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8 August 1989  
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MEMORANDUM FOR: C/Technology Transfer Assessment Center/OSWR/DDI  
FROM: [Redacted] STAT  
Legislation Division  
Office of Congressional Affairs  
SUBJECT: Review and Report on Decontrol of Certain Personal Computers

Attached for your information is a copy of the 1 August 1989 Congressional Record, wherein the Senate approved an amendment to the DoD Authorization Bill pertaining to decontrol of certain personal computers. As you will note, the amendment requires the Secretary of Defense, in consultation with the Director of Central Intelligence, to conduct a review of the report issued by the Secretary of Commerce concerning the foreign availability of certain personal computers.

[Redacted] STAT

Attachment

OCA/LEG, [Redacted] 8 Aug 89) STAT

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August 1, 1989

## CONGRESSIONAL RECORD — SENATE

S 9291

The PRESIDING OFFICER. The Senator from Arizona reserves the right to object.

Mr. McCAIN. I withdraw the objection.

The PRESIDING OFFICER. Without objection, it is so ordered.

## AMENDMENT NO. 633

(Purpose: To require the Secretary of Defense to review and report on the report of the Secretary of Commerce regarding the decontrol of certain computers)

Mr. WARNER. Mr. President, I send an amendment to the desk on behalf of the senior Senator from Wyoming and ask for its immediate consideration.

The PRESIDING OFFICER. The clerk will report the amendment.

The assistant legislative clerk read as follows:

The Senator from Virginia [Mr. WARNER], for Mr. WALLOP, proposes an amendment numbered 633.

Mr. WARNER. Mr. President, I ask unanimous consent that reading of the amendment be dispensed with.

The PRESIDING OFFICER. Without objection, it is so ordered.

The amendment is as follows:

On page 293, between lines 13 and 14, insert the following new section:

## SEC. . REVIEW AND REPORT ON DECONTROL OF CERTAIN PERSONAL COMPUTERS.

(a) REVIEW.—The Secretary of Defense, in consultation with the Director of Central Intelligence and the Science Advisor to the President, shall conduct a review of the report made by the Secretary of Commerce on the foreign availability of certain personal computers entitled "Foreign Availability Assessment: AT-Compatible Microcomputers." In conducting such review, the Secretary of Defense shall, at a minimum—

(1) determine the availability of microcomputers referred to in such report from sources other than members nations of the Coordinating Committee for Multilateral Export Controls or other nations that control the export of such computers; and

(2) assess the military significance of such computers for the Soviet Union and its Warsaw Pact allies.

(b) REPORT.—The Secretary of Defense shall submit to the Committee on Banking, Housing, and Urban Affairs of the Senate and the Committee on Foreign Affairs of the House of Representatives a report containing the results of the Secretary's review. The Secretary shall include in such report such recommendations for legislative changes as the Secretary considers appropriate to protect the national security of the United States.

(c) DEADLINE FOR REPORT.—The report required by subsection (b) shall be submitted not later than January 1, 1990.

Mr. WALLOP. Mr. President, the amendment which I intend to offer to the Department of Defense authorization bill deals with the recent decision to ease export control restrictions on certain advanced personal computers to the Soviet Union and other Warsaw pact countries. First of all, Mr. President, I want to make very clear that it is not my intention to permanently prevent such sales of personal computers. However, I am extremely concerned from what I have seen in the press and from briefings by adminis-

tration officials that U.S. national security interests may have not been fully taken into account.

In particular, Mr. President, I am appalled at the apparent disregard by the Department of Commerce for the Department of Defense's objection to the easing of these restrictions. Having just completed the wrangle over the FSX through which I was persuaded—as was the President—that the Department of Commerce needed to take another look at this issue, I am surprised that Commerce seems to be denying its sister agencies an opportunity to play a comparable role in fashioning a sensible approach to East-West technology flows.

As I understand the Export Administration Act, a study must be conducted which concludes that an item is found in a controlled country "in sufficient quantity and of comparable quality sufficient to meet the military needs of proscribed destinations" thus establishing that export controls on such items are ineffective.

Mr. President, I have serious reservations regarding the integrity and extent of Commerce's foreign availability study. First, the Commerce Department's assessment of the foreign availability of these more powerful desktop computers depends in large part on circumstantial evidence such as advertisements and occasional eyewitness sightings. Second, Mr. President, Commerce's conclusions provide us with precious little hard data—especially given the fact that their decontrol initiative would seek to loosen controls by more than 10 times in some categories. Although separate components may be sold in the world marketplace at these levels—meaning components would have to be mixed and matched—the study does not show how many whole machines are available to Warsaw Pact countries. In fact, Mr. President, I am hard pressed to find very many hard numbers from Commerce's foreign availability study.

The severity of this issue can be understood in light of the following scenario: If the United States were to follow the Department of Commerce's decontrol initiative, we effectively would be putting at the disposal of Soviet military PC's that surpass those of our own Armed Forces.

Of the 19 countries the Commerce study said could provide these computers to the Soviets, only 2 were either not already members of Cocom, parties to existing agreements designed to limit technology flows to the U.S.S.R., or parties with whom we are currently negotiating to follow Cocom regulations. These two countries are Czechoslovakia and Hungary. Although these two countries may have some indigenous capabilities, they depend very heavily on key components from the West. Moreover, Mr. President, there is no evidence that either has the ability to produce computers up to the standard or in sufficient quantity to meet Soviet military requirements.

Although Commerce has asserted that decontrolling certain advanced desktop computers will result in substantial commercial benefits for American computer manufacturers, they are overly optimistic. While the potential Soviet market may be huge, people who are unable to obtain basic commodities like milk and sugar are unlikely consumers of advanced technology computers. The latter point serves to reemphasize Secretary Cheney's observation: The most significant end-users for the new, more powerful PC's will be Soviet military and intelligence organizations.

Mr. President, I regret that action at this time cannot change the decision Secretary Mosbacher pushed through without regard to Defense Department concerns. However, I do think it is important for the Senate to go on record against an unbalanced, and I believe misguided, approach to managing East-West technology flows.

My amendment, if accepted, would require the Secretary of Defense, in consultation with the Director of Central Intelligence and the President's science advisor, to conduct a review of the foreign availability assessment conducted by the Department of Commerce. The Secretary of Defense shall then submit a report, no later than January 1, 1990, on the findings of this review to the Committees on Armed Services of the Senate and the House along with recommendations for legislative changes as the Secretary considers appropriate.

With this measure, Mr. President, both Armed Services Committees can determine whether or not Commerce's original study was indeed inconclusive. If such a determination is made, Mr. President, I would hope that Senators on both sides of the aisle would agree that legislation regarding potentially dangerous technology flows should be more comprehensively considered in the future.

Mr. President, I ask unanimous consent to print in the RECORD various items pertaining to this matter.

There being no objection, the material was ordered to be printed in the RECORD, as follows:

[From the Washington Post, Apr. 28, 1989]

## SOVIET SATELLITES' RADIATION DISTORTS SCIENTIFIC OBSERVATIONS

(By Philip J. Hilts)

Some sky-watching satellites have been blinded as much as half the time by radiation leaking from nuclear reactors that power Soviet satellites, a fact U.S. officials knew for eight years but concealed from much of the scientific community, according to the authors of five reports in today's issue of the journal Science.

As a result, large amounts of data that scientists thought were telling them something about the universe must be weeded out and discarded. Moreover, the continuing radiation problem may threaten information to be collected by some of the biggest space science projects planned for the near future, according to Joel R. Primack of the University of California at Santa Cruz.

S 9292

## CONGRESSIONAL RECORD — SENATE

August 1, 1989

author of one of five papers in Science detailing the astronomical disaster.

The threatened projects include the \$500,000 Gamma Ray Observatory and the \$1 billion Hubble Space Telescope, the most expensive piece of equipment ever put in space and the first optical telescope to see to the edge of the universe, Primack said.

The problem is caused by the Radar Ocean Reconnaissance Satellites used by the Soviets to observe U.S. naval operations. The problem could be made even worse, scientists say, by the U.S. Department of Energy, which plans to develop more reactors for space, and by similar reactors planned for the Strategic Defense Initiative.

Some scientists are now arguing for banning reactors in orbit, a step that would require the agreement of the Soviets and force the Bush administration publicly to abandon SDI plans as they are now drawn.

The Soviet Union has put up an estimated 35 spy satellites powered by nuclear reactors in the past two decades, and the United States has launched one. The reactors being designed by the Energy Department for the SDI are 25 times more powerful than the earlier U.S. device and would create far more contamination.

A number of astronomical instruments on satellites and high-altitude balloons look out into the universe specifically to see gamma rays coming from celestial objects. They are the highest-energy "light" that can be seen, and are the best way to observe the most mysterious of objects in the universe such as black holes, neutron stars, and quasars.

But the gamma rays coming from the reactors in orbit are 50 times brighter than those from sources in the sky, Primack said. So whenever a gamma ray instrument happens to look in the direction of one of the reactors, or whenever other instruments pass through the cloud of charged particles left behind by reactors, their detectors crackle madly with signals from the reactor that have been interpreted as signs of mysterious phenomena in space.

Astronomers at the University of New Hampshire who operated the instrument on a satellite called Solar Max first noticed something amiss in 1980 when they encountered about five unexplained bursts of data per month. The researchers were not told about the problem until 1981, when one was given a security clearance.

Then he and his group were told not to discuss the matter, according to documents obtained from the Defense Intelligence Agency by a Los Angeles group that monitors nuclear activity in space, called the Committee to Bridge the Gap.

By 1987 and 1988, the number and power of reactors in orbit had increased and the bursts contaminating data had grown to five a day, each lasting from less than a second to 20 minutes.

[From the New York Times, Dec. 27, 1988]  
SPACE POLLUTION FORCES NASA TO CHANGE PLANS FOR KEY PROJECTS

(By William J. Broad)

Upset and angry, scientists are being forced to modify plans and equipment for space missions in a last-ditch attempt to protect billions of dollars worth of telescopes and spacecraft from the growing hazards of pollution in the heavens.

Hundred of thousands of large and small objects left from past launchings are zipping through space at speeds up to 25 miles a second. Sky watchers now track more than 7,000 objects the size of a baseball or larger in orbit around the Earth.

Moreover, a recently revealed peril, radiation from distant nuclear reactors in space,

is already causing false readings in orbiting scientific sensors and may threaten the success of a new generation of observatories that are more sensitive to radiation.

Spacecraft designers and scientists are trying to cope with this celestial pollution by adding shielding to satellites, modifying equipment, reprogramming computers, and exploring ways to dodge debris. In several instances, however, the spacecraft are largely built, limiting the extent and effectiveness of such precautions.

Designers are considering heavy shielding and maneuvering capability for the proposed space station, which the space agency wants to loft by the late 1990's; computer software changes and minor shielding for the Gamma Ray Observatory, which is nearly finished; and software changes for the Hubble Space Telescope, which is already built and would be enormously expensive to modify extensively.

More immediately, new plans are already in place to help space shuttle crews dodge debris. Scientists on the ground are calculating the orbits of space junk that might collide with the shuttle, damaging or destroying the winged spaceship.

But space scientists are clearly upset with the need for such efforts.

"There's frustration and disgust that what ought to be a clean environment is a mess and seems to be getting worse," said Dr. James M. Ryan, an astrophysicist at the University of New Hampshire.

Telescopes on Earth, he noted, already suffer earthly interference such as "light pollution" from cities.

Now, ironically, orbiting telescopes that were meant to get above those problems and the obscuring effect of the Earth's atmosphere are facing a host of man-made impediments to such efforts to observe the universe.

Planners especially worry that space debris might hit a manned spacecraft. A small piece of debris hit the shuttle on one flight and planners consider it luck that a severe collision has not yet taken place.

To protect the space telescope, the Gamma Ray Observatory, and the space station from celestial pollution, scientists are taking a variety of steps:

Hubble Space Telescope. Now scheduled for launching late next year, the \$1 billion observatory is to search for bizarre objects at the end of the universe, its sensors probing the visible universe more deeply than any Earth-based telescope.

Precautions against space pollution have been minimal, designers say, because the telescope was started in 1976 and finished long before the severity of the problem was realized.

Jean Olivier, a manager for the project at the Marshall Space Flight Center in Huntsville, Ala., said that some changes have been made in the software for "star trackers" so that they would not be misled by reflections from orbiting debris.

The trackers fix on a star, helping the telescope's jets keep the platform stable in relation to the stars. The danger is that floating debris could be mistaken for a star, sending the telescope into wild gyrations.

It is too late, he added, to try to redesign the telescope to be better shielded from the direct impact of speeding debris. "It's impractical to try to change the hardware," he said.

He noted that the telescope, as originally designed, had only a 5 percent chance of suffering "serious degradation" during two years of operation because of the impact of orbiting debris.

But now, he said, with the steady rise over the years in space junk orbiting the Earth, that figure has increased to 15 percent.

"When it was designed, no one was worried about debris," he said. "But now we have a problem."

Gamma Ray Observatory. To be lofted in 1990, the \$500 million Gamma Ray Observatory is to probe the highly energetic, invisible radiations spewed by the hottest, most violent stars and galaxies.

It also aims to study such mysteries as gamma-ray bursters, points in space that occasionally emit explosive packets of gamma-ray energy. These bursts have yet to be linked with any known object in the universe.

A new threat to its operation was recently revealed by its designer, the National Aeronautics and Space Administration.

Orbiting nuclear reactors, the agency said, emit radiation and charged particles that can streak across hundreds of miles of space to hit orbiting gamma ray telescopes and sensors on spacecraft, producing a host of false readings.

In November, scientists revealed that radiation from Soviet nuclear reactors in space has already hampered the operation of an American satellite designed to measure gamma rays from the Sun.

The danger will be greater with the Gamma Ray Observatory, which is far more sensitive than the current gamma ray instruments in space.

Dr. Ryan, the astrophysicist at the University of New Hampshire and a scientist on the observatory project, said two protective steps were being weighed, both involving changes in the craft's on-board control software.

The first would try to predict when the craft would encounter reactor radiation and then turn off its instruments, in effect "turning a blind eye to the problem," he said. The second would try to see if the craft's onboard computers can discriminate between real and artificial readings, and filter out the false ones before they are radioed to Earth.

The other threat to the Gamma Ray Observatory is a collision with orbiting debris.

Even minor impacts could virtually wipe out its capability by damaging coverings on its sensors, allowing the instruments to be blinded by the Sun.

To try to prevent such problems, designers are increasing the thickness of coverings over sensors to better shield them.

The Space Station. The \$28 billion NASA manned space station is to be launched in the mid-1990's. At 508 feet long, it is a large target. So too, the consequences of collision are seen as great since its crew compartments can carry up to eight astronauts. Debris the size of a marble, traveling a few miles per second, can pack the explosive power of a hand grenade.

Sherman L. Avans, lead engineer for the Space Structures and Dynamics Lab at the Marshall Center, said a gas gun installation there had fired small projectiles at simulated space-station walls some 700 times to study the danger. As a result, the station will be fitted with double-walled structures and "bumper shields," adding at least 2,000 pounds of shielding to each of the six modules occupied astronauts.

Mr. Avans noted that the station also might have the capacity to be actively moved out of harm's way. With "a few hours of advance warning," he said, small jets might push the station to safety. Warnings for such "collision avoidance" might be provided by ground controllers or by on-board radar or infrared telescopes, he said.

For unmanned spacecraft, such precautions are too costly. The result, said Dr. Ryan, is that "there's a real, live possibility that a significant chunk of material is even-