

PERFORMANCE AUDIT REPORT

Aquiring Maintenance Services For Computer Equipment

**A Report to the Legislative Post Audit Committee
By the Legislative Division of Post Audit
State of Kansas
May 1987**

Legislative Post Audit Committee

Legislative Division of Post Audit

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PERFORMANCE AUDIT REPORT

ACQUIRING MAINTENANCE SERVICES FOR COMPUTER EQUIPMENT

OBTAINING AUDIT INFORMATION

This audit was conducted by Ron Green, Senior Auditor, and Rick Riggs, Auditor, of the Division's staff. If you need any additional information about the audit's findings, please contact Mr. Green at the Division's offices.

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ACQUIRING MAINTENANCE SERVICES FOR COMPUTER EQUIPMENT

Summary of Legislative Post Audit's Findings

What is the State's present and potential future liability for maintenance of computers and related equipment? State agencies will spend about \$5.6 million in fiscal year 1987 to maintain their approximately 6,900 computers and word processors. About 93 percent of that total (\$5.2 million) will be spent to acquire maintenance contracts. About 90 percent of the fiscal year 1987 cost of maintenance contracts will be spent for large computer systems, not for microcomputers or word processors. Agencies project that in fiscal year 1988 their maintenance contract expenditures will increase by about 14.6 percent, to approximately \$6.0 million.

Are maintenance contracts cost-effective for computers and related equipment? Maintenance contracts are considered to be essential for large computer systems, because of the systems' importance to agency functions and the high cost of repairs. Contracts for microcomputers generally are not cost-effective because the devices are highly reliable and inexpensive to repair. Contracts for word processors may be cost-effective in the short run, because of the machines' relatively high repair costs and breakdown rates. However, replacing word processors with microcomputers could reduce maintenance costs. The Division of Information Systems and Communications has not issued any policies or guidelines for State agencies to follow in acquiring maintenance services. As a result, agencies have adopted widely divergent maintenance practices.

Are there better or more cost-effective ways to provide for the repair and maintenance of computers and related equipment? Several Board of Regents' institutions have some form of in-house maintenance for microcomputers and other equipment, but a major in-house operation probably could not be cost-justified for computers in the Topeka area. For larger computer systems, two Board of Regents' institutions have entered into maintenance contracts with firms other than the computer manufacturer. These "third-party" service vendors provide competition within the industry, and may represent a potential for savings over the cost of manufacturers' maintenance contracts.

ACQUIRING MAINTENANCE SERVICES FOR COMPUTER EQUIPMENT

Maintenance charges for computers, word processors, printers, and related equipment are generally over and above the purchase price, and can add considerably to the overall cost. In fiscal year 1986, the State spent about \$5.3 million for maintenance of its computers and word processing equipment. Most of this money was not spent directly for parts and labor, but to acquire maintenance contracts. Under such contracts, a service vendor agrees to provide all computer maintenance and repair for a set fee.

Recently, legislative concerns have been raised that these maintenance contracts may not be the most cost-effective way to obtain maintenance and repair services for State-owned computers and word processing equipment. For example, in some cases a device's full replacement cost may be small enough that a maintenance contract may not be warranted. For other devices, electronic parts seldom wear out and can be easily and inexpensively replaced. In these cases, provisions for maintenance that are more cost-effective than contracts may be available. As a result of these concerns, the Legislative Post Audit Committee directed the Legislative Division of Post Audit to conduct a performance audit examining the State's expenditures for computer maintenance, especially maintenance services obtained under contract, and assessing the cost-effectiveness of these contracts and possible alternatives to them. The audit addresses three specific questions:

1. What is the State's present and potential future liability for maintenance of computers and related equipment?
2. Are maintenance contracts cost-effective for computers and related equipment?
3. Are there better or more cost-effective ways to provide for the repair and maintenance of computers and related equipment?

To answer these questions, the auditors reviewed central accounting data provided by the Division of Accounts and Reports and interviewed officials of the Division of Purchases and the Division of Information Systems and Communications. They also surveyed all State agencies and interviewed officials from a sample of those agencies. Finally, the auditors reviewed computer literature and interviewed industry representatives.

In general, the auditors found that in fiscal year 1987 the State will spend about \$5.2 million for computer maintenance contracts. In fiscal year 1988, agency officials expect total maintenance contract costs to increase 14.6 percent, to about \$6.0 million. These contract expenditures represent about 93 percent of the amount spent by State agencies in fiscal year 1987 for all computer maintenance.

**For Most Computer Equipment,
The Board of Agriculture Budgets
Money For Repairs Instead of
Maintenance Contracts**

The Board of Agriculture has 30 microcomputers and 23 printers, many of which are linked electronically into a network. A "file server," a device that provides data storage for the computers on the network, holds a large amount of data that are critical to agency functions. This unit is protected by a maintenance contract to ensure that, in the event of a breakdown, it is repaired as quickly as possible. For all other computer equipment, agency officials have elected to budget funds for repair expenses rather than to buy maintenance contracts.

Agency officials reported that this strategy has saved money for the Board of Agriculture. So far in fiscal year 1987, the Board has spent \$3,146 out of a budgeted \$8,600 for computer maintenance and repair, including the \$1,329 cost of the maintenance agreement on the file server. Agency officials estimate that, for the same time period, maintenance contracts on all the Board's computer equipment would have cost more than \$13,000.

According to officials of the Division of Information Systems and Communications and other agencies, maintenance contracts on large and medium-size computer systems are essential because of the high cost of repairs and the importance of computers to agency operations. On the other hand, data obtained from the auditors' surveys, the Department of Administration, and agency interviews indicate that contracts for microcomputers are not cost-effective, because the machines are reliable and fairly inexpensive to replace. Maintenance contracts for word processors may be cost-effective in the short run, but the machines are relatively outdated and are more expensive to maintain than the newer microcomputers. Cost-effectiveness of maintenance contracts on terminals, printers, and other kinds of computer equipment depends on the nature and use of the equipment. The Division of Information Systems and Communications has not provided specific, written guidelines to agencies on computer maintenance issues. The auditors also found that State agencies are attempting to implement alternatives to

traditional maintenance contracts. These and other findings are discussed in the following sections. Profiles from a sample of State agencies are shown in boxes throughout the report.

**What Is the State's Present and Potential Future Liability for
Maintenance of Computers and Related Equipment?**

To answer this question, the auditors reviewed central accounting data obtained from the Division of Accounts and Reports and interviewed officials of the Department of Administration and a number of other State agencies. They found that the data available from the State's central accounting system was not detailed enough to provide adequate information about the State's computer maintenance expenditures. To obtain more in-depth information, they administered a survey to all State agencies, asking questions about the agencies' computer maintenance expenditures, policies, and practices. The auditors also reviewed available computer and word processing equipment maintenance records at a sample of State agencies.

The auditors projected State agency expenditures for all computer maintenance in fiscal year 1987 at \$5.6 million. Of that amount, State agencies will spend about \$5.2 million, or 93 percent of the total, for computer maintenance contracts. In fiscal year 1988, agency officials expect maintenance contracts to rise to \$6.0 million, a 14.6 percent increase over the current year. Although most of the State's computers are microcomputers, the larger mainframe and minicomputer

systems account for about 90 percent of the contract costs. These and other findings are discussed in the following sections.

Most Computer Maintenance Expenditures Are for Maintenance Contracts

To determine how much money the State spends to maintain computer equipment, the auditors reviewed central accounting data from the Division of Accounts and Reports for fiscal year 1985 through the first three quarters of fiscal year 1987. By annualizing the 1987 figure and using agency survey data for comparison, the auditors projected total State computer maintenance expenditures for the remainder of fiscal years 1987 and for 1988. The table below shows the results of that analysis.

Actual and Projected Computer Maintenance Expenditures For All Agencies Fiscal Years 1985 Through 1988

<u>Fiscal Year</u>	<u>Total Computer Maintenance Expenditures</u>	<u>Percent Increase</u>
1985	\$4,657,914	--
1986	\$5,255,758	12.8
1987	\$5,596,364 (projected)	6.5
1988	\$6,412,242 (projected)	14.6

As the table shows, agencies' expenditures for all computer maintenance services have grown for the last two complete fiscal years, and are projected to continue growing during fiscal years 1987 and 1988.

Most of the total expenditures are devoted to the purchase of maintenance contracts. In their survey of all State agencies, the auditors asked agency officials to determine and report the amount they anticipated spending in fiscal year 1987 for computer maintenance contracts. (Appendix A contains a complete listing of each agency's maintenance contract expenditures in fiscal year 1987.) The sum of the amounts reported was \$5.2 million, or about 93 percent of the projected total for all computer maintenance expenditures. In other words, only about seven percent of all computer maintenance funds spent in fiscal year 1987 (about \$381,000) will be spent for computer maintenance done on an as-needed basis. For this reason, the remainder of this audit report will focus on maintenance contracts.

The Division of Information Services and Communications Approves All Computer Acquisitions, But Is Not Required To Approve the Acquisition of Maintenance Contracts

By law, any State agency that wishes to buy a computer or word processor must obtain written approval from the Division of Information Services and Communications before the item can be purchased. Each agency is also required to submit to the Division an annual information technology plan. In addition to other data about agencies' information processing equipment, the plans list current inventories of computer hardware by type of device, and additional acquisitions projected for the coming fiscal year. The Division supplied this information to the

auditors. In subsequent discussions with agency personnel, the auditors found that the Division's data did not always match current agency holdings. In these cases, the auditors updated the figures as necessary.

Although State law provides for the Division to approve all computer purchases, no such statutory or administrative control is exercised over the acquisition of maintenance contracts; each agency makes its own decisions on maintenance for its equipment. As a result, no central Statewide information is available on the number of maintenance contracts, their cost, or the equipment covered.

State Agencies Now Own More Than 6,900 Computers In Addition to Associated Printers, Terminals, And Other Equipment

Computers generally fall into four categories of information processing devices: mainframe computers, minicomputers, personal or microcomputers, and word processors. As mainframes have grown less bulky and microcomputers more intelligent, the distinctions between computer categories have grown less clearcut. Nevertheless, some general characteristics still apply:

Mainframe computers are relatively big, powerful machines that can accommodate more than one user at a time through a large number of terminals. The computers that operate the State's central accounting system and revenue functions are examples of mainframe computers. The other key distinction of a mainframe computer is its need for a special, air-conditioned room because of its physical size and the heat it generates during operation.

Minicomputers can also accommodate multiple users at one time, but they do not require special facilities because they are not as large. As their smaller size suggests, minicomputers usually have somewhat less processing power and memory capacity than mainframes.

Microcomputers are designed for only one user at a time, but can be linked with other computer systems. A microcomputer generally has one screen and one keyboard. Memory is no longer much of an indicator of microcomputer status--it is now possible to install as much memory in a microcomputer as could be handled by mainframes only a few years ago. With the right software, a microcomputer can do word processing, spreadsheets, graphics, and other information processing.

Word processors are essentially microcomputers, except they are designed to handle text exclusively, with little if any capacity for computation or graphics. Word processors are generally becoming less common than the cheaper and more flexible microcomputers.

The information developed by the auditors from the Division of Information Services and Communications' data shows that State agencies now own more than 6,900 computers of all types. That total has grown in recent years, and is projected to continue growing. The table on the facing page shows the growth rates for each type of computer:

**Actual and Projected Computer Population, By Type
Fiscal Years 1986 Through 1988**

	Fiscal Year 1986	Fiscal Year 1987		(Projection for) Fiscal Year 1988	
	<u>Number of computers</u>	<u>Number</u>	<u>% Change</u>	<u>Number</u>	<u>% Change</u>
Mainframes	18	19	+5.6%	20	+5.3%
Minicomputers	102	123	+20.6%	133	+8.1%
Microcomputers	5,142	6,388	+24.2%	7,478	+17.1%
Word Processors	<u>395</u>	<u>405</u>	<u>+2.5%</u>	<u>384</u>	<u>-5.2%</u>
TOTAL DEVICES:	<u><u>5,657</u></u>	<u><u>6,935</u></u>	<u><u>+22.6%</u></u>	<u><u>8,015</u></u>	<u><u>+15.6%</u></u>

As the table shows, most of the growth between fiscal years 1986 and 1988 is in the microcomputer area; both the numbers and the rates of increase for that group are far higher than for any other kind of device. The word processor group rose a modest 2.5 percent, and agencies indicated that the total number of word processors will drop during fiscal year 1988. This projected decline is a trend that officials in the Division and the sampled agencies expect to continue as word processor technology is supplanted by microcomputers.

More than 5,500 of the State's total 6,935 computers (79.5 percent) are owned by Regents' institutions. Appendix B shows the number of computer devices, by type, owned by each State agency. Neither the Appendix nor the table above separately lists printers, terminals, and other equipment that are linked to these computers.

**Although Most of the Growth in Computers
Is Attributable to Microcomputers, Most of the Increase in
Expenditures Is Related to Major Computer Systems**

Survey data show that most maintenance contract costs relate to mainframe and minicomputer systems, and relatively little is devoted to microcomputers and word processors. The table on page six shows how much State agencies spend for maintenance of each kind of device, and the total number of devices under maintenance contract.

As the table shows, for fiscal year 1987 State agencies and institutions have maintenance contracts on mainframe and minicomputer systems totaling \$4.7 million, or 90 percent of all maintenance contract expenditures in the fiscal year. Microcomputers account for only 2.4 percent of all maintenance contract expenditures, and word processors for less than eight percent. The average annual cost of a maintenance contract for a microcomputer and its associated printers and other such devices is about \$381. The average cost for a word processor is about \$1,283. The average \$33,000 maintenance contract cost for a mainframe or a minicomputer is not indicative of the contracts' true costs because of the wide variations in the size and capacity of the devices. Annual contract costs for mainframe computers in the State range from \$38,000 to more than \$500,000. Costs for minicomputer maintenance contracts range from about \$1,600 to \$32,000 per year.

Maintenance Contract Expenditures and Devices, By Type of Computer System

Computer Type	FY 1987 Contract Cost	% of FY 1987 Maintenance Contract Expenditures	Total Number of Devices on Contracts	Average Cost per Device
Mainframe and minicomputer systems	\$4,695,410	90.0 %	142	\$33,066
Microcomputers	126,413	2.4	332	381
Word processors	<u>393,829</u>	<u>7.6</u>	<u>307</u>	<u>1,283</u>
TOTAL	\$5,215,651	100.0 %	781	\$6,678

Microcomputers account for only a small part of the growth in maintenance contract expenditures because the cost of a maintenance contract for a microcomputer is relatively low, and because only 332 of the 6,388 microcomputers in State agencies (about five percent) are on maintenance contract. By contrast, according to the Division of Information Systems and Communications, all 142 mainframe and minicomputer systems in the State are on maintenance contracts. This figure is expected to grow by 11 to a total of 153 mainframes and minicomputers in fiscal year 1988.

Conclusion

In fiscal year 1987, State agencies will spend about \$5.2 million on maintenance contracts for computers and related information processing equipment. About 90 percent of these costs will be incurred for large computer systems, not microcomputers. According to Division of Information Systems and Communications officials, all mainframes and minicomputers are covered by maintenance contracts. On the other hand, only about five percent of State-owned microcomputers receive contractual maintenance services. Agencies expect to add 11 major computer systems in fiscal year 1988; maintenance contract costs are projected to rise another 14.6 percent, to about \$6.0 million.

Are Maintenance Contracts Cost-Effective For Computers and Related Equipment?

To answer this question, the auditors reviewed literature on the subject of computer maintenance contracts, interviewed officials in the Department of Administration and other State agencies, reviewed agencies' maintenance contract expenditures, and obtained additional information from a sample of agencies. The auditors found that there is no simple formula for determining whether maintenance contracts are the most cost-effective option for obtaining maintenance services. Rather, each type of computer equipment must be evaluated based on factors such as value, use, and expected reliability.

In general, the auditors' review of State agency maintenance contracts showed that maintenance contracts on microcomputers are not cost-effective and that maintenance contracts on word processors may be cost-effective in the short run, but updating equipment could reduce maintenance costs. Maintenance contracts on minicomputers and mainframes are considered to be essential, so their cost-effectiveness was not analyzed. Maintenance contracts on terminals and printers may or may not be cost-effective, depending on the type and value of the equipment. These findings are discussed in greater detail in the sections to follow.

Maintenance Contracts on Microcomputers Generally Are Not Cost-Effective

Annual maintenance contracts for State agencies' microcomputers generally range from \$200 to \$700. The actual charges vary based on the model, the type of service, and the location. In fiscal year 1987, the average cost for a microcomputer maintenance contract was \$381.

As shown in Appendix A, 76 of 101 State agencies own microcomputers. However, only 19 of these agencies bought maintenance contracts for their microcomputers in fiscal year 1987. These agencies are listed in the table below:

**Maintenance Contracts on Microcomputers
Fiscal Year 1987**

<u>Agency</u>	<u>Microcomputers on Maint. Contracts</u>	<u>Total Expenses for Maint. Contracts</u>	<u>Average Cost Per Microcomputer</u>
Arts Commission	1	\$ 444	\$ 444
Attorney General	1	203	203
Fish and Game Commission	2	1,468	734
Health & Environment	2	258	129
Human Resources	5	5,441	1,088
Indigents' Defense Services	3	1,000	333
Industrial Reformatory	2	620	310
Kansas Neurological Institute	1	2,466	2,466
Kansas State University(a)	128	58,106	454
KU Medical Center(a)	35	7,881	225
Legislative Admin. Services	11	10,566	961
Legislative Div. of Post Audit	19	2,501	132
Parole Board	1	960	960
Revisor of Statutes	3	1,660	553
State Library	1	217	217
University of Kansas(a)	66	10,202	155
Wichita State University(a)	49	15,837	323
Winfield State Hospital	1	1,488	1,488
Youth Center at Topeka	<u>1</u>	<u>355</u>	<u>355</u>
TOTALS	<u>332</u>	<u>\$ 121,673 (b)</u>	<u>\$ 366 (b)</u>

(a) All or most of the maintenance contracts at these universities are for maintenance services performed by internal staff members, under inter-departmental contracts.

(b) These totals are slightly lower than the Statewide totals listed in Question 1, because those totals also include contracts on individual pieces of equipment that could not be defined as a complete microcomputer. Using total expenditures, the average maintenance contract cost was \$381.

As the table shows, only 332 microcomputers were covered by maintenance contracts in fiscal year 1987. These 332 represent about five percent of the 6,388 microcomputers owned by all State agencies.

**Department of Health and
Environment Officials Have Decided
To Continue Maintenance Contracts
On Department Word Processing
Equipment**

The Department of Health and Environment operates a centralized word processing center at its facility at Forbes Field. The center has five dedicated word processors. In addition, one word processor in the center communicates with a similar device housed in Department offices at the Landon State Office Building. Currently, six microcomputers are also housed in the center, and are used for both word processing and training.

Like the Corporation Commission, the Department has maintenance contracts on most of its word processing equipment, but not on its microcomputers. Maintenance contracts on nine word processors will cost about \$18,000 in fiscal year 1987. Department officials justify this policy by saying that the word processing center does mostly "heads down" production typing, and that dedicated word processors are more efficient than microcomputers for that kind of heavy production. Officials added that quick turnaround time for the legal orders and other documents processed through the center are critical to agency functions. In contrast, all but two of the Department's 97 microcomputers are not kept on maintenance contracts because they are very reliable and not generally expensive to repair (the remaining two are used in the word processing center as word processors). Department officials report that they have spent \$78 so far this fiscal year for microcomputer repair. Also, the work done on microcomputers can generally be shifted to other devices if one breaks down.

The \$381 average annual cost of a microcomputer maintenance contract is much higher than the actual cost of maintenance services on an as-needed basis.

The following examples are from agencies that do not have microcomputers on maintenance contracts:

- The Department of Health and Environment reported that it has spent a total of only \$78 for repair bills on its 95 microcomputers during the first nine months of fiscal year 1987.
- The Kansas Water Office reported that it has spent only \$190 for repairs on its seven microcomputers and seven printers during the same period.
- The Kansas Corporation Commission reported that it has spent only \$97 for repair of its 39 microcomputers during the first nine months of fiscal year 1987. Over the past four years, the Commission has paid a total of about \$1,380 for repair of microcomputers and related devices.
- The Board of Agriculture reported that it has spent \$3,146 for maintenance of its 30 microcomputers and 23 printers (including \$1,329 for a maintenance contract on a file server) during the same period. On an annual basis, this amounts to about \$140 per microcomputer.

These agencies (and four others in the auditors' sample) are profiled in greater detail in the boxes throughout this report.

As illustrated above, maintenance contracts generally are not cost-effective because microcomputers are so reliable. A microcomputer is a system of electronic equipment with very few moving parts. As such, it does not need service or repair as often as mechanical equipment. One computer magazine article stated it as follows:

Most mechanical equipment tends to fail more frequently with use; parts wear out and tolerances exceed specifications. But electronic equipment is blessed with the opposite; most component failures will occur with initial use. So fortunately, most problems will crop up while the microcomputer is still under warranty and repair is the responsibility of the vendor, not the owner.

The \$381 average cost of a microcomputer maintenance contract also appears to be high in relation to the value of the equipment or to its replacement cost. Computer articles and officials of the Division of Information Systems and Communications indicated that a reasonable annual maintenance contract charge would be less than 20 percent of the current retail value of the equipment. The actual price of a microcomputer varies widely, according to the model, type of monitor, type of disk drive, type of printer, and the number of microcomputers served by each printer.

The cost of microcomputers on Statewide contracts have been declining steadily in recent years. For example, a Zenith microcomputer (without a printer) that cost about \$3,080 in fiscal year 1984 could be purchased for \$1,280 in fiscal year 1987. Including a basic printer, a Zenith microcomputer can be purchased for \$1,600-\$2,000. The \$400 annual on-site maintenance service fee quoted in a current Statewide contract would be 20 percent of the \$2,000 purchase price. In correspondence with the auditors, Zenith officials estimated that the annual cost of a maintenance contract was generally 16-18 percent of the total system cost.

Although no firm data are available, Department of Administration officials estimate that about 80 percent of State-owned microcomputers are Zenith models. Other major manufacturers of State-owned microcomputers include IBM, NCR, and Apple.

Even under the "worst case" assumption, maintenance contracts on microcomputers do not appear to be cost-effective. The difference between projected total Statewide maintenance expenditures (\$5.6 million) in fiscal year 1987 and total expenditures for maintenance contracts (\$5.2 million) is approximately \$381,000. The auditors could not determine what types of equipment this money was spent on. But even assuming that all \$381,000 was spent for repairing the 6,056 microcomputers not on maintenance contracts, the average cost per machine would still be less than \$65 per year. This cost is far less than the \$381 average annual cost per microcomputer on maintenance contract.

**The Kansas Water Office
Has Replaced its Word Processors
With Microcomputers**

During fiscal year 1985, the Kansas Water Office replaced its two dedicated word processors with Zenith microcomputers. Maintenance contracts for the word processors had totalled about \$1,700 per year, the equipment had not been reliable, and the manufacturer had stopped making the equipment. After consulting with the Division of Information Systems and Communications, the Water Office decided that its word processing and data processing needs could both be met using microcomputers.

The Water Office now has seven microcomputers and seven printers. No maintenance contracts have been purchased on any of this equipment. The Water Office has found that most microcomputer equipment problems occur during the initial warranty period. For the first nine months of fiscal year 1987, the agency spent only \$190 for repair service on its microcomputers. In addition, officials of the Water Office said they were happy with the performance of the microcomputers and the software used for word processing.

**Maintenance Contracts on Word Processors
May Be Cost-Effective in the Short Run,
But Updating Equipment Could Reduce Maintenance Costs**

In fiscal year 1987, State agencies owned a total of 405 word processors; 307 of these (75.8 percent) were covered by maintenance contracts. Annual maintenance contracts for State agencies' word processors generally ranged from \$500 to \$1,500. In fiscal year 1987, the average cost for a word processor maintenance contract was about \$1,280.

Word processors are more expensive to repair than microcomputers and break down more often, so maintenance contracts on word processors may be cost-effective in the short run. However, in the long run, the money spent on word processor maintenance contracts could be spent to replace the word processing equipment with microcomputers.

Having maintenance contracts on word processors may be reasonable, because word processors are expensive to repair. Five of the eight sampled State agencies owned word processors in fiscal year 1987. Four of these purchased annual maintenance contracts on some or all of their word processors. These agencies are listed in the following table:

**Maintenance Contracts on Word Processors in Sample Agencies
Fiscal Year 1987**

<u>Agency</u>	<u>Word Processors on Maint. Contracts</u>	<u>Total Expenses for Maint. Contracts</u>	<u>Average Cost Per Word Processor</u>
Corporation Commission	11	\$ 13,700	\$ 1,245
Health and Environment	9	18,000	2,000
Human Resources	19	14,800	779
Social and Rehab. Services	<u>12</u>	<u>19,000</u>	<u>1,583</u>
Total	<u>51</u>	<u>\$ 65,500</u>	<u>\$ 1,284</u>

The average maintenance contract cost varies widely because of different types and ages of equipment, but as a group the average cost for these agencies matches the Statewide average of \$1,280 per year.

All word processors at the Corporation Commission are covered by maintenance contracts. Commission officials said that the Commission's word processors (especially printers) were not always reliable, and that the technology of the equipment was about eight years old. From maintenance logs kept by the Corporation Commission, the auditors found that various parts of seven word processors were out of service for a total of 329 hours in the last 12 months. This averages to 47 hours of downtime per workstation. None of the other agencies listed in the table could provide such specific information about the reliability of their word processors.

Another agency in the auditors' sample--the Department of Administration's Division of General Services--has experienced a major expense due to breakdown of its word processing equipment. The Division's word processing system,

including three workstations and two printers, was not covered by a maintenance contract when a \$2,500 circuit board failed in May 1986. During the ensuing year, the agency spent a total of about \$4,400 for rental of replacement equipment and for quarterly maintenance contracts. The Division's plan to replace its word processors with a microcomputer network are discussed in the accompanying profile.

In many cases, buying microcomputers is a better alternative than purchasing maintenance contracts on word processors. The Division of Information Systems and Communications no longer approves State agencies' requests for purchasing dedicated word processors. The Division's Information Technology Master Plan states: "...word processing equipment that cannot communicate with central computers or with other workstations in an agency should not be acquired."

Microcomputers have a number of advantages over dedicated word processing systems. Microcomputers can use a variety of software to do spreadsheets and graphics, as well as word processing functions. Unlike word processing systems, microcomputers can be linked with minicomputers, mainframes, or telephone equipment.

The most commonly purchased microcomputer available on Statewide contract costs \$1,280--the same as the average annual word processor maintenance contract. Including a basic monitor and printer, the desktop microcomputer system would generally cost \$1,600-\$2,000. (The price would be higher if the State agency purchased a color monitor or a letter-quality printer.) In short, less than two years' maintenance charges on a word processor could be used instead to purchase a basic microcomputer system.

The Department of Administration's General Services Division Is Replacing Its Word Processors With A Local Area Network

The General Services Division first bought word processors more than five years ago. For most of that time, officials did not have maintenance contracts on the equipment, because it proved to be generally reliable and repair costs were minimal. For most of the last two years, Division officials have been working with the Division of Information Systems and Communications to develop a local area network that will allow the Division's microcomputers to communicate and share data with each other, and will replace the word processing equipment. When a \$2,500 circuit board in one of the word processors failed in May 1986, Division officials decided that it would be slightly cheaper to rent a replacement component for \$200 a month than to buy a new one, because the word processors would be discarded when the network project was completed in July 1987. This decision appears to have been sound.

In February 1987, while the Division was preparing to move to new quarters (making it necessary to move the word processors as well), the equipment vendor told Division officials that if the Division bought a maintenance agreement on the word processors, at a cost of \$1,515 per quarter, the vendor would move the equipment free of charge, and would discontinue the rental charges on the component. (Moving the equipment would have cost \$1,200.) Because the network was scheduled for completion within a few months, Division officials decided that buying the maintenance agreement for two quarters was the cheaper alternative.

Division officials say that the Division plans to acquire maintenance contracts on the devices because each is critical to agency operations. However, because the network will have 17 microcomputers, most of which will be relatively close together, it may be cheaper for the Division to buy one microcomputer for a spare, or to pay for repairs on a time-and-materials basis, rather than to pay for maintenance contracts on a group of machines that have already proven to be highly reliable.

Maintenance Contracts on Minicomputers and Mainframes Are Considered to Be Essential, so Their Cost-Effectiveness Was Not Analyzed in this Audit

According to officials of the Division of Information Systems and Communications, virtually every major computer system owned by a State agency is covered by a maintenance contract. The costs of maintenance contracts vary with the type of equipment, the required hours of service availability, and the required response time for service personnel. Because all State agencies apparently have maintenance contracts on their major computer systems, the auditors could not collect comparative information on the repair costs of any systems outside of a contractual agreement.

Division officials said that major computer systems (minicomputers and mainframes) are considered to be vital to the daily operations of State agencies. In many cases, an agency's primary mission cannot be accomplished if the computer system is down for more than a few hours. It is also more complex and expensive to provide back-up equipment for major computer systems than for microcomputers.

The Board of Indigents' Defense Services Has Reduced Maintenance Contract Spending Due to Budget Constraints and Good Experience With Its Microcomputers

The Board of Indigents' Defense Services currently owns five Zenith microcomputers. Four are in the Board's Topeka offices, and the other is in the Wichita office. Due to uncertainty about the reliability of microcomputers, the Board's Director originally wanted to cover each machine with a maintenance contract. However, State budget cuts have caused the Director to reduce spending for computer maintenance.

In fiscal year 1986, the Board spent \$2,058 for maintenance contracts on three microcomputers and four printers. Due to recent budget cuts and generally good experience with its microcomputers, the Board plans to spend only about \$1,000 for maintenance contracts on two microcomputers and one printer in fiscal year 1987.

The Board's Director would be willing to go without maintenance contracts if prompt service of critical machines could be assured. Without prompt service, the Board might not be able to meet court-imposed deadlines for filing briefs or other documents.

The Department of Human Resources Makes Maintenance Contract Decisions Based Largely On Each Device's Performance

The Department of Human Resources has maintenance contracts on at least 19 of its 31 dedicated word processors. The contracts on these units and their associated printers, controllers, and other devices will cost nearly \$14,800 in fiscal year 1987. Department officials said these 19 devices were on maintenance contracts while others were not because each office within the Department makes an independent judgment on the need for a maintenance agreement, based on the machine's past performance. Officials said that the Department's tight budget situation would likely prevent them from upgrading their word processing equipment to microcomputer technology any time in the near future.

In contrast to the word processors, most of the Department's 80 microcomputers do not have maintenance contracts. In all, only five microcomputers have contracts. In two of these cases, Department officials said, maintenance contracts are required as a condition of the federal grant with which the equipment was purchased. In three cases, contracts were purchased because those particular devices had required several repairs during the warranty period.

Finally, Division officials told the auditors that it would not be practical for State agencies to do in-house maintenance on major computer systems. They pointed out that, because of the relatively small number of such systems, it would not be cost-effective to maintain a large inventory of parts for the various dissimilar computer systems.

Maintenance Contracts on Terminals and Printers May or May Not Be Cost-Effective, Depending on the Type and Value Of the Equipment

In discussions with the auditors, Division of Information Systems and Communications' officials said that maintenance contracts on computer terminals and printers must be evaluated according to the type of computer equipment, the value of the equipment, and the type of computer to which the equipment is linked. According to the Division, private companies are not buying maintenance contracts on "dumb" terminals. (A "dumb" terminal, unlike a microcomputer, cannot be used to analyze or manipulate data independent of the host computer.) New terminals generally have a three-year warranty period, and are not very expensive--usually \$500 to \$1,000--to replace.

In the agencies sampled, the auditors noted that one agency--the Department of Social and Rehabilitation Services--spent about \$8,000 on maintenance contracts for 50 "dumb" terminals during fiscal year 1987. The auditors also noted that the Division of Information Systems and Communications has maintenance contracts on more than 700 "dumb" terminals, totalling about \$170,000 in fiscal year 1987.

Division officials also told the auditors that maintenance contracts for most inexpensive printers cannot be justified. Small, dot-matrix printers generally do not need a maintenance contract because the printers are reliable, inexpensive to replace, and often are not critical to agency functions. Laser printers under \$3,500 are highly reliable (similar to microcomputers), so they generally do not need a maintenance contract.

The Division of Information Systems and Communications Has Not Provided Written Guidelines for State Agencies To Follow in Making Decisions about Computer Maintenance

State law (K.S.A. 75-4705) requires the Division of Information Systems and Communications to determine all data processing programs, contract services,

**Kansas Corporation Commission
Plans to Phase Out Word
Processors and Upgrade to New
Units with Networking Capability**

The Kansas Corporation Commission has eight dedicated word processing stations in its Topeka office, and three in its Wichita office. Maintenance contracts for these 11 word processors cost about \$13,700 per year. In contrast, the agency has no maintenance contracts on its 39 microcomputers. Agency officials said that, over the past four years, the Commission has paid a total of about \$1,380 for repair of microcomputers and peripheral devices.

When asked about this contrast in agency policy, Corporation Commission officials said that different organizational units are responsible for microcomputers and word processors. The word processing stations have been on maintenance contracts since they were acquired in 1983.

Over the next three to four years, the Corporation Commission is planning to phase out the word processors in its Topeka office. One option under consideration is to use networked microcomputers to do its word processing. Implementation of this option could reduce or eliminate the expense of maintenance contracts and give the Commission a more up-to-date technology to meet its word processing and data processing needs.

and new data processing positions needed by any agency of the State. Although the Division has issued many standards and policies for State agencies to follow, it has not issued any written guidelines concerning the acquisition of maintenance contracts or services. As a result, State agencies have decided on their own whether to purchase maintenance contracts. In fiscal year 1987, such contracts for microcomputers and word processors totalled about \$520,000.

The same State law also requires the Division of Information Systems and Communications to audit the activities of State agencies for compliance with the standards issued by the Division. Under this statute, the Division would have the authority to follow up on any new policies on the subject of computer maintenance. The Division's current review process includes an annual review of the data processing plans submitted by State agencies. The statute calls for any recommendations from those plans to be forwarded to the Division of the Budget.

Conclusion

The auditors found that maintenance contracts on microcomputers are not cost-effective. They also found that maintenance contracts on word processors may be cost-effective in the short run, but updating equipment could reduce maintenance costs. Maintenance contract expenditures for microcomputers and word processors totalled about \$520,000 in fiscal year 1987. The Division of Information Systems and Communications has not issued any policies or guidelines for State agencies to follow in acquiring computer maintenance services. As a result, State agencies have had to decide whether to purchase maintenance contracts, and the agencies have adopted widely divergent practices.

Recommendation

The Department of Administration and its Division of Information Systems and Communications should issue a policy and procedure memorandum covering the acquisition of maintenance services on microcomputers, word processing systems, minicomputers, mainframe computers, and associated equipment such as printers and terminals. This memorandum should advise State agencies that maintenance contracts on microcomputers are not cost-effective, that maintenance contracts on word processors should be evaluated in comparison to possible purchase of microcomputers, and that maintenance contracts on dumb terminals are not cost-effective. The Division should also work with agencies in determining any special instances in which maintenance contracts may be justified for a microcomputer, word processor, or terminal. In reviewing State agencies' data processing plans, the Division should recommend to the Division of the Budget that only those maintenance contracts that have been demonstrated to be cost-effective should be included in the agencies' budget requests.

Are There Better or More Cost-Effective Ways To Provide for the Repair and Maintenance of Computers and Related Equipment?

The three possible ways to acquire computer maintenance services are commercial maintenance contracts, as-needed maintenance (paying for labor and materials), and in-house maintenance. Prior sections of this report have shown that maintenance contracts on microcomputers are not cost-effective, and that although maintenance contracts on word processors are cost-effective, agencies should review that equipment to decide whether it should be updated.

Several of the Board of Regents' institutions have some form of in-house maintenance for microcomputers and other equipment. The cost to operate such a service varies widely with the number of microcomputers, the type of repairs done, and the number of staff (or students) involved. A major service center, such as those at Kansas State University or the University of Kansas Medical Center, costs about \$50,000 per year. The auditors determined that a major State investment for an in-house microcomputer service center in the Topeka area could not be cost-justified, because Topeka-based agencies spent only about \$30,500 on microcomputer maintenance contracts in fiscal year 1987. Given these findings, this section of the report deals only with larger computer systems--mainframes and minicomputers.

Two Board of Regents' institutions have entered into maintenance contracts with firms other than the manufacturer. The University of Kansas and the University of Kansas Medical Center have each entered into at least one "third-party" maintenance contract on major computer systems. The University of Kansas has four such contracts on major computer systems, totalling about \$144,300 in fiscal year 1987. The University of Kansas Medical Center has one third-party contract on computer terminals, with a contract of about \$31,600 in fiscal year 1987.

SRS Does Not Purchase Maintenance Contracts for Microcomputers, but Spends Nearly \$19,000 Annually on Maintenance Contracts for Word Processing Equipment

The Department of Social and Rehabilitation Services is one of the few agencies in Topeka that owns word processors, microcomputers, minicomputers, and a mainframe. Most of the agency's word processing needs are met through microcomputers and a Data General minicomputer system. None of the agency's 163 microcomputers is on maintenance contract, and the agency has been happy with the reliability of its microcomputers. However, two other maintenance decisions could be questioned.

First, the agency is spending nearly \$19,000 per year to maintain 12 dedicated word processors located outside of its central office. The agency might be able to drop these maintenance contracts and use the funds to gradually replace the word processors with updated equipment.

Second, the agency has maintenance contracts on 50 terminals that are linked to its Data General system. Maintenance contracts for these terminals total about \$8,000 per year. According to DISC, most private firms are not buying maintenance contracts on this type of terminal.

SRS officials indicated that these two issues would be reviewed as the existing maintenance contracts expire.

All of the third-party contracts described above are for IBM computer equipment. While these contracts are not essentially different from maintenance contracts entered into with the manufacturer, they do indicate that competition is present in the acquisition of maintenance services. Competition could serve to improve service and to hold down prices for maintenance contract services.

The Division of Information Systems and Communications has begun taking steps to ensure that maintenance services on major computer systems are acquired on a competitive basis. The Division reported that it is drafting specifications for maintenance services on IBM computer systems in Topeka. Following review and issuance of the specifications, bids will be solicited from the manufacturer and from third-party maintenance firms. This maintenance contract is intended to cover IBM equipment owned by the Division and by the Department of Revenue. In this way, the Division can use the State's purchasing power to get the best price available for maintenance services. (By itself, the Division will spend a total of about \$1.7 million in fiscal year 1987 on computer maintenance agreements.)

Several computer magazine articles suggested that competition among manufacturers and third-party maintenance firms is improving the quality of maintenance services and driving maintenance costs down. One article said that savings realized by replacing standard manufacturer's service with a third-party maintenance agreement average 20 percent.

Recommendation

The Department of Administration and its Division of Information Systems and Communications should continue their efforts to ensure maximum competition for maintenance contracts on major State computer systems.

APPENDIX A

Maintenance Contract Expenditures by State Agencies Fiscal Year 1987

This Appendix shows the maintenance contract expenditures reported by each State agency for fiscal year 1987. Expenditures are shown in three categories: microcomputers; word processors; mainframes and minicomputers. This information was obtained and documented through the auditors' survey of all State agencies.

AGENCY NAME	MICROCOMPUTERS			WORD PROCESSORS			MAINFRAMES & MINICOMPUTERS			TOTAL
	Devices	Devices	FY 1987	Devices	Devices	FY 1987	Devices	Devices	FY 1987	FY 1987
	in Agency	on Maint. Contract	Maintenance Contract Expenditures	in Agency	on Maint. Contract	Maintenance Contract Expenditures	in Agency	on Maint. Contract	Maintenance Contract Expenditures	Maintenance Contract Expenditures
	(a)	(b)		(a)	(b)		(a)	(b)		
Abstractors' Board of Examiners	0	0	\$0	0	0	\$0	0	0	\$0	\$0
Accountancy, Board of	1	0	\$0	0	0	\$0	0	0	\$0	\$0
Adjutant General	4	0	\$0	3	0	\$0	0	0	\$0	\$0
Administration, Department of:										
Accounts and Reports	39	0	\$600	4	0	\$0	0	0	\$25,265	\$25,865
Architectural Services	1	0	\$0	3	2	\$2,012	0	0	\$0	\$2,012
Budget	3	0	\$0	0	0	\$0	0	0	\$0	\$0
Buildings and Grounds	1	0	\$0	0	0	\$0	0	0	\$0	\$0
DISC	27	0	\$0	5	4	\$4,819	3	3	\$1,643,103	\$1,647,922
Equal Employment Opportunity	1	0	\$0	2	1	\$1,006	0	0	\$0	\$1,006
General Services	15	0	\$0	4	4	\$3,030	0	0	\$0	\$3,030
Health Care Administrator	2	0	\$450	0	0	\$0	0	0	\$0	\$450
Personnel	38	0	\$1,200	3	3	\$3,530	0	0	\$0	\$4,730
Pooled Money Investment Board	1	0	\$0	1	0	\$0	0	0	\$0	\$0
Printing	3	0	\$0	0	0	\$0	2	2	\$31,354	\$31,354
Purchases	16	0	\$0	0	0	\$0	0	0	\$0	\$0
Secretary	1	0	\$0	0	0	\$0	0	0	\$0	\$0
Aging, Department of	3	0	\$0	3	3	\$3,218	0	0	\$0	\$3,218
Agriculture, Board of	30	0	\$1,329	1	0	\$0	0	0	\$0	\$1,329
Animal Health Department	0	0	\$0	0	0	\$0	0	0	\$0	\$0
Arts Commission	1	1	\$444	2	2	\$941	0	0	\$0	\$1,385
Attorney General	1	1	\$203	2	2	\$2,122	1	1	\$5,759	\$8,084
Banking Commissioner	1	0	\$0	2	2	\$562	0	0	\$0	\$562
Barber Examiners, Board of	0	0	\$0	0	0	\$0	0	0	\$0	\$0
Behavioral Sciences, Board of	1	0	\$0	0	0	\$0	0	0	\$0	\$0
Civil Rights, Commission on	8	0	\$0	0	0	\$0	0	0	\$0	\$0
Commerce, Department of	6	0	\$0	0	0	\$0	0	0	\$1,800	\$1,800
Conservation Commission	1	0	\$0	1	1	\$1,314	0	0	\$0	\$1,314
Consumer Credit Commissioner	1	0	\$0	0	0	\$0	0	0	\$0	\$0
Corporation Commission	41	0	\$0	11	11	\$13,699	0	0	\$1,866	\$15,565
Correctional Institute at Lansing	3	0	\$0	0	0	\$0	0	0	\$0	\$0
Correctional Voc. Training Ctr.	0	0	\$0	0	0	\$0	0	0	\$0	\$0
Corrections, Department of	31	0	\$0	4	3	\$3,292	1	1	\$22,416	\$25,708
Corrections, Ombudsman Board	0	0	\$0	0	0	\$0	0	0	\$0	\$0
Cosmetology, Board of	3	0	\$0	0	0	\$0	0	0	\$0	\$0
Credit Unions, Department of	0	0	\$0	0	0	\$0	0	0	\$0	\$0
Crime Victims Reparations Board	0	0	\$0	1	1	\$1,255	0	0	\$0	\$1,255
Deaf, School for the	11	0	\$0	2	2	\$1,765	0	0	\$0	\$1,765
Dental Board	0	0	\$0	0	0	\$0	0	0	\$0	\$0
Education, Department of	25	0	\$0	5	5	\$8,836	1	1	\$7,560	\$16,396
Emporia State University	193	0	\$0	7	4	\$4,529	1	1	\$47,938	\$52,467
Fire Marshal	4	0	\$0	0	0	\$0	0	0	\$0	\$0
Fish and Game Commission	12	2	\$1,468	2	0	\$1,092	0	0	\$0	\$2,560
Fort Hays State University	229	0	\$0	1	1	\$1,464	3	3	\$56,318	\$57,782
Governor	0	0	\$0	12	12	\$6,396	1	1	\$0	\$6,396
Grain Inspection Department	0	0	\$0	0	0	\$0	1	1	\$4,176	\$4,176
Healing Arts, State Board of	0	0	\$0	1	0	\$0	0	0	\$0	\$0
Health & Environment, Dept. of	97	2	\$258	9	9	\$18,049	2	2	\$16,667	\$34,974
Hearing Aid Examiners, Board of	0	0	\$0	0	0	\$0	0	0	\$0	\$0
Highway Patrol	3	0	\$0	1	1	\$696	1	1	\$20,777	\$21,473
Historical Society, State	29	0	\$0	3	3	\$2,456	0	0	\$1,195	\$3,651
Human Resources, Department of	80	5	\$5,441	31	20	\$14,763	3	3	\$455,824	\$476,028
Indigents' Defense Services, Bd. of	5	3	\$1,000	0	0	\$0	0	0	\$0	\$1,000
Industrial Reformatory, State	28	2	\$620	0	0	\$0	0	0	\$1	\$621
Insurance Department	1	0	\$0	0	0	\$0	3	3	\$15,571	\$15,571
Judicial Council	0	0	\$0	1	1	\$1,295	0	0	\$0	\$1,295
Judiciary	105	0	\$0	0	0	\$0	1	1	\$32,366	\$32,366
Kansas Bureau of Investigation	8	0	\$0	3	0	\$0	1	1	\$25,903	\$25,903
Kansas Neurological Institute	4	1	\$2,466	0	0	\$0	1	1	\$0	\$2,466
Kansas State University	1,638	128	\$58,106	41	23	\$35,272	12	12	\$314,588	\$407,966
Kansas Technical Institute	97	0	\$0	1	0	\$0	3	3	\$32,385	\$32,385
Kansas, Inc.	1	0	\$0	0	0	\$0	0	0	\$0	\$0
Larned State Hospital	13	0	\$0	0	0	\$0	0	0	\$0	\$0
Legislative Administrative Services	12	11	\$10,566	4	4	\$6,178	0	0	\$0	\$16,744
Legislative Research Department	11	0	\$0	6	6	\$2,680	0	0	\$0	\$2,680
Library, State	9	1	\$217	0	0	\$0	0	0	\$0	\$217
Lieutenant Governor	0	0	\$0	1	0	\$0	0	0	\$0	\$0

(a) This column shows the number of complete devices in each agency.

(b) This column shows the number of complete devices on maintenance contract. Some agencies have contracts on printers or other parts, but not on a complete device.

AGENCY NAME	MICROCOMPUTERS			WORD PROCESSORS			MAINFRAMES & MINICOMPUTERS			TOTAL
	Devices in Agency	Devices on Maint. Contract	FY 1987 Maintenance Contract Expenditures	Devices in Agency	Devices on Maint. Contract	FY 1987 Maintenance Contract Expenditures	Devices in Agency	Devices on Maint. Contract	FY 1987 Maintenance Contract Expenditures	FY 1987 Maintenance Contract Expenditures
	(a)	(b)		(a)	(b)		(a)	(b)		
Mortuary Arts, Board of	0	0	\$0	1	0	\$0	0	0	\$0	\$0
Norton State Hospital	9	0	\$0	0	0	\$0	0	0	\$0	\$0
Nursing, Board of	1	0	\$0	1	0	\$0	1	1	\$0	\$0
Optometry Examiners, Board of	0	0	\$0	0	0	\$0	0	0	\$0	\$0
Osawatomie State Hospital	20	0	\$0	0	0	\$0	1	1	\$1,644	\$1,644
Park and Resources Authority	1	0	\$0	0	0	\$0	0	0	\$0	\$0
Parole Board, Kansas	1	1	\$960	1	1	\$1,110	0	0	\$0	\$2,070
Parsons State Hospital	8	0	\$0	0	0	\$0	0	0	\$0	\$0
Penitentiary, State	2	0	\$0	4	4	\$6,197	0	0	\$0	\$6,197
Pharmacy, Board of	0	0	\$0	0	0	\$0	0	0	\$0	\$0
Pittsburg State University	191	0	\$0	12	7	\$10,285	3	3	\$76,345	\$86,630
Post Audit, Legislative Division of	19	19	\$2,501	0	0	\$0	0	0	\$0	\$2,501
Public Broadcasting Commission	0	0	\$0	0	0	\$0	0	0	\$0	\$0
Public Disclosure Commission	2	0	\$0	0	0	\$0	0	0	\$0	\$0
Rainbow Mental Health Facility	3	0	\$0	0	0	\$0	0	0	\$0	\$0
Real Estate Commission	0	0	\$0	0	0	\$0	0	0	\$0	\$0
Reception & Diagnostic Center	8	0	\$0	0	0	\$0	0	0	\$0	\$0
Regents, Kansas Board of	10	0	\$0	0	0	\$0	0	0	\$0	\$0
Retirement System, KS Pub. Empl.	4	0	\$702	2	1	\$2,046	1	1	\$11,005	\$13,753
Revenue, Department of	42	0	\$0	4	3	\$18,108	4	4	\$72,742	\$90,850
Revisor of Statutes	4	3	\$1,660	0	0	\$0	0	0	\$8,785	\$10,445
Savings and Loan Department	0	0	\$0	0	0	\$0	0	0	\$0	\$0
Secretary of State	0	0	\$0	0	0	\$0	1	1	\$18,073	\$18,073
Securities Commissioner of Kansas	1	0	\$0	1	1	\$1,032	0	0	\$0	\$1,032
Social & Rehabilitation Services	163	0	\$0	12	12	\$18,870	20	20	\$130,071	\$148,941
State Fair, Kansas	3	0	\$0	0	0	\$0	0	0	\$95	\$95
Tax Appeals, Board of	3	0	\$0	4	0	\$0	0	0	\$0	\$0
Technical Professions, Board of	0	0	\$0	2	2	\$2,394	0	0	\$0	\$2,394
Topeka State Hospital	7	0	\$0	0	0	\$0	2	2	\$0	\$0
Transportation, Department of	87	0	\$0	4	4	\$4,025	9	9	\$259,314	\$263,338
Treasurer, State	2	0	\$155	0	0	\$0	1	1	\$64,794	\$64,949
Univ. of Kansas	1,336	66	\$10,202	35	28	\$39,562	31	31	\$737,583	\$787,347
Univ. of Kansas Medical Center	175	35	\$7,881	65	65	\$84,930	18	18	\$281,623	\$374,434
Univ. of Kansas School of Medicine	39	0	\$0	17	11	\$18,121	1	1	\$37,943	\$56,063
Veterans' Affairs, Commission on	1	0	\$0	0	0	\$0	0	0	\$0	\$0
Veterinary Examiners, Board of	0	0	\$0	0	0	\$0	0	0	\$0	\$0
Visually Handicapped, School for	4	0	\$200	0	0	\$0	0	0	\$0	\$200
Vocational Ed., State Council on	0	0	\$0	1	0	\$0	0	0	\$0	\$0
Water Office, Kansas	7	0	\$0	0	0	\$0	0	0	\$0	\$0
Wheat Commission	3	0	\$104	1	0	\$0	0	0	\$0	\$104
Wichita State University	1,300	49	\$15,837	55	38	\$40,878	8	8	\$232,562	\$289,277
Winfield State Hospital	15	1	\$1,488	0	0	\$0	0	0	\$0	\$1,488
Youth Center at Atchison	2	0	\$0	0	0	\$0	0	0	\$0	\$0
Youth Center at Beloit	12	0	\$0	0	0	\$0	0	0	\$0	\$0
Youth Center at Larned	1	0	\$0	0	0	\$0	0	0	\$0	\$0
Youth Center at Topeka	3	1	\$355	0	0	\$0	0	0	\$0	\$355
TOTALS, ALL AGENCIES:	6,388	332	\$126,413	405	307	\$393,829	142	142	\$4,695,410	\$5,215,651

(a) This column shows the number of complete devices in each agency.

(b) This column shows the number of complete devices on maintenance contract. Some agencies have contracts on printers or other parts, but not on a complete device.

APPENDIX B

Computers Owned by State Agencies Fiscal Years 1986, 1987, and 1988

This Appendix shows the number of computers owned by each State agency in fiscal years 1986, 1987, and 1988 (projected). Agency totals are shown in four categories: microcomputers, word processors, minicomputers, and mainframes. This information was obtained initially from the Division of Information Systems and Communications, and was updated by the auditors as necessary.

AGENCY NAME	MICROCOMPUTERS			WORD PROCESSORS			MINICOMPUTERS			MAINFRAMES		
	FY86	FY87	FY88	FY86	FY87	FY88	FY86	FY87	FY88	FY86	FY87	FY88
Abstractor's Board of Examiners	--	--	--	--	--	--	--	--	--	--	--	--
Accountancy, Board of	1	1	1	--	--	--	--	--	--	--	--	--
Adjutant General	3	4	4	3	3	3	--	--	--	--	--	--
Administration, Department of:												
Accounts and Reports	32	39	40	4	4	--	--	--	--	--	--	--
Architectural Services	--	1	1	3	3	3	--	--	--	--	--	--
Budget	2	3	18	--	--	--	--	--	--	--	--	--
Buildings and Grounds	1	1	1	--	--	--	--	--	--	--	--	--
DISC	7	27	29	1	5	5	--	--	--	3	3	3
DISC (TELE)	--	--	--	--	--	--	--	--	--	--	--	--
Equal Employment Opportunity	--	1	1	2	2	2	--	--	--	--	--	--
General Services	7	15	16	4	4	4	--	--	--	--	--	--
Health Care Administrator	--	2	2	--	--	--	--	--	--	--	--	--
Personnel	23	38	38	3	3	3	--	--	--	--	--	--
Pooled Money Investment Board	--	1	2	1	1	1	--	--	--	--	--	--
Printing	3	3	4	--	--	--	2	2	3	--	--	--
Purchases	14	16	16	8	--	--	--	--	--	--	--	--
Secretary	1	1	1	--	--	--	--	--	--	--	--	--
Aging, Department of	3	3	3	3	3	3	--	--	--	--	--	--
Agriculture, Board of	28	30	30	1	1	1	--	--	--	--	--	--
Animal Health Department	--	--	1	--	--	--	--	--	--	--	--	--
Arts Commission	1	1	1	1	2	2	--	--	--	--	--	--
Attorney General	--	1	1	2	2	2	1	1	1	--	--	--
Banking Commissioner	1	1	18	2	2	2	--	--	--	--	--	--
Barber Examiners, Board of	--	--	--	--	--	--	--	--	--	--	--	--
Behavioral Sciences, Board of	1	1	1	--	--	--	--	--	--	--	--	--
Civil Rights, Commission on	8	8	8	--	--	--	--	--	--	--	--	--
Commerce, Department of	3	6	17	--	--	--	--	--	--	--	--	--
Conservation Commission	1	1	1	1	1	1	--	--	--	--	--	--
Consumer Credit Commissioner	--	1	1	--	--	--	--	--	--	--	--	--
Corporation Commission	25	41	59	11	11	11	--	--	1	--	--	--
Correctional Institute at Lansing	3	3	4	--	--	--	--	--	--	--	--	--
Correctional Voc. Training Ctr.	--	--	--	--	--	--	--	--	--	--	--	--
Corrections, Department of	28	31	36	4	4	4	1	1	3	--	--	--
Corrections, Ombudsman Board	--	--	--	--	--	--	--	--	--	--	--	--
Cosmetology, Board of	--	3	3	--	--	--	--	--	--	--	--	--
Credit Unions, Department of	--	--	--	--	--	--	--	--	--	--	--	--
Crime Victims Reparations Board	--	--	--	1	1	1	--	--	--	--	--	--
Deaf, School for the	8	11	11	2	2	2	--	--	--	--	--	--
Dental Board	--	--	--	--	--	--	--	--	--	--	--	--
Education, Department of	24	25	36	5	5	5	--	1	1	--	--	--
Emporia State University	165	193	208	7	7	7	0	0	1	1	1	1
Fire Marshal	--	4	6	--	--	--	--	--	--	--	--	--
Fish and Game Commission	7	12	14	2	2	2	--	--	--	--	--	--
Fort Hays State University	105	229	313	1	1	1	2	2	2	1	1	1
Governor	--	--	--	12	12	--	--	1	1	--	--	--
Grain Inspection Department	--	--	14	--	--	--	1	1	1	--	--	--
Healing Arts, State Board of	--	--	--	--	1	1	--	--	--	--	--	--
Health & Environment, Dept. of	84	97	100	9	9	6	1	2	2	--	--	--
Hearing Aid Examiners, Board of	--	--	--	--	--	--	--	--	--	--	--	--
Highway Patrol	2	3	21	1	1	1	--	1	1	--	--	--
Historical Society, State	20	29	30	--	3	3	--	--	--	--	--	--
Human Resources, Department of	59	80	83	31	31	31	1	1	1	2	2	2
Indigents' Defense Services, Bd. of	4	5	6	--	--	--	--	--	--	--	--	--
Industrial Reformatory, State	10	28	28	--	--	--	--	--	--	--	--	--
Insurance Department	1	1	2	--	--	--	2	3	3	--	--	--
Judicial Council	--	--	--	1	1	1	--	--	--	--	--	--
Judiciary	4	105	105	--	--	--	1	1	1	--	--	--
Kansas Bureau of Investigation	2	8	16	3	3	3	1	1	1	--	--	--
Kansas Neurological Institute	4	4	6	--	--	--	1	1	1	--	--	--
Kansas State University	1,489	1,638	1,802	46	41	37	10	10	11	2	2	2
Kansas Technical Institute	75	97	150	--	1	1	3	3	3	--	--	--
Kansas, Inc.	--	1	--	--	--	--	--	--	--	--	--	--
Larned State Hospital	11	13	13	--	--	--	--	--	--	--	--	--
Legislative Administrative Services	12	12	13	4	4	4	--	--	--	--	--	--
Legislative Research Department	8	11	14	6	6	7	--	--	--	--	--	--
Library, State	5	9	10	--	--	--	--	--	--	--	--	--
Lieutenant Governor	--	--	--	1	1	1	--	--	--	--	--	--
Mortuary Arts, Board of	--	--	--	--	1	1	--	--	--	--	--	--
Norton State Hospital	6	9	12	--	--	--	--	--	--	--	--	--
Nursing, Board of	1	1	1	--	1	1	--	1	1	--	--	--
Optometry Examiners, Board of	--	--	--	--	--	--	--	--	--	--	--	--
Osawatimie State Hospital	9	20	25	--	--	--	1	1	1	--	--	--

AGENCY NAME	MICROCOMPUTERS			WORD PROCESSORS			MINICOMPUTERS			MAINFRAMES		
	FY86	FY87	FY88	FY86	FY87	FY88	FY86	FY87	FY88	FY86	FY87	FY88
Park and Resources Authority	1	1	1	--	--	--	--	--	--	--	--	--
Parole Board, Kansas	1	1	1	1	1	1	--	--	--	--	--	--
Parsons State Hospital	4	8	11	--	--	--	--	--	1	--	--	--
Penitentiary, State	1	2	6	4	4	4	--	--	--	--	--	--
Pharmacy, Board of	--	--	--	--	--	--	--	--	--	--	--	--
Pittsburg State University	174	191	198	12	12	12	3	3	4	--	--	--
Post Audit, Legislative Division of	19	19	19	--	--	--	--	--	--	--	--	--
Public Broadcasting Commission	--	--	--	--	--	--	--	--	--	--	--	--
Public Disclosure Commission	2	2	2	--	--	--	--	--	--	--	--	--
Rainbow Mental Health Facility	2	3	3	--	--	--	--	--	1	--	--	--
Real Estate Commission	--	--	--	--	--	--	--	--	--	--	--	--
Reception & Diagnostic Center	7	8	8	--	--	--	--	--	--	--	--	--
Regents, Kansas Board of	9	10	10	--	--	--	--	--	--	--	--	--
Retirement System, KS Pub. Empl.	1	4	5	2	2	0	1	1	1	--	--	--
Revenue, Department of	37	42	57	4	4	4	2	4	4	--	--	--
Revisor of Statutes	3	4	6	--	--	--	--	--	--	--	--	--
Savings and Loan Department	--	--	1	--	--	--	--	--	--	--	--	--
Secretary of State	--	--	--	--	--	--	1	1	1	--	--	--
Securities Commissioner of Kansas	--	1	3	1	1	1	--	--	--	--	--	--
Social & Rehabilitation Services	144	163	288	12	12	12	18	19	19	--	1	2
Soldiers Home	--	--	--	--	--	--	--	--	--	--	--	--
State Fair, Kansas	3	3	4	--	--	--	--	--	--	--	--	--
Tax Appeals, Board of	2	3	4	4	4	4	--	--	--	--	--	--
Technical Professions, Board of	--	--	--	2	2	2	--	--	--	--	--	--
Topeka State Hospital	1	7	10	--	--	--	1	2	2	--	--	--
Transportation, Department of	28	87	87	4	4	4	--	9	9	--	--	--
Treasurer, State	1	2	2	--	--	--	--	--	--	1	1	1
Univ. of Kansas	1,087	1,336	1,636	35	35	35	25	27	28	4	4	3
Univ. of Kansas Medical Center	140	175	210	60	65	65	17	17	17	1	1	2
Univ. of Kansas School of Medicine	27	39	59	16	17	18	0	0	0	1	1	1
Veterans' Affairs, Commission on	--	1	1	--	--	--	--	--	--	--	--	--
Veterinary Examiners, Board of	--	--	--	--	--	--	--	--	--	--	--	--
Visually Handicapped, School for	2	4	4	--	--	--	--	--	--	--	--	--
Vocational Ed., State Council on	--	--	--	1	1	1	--	--	--	--	--	--
Water Office, Kansas	4	7	7	--	--	--	--	--	--	--	--	--
Wheat Commission	2	3	3	1	1	1	--	--	--	--	--	--
Wichita State University	1,100	1,300	1,400	50	55	57	6	6	6	2	2	2
Winfield State Hospital	12	15	15	--	--	--	--	--	--	--	--	--
Youth Center at Atchison	2	2	2	--	--	--	--	--	--	--	--	--
Youth Center at Beloit	12	12	12	--	--	--	--	--	--	--	--	--
Youth Center at Larned	1	1	1	--	--	--	--	--	--	--	--	--
Youth Center at Topeka	2	3	5	--	--	--	--	--	--	--	--	--
TOTALS:	5,142	6,388	7,478	395	405	384	102	123	133	18	19	20

APPENDIX C

Agency Response

On May 26, 1987, a copy of the draft audit report was sent to the Department of Administration for review and comment. The Department's written response is included in this appendix.

STATE OF KANSAS



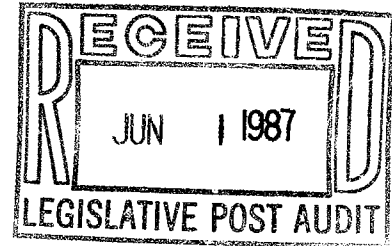
DEPARTMENT OF ADMINISTRATION

State Capitol
Topeka 66612-1572
(913) 296-3011

H. Edward Flentje, *Secretary*

June 1, 1987

Meredith Williams
Legislative Post Auditor
Legislative Division of Post Audit
Mills Building
BUILDING MAIL



Dear Mr. Williams:

Thank you for providing the draft of your audit report on Acquiring Maintenance Service for Computer Equipment. We are in general agreement with the report and its findings. The Division of Information Systems and Communications (DISC) is already drafting a policy and procedure memorandum covering acquisition of maintenance service.

We do not believe, however, that we can advise agencies to drop maintenance contracts on all terminals. Circumstances vary from agency to agency and factors in addition to cost must be considered. In some situations, access to the mainframe is critical to the agency's operations and response time for repair must be measured against cost. On a practical note, we have long-term maintenance contracts on terminals (primarily Sperry) for which we are obligated until the equipment is paid for.

We do agree that in today's competitive environment, with lower terminal costs, maintenance contracts may not always be advisable. DISC will be working with agency personnel to determine the best course on a case-by-case basis.

Sincerely,

A handwritten signature in cursive script, appearing to read "H. Edward Flentje".

H. Edward Flentje
Secretary of Administration

HEF:cm
4082