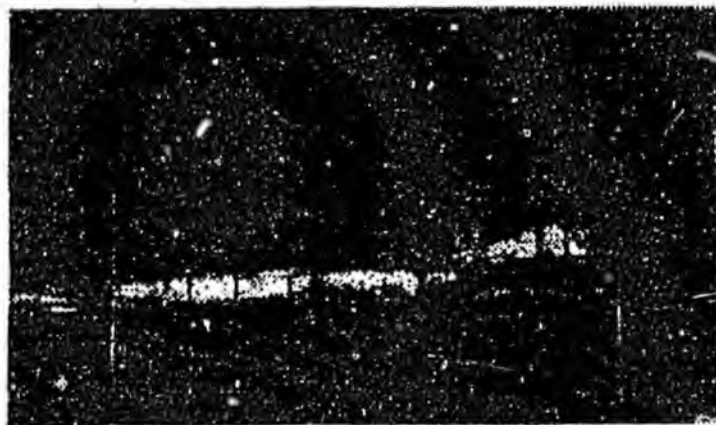


HAAARP

4/2/96

The High Frequency Active Auroral Research Program



about the HAARP Program

A scientific research facility devoted to the study of the Earth's ionosphere is being built under the HAARP program at a location in Gakona, AK. The program is jointly managed by the Office of Naval Research and the Air Force Phillips Laboratory.

Purpose and Objectives,

HAARP Fact Sheet,

HAARP Frequently Asked Questions,

HAARP in the news,

Recent Events,

HAARP Location,

Resources.

Photographs

The following photographs of the HAARP site are available in GIF format:

HAARP Temporary Operations Center,

Demonstration Prototype Antenna Array,

Transmitter Shelters,

Aircraft Detection Radar,

Overhead Photograph of the Site,

Photo Album.

The Ionospheric Research Instrument

The Ionospheric Research Instrument (IRI) is the primary tool that will be used in the HAARP program for the study of ionospheric physics.

A Comparison of IRI Phases of Completion,

The Developmental Prototype (DP),

Calculate Specific Performance,

Comparison with other high power facilities.

Search the HAARP pages for specific information

Program Milestones

The HAARP program began early in 1991 and has progressed through early conceptual phases, environmental assessment and is currently undergoing prototype evaluation. A more detailed schedule describes the work that has been completed on this effort to date.

HAARP diagnostics

Other scientific instruments will be installed on or near the HAARP site for use either in conjunction with the IRI or for independent study of the upper atmosphere. We have provided some of the data including local

weather, currently being collected by NRL's spectrum monitor at the HAARP site. Eventually, we hope to provide near real time data from other instruments and geophysical monitors operating at the site.

For more information

We have provided a list of individuals who can provide additional information about the HAARP program.

Return to the 5550 Home Page.

Send questions or suggestions via e-mail to kennedy@itd.nrl.navy.mil or leave a comment right now on our server.

Last updated January 26, 1996.



Search for Haarp

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[Internet Shopping Network](#), a one-stop shop for hardware, software, and more.

Results 1 through 10 (of the best 41), sorted from highest to lowest score:

Earthlight HomePage

-- <http://www.xyz.net/~nohaarp/earthlight.html> (Score 83, Size 63K)

This is the Earthlight Homepage . It is a publication of . Earthpulse Press . Last Updated Feb 26, 1996 .
"Pandora's Box" : An introduction to Angels Don't Play This HAARP . HAARP : Joint Services Planning Document ... (See also [Similar Pages](#))

HAARP.html

-- <http://www.peg.apc.org/~nexus/HAARP.html> (Score 83, Size 34K)

HAARP: VANDALISM IN THE SKY? . Published in Nexus Magazine, Volume 3, Number 1 (December '95-January '96) . PO Box 30, Mapleton Qld 4560 Australia. email: nexus@peg.apc.org . Telephone: +61 (0)74 429 280; Fax: +61 (0)74 429 381 . Copyright: ... (See also [Similar Pages](#))

Alternative HAARP Homepage

-- <http://www.geocities.com/CapitolHill/1606/akhaarp.html> (Score 83, Size 3K)

The Alternative HAARP Page . (High-frequency Active Auroral Research Program) . The Navy and Air Force official line is that HAARP is a harmless project to study the Aurora Borealis for communications purposes. . EISCAT in ... (See also [Similar Pages](#))

<http://server5550.itd.nrl.navy.mil/projects/haarp/faq.html> ---

-- <http://www.tezcat.com/octopus/HAARP/HAARP.faq> (Score 83, Size 5K)

HAARP Frequently Asked Questions ----- Please use our comment page to submit a question. Or use the e-mail address below and we will add your question to this page. ... (See also [Similar Pages](#))

HAARP Main Page

-- <http://server5550.itd.nrl.navy.mil/projects/haarp/haarpindex.html> (Score 82, Size 3K)

The High Frequency Active Auroral Research Program . About the HAARP Program . A scientific research facility devoted to the study of the Earth's ionosphere is being built under the HAARP program at a location in Gakona, AK. The program ... (See also [Similar Pages](#))

CountryJournal21SEP95

-- <http://server5550.itd.nrl.navy.mil/projects/haarp/news/crcj995p1.html> (Score 82, Size 4K)

From the Copper River Country Journal . September 21, 1995 . Part 1 of 2 . THE HAARP SITE on the Tok Road held a coffee and Open House last weekend, and over 80 people logged in their names in the visitor guest book. Some were just ... (See also [Similar Pages](#))

TOP CENSORED NEWS STORIES OF 1994!

-- <http://censored.sonoma.edu/ProjectCensored/Stories1994.html> (Score 82, Size 33K)

For Release: April 3, 1995 Contact: Mark Lowenthal 707/664-2893 . (Editor's note: A national panel of media experts annually selects the top ten under-reported news stories of the year.) . The Deadly Secrets of the

Barry Byrne - WF3 - HAARP Page

-- <http://www.alaska.net/~babyrne/wf3haarp.htm> (Score 81, Size 7K)

The HAARP Project, Fact & Fiction . Recently I have run into several people who keep telling me about the shameful things the United States Government is doing here in Alaska. Their most worrisome thing is the High Frequency Active Auroral ... (See also [Similar Pages](#))

HAARP Prototype Array

-- <http://server5550.itd.nrl.navy.mil/projects/haarp/HaarpSite.html> (Score 81, Size 1K)

The HAARP Prototype Antenna Array . This is the Developmental Prototype (DP) of the HAARP Ionospheric Research Instrument. It consists of 48 antenna elements arranged as 8 rows by 6 columns. Construction of the DP antenna array was ... (See also [Similar Pages](#))

H.A.A.R.P.

-- <http://www.io.com/~throne/haarp/haarp.html> (Score 77, Size 3K)

". Advances in Tesla Technology . Available from . T.H.R.O N E, . this book reveals threats to: . large scale weat'er patterns . global communications . your health . the integrity of your mind . control over your mental processes ... (See also [Similar Pages](#))

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Fall 1994- Project HAARP: The Military's Plan to Alter the Ionosphere

by *Clare Zickuhr and Gar Smith*

Clare Zickuhr, a former ARCO employee and ham radio operator based in Anchorage, is a founder of the NO HAARP campaign. Gar Smith is editor of the editor of Earth Island Journal.

The Pentagon's mysterious HAARP project, now under construction at an isolated Air Force facility near Gakona, Alaska, marks the first step toward creating the world's most powerful "ionospheric heater." Scientists, environmentalists and native peoples are concerned that HAARP's electronic transmitters – capable of beaming "in excess of 1 gigawatts" (one billion watts) of radiated power into the Earth's ionosphere – could harm people, endanger wildlife and trigger unforeseen environmental impacts.

The High Frequency Active Auroral Research Project (HAARP), a joint effort of the Air Force and the Navy, is the latest in a series of a little-known Department of Defense (DoD) "active ionospheric experiments" with code names like EXCEDE, RED AIR and CHARGE IV.

"From a DoD point of view," internal HAARP documents state, "the most exciting and challenging part of the experiment is its potential to *control* ionospheric processes" for military objectives [emphasis in the original]. According to these documents, the scientists pulling HAARP's strings envision using the system's powerful 2.8-MHz megahertz (MHz) beam to burn "holes" in the ionosphere and "create an artificial lens" in the sky that would focus large bursts of electromagnetic energy "to higher altitudes... than is presently possible." The minimum area to be heated would be 50 km (31 miles) in diameter.

The initial \$26 million, 320 kW HAARP project will employ 360 72-foot-tall antennas spread over four acres to direct an intense beam of focused electromagnetic energy upwards to strike the ionosphere. The Earth's ionosphere is composed of a layer of negatively and positively charged particles (electrons and ions) lying between 35 and 500 miles above the planet's surface. The next stage of the project would expand HAARP's power to 1.7 gigawatts (1.7 billion watts), making it the most powerful such transmitter on Earth. While the project's acronym implies experimentation with the Earth's aurora, HAARP's public documents make no mention of this aspect. For a project whose backers hail it as a major scientific feat, HAARP has remained extremely low-profile – almost unknown to most Alaskans, and the rest of the country.

A November 1993 "HAARP Fact Sheet" released to the public by the Office of Naval Research (ONR) stated that the Department of Defense (DoD)-backed project would "enhance present civilian capabilities" in communications and "provide significant scientific advancements." However, while previous DoD experiments with smaller high frequency (HF) heaters in Puerto Rico, Norway and Alaska were conducted to "gain [a] better understanding" of the ionosphere, internal HAARP documents obtained through the Freedom of Information Act (FOIA) reveal that the project's goal is to "perturb" the ionosphere with extremely powerful beams of energy and study "how it responds to the disturbance and how it ultimately recovers...."

The public fact sheet describes HAARP as "purely a scientific research facility which represents no threat to potential adversaries and would therefore have no value as a military target." However, while ionospheric experiments at the government's Puerto Rico transmitter site are managed by the civilian National Science Foundation, the Journal has learned that proposals for experiments on HAARP are to be routed through the Pentagon's Office of Naval Research.

A February 1990 Air Force-Navy document acquired by the Journal lists only military experiments for the HAARP project, including: "Generation of ionospheric lenses to focus large amounts of HF energy at high altitudes... providing a means for triggering ionospheric processes that potentially could be exploited for DoD purposes...; Generation of ionization layers below 90 km [56 miles] to provide radio wave reflectors ("mirrors") which can be

exploited for long range, over-the-horizon, HF/VHF/UHF surveillance purposes, including the detection of cruise missiles and other low observables." The document concluded that "the potential for significantly altering regions of the ionosphere at relatively great distances (1000 km or more) [621 miles] from a heater is very desirable" from a military perspective.

One of HAARP's less-publicized goals is to find ways to disrupt the global communications capabilities of adversaries while preserving US defense communications. The Pentagon also wants to know if HAARP could bounce signals to deeply submerged nuclear subs by heating the ionosphere to trigger bursts of Extremely Long Frequency (ELF) radio waves.

Patents held by ARCO Power Technologies, Inc. (APTI), the ARCO subsidiary that was contracted to build HAARP, describe a similar ionospheric heater invented by Bernard Eastlund that claimed the ability to disrupt global communications, destroy enemy missiles and change weather (see sidebar). One of ARCO's patents identifies Alaska as a perfect site for a transmitter because "magnetic field lines... which extend to desirable altitudes for this invention; intersect the Earth in Alaska."

While HAARP officials deny any link to Eastlund's inventions, Eastlund has told National Public Radio that a secret military project was begun in the late-1980s to study and implement his work and, in the May/June 1994 issue of *Microwave News*, Eastlund claimed that "The HAARP project obviously looks a lot like the first step" toward his vision of surrounding the entire planet with a "full, global shield" of charged particles that could explode incoming enemy missiles.

The military implications of HAARP were further underscored in June, when ARCO sold APTI to ~~EL~~ Systems, a defense contractor noted for its work in counter-surveillance.

Electromagnetic Guinea Pigs

HAARP surfaced publicly in Alaska in the spring of 1993, when the Federal Aviation Administration (FAA) began advising commercial pilots on how to avoid the large amounts of intentional (and some unintentional) electromagnetic radiation that HAARP would generate. Despite the protests of FAA engineers and Alaska bush pilots (for whom reliable communications can be a matter of life or death) the Final Environmental Impact Statement (FEIS) gave HAARP the green light. Ironically, the FEIS also concluded that the project's radio interference would be too intense to allow HAARP to be located near any military facilities.

On November 11, 1993, Inupiat tribal advisor Charles Etok Edwarden, Jr., wrote to the White House on behalf of the Inupiat Community of the Arctic Slope and the Kasigluk Elders Conference. "Many of us are not happy with the prospect of ARCO altering the Earth's neutral atmospheric properties," Edwarden wrote. "We do not wish to be anyone's testing grounds, as the Bikini Islanders have been..." referring to Pacific Islanders subjected to radiation exposure from US atomic bomb testing. Edwarden has appealed to President Clinton to deny further funding to HAARP.

In the past, the EPA has accused the USAF of "sidestepping" the nonthermal hazards of electromagnetic pollution from powerful radar transmitters. Over the past three decades, numerous US and European studies have linked electromagnetic exposure to a range of health problems including fatigue, irritability, sleepiness, memory loss, cataracts, leukemia, birth defects and cancer. Electromagnetic radiation can also alter blood sugar and cholesterol levels, heart-rate and blood pressure, brain waves and brain chemistry.

Wildlife advocates also have cause to be concerned. The HAARP site lies 140 miles north of the town of Cordova on Prince William Sound, on the northwest tip of Alaska's Wrangell-St. Elias National Park. Since ordinary radar is known to be deadly to low-flying birds, HAARP's powerful radiation beam could pose a problem for migratory birds because the transmitter stands in the path of the critical Pacific Flyway. In addition, HAARP's ability to generate strong magnetic fields could conceivably interfere with the migration of birds, marine life and Arctic animals that are now known to rely on the Earth's magnetic fields to navigate over long distances.

The HAARP fact sheet states that "most of the energy of the high-power beam would be emitted upward rather than toward the horizon." Later on, however, the fact sheet notes that care will have to be taken "to reduce the percentage

of time large signal levels would be transmitted toward large cities." The closest large cities are Fairbanks and Anchorage.

Even if HAARP's beam were to be directed primarily at the ionosphere, people on the ground would still have reason to be concerned. According to DoD consultant Robert Windsor, clear damp nights, downdrafts and temperature inversions can cause "ducting" and "super-refracting" that can send energy beams streaming back to Earth with "a significant -- up to tenfold -- increase in field intensity."

In addition to their main beams, all electromagnetic transmitters produce large swaths of "sidelobe" radiation along their flanks. US-based PAVE PAWS over-the-horizon radars, for example, use approximately one megawatt of power to send a 420-430-megahertz (MHz) beam on a 3000-mile-long sweep. At the same time, the "incidental" sidelobe radiation from these Pentagon radars can disable TVs, radios, radar altimeters and satellite communications over a 250-mile range. PAVE PAWS radiation can also disrupt cardiac pacemakers seven miles away and cause the "inadvertent detonation" of electrically triggered flares and bombs in passing aircraft. At peak power, the energy driving HAARP could be more than a thousand times stronger than the most powerful PAVE PAWS transmitter.

HAARP's High-Level Hazards

HAARP project manager John Heckscher, a scientist at the Department of the Air Force's Phillips Laboratory, has called concerns about the transmitter's impact "unfounded." "It's not unreasonable to expect that something three times more powerful than anything that's previously been built might have unforeseen effects," Heckscher told *Microwave News*. "But that's why we do environmental impact statements."

The July 1993 EIS does, in fact, admit that HAARP is expected to cause "measurable changes in the ionosphere's electron density, temperature and structure," but argues that these disruptions are insignificant "when compared to changes induced by naturally occurring processes."

Subjecting the ionosphere to HF bombardment can ionize the neutral particles in the upper atmosphere. The HAARP Fact Sheet notes that "ionospheric disturbances at high altitudes also can act to induce large currents in electric power grids" on the ground, causing massive power blackouts. According to the 1990 Air Force-Navy document, power levels of one gigawatt and above "can drastically alter [the ionosphere's] thermal, refractive, scattering and emission character." While the ionosphere over the government's smaller HF transmitter in Puerto Rico is relatively "stable," the document notes that the ionosphere above Alaska is "a dynamic entity" where added bursts of electromagnetic energy could trigger exaggerated effects.

Writing in *Physics and Society* (the quarterly newsletter of the American Physical Society), Dr. Richard Williams, a consultant to Princeton University's David Sarnoff Laboratory, denounced ionospheric heating tests as irresponsible and potentially dangerous.

"Trace [chemical] constituents in the upper atmosphere can have a profound effect" on the formation of ozone molecules, Williams stated. It is known that altering the temperature of the ionosphere can affect the chemical reactions that produce ozone. Referring to the Montreal Protocol (the international agreement to protect the ozone layer from ozone-depleting chemicals), Williams warned that activating HAARP's ionospheric heater "might undo all that we have accomplished with this treaty."

"Look at the power levels that will be used -- 10^9 to 10^{11} watts!" Williams told the *Journal* in a recent interview. "This is equivalent to the output of ten to 100 large power-generating stations. A ten-billion-watt generator, running continuously for one hour, would deliver a quantity of energy equal to that of a Hiroshima-sized atomic bomb."

"Of course," Williams added, "they will operate in a pulsed mode [producing a series of short, powerful bursts], rather than continuously." The HAARP fact sheet states that the HF beam, which operates in the 2.8-10 MHz band, will only be used 4-5 times a year for several weeks at a time over a 20-year period. Nonetheless, Williams argued, to proceed without a full public discussion of HAARP's potential impacts runs the risk of committing "an irresponsible act of global vandalism. With experiments on this scale," Williams concluded, "irreparable damage could be done in a short time. The immediate need is for open discussion."

The HAARP Project, Fact & Fiction

Recently I have run into several people who keep telling me about the shameful things the United States Government is doing here in Alaska. Their most worrisome thing is the High Frequency Active Auroral Research Project (HAARP).

One of them was so concerned that she gave me a newsletter from her Political Action Committee, "Americans for the Constitution". This is an article I scanned in from their September 1995 newsletter. I kid you not, I didn't make this stuff up! Things I seriously question are in red. You decide who is crazy here, but in my book, these people are looney.

HAARP

This is such an important issue we've got to keep harping on it. If you've never heard of Nikola Tesla, well, now you have. He was a scientific genius, who lived into his 80's, had over 1,000 patents, is responsible for alternating current, invented the radio 9 months before Marconi did and was posthumously declared by the Supreme Court to be the actual inventor of the radio, died in the '40's, never married, was an assistant to Edison for a year and a half in the early 1900's, and has had a major impact on our lives. Every time you switch on a light you have Nikola Tesla to thank for it, and yet, there is no mention of him in contemporary history books.

Sad to say, true history has been gutted in the public schools. Perhaps if we knew what has transpired down through history we would have recognized the signs of the decline and fall of America the Beautiful long ago. Ignorant, misinformed, uneducated people are much easier to enslave than an alert, intelligent, well-read public. Part of the Communist philosophy is to focus the attention of the public on sports. Caesar said something to the effect, "Give a man 2 tickets to the circus and a pot of beans and you can do anything you want." Americans for the Constitution is competing with Monday night football. But back to Tesla.

(remark: This group meets on Monday nights at Denny's, and can't get people to come because of Monday Night Football, so I guess ABC Sports and the NFL are part of an insidious conspiracy!)

Nikola Tesla: Man Out of Time is one of the five or so books about Tesla. He did many experiments electromagnetic energy. He said he could manipulate the weather, that he could split the jet stream with standing waves, standing walls, of electromagnetic energy and stall storms causing them to spill all their moisture in one area, such as the floods in the Midwest, rather than move across the country as they normally do. He lit up the World's Fair in Chicago in 1893 (sic) with alternating current and demonstrated remote control there, and also stated in the course of his long and illustrious career that he could create earthquakes, even to the extent that he could split the earth in half. He was chided, ridiculed, belittled, discredited and laughed at by the media and the scientific community but there was always enough money from his patrons, such as J.P. Morgan, to continue his experiments and make new discoveries but never enough to bring them to fruition. Within 3 days of his death all his papers disappeared from his safe.

(remark: My grandfather once met a man who said he could cure Gout with snake oil!)

HAARP (High Frequency Active Auroral Research Project) is a Tesla transmitter, the largest in the world, and it is right here in Alaska at Gakona, and we Alaskans especially ought to be concerned about it. It consists of a 30 acre field of antennas that beam powerful radio signals into the upper atmosphere. It is also called an ionospheric heater and it disrupts the earth's magnetic field, which keeps the earth in balance with the sun and moon. What HAARP is able to do is transmit power into a focused beam that can be transferred to any place on earth. The receiving sites can then transmit their own ELF (Extremely Low Frequency) electromagnetic waves.

(remark: I couldn't let this one go, the magnetic field holds the planets in place? Gee, I always thought it was gravity! More on this at the end.)

The GWEN (Ground Wave Emergency Network) receiving towers are 299 feet high and have 100 copper wires, each 380 feet long, fanning out from the tower one foot underground. Each tower transmits a signal 200 to 250 miles in all directions, which is how far apart the wires will be when they are all completed. The official government propaganda is that in case of EMP (ElectroMagnetic Pulse) from a nuclear blast, we will still have communications capabilities. Not so. The system is vulnerable to EMP, EMP produced ground currents could decrease transmissions, and the location of every single tower is known to foreign intelligence and vulnerable to attack. Besides, we are systematically

dismantling our war making nuclear capability, so, obviously we are not planning on fighting back. So, I guess we are supposed to believe that we just want to be able to talk about it. That would be comforting. Of course, if our FAX machines are still operable we should use those because they are 80 times faster.

The potential uses of GWEN and HAARP are In the fields of weather manipulation and mind-control. In addition, these towers have sensor and tracking surveillance systems. As reported in the March issue of this newsletter, this technology can transmit subliminal voices, attack the central nervous system, simulate UFO abductions, and more. The most important thing It can do is alter the behavior of people on a massive scale invisibly, portably, and by remote.

(remark: Portably? The damn thing covers over 30 acres! I'd like to see anyone call that portable.)

There will be more articles on this subject in the future as information continues to surface. There is a book by Nick Begich (older brother of Mark) former govenor of Alaskawhich will be available at 5th Avenue Pawn in a few weeks. Also, Jim Roderick of Homer, Alaska, an expert on this subject, has some magazine interviews to be published soon.

No doubt it ties in with Operation Garden Plot. The more we learn the more we discover how utterly insidious and ruthless our shadow government is.

So, I wonder what their problem is? If HAARP can simulate UFO abductions, do mind control, and knock the planets out of kilter, what is the harm? While the Sun, Earth, and Moon are all falling into each other, via mind control we are all going to believe that we are on some flying saucer with ET going off to live with the folks out of the movie Cocoon, and we will never know what is happening. Sounds like a pleasant way to go.

To be fair, you can find out more about Americans For The Constitution [here](#). They would like some cash from you, but I think you'd be better off buying a ~~beer~~.

Take me back to **WF3**

The HAARP Prototype Antenna Array



This is the Developmental Prototype (DP) of the HAARP Ionospheric Research Instrument. It consists of 48 antenna elements arranged as 8 rows by 6 columns. Construction of the DP antenna array was completed in November 1994. The DP array is being used to evaluate the engineering design for the HAARP IRI.

Initial testing of the DP began in December 1994 and has occurred intermittently since that time. Recent test periods are discussed in the recent events page.

Return to the [\[HAARP Main Page\]](#)

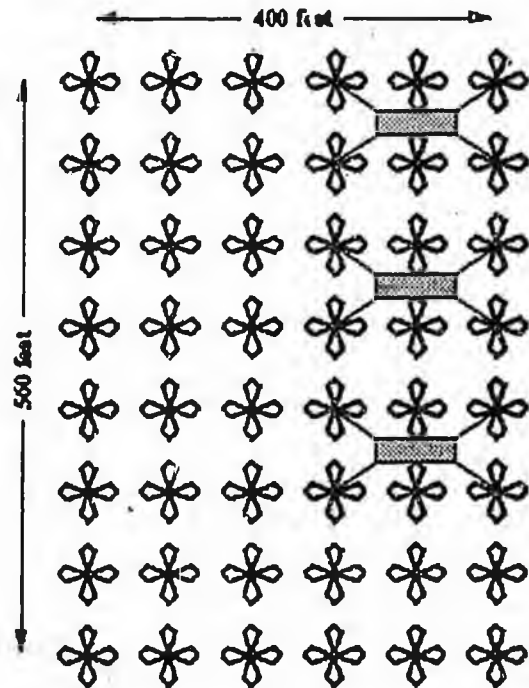
Send questions or suggestions via e-mail to kennedy@itd.nrl.navy.mil or leave a comment right now on our server.

Last updated February 6, 1996.

The HAARP Developmental Prototype (DP)

The HAARP developmental prototype (DP) is a small portion of the planned Ionospheric Research Instrument (IRI). Its purpose is to permit evaluation of the engineering design for the full size IRI prior to beginning final construction.

The DP size was determined based on minimizing the initial cost to prove the validity of the engineering design while still assembling enough of the antenna array to simulate a true array environment. An array size consisting of 48 antenna elements, arranged in eight rows by six columns was selected as an appropriate size. The following figure shows a plan view of the DP array.



HAARP Developmental Prototype Antenna Array

Each of the 48 antenna elements in the DP array consists of two crossed dipole antennas, oriented approximately North-South and East-West. There are separate crossed dipoles for the low frequency (2.8 - 7 MHz) and the high frequency (7 - 10 MHz) bands. Each of the crossed dipoles in the IRI will be driven by a dedicated transmitter, two of which are contained in a transmitter cabinet. Thus, a transmitter cabinet is dedicated to a complete crossed dipole pair. In the DP, only 18 of the 48 antenna elements are actually connected to transmitters, however, and these are shown in red in the figure presented above. All of the transmitters are housed in environmentally controlled shelters, each of which can accommodate six transmitter cabinets. The existing transmitter shelters are shown in yellow in the above figure. Primary power for each of the shelters is currently obtained from independent diesel-generator sets located adjacent to the shelters. None of the power required by the transmitters is obtained from the commercial power grid.

The HAARP DP is intended for engineering evaluation of the IRI design. Some of its expected performance capabilities are shown below.

- Frequency range: 2.8 - 10 MHz.
- Maximum radiated power: 360 kW.
- Modulation: AM/FM/PM.
- Antenna pattern beam width: 12 - 75 degrees.*
- Directivity: 10 - 21 dB.
- Effective radiated power (ERP): 65 - 76 dBW.*
- Beam steering: 30 degrees from vertical.*

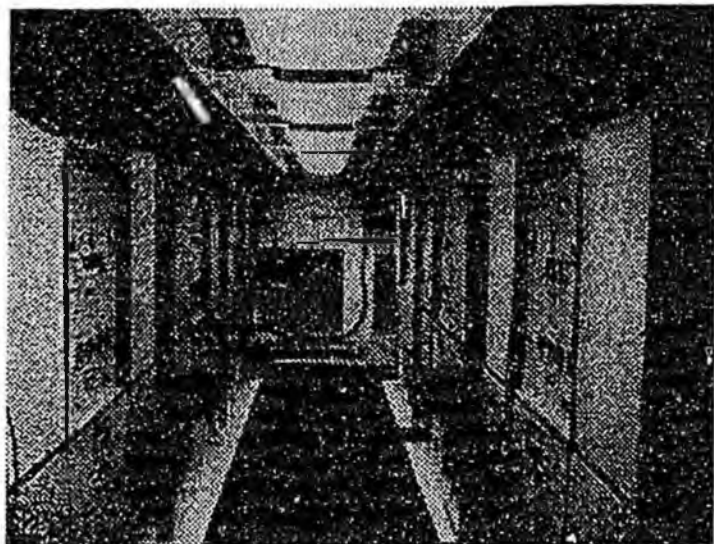
* = frequency dependent.

Return to the [HAARP Home Page](#).

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Last updated November 7, 1995.

HAARP Transmitter Shelter



A [larger image](#) is also available (88 K).

This photograph shows the interior of one of the three transmitter shelters currently in use for evaluation of the developmental prototype of the HAARP IRI. Each shelter contains six transmitter cabinets. There are two transmitters in each cabinet, one for the N-S element and one for the E-W element of a single array tower.

[\[HAARP Main Page\]](#) [\[Projects and Research\]](#) [\[5550 Home Page\]](#).

Send questions or suggestions via e-mail to kennedy@itd.nrl.navy.mil or leave a [comment](#) right now on our server.

Last updated July 17, 1995.



HAARP Spectrum Monitor

In support of the HAARP Electromagnetic Compatibility Program, NRL developed and installed a spectrum monitor at the HAARP site in Alaska. This diagnostic was initially operated during the summer of 1993 to obtain information about the spectral occupancy at the proposed HAARP location. Following completion of the Environmental Impact Process, this instrument was temporarily removed from the site and returned to NRL.

The spectrum monitor was re-installed during the DP construction phase in September 1994, so as to be available to monitor all HAARP transmissions occurring during the DP evaluation testing. During these periods, the monitor serves as the primary diagnostic for assuring compliance with the stringent HAARP specification for harmonic and spurious emissions. The monitor is automated and operates continuously, archiving data relative to spectral usage in the area surrounding the HAARP array over the frequency range 100 kHz to 1 GHz.

Currently, spectral data is transferred to NRL via telephone modem. In the future, we expect to have a higher bandwidth link to the HAARP site and near real time spectral information will be available along with data collected by the other diagnostic instruments on the site.

The spectrum monitor includes a high quality weather station to archive weather and other environmental conditions at the HAARP site.

Additional Information about the Spectrum Monitor including sample data:

Spectrum Monitor Antenna System.

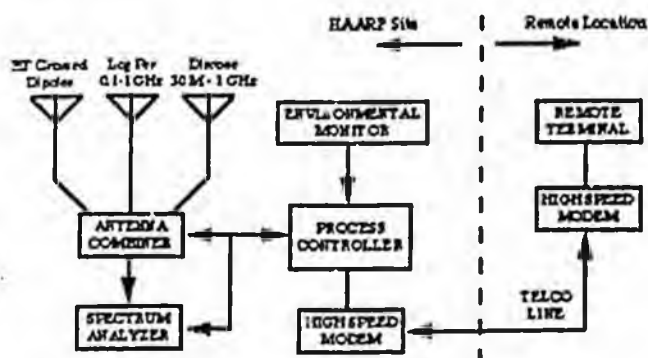
Spectrum Monitor block diagram and technical description.

Sample Spectral Plots.

Gakona Weather Information.

Spectrum Monitor Block Diagram

The spectrum Monitor is an automated data collection system. During periods when the HAARP IRI is not in use, the system observes and archives the background electromagnetic spectrum as observed at the HAARP site to maintain a data base of existing spectral usage. In addition, it monitors a variety of environmental parameters to use in evaluation of the performance and durability of external components of the HAARP IRI.



The system uses a Macintosh computer as the system controller. The computer communicates with a high quality Spectrum Analyzer (HP-8560) using standard GP-IB protocol. In normal operation, the computer monitors up to 5

bands continuously throughout the day. The computer can be controlled remotely either for downloading collected data, or for taking over control of the system for manual operation over the remote link.

Sample Spectral Plots

We have provided several sample plots of the electromagnetic frequency spectrum as observed at the HAARP site to show the type of data that is being archived by the spectrum monitor. In the future, we hope to be able to provide this information on a near real time basis.

The following plots are examples of one way to present the results of the electromagnetic surveys being collected by the spectrum monitor. The charts show the strength-time history of signals generated by other users of the spectrum in the frequency range from 1 to 30 MHz. Observed signal intensity is plotted as a function of time (in UTC) along the x-axis and frequency (in MHz) along the y-axis. (To convert UTC to local time, subtract 8 hours.) In the survey mode, signals are collected in twenty minute blocks. The plots that we have provided show the *maximum* signal observed in each frequency bin during each 20 minute period throughout the full day.

The following plots are available (approximate size is 45K):

[27April95](#)

[3May95](#)

[10May95](#)

[20Jun95](#)

The previous "Waterfall" plots are derived from individual 20 minute spectrum samples taken throughout the day in several frequency bands. Retrieve the following file for a sample of sweeps for four of the bands. These data were taken on June 14 at 1210 UTC (or 4:10 AM AKDT) and on January 28, 1996 at 2336 UTC (or 2:36 PM AKST):

[Sweep Samples \(14June95\)](#)

Weather at the HAARP Site

Part of the function of the automated spectrum monitor installed at the HAARP site is to record local environmental conditions including weather. This information is valuable in the evaluation of the performance of many of the components making up the HAARP facility, especially those that must withstand the extremes of the Alaskan climate.

Six day weather observations are available in chart format. Please select a date in the following boxes to view the applicable chart.

Month Day

Get File

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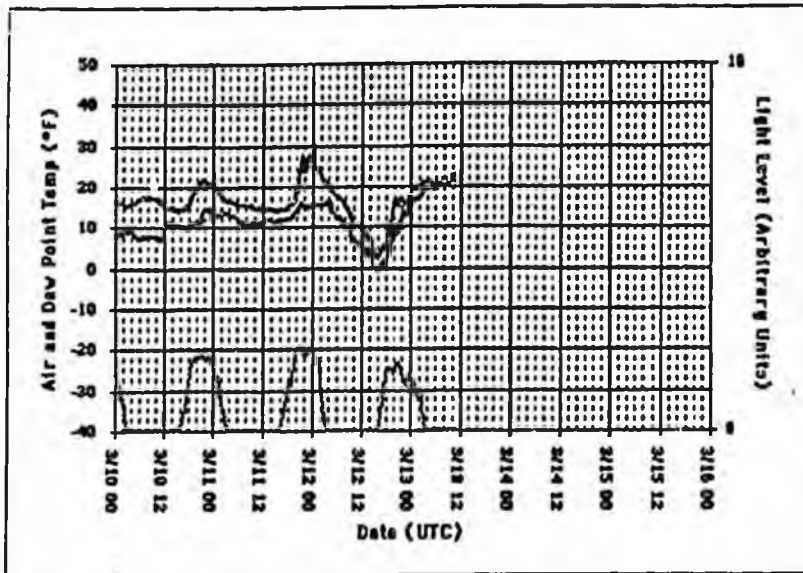
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Last updated November 19, 1995.

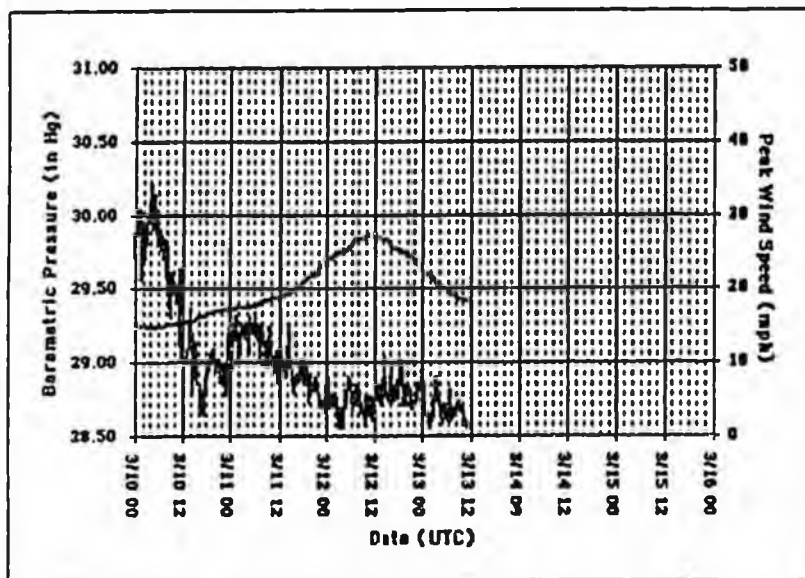
Weather at the HAARP Site

Around the Date 14 MAR 96

The following chart shows the outside air temperature (red) and dew point temperature (blue). The brown curve is a relative indication of outside light level, showing both sunrise and sunset times as well as day-to-day variations arising from cloud cover, for example. Large changes in this measurement are sometimes caused by artificial light both inside and outside.



The following chart shows barometric pressure in the blue curve and the peak wind speed observed during the previous 5 minute period in the red curve.

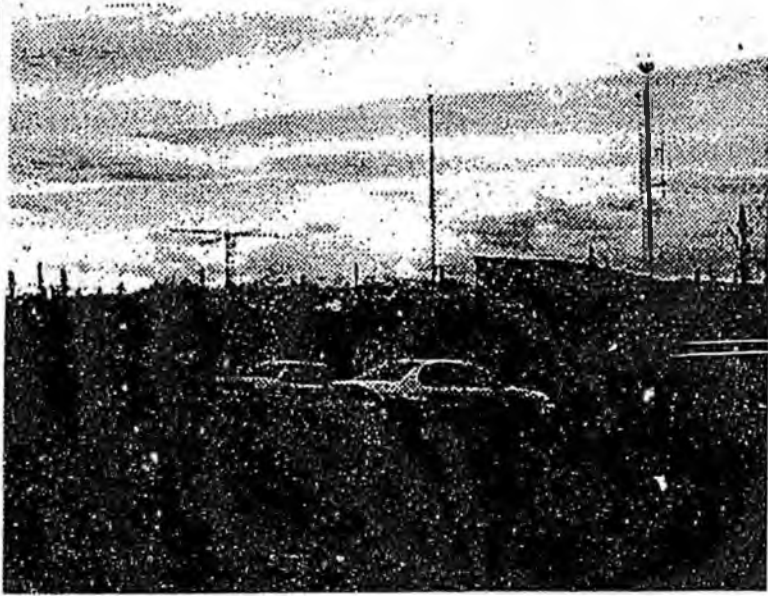


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This page was generated 3/14/96; 3:43:00 PM

Temporary HAARP Operations Center



The temporary trailers shown in this photograph house the control center for the HAARP development prototype as well as all currently installed diagnostic and scientific instruments.

The antenna masts in the background are (left to right), the Spectrum Monitor HF antennas, the spectrum monitor VHF/UHF tower, and the X-band aircraft detection radar tower.

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Last updated February 6, 1996.

The HAARP Aircraft Detection Radar



A C-band radar has been installed at the HAARP site for evaluation during the developmental prototype phase of the HAARP project. The radar will be used to disable HAARP transmissions when aircraft are detected in air space close to the array.

Initial tests of this radar have demonstrated its ability to detect all types of aircraft including small general aviation planes typically used in Alaska. The display for this radar is installed in the Temporary Operations Center.

An additional X-band radar is also being evaluated for its ability to increase safety.

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Last updated February 6, 1996.

Recent Activities

Current (Through Wednesday, March 6, 1996.)

The HAARP facility was shut down at the end of the last set of low power tests on the Developmental Prototype on November 21, 1995. No testing has been done since that time.

November 17, 1995

HAARP hosted visitors from the Geophysical Institute of the University of Alaska and Dermot Cole, a reporter from the Fairbanks Daily News-Miner. The visitors were given a tour of the HAARP facility, including a look at the diagnostic and scientific instruments now operating at the facility.

November 10 - 21, 1995

Additional tests were conducted on the developmental prototype of the HAARP IRI. The purpose of these tests was to evaluate improvements to the antenna array that were identified during July tests. This required testing the array over the full operating frequency range of the IRI array. Testing was set up such that the time spent on any given frequency was less than 1 milli-second at a maximum power level of less than 10 Watts total ERP. Some additional testing on fixed frequencies was conducted at higher power levels.

October 19, 1995

Professor Michael Kelley of Cornell University was interviewed on the talk radio program "Coffee Talk," on Public Radio Station KCHU in Valdez, AK. Dr Kelley discussed various aspects of the scientific research that is planned for the HAARP facility with radio host Dick Reichman, and answered questions from telephone callers in the Valdez/Copper Valley region

October 4, 1995

HAARP program manager, John Heckscher and a representative from Phillips Lab, Rich Garcia, were interviewed during the talk radio program "Coffee Break." This program, which is aired by Valdez public radio station KCHU, is hosted by Dick Reichman. The program was extended to an hour and a half so that Mr. Heckscher could respond to questions from callers in the KCHU coverage area.

September 18 - 20, 1995

A second radar system operating at X-band was installed and tested to evaluate its ability to supplement the detection characteristics of the primary S-band system already installed at the site. These radars will be used for the purpose of shutting down the IRI transmitters when aircraft are detected in the area.

September 18, 1995

The Glennallen High School Physics class spent nearly four hours at the HAARP site. The field trip included a tour of the IRI prototype and a look at the diagnostic and scientific instruments now operating at the facility. Professor Kelley answered many interesting and thoughtful questions on the physics of the ionosphere and the types of research to be conducted at the site.

September 17, 1995

The first HAARP open house was held at the Gakona site. Approximately 100 visitors from all over the state of

Alaska attended. In addition to tours of all the HAARP facilities, Professor Mike Kelley of Cornell University was present to answer questions about the ionosphere and about how HAARP will be used to further our understanding of it.

July 22 - 31, 1995

Additional tests were conducted on the developmental prototype of the HAARP IRI. The purpose of these tests was to evaluate the performance of the antenna matching units over the complete operating frequency range of the IRI array. Testing was set up such that time on any given frequency was less than 1 milli-second at a maximum power level of less than 100 Watts total ERP.

April 7, 1995

A briefing on the technical and programmatic aspects of the HAARP system was given to the Anchorage Amateur Radio Club during the regular monthly meeting.

April 5 - 12, 1995

The development prototype of the HAARP IRI was tested to evaluate how well it performs relative to the contract requirements. Tests were conducted at various times during this period at fixed, assigned frequencies between 4 and 10 MHz. All power levels up to the maximum allowed by the frequency assignment were utilized and the prototype was tested for specified modulation performance. Other items evaluated were antenna pattern steering, harmonic suppression and control system response.

The S-band aircraft detection radar was evaluated in a series of runs using a small, general aviation aircraft flying at three different altitudes and along multiple bearings.

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Last Updated March 6, 1996.

Location of the HAARP Site



The HAARP research facility is located near mile 11 on the Tok highway, near the village of Gakona in South-Central Alaska. The map below shows its position relative to other locations in Alaska.



[Larger version](#) of this image (jpeg 24K) is also available.
The geographical coordinates of the HAARP site are:

62 deg 23.5 min North Latitude
145 deg 8.8 min West Longitude

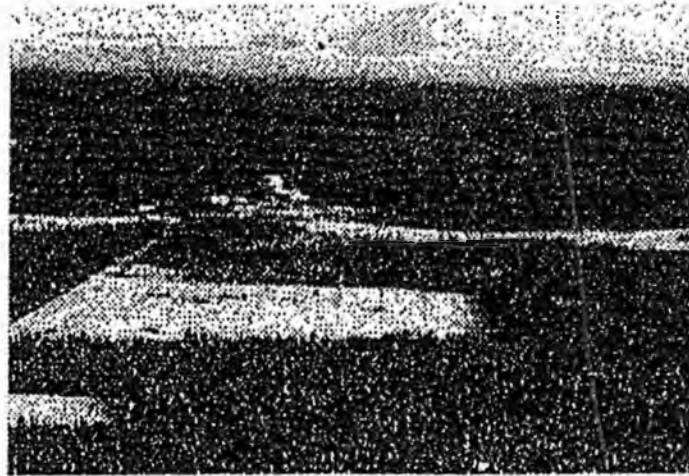
This places the site about 160 miles northeast of Anchorage and about the same distance southeast of Fairbanks.

[HAARP Main Page](#) | [Projects and Research](#) | [5550 Home Page](#).

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Last updated October 4, 1995.

Aerial View of the HAARP Array



This is an aerial view, looking east, of the HAARP Developmental Prototype Array located near Gakona, Alaska. The small pad in the lower left corner of the photograph is being used for the two Riometers currently operating at the site.

The larger pad in the lower center of the photograph contains the 48 element Developmental Prototype of the HAARP Ionospheric Research Instrument.

The Aircraft Detection Radar is located along the road, just beyond the lower left corner of the photograph.

The mountain in the background is Mt. Sanford, part of the Wrangle-St. Elias Park.

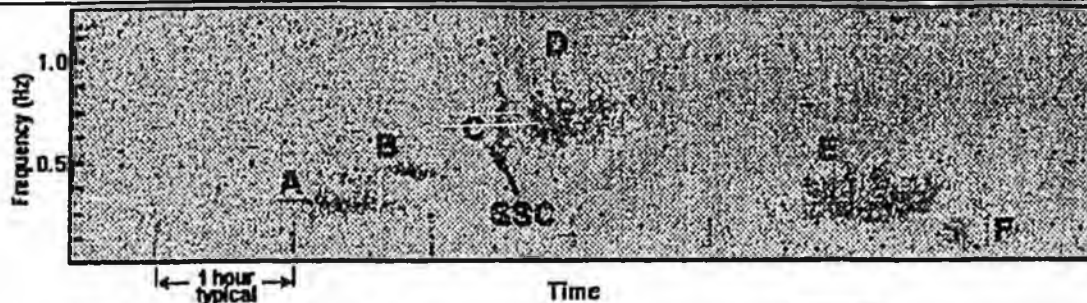
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Last updated February 6, 1996.

GEOPHYSICAL INSTITUTE MAGNETOMETER STUDIES

INDUCTION MAGNETOMETER SPECTROGRAM



Spectrogram of a suite of Pc1 pulsations which occurred on 29 July, 1977 recorded by the induction magnetometer project at the Geophysical Institute. From left to right the signals are: (A), (B), (C) structured Pc1 in the afternoon sector; (D) hydromagnetic chorus stimulated by the SSC (arrow); (E) evening sector substorm emissions finishing with IPDP (F). A study of these waves was published by J. Olson in the Journal of Geophysical Research in 1982.

(An audio WAV or AU file (245 K) of this data is also available.)

🔊 Excellent TRUE SPEECH technology! The true speech audio file is only 23K - true speech enabled users can listen to it in "real-time" with a 14.4K modem or better!

🔊 Items marked with this symbol were added or updated on Nov 27, 1995. 🔊

Overview

The data above represent one aspect of the magnetometer studies carried out at the Geophysical Institute, University of Alaska for over 25 years. From the late 1950's and up to the IMS program in the late 1970's analog recordings were made on a continuous basis. By 1980 digital recordings of the local field were being made using both induction and fluxgate magnetometers.

During the IMS the Alaska-Canada Meridian Chain of magnetometers and riometers was established and digital data were collected. Data from these stations are recorded in real time by the Space Environment Lab (SEL) in Boulder, Colorado. The data are kept on-line for approximately one month and are then archived at the World Data Center.

Current programs include regular recording of data from field sites throughout Alaska and the world. These data are currently archived at the Geophysical Institute.

Magnetometer Programs

The following projects, headed by Dr. John Olson, UAF Physics Department, are sites where magnetometer data are, or have been, acquired in digital format. These data are available upon request.

🔊 ALASKA-CANADA MERIDIAN CHAIN PROJECT (map)

- 🔊 Talkeetna, AK
- 🔊 College, AK
- 🔊 Fort Yukon, AK

- Arctic Village, AK
- Cape Parry, NWT
- Sachs Harbor, NWT
- Mould Bay, NWT
- Eureka, NWT

• USGS College Magnetometer data plots * *Back on line!*

• **GEM CUSP PROGRAM**

- Longyearbyen, Svalbard Site (map)
 - Magnetometer data (induction, fluxgate)
 - Optical data (msp, all sky camera)
- 1995 GEM/Snowmass presentation

• **POKER FLAT DOWNRANGE OBSERVATORY PROJECT (map)**

- Kaktovic, AK
- College, AK
- Kotzebue, AK
- Eagle, AK
- Bettles, AK
- Tok, AK

• **HAARP (High-Frequency Active Auroral Research Program) (map)**

- Gakona, AK

• Koror (equatorial site)

• Longyearbyen November 1993 data plots

• **SCIFER cusp rocket (map)**

- Magnetomer data
- Optical data



Last Modified: 26 October 1995

Submit web comments to: rjr@maxwell.gi.alaska.edu

Here are some scenes of activity at the HAARP site in Gakona, Alaska. Click on a thumbnail to get a full-size JPEG image.



Here's a nice view of the mountain range that's east of the site. The operations center is visible behind the engineer. He's very happy to have that parka!

[This is a 45K jpeg image](#)



There is a small network of computers in the operations center and this equipment will act as the server. Mike was instrumental in getting the network running.

[This is a 138K jpeg image](#)



This is typical of the fantastic Alaskan sunsets here. The structures that resemble umbrellas are the antennas used to direct HAARP transmissions upward. The shelters at the ground level house the transmitters used to generate HAARP's signals.

[This is a 93K jpeg image](#)



These individuals are measuring the electric fields around the site to confirm that the site is safe during IRI operation.

[This is a 135K jpeg image](#)



This photograph was taken inside the temporary operations center. All of the equipment on the site is controlled from this room. The room also contains displays for the various scientific observation instruments at the site. The aircraft detection radar display is located in the corner.

[This is a 153K jpeg image](#)



A few of the many individuals who are involved in the construction and testing of the HAARP Ionospheric Research Instrument.

[This is an 72K jpeg image](#)

Return to the [HAARP Home Page](#).

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Last updated February 6, 1996.

Phases of Completion of the IRI

The Ionospheric Research Instrument (IRI) is the primary tool that will be used to study ionospheric physics in the HAARP program. The IRI will be used to induce a small, localized change in ionospheric temperature so that resulting physical reactions can be studied by other instruments located either at or close to the HAARP site.

An Environmental Impact analysis was completed prior to beginning construction of the IRI. The Record of Decision that resulted from this process permits the construction of an antenna array with a maximum size of 180 antenna elements, arranged in 15 columns by 12 rows. This final array will not be completed for several years. Instead, the IRI will be completed in smaller phases beginning with the Developmental Prototype (DP) and continuing with the filled DP (FDP), the Limited IRI (LIRI) and ending with the full size or final IRI (FIRI).

The following table compares all of the IRI phases with each other for several of the major electrical characteristics.

Comparison of IRI Phases

	DP	FDP	LIRI	FIRI
Number of Active Antenna Elements	18	48	108	180
Total Transmitter Power (kW)	360	960	2160	3600
Maximum Antenna Gain (dB)	19	24	29	31
Max Effective Radiated Pwr (dBW)	74	84	92	96
Min Antenna Pattern Width (degrees)		9	8	5
Frequency Range	2.8 to 10 MHz			
Modulation Types	CW/AM/FM/PM			

Note: The maximum antenna gain and ERP and the minimum width in antenna pattern all occur at the highest frequency, 10 MHz.

Also take a look at the [Comparison Chart](#) that shows how the various phases of HAARP relate to other high power facilities operating in the High Frequency spectrum.

The degree to which the IRI will be useful as a research tool is also a function of the phase of completion. The DP, for example, is only minimally useful for ionospheric studies. Beginning with the FDP, however, meaningful research will be possible. The LIRI will provide a capability about equivalent to the best existing facility, and the FIRI will reach the final, world class capability envisioned at the program's conception.

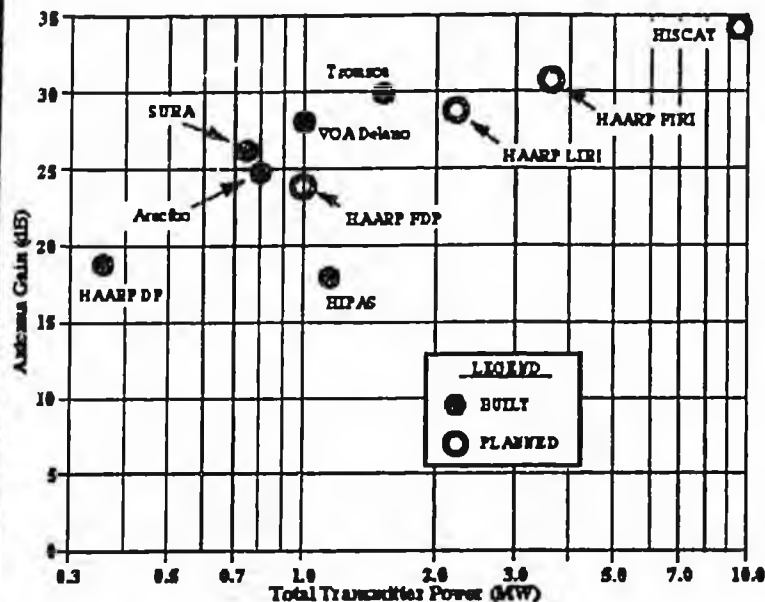
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Last updated December 12, 1995.

Comparison of High Power Transmitters Operating in the HF Frequency Range

The HAARP IRI is a high power transmitter operating in the High Frequency (HF) portion of the electromagnetic spectrum. Many other high power installations operate in this band including other ionospheric research facilities and international broadcast stations. The following chart compares a few other such facilities with the HAARP IRI at various phases of its construction up to the final completed facility, the FIRI.



The full names for each of these facilities are:

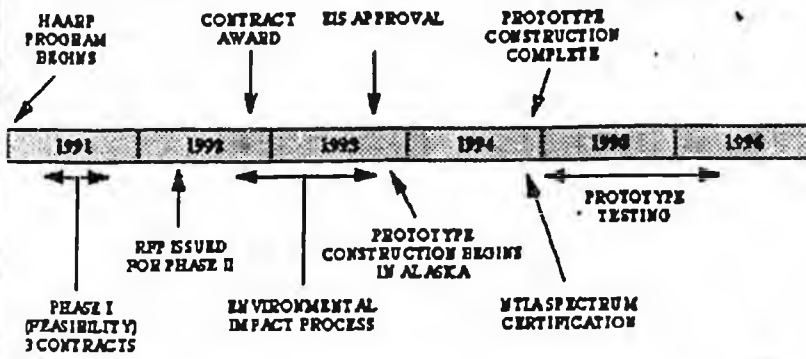
- Arecibo (National Astronomy and Ionosphere Center, Puerto Rico)
- HAARP DP (Developmental Prototype)
- HAARP FDP (Filled Developmental Prototype)
- HAARP LIRI (Limited IRI)
- HAARP FIRI (Full IRI)
- HISCAT (International Radio Observatory, Sweden)
- SURA (Radiophysical Research Institute, Nizhny Novgorod, Russia)
- Tromsø (EISCAT facility, Norway)
- VOA (Voice of America - Delano, CA)

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Last updated March 12, 1996.

HAARP Program Milestones



For additional information about the schedule for development of the HAARP facility please look at the following pages:

[Phases of completion for the HAARP IRI.](#)

[Recent Events.](#)

[Return to the HAARP Main Page](#)

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Last updated January 29, 1996.

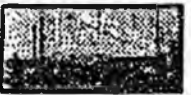
From the Copper River Country Journal

September 21, 1995

Part 1 of 2



THE HAARP SITE on the Tok Road held a coffee and Open House last weekend, and over 80 people logged in their names in the visitor guest book. Some were just curious. Others were concerned. There were people there from the immediate Gakona area, from the Copper Valley, and from other parts of the state. Paul Anthony (right) came up from Anchorage. He is shown talking with HAARP Project Manager John Heckscher. Anthony was carrying a copy of a book by Nick Begich called "Angels Don't Play This HAARP." Begich claims in the book that the HAARP project is "the most incredible weapon yet devised." When he first arrived, Paul Anthony seemed to be speaking for more than one person when he told the Journal, "I'm concerned about concentration camps in America... You don't have to be a scientist to understand the implications of this. By what authority can these experiments be conducted that have such far-reaching effects..." Some of the other visitors expressed other concerns, including fears of weather control, concerns about somehow "amplifying" energy, fears of injuring the ionosphere, and concerns that the project is somehow "a decoy." Several even expressed a fear the HAARP will be used for mind control. After several hours of looking around, and taking videos and photographs, Anthony said, "This is a good tour today. I think the open house is a good first step."



PEOPLE CAME to see the HAARP project's array of antennas at the site on the Tok Road in Gakona. The idea of the project is to scientifically measure what happens to the ionosphere when the conditions normal to an aurora are duplicated on a smaller scale by the project's scientists. Although the antenna array looks impressive, it doesn't come close to an actual aurora. "If we have an aurora here (during one of the study periods) we have to pack up and go home," commented Project Manager John Heckscher. The day after the Open House, Glennallen High School science teacher Gene Crow brought his science class to the facility, which they toured for 3 hours. John Rasmussen of HAARP told the Journal he intends to try to get Neil Brown, semi retired director of the Poker Flat Rocket Range together with the science students.



BILL HUHN came from Fairbanks to see the Gakona facility. He's facility manager at a similar site outside of Fairbanks, where he has worked 8 years. When asked if the Fairbanks site was a secret military project, he said, "It's silliness. We broadcast at 2.85 megahertz. Only a little bit higher than a regular AM station. You have tens of hundreds of thousands of radio stations broadcasting music. Why is that controlling people's minds? I've got a mind. I don't want it controlled."



THIS IS A CHART that was on a wall inside a HAARP project building. It shows (from right to left) the disturbance caused by a transmission from HAARP, and how it is charted. The flat line at the bottom shows how "The Ionosphere quickly returns to normal after the transmitter goes off." The HAARP project is the subject of much recent controversy, and is featured in Popular Science, Jane's Defense Weekly, and a number of alternative publications. Staff from "We Alaskans" a Sunday magazine of the Anchorage Daily News, visited the site Sunday. A group from Fox TV's show, "Sightings", were due to visit Monday.

Continue with Part 2

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Last updated October 4, 1995.

Calculate HAARP IRI Performance

First select an array size

The HAARP IRI will proceed through several phases, beginning with the developmental prototype and ending with the full size IRI.

Next, select a frequency

The HAARP IRI is limited to the frequency range 2.8 to 10 MHz. Selections below this range will be converted to 2.8 MHz.

- MHz
-

Next, select an ionospheric layer

The power density in the ionosphere along with the size of the interactive region are both affected by the array size and frequency that you have already set, and by the altitude of the layer.

Please note that this calculation is based on ideal engineering assumptions and the results will represent the best performance that can be expected for the given array sizes.

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Last updated December 12, 1995.

Results of the Calculation

You have selected the following parameters:

The selected array is the 6X8 DP, All Transmitters
The frequency is: 2.8 MHz
Ionospheric calculations apply to the E layer (100 km)

The selected array:

Contains 48 active elements.
Occupies an area of approximately 5.1 acres.
Has a total available transmitter power of 960.0 kW.

At this frequency:

The wavelength is 107.1 meters.
The antenna array gain is approximately 22 (13.4 dB)
The half power beamwidths are:
 31.9 degrees in the N-S plane.
 44.6 degrees in the E-W plane.
The effective radiated power at the center of the beam is 73.4 dBW.

At the altitude of the E layer (100 km):

The interactive region (between the half power points) is approximately 57 km by 82 km.
The power density at the center of the interactive region is about 0.017 micro-watts per square-cm.

The calculation of power density in the ionosphere is for the ideal case. For a typical experiment, there will usually be additional, intervening losses in lower ionospheric layers. Thus, for example, the power density in the F2 layer will depend on losses sustained in the lower D, E and F1 layers.

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HAARP Diagnostic Instruments

The HAARP program is developing an extensive set of scientific research instruments. These instruments are an essential part of the HAARP program since they provide the means to observe effects in the ionosphere that are produced as a result of IRI transmissions. Many of these instruments are useful in their own right, having the capability to observe naturally occurring ionospheric processes even when the IRI is not being used.

Output from these instruments will be combined into an integrated data package which will be available throughout the country in near real time, allowing scientists to observe results, and thereby participate in the investigations, directly from their laboratories.

All of the following instruments are either planned or are already installed either at Gakona or elsewhere in Alaska.

At the HAARP site:

- HF Vertical Incidence Sounder.
- HF Stimulated Emissions Receiver.
- ELF/VLF/LF Receivers.
- Magnetometer.
- VHF (30 MHz) Riometer.
- VHF Imaging Riometer.
- Spectrum Monitor.
- UHF Scintillation System.
- HF (28 MHz) RADAR.
- VHF (50 MHz) RADAR.
- UHF Incoherent Scatter RADAR.
- Optical Imager.
- Rayleigh LIDAR.
- IR Photometer.
- IR Imager.

At The High Latitude Monitoring Site (HLMS/Anchorage):

- VHF RADAR.
- Riometer.
- Magnetometer.

At Poker Flat Rocket Range (Fairbanks):

- Optical Chain.
- Magnetometer Chain.
- Riometer Chain.

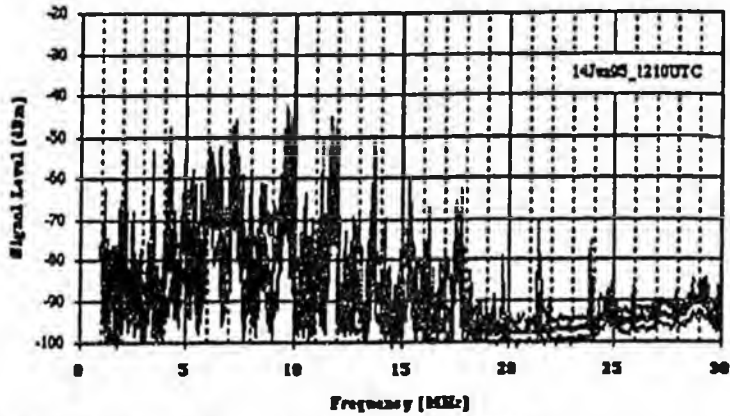
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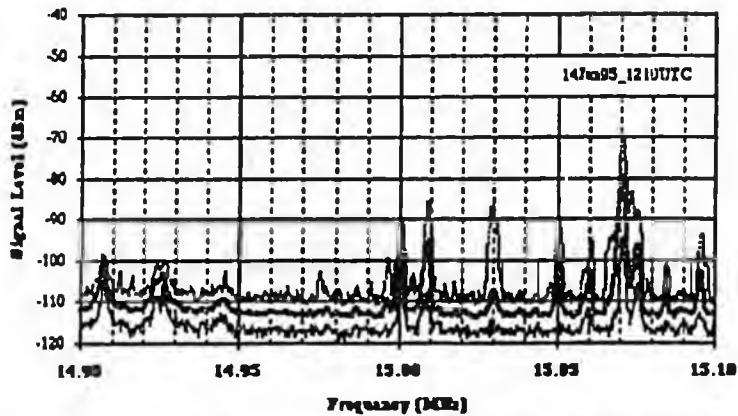
Last updated February 22, 1996.

Samples of HAARP Spectrum Monitor Frequency Sweeps

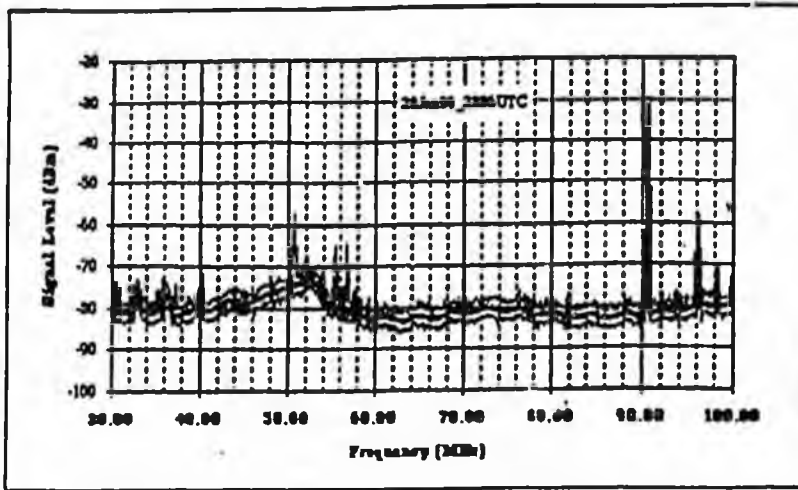
The following chart shows the signal level in dBm for a frequency sweep covering the 1 - 30 MHz band. The red curve is the maximum, black the median, and blue the minimum signals observed during the 20 minute period ending 1210 UTC on 14 June 1995.



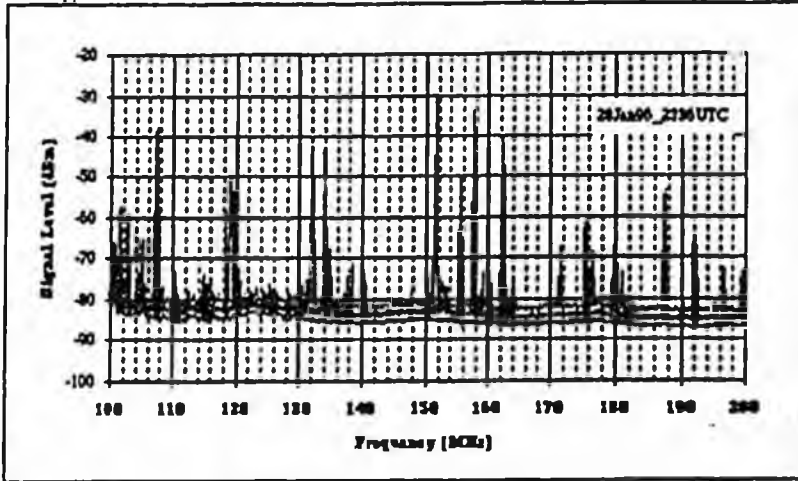
The following chart shows the signal level in dBm for a frequency sweep covering the 14.9 - 15.1 MHz band. The red curve is the maximum, black the median, and blue the minimum signals observed during the 20 minute period ending 1210 UTC on 14 June 1995. This sweep was set up to observe the variation in signal level for standard time stations WWV, WWVH and JJY which operate on 15 MHz.



The following chart shows the signal level in dBm for a frequency sweep covering the 30 - 100 MHz band. The red curve is the maximum, black the median, and blue the minimum signals observed during the 20 minute period ending 2336 UTC on January 28, 1996. This frequency range contains the television broadcast and fixed and mobile communication services, and the FM broadcast band at the upper end. The large signal at 90.5 MHz is due to a local repeater for Valdez public radio station KCHU.



The next chart is identical to the previous one except that it covers the frequency range 100 - 200 MHz. The red curve is the maximum, black the median, and blue the minimum signals observed during the 20 minute period ending 2336 UTC on January 28, 1996. This frequency range contains (from left to right) the FM broadcast band, aircraft navigation and communication, television broadcast and fixed and mobile communication services.



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Last updated January 29, 1996.

Winter 1995-Project HAARP: The "Official" Impacts by Gar Smith

Earth Island Journal.
Winter 95
Vol. 10 Issue 1
p21

The Fall issue of *Earth Island Journal* featured an article on Project HAARP, a joint US Air Force-Navy plan to "perturb" the Earth's ionosphere with intense blasts of electromagnetic energy beamed from a site in Gakona, Alaska. Project HAARP officials subsequently supplied the *Journal* with a copy of the Final Environmental Impact Statement (FEIS). Here is an update.

The construction of the HAARP transmitter will affect 51 acres of black spruce forest and 18 acres of wetlands. The forests will be cut and the wetlands filled. The FEIS deemed these conifer forests "the least sensitive and most expendable" because they "are so common."

According to "preliminary estimates," HAARP construction would require the delivery of 7300 truck loads, totaling 160,000 cubic yards of "non-frost susceptible gravel." The gravel site with the most "potential" is 20 miles away.

The impacts on the native moose population would include "loss of habitat, interference with migration patterns, and increased human-caused mortality [i.e., from hunting]. The HAARP project would directly remove, through logging, filling or fencing, approximately 51 acres of habitat..." Habitat loss would also affect black bear populations, wolf packs (totaling 15-24 wolves) and two caribou herds as well as a host of smaller animals including red fox, coyote, lynx, marten, muskrat, ermine, beaver, river otter, wolverine, mink, lemming, vole, Arctic shrew, Arctic ground squirrel and snowshoe hare.

Fouling the Air

"The most important source of air pollutants" would be HAARP's 15-megawatt power plant, driven by six 3600 hp diesel generators. The power plant would consume an estimated 191,800 pounds of diesel fuel per day, producing roughly 1870 pounds of SOx (sulfur oxides) and 13,300 pounds of NOx (nitrous oxides).

Rooftop radiators would disperse the heat skyward through exhaust stacks (not yet designed). The plant could operate at full power for only 38 days before exceeding federal air-quality standards.

Approximately 200,000 gallons of diesel fuel (stored onsite in four 50,000-gallon above-ground fuel storage tanks) would be burned during each HAARP "campaign" -- a campaign includes ten preparation days, 14 experiment days and four shutdown days.

The FEIS states that if more than five campaigns were scheduled per year, "this might require that additional emission-control devices be used at the HAARP site." Conveniently, HAARP is only scheduled to host "four to five campaigns a year...."

Hitting the HAARP Strings

Swans are the most abundant of the region's 119 bird species, followed by ducks and passerines. The FEIS notes that the Gakona site "lies within the Copper River Basin, which is one of Alaska's more important migration corridors" along the Pacific Flyway, but concludes that only birds weighing more than three pounds and measuring more than 16 inches in length would be at risk from HAARP's 10 MHz beams.

The real danger to birds, however, is from flying into the network of HAARP's wire-anchored antennas. Most at risk would be swans, owls, ducks and passerines.

HAARP's 115-foot-diameter Incoherent Scatter Radar (ISR) dish would stand on a 25-foot thick, 35-foot-tall support structure. Other HAARP antenna elements would rise 80-100 feet above the ground. Observers reported that song birds and shore birds flew within the danger zone 41 percent of the time.

According to the FEIS, "swans, especially trumpeter swans, are probably the group most at risk of colliding with the antenna structures," especially during the October migration when poor weather conditions force the swans to fly low to the ground.

Zapping the Ground and the Sky

The FEIS reports that "the government commissioned a special study" to determine the "bioeffects" of HAARP's radio frequency radiation (RFR). The report concluded that "chronic exposure to RFR... did not result in demonstrable, detrimental health effects" to humans. The FEIS admitted that RFR exposure could cause the human body to heat up, but that this unwanted heat "can be easily accommodated within the thermoregulatory capabilities of an individual [and] may not necessarily be harmful."

The FEIS corroborated the Journal's concern that "potentially affected systems... [would] include cardiac pacemakers, electro-explosive devices [EEDs], and fuel handling systems." EEDs, including flares carried by individuals or in vehicles, could be exploded 1300 feet from HAARP's Ionospheric Research Instrument (IRI) transmitter -- a quarter-mile away.

Radio frequency radiation could be a problem since, as the FEIS notes, Gakona lies "within a major commercial air traffic corridor that links Anchorage with the eastern and mid-western US. It also is within the path of flight to and from the Orient and Canada. Twelve-to-20 commercial flights per day utilize the airspace above the Gakona Site.

The IRI's 8.0 MHz and 10.0 MHz beams "could potentially pose a hazard to occupants of aircraft flying nearby... in the unlikely event they remain in the main beam for an extended period of time." At aircraft cruising altitude of 30,000 feet (5.7 miles), the inverted cone formed by the sweep of the IRI beam is 6.8 miles wide.

Countering assumptions that most of HAARP's energy would be "lost" to space, the FEIS reveals that "80-90 percent of the experiments would employ the IRI in modes that refract fundamental radio frequency energy Earthward from the ionosphere."

And What About the Ionosphere?

The 440-page FEIS states flatly that "The ozone layer would not be affected and ozone would not be depleted" as a result of HAARP operations, but devotes less than a page to this critical topic. The only study cited is a single 13-page "draft assessment" by the Mission Research Corporation (MRC).

The FEIS spends less than three pages on HAARP's ionospheric effects and bases its conclusions solely on "personal communications" between officials at MRC and the consulting firm of Metcalf and Eddy. The FEIS reports that IRI transmissions will cause the temperature of free electrons in the Earth's ionosphere could rise by 80 degrees F. Below 124 miles, the IRI would trigger a 20 percent increase in "electron density," while above 124 miles, electron densities would decrease 10-15 percent. The effect could last "an entire polar night."

A second study, "Independent Assessment of HAARP Effects on the Upper atmosphere" by R. Roble, also concluded that "there would be no measurable effects to the Earth's ozone layer." The FEIS identified this study as having been provided by MRC. The study was described as consisting of "one page."

The authors of the Journal's HAARP story remain convinced that the potential impacts of Project HAARP deserve a through scientific and public hearing.

HAARP Update

On November 22, then-House Armed Service Committee chairman Ron Dellums (D-CA), formally invited the Pentagon to respond to the issues raised in the *Journal's* Fall article

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Dr. Daniel N. Baker, director of the University of Colorado's Laboratory for Atmospheric and Space Physics, offered a less-alarming assessment. "The natural input of energy to the magnetosphere from the sun is very commonly 10^{11} - 10^{12} watts," Baker told the Journal. "Thus, HAARP may be a small fraction of the energy that flows into the region." Baker added that the ionosphere is, by nature, a "highly dynamic and fluctuating" environment that is able to "flush" away energy disturbances in a matter of hours or days.

Of course, in nature, one cannot simply "flush" something away without anticipating potential "downstream" consequences. Caroline L. Herzenberg, an environmental systems engineer at the Argonne National Laboratory, has suggested that, by "changing the chemical composition of the atmosphere; [and] transporting plumes of particulates or plasma within the atmosphere," HAARP may violate the 1977 Environmental Modification Convention, which bans all "military or any other hostile use of environmental modification techniques having widespread, long-lasting, or severe effects...." The US ratified the convention in 1979.

"X-Raying" the Earth?

On June 14, a Senate committee report noted that the Deputy Secretary of Defense had called for increasing HAARP funding from \$5 million to \$75 million in the 1996 defense budget. The sudden increase would be used to promote a disturbing new mission for HAARP.

Instead of just pouring its vast energy into the skies, the transmitter's power would be aimed back at the planet to "allow earth-penetrating tomography over most of the northern hemisphere" -- in effect, turning HAARP into the world's most powerful "X-ray machine" capable of scanning regions hidden deep beneath the planet's surface. According to the Senate report, this would "permit the detection and precise location of tunnels... and other underground shelters. The absence of such a capability has been... a serious weakness for [DoD] plans for precision attacks on hardened targets...."

Meanwhile, construction on the larger HAARP facility -- with a potential effective radiated power of 1.7 GW (1.7 billion watts) -- is set to begin in 1995. This expanded version would require additional funding from Congress. According to the 1990 project document: "The desired world-class facility... will cost on the order of \$25-30 million." The Senate Committee's April report, however, predicts that the cost "could be as much as \$90 million."

What You Can Do

Write Congress to demand a review of HAARP's environmental impacts. Request that the National Telecommunications and Information Administration [NITA, c/o US Department of Commerce, Washington, DC 20230] reject the HAARP frequency/power request pending the outcome of a Congressional inquiry. Queries and contributions may be sent to NO HAARP c/o Jim Roderick, PO Box 916, Homer, AK 99603.

"Visibility is a crude criterion for assessing environmental damage.... An unprecedented amount of energy can produce an unprecedented reaction. Experimenting with [the ionosphere] is a very delicate thing. A localized event can spread around the Earth fairly quickly." -- Prof. Dick Williams

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HAARP Frequently Asked Questions

Please use our comment page to submit a question. Or use the e-mail address below and we will add your question to this page.

Are there any health hazards due to fields produced by HAARP?

The health and safety of the public (and of the scientific researchers who will be present at the site) has been a primary focus in the design of the HAARP IRI. There are no locations on-site where the E-M fields exceed standards for RFR exposure as defined by the IEEE and adopted by the ANSI (C95.1-1991). In fact, the E-M fields measured at the closest public access to the site are lower than those existing in many urban environments. We have provided a more detailed look at this issue in a separate page on [HAARP E-M Safety](#).

Will HAARP be used to generate ELF?

Previous experience at other facilities has shown that it is possible to generate a small but useful ELF signal through ionospheric heating. This field will be more than **one and a half billion** times weaker than the Earth's background field and about **one million** times weaker than the level where researchers have reported biological effects in the literature. The field is so weak, in fact, that sophisticated instruments must be used to observe it, yet it is still quite useful for many applications.

ELF Field Strength Chart

Also see the [ELF section](#) for a thorough discussion of this aspect of ionospheric research.

What about radio frequency interference?

Analyses conducted during the environmental impact process suggest that radio frequency interference could occur for receiver systems that operate in the areas surrounding Gakona. However, other facilities similar to the HAARP IRI and its diagnostic instruments have achieved compatibility with other users of the radio frequency environment. The government is committed to achieve compatibility with other users of the electromagnetic spectrum and an [electromagnetic compatibility program](#) has been established to assure this goal is achieved.

How large will the HAARP IRI be when it is complete?

The full size IRI will consist of 180 antennas on a total land area of about 23 acres. It will have a total transmitter power of about 3,600 kilowatts. This is the final phase of the project and is the maximum size that was approved in the Environmental Impact Process. A comparison of the [various phases](#) of the IRI can be found in the IRI section of the HAARP Home Page.

How does HAARP compare with other high power facilities?

The HAARP IRI is similar in size to several other high power transmitters operating in the High Frequency range. We have provided a [Comparison Chart](#) that shows how HAARP relates to some of these other facilities.

Can HAARP create an artificial aurora?

The natural aurora is created when very high energy particles emitted by the sun, reach the Earth's vicinity, are swept toward the Earth's magnetic poles, and collide with gas molecules existing in the upper atmosphere. The energy involved in this process is enormous but is entirely natural and it has been a normal event throughout Earth's history.

HAARP is so much weaker than these naturally occurring processes that it is completely incapable of producing any

optical effects that can be seen without using very sensitive telescopes.

What effect will HAARP have on the Earth's magnetic field?

Random variations in the Earth's magnetic field occur all the time, day in and day out. These variations are like the radio noise heard in a radio receiver and are purely natural. The full size HAARP facility will eventually be able induce a variation in the Earth's field that is about equal to the low level, random variations that occur naturally.

The HAARP IRI becomes useless during a geomagnetic storm. During these common solar induced events, the natural variations reach a level that is more than 10,000 times stronger than any variation that HAARP could produce.

The Earth's static magnetic field is, in turn, more than 1,000 times stronger than the variations that occur during a magnetic storm and more than 10,000,000 times stronger than the variations that HAARP could produce.

Why use HAARP if it has such a weak effect?

The HAARP facility consists of a full set of sophisticated scientific instruments. The weak ionospheric effects that HAARP is capable of producing are useful because their exact characteristics (such as their frequency and phase) are known with great precision and the instruments used to observe them can be synchronized to detect them, even in the presence of considerably stronger natural ionospheric variations.

Is there university involvement in HAARP?

Several universities have played a major role in HAARP from its inception to the present time including the University of Alaska, Boston College, UCLA, Clemson University, Cornell University, Johns Hopkins University, University of Maryland, University of Massachusetts, MIT, Polytechnic University, Stanford University, and the University of Tulsa. The development of the program objectives and initial design concept, selection of the prime contractor, development of diagnostic equipment, and the planning of research campaigns have all been heavily dependent on university involvement. Of the eighteen diagnostic instruments associated with HAARP, eight have been produced by universities and the three instruments currently deployed at the HAARP site are all university developed and operated. To provide support to the local community, the University of Alaska is working with HAARP to develop a cooperative science program with the Glennallen High School. In addition, seventeen universities were represented at the research campaign planning meeting held in Santa Fe, NM in April 1995.

Is HAARP capable of affecting the weather?

The ionosphere is created and continuously replenished as the sun's radiation interacts with the upper levels of the Earth's atmosphere. There is no evidence, however, that ionospheric variations can affect the atmosphere below, even at the extraordinarily high levels that the sun can produce during a geomagnetic storm. If the electromagnetic disturbances caused by the sun itself don't affect the weather, there is no chance that HAARP can do so either.

How long do the effects of ionospheric heating last?

Since the ionosphere is, inherently, a turbulent medium that is being both "stirred up" and renewed by the sun, artificially induced effects are quickly obliterated. Depending on the height within the ionosphere where the effect is originally produced, these effects are no longer detectable after times ranging from less than a second to ten minutes.

A good analogy to this process is dropping a stone into a fast moving stream. The ripples caused by the stone are very quickly lost in the rapidly moving water and, a little farther down the stream, are completely undetectable.

Does HAARP have a secret agenda?

The HAARP program is completely unclassified. There are no classified documents pertaining to HAARP and the environmental impact process documents are still (and will always be) completely descriptive of the general interest physics research that will be conducted at the HAARP facility. The EIS documents are a matter of public record.

Can HAARP be used for military purposes?

The HAARP facility will be used for basic and applied research related to the study of the Earth's ionosphere. It is not designed to be an operational system for military purposes. The HAARP specifications were developed by a consortium of universities to meet the requirements for a world-class research facility and an expanded group of universities are playing a major role in the design of future research efforts.

Administratively, HAARP is restricted to operate only on a "not to interfere" (NIB) basis by the NTIA and is classified as an experimental station in the NTIA spectrum certification document.

Please use our comment page to submit a question. Or use the e-mail address below and we will add your question to this page.

Return to the [HAARP Home Page](#).

Send questions or suggestions via e-mail to kennedy@itd.nrl.navy.mil or leave a [comment](#) right now on our server.

Last updated March 12, 1996.

Purpose and Objectives of the HAARP Program

HAARP is a scientific endeavor aimed at studying the properties and behavior of the ionosphere, with particular emphasis on being able to understand and use it to enhance communications and surveillance systems for both civilian and defense purposes.

The HAARP program is committed to developing a world class ionospheric research facility consisting of:

The ionospheric research instrument (IRI), a high power transmitter facility operating in the HF frequency range. The IRI will be used to temporarily excite a limited area of the ionosphere for scientific study. Diagnostic instruments that will be used to observe the physical processes that occur in the excited region.

Observation of the processes resulting from the use of the IRI in a controlled manner will allow scientists to better understand processes that occur continuously under the natural stimulation of the sun.

In addition, diagnostics installed at the HAARP facility will be useful for a variety of other research purposes including the study of global warming and ozone depletion.

[\[HAARP Main Page\]](#) [\[Projects and Research\]](#) [\[5550 Home Page\]](#).

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Last updated July 17, 1995.

From the Fairbanks News-Miner

September 17, 1995

Dermot Cole

HAARP controversy

WE MAY BE HEARING a lot about HAARP in the months to come, but because the subject is getting sensational treatment on radio and in print, it may be a challenge to separate science fact from science fiction.

Consider the front-page headline in the September issue of Popular Science magazine about HAARP: "Exclusive: The Secret Agenda of a Military Project in Alaska."

HAARP stands for High frequency Active Auroral Research Program. It is sponsored by the Office of Naval Research and the US Air Force and is being run by the Phillips Laboratory of Hanscom AFB, Massachusetts.

The project features a powerful radio transmitter near Gakona, 200 miles southeast of Fairbanks, which is to direct a narrowly focused radio beam straight up into the ionosphere.

An Environmental Impact Statement was completed before the project started and the early work involved nine universities including UAF, as well as other institutions. The plan is to use a radio transmitter, one that is about as powerful as some transmitters used by the Voice of America, to heat small parts of the ionosphere.

Brent Watkins, a geophysics professor at the UAF Geophysical Institute, compared it to placing a one-kilowatt heater in the Yukon River. He said it will not change the overall dynamics of the ionosphere.

Driving this research is the fact that most of the frequency ranges used for radio communications have been allocated and it is hard to find space for new frequencies. Researchers are looking at using lower frequencies, but the catch is that those would require antennas hundreds of miles long.

AS AN ALTERNATIVE, scientists are proposing that the aurora be used as an antenna. This would be done by inducing a slight modulation in the aurora with the radio beam from HAARP.

A transmitter that also directs a beam into the ionosphere, and which has about one-quarter or less of the power of HAARP, is located off 25 Mile Chena Hot Springs Road. The HIPAS facility, operated by UCLA, has been used for the past 12 years without a problem.

There have been articles in various publications over the past year that claimed HAARP is a "mysterious" and "secret" project. "Project Censored" said HAARP was one of the top 10 under-reported news stories of 1994 in the US.

A lot of the speculation about sinister motives seems to be based on "Star Wars" defense theories, some of them from a scientist who hasn't been connected with HAARP for eight years.

HAARP has also been talked about on Art Bell's nationally syndicated radio show, where the discussion often turns to flying saucers and human abductions by aliens.

Alaskan Nick Begich Jr., who recently got a doctorate in the study of alternative medicine from a school based in Sri Lanka, has written and published a new book in which he alleges that HAARP could lead to "global vandalism" and affect people's "mental functions."

Syun Akasofu, director of the Geophysical Institute, said the electric power in the aurora is hundreds of thousands of times stronger than that produced by HAARP.

The most outlandish charges about HAARP are that it is designed to disrupt the human brain, jam all communications systems, change weather patterns over a large area, interfere with wildlife migration, harm people's health and

unnaturally impact the Earth's upper atmosphere.

These and other claims appear to be based on speculation about what might happen if a project 1,000 times more powerful than HAARP is ever built.

That seems to be in the realm of science fiction.

Dermot Cole is a News-Miner columnist. He can be reached at (907) 456-6661, ext. 368.

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Last updated September 19, 1995.

From the FAA Flyer

January 1996

Background

The September 1995 issue of **Popular Science** contained a story about the HAARP project, written by Mark Farmer. This article contained numerous misrepresentations including a particularly misleading statement attributed to the FAA, contained in the article's introduction. The following article, which appeared in the January 1996 issue of FAA Flyer addresses that misstatement.

HIGH FREQUENCY RESEARCH PROJECT NO THREAT

The September issue of **Popular Science** contained a mistaken warning to pilots. It had this to say about the HAARP (High Frequency Active Auroral Research Project) near Gulkana: "Its existence first surfaced publicly in Alaska in 1993, when the FAA began instructing pilots to avoid HAARP's electromagnetic radiation."

In fact, the FAA has never issued any warning concerning this facility, nor is there any reason for pilots to modify their flight plans because of the project. To date only a fraction of the final facility configuration is built, and that only to evaluate proof-of-concept. We will not see a final configuration facility for many years, and the existing test facility poses no threat to anyone. The FAA maintains a representative on the HAARP interference coordination committee. This committee exists to assure that no interference to communications and aeronautical navigation results from any testing or operation of the facility now or in the future. The committee also works to confirm that the project produces no harmful radiation to man or animal. Safety remains a paramount objective of the project.

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Last updated December 20, 1995.



HAARP FACT SHEET



What Is HAARP?

HAARP (High frequency Active Auroral Research Program) is to be a major Arctic facility for upper atmospheric and solar-terrestrial research. Scheduled for completion in 2002, HAARP is being built on a DoD-owned site near Zakona, Alaska. Principal instruments include a high power, high-frequency (HF) phased array radio transmitter known as the Ionospheric Research Instrument, or IRI, used to stimulate small, well-defined volumes of ionosphere, and an ultra-high frequency (UHF) incoherent scatter radar (ISR), used to measure electron densities, electron and ion temperatures, and Doppler velocities in the stimulated region and in the natural ionosphere. To further the scientific capabilities and usefulness of the IRI and ISR, HAARP is supporting the design and installation of the latest in modern geophysical research instruments, including an HF ionosonde, ELF and VLF receivers, magnetometers, riometers, a LIDAR (Light Detection And Ranging) and optical and infrared spectrometers and cameras which will be used to observe the complex natural variations of Alaska's ionosphere as well as to detect artificial effects produced by the IRI.

Is HAARP Unique?

Ionospheric research facilities have been in continuous use since the 1950's to investigate fundamental physical principles which govern the earth's ionosphere, so that present and future transmission technologies may take into account the complexities of the ionosphere. At the present time the US operates two ionospheric research sites, one in Puerto Rico, near the Arecibo Observatory, the other (known as HIPAS) in Alaska near Fairbanks. Both of these employ active and passive radio instrumentation similar to that being built at HAARP. Interest in the ionosphere is not limited to the US: a five-country consortium runs the European Incoherent Scatter Radar site (EISCAT), a premier world-class ionospheric research facility located in northern Norway near Tromsø. Facilities also are located at Jicamarca, Peru; near Moscow, Nizhny Novgorod ("SURA") and Apatity, Russia; near Kharkov, Ukraine and in Dushanbe, Tadzhikistan. All of these installations have as their primary purpose the study of the ionosphere, and most employ the capability of simulating to a varying degree small, localized regions of the ionosphere to discover in a controlled manner what nature produces at random. HAARP also will have such a capability, but what sets HAARP apart from existing facilities is the unusual combination of a research tool which provides electronic beam steering, wide frequency coverage and high effective radiated power collocated with a diverse suite of scientific observational instruments.

Who is Building HAARP?

Technical expertise and procurement services as required for the management, administration and evaluation of the program are being provided cooperatively by the Air Force (Phillips Laboratory) and Navy (Office of Naval Research and Naval Research Laboratory). Since HAARP consists of many individual items of scientific equipment, both large and small, there is a considerable list of commercial, academic and government organizations which are contributing to the building of the facility by developing scientific diagnostic instrumentation and by providing guidance in the specification, design and development of the IRI. Advanced Power Technologies, Inc. (APTI), a subsidiary of E-Systems, Inc. which is wholly owned by Raytheon Corporation, was awarded the contract to design and build the IRI, based on a proposal submitted in response to an RFP issued by the Office of Naval Research and published in the Commerce Business Daily. Other organizations which have contributed to the program include the University of Alaska, University of Massachusetts, UCLA, MIT, Stanford University, Clemson University, University of Tulsa, University of Maryland, Cornell University, SRI International, and Geospace, Inc.

What is the Value of Ionospheric Research?

The ionosphere begins approximately 35 miles above the earth's surface and extends out beyond 500 miles. In contrast

to the dense atmosphere close to the earth which is composed almost entirely of neutral gas, the thin ionosphere contains both neutral gas and charged particles known as ions and electrons. This ionized medium can distort, reflect and absorb radio signals, and thus can affect numerous civilian and military communications, navigation, surveillance and remote sensing systems in many varied ways. For example, the performance of a satellite-to-ground communication link is affected by the ionosphere through which the signals pass. AM broadcast programs, which in the daytime can be heard only within a few tens of miles from the station, at night sometimes can be heard hundreds of miles away, due to the change from poor daytime to good nighttime reflection from the ionosphere. A long-range HF communication link which uses multiple hops or reflections from the ionosphere, often experiences amplitude fading caused by interference between signals which have traveled from the transmitter to the receiver by two (or more) different ionospheric paths.

Since the sun's radiation creates and maintains the ionosphere, sudden variations in this radiation such as those caused by solar flares can affect the performance of radio systems. Sometimes the changes are sufficient to induce large transient currents in electric power transmission grids, causing widespread power outages. Lightning is known to cause substantial heating and ionization density enhancement in the lower ionosphere, and there are indications that ground-based HF transmitters, including radars and strong radio stations, also modify the ionosphere and influence the performance of systems whose paths traverse the modified region. Perhaps the most famous example of the latter is the "Luxembourg" effect, first observed in 1933. In this case a weak Swiss radio station appeared to be modulated with signals from the powerful Luxembourg station, which was transmitting at a completely different frequency. Music from the Luxembourg station was picked up at the frequency of the Swiss station.

The proliferation of space-based civilian and military systems whose performance depends on transionospheric paths encourages not only good characterization and monitoring of the ionospheric state, but also an examination of what controlled local modification of the ionosphere, using ground HF transmitters, could do for and to these systems. Thus, while the HAARP facility is expected to provide significant advancements in understanding ionospheric science by stimulating and controlling plasma processes in a tiny localized region within the ionosphere, it also has the potential for significantly affecting the planning and economics of space-based systems.

Why is the DoD Involved?

The Department of Defense (DoD) conducts Arctic research to ensure the development of the knowledge, understanding and capability to meet national defense needs in the Arctic. Interest in ionospheric research at HAARP stems both from the multiplicity of communication, surveillance and navigation systems that have radio paths which pass through the ionosphere, and from the unexplored potential of technological innovations which suggest applications such as detecting underground objects, communicating to great depths in the sea or earth, and generating infrared and optical emissions. Expanding our knowledge about the interactions of signals passing through or reflecting from the ionosphere can help to solve future problems in the development of DoD systems, and could as well enhance the utilization of commercial systems which rely on the expedient transfer of real-time communications.

Why Gakona, Alaska?

During HAARP's environmental impact study, Gakona was identified as one of two DoD-owned, Alaskan locations which satisfied the site selection criteria of being within the auroral zone, near a major highway for year-round access, away from densely settled areas, of sufficient size to allow for equipment siting and separation space, on relatively flat terrain, of realistic and reasonable construction and operation costs as well as minimal environmental impacts. On October 18, 1993 following the July 15, 1993 issuance of the Air Force's Environmental Impact Statement which evaluated potential environmental effects of constructing and operating the HAARP facility, a Record of Decision (ROD) signed by the Deputy Assistant Secretary of the Air Force for Installations selected Gakona as the HAARP site.

Location of the HAARP Facilities

The access road is located at Milepost 11.3 on the Tok highway. The geographic coordinates of the IRI array are approximately 62 deg 23.5'N, 145 deg 8.8'W.

What is the IRI and what does it transmit?

Basically, the IRI is what is known as a phased array transmitter. It is designed to transmit a narrow beam of high power radio signals in the 2.8 to 10 MHz frequency range. Its antenna is to be constructed on a 1000' x 1200' gravel pad (about 33 acres). There are to be 180 towers, 72' in height mounted on thermopiles spaced 80' apart in a 12 x 15 rectangular grid, each of which supports near its top, two pairs of crossed dipole antennas, one for the low band (2.8 to 7 MHz), the other for the high band (7 to 10 MHz). To prevent possible damage to the antenna towers or harm to large animals, an exclusion fence has been constructed around the array. An elevated ground screen attached at the 15' level acts as a reflector for the antenna array while allowing vehicular access underneath to the 30 environmentally-controlled transmitter shelters spaced throughout the array. Each shelter contains 6 pairs of 10 kW transmitters, for a total of $6 \times 30 \times 2 \times 10 \text{ kW} = 3600 \text{ kW}$ available for transmission. The transmitters can be switched to drive either the low or high band antennas. Electric prime power is to be obtained from six, 2500 kW generators, each driven by a 3600 hp diesel engine. From a control room within the Operations Center the transmissions from each dipole are adjusted in amplitude and phase so as to form a narrow beam directed upward toward the ionosphere. The beam is partially absorbed, at an altitude which depends on the HF frequency, in a small volume a few hundred meters thick, the remainder either reflecting back toward the earth or continuing through the ionosphere into space. The intensity of the HF beam in the ionosphere is of the order of a few milliwatt/m², hundreds of times less than the variations in intensity of the Sun's natural ultraviolet (UV) energy which creates the ionosphere.

Are these transmission harmful?

Because the IRI beam will be directed upward, rather than toward the horizon, radio field strengths at ground level, including directly under the antenna array, are calculated to be smaller than Radiofrequency Radiation (RFR) standards allow for human exposure. This is possible because the individual transmitters are spaced apart over 33 acres so that the concentration of radio fields never exceeds the RFR standards. Radio field strengths on the ground around the array were measured during the April 1995 tests of the Development Prototype, and show good agreement with the calculations. At the point of closest public access on the Tok Highway, the measured fields are ten-thousand times smaller than permitted by the RFR standards and one-thousand times smaller than typically found near AM broadcast station antennas.

What about aircraft?

The upward-directed IRI main beam radio fields may have sufficient strength to interfere with electronic equipment in aircraft flying nearby. Therefore, to ensure the safety of all flight operations in the vicinity of HAARP, an aircraft alert radar (AAR) will automatically shut off appropriate transmissions when aircraft are detected either within or approaching a defined safety zone around the facility. Flight tests conducted using a Piper Super Cub demonstrated the capability of the Raytheon radar to detect even very small targets. Ensuring correct operation of the AAR will be a prelude to starting high power transmissions.

What is the potential for Radio Frequency Interference (RFI)?

Every radio transmitting facility has the potential to interfere with other radio spectrum users. To determine the likelihood that HAARP's transmissions inadvertently might interfere with Alaskan TV, AM/FM radio, ham radio, animal tracking receivers, cellular phones, satellite links, aircraft navigation and communications equipment, pipeline communications, or even with HAARP's own sensitive radio receiving equipment, a comprehensive RFI study was conducted. Theory predicted that in several worst-case scenarios, interference may be encountered by some users sharing the RF spectrum. On the other hand, the real world experiences of similar ionospheric research instruments and radar diagnostics employed elsewhere in the world suggest that compatible operations are practical. Included in HAARP's frequency application to the Spectrum Planning Subcommittee of the National Telecommunications and Information Administration (NTIA) is the commitment to a mitigation program that includes acquisition of state-of-the-art transmitters with stringent requirements for minimizing out-of-band transmissions; proper orientation of the IRI array and adoption of operating procedures, including beam steering, to minimize array sidelobes; employing special techniques such as waveform shaping, filtering and antenna null placement; and working with affected spectrum users, if any, to reach mutually agreeable solutions. A local phone number (907) 822-5497, permits anyone believing they have interference from HAARP to contact the Gakona site operations center.

What is the RFI Resolution Advisory Committee?

The Record of Decision stipulated that an RFI Resolution Advisory Committee ("Committee") would be formed with local representation, to help mitigate potential RFI issues. The local community-appointed resident would serve as an ombudsman to ensure community satisfaction with the RFI mitigation approaches undertaken by HAARP. The purpose of the Committee is to provide a forum for the thorough review of confirmed RFI reports. The first organizational Committee meeting took place on December 6, 1995 in Glennallen. Committee members were from the following organizations (one from each): Community-appointed resident, Aircraft Owners and Pilots Association (AOPA), ALASCOM, Alyeska Pipeline Service Co., American Radio Relay League (ARRL), Coast Guard, Federal Aviation Administration (FAA), Fish & Wildlife (Federal), Fish & Game (State), HAARP Environmental Liaison Officer, HAARP operational staff (site supervisor or delegate), HAARP Program-appointed chairperson, National Park Service, Naval Research Laboratory (NRL), and the combined Alaska military command (ALCOM) frequency coordinator.

To ensure that all concerns, including aircraft safety as well as radio frequency interference issues, are addressed completely before the IRI operates at full power, a Development Prototype (DP) has been constructed and is being operated at the Gakona site. A 6 x 8 array of crossed dipole antennas was built as the NE corner of the 12 x 15 IRI antenna field, and a 3 x 6 subset of these are energized by 18 pairs of 10 kW transmitters, contained in three separate shelters, thus supplying up to a maximum of 360 kW. Prime power is obtained from three 300 kW diesel generators. Calculations of expected HF fields in the vicinity of the DP antenna array show that field intensities everywhere, including within the DP beam, are below recommended international safety limits for fly-by-wire aircraft. Nonetheless, the DP will be energized only when the aircraft alert radar is operating, to insure that no high power transmissions occur when there is local flight traffic. Operation and test of the DP will verify the system design, identify any radio frequency interference problems resulting from spurious and/or harmonic emissions and permit mitigation measures to be tested and employed, if necessary.

HAARP Diagnostics

HAARP is developing an extensive set of diagnostic instrumentation to support ionospheric research at auroral latitudes, to characterize the processes triggered in the upper atmosphere and ionosphere by high power radio waves and to assess the potential of ionospheric modification technology for DoD applications. While some of the diagnostic instruments would be collocated with the IRI at the research facility, others, due to geometrical considerations, must be located off-site at various distances from the IRI. One of the primary active on-site diagnostics is to be the incoherent scatter radar (ISR) which would transmit radiowave signals in the 430 - 450 MHz band. Another is the HF ionosonde, which transmits in the 1-30 MHz band and is used to provide scientists with information about the electron density profile in the ionosphere. The LIDAR can detect minute concentrations of atmospheric pollutants such as stratospheric ozone. Passive on-site instruments include a magnetometer for the measurement of the earth's magnetic field and its variations, and a riometer (relative ionospheric opacity meter) to sense ionospheric absorption of the celestial background electromagnetic radiation. The radio spectrum from 100 kHz to 1 GHz is being recorded to determine frequency of usage and to monitor HAARP transmissions to ensure adherence to FCC and NTIA requirements. The diagnostic information will be combined into an integrated data package which eventually will be available on the internet in near real time, allowing scientists to participate in the investigations directly from their laboratories. In addition to the instruments specifically developed by HAARP, a number of diagnostics potentially are available through other federal agencies and the University of Alaska's Geophysical Institute.

Use of Local Resources

The Geophysical Institute of the University of Alaska Fairbanks (UAF) has played a major role in the development of diagnostics and coordination of Arctic programs with the US scientific community. UAF led a consortium of universities and industries which provided support in the design and development of the Gakona facility and associated diagnostic instruments. Advanced Power Technologies, Inc. (APTI), the prime contractor for the IRI, utilized Eric Goozen for initial site survey work. APTI employed a Glennallen-based company, Ahtna Construction, Inc., which subcontracted to Cruz, Survey Alaska and Double S Trucking for clearing and constructing the DP gravel pad. Ahtna also is providing nightly security coverage. Anchorage-based engineering firms Duane Miller & Associates and USKH prepared the civil and pad design work and conducted the on-site testing and evaluation. Arctic Foundation of Anchorage designed and manufactured, and Kiewit Pacific Company installed, thermopiles in the pad, using Amtec, Inc. to survey the thermopile locations and Tester Drilling and EBA Engineering to provide drilling

support. Acme Fence Company installed fencing, using the services of Mark Lappi to survey the fence lines and B&B Plumbing to steam thaw the ground for drilling. City Elec. Inc. erected the towers, antennas, and ground screen. Alaska Detroit Diesel delivered, wired and tested the three diesel generators which power the DP transmitters and Service Oil delivered and placed the 5000 gallon DOT-approved tanker. Copper Valley Telephone installed the telephone lines, and Copper Valley Electric supplies commercial housekeeping power. Newbery Alaska installed the electrical distribution lines and provided the pole for the aircraft alert radar antenna. Bishop & Sons Enterprises supplies water, while CBS Service provides trash removal and sewage disposal. Harley McMahon flew sorties to test the capabilities of the aircraft alert radar and provide the opportunity for aerial photography.

Current/Future Operations at the HAARP Research Facility

Completing the Development Prototype testing is the primary goal of the current operations at HAARP. Initial DP tests were conducted during 15 December 1994 to 12 April 1995, and follow-on tests are scheduled for 24 July through 11 August 1995. Future milestones include: initiating research with the DP itself in mid-September 1995, using it both to generate ELF for the first time and as a transmitter in a cooperative experiment with HIPAS; conducting another ELF campaign in March 1996; and filling the DP antenna array with an additional 30 transmitter-pairs by summer 1997. During the campaigns the researchers would depend on the local economy for subsistence and other necessities. Both on- and off-site diagnostic instruments are providing data on the natural high latitude ionosphere and supporting research at the HIPAS facility near Chena Hot Springs. Currently these include a magnetometer, ELF/VLF receivers, an imaging riometer, a 30 MHz riometer and a spectrum monitor.

Environmental Process

In accordance with the National Environmental Policy Act (NEPA), an environmental impact statement (EIS) evaluated the consequences of constructing and operating the HAARP research facility in Alaska. The EIS discusses impacts on such diverse topics as electromagnetic and radio frequency interference, vegetation, wetlands, wildlife, air quality, subsistence, cultural resources, atmosphere and others.

State and federal environmental regulatory agencies were consulted to identify issues, and additional input was solicited from the public during scoping meetings held in Anchorage and Glennallen, Alaska in August 1992. A draft of the EIS was prepared and distributed to the public and to specific organizations on March 12, 1993. Public hearings were held in Glennallen and Anderson, municipalities close to the sites under consideration. The final EIS was released to the public on July 15, 1993 and the Record of Decision selecting Gakona, Alaska as the site for the HAARP Ionospheric Research Facility was signed on October 18, 1993.

In addition to the NEPA process described above, all applicable state and federal regulations for construction and operation of the HAARP facility are being complied with.

Additional Information

An updated version of this fact sheet will be issued as often as program changes warrant to keep interested parties apprised of significant developments in regard to HAARP. Any individual seeking additional information about HAARP, or wishing to provide comments regarding HAARP, may contact:

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Send questions or suggestions via e-mail to kennedy@itd.nrl.navy.mil or leave a comment right now on our server.

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HAARP: VANDALISM IN THE SKY?

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Technonet is the protest form of the 1990s-picketing on the information highways. For example, a fast-growing assortment of men and women around the world are using the Internet (started by the US military for information transfer and exchange that would never be interfered with) to draw attention to a questionable military project in Alaska. Now these Interneting, e-mailing, faxing folks are blowing holes in the US Department of Defense secrecy wall by using the government's own system.

The printed-word part of the protest started when Dennis Specht, an anti-nuclear activist then living in Alaska, sent a news item to NEXUS on the topic of HAARP-the High-frequency Active Auroral Research Program. Then, an Alaskan political activist and science researcher in Anchorage, Nick Begich, networked with Patrick and Gael Crystal Flanagan, who are self-described "technomonks" living in Sedona, Arizona, and was told to check out that same Australian-based magazine. Begich was surprised to see an item from his home town in NEXUS and immediately headed to the local library to dig out the documents cited in the article.

That research led to articles and the book, *Angels Don't Play this HAARP: Advances in Tesla Technology*, which is 230 pages of detailed information on this intrusive project. This article will only give highlights. Despite the amount of research (350 footnotes), at its heart it is a story about ordinary people who took on an extraordinary challenge.

HAARP BOILS THE UPPER ATMOSPHERE

HAARP will zap the upper atmosphere with a focused and steerable electromagnetic beam. It is an advanced model of an 'ionospheric heater'. (The ionosphere is the electrically-charged sphere surrounding Earth's upper atmosphere. It ranges between about 40 to 600 miles above Earth's surface.)

Put simply, the apparatus for HAARP is a reversal of a radio telescope: antennas send out signals instead of receiving. HAARP is the test run for a super-powerful radio wave beaming technology that lifts areas of the ionosphere by focusing a beam and heating those areas. Electromagnetic waves then bounce back onto Earth and penetrate everything-living and dead. HAARP publicity gives the impression that the High-frequency Active Auroral Research Program is mainly an academic project with the goal of changing the ionosphere to improve communications for our own good. However, other US military documents put it more clearly: HAARP aims to learn how to "exploit the ionosphere for Department of Defense purposes". Communicating with submarines is only one of those purposes.

Press releases and other information from the military on HAARP continually downplay what it could do. Publicity documents insist that the HAARP project is no different than other ionospheric heaters operating safely throughout the world in places such as Arecibo, Puerto Rico; Tromsø, Norway; and the former Soviet Union. However, a 1990 government document indicates that the radio frequency (RF) power zap will drive the ionosphere to unnatural activities:

"...at the highest HF powers available in the West, the instabilities commonly studied are approaching their maximum RF energy dissipative capability, beyond which the plasma processes will 'run away' until the next limiting factor is reached."

If the military, in cooperation with the University of Alaska, Fairbanks, can show that this new ground-based "Star Wars" technology is sound, they both win. The military has a relatively inexpensive defence shield and the university can brag about the most dramatic geophysical manipulation since atmospheric explosions of nuclear bombs. After successful testing, they would have the military megaprojects of the future and huge markets for Alaska's North Slope natural gas.

Looking at the other patents which built on the work of a Texas physicist named Bernard Eastlund, it becomes clearer how the military intends to use the HAARP transmitter. It also makes governmental denials less believable. The military knows how it intends to use this technology, and has made it clear in their documents. The military has deliberately misled the public through sophisticated word games, deceit and outright disinformation.

The military says the HAARP system could:

- give the military a tool to replace the electromagnetic pulse effect of atmospheric thermonuclear devices (still considered a viable option by the military through at least 1986);
- replace the huge Extremely Low Frequency (ELF) submarine communication system operating in Michigan and Wisconsin with a new and more compact technology;
- be used to replace the over-the-horizon radar system that was once planned for the current location of HAARP, with a more flexible and accurate system;
- provide a way to wipe out communications over an extremely large area, while keeping the military's own communications systems working;
- provide a wide-area Earth-penetrating tomography which, if combined with the computing abilities of EMASS and Cray computers, would make it possible to verify many parts of nuclear nonproliferation and peace agreements;
- be a tool for geophysical probing to find oil, gas and mineral deposits over a large area;
- be used to detect incoming low-level planes and cruise missiles, making other technologies obsolete.

The above abilities seem like a good idea to all who believe in sound national defence and to those concerned about cost-cutting. However, the possible uses which the HAARP records do not explain, and which can only be found in US Air Force, Army, Navy and other federal agency records, are alarming. Moreover, effects from the reckless use of these power levels in our natural shield-the ionosphere-could be cataclysmic, according to some scientists.

Two Alaskans put it bluntly. A founder of the *NO HAARP* movement, Clare Zickuhr, says: "The military is going to give the ionosphere a big kick and see what happens."

The military failed to tell the public that they do not know what exactly will happen, but a Penn State science article brags about that uncertainty. Macho science? The HAARP project uses the largest energy levels yet played with, by what Begich and Manning call "the big boys with their new toys". It is an experiment on the sky, and experiments are done to find out something not already known. Independent scientists told Begich and Manning that a HAARP-type 'skybuster' with its unforeseen effects could be an act of global vandalism.

HAARP HISTORY

The patents described below were the package of ideas which were originally controlled by ARCO Power Technologies Incorporated (APTI), a subsidiary of Atlantic Richfield Company, one of the biggest oil companies in the world. APTI was the contractor that built the HAARP facility. ARCO sold this subsidiary, the patents and the second phase construction contract to E-Systems in June 1994.

E-Systems is one of the biggest intelligence contractors in the world, doing work for the CIA, defence intelligence organisations and others. US\$1.8 billion of their annual sales are to these organisations, with \$800 million for black projects-projects so secret that even the United States Congress isn't told how the money is being spent.

E-Systems was bought out by Raytheon which is one of the largest defence contractors in the world. In 1994 Raytheon was listed as number 42 on the "Fortune 500" list of companies. Raytheon has thousands of patents, some of which will be valuable in the HAARP project. Twelve patents are the backbone of the HAARP project, and are now buried among the thousands of others held in the name of Raytheon.

Bernard J. Eastlund's US Patent #4,686,605, "Method and Apparatus for Altering a Region in the Earth's

Atmosphere, Ionosphere and/or Magnetosphere", was sealed for a year under a government secrecy order.

The Eastlund ionospheric heater was different: the radio frequency (RF) radiation was concentrated and focused to a point in the ionosphere. This difference throws an unprecedented amount of energy into the ionosphere. The Eastlund device would allow a concentration of one watt per cubic centimetre, compared to others only able to deliver about one millionth of one watt.

This huge difference could lift and change the ionosphere in the ways necessary to create futuristic effects described in the patent. According to the patent, the work of Nikola Tesla in the early 1900s formed the basis of the research.

What would this technology be worth to ARCO, the owner of the patents? They could make enormous profits by beaming electrical power, without wires, from a powerhouse in the gas fields to the consumer.

For a time, HAARP researchers could not prove that this was one of the intended uses for HAARP. In April 1995, however, Begich found other patents, connected with a 'key personnel' list for APTI. Some of these new APTI patents were indeed a wireless system for sending electrical power.

Eastlund's patent said the technology can confuse or completely disrupt airplanes' and missiles' sophisticated guidance systems. Further, this ability to spray large areas of Earth with electromagnetic waves of varying frequencies, and to control changes in those waves, makes it possible to knock out communications on land or sea as well as in the air. The patent said:

"Thus, this invention provides the ability to put unprecedented amounts of power in the Earth's atmosphere at strategic locations and to maintain the power injection level, particularly if random pulsing is employed, in a manner far more precise and better controlled than heretofore accomplished by the prior art, particularly by detonation of nuclear devices of various yields at various altitudes..."

"...it is possible not only to interfere with third party communications but to take advantage of one or more such beams to carry out a communications network even though the rest of the world's communications are disrupted. Put another way, what is used to disrupt another's communications can be employed by one knowledgeable of this invention as a communication network at the same time.

"...large regions of the atmosphere could be lifted to an unexpectedly high altitude so that missiles encounter unexpected and unplanned drag forces with resultant destruction..."

"Weather modification is possible by, for example, altering upper atmosphere wind patterns by constructing one or more plumes of atmospheric particles which will act as a lens or focusing device. ...molecular modifications of the atmosphere can take place so that positive environmental effects can be achieved. Besides actually changing the molecular composition of an atmospheric region, a particular molecule or molecules can be chosen for increased presence. For example, ozone, nitrogen, etc. concentrations in the atmosphere could be artificially increased..."

Begich found 11 other APTI patents. They told how to make "Nuclear-sized Explosions without Radiation", power-beaming systems, over-the-horizon radar, detection systems for missiles carrying nuclear warheads, electromagnetic pulses previously produced by thermonuclear weapons and other "Star Wars" tricks. This cluster of patents underlay the HAARP weapon system.

Related research by Begich and Manning uncovered bizarre schemes. For example, US Air Force documents revealed that a system had been developed for manipulating and disrupting human mental processes through pulsed radio-frequency radiation (the stuff of HAARP) over large geographical areas. The most telling material about this technology came from writings of Zbigniew Brzezinski (former National Security Adviser to US President Carter) and J. F. MacDonald (science adviser to US President Johnson and a Professor of Geophysics at UCLA), as they wrote about use of power-beaming transmitters for geophysical and environmental warfare. The documents showed how these effects might be caused, and the negative effects on human health and thinking.

The mental-disruption possibilities for HAARP are the most disturbing. More than 40 pages of the book, with dozens of footnotes, chronicle the work of Harvard professors, military planners and scientists as they plan and test this use of the electromagnetic technology. For example, one of the papers describing this use was

from the International Red Cross in Geneva. It even gave the frequency ranges where these effects could occur-the same ranges which HAARP is capable of broadcasting.

The following statement was made more than 25 years ago in a book which Brzezinski wrote while a professor at Columbia University:

"Political strategists are tempted to exploit research on the brain and human behaviour. Geophysicist Gordon J. F. MacDonald-specialist in problems of warfare-says accurately-timed, artificially-excited electronic strokes 'could lead to a pattern of oscillations that produce relatively high power levels over certain regions of the Earth... In this way, one could develop a system that would seriously impair the brain performance of very large populations in selected regions over an extended period...' No matter how deeply disturbing the thought of using the environment to manipulate behaviour for national advantages, to some the technology permitting such use will very probably develop within the next few decades."

In 1966, MacDonald was a member of the President's Science Advisory Committee and later a member of the President's Council on Environmental Quality. He published papers on the use of environmental control technologies for military purposes. The most profound comment he made as a geophysicist was:

"The key to geophysical warfare is the identification of environmental instabilities to which the addition of a small amount of energy would release vastly greater amounts of energy."

While yesterday's geophysicists predicted today's advances, are HAARP program managers delivering on the vision? The geophysicists recognised that adding energy to the environmental soup could have large effects. However, humankind has already added substantial amounts of electromagnetic energy into our environment without understanding what might constitute critical mass. The book by Begich and Manning raises questions. Have these additions been without effect, or is there a cumulative amount beyond which irreparable damage can be done? Is HAARP another step in a journey from which we cannot turn back? Are we about to embark on another energy experiment which unleashes another set of demons from Pandora's box?

As early as 1970, Zbigniew Brzezinski predicted a "more controlled and directed society" would gradually appear, linked to technology. This society would be dominated by an elite group which impresses voters by allegedly superior scientific know-how. *Angels Don't Play This HAARP* further quotes Brzezinski:

"Unhindered by the restraints of traditional liberal values, this elite would not hesitate to achieve its political ends by using the latest modern techniques for influencing public behaviour and keeping society under close surveillance and control. Technical and scientific momentum would then feed on the situation it exploits," Brzezinski predicted.

His forecasts proved accurate. Today, a number of new tools for the "elite" are emerging, and the temptation to use them increases steadily. The policies to permit the tools to be used are already in place. How could the United States be changed, bit by bit, into the predicted highly-controlled technosociety? Among the 'stepping stones' Brzezinski expected were persisting social crises and use of the mass media to gain the public's confidence.

In another document prepared by the government, the US Air Force claims:

"The potential applications of artificial electromagnetic fields are wide-ranging and can be used in many military or quasi-military situations... Some of these potential uses include dealing with terrorist groups, crowd control, controlling breaches of security at military installations, and antipersonnel techniques in tactical warfare. In all of these cases the EM (electromagnetic) systems would be used to produce mild to severe physiological disruption or perceptual distortion or disorientation. In addition, the ability of individuals to function could be degraded to such a point that they would be combat-ineffective. Another advantage of electromagnetic systems is that they can provide coverage over large areas with a single system. They are silent, and countermeasures to them may be difficult to develop... One last area where electromagnetic radiation may prove of some value is in enhancing abilities of individuals for anomalous phenomena."

Do these comments point to uses already somewhat developed? The author of the government report refers to an earlier Air Force document about the uses of radio-frequency radiation in combat situations. (Here, Begich and Manning note that HAARP is the most versatile and the largest radio-frequency radiation transmitter in the world.)

The United States congressional record deals with the use of HAARP for penetrating the Earth with signals bounced off the ionosphere. These signals are used to look inside the planet to a depth of many kilometres in order to locate underground munitions, minerals and tunnels. For 1996 the US Senate has set aside US\$15 million to develop this ability alone: Earth-penetrating tomography. The problem is that the frequency needed for Earth-penetrating radiations is within the frequency range most cited for disruption of human mental functions. It may also have profound effects on migration patterns of fish and wild animals which rely on an undisturbed energy field to find their routes.

As if electromagnetic pulses in the sky and mental disruption were not enough, Eastlund bragged that the super-powerful ionospheric heater could control weather. Begich and Manning brought to light government documents indicating that the military has weather-control technology. When HAARP is eventually built to its full power level, it could create weather effects over entire hemispheres. If one government experiments with the world's weather patterns, what is done in one place will impact everyone else on the planet. *Angels Don't Play This HAARP* explains a principle behind some of Nikola Tesla's inventions-resonance-which affects planetary systems.

BUBBLE OF ELECTRIC PARTICLES

Angels Don't Play This HAARP includes interviews with independent scientists such as Elizabeth Rauscher. She has a Ph.D., a long and impressive career in high-energy physics, and has been published in prestigious science journals and books. Rauscher commented on HAARP: "You're pumping tremendous energy into an extremely delicate molecular configuration that comprises these multi-layers we call the ionosphere." The ionosphere is prone to catalytic reactions, she explained: if a small part is changed, a major change in the ionosphere can happen.

In describing the ionosphere as a delicately balanced system, Dr Rauscher shared her mental picture of it: a soap bubble-like sphere surrounding Earth's atmosphere, with movements swirling over the surface of the bubble. If a big enough hole is punched through it, she predicts it could pop.

SLICING THE IONOSPHERE

Physicist Daniel Winter, Ph.D., of Waynesville, North Carolina, says HAARP high-frequency emissions can couple with long wave (low frequency or ELF) pulses the Earth grid uses to distribute information as vibrations to synchronise dances of life in the biosphere. Dan terms this geomagnetic action "Earth's information broadcast", and says it is likely that coupling of HAARP HF (high frequency) with natural ELF (extremely low frequency) can cause unplanned, unsuspected side-effects.

David Yarrow of Albany, New York, is a researcher with a background in electronics. He described possible interactions of HAARP radiations with the ionosphere and Earth's magnetic grid:

"HAARP will not burn 'holes' in the ionosphere. That is a dangerous understatement of what HAARP's giant gigawatt beam will do. Earth is spinning relative to thin electric shells of the multilayer membrane of 'iono-spheres' that absorb and shield Earth's surface from intense solar radiation, including charged particle storms in solar winds erupting from the Sun. Earth's axial spin means that HAARP in a burst lasting more than a few minutes-will slice through the ionosphere like a microwave knife. This produces not a hole, but a long tear-an incision.

CRUELY PLUCKING THE STRINGS

"Second concept: As Earth rotates, HAARP will slice across geomagnetic flux...a donut-shaped spool of magnetic strings-like longitude meridians (on maps). HAARP may not 'cut' these strings in Gaia's magnetic mantle, but will pulse each thread with harsh, out-of-harmony high frequencies. These noisy impulses will vibrate geomagnetic flux lines, sending vibrations all through the geomagnetic web.

"The image comes to mind of a spider on its web. An insect lands, and the web's vibrations alert the spider to possible prey. HAARP will be a manmade microwave finger poking at the web, sending out confusing signals, if not tearing holes in the threads.

"Effects of this interference with symphonies of Gaia's geomagnetic harp are unknown, and I suspect barely thought of. Even if thought of, the intent [of HAARP] is to learn to exploit any effects, not to play in tune to global symphonies."

Among other researchers quoted is Paul Schaefer of Kansas City. His degree is in electrical engineering and he spent four years building nuclear weapons. "But most of the theories that we have been taught by scientists to believe in seem to be falling apart," he says. He talks about imbalances already caused by the industrial and atomic age, especially by radiation of large numbers of tiny, high-velocity particles "like very small spinning tops" into our environment. The unnatural level of motion of highly energetic particles in the atmosphere and in radiation belts surrounding Earth is the villain in the weather disruptions, according to this model which describes an Earth discharging its buildup of heat, relieving stress and regaining a balanced condition through earthquakes and volcanic action.

FEVERISH EARTH

"One might compare the abnormal energetic state of the Earth and its atmosphere to a car battery which has become overcharged with the normal flow of energy jammed up, resulting in hot spots, electrical arcing, physical cracks and general turbulence as the pent-up energy tries to find some place to go."

In a second analogy, Schaefer says:

"Unless we desire the death of our planet, we must end the production of unstable particles which are generating the Earth's fever. A first priority to prevent this disaster would be to shut down all nuclear power plants and end the testing of atomic weapons, electronic warfare and 'Star Wars'."

Meanwhile, the military builds its biggest ionospheric heater yet, to deliberately create more instabilities in a huge plasma layer—the ionosphere—and to rev up the energy level of charged particles.

ELECTRONIC RAIN FROM THE SKY

The military has published papers about electron precipitation from the magnetosphere (the outer belts of charged particles which stream toward Earth's magnetic poles) caused by manmade very-low-frequency electromagnetic waves:

"These precipitated particles can produce secondary ionisation, emit X-rays, and cause significant perturbation in the lower ionosphere."

Two Stanford University radio scientists offer evidence of what technology can do to affect the sky by making waves on Earth. They showed that very low frequency radio waves can vibrate the magnetosphere and cause high-energy particles to cascade into the Earth's atmosphere. By turning the signal on or off, they could stop the flow of energetic particles.

WEATHER CONTROL

Avalanches of energy dislodged by such radio waves could hit us hard. Their work suggests that technicians could control global weather by sending relatively small 'signals' into the Van Allen belts (radiation belts around Earth). Thus Tesla's resonance effects can control enormous energies by tiny triggering signals.

The Begich/Manning book asks whether that knowledge will be used by war-oriented or biosphere-oriented scientists.

The military has had about 20 years to work on weather warfare methods, which it euphemistically calls weather modification. For example, rainmaking technology was taken for a few test rides in Vietnam. The US Department of Defense sampled lightning and hurricane manipulation studies in *Project Skyfire* and *Project Stormfury*. And they looked at some complicated technologies that would give big effects. *Angels Don't Play This HAARP* cites an expert who says the military studied both lasers and chemicals which they figured could damage the ozone layer over an enemy. Looking at ways to cause earthquakes, as well as to detect them, was part of the project named *Prime Argus*, decades ago. The money for that came from the Defense Advanced Research Projects Agency (DARPA, now under the acronym ARPA).

In 1994 the US Air Force revealed its *Spacecast 2020* master plan which includes weather control. Scientists have experimented with weather control since the 1940s, but *Spacecast 2020* noted that "using environmental modification techniques to destroy, damage or injure another state [is] prohibited". Having said that, the Air Force claimed that advances in technology "compels a re-examination of this sensitive and potentially risky topic".

FORTY YEARS OF ZAPPING THE SKY?

As far back as 1958, the chief White House adviser on weather modification, Captain Howard T. Orville, said the US defence department was studying "ways to manipulate the charges of the Earth and sky and so affect the weather by using an electronic beam to ionise or de-ionise the atmosphere over a given area.

In 1966, Professor Gordon J. F. MacDonald was Associate Director of the Institute of Geophysics and Planetary Physics at the University of California, Los Angeles, was a member of the President's Science Advisory Committee, and later a member of the President's Council on Environmental Quality. He published papers on the use of environmental control technologies for military purposes. MacDonald made a revealing comment:

"The key to geophysical warfare is the identification of environmental instabilities to which the addition of a small amount of energy would release vastly greater amounts of energy."

World-recognised scientist MacDonald had a number of ideas for using the environment as a weapon system and he contributed to what was, at the time, the dream of a futurist. When he wrote his chapter, "How to Wreck the Environment", for the book *Unless Peace Comes*, he was not kidding around. In it he describes the use of weather manipulation, climate modification, polar ice-cap melting or destabilisation, ozone depletion techniques, earthquake engineering, ocean wave control and brainwave manipulation using the planet's energy fields. He also said that these types of weapons would be developed and, when used, would be virtually undetectable by their victims. Is HAARP that weapon? The military's intention to do environmental engineering is well-documented.

US Congress's subcommittee hearings on Oceans and International Environment looked into military weather and climate modification conducted in the early 1970s. "What emerged was an awesome picture of far-ranging research and experimentation by the Department of Defense into ways environmental tampering could be used as a weapon," said another author cited in *Angels Don't Play This HAARP*.

The revealed secrets surprised legislators. Would an inquiry into the state of the art of electromagnetic manipulation surprise lawmakers today? They may find out that technologies developed out of the HAARP experiments in Alaska could deliver on Gordon MacDonald's vision, because leading-edge scientists are describing global weather as not only air pressure and thermal systems but also as an electrical system.

SMALL INPUT, BIG EFFECT

HAARP zaps the ionosphere where it is relatively unstable. A point to remember is that the ionosphere is an active electrical shield protecting the planet from the constant bombardment of high-energy particles from space. This conducting plasma, along with Earth's magnetic field, traps the electrical plasma of space and holds it back from going directly to the Earth's surface, says Charles Yost of Dynamic Systems, Leicester, North Carolina:

"If the ionosphere is greatly disturbed, the atmosphere below is subsequently disturbed."

Another scientist interviewed said there is a super-powerful electrical connection between the ionosphere and the part of the atmosphere where our weather comes onstage: the lower atmosphere.

One manmade electrical effect-power-line harmonic resonance-causes fallout of charged particles from the Van Allen (radiation) belts, and the falling ions cause ice crystals (which precipitate rain clouds).

What about HAARP? Energy blasted upward from an ionospheric heater is not much compared to the total in the ionosphere, but HAARP documents admit that thousandfold greater amounts of energy can be released in the ionosphere than injected. As with MacDonald's "key to geophysical warfare", "nonlinear" effects (described in the literature about the ionospheric heater) mean small input and large output.

Astrophysicist Adam Trombly told Manning that an acupuncture model is one way to look at the possible effect of multi-gigawatt pulsing of the ionosphere. If HAARP hits certain points, those parts of the ionosphere could react in surprising ways.

Smaller ionospheric heaters such as the one at Arecibo are underneath relatively placid regions of the ionosphere compared to the dynamic movements nearer Earth's magnetic poles. That adds another uncertainty to HAARP: the unpredictable and lively upper atmosphere near the North Pole.

HAARP experimenters do not impress common-sense Alaskans such as Barbara Zickuhr, who says: "They're like boys playing with a sharp stick, finding a sleeping bear and poking it in the butt to see what's going to happen."

COULD THEY SHORT-CIRCUIT THE EARTH?

Earth as a spherical electrical system is a fairly well-accepted model. However, those experimenters who want to make unnatural power connections between parts of this system might not be thinking of possible consequences. Electrical motors and generators can be caused to wobble when their circuits are affected. Could human activities cause a significant change in a planet's electrical circuit or electrical field? A paper in the respected journal *Science* deals with manmade ionisation from radioactive material, but perhaps it could also be studied with HAARP-type skybusters in mind:

"For example, while changes in the Earth's electric field resulting from a solar flare modulating conductivity may have only a barely detectable effect on meteorology, the situation may be different in regard to electric field changes caused by manmade ionisation..."

Meteorology, of course, is the study of the atmosphere and weather. Ionisation is what happens when a higher level of power is zapped into atoms and knocks electrons off the atoms. The resulting charged particles are the stuff of HAARP. "One look at the weather should tell us that we are on the wrong path," says Paul Schaefer, commenting on HAARP-type technologies.

Angels Don't Play This HAARP: Advances in Tesla Technology is about the military's plan to manipulate that which belongs to the world: the ionosphere. The arrogance of the United States Government in this is not without precedent. Atmospheric nuclear tests had similar goals. More recently, China and France put their people's money to destructive use in underground nuclear tests. It was recently reported that the US Government spent US\$3 trillion on its nuclear program since its beginnings in the 1940s. What new breakthroughs in life science could have been made with all the money spent on death?

Begich, Manning, Roderick and others believe that democracies need to be founded on openness rather than the secrecy which surrounds so much military science. Knowledge used in developing revolutionary weapons could be used for healing and helping mankind. Because they are used in new weapons, discoveries are classified and suppressed. When they do appear in the work of other independent scientists, the new ideas are often frustrated or ridiculed, while military research laboratories continue to build their new machines for the killing fields.

However, the book by Manning and Begich gives hope that the military-industrial-academic-bureaucratic Goliath can be affected by the combined power of determined individuals and the alternative press. Becoming informed is the first step to empowerment.

The book, *Angels Don't Play This HAARP: Advances in Tesla Technology*, is available for USD\$14.95 plus postage and handling (USD\$1.50; USD\$4.00 international) from Earthpulse Press, c/o Dr Nick Begich, PO Box 201393, Anchorage, Alaska 99520, USA. It can also be ordered by Visa/MasterCard by phoning +1 (907) 249 9111.

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Alaska State Legislature
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Minority Whip

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15 Feb '96

Representative Jeannette James, Chair
House State Affairs Committee
Capitol Building, Room 102
Juneau, Alaska 99801

Dear Representative James *Jeannette*

During the course of this session I have been receiving an increasing number of letters and POMS regarding the HAARP project located in the interior region of my district. In order to better understand the situation, I have been collecting material, and I recently talked with Dr. Nick Begich, author of the book "Angels Don't Play This HAARP."

Based upon my review of the material I have received, I can see why my constituents living in the Copper Valley region may have cause to be worried about this project. For that matter, I can see why Alaskans, perhaps Americans in general, could have reason to question what is being undertaken in the name of science. I have included a copy of an article for your perusal.

According to a number of documents I have read, the experts are divided whether manipulating the ionosphere to the degree planned by the HAARP project can have unknown and potentially dangerous consequences. Richard Williams, a physical chemist at Princeton University stated that his "concern is its [HAARPS] effects on a global scale. With experiments on this scale, irreparable damage could be done in a short time."¹ Even a proponent of the project, such as Professor James Van Allen, the discoverer of the Earth-girdling radiation belts that bear his name, admitted that "HAARP will perturb the ionosphere markedly for an hour, or maybe even a day, or perhaps at most a month."²


¹Popular Science, "Mystery in Alaska" September 1995.

² Ibid.

Representative James, as Chair of the State Affairs Committee, I wish you would consider holding a hearing on the HAARP project. Based upon my inquiries, there are a number of Alaskans concerned about this project. Further, a hearing may well be the best way to address this issue: by getting all the questions on the table with all the appropriate parties present to answer them. In this way, we may be able to help, as Mr. Dermot Cole, columnist for the Fairbanks Daily News Miner, stated it: "separate science fact from science fiction."

If you would like me to provide any further information regarding HAARP, please don't hesitate to contact me.

Sincerely,


Representative Gene Kubina
District 35

GK/tvb

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RECEIVED BY
MAR 13 1995
Rep. Joannette James

March 9, 1996

Senator Georgianna Lincoln
State Capitol Room 510
Juneau, AK 99801

Dear Senator Lincoln:

A groundswell of growing public concern about [REDACTED]'s unknown effects on Alaska's environment and thus, on our health and welfare, seems to be now reaching Juneau. It may be timely for the Legislature to begin a dialogue to eventually make the political decision on whether the state should be monitoring this DOD project operating within its borders. A public forum with HAARP planners, atmospheric/ionospheric scientists, legislators and concerned citizens is essential to this debate.

I believe it is in the state's best interest that ADEC be funded to research and analyze baseline radiation levels versus HAARP's testing effects through prototype completion (summer, '97) and full-scale development (2000-2002) of the facility. The full antenna array of 360 transmitters is expected to generate nearly one billion watts of effective radiated power at ionospheric heights. Though this perturbation may be insufficient to cause any dire environmental consequences, technological gains in futuristic communications/weapons systems could prompt rapid development of a mega-HAARP, with vastly increased power beaming capabilities to strengthen these gains.

The first major testing campaign of HAARP's prototype will occur this month in conjunction with the HIPAS (High Power Auroral Stimulation) facility near Fairbanks. This collaboration will focus on ELF/VLF (extremely low/very low frequency) wave generation techniques and pattern control using both ionospheric heating sources. This information was gleaned from ACTIVE Experiments Newsletter No. 1, handed out at HAARP's Sept. '95 open house. According to its author, Dr. Michael Kelly, ionospheric scientists are under increasing pressure to achieve new goals if the DOD Science Program (and related research in the former Soviet Union) are to continue being funded. In other words, development of HAARP to produce technological breakthroughs in ionospheric modification may be on a fast track, without due consideration of environmental concerns.

Though it can be argued that the US must develop this technology for a strong national defense in the 21st century, it is insane to jeopardize the stability of our environment (in which our very survival depends) in order to better protect it against enemy attack.

Independent scientific review of HAARP's effects may be problematic due to its integration with two other US ionospheric facilities cooperating in this experiment. Also, setting up and operating a community monitoring station with the necessary diagnostic instrumentation to detect anomalies in sensitive environmental parameters may be prohibitively expensive without federal funding. The enclosed page on the NEWNET (Neighborhood Environmental Watch Network)

Senator Georgianna Lincoln
March 9, 1996 Page 2

alludes to the latter. Due to the hemispheric or global nature of ionospheric experimentation, a community monitoring concept might not be applicable (unless a site could serve as an index, or indicator of change, to the overall environmental picture). Could Gakona or Fox, for example, qualify as suitable monitoring sites, and would EPA fund operation of a HAARP monitoring station?

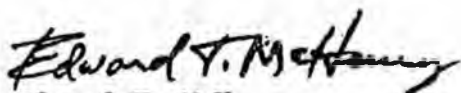
Perhaps the least costly and simplest means of keeping tabs on HAARP effects would be via the Internet. On page 6 of the 17 July 95 HAARP Fact Sheet is stated "The diagnostic information will be combined into an integrated data package which will be available throughout the country in real time, eventually allowing scientists to participate in the investigations directly from their laboratories." If this information can be accessed by ADEC and correlated with environmental phenomena observed during (or resulting from) testing campaigns, this approach might be the most feasible to HAARP monitoring.

Ideally, an Environmental Review Committee, similar to the Radio Frequency Interference group emplaced, should be established by HAARP planners to alleviate public concerns. Their willingness to do so now, however, following no serious environmental objections raised through the EIS process, probably is nil. Evidently, nobody knew enough about the nebulous technology involved to ask the hard questions, despite that ionospheric experimentation has been conducted world-wide since the 1950's.

When, and if, HAARP's ionospheric technology is deemed successful by USAF and USN brass, the real sky-frying (and our global environmental worries) may just be beginning. HF (high frequency) power beaming into the ionosphere could be magnified many fold as the US military pushes the envelope to beat the competition in 21st century communications/weapons systems supremacy. Hopefully, HF power increases will not exceed some unknown "critical mass" threshold to trigger a global environmental apocalypse. For the state to keep its head in the sand while DOD pursues these objectives in Alaska, is not only politically imprudent but biologically unconscionable. I doubt the Alaskan public will allow that to happen.

Thank you for your consideration and earliest attention to this matter. It is vitally important.

Sincerely,



Edward T. McHenry
Chairman, Copper Country Alliance

Encl.

cc: Governor Tony Knowles
Commissioner Michele Brown, ADEC
Doug Dasher, ADEC
✓ Jeanette James, House State Affairs Committee Chair

ILLUSTRATIONS

oooooooooooooooooooo

HAARP

From Angels don't play
this HAARP
Dr. Begich

The below diagram was taken from the "Biennial Report 1991-92, Geophysical Institute, University of Alaska Fairbanks". It shows the inter-relationships of the various programs being operated by the University.

