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New Computer Was Not Needed for the St. Louis Computer Center.  
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Report to Sen. Gale W. McGee, Chairman, Senate Committee on  
Appropriations: Agriculture and Related Agencies Subcommittee;  
by Elmer B. Staats, Comptroller General.

Issue Area: Automatic Data Processing: Acquiring and Using  
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Congressional Relevance: House Committee on Government  
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and Related Agencies Subcommittee.

Authority: Federal Management Circular 74-5.

The procurement of a Burroughs Corporation B-4781 computer system for the Department of Agriculture's St. Louis Computer Center was reviewed. Findings/Conclusions: The St. Louis Computer Center's data processing system has two computers and equipment that support, exclusively, the lending activities of the Farmers Home Administration. The procurement of a replacement computer system was not justified because the existing computer had sufficient capacity; the projected workload increases were overstated; improved use of computer resources would have enabled the Center to operate without the new computer system until consolidating with the Kansas City Computer Center and implementing a new management information system in fiscal year 1978; and implementation of suggested improvements could have resulted in annual savings of about \$442,000. Recommendations: The Secretary of Agriculture should replace the 27 fixed head disk drives being leased by the Center with removable disk pack drives; acquire a front-end communications processor; require that the Center evaluate ways of making greater use of virtual memory in its application programs; discounting using terminals to correct discrepancies and increase the use of the more efficient, less costly manual input system; and fully comply with Federal regulations before consolidating the St. Louis Center with the Kansas City Computer Center. (Author/SC)



*REPORT OF THE  
COMPTROLLER GENERAL  
OF THE UNITED STATES*

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**New Computer Was Not Needed For  
The St. Louis Computer Center**

Department of Agriculture

Procurement of a replacement computer system was not justified because

- the existing computer had sufficient capacity,
- projected workload increases were overstated, and
- improved use of computer resources would have enabled the Center to operate without the new computer system until consolidating with the Kansas City Computer Center and implementing a new management information system in fiscal year 1978.

Furthermore, improvements could result in annual savings of over \$400,000.



COMPTROLLER GENERAL OF THE UNITED STATES  
WASHINGTON, D.C. 20548

B-146864

The Honorable Gale McGee  
Chairman, Subcommittee on Agriculture  
and Related Agencies  
Committee on Appropriations  
United States Senate

Dear Mr. Chairman:

Your November 24, 1975, letter requested a review of the Department of Agriculture's proposal to procure equipment for its St. Louis Computer Center and to report as to whether the proposal was reasonable, proper, in the Government's best interest, and in compliance with Federal procurement requirements.

Our findings and recommendations concerning the procurement, which was made in June 1976, are included in this report.

As agreed by your office, we are sending copies of this report to the Chairman of the House Committee on Government Operations because of his request of January 17, 1976, and to other committees and members of the Congress who have expressed an interest in the proposed procurement. We are also sending copies to the Secretary of Agriculture; the Administrator of General Services; and the Director, Office of Management and Budget.

Sincerely yours,

A handwritten signature in black ink that reads "James B. Stacks".

Comptroller General  
of the United States

## C o n t e n t s

	<u>Page</u>	
DIGEST	i	
CHAPTER		
1	INTRODUCTION	1
	Scope of review	4
2	JUSTIFICATION DOES NOT SUPPORT PROCUREMENT OF COMPUTER SYSTEM	5
	Evaluation of justification	5
3	ANALYSIS AND EVALUATION OF EXISTING AND PROPOSED COMPUTER RESOURCES	10
	Disk storage	11
	Core storage requirements	14
	Central processing unit	17
	Impact of terminals on system resources	19
4	ALTERNATIVES TO SOLE-SOURCE PROCUREMENT CONSIDERED BY AGRICULTURE	23
5	CONCLUSIONS, AGENCY COMMENTS AND OUR EVALUA- TION, AND RECOMMENDATIONS	26
	Conclusions	26
	Agency comments and our evaluation	29
	Recommendations	31
APPENDIX		
I	Letter dated August 13, 1976, from the Assistant Secretary for Administration, Department of Agriculture	32
II	Letter dated November 24, 1975, from the Chairman, Subcommittee on Agriculture and Related Agencies, Senate Committee on Appropriations	49
III	Letter dated January 17, 1976, from the Chairman, House Committee on Government Operations	50
IV	Principal officials responsible for the activities discussed in this report	51

## ABBREVIATIONS

ADP	automatic data processing
ADS	Office of Automated Data Systems
FmHA	Farmers Home Administration
GAO	General Accounting Office
GSA	General Services Administration
OMB	Office of Management and Budget

COMPTROLLER GENERAL'S  
REPORT TO THE SUBCOMMITTEE  
ON AGRICULTURE AND RELATED  
AGENCIES, COMMITTEE ON  
APPROPRIATIONS, UNITED  
STATES SENATE

NEW COMPUTER WAS NOT NEEDED FOR  
THE ST. LOUIS COMPUTER CENTER  
Department of Agriculture

## D I G E S T

The Department of Agriculture's St. Louis Computer Center's data processing system has two computers and equipment that support, exclusively, the lending activities of the Farmers Home Administration. In August 1975, Agriculture requested authority from the General Services Administration to replace--on a sole-source basis--one of these computers with a later model that could accommodate additional workload.

The procurement authority was granted in November; however, it was canceled several days later over congressional concern that data on the projected workload increase had not been provided and there was no indication that alternatives to the procurement had been considered.

The Office of Management and Budget reviewed additional justification data submitted by Agriculture and approved the procurement in May 1976. The General Services Administration then issued a new delegation of authority for Agriculture to lease a replacement computer. The additional cost of leasing the replacement system is about \$149,000 annually. (See p. 3.)

Before new data processing equipment is acquired, Federal agencies must revalidate workload and data processing requirements and determine the possibility of improving the performance of existing data processing facilities. (See p. 2.)

Agriculture justified its proposed procurement based on:

- A projected 22-percent annual increase in loan program activity.
- Three provisions of recent legislation that would put a further strain on the existing computer system.
- Existing and anticipated capacity deficiencies in computer resources at the St. Louis Computer Center.

GAO found that the projected increase in loan program activity was considerably overstated and, based on available data, should have been about 9 to 16 percent instead of 22 percent. (See p. 7.)

The statement that three provisions of recent legislation would considerably increase loan program activity was misleading. Farmers Home did not intend to implement two provisions pertaining to escrow accounting and rural rent subsidies until the Unified Management Information System was implemented in fiscal year 1978, and had not identified the impact of the third provision which increased the number of rural areas that could be serviced by it.

Because of the time required to submit, process, and approve loans from the new rural areas, the increase in loan activity will probably be gradual until the planned consolidation and move of the St. Louis Computer Center to Agriculture's Kansas City Computer Center in fiscal year 1978. (See p. 8.)

GAO's analysis and evaluation of computer resources at the St. Louis Computer Center showed that there was sufficient capacity to handle the Farmers Home workload until June 1977 without acquiring a new computer. Changing and improving existing operations would have provided sufficient capacity until the two Computer Centers consolidated. (See p. 10.)

Satisfying Agriculture's stated need for more disk storage space was not dependent upon acquiring a new computer. A change in the type of disk drives being used would have provided the needed space at considerably less cost. Replacing 27 leased disk drives by 4 more recent model disk drives would have provided, and still can, more disk space and save about \$253,000 annually. (See p. 11.)

The need for additional computer core storage, a part of the new computer's justification, was overstated. At the time of GAO's review, three of the five applications and enhancements for which additional core was requested had already been developed and were in use, and developing a fourth was not planned until the Unified Management Information System was installed in fiscal year 1978.

GAO suggested ways of improving the use of available core storage. One way would have increased the available core space by more than 10 percent and reduced annual costs by about \$17,000. (See p. 15.)

Agriculture's projected increase in demand for time on the computer's central processing unit (initially 13 hours a month, but later adjusted to 9 hours) indicated that computer capacity would be exceeded in February 1977; however, GAO determined that the increased demand was only about 7 hours a month, indicating that capacity would not be exceeded until June 1977. (See p. 17.)

GAO suggested ways of improving the use of the central processing unit to enable the Center to operate until consolidating with the Kansas City Computer Center. One way would make much of the computer daytime shift available for other purposes and reduce operating costs by about \$172,000 annually. (See p. 20.)

GAO found several deficiencies in Agriculture's determination that, of available alternatives, the sole-source procurement method was the



least costly way of augmenting the Center's computer capability. Agriculture determined that using offsite computer services was not practicable, because none could accommodate the large workload of the Center, which Agriculture said was not separable. GAO found that the workload was separable.

GAO also found that modifying the existing system was less costly than the proposed procurement, because Agriculture had incorrectly assumed that certain less costly components were not compatible with the existing system. (See p. 24.)

GAO concluded that Agriculture had not demonstrated that it needed the new computer before June 1977 and that, with the suggested improvements in using computer resources, the Center could handle its increased workload until implementing the Unified Management Information System and consolidating with the Kansas City Center in fiscal year 1978. (See p. 26.)

In commenting on the report, the Assistant Secretary for Administration stated that Agriculture generally did not agree with GAO's conclusions and thought that the report was inaccurate, unfair, and incomplete. (See p. 29 and app. I.) Because of the length of Agriculture's comments, most of the comments and GAO's evaluation have been incorporated in the sections of the report to which they pertain.

On June 28, 1976, Agriculture awarded a contract for the new computer which was installed in September 1976. Since the computer has already been installed, GAO recommends (see p. 31) that the Secretary of Agriculture:

--Institute those improvements identified in this report that will increase the availability of disk storage space, core storage, and the central processing unit.

--Require a revalidation of workload and data processing requirements and action to improve performance of existing systems, before completing the design of the Unified Management Information System and the planned consolidation of the St. Louis and Kansas City Computer Centers.

## CHAPTER 1

### INTRODUCTION

We reviewed the procurement of a Burroughs Corporation B-4781 computer system for the Department of Agriculture's St. Louis Computer Center. Our review was made in response to requests from the Chairman of the Subcommittee on Agriculture and Related Agencies, Senate Committee on Appropriations, dated November 24, 1975, and from the Chairman of the House Committee on Government Operations, dated January 17, 1976. (See apps. II and III.)

The Chairman of the Subcommittee on Agriculture and Related Agencies wanted to know whether the procurement was reasonable, proper, in the Government's best interest, and in compliance with Federal procurement regulations. The Chairman of the House Committee on Government Operations wanted to know whether the procurement was justified and if it had to be made on a noncompetitive basis.

The St. Louis Computer Center is one of the five regional centers operated by the Department of Agriculture. It exclusively supports the Farmers Home Administration (FmHA), which administers credit loan programs and grants to rural communities and residents through a system of about 1,800 State and county offices. FmHA's accounting operations are centralized at its National Finance Office that is located at the Center.

When our review began, the Center was equipped with a Burroughs Corporation B-3500 computer system purchased in 1967 and a leased Burroughs Corporation B-2771 system that was installed in March 1974. The B-2771 was acquired on a sole-source basis to meet short-term requirements. It was acquired after the General Services Administration (GSA) granted Agriculture procurement authority, with the stipulation that the B-2771 would be replaced within 2 years through a competitive procurement.

In February 1975 FmHA's National Finance Office advised the Office of Automated Data Systems (ADS), which manages Agriculture's automatic data processing (ADP) resources, that additional resources were needed to support the Center's operations through fiscal year 1976. In April 1975 the Director of the Center recommended to ADS that the B-2771 system be replaced with a Burroughs Corporation B-4781 system to provide additional capacity.

In August 1975 Agriculture requested procurement authority from GSA to lease a B-4781 system for 2 years. It submitted a findings and determination statement to justify the sole-source acquisition and other documentation to indicate that the requirements of Federal Management Circular 74-5 had been satisfied.

Federal Management Circular 74-5, dated July 30, 1974, and issued by GSA, prescribes the policies and procedures for agencies to follow in acquiring ADP equipment. Four of the circular's provisions, applicable to the procurement for the St. Louis Computer Center, are described below.

1. Workload and data processing requirements are to be revalidated to determine if nonmission-type work can be reduced.
2. Action is to be taken to determine the possibility of improving performance of existing data processing facilities through interim upgrade or system modifications, rescheduling, software changes, improved work center procedures, or extended shift operations.
3. Any new systems, procedures, and methods employed in performing the proposed functions or processes are to be designed to achieve the highest practicable degree of effectiveness and operational economy.
4. In accordance with Office of Management and Budget (OMB) Circular A-76, the decision to establish or augment an ADP facility must be preceded by a comparative cost analysis to verify that the use of commercial services is not more appropriate.

The circular also provides that when there is a noncompetitive interim upgrade procurement, the agency shall replace that equipment with a competitive procurement of equipment, based on new specifications within 2 years of the initial acquisition, unless GSA and the agency agree to a longer period due to unusual circumstances. The circular defines interim upgrade as follows:

"Interim upgrade means the acquisition of additional and/or augmentation of installed components or subsystems to increase or improve the data processing capability of ADPE [automatic data processing equipment] or systems. The acquisition and/or augmentation must be on a temporary basis, pending a fully competitive reprourement, to meet unforeseen, urgent, data processing requirements."

On November 25, 1975, GSA authorized Agriculture to lease the B-4781. The authorization was canceled on December 1, 1975, because the Chairman of the Government Activities and Transportation Subcommittee, House Committee on Government Operations, asked GSA to defer issuing the procurement authority to Agriculture. The Chairman (1) was concerned that documentation GSA provided to the committee did not indicate that Agriculture had considered alternatives to procuring a new system and (2) questioned the sole-source acquisition of the B-4781 to replace the B-2771. Also, OMB had notified GSA that it was withholding approval of the procurement until Agriculture provided data demonstrating that there was an emergency condition at the Center.

Later, on May 13, 1976, OMB approved the proposed procurement after receiving additional justification data indicating that FmHA's workload was increasing, the existing computer system was nearing capacity, and that alternatives for meeting the requirement for additional capacity had been reasonably explored. On the same day, GSA issued a new delegation of procurement authority for Agriculture to lease the B-4781.

The B-4781 was ordered on June 28, 1976, and installed in September 1976. The additional cost of leasing the replacement system is about \$149,000 annually.

According to a study report, ADP operations at the Center will be phased out--starting in the latter part of fiscal year 1977--because Agriculture plans to consolidate the Center with another center at Kansas City, Missouri. <sup>1/</sup>New equipment, to be acquired on a competitive basis, will be used to handle the FmHA and Kansas City work.

An ongoing FmHA project that will affect ADP operations is the development of a Unified Management Information System. The system is intended to provide responsive and timely information to management at the county, district, State, finance, and national offices, and improved capability to serve loan applicants and borrowers. FmHA plans to have the system operational at Kansas City in January 1978.

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<sup>1/</sup>In commenting on this report, Agriculture stated that after the consolidation, it would continue to run the St. Louis Center for a minimum parallel period, at least March to October 1978.

## SCOPE OF REVIEW

We reviewed OMB circulars and guidelines and GSA and Agriculture regulations related to planning and procuring ADP equipment. We analyzed the performance of the B-2771 computer system, and selected applications, and workload projections prepared by Agriculture to justify the procurement of the B-4781 computer system. We also interviewed officials and obtained information pertaining to the planning and proposed acquisition of equipment for the St. Louis Computer Center at Agriculture headquarters in Washington, D.C., and at the Center and FmHA Finance Office in St. Louis, Missouri.

## CHAPTER 2

### JUSTIFICATION DOES NOT SUPPORT

### PROCUREMENT OF COMPUTER SYSTEM

The Department of Agriculture does not have adequate justification to support its sole-source procurement of the B-4781 computer system for its St. Louis Computer Center. The justification documents show that the system was needed to process the Farmers Home Administration's increasing loan program workload. However, the workload projection was overstated and the B-2771 system, which was replaced by the B-4781 system, had sufficient unused capacity to process FmHA's workload until June 1977. Further, certain improvements and modifications could have been made to expand that capacity sufficiently to continue processing the workload into fiscal year 1978. Those improvements, in addition to providing more capacity, could have saved the Government about \$442,000 annually. The improvements are also applicable to the replacement computer system, with about the same savings.

The procurement was completed and the B-4781 was installed at the St. Louis Center in September 1976. Agriculture plans to operate the system until the Center consolidates with the Kansas City Computer Center and the Unified Management Information System is implemented in fiscal year 1978. The leasing of the B-4781 during that time will cost the Government about \$149,000 more annually than the continued leasing of the B-2771.

Our evaluation of Agriculture's justification is discussed below. The improvements and modifications that could have extended the use of the B-2771 and the associated savings are discussed in chapter 3.

### EVALUATION OF JUSTIFICATION

On August 13, 1975, Agriculture requested procurement authority from GSA to lease, on a sole-source basis from the Burroughs Corporation, a B-4781 computer system. A findings and determination statement and a study report required by Federal Management Circular 74-5, as well as other documentation, were provided with the request to support the procurement.

According to those justification documents, the B-4781 was needed by October 1975 to meet projected workload requirements. The documents stated that FmHA's increased activity in existing caseload, current lending activity and enhancements, and new applications to the FmHA accounting and reporting systems had saturated the existing equipment capability and that legislation recently passed by the Congress would generate additional workload which will exceed the St. Louis Computer Center's capabilities.

#### Unused computer capacity

The St. Louis computers were not saturated by existing workload when the procurement request was submitted to the General Services Administration. In fact, the B-2771 had unused capacity, some of which FmHA later used to expand its telecommunications processing and to implement new online applications that were mentioned in the justification. According to Agriculture's own analysis, made in April 1976, unused capacity was sufficient to process FmHA's workload until February 1977. (See p. 17.) An evaluation of the analysis and adjustments thereto indicated that the B-2771 could have continued to process the workload to June 1977 without improvements. With the improvements, suggested later in this report, the B-2771 could have been used until consolidation with the Kansas City Computer Center.

Even though Agriculture did not agree with our suggested improvements, it had ample time to assess the capability of these measures to provide sufficient capacity and could have acquired additional capacity if shortfalls did develop. This would have been possible in view of the short leadtime necessary to upgrade to a larger computer.

Further, FmHA's projected workload was considerably overstated and the recently passed legislation had no immediate impact on computer use. These two major factors are discussed below.

#### Projected workload growth

FmHA projected an annual workload growth rate of 22 percent, based upon 1 type of about 100 types of loan transactions--loan payments made during fiscal years 1971 through 1975. Because loan payments accounted for only about 35 to 45 percent of the total transactions processed during those years, we questioned the projection's validity.



FmHA provided us a document entitled "Workload Volume for Fiscal Years 1970 through 1977," dated January 1976, to support its projection. The document contained various statistical charts on FmHA loan program activities. One chart showed that loan payments made during fiscal years 1971 through 1975 increased at an average annual rate of about 17 percent, as opposed to the 22 percent stated in the justification. Another chart showed that all transactions increased about 9 percent in fiscal year 1975.

Other statistical reports provided by FmHA were reviewed in an attempt to prepare a table to show, by fiscal year, the number of new loans made, satisfied, and outstanding at the end of each year. The table would have shown past fluctuations that would indicate total program changes. However, the tabulation was not prepared because (1) some vital data was inconsistent and (2) there were considerable omissions and discrepancies regarding loans satisfied.

Statistics accumulated for developing the Unified Management Information System were also reviewed to find other indicators of workload growth, such as new loans or loans outstanding. For fiscal year 1975, the number of loans outstanding increased about 7 percent, and increases for fiscal years 1976, 1977, and 1978 were projected at 6, 5, and 4 percent, respectively.

Based upon analyses of the various reports and documents that FmHA provided we concluded that, although the workload is increasing, FmHA cannot support the projected 22-percent workload growth rate.

### Impact of new legislation

Part of the justification for procuring the B-4781 was that recently enacted legislation (Public Law 93-383 (42 U.S.C. 5301 et seq.) Aug. 22, 1974) would put a further strain on the existing computer system.

Item 2 of the findings and determination statement submitted to GSA in August 1975 is as follows:

- "2. The Center provides prime ADP support for all loan processing with the Farmers Home Administration (FmHA). Increased activity in existing caseload, current lending activity and enhancements, and new applications to the FmHA accounting and reporting systems have saturated

the existing equipment capability. In addition to this increased workload, the Congress has recently passed several laws which will further tax FmHA's computing capability with implementation of the following:

- a. FmHA will have to maintain and collect property taxes and insurance throughout the year as do other mortgage companies. This type of escrow accounting is not being done now.
- b. Congress has also provided for rent subsidies for rural rentals. If funds are appropriated FmHA will be tasked with implementing this operation.
- c. Congress has changed the definition of a rural area from 10,000 population to 20,000. This means more rural residents will be eligible for FmHA money.

The addition of these requirements will exceed the capabilities of the center's equipment."

Although these provisions were used as part of the justification, FmHA (1) did not plan to implement the first two provisions until after implementation of the Unified Management Information System in January 1978, even if the new system was acquired and (2) had not determined the effect of the third provision.

In a January 16, 1976, letter to the Associate Administrator, FmHA, the Director of the FmHA Finance Office, in discussing the impact on operations if the B-4781 were obtained, made the following statement.

"The Finance Office will not, however, be able to initiate system development work relating to any new program or programs which have been or may be authorized by Congress: such as Escrow Accounting or the Rural Rental Housing Subsidy Program."

The Federal Register of April 14, 1976, contains a listing of 254 additional rural areas that can be serviced by FmHA, because of the legislative change in definition that increased the population limitation to 20,000. An FmHA official said that FmHA had not determined what impact the additional rural areas might have on its workload. He

was unable to say how many rural areas were being serviced by FmHA before the definition change.

Although the addition of 254 rural areas will increase FmHA's workload, it is likely that the increase will be gradual until the planned consolidation of the St. Louis and Kansas City Computer Centers, because of the time required for the submission, processing, and approval of loan applications. Consequently, we believe that the new legislation does not support the need for the B-4781 computer.

In commenting on our draft report (see pp. 34 and 35) Agriculture said that (1) it used the 22-percent growth rate only as a general indicator of growth, and the average annual growth rate, based on all loan transactions for fiscal years 1972 through 1975, was about 15 percent and (2) recent legislation was not used as a basis for justifying the need for the new computer, and information furnished to us, and previously to GSA in August 1975, showed the contrary.

The statistical support provided in Agriculture's comments shows only input transactions (mostly cash payments) which accounted for only 56 percent of the total transactions. We believe that the total number of transactions, which increased about 9 percent in 1975, and the increase in the number of loans outstanding in 1975--7 percent--would have been more realistic indicators of loan activity growth than those used by Agriculture.

Regarding the impact of new legislation, item 2 from the determination and findings statement is self-explanatory.

## CHAPTER 3

### ANALYSIS AND EVALUATION OF EXISTING AND

#### PROPOSED COMPUTER RESOURCES

The August 1975 justification did not contain sufficient quantifiable data or a description of computer needs. Responding to questions and a request for such data from the Office of Management and Budget, the Department of Agriculture submitted additional justification data in December 1975.

In that data, Agriculture said that, based on current operations and a projection of trends in demand for Center resources, there were indications that capacity deficiencies already existed in two resources--disk storage space 1/ and core storage requirements 2/--and that the Center would experience a deficiency in the third resource--the central processing unit, 3/ sometime between May and July 1976. Agriculture concluded that these deficiencies would leave the Center unable to handle the Farmers Home Administration workload until the planned consolidation.

We evaluated the deficiencies in computer resources Agriculture identified and found that existing resources, without acquiring the B-4781, would have provided sufficient capacity for the Center to handle FmHA's increased workload until June 1977. Also, although Agriculture had taken some actions to improve the performance of existing computer resources, other actions that would have resulted in more efficient use of these resources either were not considered or not taken. The improvements and changes in equipment and operations described in this chapter would have enabled the Center to handle the projected increase in workload until consolidating with the Kansas City Computer Center and until installation of the Unified Management Information System in

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1/Disks are round flat plates coated with a magnetic substance on which data is stored. Although they are used primarily for the storage of files, they are also used for temporary work space.

2/Core is the computer's internal or main memory in which programs and data are stored for processing.

3/The central processing unit is that part of the computer system where instructions are executed.

fiscal year 1978. These improvements and changes are also applicable with the B-4781 and can result in annual savings of about \$442,000.

### DISK STORAGE

According to the December 1975 justification, the Center's 840 million bytes 1/ of disk storage (42 fixed head disk drives 2/ capable of storing 20 million bytes each) were fully used and an additional 255 million bytes were needed to handle the estimated storage demand through fiscal year 1976. This need was to be satisfied by procuring with the B-4781 two removable disk pack drives 3/ capable of storing online 174 million bytes each or a total of 348 million bytes. Agriculture believed that (1) the removable packs would increase the flexibility of the Center's operations, (2) they could be delivered in much less time than fixed head disk drives, and (3) the cost per byte would be about 30 percent of the cost for fixed head disk drives.

A part of the storage requirements was satisfied in December 1975 when Agriculture acquired seven additional fixed head disk drives with storage capacity of 20 million bytes each. As a result, the Center had 49 disk drives-- 22 Government-owned and 27 leased--that provided 980 million bytes of disk space. The two removable disk pack drives with 348 million bytes were ordered by Agriculture in June 1976 along with the B-4781.

Agriculture could have expanded its storage capacity from 980 million to 1,136 million bytes and saved \$253,000 a year by replacing the 27 leased fixed head disk drives with 4 leased removable disk pack drives. Agriculture can still do this, as shown in the following table.

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1/A byte is a group of adjacent binary digits, representing data that can be stored on a disk or processed as a unit.

2/A fixed head disk drive (often referred to as a head-per-track drive) uses a stationary, rigidly mounted head that reads or writes on a particular track.

3/A removable disk pack drive uses a movable head that can read or write on interchangeable disk packs.

	<u>Fixed head disk drive</u>	<u>Removable disk pack drive</u>
Bytes of storage capacity for each disk drive	20,000,000	174,000,000
Capacity of 27 drives being leased by the Center	540,000,000	
Removable disk pack drives needed (4) to provide equivalent capacity (3 drives would provide 522 million bytes)		696,000,000
Annual rental costs, including control units	\$ 329,000	\$ 76,000

The 696 million bytes that would have been provided by the 4 removable disk pack drives and the 440 million bytes available from the 22 Government-owned fixed head disk drives would have given the Center 1,136 million bytes, or about 41 million more bytes than the projected number needed by FmHA by the end of fiscal year 1976. If additional disk storage had been needed after that date, it could have been added in multiples of 174 million bytes, at an annual cost of about \$11,600 for each removable disk pack drive.

The fact that Agriculture has already acquired 2 of the removable disk pack drives, but still retained 27 leased fixed head disk drives, indicates that the potential for saving about \$253,000 still exists.

In commenting on our draft report (see p. 38), Agriculture agreed that using removable disk packs would result in savings, but stated that their use was feasible only if the B-4781 was acquired. It stated that the following problems would have been encountered if removable disks were used with the B-2771.

--The type of removable disk packs needed would have only provided 129 million bytes instead of 174 million bytes and, therefore, would have required five disk drives instead of four, reducing the potential savings.

--FmHA would have had to allocate scarce resources to reprogram its files, which would not have been good management practice in view of the short period of the disks' use.

--The data transfer rate of fixed head disk drives is 60-percent faster than the transfer rate of removable disk pack drives, increasing the waiting time and reducing the available capacity of an already saturated central processing unit.

--Removable disk pack drives allow only two processor-to-pack paths for data accessing as opposed to the four paths available using fixed head disk drives, thus reducing the availability of the central processing unit.

Burroughs first introduced removable disk pack drives in August 1973 and introduced an improved version in September 1974. Their compatibility with the B-2771 was well established long before Agriculture prepared the August 1975 procurement justification. The 174 million byte removable disk pack could have been used with the B-2771 system. The December 1975 justification statement submitted to OMB states that "even if an upgrade were not necessary, SLCC [St. Louis Computer Center] should consider replacement of the fixed head devices by removable head devices."

Even if five removable disk pack drives had been needed, the added cost would have been only \$11,600. However, since Agriculture acquired the B-4781, only 4 removable disk pack drives will be needed to replace the 27 leased fixed head disk drives.

Regarding Agriculture's contention that using removable disk pack drives would require using scarce resources to reprogram the files, a Burroughs representative said that a minimal amount of reprogramming might have been required. If reprogramming were necessary, the cost would probably be minimal compared to the potential savings.

Agriculture is not entirely correct regarding the slower transfer rate of removable disk pack drives. According to published equipment specifications, the data transfer rate of Burroughs' removable disk pack drives is more than twice as fast as its fixed head disk drives. However, the time required for the removable disk pack drives to locate and access data on the disk before transferring it to the computer is much longer than that for the fixed head disk drives. Because of the accessing time and other factors, such as record size and data files distribution, the fixed head disk drives can be faster than the removable disk pack drives in feeding data into the computer.

Since there are differences between the two types of drives, each has a different purpose in computer operations. The removable disk pack drives, because of their cost effectiveness, are generally used to store production data for computer processing. The fixed head disk drives, which are more costly than the removable disk pack drives, are generally used to store segments of the computer's operating system or software and application programs that need to be fed into the computer at the highest rate of speed. Agriculture has 22 Government-owned fixed head disk drives that can be used for the latter purposes. Thus, the need for faster drives should not preclude Agriculture from using removable disk pack drives as suggested.

Agriculture stated that the four data paths available with fixed head disk drives are more advantageous than the two paths possible with removable disk pack drives, because they reduce the wait time of the central processing unit. That statement is misleading. Although a removable disk pack drive has 2 data paths to the computer, 5 drives can be linked to the computer to provide a maximum of 10 data paths. It is our opinion that any difference in response time that might result would not be sizeable.

CORE STORAGE REQUIREMENTS

Agriculture stated in the December 1975 justification data that the B-2771 computer's 300,000 bytes of core storage could not support planned online applications, because the prime daytime shift workload consumed 270,000 to 280,000 bytes. The proposed B-4781 computer, with added core, would provide 500,000 bytes of storage. Agriculture further stated that the following planned online applications would have to be deferred until additional core capacity--at least 100,000 bytes--could be procured.

<u>Application</u>	<u>Core requirements (bytes)</u>
Software required for additional 24 terminals (in the Finance Office)	6,500
Discrepancy reporting system	10,000
Online compile and test system	41,000
County office management system	20,000
Enhancements to existing systems	<u>46,000</u>
 Total	 <u>123,500</u>



We found that Agriculture had already developed and was using the first three applications described above and that the fourth, the county office management system, would not be developed until after the design of the Unified Management Information System is completed in fiscal year 1978. Regarding the fifth item, it appears the projected 46,000 bytes needed was a reasonable estimate.

These findings indicated that the need for additional core storage was considerably less than that stated. We examined some current applications which indicated that more than the 46,000 required bytes of core for the B-2771 could have been provided if certain changes, such as those described in later sections of this chapter, were made.

In its comments (see p. 39), Agriculture stated that the need for 123,500 bytes of core storage was bona fide when the August 1975 justification was submitted to the General Services Administration, but because of the desire to improve service to FmHA's 1,800 field offices, significant changes were made in the existing terminal application program in the fall of 1975. Those changes, according to Agriculture, reduced core requirements and permitted the development and implementation of three of the applications that were included in the August justification statement. Agriculture further stated that reinstating two features eliminated in the terminal application program would require the additional core storage.

The four applications, plus enhancements, comprising the 123,500 bytes of core were identified as future additions in Agriculture's December 1975 justification submitted to OMB. No mention was made of the changes discussed above; nor was any mentioned in documentation furnished to the Comptroller General by the FmHA Administrator on April 16, 1976. The planned applications were identified and the statement was made that these applications were expected to require approximately 125,000 bytes of core storage and that their addition would exceed core capacity by 100,000 bytes.

#### Front-end communications processor

Agriculture had previously considered acquiring a front-end communications processor to replace several minicomputers used to assemble data for input to the computer and to control data communications. Using the processor would have saved about \$17,000 annually and would have made more core storage and central processing unit time available. We

estimated that about 39,000 bytes of core storage could have been provided during the prime shift. However, Agriculture's decision to acquire the processor was being delayed until installation of the proposed B-4781 computer.

Agriculture agreed that using a front-end communications processor could increase core storage and central processing unit time, but stated that when the decision was made to acquire a B-4781, it did not have sufficient information to determine the exact impact on computer capacity and did not know whether the communications processor could increase capacity enough to extend the system life more than 2 or 3 months. (See p. 40.)

In view of these acknowledgements, the deficiencies in computer resources cited by Agriculture, and the savings that could have been achieved by replacing the minicomputers, we believe that the front-end processor should have been acquired.

#### Virtual memory

The Burroughs B-2771 system provides a "virtual memory" feature. The system can logically segment all programs and create a detailed record of how the segmentation is performed, which allows a program of unlimited size to be executed within a relatively small amount of core.

FmHA's terminal application program--which uses approximately 40 percent of the total core capacity in the prime shift--is not separated into virtual memory segments that can be moved out of core when they are not being used. An evaluation should be made, possibly using a software monitor, to determine the extent to which software programs are structured to take maximum advantage of the virtual memory feature.

In commenting on this matter (see p. 41), Agriculture said that (1) many programs already use that feature, (2) it did not believe using that feature in the terminal application program would be cost effective, and (3) such use in the terminal application program would make the central processing unit saturation problem more severe.

Since no evaluation has been made to determine the costs and benefits of extending the use of the virtual memory feature, we believe that Agriculture should study the matter, particularly for potential application to the B-4781 or successor computers.

## CENTRAL PROCESSING UNIT

The December 1975 justification, while acknowledging that there was still time remaining on the central processing unit, stated that historical data for May 1974 through November 1975 indicated a growth in demand for the computer of about 13 hours of direct time a month. Based on that rate of growth, Agriculture estimated that the computer's capacity (availability of the central processing unit) would be exceeded sometime between May and July 1976, assuming that the current operating schedule of 16 shifts a week was maintained. The justification further stated that it would not be feasible to operate on the theoretical maximum of 21 shifts a week, because files had to be updated and balanced at the beginning of each business day and there was little opportunity to defer that type of work for weekend processing, when the remaining 5 shifts could be added.

Our evaluation of Agriculture's projected 13 hours a month growth rate showed that utilization statistics for May and July 1974 were considerably understated. These understatements seriously distorted the trend projection.

Agriculture had treated May 1974 as a full month of utilization, even though computer hours were not recorded until May 9, 1974. The hours for July were understated because a portion of the hours used, as recorded by the computer, were erased after a computer failure. Agriculture had not adjusted its projection to reflect these conditions.

In April 1976 Agriculture acknowledged the understatement for May 1974 and adjusted its projection based upon a new period--June 1974 through March 1976--and a method that eliminated seasonal peaks in workload. The new projection, based on a 17-shift week, showed that the growth rate was almost 9 hours a month and that computer capacity would not be exceeded until February 1977.

We reviewed the new projection and Agriculture did not include the missing hours for July 1974. Accordingly, we adjusted the projection to reflect those hours, and the growth rate was about 7 hours a month. At that rate of growth, computer capacity would not have been exceeded until June 1977. If additional capacity is needed to handle the projected increase in workload after June 1977, pending transfer of the St. Louis operation to Kansas City in 1978, it would be possible to implement interim measures to extend the computer's capability.

Since the June 1977 computer capacity computations were based on 17 shifts per week, additional shifts could have been added to satisfy increased demands (as was done in January when 21 shifts were used) and at other times during the year when needed. For example, one shift added on Saturdays could have increased central processing unit availability by about 32 hours a month and, based on a 7 hour a month growth rate, could have extended the life of the B-2771 system by about 4 months. The extra Saturday shift could also have been used to catch up on any delays in the daily updating of borrowers accounts that might have occurred during the week. Extra shifts have been used on Saturdays and Sundays by Agriculture in the past.

Another way in which use of the B-2771 could have been improved is described on page 19.

Agriculture believes that we misinterpreted complex technical data and did not clearly understand its plans for consolidating the St. Louis and Kansas City Computer Centers, because there was a need for the St. Louis Computer Center to continue to operate until the March to October 1978 period, when applications at the St. Louis Center would be phased out and dropped. (See p. 33.)

We did not misinterpret complex technical data or other data related to Agriculture's consolidation plans. We reviewed the June 1975 request for proposals for design of the Unified Management Information System and the January 1976 site location study for the two Centers. The January 1976 study shows that competitively procured equipment for the Kansas City Computer Center is to be installed in March 1977 and that the phasing in period for existing applications at St. Louis is due to be completed by March 1978, when the then proposed B-4781 was to be released.

If Agriculture had implemented our suggestions for improving the use of the B-2771 central processing unit, it could have extended the useful life of the system--beyond the projected June 1977 saturation date--until the Kansas City consolidation in fiscal year 1978 and avoided the upgrade to a B-4781. The suggestions were:

- Acquiring a front-end communications processor that would have extended the system life a minimum of 2 to 3 months. (See p. 15.)

--Adding another shift on Saturday that would have added about 4 months. (See p. 18.)

--Discontinuing the use of terminals to process discrepancies that would have added about 13 months. (See following section.)

Other suggestions, as well as the phasing in period, would have added more time to the capability of the B-2771 to service the needs of FmHA.

### IMPACT OF TERMINALS ON SYSTEM RESOURCES

Agriculture stated that existing and anticipated deficiencies in core storage capacity and available central processing unit hours impacted existing and planned online applications during the prime shift. We question, however, whether all of these applications need be online during prime time. A review of one online application--discrepancy processing, which involves the use of terminals located in FmHA's Finance Office--showed that it (1) was less efficient than an existing manual input system which was not online or run during the prime shift and (2) was considerably more costly than the manual system. The discrepancy processing application should be taken offline to increase the availability of the central processing unit.

FmHA's Loan Accounting Branch had 43 terminals. Eleven of these were used exclusively to access the computer in response to telephone inquiries from the county offices. The remaining 32 terminals were used to correct discrepancies in transactions previously processed and for entering other transactions. There were indications that the 32 terminals accounted for about 60 percent of the total activity of FmHA's 61 terminals during the prime shift. Eliminating this process on the terminals could have extended the life of the system about 13 months.

Acquiring 25 terminals in December 1975 was justified because the discrepancy workload had increased considerably and the terminals were more cost effective in processing discrepancies than the manual input method. This latter method involved placing discrepancy-related data on magnetic tape during shifts other than the prime shift.

In making our analysis of activity, the daily activity reports of FmHA's Loan Accounting Branch for the 3-month period ended March 31, 1976, were used. These reports show

total transactions and rejections for both methods and specifically identify discrepancies processed by terminals and manually.

The analysis of the cost of the two methods was based on the methodology used by Agriculture to justify the 25 terminals acquired in December 1975; however, an adjustment of about \$14,000 was made for the monthly cost of leasing the B-2771 computer system, which Agriculture had understated in its justification. We also used employee cost factors and estimated the number of personnel performing certain manual functions, based on the earlier FmHA cost comparison.

The following tabulation summarizes the results of the analysis.

	<u>Terminal</u>	<u>Manual</u>
Total discrepancies corrected	74,400	76,700
Average number of discrepancy line items processed daily by each operator or clerk	40	136
Average cost to process a discrepancy line item	\$1.47	\$0.89

Based on the above analysis, we estimated that about \$43,000 could have been saved during the 3-month period if all discrepancy corrections had been made manually. If the activity for the 3-month period is indicative of activity for an entire year, the annual savings could have been about \$172,000. Since Agriculture has acquired the more costly B-4781, the savings would be higher than that amount. More importantly, however, prime shift computer resources could have been, and can still be, made available for other functions if all corrections were made manually.

The analysis also showed that using terminals to process all types of transactions in the Loan Accounting Branch was not as efficient as the manual method. About 21 percent of the transactions processed on the terminals were rejected because of errors, while the rejection rate for the manual method was about 5 percent. Rejections of discrepancy items processed were not specifically identified.

Agriculture agreed that the cost of processing discrepancies with its 32 terminals is higher than the cost of

processing with the manual system, but contended that the difference in unit costs is 14 cents--not the 58 cents computed above. (See p. 44.) Agriculture said that it did not understand how we arrived at our estimate of savings or how we could have made a comparative analysis of the efficiency of the two methods of processing discrepancies from the FmHA daily activity reports that we reviewed. Agriculture concluded that, despite the cost savings of the manual processing method, using terminals enables FmHA to update borrowers' accounts 3 days sooner, and to discontinue their use would have a derogatory impact on the service provided to field offices.

As previously discussed, one reason for the difference in unit costs was Agriculture's understatement of about \$14,000 for the monthly lease cost of the B-2771 system. Another reason was a change in the methodology used by Agriculture. Our unit costs--like Agriculture's earlier unit costs--are based on discrepancy line items only, whereas Agriculture's latest unit costs are computed on the basis of total transactions. The total transaction method cannot reliably establish the costs of processing discrepancies.

Regarding Agriculture's statement that using terminals results in borrowers' accounts being updated 3 days sooner, no mention was made in the justification for the terminals of the need for, or desirability of, updating borrowers' accounts any sooner than was already being done under the manual method. Furthermore, the request for proposals for the design of the Unified Management Information System showed that payments on about half the loans were only made on an annual basis.

We believe, however, that Agriculture has omitted comments on two major points. First, there is no comment on the productivity aspect. As noted on page 20, three times as many discrepancies were processed manually by each clerk than were processed by each terminal operator. Thus, expanded use of the manual method appears more beneficial in handling the increased workload for which the terminals were justified.

Second, and more importantly, Agriculture has not addressed our conclusion that discontinuing the use of the 32 terminals for discrepancy processing during the prime shift would have made about 60 percent more time available on the central processing unit during that shift. The shortage of available time was one of the reasons used to justify procurement of the B-4781 computer system.

While Agriculture declined to substitute less costly removable disk packs for fixed head disk packs, in part, because it would have an adverse effect on central processing unit utilization (see p. 13), it nevertheless instituted and retained a more costly process, even though its deferral would have released critical central processing unit time.



## CHAPTER 4

### ALTERNATIVES TO SOLE-SOURCE PROCUREMENT

#### CONSIDERED BY AGRICULTURE

Agriculture's August 1975 request to the General Services Administration for authority to lease the B-4781 computer system on a sole-source basis stated that, of the four alternatives considered for augmenting the capability of the Computer Center, this was the least costly. The four alternatives are summarized below.

1. Rent or lease time offsite from another Burroughs user in Government or industry. This was not considered practicable because (1) the process of transferring data from disks to tapes and shipping it elsewhere for processing would be cumbersome and costly and (2) there were no other Burroughs systems in the area that could handle the large disk and core requirements of the Farmers Home Administration operation.
2. Procure a replacement system on a competitive basis. This was not considered feasible because (1) the system and program conversion costs would be exorbitant for the short system life involved and (2) there was not enough time to conduct a competitive procurement and accomplish the conversion to meet the need for additional processing power.
3. Acquire additional computer core storage and equipment for the existing system. The estimated additional monthly cost of the alternative was about \$36,800.
4. Replace the B-2771 computer system with a B-4781 system and acquire additional disk equipment that would be shared by the B-4781 and the B-3500. Burroughs was considered the only source of supply, and the monthly cost of this alternative was estimated at \$33,900.

In its consideration of renting or leasing computer time offsite, Agriculture did not consider teleprocessing as a means of transferring data. It also did not consider transferring part of its workload. Agriculture determined that the use of other Burroughs systems in the area was impracticable because none could accommodate FmHA's entire workload.

This was based on FmHA's determination that all files and programs at the Center were interrelated; however, the Center had designed a configuration for the proposed B-4781 computer system and the existing B-3500 computer system where the files were separated and dedicated to each computer system. This distribution indicated that about 20 percent of the files and 43 percent of the programs were separable.

In considering the acquisition of equipment competitively, Agriculture stated that this was not feasible because (1) system and program conversion costs would be exorbitant for the short systems life and (2) time was not available to conduct a competitive procurement action and accomplish the conversion before additional processing power was needed. If the proposed equipment was needed immediately, the time frame required for a fully competitive procurement would prohibit use of this alternative; however, as noted in chapters 2 and 3, time was not a critical factor because (1) the estimated increase in loan program activity for fiscal year 1976 was not as great as that projected by Agriculture and (2) improved use of existing data processing resources could have provided sufficient capacity until the planned consolidation with the Kansas City Computer Center in fiscal year 1978.

We evaluated alternatives three and four to determine the difference in cost. The analysis showed that Agriculture used a faulty assumption in arriving at its \$36,800 monthly cost for the upgraded B-2771 computer system. Agriculture included the costs of fixed head disk drives instead of costs for less expensive removable disk pack drives, on the assumption that the latter were not compatible with the B-2771 computer.

After Agriculture officials were informed that the less costly units were compatible, they acknowledged the oversight. The difference in the monthly cost of the two types of disk drives was about \$4,100. Thus, the estimated monthly cost of an upgraded B-2771 should have been about \$32,700, or about \$1,200 a month less than the \$33,900 estimated cost of the B-4781. On an annual basis, the difference was about \$14,400; however, due to price increases for fiscal year 1976, the estimated annual cost of the upgraded B-2771 was about \$33,600 less than that of the B-4781.

Agriculture, in its comments (see p. 45), acknowledged that the upgraded B-2771 computer would have been less costly than leasing the B-4781, but contended that (1) at the time the August 1975 justification for procurement was prepared,

it was not yet established that the less costly removable disk pack drives would be compatible with the B-2771 computer and (2) the upgraded B-2771 would have satisfied the need for more core and disk storage, but not the need for more central processing unit capacity.

As noted on page 13, the compatibility of removable disk pack drives with the B-2771 computer had been established at the time the August 1975 justification for procurement was prepared. Although Agriculture now states that the upgraded B-2771 would not have been a viable alternative because of capacity limitations, that consideration was not reflected in the August justification. In that document, the only reason given for not selecting the upgraded B-2771 was the purported high cost. In any event, methods for increasing central processing unit availability are discussed on pages 18 and 19.

## CHAPTER 5

### CONCLUSIONS, AGENCY COMMENTS AND OUR

#### EVALUATION, AND RECOMMENDATIONS

#### CONCLUSIONS

We were asked to (1) review the proposed sole-source procurement of a B-4781 computer system to replace an existing system at the St. Louis Computer Center and (2) determine whether the procurement was justified and in compliance with Federal procurement requirements.

We concluded that:

- Existing computer resources were not saturated.
- Agriculture's projected increases in workload were overstated.
- The existing computer system could have handled the Farmers Home Administration's existing and anticipated workload until June 1977 before becoming saturated.
- Implementation of methods described in this report for improved use of the Center's computer resources would have enabled it to operate without the B-4781 until St. Louis computer operations are phased out and the Unified Management Information System becomes operational at Kansas City in fiscal year 1978.
- Implementation of the suggestions could have resulted in annual savings of about \$442,000.

Our conclusions are based on the following findings.

- The 22-percent projected increase in loan program activity for fiscal year 1976, used by Agriculture to justify the need for the B-4781, was based only on loan payments instead of total activity, which only increased about 9 percent in fiscal year 1975. A projection made in connection with development of the Unified Management Information System showed a 6-percent increase in the number of loans outstanding for fiscal year 1976.

--The statement by Agriculture that three provisions of recent legislation would considerably increase loan program activity was misleading because (1) FmHA did not intend to implement two provisions pertaining to escrow accounting and rural rent subsidies until implementing the Unified Management Information System in January 1978 and (2) had not identified the impact of the third provision which increased the number of rural areas that could be serviced by FmHA. Because of the time required to submit, process, and approve loans from the new rural areas, it is likely that the increase in loan activity will be gradual until the planned consolidation of the St. Louis and Kansas City Computer Centers.

--Satisfying Agriculture's stated need for more disk storage was not dependent upon acquiring a new computer. A change in the type of disk drives being used would have provided any needed space at considerably less cost. The Computer Center had 49 fixed head disk drives, of which 22 were Government-owned and 27 were leased. If the 27 leased fixed head disk drives, with 540 million bytes of space, were replaced by removable disk pack drives, 4 such drives would provide 696 million bytes of space at an annual savings of about \$253,000. This would have provided 41 million more bytes than the Center's projected need through fiscal year 1976.

--The need for about 100,000 bytes of additional core storage, also a part of the justification, was overstated. At the time of our review, three of the five applications and enhancements, for which additional core was requested, had already been developed and were in use. Developing a fourth application was not planned until after the design of the Unified Management System is completed in fiscal year 1978. An estimated 46,000 bytes of core storage needed for development of enhancements appeared to be reasonable.

--If additional core storage was needed, there were economical ways of obtaining it without acquiring a new computer. If several minicomputers, being used to assemble data for the computer, had been replaced by a front-end communications processor (previously considered by Agriculture), about 39,000 bytes of core storage would have been made available and annual lease costs could have been reduced by about \$17,000.

It also appeared that Agriculture was not making maximum use of the virtual memory feature of the existing B-2771 system. If more core storage was needed, an evaluation should have been made to determine if all software programs were structured to take maximum advantage of the virtual memory feature.

- Agriculture's projected increase in the demand for central processing unit time (initially 13 hours a month, but later adjusted to 9 hours), indicated that computer capacity would be exceeded in February 1977; however, the projected increase in demand for central processing unit time should have been about 7 hours a month, indicating that capacity would not be exceeded until June 1977.
- If additional computer time (availability of the central processing unit) was needed, more shifts could have been added, as was done in January 1976 when 21 shifts were used. The Center generally operated using 16 shifts a week. Another way of providing more prime shift time in the computer would have been to revert to the manual system of correcting discrepancies. FmHA was using a manual input system (not online) as well as 32 terminals online to correct discrepancies in transactions previously processed and to enter new transactions. Using the terminals to correct discrepancies consumed prime shift time and was less productive and more costly than the manual method. About \$172,000 a year could have been saved if all discrepancies were corrected manually.
- Agriculture's determination that the sole-source procurement of a B-4781 computer system was the least costly method of augmenting the Center's computer capability was deficient, because in considering alternatives, Agriculture made assumptions that were inconsistent or incorrect. Although Agriculture had stated that the use of offsite computer services was not practicable because none could accommodate the Center's large workload which Agriculture said was not separable, a tentative separation of the workload had been identified for use with the proposed new computer. Another alternative, the upgrading of the existing B-2771 computer system, was actually less costly than the procurement of the B-4781.

We believe that this report, as summarized in the above findings, shows that Agriculture (1) did not demonstrate that its projected increase in loan program activity justified the need for a new computer system and (2) did not consider or take actions to improve the performance of the existing system that would have increased capacity in the three critical areas of disk storage, core storage, and central processing unit time. We further believe that implementing the suggested improvements to the existing system would have (1) enabled the St. Louis Computer Center to meet its responsibilities for existing FmHA loan program activity, and anticipated increases, until consolidating with the Center at Kansas City and (2) resulted in an annual reduction of about \$442,000 in operating costs.

In a draft report submitted to Agriculture for comment on July 2, 1976, we suggested that the Secretary of Agriculture cancel the proposed procurement of the B-4781 computer system and implement our suggested improvements for the existing computer system. A contract for the lease of the B-4781 computer system had been awarded on June 28, 1976, and the equipment was installed in September.

#### AGENCY COMMENTS AND OUR EVALUATION

On August 13, 1976, the Assistant Secretary for Administration, in commenting on the report (see app. I), stated that Agriculture did not generally agree with our conclusions and recommendations because it believed that the report does not

--accurately and fairly present all the facts which are pertinent to Agriculture's justification for requesting additional hardware capability to meet FmHA's expanding mission and

--provide any cost-effectiveness evaluation on software impact in order to achieve the recommendations on computer hardware changes.

Regarding cost-effectiveness evaluations on software impact related to our recommendations for improving the existing system, the purpose of our suggested improvements was to alleviate existing and projected shortages that Agriculture said that it had or would have in the areas of disk storage, core storage, and central processing unit time. As noted in the report, the impact on software is nominal or non-existent. Even though our suggestions would have alleviated

the three areas of shortage in the existing system, Agriculture rejected them by stating that the cost of software associated with a complete revision in three major programs used with the existing system--\$738,000--would be prohibitive compared to the added cost--\$298,000--of leasing the B-4781 computer over a 2-year period. We did not suggest a complete revision of the software for the three major programs. Revisions in software would be necessary only for the improvements that we suggested, and the associated costs would be nominal.

Even though some of the improvements had previously been suggested by some Agriculture officials, the earlier suggestions had been rejected without an adequate evaluation. The decision to procure a B-4781 computer overshadowed other considerations and decisions that might have been made. In commenting on the suggested improvements, Agriculture has highlighted and exaggerated the negative aspects, instead of evaluating the total impact on the Center's automatic data processing resources. Considering that saturation of the central processing unit was expected to occur about June 1977, without the improvements, Agriculture would have had ample time to assess them and would still have been in a position to acquire additional capacity if shortfalls did develop.

The Assistant Secretary also stated that our findings and conclusions had not been discussed with FmHA officials and others. That statement is inaccurate. The following listing identifies (1) the principal Agriculture officials with whom we discussed our review work, tentative findings, and conclusions and (2) the dates on which we met.

<u>Date</u>	<u>Officials</u>
February 18, 1976	Associate Administrator, FmHA
February 20, 1976	Assistant Secretary for Administration Director, ADS
March 16, 1976	Assistant Secretary for Administration Associate Administrator, FmHA Director, ADS
March 18, 1976	Associate Administrator, FmHA Director, ADS
April 1, 1976	Director, ADS Assistant Director, ADS (formal close-out conference)

Agriculture's specific comments and our evaluation are included in the sections of the report to which they relate.



## RECOMMENDATIONS

We recommend that the Secretary of Agriculture:

- Replace the 27 fixed head disk drives being leased by the Center with removable disk pack drives.
- Acquire a front-end communications processor.
- Require that the Center evaluate ways of making greater use of virtual memory in its application programs.
- Discontinue using terminals to correct discrepancies and increase the use of the more efficient, less costly manual input system.
- Require that FmHA and the St. Louis Computer Center, before completing the design of the Unified Management Information System and consolidating with the Kansas City Computer Center, fully comply with the provisions of Federal Management Circular 74-5 that require (1) a revalidation of workload and data processing requirements, (2) action be taken to improve performance of the existing system, and (3) any new systems or procedures be designed to achieve the highest practicable degree of effectiveness and operational economy.



DEPARTMENT OF AGRICULTURE  
OFFICE OF THE SECRETARY  
WASHINGTON, D C 20250

AUG 13 1976

Mr. Fred J. Shafer, Director  
Logistics and Communications Division  
U.S. General Accounting Office  
441 G Street, S.W.  
Washington, D.C. 20548

Dear Mr. Shafer:

This is in response to your letter of July 2, 1976, enclosing a draft report to the Subcommittee on Agriculture and Related Agencies, Committee on Appropriations, U.S. Senate, on "New Computer Not Needed for the St. Louis Computer Center, Department of Agriculture."

We have reviewed the draft report and believe the report does not:

- accurately and fairly present all the facts which are pertinent to Agriculture's justification for requesting additional hardware capability to meet FmHA's expanding mission and
- provide any cost effectiveness evaluation on software impact in order to achieve the recommendations on computer hardware changes.

Because the draft report lacks demonstration of the findings in Chapters 2, 3 and 4, we do not generally agree with the conclusions and recommendations in the report.

I would like to point out that, contrary to Mr. Eschwege's letter to the Secretary, findings and conclusions of the draft report were not discussed with officials of the Farmers Home Administration nor were all findings and conclusions discussed with the other principals.

Lacking, also, from GAO's audit approach was a thorough consideration of risk to the administration of a multi-billion dollar program which responsible FmHA and ADS management were required to make in determining the most appropriate course of action.

Our detailed comments are attached.

Sincerely,

A handwritten signature in cursive script, appearing to read "J. Paul Bolduc".

J. PAUL BOLDUC  
Assistant Secretary  
for Administration  
Attachment

### Introduction

During the early part of 1975, USDA determined that the workload requirements of FmHA might soon saturate the two Burroughs computers located at the Department's St. Louis Computer Center. By April 1975, it had become apparent that continuation of observed workload growth trends would cause saturation of at least three critical computer resource capabilities before an expected competitive procurement process could be completed and relief provided. Within available resources, FmHA set about to improve the operating efficiency of its current applications. As these actions did not fully offset the growing workload, USDA then considered shifting work to external sources, but after considerable study rejected this approach as being of relatively high risk and cost. USDA then considered various equipment upgrade alternatives and selected replacement of the Burroughs 2700 by a Burroughs 4781 as the most cost effective approach. In all its analyses and the ultimate decision, USDA fully considered the factors of cost, benefits, time and risk to the supported multi-billion dollar FmHA program area.

We believe that GAO misinterpreted complex technical data and did not clearly understand USDA plans. For instance, GAO concludes, on page 19, that existing computer capabilities at St. Louis would be exceeded by June 1977. GAO then assumed that the current workload would then be transferred to the newly installed competitive equipment at Kansas City. However, USDA plans clearly indicated that such was not our intent. FmHA's Unified Management Information System is to be placed on the newly acquired competitive equipment and the current applications at St. Louis would continue to run to St. Louis for a minimum parallel period -- at least to March-October 1978 -- at which time they will be phased out and dropped. These dates were available to the GAO audit team in the ADS St. Louis/Kansas City Relocation Study and in FmHA's UMIS Study. Therefore, a major error in the GAO team's conclusions is that, using their own figures, they indicate the existing equipment cannot possibly meet our requirements.

Improving efficiency of computer systems usually requires trade-offs between scarce resources such as CPU time, core storage and programmer time. Generally speaking, if one or two of these elements are reduced, the third must of necessity increase. In the Draft Report, GAO suggests certain modifications that affect all three; however, GAO does not address the trade-offs required nor the impact of their suggestions in related terms of cost, benefits, time and FmHA programmatic risk.

The Digest and the three "Finding" Chapters are as follows:

Digest

On page ii of the Draft Report, GAO indicates that they found "Agriculture did not fully comply with the Government requirement in that workload and data processing requirements were not revalidated and actions to improve the performance of existing facilities either were not considered or not taken." An individual reading the Digest would conclude that USDA had accomplished no requirements analysis nor had it taken any action to improve the performance of existing facilities. USDA did conduct a comprehensive requirements analysis and augmented it on several occasions throughout the period from April 1975 through May 1976. Further, FmHA had taken significant actions to improve the efficiency of their applications systems and ADS had taken numerous actions to improve the performance of the existing facilities. In fact, a Computer Performance Evaluation analysis conducted in April 1976 using hardware monitoring equipment concluded that:

- (1) The B3500 is at its maximum capacity and is optimally tuned.
- (2) The B2700 is well utilized, optimally tuned, and has less than 15 percent remaining capacity.

Chapter 2 - Projected Increases in Loan Program Activity Not Supported

This Chapter questions the reliability of the information used by FmHA for projecting increases in loan program activity. Specifically, the report states that the projections were overstated and unsupported and that due to the incompleteness and inconsistency of the data used for projecting increases, GAO was unable to determine what the proper projection should have been. This Chapter also questions the use of recent legislation by FmHA as a basis for justifying the need for obtaining additional hardware capability.

We believe that sufficient information was furnished to GAO for the purpose of determining the growth rate for FmHA's total loan program activities. <sup>1/</sup> Specifically, at GAO's request FmHA prepared a chart which showed the total actual volume of all loan input transactions for Fiscal Years 1972 through 1975. (See Attachment I.) This chart shows that the actual average growth rate for the 4-year period for all loan transactions was 14.7 percent. A further evaluation of the documentation supporting the information in the chart, which was also furnished to GAO, would disclose the following growth patterns relating to cash transactions, new loan transactions, and all other types of loan transactions:

<sup>1/</sup> With regard to the 22% growth rate indicated by FmHA in earlier studies, ADS used that figure only as a general indicator of growth. Time series analysis of actual computer resource utilization and observed saturation of disk and core resources were the techniques used to calculate future computer resource requirements.

Fiscal Year	ACTUAL LOAN ACTIVITY			Total Input Transactions
	Cash Transactions	New Loan Transactions	Other Transactions	
1972	5,372,279	620,935	627,104	6,620,318
1973	6,040,055	865,381	1,158,161	8,064,097
1974	7,005,960	697,019	912,536	8,615,515
1975	8,046,956	761,284	1,135,706	9,943,946 <sup>1/</sup>
Total Growth Rate 1972 thru 1975 (Percent)	50.0	23.0	81.0	50.0
Average Annual Growth Rate (Percent)	14.4	9.8	29.4	14.7

The above table clearly shows a distinct and reliable growth pattern for all input loan program activities. In addition, the total growth rate in actual loan obligations for the period of FY 72 through FY 77 is 130% and the current loan obligation increase between FY 76 and FY 77 is 20%. These funding increases will generate significant corresponding increases in all the various types of transactions. As pointed out on numerous occasions to the GAO auditors, the present and projected workload requirements of FmHA have already impacted on three critical computer resources--core memory, disk storage, and the central processing unit--to the point that temporary file storage, system work space and permanent space have already exceeded the system capacity. We firmly believe that the present and projected workload requirements more than adequately justify obtaining additional hardware capability.

We do not agree with the statements made in Chapter 2 regarding the use of recent legislation as a basis for justifying the need for additional computer hardware. Sufficient documentation furnished to GAO during its audit showed the contrary. It was clearly pointed out in 1) an April 1975 letter from the Acting Director of the St. Louis Computer Center to the Assistant Director for Operations, ADS, Department of Agriculture, and 2) the Agriculture's August 1975 request

<sup>1/</sup> Included in this total are 175,000 transactions representing an adjustment to focal interest which is slightly higher than normal. Deletion of these transactions changes the Average Annual Growth Rate from 14.7 to 13.8 percent.

to GSA that new legislation was not considered as a basis for justifying an upgrading of hardware capacity. Both documents will show that only those projects that have been approved and that will be installed over the next fiscal year have been considered in the request to lease a B-4781.

### Chapter 3 - Analysis and Evaluation of Existing and Proposed Computer Resources

This Chapter asserts that more efficient use of disk space, core storage, and central processing unit through changes in equipment and operations could result in annual savings of about \$442,000. More specifically, the report states that disk and core capacity could be increased by (1) instituting procedures to improve the allocation and use of disk space, (2) replacing fixed head disk drives with removable pack disk drives, (3) increasing the number of shifts during which the B-2771 computer is run, (4) acquiring a front-end communication processor, (5) evaluating the possibilities for making greater use of the virtual memory feature of the B-2771, and (6) discontinuing the use of terminals to correct discrepancies.

We believe the draft report does not effectively demonstrate that GAO made a thorough evaluation of existing hardware and software applications in determining whether it would be more cost EFFECTIVE to make improvements and changes to the existing system as compared to obtaining the needed additional hardware capability.

Before responding to each of the six areas mentioned above, we would like to reemphasize several points made to the GAO representatives during their audit. FmHA has been involved in a continuing effort over the past 18 months to upgrade the efficiency of its system applications in the St. Louis Finance Office. During the 18-month period, 11 system enhancements were made which have resulted in substantial savings in interest, administrative, supply costs, improved response time in processing loan and grant transactions, and better utilization of computer time. (See Attachment 2.)

Most of these improvements are now an integral part of FmHA's method of operation and could not be discontinued without serious derogatory impact on the services provided to the county offices. Despite these improvements, FmHA recognized that its current system represents a fragmented approach to providing information about program activities. Other problems relating to its current system included:

- The need for GAO approved loan accounting system.
- The need to have improved integration of programs and administrative accounting to provide better measures of program operating costs.

- Continuous increases in loan volume expected to exceed the capacity of present computer hardware capabilities.
- Budgetary controls tend to operate too late because information on current activities is delayed.

Recognizing these problems, FmHA entered into a contract in November 1975 to develop a Unified Management Information System (UMIS) over a 2-year period. To provide adequate computer support for the current system during the 2-year UMIS development period, FmHA explored ways to control and reduce its computer requirements. The major use of the computer time is three master UPDATE programs, which are the backbone of the total system in the St. Louis Finance Office.

FmHA determined that 36 manyears would be required at a cost of \$738,000 to perform the necessary revisions and reprogramming of the three programs. When the cost to revise and reprogram the UPDATE programs was compared to the increased rental cost of the B-4781 over the 2-year period, which is \$298,000<sup>1/</sup>, FmHA determined that reprogramming would not solve FmHA's immediate demands for additional hardware capability. Furthermore, FmHA determined that it would not be cost effective to make significant changes to its current system, since such changes would have an expected lifetime of less than 2 years.

Our comments relative to the six areas discussed in Chapter 3 are as follows:

#### Disk Space Requirements

[See GAO note 1.]

On page 14 of the report, GAO asserts that \$253,000 would be saved annually if the Department replaced the 27 fixed head disk drives currently being leased with four removable pack devices.

<sup>1/</sup> Incremental monthly equipment rental for the B-4781 will be approximately \$144,000 per year. Some additional cost (estimated to be about \$5,000 per year) will be incurred for "on-call" maintenance services.

USDA was aware of the potential economies which could be realized using removable packs. However, this alternative is only technically feasible if upgraded processor capabilities can be secured to support these devices, i.e., only if the B-4781 processor is procured to replace the B-2771.

Specifically, the problems which would be encountered in proceeding with immediate transfer to the removable pack technology would be as follows:

- (1) The fixed head devices would have to be replaced by head-per-track "look alike" disk packs which only make 129.5 million bytes available as opposed to 174.4 million bytes in the "native state." (GAO estimated figures are based on "native state" disk packs.) Thus, five devices would be required as opposed to four, somewhat reducing the potential annual savings reported by GAO.

If USDA were to install "native state" devices, as recommended by GAO, FmHA would be required to allocate scarce resources to reprogram its files because of the difference in segment size of the disks. This trade-off was not discussed by GAO. It would not represent good management practice given the short term of the interim procurement period.

- (2) The transfer rate of data from fixed head drives is 60 percent faster than the transfer rate on the removable pack drives. Thus substitution of the "look alike" drives would increase processor overhead (Wait State Time), effectively reducing the available CPU capacity on an already saturated machine. This trade-off was not discussed by GAO.
- (3) Finally, processor overhead would be increased because removable pack drives allow only two processor-to-pack paths for data accessing as opposed to the four paths currently available using fixed head devices. This would increase the percentage of time during which all channels are busy and the processor is forced to wait for channel response. The overhead increase will result in processor capacity degradation in SLCC's I/O bound environment. This trade-off was not discussed by GAO.

[See GAO note 1.]



[See GAO note 1.]

Core Requirements

This section of the report takes issue with the amount of additional core requirements, which FmHA determined were necessary to develop and implement five on-line applications.

We would like to point out that the 123,500 bytes of core were bona fide requirements in August 1975, when the Department of Agriculture furnished its request to GSA to lease a B-4781. Recognizing the urgency to provide

[See GAO note 1.]

improved services to FmHA's 1800 field offices due to its expanding mission of serving rural America, FmHA made significant changes to the existing terminal software application program in the fall of 1975. The changes were made to reduce the core requirements for this program and to make the core available to develop and implement three on-line applications; namely, the software for 24 additional terminals, the discrepancy reporting system, and the on-line compile and test system. The revisions made to the terminal application program had compromised the original operating objectives of the terminals, because two features of the program were eliminated. FmHA made this compromise, however, in order to obtain additional core, optimize the program, and improve response time. The reinstatement of either feature would require additional core, which is not presently available in the existing system.

#### Front-End Communication Processor

Page 17 of the report states that FmHA had previously considered a front-end communications processor, but had postponed the acquisition pending the B-4781 proposal. The report also states that the use of the processor would result in savings of about \$17,000 annually and would make more core storage and central processing time available.

We agree that potentially additional core storage and central processing time could be realized by leasing a B-744 front-end communication processor. However, this equipment was not effectively marketed until early 1975. At the time the decision was made to upgrade to the B-4781, there was no firm evidence available to ADS to determine exactly the impact of the B-774 on processor capacity.

It was not then established nor is it now established, that the B-774 would increase system processor capacity by enough to extend current system life more than 2-3 months, given the workload growth rate now being experienced.

USDA will continue to evaluate the feasibility of leasing a B-774 front-end communication processor to more efficiently handle its communication requirements.

#### Virtual Memory

Page 17 of the report asserts that the B-2771 system has "virtual memory" and that FmHA's terminal application program does not utilize this feature. The report recommends that an evaluation should be made to determine if all software programs are structured to take advantage of this feature.

It should be pointed out that the "virtual memory" feature is not an automatic feature of the operating system. It is a feature which allows for a program to use only a small amount of core storage and hold other portions of the program on disk. The portions on disk are called into core storage only when needed. Since 1966, FmHA has used this feature in its large update programs. Also, all on-line programs, except for the terminal application program, and many other programs used this feature.

Virtual memory has not been used in the application program because this feature required a disk access each time another portion of the program is needed. The terminal application program supports over 100 different types of transactions, which are randomly being requested from the Finance Office terminals. The result of using "virtual memory" in this environment would be significant degradation of response time on the terminals. Therefore, USDA believes that it would not be cost effective to implement this feature in the terminal application program.

Additionally, it must be pointed out that this method of relieving the core burden would exacerbate the processor saturation problem. Increasing the number of overlays relates directly to an increasing requirement for CPU cycles for a given application. As indicated above, the processor is already saturated and core-processor trade-offs are not feasible under the current environment.

#### Central Processing Unit

Page 19 of the report states that the central processing unit growth rate is about 7 hours per month; thus indicating that existing computer capacity in St. Louis would not be exceeded until June 1977. The report further states that since the date of the planned co-location of the St. Louis Computer Center with the one in Kansas City is scheduled for July 1977, there appears to be available time on the computer to satisfy FmHA's requirements, at the current rate of growth.

GAO has stated that the present FmHA workload could be transferred onto the new competitive computer when it is installed in KCCC on or about June 1977. This statement is incorrect. Current FmHA applications will be replaced by the UMIS system and will not be placed on the new competitive equipment. The operation of current applications is projected to be needed at least to March-October 1978, which allows for a period of parallel operation with the new UMIS system to be installed in KCCC. This means that the interim equipment will be needed at least until that time and any co-location before that time would be double conversion which would not be cost effective.

The volume of FmHA production work at the SLCC is expected to continue expanding at a rate at least as high as that which has been observed since installation of the B-2771 in May 1974. ADS has quantified

this workload growth at 8.65 Direct Time hours per month, using a six month moving average time series to dampen the effect of seasonal fluctuations in the workload. This technique yields a conservative projection since the time series indicates an acceleration of the rate<sup>17</sup> the later months of the period.

GAO has made an unspecified "adjustment" to the moving average technique and has determined that the workload growth rate is approximately seven hours per month, "indicating that computer capacity would not be exceeded until June 1977." (See page 18 of the draft report.) As mentioned above, if capacity was to be exceeded by June 1977, service to FmHA would be degraded for a minimum of nine to fifteen months. Any unavoidable delays in redesign and relocation of FmHA applications would extend this degraded service period. Such degradation of service is not acceptable given the importance of the FmHA missions served and the ADS objective to fulfill user requirements efficiently and cost effectively.

An ADS study dated April 5, 1976 shows that SLCC processor capacity (900 Direct Time hours) had been effectively saturated for normal 17 shift capacity operations during February and March 1976 (882 and 883 Direct Time hours, respectively).<sup>17</sup> In January 1976, twenty-one shift capacity was about 96 percent utilized. Thus, SLCC processor capacity had been effectively saturated under both peak load (FmHA year-end accounting) and normal load conditions during a working month. This capacity utilization data indicates that SLCC is closer to saturation than estimated by GAO.

GAO suggests that a possible way of relieving the processor saturation problem is to increase the number of shifts run by the Center on a normal basis.

This alternative means of expanding processor capacity has been considered by ADS and was rejected because of:

- (1) The cost of and time to hire required additional operations staff.
- (2) The cost and time to FmHA of hiring additional staff for the Process Control area.
- (3) The cost of required FmHA applications development personnel to work on weekends.
- (4) The nature of the production workload which is keyed to a daily cycle and which does not allow critical workload to be shifted to weekends.

<sup>17</sup> In fact, since March 1976, the SLCC processors have been utilized to 99 percent, 81 percent and 93 percent of 17 shift capacity for April, May and June, respectively. Thus, SLCC remains uncomfortably close to capacity saturation and resultant suppression of FmHA daily demand.

Finally, GAO states that USDA may be able to extend the productive life of the existing SLCC processors by taking action "to improve performance of the existing system." This matter was thoroughly studied by a Computer Performance Evaluation expert during the period March 29, 1976 through April 3, 1976. He concluded:

- (1) The B-3500 is at its maximum capacity and is optimally tuned.
- (2) The B-2700 is well utilized, optimally tuned, and has less than 15 percent remaining capacity.
- (3) The Burroughs Logger Data is a reliable source for reporting resource utilization.

This analysis was based on extensive hardware monitoring activity, and indicated that further effort to increase system performance could only produce marginal benefits.

#### Impact of Terminals on System Resources

This section of the report indicates that terminal processing of discrepancies is (1) less efficient than an existing manual system, and (2) substantially more costly than the manual system. The report further indicated that GAO analyzed daily activity reports for a three-month period ending March 31, 1976, and compared production and costs for both methods of correcting discrepancies and determined that it costs \$1.47 for terminals as compared to \$.89 to process a discrepancy line item. This section of the report concluded that annual savings of about \$172,000 could be realized if all discrepancies are processed manually.

On the basis of the information furnished to the GAO representatives during their audit (Form FmHA 300-11 Daily Processed Transaction Report), FmHA does not fully understand how GAO could have arrived at its conclusion on cost savings. An adequate analysis cannot be made as to the efficiency of processing discrepancies through the terminal versus manual with the information shown on the Form FmHA 300-11. This Form shows in total the number of input transactions processed through the 32 terminals for many different types of transactions. Such transactions would include, not only discrepancies, but also assumption agreements, renewal notes, reamortizations, name and address changes, payment plan changes, and requests for change in application of payment. Because the 32 terminals are not used exclusively for discrepancy processing, the cost savings used in the report are overstated.

Additional information in other FmHA operating reports would have had to been used to determine more accurately the cost of processing various

types of transactions in the Loan Accounting Branch of the Finance Office. Our analysis of the cost to process transactions through the 32 terminals versus manual operations for the same three-month period showed the following:

COST ANALYSIS TO PROCESS ONE TRANSACTION  
TERMINAL VERSUS MANUAL INPUT

<u>Function Performed</u>	<u>Manual</u>	<u>Cost</u> <u>Terminal</u>
Terminal Equipment Cost	\$.00	\$.13
Pulling & Associating Disc.	.03	.02
Transaction Processing (Terminal)	.00	.42
Transaction Processing (Manual):		
Document Preparation	.20	.00
Document Verification	.05	.00
Batch Blocking Documents	.05	.00
Data Conversion (Keypunch)	.04	.00
Data Conversion Equipment	.03	.00
Total Initial Costs	<u>.40</u>	<u>.57</u>
Discrepancy Re-entry (See "Summary" comments)	<u>.15</u>	<u>.12</u>
Total Costs	<u>.55</u>	<u>.69</u>

As shown in the above table, there is a cost difference of 14 cents between both methods as compared to the 58 cents shown on page 21 of the report. FmHA's analysis also showed that 26.6 percent of the transactions processed manually were rejected and that 17.7 percent of the transactions processed by the terminals were rejected. This represents a decrease of 8.9 percent in error rate when the terminals are used to process discrepancies. These rejection rates are substantially different than the rates used in the draft report.

Although FmHA's current analysis does show that the cost to process discrepancies by terminals is slightly higher than the manual operations, the use of terminals has resulted in a significant reduction in time to process a discrepancy and update our borrowers' accounts the same day, whereas transactions processed manually are updated to the borrowers' accounts 4 days later because of the time required to verify, block, keypunch and schedule the transactions to the computer.

The earlier update of the transactions to the borrowers' accounts afforded by the terminals is a significant factor in providing the most current account status information to our field offices. The ability of FmHA to update borrowers' accounts as timely as possible is a necessity in view of the inquiry services, which the Finance Office provides to the field offices. During the month of June 1976, over 30,000 inquiries were received from the field regarding the status of borrowers' accounts.

In conclusion, the terminals are vital to FmHA's operations and the discontinuance of the terminals would have a derogatory impact on the services provided to the field offices. GAO has examined relative costs of alternatives without regard to their relative effectiveness.

#### Chapter 4 - Alternatives to Sole Source Procurement Considered By Agriculture

This Chapter attempts to evaluate the four alternatives considered by the Department of Agriculture in justifying that the rental of the B-4781 be obtained under the sole source basis. The report asserts that Agriculture did not consider teleprocessing as a means of transferring data and that it did not consider transferring part of FmHA's workload to outside data processing services. The report further states that the time was not critical enough to prevent a competitive procurement; and that the cost of upgrading the B-2771 with additional core and disk would be less than the cost of replacing the B-2771 with a B-4781 processor.

ADS has considered both local and remote commercial service bureau alternatives. Local arrangements were rejected because of a lack of compatible local sites with sufficient core and disk resources. Remote arrangements were rejected on the basis of the scheduling problems, conversion costs, operation costs, and finally, because of the interdependencies among master files and jobs at SLCC. Even under the assumption that FmHA workload would be infinitely divisible (i.e., that there was no interdependence of files and application programs), remote processing of overflow workload proved to be significantly more expensive on a monthly basis than upgrade to the B-4781.

The principal factor in considering a competitive procurement for equipment was not the timing element for the procurement process, but the significant conversion cost that would be incurred to phase in existing software applications to the new vendor's equipment and the expected two-year life of the equipment. As indicated above, the reprogramming of the three major FmHA update programs would require one year for 36 personnel at a cost of \$738,000. Also, a competitive procurement for a system with a two-year life would necessitate a double conversion in order to implement the UMIS project.

Additionally, since processor saturation has been shown to be an immediate problem as early as February of 1976 during a "normal" processing month, GAO would agree that "the time frame required for a fully competitive procurement would prohibit use of this alternative." (See page 24 of the draft report).

Finally, GAO report on page 25 states that the upgrade of the B-2771 would constitute a less costly course of action for the Government,

being some \$33,000 less expensive on an annual basis than would be the B-4781 upgrade.<sup>1/</sup> Such a cost differential is to be expected, given the fact that the B-2771 upgrade eliminates only two of the three hardware bottlenecks which are impacting the quality of services at SLCC. Only the B-4781 upgrade eliminates all three bottlenecks. Thus, the B-2771 cannot legitimately be viewed as more cost EFFECTIVE than the B-4781 alternative since it would not provide the added processor capacity required prior to the transfer of production workload to the KCCC environment.

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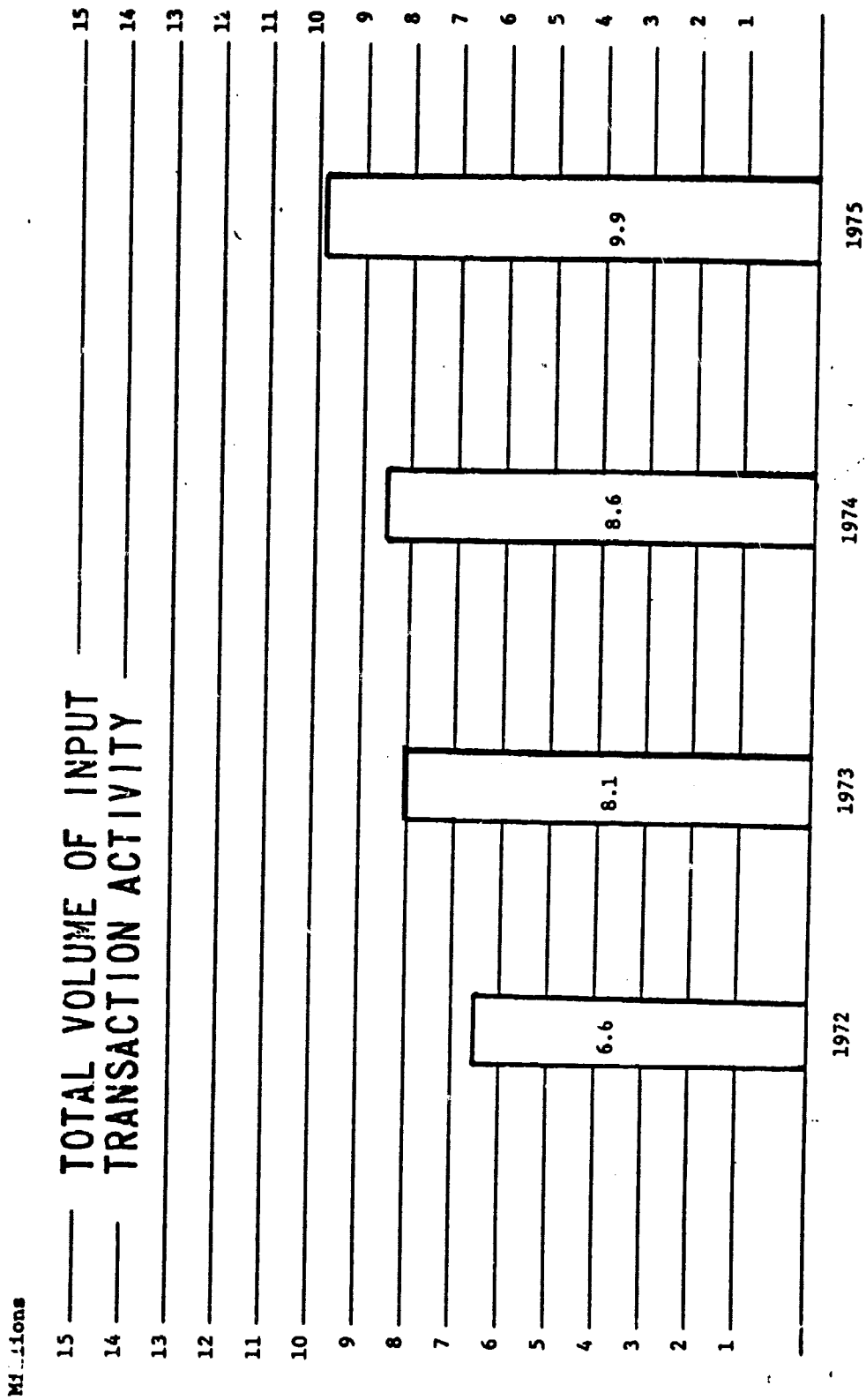
<sup>1/</sup> It should be noted here that in the July 1975 Request for Delegation of Procurement Authority the B-4781 alternative would have been approximately \$36,000 less expensive on an annual basis than the B-2771 upgrade alternative based upon the Burroughs FY 1976 schedule price list, the only cost data available at the time the original study was developed. Burroughs FY 77 price list was not released until 1976. Additionally, at the time this original study was developed, it had not yet been established that removable disk pack devices would be compatible with the B-2771 processor, requiring that the more expensive fixed head devices be costed in the B-2771 upgrade alternative.

- GAO notes:
1. Portions of this letter have been deleted because they are no longer relevant to the matters discussed in this report.
  2. Page references in this appendix refer to the draft report and do not agree with the page numbers in this final report.



UNITED STATES DEPARTMENT OF AGRICULTURE  
FARMERS HOME ADMINISTRATION  
FINANCE OFFICE

Attachment 1



Attachment 2

SYSTEM ENHANCEMENTS  
MADE BY FmHA

- THE IMPLEMENTATION OF THE INQUIRY STATION
- AUTOMATION OF DIRECT CASH BALANCING
- TERMINAL PROCESSING OF DISCREPANCY ITEMS
- USE OF MICRO-FICHE FOR COMPUTER OUTPUT
- AUTOMATION OF GENERAL LEDGER
- IMPLEMENTATION OF THE NEW LOAN DISBURSEMENT SYSTEM
- AUTOMATION OF APPROPRIATION ACCOUNTING
- AUTOMATION OF BUDGET PROCESSING
- TERMINAL PROCESSING OF ASSUMPTION AGREEMENTS
- DATA CONVERSION REQUIREMENTS
- REVIEW REPORTING REQUIREMENTS

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## United States Senate

COMMITTEE ON APPROPRIATIONS  
 WASHINGTON, D.C. 20510

JAMES R. GALLOWAY  
 CHIEF COUNSEL AND STAFF DIRECTOR

November 24, 1975

Honorable Elmer B. Staats  
 Comptroller General of the  
 United States  
 Washington, D. C. 20548

Dear Mr. Staats:

Thank you for furnishing me a copy of your letter of October 28, 1975 to Congressman John Moss in reference to computer acquisition activities of the Department of Agriculture.


As you know, the Department of Agriculture has indicated its desire to proceed with two computer facilities proposals. They propose to upgrade the Burroughs equipment which is currently in operation at the St. Louis Computer Center. I understand this would be done on a sole source basis.

The Department also proposes to modify some of the equipment currently in use at its Washington Computer Center. This proposal, as I understand it, involves a "brand name or equal" procurement.

This letter is to request that the General Accounting Office undertake an immediate review of the above proposals and report to this Committee as to whether these proposals are reasonable, proper, in the Government's best interest and in compliance with Federal procurement requirements. The Committee would like to be advised specifically as to the cost estimate of each proposal.

The Department has advised me that time is a critical factor in each of these proposals and I would therefore request that this matter be undertaken and completed as expeditiously as possible.

Sincerely yours,

  
 GALE McGEE, Chairman  
 Subcommittee on Agriculture  
 and Related Agencies

cc: Hon. John Moss  
 Hon. Jamie Whitten  
 Hon. Joseph Wright

GM:ma

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NINETY-FOURTH CONGRESS  
**Congress of the United States**  
**House of Representatives**

COMMITTEE ON GOVERNMENT OPERATIONS  
 2157 Rayburn House Office Building  
 Washington, D.C. 20515

January 17, 1976

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 MAJORITY 225-9081  
 MINORITY 225-3074

The Honorable Elmer B. Staats  
 Comptroller General of the United States  
 Washington, D. C. 20548

Dear Elmer:

I remain concerned over the Department of Agriculture's ongoing ADP procurement policies and practices.

In the wake of the cancellation of USDA's major ADP systems procurement, which was designed to replace existing equipment, USDA has commenced a program of upgrading such existing equipment by means of sole-source procurements. To date, noncompetitive upgrades have been announced for USDA's St. Louis and Ft. Collins computer centers. It is believed that similar type upgrades will be initiated at USDA's other three computer centers.

The GAO recently issued a well documented report describing USDA's failure to justify the need for new equipment. I question, therefore, whether data exists upon which USDA can now justify the initiation of this nation-wide upgrade. I am further concerned over the noncompetitive nature of these proposed upgrades.

I would appreciate your reviewing USDA's proposed procurements at their five computer centers with a view to determining whether USDA can now justify the upgrades, and also whether such upgrades need be non-competitive.

Thank you for your assistance in this matter.

Sincerely,



Jack Brooks  
 Chairman

PRINCIPAL OFFICIALS RESPONSIBLE FOR THE  
ACTIVITIES DISCUSSED IN THIS REPORT

	<u>Tenure of office</u>	
	<u>From</u>	<u>To</u>
<b>SECRETARY OF AGRICULTURE:</b>		
John A. Knebel	Nov. 1976	Present
John A. Knebel (acting)	Oct. 1976	Nov. 1976
Earl L. Butz	Dec. 1971	Oct. 1976
<b>ASSISTANT SECRETARY FOR ADMINIS-</b>		
<b>TRATION:</b>		
J. Paul Bolduc	Feb. 1976	Present
Joseph R. Wright, Jr.	Mar. 1973	Feb. 1976
Frank B. Elliott	Apr. 1971	Mar. 1973
<b>DIRECTOR, OFFICE OF AUTOMATED</b>		
<b>DATA SYSTEMS (note a):</b>		
Henry Meetze	Jan. 1975	Present
J. Paul Bolduc (acting)	Aug. 1974	Jan. 1975
Arthur T. Devlin (acting)	June 1974	Aug. 1974
Melvyn R. Copen	Sept. 1971	May 1974
<b>ADMINISTRATOR, FARMERS HOME</b>		
<b>ADMINISTRATION:</b>		
Frank B. Elliott	Mar. 1973	Present

a/Before a reorganization in January 1974, the Office of Information Systems, established in March 1972, had Department-wide responsibility for managing automatic data processing activities. Before that date, the Office of Management Improvement was responsible for coordinating ADP operations.