering relevant questions or were in directions that originally seemed logical and useful.

- Be sure to budget your time throughout the year and plan your work appropriately. Don't wait till just before a deadline to complete the work for that deadline. Pace yourselves.

- Consider writing up rough drafts of the introductory or research-related sections of the report as soon as you have made the necessary decisions or found the information you want to include in those parts. Starting to write is the hardest part of the writing process.

- Take deadlines seriously.

- Take careful notes on your work throughout the year so that you don't need to recreate it all from memory when you start to write the final report. This especially applies to research sources. If you jot down or print out the essential source documentation when you do the research it will there for you when you are ready to write. Further, if you need to double check a fact, you will not have to recreate the whole search.

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Rules and Requirements.

Remember that you signed the Acceptable Use Policies (AUP) when you registered for the Kickoff. There is a link to this from the Menu.

http://www.challenge.nm.org/Glorieta/aup.shtml

In general, if you're concerned that you shouldn't be accessing, reading, or sending something, don't do it. Specifically, do the following:

- Use e-mail properly (which does not include chain letters, vulgar language, pornography, or harassment of anyone).

- Stay out of unauthorized areas of any computer system. Computer hacking is illegal. Attempting to break into government computers for which you are not authorized access is a SERIOUS federal offense.

- Use the Internet access and dial-up accounts provided to you only for project-related purposes. Do not use this Internet access and the dial-up account for personal business or business related to illegal activities; publishing unsolicited advertisements of goods or services; publishing abusive, profane, or sexually offensive material; publishing information that violates the rights of others; or playing games over the Internet.

- Get the author's permission for online distribution before you electronically download or distribute any copyrighted material. Permission can be specified in the document itself, can appear on the Internet, or can be obtained directly from the author. For your legal protection, keep a hard copy of the author's consent.

- Respect all AiS Challenge participants and their right to use and enjoy the AiS Challenge computing and networking systems (in other words, don't try to keep the other participants from accessing the available computing and networking resources).

- Be aware that security managers at all computing sites that provide AiS Challenge computing services can monitor your online activities. This is not an attempt by adults to control students who should be old enough to make decisions for themselves. This is a practice of the business world, where employers monitor their employees in a similar manner. These organizations will fully cooperate with any local, state, or federal officials investigating the transmission of information to or from these sites.

- Treat all of the resources that the AiS Challenge provides with respect. Although use of the 800 numbers, circuits, computer accounts, and loaned equipment are free to you, they are costly to the AiS Challenge program. Please help us stay within the AiS Challenge budget by not wasting, abusing or misusing these resources. Use your local dial-in number rather than the 800 number, for instance.

- If you have any problems or questions related to Internet access, if you think that someone might have unlawfully accessed your account, or if your password is lost or stolen, contact consult at consult@challenge.nm.org or (505-665-4444 extension 811) **immediately**. You are responsible for all use of your accounts.

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Project Requirements.

The following rules apply to all projects for the AiS Challenge:

- Your project problem MUST represent a real science or mathematics problem from the approved list of appropriate science areas for the AiS Challenge. You must clearly demonstrate that the solution requires the use of computing resources.

- The final version of your computer application software must be written in FORTRAN, C, C++, or Java programming languages. If you wish to use another programming language, contact consult@challenge.nm.org first.

- Your project cannot involve live vertebrate animal experimentation.

- If you submit your project as a Category B (noncompetitive) project this year, you can work on the same project again next year. You must submit a final report **each** year.

- If you wish to use human subjects in your AiS Challenge project, you must get approval beforehand from the AiS Challenge Executive Committee.

Software (programs, papers) submitted during the course of the AiS Challenge competition will be the exclusive property of each participant. Each participant does grant the sponsoring organizations a nonexclusive right to reproduce, modify, use, display, and distribute such software and other material that they submit.

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Your Sponsoring Teacher's Responsibilities

Any interested and committed teacher who is employed at your school or authorized by your school district can serve as a team sponsor. You can even have two teachers who share that role. We advise that one teacher should not be the sponsor of more than three teams, especially if the teams are extracurricular.

The AiS Challenge program provides textbooks and training in the summers and throughout the year. There are also online curriculum materials, tutoring programs and textbooks at http://www.challenge.nm.org/teachers/.

Upon request, AiS Challenge staff will visit your school to do a programming workshop or assist with getting your computer lab functioning. The AiS Challenge could prove to be a good learning experience for a teacher who is somewhat new to computer technology. Teachers who are interested in the AiS Challenge and are also knowledgeable about the scientific process, mathematics, or computer science and modeling will clearly have a higher comfort level. Past AiS Challenge sponsoring teachers have been a very diverse group, including even elementary teachers and librarians.

The sponsoring teacher will serve as your mentor and supervisor throughout the competition. He or she will help you submit all forms, reports (abstract, interim, and final), and applications before their deadlines. The sponsoring teacher will arrange for transportation to remote events, ensure your attendance at AiS Challenge activities and supervise you (or arrange for an authorized substitute) at such events. Supervision includes setting standards for appropriate dress, behavior, and preparation for the event. Your sponsoring teacher can also help you find a project mentor.

The time commitment involved for the teacher will depend on the complexity of your project and on your team's experience. Please recognize that participating in the AiS Challenge as your sponsoring teacher means extra, often unpaid, responsibilities for your teacher. Rather than using their time to pursue personal interests, your teacher is willingly making it possible for you to pursue yours. Appreciate their commitment to your future, and make sure you put out your best effort — that's the best possible way to show your thanks.

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Your Team Mentor's Responsibilities

A project mentor, or an expert in the area of science you have chosen for your project, can be a great help to you throughout the year. Ideally, a mentor serves as a sounding board, a reality checker, a guide, and an inspiration. He or she shouldn't provide you with all related research information, pick your project, or develop your program model.
We consider the mentor to be very valuable contributor to a team's success in the competition. Your mentor can:

- help you brainstorm prospective problems to solve within the area of science you have selected and help you eliminate or redefine unfeasible ones (unfeasible projects could be too complex for your capabilities or for the time limits of the program),

- help you find resources (literature, network information, data, and people) related to your chosen project,

- provide information about the math and science that you need to use in your project,

- help you select the proper platform and software for the computations involved in your project,

- ask you lots of questions about the code to get you to think through the problem and possible solutions as guide and motivator.

- monitor your team's progress and make sure you set and meet milestones to keep the project on track.

We expect that your mentor will:

- show interest in your project and meet with you at regularly scheduled times,

- ask you to explain your project often (to be sure you're staying on track and not losing sight of the original problem as you wade through the research and code),

- keep sight of the milestones and deadlines and help you to meet them, and

- keep in mind that you are high school students rather than professionals or college students and assist you to simplify the highly technical information appropriately.

We hope your mentor will be at Glorieta for at least part of the Kickoff conference to get to know you and to begin talking about the project. After that, you will probably use a combination of e-mail, phone calling, and meetings to communicate with your mentor. In the past, teams who have met with their mentors regularly have done well in the AiS Challenge.

We'd like you to try to take a hand in getting one or more mentors for your team. Mentors can be parents, neighbors, employees from local businesses, schoolteachers or college professors — the possibilities are endless. How do you turn the possibilities into actual mentors? First, recognize that many people are already familiar with the AiS Challenge and will be happy to be involved in helping dedicated students like you. Those who haven't heard of the program are generally pleased to hear about a program that's got so much going for it.

There are very few people who can resist sharing information and help about a topic that they know a lot about, especially if they have an interested audience.

The point here is that you don't need to feel reluctant about asking someone to serve as your mentor. That person might be so overloaded with work that he or she can't serve as your mentor, but the person will likely feel pleased to have been asked. And perhaps he or she will be able to suggest somebody else who will be a great mentor instead.

If you don't have a mentor, ask us (consult@challenge.nm.org), and we'll help you find one.

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Project Abstract

One of the most important things that you will do at the AiS Challenge Kickoff is enter your Project Abstract electronically in one of the computer labs. The abstract is a one or two paragraph description (at least 250 words and not more than one typed page) of the problem you have chosen. In the abstract, you must clearly state:

what the problem is,
the definition of the problem,
why it is important,
the purpose of the project or what results you hope to get,
how you plan to work on it, and
the plan of action or methods you hope to use.

The abstract is helpful to both you and the judges who will review the completed projects. Preparing the abstract helps the team define exactly what its project will be. After you pin down the problem that you will solve, you must devise a plan of action, in other words, decide how you will solve the problem. This plan of action will guide your work during the year. The plan may include doing research, writing a computer program, analyzing data, talking to people in that particular field, and drawing conclusions. The judges will read each abstract to get an initial impression of the project. You can read last year's abstracts at:

http://www.challenge.nm.org/Archive/00-01/Abstracts/

Remember abstracts are short and concise. Each of the points can be covered in one or two sentences. You must also include the following: team number, school name, area of science, project name, the problem that you'll solve, and what you hope the outcome will be. Your abstract and your project must fall under the general area of science that you stated on your registration form, but you can make changes to your specific project up until you submit your interim report in December.

By the close of the Kickoff, teams should have uploaded their abstracts to the AiS Challenge machine (mode). The abstract gives the judges a baseline from which to measure your progress during the year.

Abstract Submission.

Bring a paper copy of the abstract to the Kickoff Conference. You will use it during the Team Project Development session. Before leaving the conference, enter the abstract online in the directory public_html. You must use either the pico or vi editor, OR you can bring the abstract on disk and upload the file to mode.lanl.k12.nm.us without retyping it. Be sure to send an e-mail message to your mentor to make sure that he or she will know that it has been posted.

You will find an abstract template at: http://www.challenge.nm.org/abstract.html

This is the file that will be in the public_html directories of AiS Challenge accounts. Review the text and CHECK THE SPELLING. Submit the abstract with the command:

submit abstract0102.html

AiS Challenge staff will place your abstract on the AiS Challenge web page. Teams who need assistance with their abstracts or uploading the abstract will find help with the friendly and knowledgeable AiS Challenge staff.

Figure 1: Example of an abstract:
(Team Number 25 from Animas HS was a participant in the 2000 – 2001 Challenge.)

School Name: Animas High School
Area of Science: Topology
Project Title: Topology/Geology at differing terrain levels

Abstract: As many of you know, New Mexico has a quite varying contour of terrain. Many of us live in mountainous areas, and others, in the eastern plains of our state. Whenever you travel, you will experience many changes, sometimes drastic, in terrain.

Our project is to develop a means of calculating the surface area of a certain portion of land, including many varying factors. These factors include, but are not limited to, two and three dimensional land contours. In order to do this, we are going to use an actual contour map of a certain area of land locally, and comparatively create a program for calculating basic topology. By accomplishing this goal, we may be able to further validate Bureau of Land Management maps. This program will also be handy in real world scenarios, for instance, in measuring square sections for ranch fencing and livestock grazing**.**

Team Members: David Justice, Frank Orphey, Mark Cavaliere, and Rachel Wright

Sponsoring Teacher: Ed Kerr

Project Advisor: Dr. Richard Oliver

http://www.challenge.nm.org/Archive/00-01/Abstracts/025.shtml

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Computers, Connections, and Sources for Help

After you and your team members return from the AiS Challenge Kickoff conference, you will want to make sure that you immediately try connecting to the computers at Los Alamos by using the Internet connection at your school, or by using a dial-up account.

You will need access to these computers in order to work on your project. These computers are also your contact with your project mentors, and the AiS Challenge web page,

http://www.challenge.nm.org

This is the best way to stay informed about the next AiS Challenge milestone and the Monday morning news.

Computers.

As a participant in the AiS Challenge, you have access to LANL's Pi machine, an SGI O200 running the IRIX operating system. You will also have an account on the Mode machine, which runs the LINUX operating system.

Other machines at New Mexico State University, Sandia National Laboratories, and the Albuquerque High Performance Computing Center may also be available for your use with special permission. Only those students working on projects with extraordinary computation requirements will be given access to the other machines. If you want to request an account on an additional machine, please send an e-mail message justifying your need for an account on that machine to consult@challenge.nm.org.

Connecting To the Internet Using a Dial-up Connection.

As a participant in the AiS Challenge, you have access to New Mexico Technet's dial-in Internet access. The AiS Challenge dial-up service is a standard Internet PPP dial-up connection that is good for 60 hours per month per AiS Challenge participant. You can find the instructions to set up dial-up networking on your PC from the Menu or you can go to http://www.challenge.nm.org/ctg/login/dialup.shtml.

When you dial-in to Technet modems, you establish a "session." Each session may last no longer than two hours. If you have not disconnected within two hours, you will be automatically disconnected. It is important to save your work often so that

you do not lose it if you are disconnected. After each session, you may dial again and log in for another two-hour session.

Dial-In Phone Numbers.

Whenever possible, please use local telephone numbers to dial into Technet. Teams from areas that have local dial-in numbers will not be authorized to use the 800 numbers. Using the 800 numbers costs the AiS Challenge a substantial amount of money; using the local dial-in numbers costs much less.

If you have a problem getting through on the local dial-in numbers, you should contact consult@challenge.nm.org from another connection or phone one of the AiS Consultants. Their numbers are linked from the Menu.

This chart shows the phone number that you should dial from your home area to reach the Technet computer.

City	Local Number
Alamogordo	437-4209
Albuquerque	345-8751
Artesia	746-3081
Aztec/Bloomfield/ Farmington	334-1532
Carrizozo	648-5561
Clovis	762-8673
Crownpoint	786-5602
Cuba	289-2009
Des Moines	278-2610
Española	753-3836
Gallup	726-0429
Hobbs	391-9131
Las Cruces	525-8688
Portales	356-8633
Ramah	783-4747
Raton	445-3395
Roswell	347-2568
Ruidoso	257-3441
Santa Fe/Los Alamos	827-6780
Socorro	835-6900
Taos	737-0870
Tucumcari	461-3852
Zuni	782-4409

For 800 Service call (800) 283-2638.

More information on Technet's modems is available at
http://www.nm.org/services/lcl-dial.html

Connecting to Machine Mode through Telnet.

Once you have Internet access (either dial-up access or dedicated access from your school), you can log into the Mode machine by using a Telnet program. Telnet is the primary protocol used on the Internet for ***remote login***. Remote login is the ability to connect a computer on one network to a computer on another network and have the local computer behave as if it is directly connected to the remote machine. The AiS Challenge web page has instructions on how to use the telnet command to login to Machine mode at

http://www.challenge.nm.org/ctg/login/telnet.shtml

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Interim Reports

After the Kickoff Conference, you will have until Friday, December 21, 2001, to refine your project and electronically submit your interim report. This report should describe your project, your progress to date, and your expected results.

The interim report, which must be at least 500 words in length, should expand on the information in your abstract. Please note that the interim report may not be a copy of the abstract that you submitted at the Kickoff.

The interim report should include the following information:

- the definition of the problem,
- your plan for solving the problem computationally,
- a description of the progress you have made up to this time,
- and the results you expect to get.

Interim Report Submission

Before 5:00 PM on December 21, 2001, you should:

- Begin by copying the abstract file in the **public_html** directory and calling it **interim.html** and changing the word abstract to interim wherever it occurs in the file. Then add in your interim information.
- Review the text and check the spelling.
  (http://mode.lanl.k12.nm.us/~ch099abc/interim.html)
- Submit the report with the command **submit interim.html** .

Figure 2. Example of an interim report
(Team 64 from Alamogordo HS was a finalist in the 2000 – 2001 Challenge)

Team Number: 064
School Name: Alamogordo High School
Area of Science: Artificial Intelligence
Project Title: An Investigation in Conditional Decision Making

Problem Definition:
Artificial intelligence, although initially thought to be a fanciful representation of scientific concepts with little basis in fact, has been validated and its theories affirmed through the research and analysis of the logical foundations of its principles.

Modern interpretations of the artificial intelligence theory have led scientific theorists to begin to accept the feasibility of ideas formerly thought to reside only in the realm of science fiction, such as advanced computerized decision making. In attempting this project, our group is undertaking the investigation and simulation of the concepts involving advanced computerized decision-making.

The goal of this project is to create a sophisticated computerized artificial intelligence system that enables the computer to think logically and formulate the best strategy for accomplishing a task. The computer will both make "educated guesses" in-simulation based on it's likelihood for a successful outcome, and compares this to previous attempts at success, so that the computer can successfully formulate the most effective strategy possible in a real time environment. This will empower the computer to think in the same general manner a human does in order to, in the most effective way possible, determine the best method for completing its function.

Problem Solution:
The environment in which this simulation would be conducted, is drafted from the avionics dogfight. The computer would be responsible for taking knowledge of enemy positions and previous failures/successes, and, using logical paths, decide both immediate decisions and a strategy for winning the simulation. The AI would decide the best method for flight, whereby subsequently positioning the plane behind the enemy so as to effect a kill. Using a series of "evaluators", the AI would determine the effectiveness of an action, log it, and refer to it to make the next decision. Eventually, two "intelligent" AI's will be pitted against each other in the simulation to test their interactions with each other.

Progress to Date:
Presently, a simulation has been constructed in which two players get one plane each with which to attack each other. A clear (no obstructions) 3D square map is set up in which the planes will "fly." The players start at opposite corners (in the x-y coordinate plane) of the map, and in the simulation, their goal is to destroy each other. The planes controlled by the players can move in all three dimensions, in order to out-maneuver each other and position themselves in good locations from which to effect a kill. The environment in which the planes move, the plane movement and attack algorithms, rudimentary physics, constructing/destroying planes and players, and other parts of the simulation have been coded. We also have a layout for displaying the simulation graphically through the OpenGL 3D programming API. We plan now to program Artificial Intelligence (AI) systems for the planes. Initially we will implement very simple AI: each plane will simply fly towards the other. Further development of the AI will continue in two areas, attack and evasion. Attack AI will be used to direct a plane in the most efficient way towards its target, and Evasion AI will be used to make a plane attempt to maneuver out of its attacker's line of fire as quickly as possible. The Attack AI will drive one player's plane, and the Evade AI will drive the other player's plane for testing

purposes. Eventually, both AIs could be combined, and each plane could both attack and evade the other when necessary.

Expected Results:
After programming, testing, and refining of the artificial intelligence system being created in this project, this final system could blaze the trail for future, more advanced systems that could develop the "best" solutions for any given problem much more quickly and efficiently than could a human (these decisions would often be better than those a human would make, as well, because the computer can base its choices upon many more variables than a human could comprehend). Using such a technology, many tasks could be accomplished by computers alone. This technology could be implemented in unmanned spacecraft, mechanical probes entering areas too dangerous for humans to traverse, and even in machines that would perform household tasks. Such implementations would take input from the real world and logically decide what method of action would be the best to take, just as the players in the simulation described above take input from its simulated surroundings and determine the best route to success, and just as humans take input from their surroundings and formulate the best route to accomplish their goals.

Team Members: Chris Berger, Joseph Farfel, Mathew Hoppe, Vincent Hoppe and Scott Richardson

Sponsoring Teachers: Albert Simon

Project Mentor(s):

http://www.challenge.nm.org/Archive/00-01/Interims/064.shtml

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Regional Workshops

One-day workshops will be held at locations around the state from Tuesday, January 8, 2002, through Friday, January 18, 2002. Your team will be invited to attend the session nearest your school. Your whole team and your teacher should attend the workshop. In the case of a schedule conflict, you can let us know that you will need to attend a different session on another date.

Your regional workshop will provide you with the opportunity to have questions answered, receive assistance with your projects, work on your programming skills, and discuss project progress with teams from other schools. AiS Challenge staff from Los Alamos Laboratory and from New Mexico Technet will provide training, games, problems, and presentations.

Please check the website, http://www.challenge.nm.org, for maps to these sites.

Region	Location	Date	Host
1	Eastern New Mexico University - Portales	Tues, Jan 8	Ron Oberhaus
2	New Mexico State University - Las Cruces	Thurs, Jan 10	Shaun Cooper
3	New Mexico Highlands University– Las Vegas	Wed, Jan 16	Wayne Summers
4	University of New Mexico - Albuquerque	Tues, Jan 14	Terry Babbitt
5	San Juan Community College - Farmington	Fri, Jan 18	Paull Holmes
6	New Mexico Tech - Socorro	Fri, Jan 11	Mike Topliff

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Final Reports

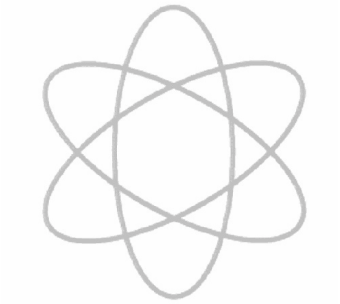
Deadline

Every team must submit a final report in either Category A (to compete for prizes) or Category B (to get feedback to use toward completing the project the following year). All reports must arrive in HARD COPY form (**no faxes – faxes do not make good copies**) at New Mexico Technet no later than NOON on Wednesday, April 3, 2002. Teams who choose Category A must also email an MS Word attachment (team_xx_report.doc) of their final report to consult@challenge.nm.org by the same deadline. The paper copy will be used for judging. The electronic copy may be used on the web page and to prepare a CD for distribution to educators. The electronic and the paper copy should have exactly the same content. **All members of any team that submits a Final Report is invited to Awards Day in Los Alamos.**

Writing the Final Report.

Before writing a report, it is important to decide what topics and information you will include. Developing an outline can be critical to your success in conveying your work to your readers. To keep readers' attention, you need to present carefully structured information that they can absorb and process without confusion.

For your AiS Challenge report, you won't need to develop an outline because we have developed one for you to use. We want to ensure that you present your work in the best possible manner. In the past, the best-written reports have followed this outline, and we strongly urge you to follow it as well. In technical reports, creativity matters far less than clarity and organization.



Remember, for you to become a finalist team with the opportunity to present your project orally, you must first sell the quality of your project through the written final report. The process of writing the report will help you prepare your information for the oral presentation and for answering the judges' questions.

The hardest part of writing a final report is starting, so if you get the introduction and description of your project on paper as soon as possible, you'll have conquered the hardest part.

Build from your interim report, using it as a first draft for your introduction and the description of your project.

Outline

Cover page - Please follow the sample and specifications shown here.

This figure of a sample cover page shows what information you should include and how you could arrange it. When you prepare your cover page, you will change the words in italics to the proper information for your team and your project.

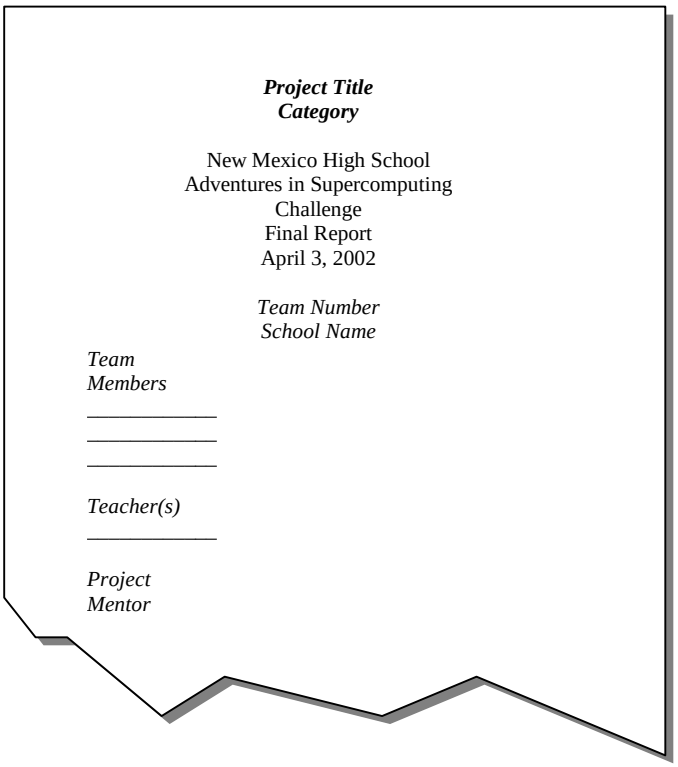


Figure 3. Format of cover page for the hard-copy final report.

Table of contents - Please include any figures, tables, and appendices.

Executive summary - An executive summary is generally read as a stand-alone document by the supervisors of a company in order to make decisions about supporting the project. Therefore, the executive summary is a brief, comprehensive snapshot of a project from its inception to its conclusion. ***In order to make it to the finals of the AiS Challenge you need to have written a concise and complete executive summary*** that

- covers the significant points of the report,
- is well-organized and very tightly written (i.e., all necessary, but no extraneous material), and
- is written in plain English rather than in technical terms.

Body of the report - The report must show that you conducted a scientific investigation, obtained results, and arrived at some conclusions. The following components are all critical to the reader's understanding of and appreciation for your work. Please be sure that you address each one clearly and completely.

- An **introduction** describes the project, the computational problem that you have investigated, your purpose in choosing it, and the problem's significance to you. It provides necessary background information to assist the reader in understanding your work.

- A **description** of the project states all the important details about the scope (limits) of your work, the materials you used, and the step-by-step methods that you used to solve your problem or incorporated into the project.

- The **results** include the data from your computer program and what you learned from doing this project. Please don't mistake graphs or figures for results. Well-designed graphs with carefully crafted captions that explain the details of the figures can be *included* as *part* of the results, but they are NOT the results. You should have a precise, detailed, and complete description of what you did or didn't discover in the course of your project.

- In your **conclusions**, you interpret your results based on the facts and evidence that you have gathered. You should show that you have thoroughly processed your results with regard to the context of the original problem that you selected. It is important to clearly state what was your most significant original achievement on the project.

- **Recommendations** are especially useful if you had to greatly narrow the scope of your project in order to complete it in the limited time that you had, if your results weren't at all what you expected to get, or if you don't believe your results to be complete or accurate.

- **Acknowledgments** (optional) give you an opportunity to thank the people who have helped you on the project (mentors, teachers, administrators, etc.).

- **Reference list** or **bibliography -** You must be sure to identify the sources from which you obtained information. You can find formats for citing the various types of printed material (books, reports, articles, etc.) in textbooks such as the *Harbrace College Handbook* (Horner et al. 1998). Several examples are provided in this handbook so that you need not go searching for another resource. It is important to be complete, accurate, and consistent. See Sample Reference Formats.

    - The sources must be listed in alphabetical order by the authors' last names.

    - The sources should be readily traceable by the reader because of the thoroughness of the information you have provided.

    - The sources should be presented in a consistent format (see samples of formats provided on the attached sheet).

- **Appendices** - One or more are optional that are referred to in the body of the report and that follow the body of the report in the order in which you refer to them in the body. They should be identified by capital letters of the alphabet and used in sequence (the exception being when you only have one appendix, in which case you just call it "the Appendix"). Appendices are used to provide information that supports your report but would serve as a distraction to your reader in the body of the text. They may include data, programming codes, charts, and tables

Essential Details

- Define technical terms.
- Define an acronym at its first use.
- Use headings and subheadings to help the reader focus on each part of the report.
- Place captions an all tables, charts, and graphics.
- Use at least a 10-point font size so that the text can be easily read**.**
- Number the pages of your report.
- Proofread carefully. Don't rely on the spell checker.

Your final report should focus on your project rather than on the experiences of your team. Be sure to follow the rules that govern the submittal of final reports. Please keep a copy of your report in case any problems arise in delivering it or copying it for the judges. Please follow these guidelines for your report:

- Use 8.5- by 11-inch paper.
- Allow one-inch margins at the top, bottom, and sides.
- Place a binder clip at the top left corner. (Please do not use any other form of binding for the report – **No Staples**!)

Carefully check your final report for spelling and typographical errors. You should have each team member check, since spelling mistakes and other errors will be counted against you. See if you can get extra credit in your English class for your report.

Sample Reference Formats.

Citing Information: Electronic Sources - Information that you obtain online should be treated in a special way in your bibliography. You must identify the type of medium that you used to get the information and include an availability statement that gives the "path" for retrieving the information.

The general form for citing electronic information is:

Author. (date). *Titl*e (edition), [type of medium]. Available.

You will notice that periods separate all of the items except edition, which is followed by a comma. The title is in italic typeface, and only the first word of the title is capitalized unless it contains proper nouns. The "type of medium" statement identifies the means of

communication that you used, such as online, CD-ROM, or disk. In the "Available" statement, be sure to give enough information to permit retrieval of the cited work. You will notice in the examples that the protocol to be used (FTP, Telnet, etc.) is stated, followed by the directory and the file name. Email citations include the message that should be used to retrieve the information. **List the actual date a web site was visited as the information might change over time.**

Do check out the interactive Cite Works Form at

http://www.oslis.k12.or.us/tutorials/cited/citeintro.html

which will automatically help create a bibliography.

If you have questions about citing a particular item, send email to consult@challenge.nm.org for help with the proper form.

Examples of citations for electronic sources:

- Kehoe, B. P. (1992). *Zen and the art of the Internet* (2nd ed.), [Online]. Available FTP: quake.think.com Directory: pub/etext/1992 File: zen10.txt
  (This example shows a work that was transferred by FTP.)

- *The educational directory* [Online]. (1992). Available: Knowledge Index File: The Educational Directory (EDUC6)
  (This example shows an individual work with no listed author.)

- Bowers, K. L., LaQuey, T., Reynolds, J. (1990, August). *FYI on where to start—bibliography of Internet working information* [Online]. Available e-mail: NISINFO@NIS.NSF.NET Message: Get RFC1175.TXT-1
  This information is taken from the book *Electronic Style: A Guide to Citing Electronic Information* by Xia Li and Nancy B. Crane.
  (This example shows an individual work with multiple authors. It was obtained by electronic mail.)

Minch, Edwin W. "*Spider*." World Book Online. July 20, 1999 <http://wbonline.worldbook.com/dynaweb/wbcoll/wboearts/IDMATCH(ID,AR524980)?DwebQuery=%22spider%22#top>.

(Format is: Author's Last Name, Author's First Name. "Title of Article." Encyclopedia Title. Date of Visit to Site <URL of Article>.)
This example shows an encyclopedia article on the Web.

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Judging Criteria

Projects are judged on overall quality and on the progress that your team makes during the AiS Challenge year. Remember that it is important to submit a project that is complete. Modest but complete results are more impressive than a grand scheme with no solid results.

When examining projects, the judges consider the scientific content; the effectiveness of the computational approach; the creativity, innovation, and initiative that you showed in developing and carrying out the project; and the clarity of your presentation.

As you prepare your project for the judging, you might want to use the following checklist of items that the judges will consider.

1. Scientific Content

- Is the scientific content significant?
- Do you have a plan or procedure for getting a solution?
- Do you clearly recognize and define the variables?
- Do you recognize when controls are needed and use them correctly?
- Do you have adequate data to support your conclusions?
- Do you recognize the limitations of the data?
- Have you shown how the project ties in with related research?
- Do you know what additional research is indicated?

2. Effectiveness of the Computational Approach

- Is your computational approach appropriate for the project?
- Is the solution workable? Unworkable solutions may be interesting, but they have no value.
- Is the solution economically feasible? Supercomputers can make computational tasks feasible that once were not.
- Have you tested your software to see how it will perform in actual use?
- Does your software solution cover the problem you defined for your project?

3. Creativity and Innovation

- Where did you get the idea for the project? Was it an original idea that you developed from reading or work that you have done, or did you derive it from a textbook?
- To solve the problem, did you devise a new solution or use a known solution in a creative way?
- In interpreting the data, have you contributed new insights or shown new intuitions?

4. Clarity, Conciseness, and Organization

- Did you state the problem clearly?
- Did you clearly explain the purpose of the project, the procedures used, and the results or conclusions of your work?
- Did you clearly show your data and results?

- Is your software documented, and have you included sufficient comments in your source code?
- Have you presented the material in a forthright manner, without tricks or gimmicks?
- Did you acknowledge all of the help that you received?

Original Code versus Borrowed Code.

You must decide whether to write your own computer code or borrow existing code. The judges might give credit to a team for writing an original program; however, teams who use existing code are not downgraded. In making this decision, you should look at your team's programming strengths, the type of code you need for the problem you are working on, and the approach that will give you the best overall solution.

If you do use borrowed code, be sure to acknowledge the originator of the code. Indicate any modifications that you make to the code and explain the purpose of the modifications.

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Regional Expos

Regional Expos will be held approximately ten days after the Final Reports are submitted. There will be an Expo in Albuquerque for teams from the Northern part of the state, and one in Las Cruces for the Southern teams. Each Category A team will prepare a Display Board Presentation of their work. Category B teams are encouraged to share their work, too. The board should reflect the content of the Final Report. For hints and ideas about designing and constructing a Display Board Presentation, visit

`http://ublib.buffalo.edu/libraries/units/sel/bio/posters.html#Designing`

For Category A teams, Judges who are familiar with your Final Report will visit your team and its Display Board and talk with all of you about your work including research, scientific methodology, computational results, and conclusions. They will ask questions to ascertain how clearly you understand your project. All team members should be able to show that they understand the work. Remember that you will have divided up the work including research, model development, programming, report writing, and the poster presentation.

Category A teams whose work is judged exceptional will give oral presentations to all judges as well as the other teams and visitors. Therefore, every team should be prepared to make a concise, ten-minute presentation that includes three minutes for questions. Top Category A teams will be invited to Los Alamos to compete in Final Judging.

Each Category B team will be interviewed by at least one judge who will have read their project report. These teams will receive encouragement and direction to continue their projects as Category A projects the next year.

All teams, A and B, may bring a separate poster for the 2002-2003 Logo contest. Teams may choose to have one of their graphics from their Display Board Presentation be their Logo Contest entry. Similarly, Category A teams may indicate on their Display Board Presentation a particular section to be considered for the 2002-2003 Technical Poster Award. Posters must be comprised of **original artwork and text**! You may not copy or borrow pictures, artwork, slogans, etc. from any outside source.

Regional Awards will be given to Category A winners. In addition, the top Category A teams will be invited to Los Alamos to compete in the finalist judging process. Additionally, Teacher Choice and Student Choice Awards will be presented. The winning Logo Contest design and Technical Poster design from each Expo will be displayed at the Final Judging in Los Alamos. Final selection of the Logo and Technical Poster winners will be decided by the students, teachers, and visitors who attend Awards Day. Every student whose team submits a

Final Report in either Category A or B is invited to come to Los Alamos for Awards Day.

All teams are encouraged to write to Consult if they would like to discuss their work after judging is completed.

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Final Judging

On April 23 the final judging for Category A (competitive) projects is held in Los Alamos. These teams are selected at the two Regional Expos. The AiS Challenge judging panel is made up of scientists and computer professionals who work in New Mexico's universities, government laboratories, and businesses. Teams are encouraged to write to Consult if they would like to discuss their work after judging is completed.

Finalists should bring the Display Board Presentation developed for the Expo to Final Judging. This gives the Judges another opportunity to study your work.

The finalist teams make 30-minute presentations of their projects to the full panel of judges on the day before Awards Day. During each finalist team's presentation, the various members of the team describe the project, demonstrating their teamwork and shared work responsibilities. See Preparing Effective Visual Aids.

There will need to be a few minutes remaining at the end of the 30-minute session to allow for questions from the judges. Try to imagine what questions the judges might ask. If you can't include that information in your presentation, be sure to prepare answers in case the questions are asked. Decide ahead of time what topics will be covered by which team members.

Teams will have connectivity to the Internet. A flip chart, VCR, overhead projector, PC and computer projection will be available. Each room has a white board. Teams need to let Consult know if they have special requirements. PowerPoint 2000 is the version that will be

loaded on the PC. Teams are welcome to bring their own systems. Remember that software is generally upwardly compatible. Files created on older versions of PowerPoint will run on 2000 but files created on MS XP may not run on 2000.
There is a preparation room for teams to use before they start setting up in the room in which their judging takes place.

Each team has 30 minutes before judging to prepare and make sure everything is working. A Consultant will be available to help iron out problems. At the end of the 30 minutes the judges will come into the room and judging will begin. At the end of the presentation and questions, the judges will move to the other room to judge the next team. Your team needs to get your presentation materials packed up and out so that the next team can get ready.

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Preparing Effective Visual Aids

Many people take in information better by eye than by ear, so a visual aid can be a powerful tool to get your message across during your presentation. The following hints can help you design effective visual aids for your presentation to the AiS Challenge judges. However, remember that your facial expression, gestures, body language, and clothing are your most fundamental and most effective visual aids.

PLAN your presentation.

- Know your audience. What kinds of information will best to show the judges what your project is about and what you accomplished?

- Know your environment. Think about how you will setup the area you and your teammates will use while you are speaking.

- **Choose** the type of visual aids that you will use.

- Overhead Transparencies

  - Advantage: Transparencies are easy to prepare. You can use overlays of additional transparencies to build a complex picture, or you can cover a series of bullets and reveal them as you speak

  - Disadvantage: Changing transparencies or losing the correct order can distract you and the audience.

  Projected Computer Images

  - Advantage: You can combine screens of information with a live demonstration of your computer software.

  - Disadvantage: Equipment failures can ruin your presentation; always have back-up visuals prepared. You may not be able to face your audience if you are seated at a computer.

- White/Chalk Board or Flip Chart

  - Advantage: You can make impromptu sketches and notes

  - Disadvantage: Information may not be visible to large audiences.

  - **DESIGN THE LAYOUT** keeping in mind that your audience must be able to see easily what you want to communicate.

- Keep each visual simple.

  - Use main points and keywords rather than sentences.

  - Place a margin on all sides to frame the information.

  - Leave adequate space between words and lines.

- Coordinate the use of color.

  - Use no more than three colors per visual.

  - Be consistent when using color (all titles should be in the same color).

  - Avoid visuals that are too dark or too light to be easily seen.

- Emphasize readability.

  - **Choose a typeface and size that can be easily read from the back of the room**.

  - Write text with both upper case and lower-case letters (all uppercase are hard to read).

  - Use bar charts to show varying quantities or to compare two or more types of data.

  - Use pie charts to show portions or percentages (identify each component).

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Awards Day

All participants who have submitted a final report are invited to the Awards Day activities at the Los Alamos National Laboratory on Wednesday, April 24, 2002. You can take tours of the Laboratory and talk to scientists about the many kinds of work going on at LANL. At Awards Day, you will choose the Logo for Tee Shirts and publications and the Technical Poster for the cover of the Final Reports for 2002-3, attend the awards ceremony, and awards reception.

Awards and Scholarships

This AiS Challenge year, scholarships and financial awards will be awarded to juniors and seniors for excellence in such areas as leadership, scientific or mathematical achievement, research, programming, and project development within a team. If you feel that you have demonstrated superior skill in one or more of these areas, you should apply for a scholarship. Students wishing to be considered MUST complete the process described.

The following school specific scholarships are available:

- One-year full-tuition scholarship to NMSU.
- One-time $2,400 financial award to UNM.
- One-time $2,400 financial award to NM Tech.
- Renewable full-tuition scholarship to NMHU - renewable up to four years.
- One-time $1,300 scholarship to ENMU.
- Renewable $1,000 Physics scholarship to NMSU - renewable up to four years
  Conditions: must major in physics at NMSU (could be a double major), must maintain GPA of 3.0 or better, AiS Challenge project must have a strong physics component.

Flexible scholarships

- Amy Beth Boulanger Memorial Scholarship: Four years/$2400 per year, restricted to seniors only. The Board of Directors of New Mexico Technet, Inc awards this scholarship.

- One time $3,000 Scholarship from Compaq will be awarded to a senior from one of the following counties: Rio Arriba, Taos, Mora, Sandoval, and San Miguel. This is a need based scholarship which can be used at any university in the United States.

- One-time $2,500 financial award from Intel to any accredited institution of higher education in New Mexico.

- One-time $500 financial award to attend any member institution in New Mexico given by the Council for Higher Education Computing Services, Inc. (CHECS); awarded by random drawing to a student or teacher present at Awards Day.

If you apply for the Amy Beth Boulanger Memorial Scholarship, you will automatically be considered for the one-time scholarships.

All scholarships are valid only through the institution's fall registration cycle for the calendar year in which the recipient graduates from high school.

Scholarship Application Process.

The deadline for applications is noon on Wednesday April 3, 2002. To apply for a scholarship you must:

- be an active member of a AiS Challenge team,

- plan to attend a four-year university in New Mexico (any CHECS member institution),

- be a New Mexico resident,

- plan to pursue a science, engineering, or mathematics major, and

- meet the university GPA requirements.

If you want to be considered for a scholarship award, you MUST submit a letter describing your contribution to the team project with an emphasis on the specific skill that you felt you demonstrated to a superior level.

The sponsoring teacher MUST endorse your letter and outline the superior skill or quality under consideration, providing examples of situations in which you exhibited it and discussing the impact that your superior skill or quality had on the project. Whereas multiple students from your team can apply for scholarships, only one student on your team should apply for a scholarship for outstanding leadership.

Your project mentor and/or other team members may also provide statements that support the superior nature of your particular skill or quality and your contribution to the team effort. It

is the responsibility of the sponsoring teacher to ensure that all documentation, including supportive statements, are mailed in an envelope to:

NM HS AiS Challenge
c/o New Mexico Technet
5921 Jefferson, N.E.
Albuquerque, NM 87109
Attention: Scholarship Competition

NOTE: Do not include any other team project documentation with this application. Both interim and final reports MUST be submitted for any member of that team to compete for a scholarship.

The scholarship applicants will be invited to appear before a panel of AiS Challenge judges to discuss their outstanding quality or skill in the context of their team project. This question-and-answer session will take place on Tuesday, April 23, 2002, in Los Alamos.

Special Awards.

Sponsors, contributors, or professional organizations may present prizes in special categories. These awards are usually trophies, plaques, or medals. Special awards have been presented by Sandia National Laboratories for ***Creativity and Innovation*** in the past.

Awards are presented for outstanding scientific projects, team leadership, and excellence in many different categories. The following awards for outstanding projects are available to participants in this year's AiS Challenge and are presented to both the team members and their sponsoring schools:

- **Awards to Team Members**

  1st Place: Each student on the team will receive a $1000.00 savings bond from New Mexico Technet.

  2nd Place: Each student on the team will receive a $500.00 savings bond from New Mexico Technet.

  3rd Place. 3rd Place award was given in 2001.

- **Awards to the Schools**

  The schools sponsoring the first- or second-place teams will receive computer equipment for the teacher of the winning team to use in the classroom. The schools sponsoring the honorable mention teams will receive computing or networking equipment for the sponsoring teacher to use in the classrooms. If a team has more

than one teacher, the AiS Challenge will provide one set of equipment to be shared. In the 2000 – 2001 year, three honorable mention awards were made.

- Electronic Search and Browse
- Environmental Modeling
- High-Performance Computing
- Judges' Special Recognition
- Multimedia Presentation
- Oral Presentation
- Poster (technical presentation)
- Logo (graphical presentation) - $200
- Teamwork
- Written Final Report
- Best Use of a Microsoft Product

If they wish, the panel of judges may award a special Judges' Recognition Award to a team that impresses the judges by the quality of its work. Any team that submits a final report in Category A or Category B will be eligible.

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Sponsors

The AiS Challenge is sponsored in collaboration among national laboratories, educational and commercial partners.

http://challenge.nm.org/sponsors.shtml

They contribute major funding to cover the cost of the Kickoff Conference in the fall and the Awards Day events in the spring. These organizations also provide time on the computers for your project work; and provide employees to conduct training sessions and advise AiS Challenge teams throughout the year. Be sure to look for sponsor representatives at the AiS Challenge activities during the year so that you can thank them!

Acceptable Use Policies

As a participant in the New Mexico High School Adventures in Supercomputing Challenge, you will have 60 HOURS of MONTHLY access to the New Mexico Technet, Inc. dial-in lines. Use of New Mexico Technet's dial-in lines, and all the provided computing systems is a PRIVILEGE, and you MUST act in a responsible and ethical way at all times.

Through these facilities, you will be able to access information on computer systems around the world. AiS Challenge participants, their parents, and their schools must understand that New Mexico Technet, Inc., and the AiS Challenge sponsors and their employees have NO control over the access to specific systems or the content of information on any system. Some systems may contain material that is inappropriate for high school students. AiS Challenge participants are strictly prohibited from accessing and using inappropriate materials. Parents of participants are asked to monitor home use of the computer systems.

AiS Challenge participants are encouraged to seek help for their projects using e-mail and other Internet resources. Bear in mind, however that the accuracy, advice, opinions, and services provided via these services and contacts are solely the responsibility of the organization or individual providing them. None of the AiS Challenge sponsoring organizations is responsible for any information that is received from any other source.

As a AiS Challenge participant, you have access to a wide array of computing facilities and information:

Dial-in connectivity and technical support: (505) 665-4444 extension 811.

Security

Each AiS Challenge participant receives an individual account and password that no one else may use. Always protect your password and the access to your account. If your password is lost or stolen or if you believe someone may have unlawfully entered your account, you must immediately notify New Mexico Technet and LANL.

e-mail: consult@challenge.nm.org
phone: (505) 665-4444 extension 811

Online Conduct

Los Alamos National Laboratory and other organizations providing access to their computing resources also have strict rules about using their facilities.

Your actions while online must always be at the highest ethical level. System and network administrators monitor all activity. Any inappropriate actions may result in your being dismissed from the AiS Challenge and your account being terminated.

Any inappropriate behavior or attempt to restrict or inhibit other AiS Challenge participants from using and enjoying the AiS Challenge computing and networking systems is strictly prohibited.

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Table of Contents

Setting Up Dial-up Networking on a PC

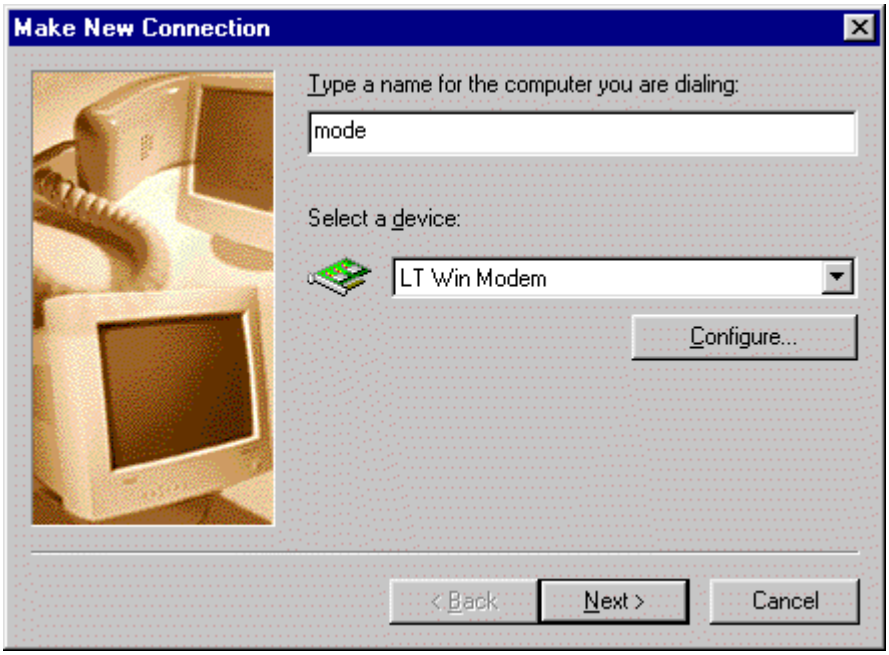
To use dial-up networking on a PC to access machine **mode.lanl.k12.nm.us** at LANL through the New Mexico Technet network, follow the example below.

Setup Step 1.

1. Click on **Start**
2. Click on **Programs**
3. Click on **Accessories**
4. Click on **Communications**
5. Click on **Dial-Up Networking** and you will see

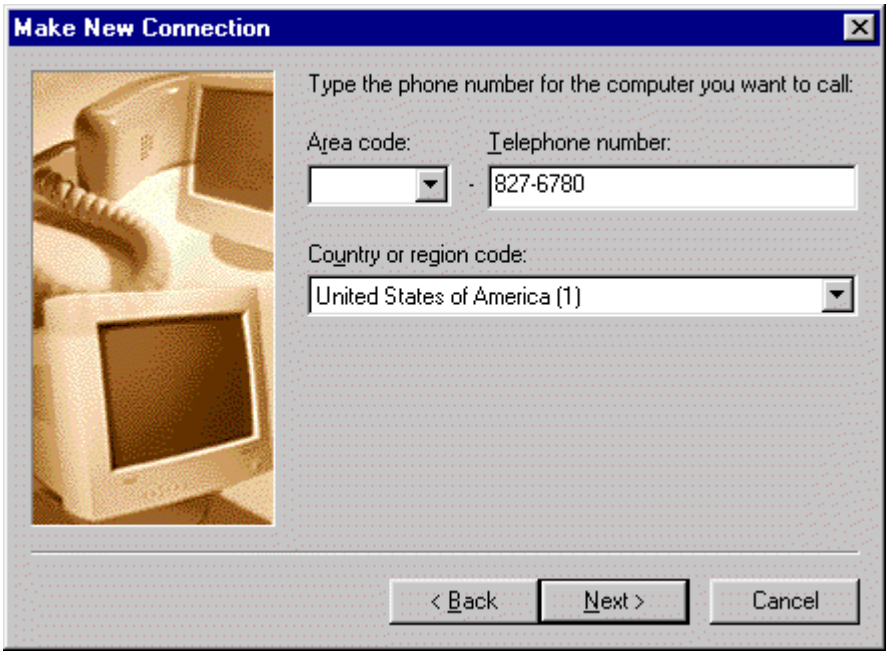
Setup Step 2.

1. Double click on the **Make New Connection** icon.
2. Enter a name for this connection, like Technet dial-up or mode. In this example we will use **mode**
3. **Select** the device (modem) you will be using.
4. Click **Next**.



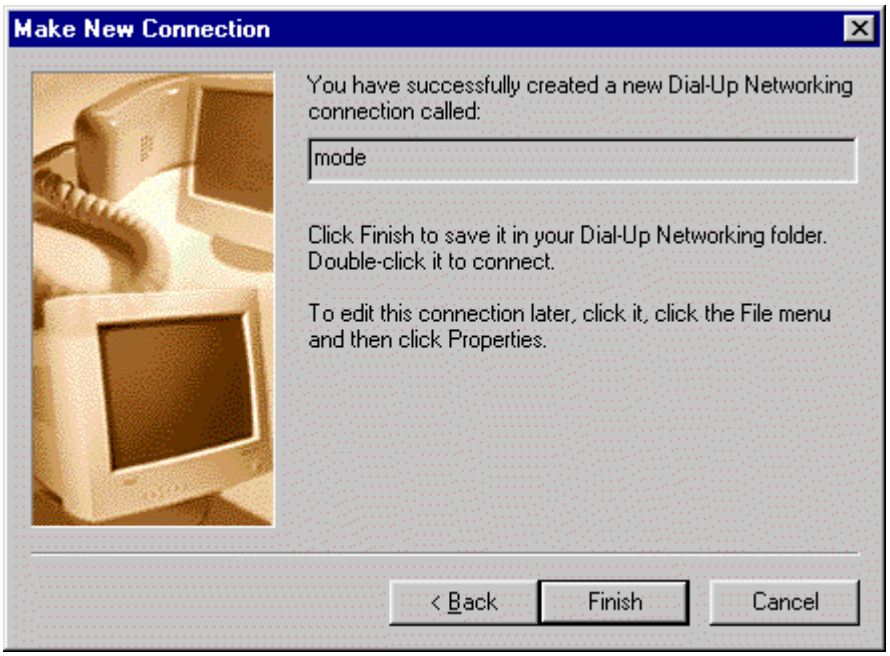
Setup Step 3.

1. Look up the local dial-up number for your area from the AiS Challenge Handbook and enter it. (You don't need to put in the area code.) We have used the Santa Fe number in this example.
2. Click **Next**.



Setup Step 4.

1. That's just about it.
2. Click on **Finish**.

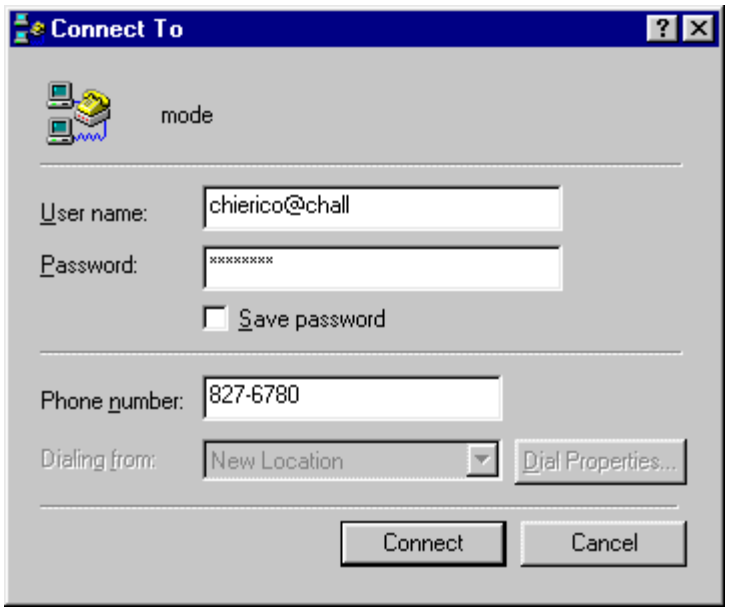


Dialing in, Step 1.

1. Click on the **mode icon** in the **Dial-Up Networking** folder.

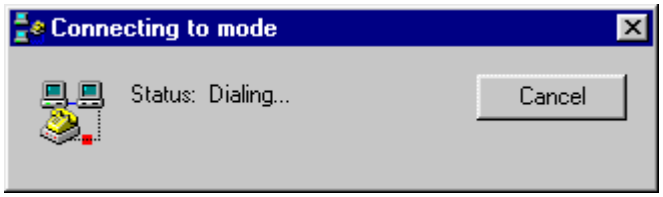
2.

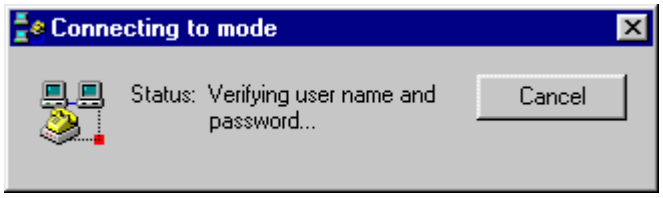
2. Enter your AiS Challenge username followed by **@chall**
3. Enter your password.
4. The phone number should already be there, from the setup.
5. Click **Connect**.

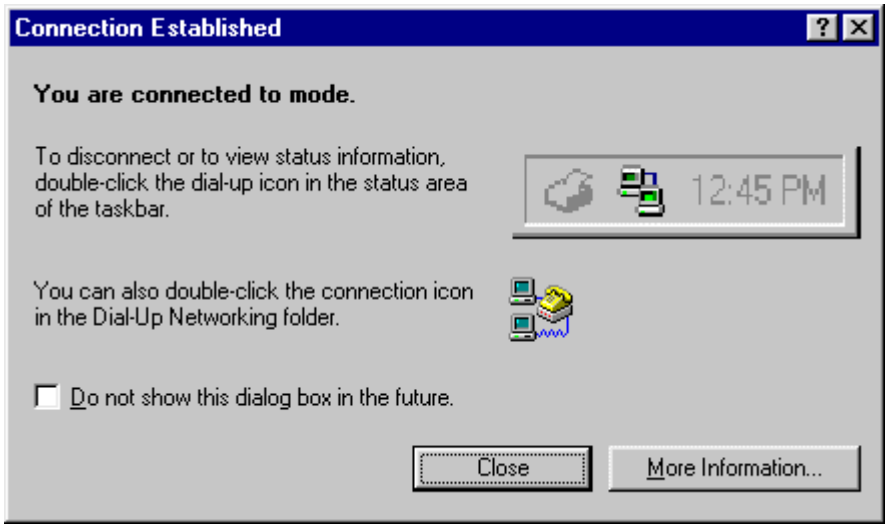


Dialing in, Step 2.

1. It should be automatic from here on.



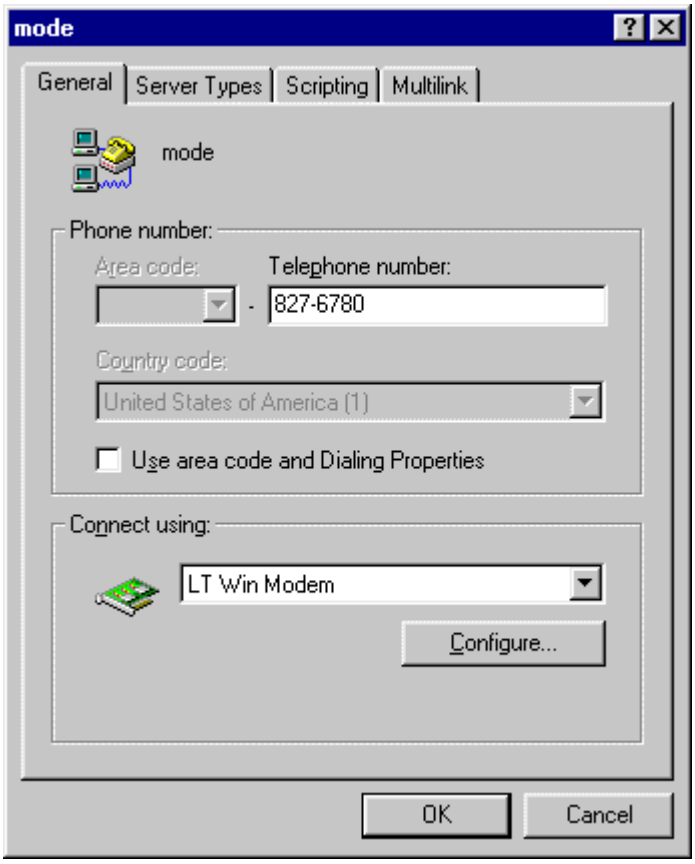




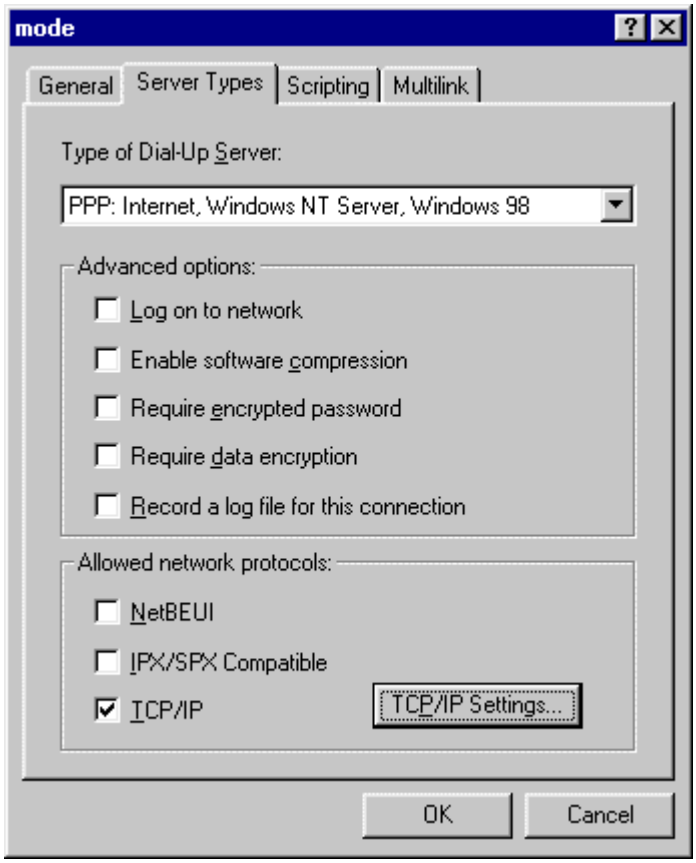
2. You can close this window.
3. You now have a connection to the Internet and can use a web browser to access Internet sites or use telnet (Start, Run, enter **telnet mode.lanl.k12.nm.us**).

Troubleshooting.

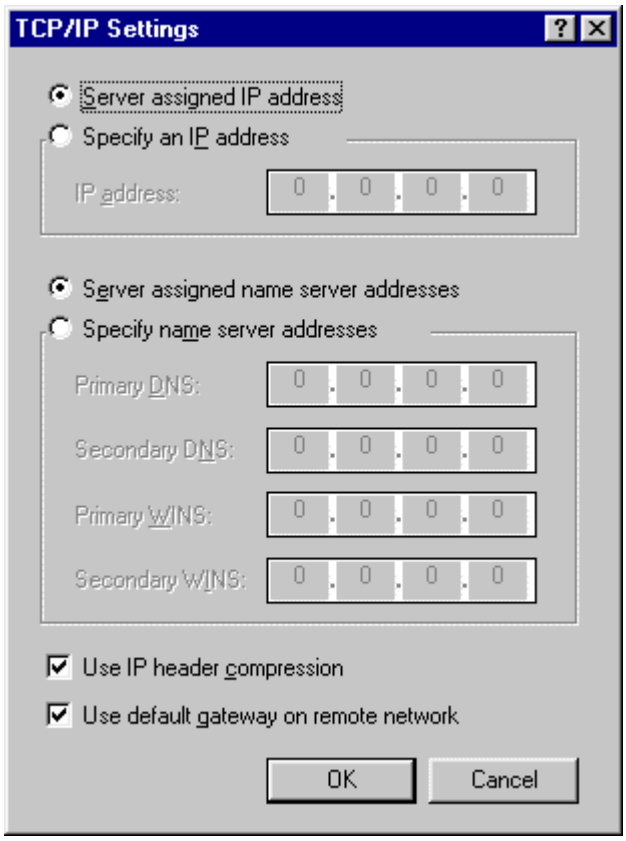
1. If things don't work correctly, highlight the **mode icon** and **right click** and select **Properties**. They should look like:



2. Click on the **Server Types** tab to see:



3. Click on **TCP/IP Settings** to see:



4. If you are still having trouble, contact consult@challenge.nm.org or call (505) 667-1019.