

IG-97-025

**AUDIT  
REPORT**

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**OFF-SITE USE OF NASA  
COMPUTER RESOURCES**

June 26, 1997

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National Aeronautics and  
Space Administration

**OFFICE OF INSPECTOR GENERAL**

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National Aeronautics and  
Space Administration  
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Reply to Attn of:

**W**

JUN 26 1997

**TO:** AO/Chief Information Officer

**FROM:** W/Acting Assistant Inspector General for Auditing

**SUBJECT:** Audit Survey Report on Off-site Use of  
NASA Computer Resources  
Assignment No. A-HA-97-038  
Report No. IG-97-025

The Office of Inspector General has completed a survey of the off-site use of NASA computer resources. Our survey found that NASA has realized additional productivity from employees who use NASA-owned computers at home. However, by using software licensing agreements NASA can maintain this increased productivity, while reducing the number of computers lent out. We recommend that NASA make maximum use of software license agreements that allow employees to install NASA-purchased software on their personally-owned computers, at no additional cost to NASA.

The OIG issued a draft report to management on May 30, 1997. Management's response was considered responsive to our recommendations, and is included in its entirety as Appendix 2 of the report. We consider recommendations 1 and 2 closed upon issuance of this report. However, we will evaluate the actions taken as outlined in management's response to recommendation 2 during our review of NASA's desktop outsourcing initiative. If you have any questions, please call me at 358-1232.

  
Robert J. Wesolowski

Enclosure

cc:  
ARC/W/OIG Program Directors (w/o encl.)  
ARC/241-11/Audit Liaison Representative

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## ***BACKGROUND***

NASA employees use desktop and notebook computers to do official Government work at off-site locations, at home or while traveling. As of March 24, 1997, NASA had lent more than 1,100 computers to its employees at the various NASA centers. These employees may use the computers only for approved Government work. Normally, NASA does not compensate its employees for the time they use the computers in an off-duty status. Typically, employees who possess an off-site computer (desktop or notebook) also use a desktop computer at their on-site office.

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## ***OBJECTIVE***

Our original survey objective was to determine whether NASA can achieve cost savings by providing a single portable (notebook) computer to those NASA employees who use two NASA-owned computers, one in the office and one at home. The survey showed that currently, NASA cannot cost effectively provide an adequately-configured notebook computer to replace the employees' office desktop computer and off-site computer. Notebook computers generally cost twice as much as comparable desktop computers.

Our preliminary survey results indicated that NASA may, nonetheless, realize increased productivity through related opportunities. Accordingly, we changed our survey objective to determine whether NASA may realize cost savings and increased productivity through greater off-site use of NASA-provided computer resources.

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## ***SCOPE AND METHODOLOGY***

We distributed a questionnaire to a judgment sample of Ames Research Center (ARC) and Goddard Space Flight Center (GSFC) employees who had borrowed Government-owned computers for use at off-site locations, generally in their own homes. We used NASA Equipment Management System (NEMS) records to identify the universe and draw the sample. According to NEMS criteria, listed employees had borrowed a computer for at least 6 months. We did not question the employees' need for the borrowed computers nor did we attempt to determine whether the employees had ever used their borrowed computers for unauthorized purposes. Also, we did not attempt to validate their responses. Appendix 1 summarizes the overall results of the OIG questionnaire.

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***AUDIT FIELD  
WORK***

We conducted our field work during the period February through March 1997, according to generally accepted government auditing standards.

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***OVERALL  
EVALUATION***

Our survey found that NASA has realized increased productivity when its employees use NASA computers at home. The extent of this practice varies among the centers. For example, the Johnson Space Center (JSC) had lent only 11 computers, while ARC, GSFC, and the Langley Research Center (LaRC), had lent 365, 334, and 277 computers, respectively. JSC has encouraged its employees to install NASA purchased, widely used software on their personally owned computers.

The JSC Chief Information Officer (CIO) said the JSC approach produces two benefits. First, employees learn to use the software more quickly. Second, NASA realizes increased productivity when employees use the software to perform NASA-related work at home. This approach is an especially attractive way to increase employee productivity, without additional cost to NASA.

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***OFF-SITE USE OF  
NASA COMPUTERS  
HAS INCREASED  
PRODUCTIVITY***

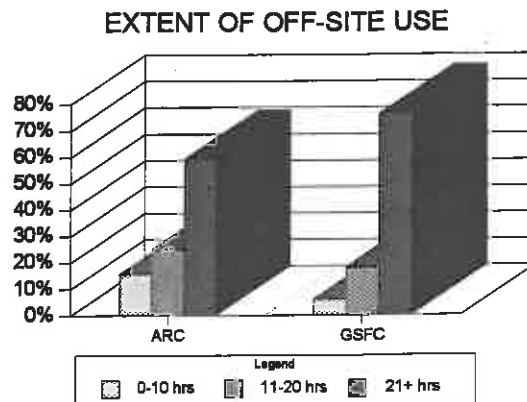
Survey results showed that NASA has gained additional productivity from employees who use NASA-owned computers in their homes. Property management personnel reported the following numbers of desktop and laptop computers lent to NASA employees, as of March 1997. (Property management personnel at Headquarters (HQ) and the Kennedy Space Center (KSC) were unable to identify the number of off-site desktop and laptop computers at their respective locations.)

<u>Location</u>	<u>Number</u>
ARC	365
DFRC	55
GSFC	334
HQ	Unknown
JPL	0
JSC	11
KSC	Unknown

<u>Location</u>	<u>Number</u>
LaRC	277
LeRC	23
MSFC	60
SSC	0
Total	<u>1,125</u>

In conducting this survey, we distributed a questionnaire to a judgment sample of 109 ARC \* and 160 GSFC employees who, according to NASA Equipment Management System (NEMS) records, had borrowed NASA computers for use in their homes. Fifty-one percent of the ARC recipients (56 employees) and 39 percent of the GSFC recipients (63 employees) responded to the questionnaire. Of those who responded, 90 percent were scientists, engineers and technicians, and 10 percent were nontechnical personnel.

Survey responses showed that the respondents spent an average of 25.2 hours per month using the NASA-provided computers to do official NASA work at home. The following illustration shows that most of the productivity gains resulted from employees who used their NASA-provided computers 21 or more hours per month.



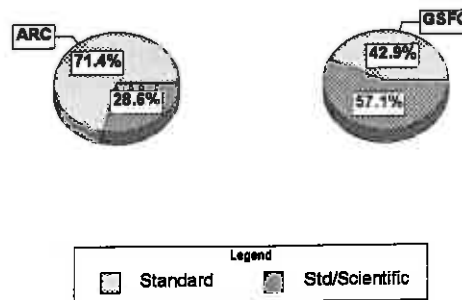

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\*This does not include "test" questionnaires sent to another 50 ARC employees.

We asked the sampled employees how many hours they would otherwise work at their respective centers if they did not have a NASA computer at home. Employees responded that they would work an average of 1.1 additional hours per month at their NASA office. Based on these estimates, NASA may realize an average of 24.1 (25.2 minus 1.1) hours of increased productivity per month from each employee using a NASA computer at home. (See Appendix 1.)

Most respondents said they used only standard, general purpose software on their NASA-provided computer (e.g., word processing, spreadsheets, and electronic communications). About 10 percent of them required an off-site computer for their jobs to, for example, monitor on-campus computers or other center operations. The following graphs show the type of software that the respondents used on their borrowed computers.

### Software Types Used



While "home-use" computers have apparently generated productivity increases, they also cause difficulties not associated with on-site computers. For example:

- The borrowing employee must return the off-site computer to NASA for any repairs.
- Off-site computers do not enjoy the same level of physical security as on-site computers.
- NASA is less able to ensure that off-site computers are used only for approved business purposes.



- NASA may be unable to provide off-site computers to all employees who request them.

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***TAILORED SOFTWARE  
LICENSE AGREEMENTS MAY PROVIDE  
A MORE PRACTICAL  
ALTERNATIVE***

According to JSC's Chief Information Officer (CIO), the Center has realized increased productivity by allowing its employees to install NASA-purchased software on their own computers. It has generally not provided computers for home use. JSC's CIO cited three reasons for the small number of off-site computers at JSC:

- The Center wants to avoid a possible negative public perception that it has wastefully given computers to its employees for use in their homes;
- the difficulty of ensuring that JSC employees use the off-site computers only for approved business purposes; and
- the Center has allowed its employees to install NASA purchased, general purpose software on their personally owned computers.

Regarding the third reason, JSC has a license agreement with Microsoft Corporation that allows Center employees to install Microsoft software on their own computers. JSC incurred no additional cost for this provision, and requires no justification from its employees. The CIO said he believes this policy encourages JSC employees to perform NASA work at home, thereby increasing productivity without NASA investing in costly computer hardware. Furthermore, Center employees train themselves on the software, on their own time. The Center realizes increased productivity because it can reduce employee training costs, and employees take less time away from their normal duties to attend training classes.

The relevant section of the JSC/Microsoft license agreement reads as follows:

*The primary user of a computer on which a copy of the Software is installed or which runs the Software from a storage device used only to install or run the software on Licensee's computers over an internal network may make a second copy for his or her*

exclusive use on a home or portable computer: provided: (x) the total number of second copies made by Licensee's users all grants evidenced by this License Confirmation may not exceed the number of Licenses acquired by Licensee: . . . and (z) Licensee must maintain records that enable Licensee to determine that it is in compliance with the limitation expressed in clause (x) above.

Some other NASA locations have applied this technique to varying degrees. According to JSC's CIO, ARC and several other centers plan to, or already use, JSC's existing license to acquire additional software, including the existing copying privileges.

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***CONCLUSION***

We believe NASA can achieve increased productivity by encouraging its employees to use NASA-provided computer resources at home. In this regard, NASA appears to have realized positive returns on the computers it has provided its employees for home use. Notwithstanding these positive returns, greater use of software license agreements, such as JSC's agreement with Microsoft, may be a better alternative.

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***RECOMMENDATION 1***

The NASA Chief Information Officer, Code AO, should encourage NASA contracting officers to negotiate license agreements that permit NASA employees to install widely used software on their personally owned computers, when deemed cost beneficial.

***Management Response***

[This] is already a current practice of NASA. In addition to JSC, Headquarters, GSFC, LaRC, LeRC, and MSFC all have similar contracts.

***Evaluation of Management's Response***

Management's response satisfies the intent of our recommendation. We encourage KSC and ARC to adopt this practice.

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***RECOMMENDATION 2***

To the extent license agreements for widely used software can effectively reduce the need for off-site computers, the NASA Chief Information Officer, Code AO, should reflect such reductions in the total number of desktop computers that may be outsourced.

***Management Response***

The current practices of loaning computers and/or providing software for home use is being reviewed by this office in conjunction with the activity to outsource desktop computers. No decisions have been made in these areas as of this date, but we will endeavor to ensure that this activity is handled in the most cost-effective manner, consistent with the fixed-price-per-seat, performance-based contract that will support the outsourcing initiative.

***Evaluation of  
Management's Response***

The actions to be taken satisfy the intent of our recommendation.

**SUMMARY RESULTS OF OIG QUESTIONNAIRE**

	ARC	GSFC	Total	Percent
Total number of off-site computers	365	334	699	—
Copies of revised questionnaire issued to employees	109	160	269	—
Number of responses received	56	63	119	—
Response rate	51.4%	39.4%	44.2%	—
<b><u>Questionnaire Summary:</u></b>				
No. of scientists/engineers/technicians who responded	50	57	107	89.9%
No. of non-technical personnel who responded	6	6	12	10.1%
Total number of respondents	56	63	119	100.0%
Type of computer used off-site:				
Desktop	36	25	61	50.8%
Laptop	20	39	59	49.2%
Total	56	64	120	100.0%
Number of employees who said they required more than one Government computer due to nature of their job (e.g., to monitor various computers at the office)	6	6	12	—
Percent of total respondents	10.7%	9.5%	10.1%	—
Total amount of off-site computer use per month (hours)	523	1749	2272	—
Less: No. of hours respondents were willing to work in their on-site office if no off-site computers were provided	14	93	107	—
Net off-site computer hours per month	509	1656	2165	—
Total number of respondents	27	63	90	—
Average off-site computer use per person per month	19.4	27.8	25.2	—
Average net off-site computer usage per person per month	18.9	26.3	24.1	—

National Aeronautics and  
Space Administration  
**Office of the Administrator**  
Washington, DC 20546-0001



JUN 11 1997

**TO:** W/Inspector General

**FROM:** AO/Chief Information Officer

**SUBJECT:** Draft Report, Off-Site Use of NASA Computer Resources,  
Assignment No. A-HA-97-038 and Need to Reflect Off-Site Computer  
Resources in its Outsourcing Desktop Initiative for NASA (ODIN) Draft  
Management Letter M-IG-97-XXX, Audit Assignment No. A-HA-97-050

I would like to thank you for the opportunity to comment on the subject report and draft management letter. I fully concur with your findings that to supply NASA employees, who have a computer on loan at their residence, with a portable (notebook) computer, would be inefficient and more costly than the current practice. To my knowledge, it is not now nor has it ever been a practice of NASA to do so.

In response to your recommendation number 1, that "The NASA Chief Information Officer, Code AO, should encourage NASA contracting officers to negotiate license agreements that permit NASA employees to install widely-used software on their personally-owned computers, when deemed cost beneficial," is already a current practice of NASA. In addition to JSC, Headquarters, GSFC, LaRC, LeRC, and MSFC all have similar contracts.

Your recommendation number 2 states "To the extent license agreements for widely-used software can effectively reduce the need for off-site computers, the NASA Chief Information Officer, Code AO, should reflect such reductions in the total number of desktop computers that may be outsourced." The current practices of loaning computers and/or providing software for home use is being reviewed by this office in conjunction with the activity to outsource desktop computers. No decisions have been made in these areas as of this date, but we will endeavor to ensure that this activity is handled in the most cost-effective manner, consistent with the fixed-price-per-seat, performance-based contract that will support the outsourcing initiative.

  
Ronald S. West

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Budget Examiner, Energy and Science Division, Office of Management and Budget  
Associate Director, National Security and International Affairs Division, General Accounting Office  
Special Counsel, Subcommittee on National Security, International Affairs, and Criminal Justice

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House Subcommittee on VA-HUD-Independent Agencies  
House Committee on Government Reform and Oversight  
House Committee on Science  
House Subcommittee on Space and Aeronautics

### **Congressional Members**

The Honorable Pete Sessions, U.S. House of Representatives

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