

MINUTES OF THE MEETING
GENERAL GOVERNMENT AND HIGHWAYS SUBCOMMITTEE
MONTANA STATE
JOINT SUBCOMMITTEE

February 5, 1985

The meeting of the General Government and Highways Subcommittee was called to order by Chairman Quilici on February 5, 1985 at 7:00 a.m. in Room 437 of the State Capitol.

ROLL CALL: All members were present with the exception of Senator Stimatz, who was excused. Also present were Cliff Roessner, from the LFA Office, and Doug Booker from the Governor's Office.

DEPARTMENT OF ADMINISTRATION

Information Services Division: Mike Trevor, Administrator, explained the purpose of the division. Exhibit No. 1 is information for the budget hearing, and an outline of the subjects. Page 1 of the Exhibit is general information about the division. Page 2 is an organizational chart.

There was discussion on the need for computers, and it was questioned that with all the money spent for providing computers, if the services received are worth the cost. Representative Bardanouve asked why other agencies can get their own computers for less cost. Mike Trevor explained that they are only looking at the hardware cost, which are decreasing day by day. He explained that with the mainframe cost of the administration, they provide the hardware, software, backup, and other important services (46;B;552).

Page 4 is the comparison of projected income and expenses for the biennium (47;A;01).

Pages 5,6, and 7 are information graphs. The Central Computer and Network Operations information is found on page 8 (47;A;107). Page 9 is the Subprogram 00074, and the budget issues are explained (47;A;209).

The budget modification request for two FTE to handle the workload increase to improve records management programs in the State is found on page 13 (47;A;506).

Brian Cockhill, Administrator of the Historical Society, testified in support of this budget modification found on page 13, and asked that it be considered (47;A;597).

GENERAL GOVERNMENT AND HIGHWAYS
February 5, 1985
Page 2

The budget modification for workload increases in computer usage and processing is found on pages 12 and 13 (47;B;01).

There was a short recess.

The Systems Development Subprogram 00078 is found on Page 15 along with the budget issues (47;B;460).

The budget modification requesting spending authority to contract for programming and systems services is found on page 18 (48;A;12).

Mike Trevor then went over page 20, which is the Subprogram 00075, for the Information Center. The budget needs are listed on this page and also page 21 (48;A;40).

The Subprogram 00073 for Resource Management/Administration is found on page 23, listed also are the budget needs (48;A;395).

The Telecommunications Subprogram 00200, is found on page 25. It lists the services provided and the accomplishments (48;A;590). Exhibit No. 2 is the Telecommunications Report for 1985.

Page 29 shows the total budget package for Telecommunications, it also lists the budget needs.

Chairman Quilici asked for a breakdown of the \$200,000 consulting fee.

Tony Herbert, Chief of the Telecommunications Bureau, explained the lease participation notes to the committee (48;B;465). The budget requests are listed on page 32.

ENVIRONMENTAL QUALITY COUNCIL (Executive Session)

Cliff explained the budget issues of rent and travel (49;A;150).

Senator Keating moved the 6.25 FTE with no vacancy savings, and the LFA budget with the adjustment to contracted services of \$5,477 in FY 1987, and the adjustment to travel of \$4,575 in FY 1986. The motion was seconded, and passed unanimously.

ADJOURN: There being no further business before the committee, the meeting was adjourned at 11:45 a.m.


JOE QUILICI, Chairman

DAILY ROLL CALL

General Government and Highways SUB COMMITTEE

49th LEGISLATIVE SESSION -- 1985

Date _____

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DEPARTMENT OF ADMINISTRATION
INFORMATION SERVICES DIVISION

Information for Budget Hearing on Tuesday, February 5, 1985

The attached packet of information contains material to be presented in the Information Services Division budget hearing on February 5th. The information is organized as follows:

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level budget needs	
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level budget needs	
Resource Management/Administration (subprogram 00073)	23
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level budget needs	
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DEPARTMENT OF ADMINISTRATION
INFORMATION SERVICES DIVISION
GENERAL INFORMATION

In May of 1984, the divisions of Computer Services and Communications were combined to form the Information Services Division. The new division is responsible for providing data processing and telecommunications services to the agencies of state government. The division also has the responsibility for planning and coordinating the appropriate use of data processing and telecommunications systems and technology by state agencies and in some instances, local government as well.

The organization chart on the following page shows the organizational structure and separation of functions within the division. This structure provides the basis for identifying the subprogram structure of the division budget and the separation of the two proprietary accounts, which currently provide the sole source of funding for the entire division.

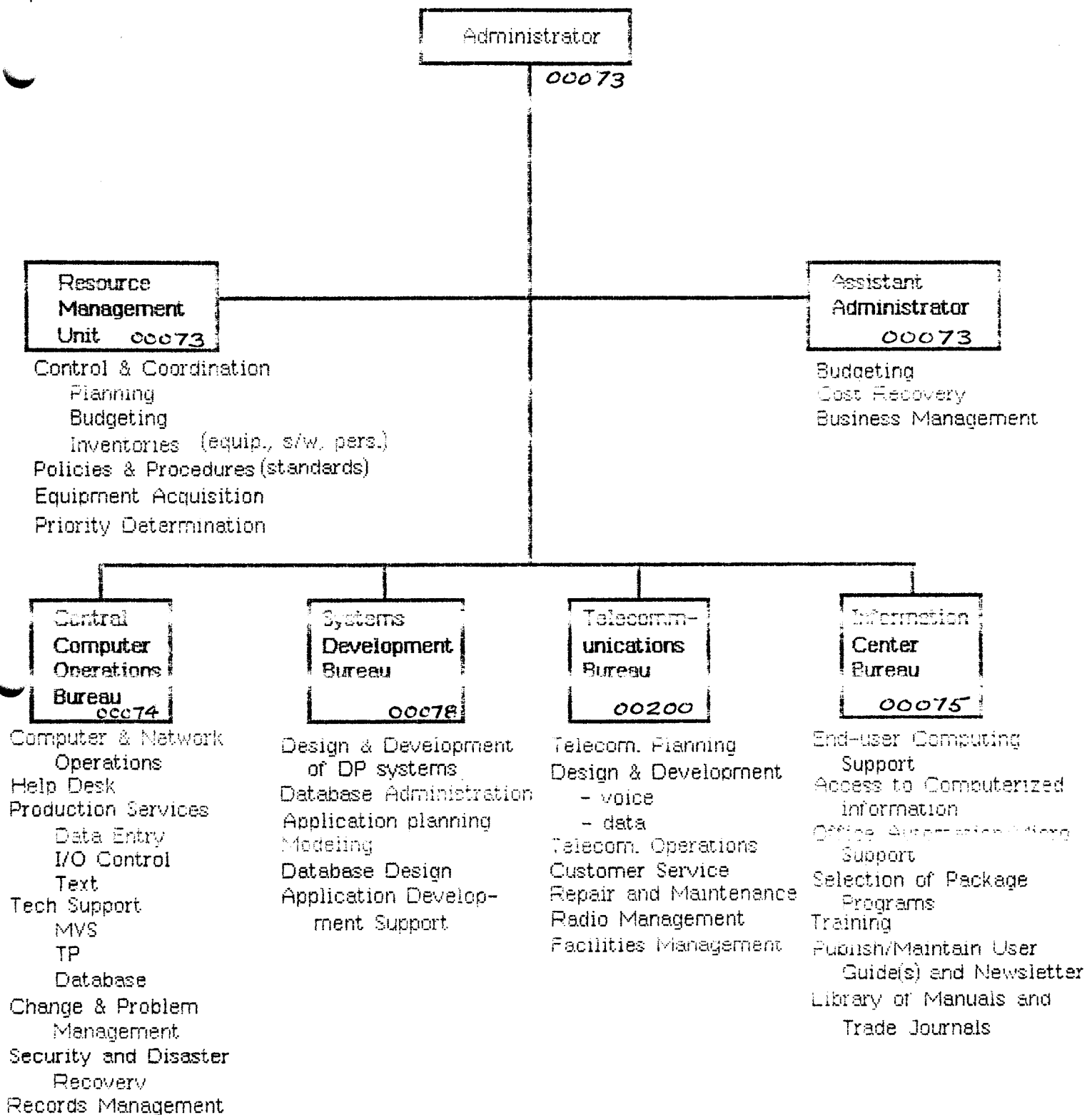
The computer services proprietary account provides the funding mechanism for the following subprograms:

Central Computer & Network Operations	- 00074
Systems Development	- 00078
Information Center	- 00075
Resource Management/Administration	- 00073

The telecommunications proprietary account provides the funding mechanism for the major subprogram:

Telecommunications	- 00200
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Each of the five subprograms listed above will be presented individually in order to establish the division's total budgetary need.



INFORMATION SERVICES DIVISION
ORGANIZATION CHART & FUNCTIONS
EFFECTIVE 5/28/84

DEPARTMENT OF ADMINISTRATION
INFORMATION SERVICES DIVISION

Justification of Computer Services Proprietary Account Subprograms
Total Budget (aggregate of 00074, 00078, 00075 and 00073)

Growth

The mainframe computer processing workload continues to grow at a compound rate of approximately 20% per year despite the fact that office automation and the use of microcomputers are well established in state government. The explosive interest in micros and office automation has created a better understanding of the productivity value of automation in general, which carries over into increased utilization of mainframe and data network services.

Mainframe usage is measured and billed to the agencies on the basis of "Machine Unit Hours" (MUH). The total MUH workload projection for the FY'86 - FY'87 biennium is 40% higher than the FY'84 - FY'85 biennium.

In 1983 the subcommittee on appropriations was presented with the projections that workload (i.e., MUH's) would increase 30% between the FY'82 - FY'83 biennium and the current FY'84 - FY'85 biennium. The increase in budget requested was only 13% between bienniums. We have stayed within our budget and actually processed a 43% increase in workload (Jan. - June, 1985 is estimated conservatively rather than actual).

The net effect has been a 43% increase in productivity for a 13% increase in cost!

Rates

The computer processing rate was reduced from \$29.88/MUH to \$25.72 on July 1, 1983. That change represented a 7.2% decrease in the rate that brings in approximately 84% of the income to the Computer Services Proprietary Account.

Planning

The budget request for the four subprogram areas that are funded through the Computer Services Proprietary Account is based on better planning for the coming biennium than ever before. The process utilized to prepare the "Statewide Information Systems Plan" provided a draft of each agencies' plans to ISD prior to the finalization of our budget request last August.

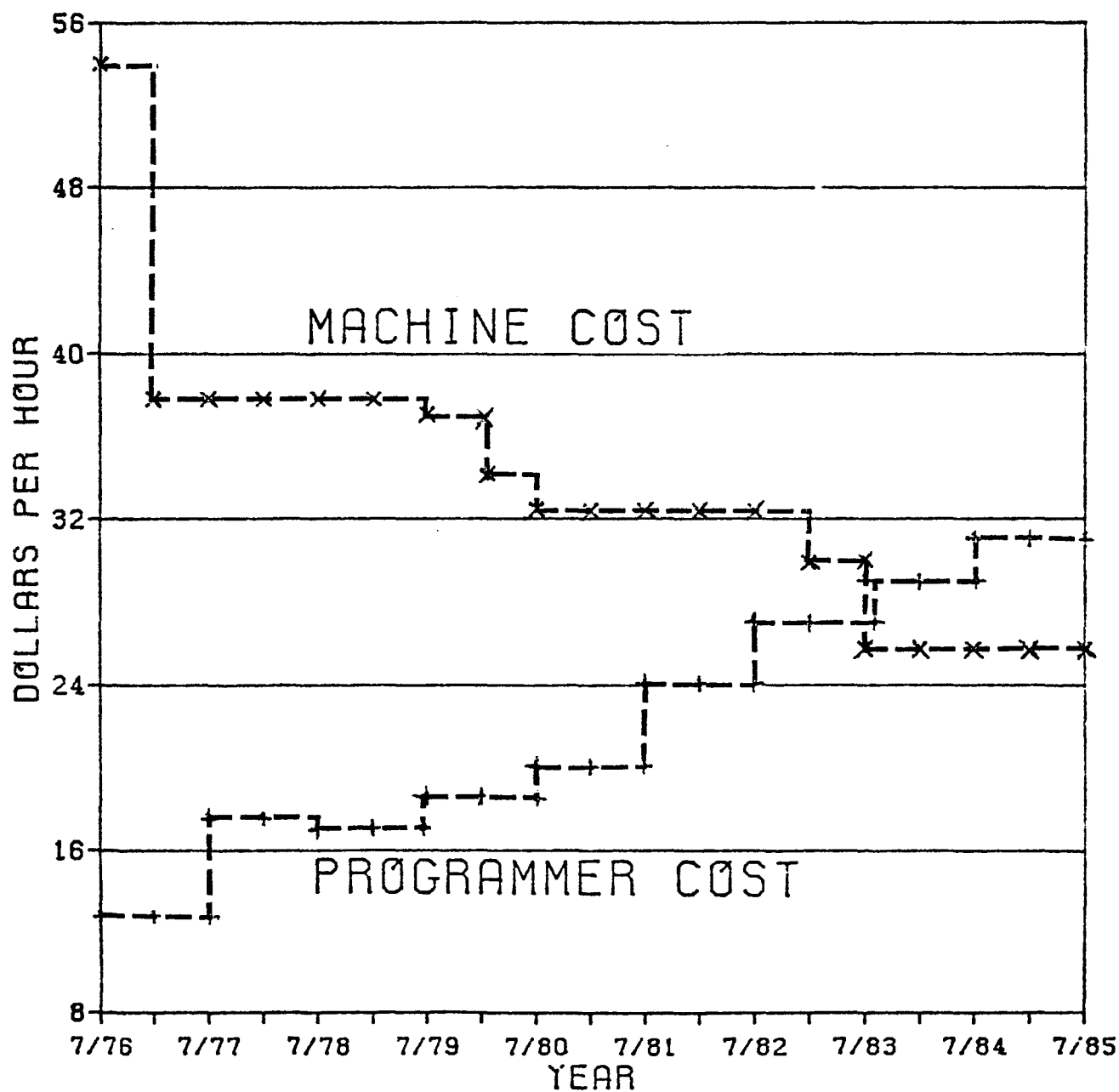
The budget prepared by this division for Computer Services reflects, with reasonable accuracy, the income (both budgeted and nonbudgeted by the agencies) to be realized during the coming biennium. The following table shows that the Computer Services portion of the total ISD budget (including modified requests) is substantiated by the summation of agencies' budgets for computer services (contracted services - expenditure ID's 2172 and 2175) and an adjustment for income that wasn't budgeted by the agencies as contracted services.

INFORMATION SERVICES DIVISION (ISD)
COMPUTER SERVICES PROPRIETARY ACCOUNT

Comparison of Projected Income and Expense
for FY'86 and FY'87 Biennium

	<u>FY'86</u>	<u>FY'87</u>
Computer Services Budgeted Expenditures (subprograms 00074, 00078, 00075 and 00073) current level & modified.	<u>\$7,477,854</u>	<u>7,472,076</u>
 Budgeted Income from the agencies (executive budget)	 \$7,231,160	 \$7,136,047
Other sources of funds for ISD that were not budgeted as contracted services:		
o General Fund (Records Mgt.)	\$ 44,193	\$ 44,210
o Equipment Pool	50,000	75,000
o University Data Link	70,000	100,000
o Dept. of Justice Data Lines	<u>150,000</u>	<u>159,460</u>
	<u>\$ 314,193</u>	<u>\$ 378,670</u>
 TOTAL COMPUTER SERVICES ACCOUNT INCOME	 <u>\$7,545,353</u>	 <u>\$7,514,717</u>

MACHINE COST VS. PROGRAMMER COST

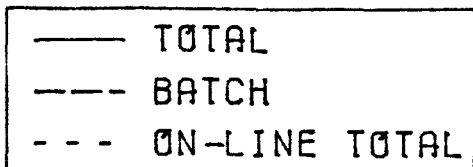
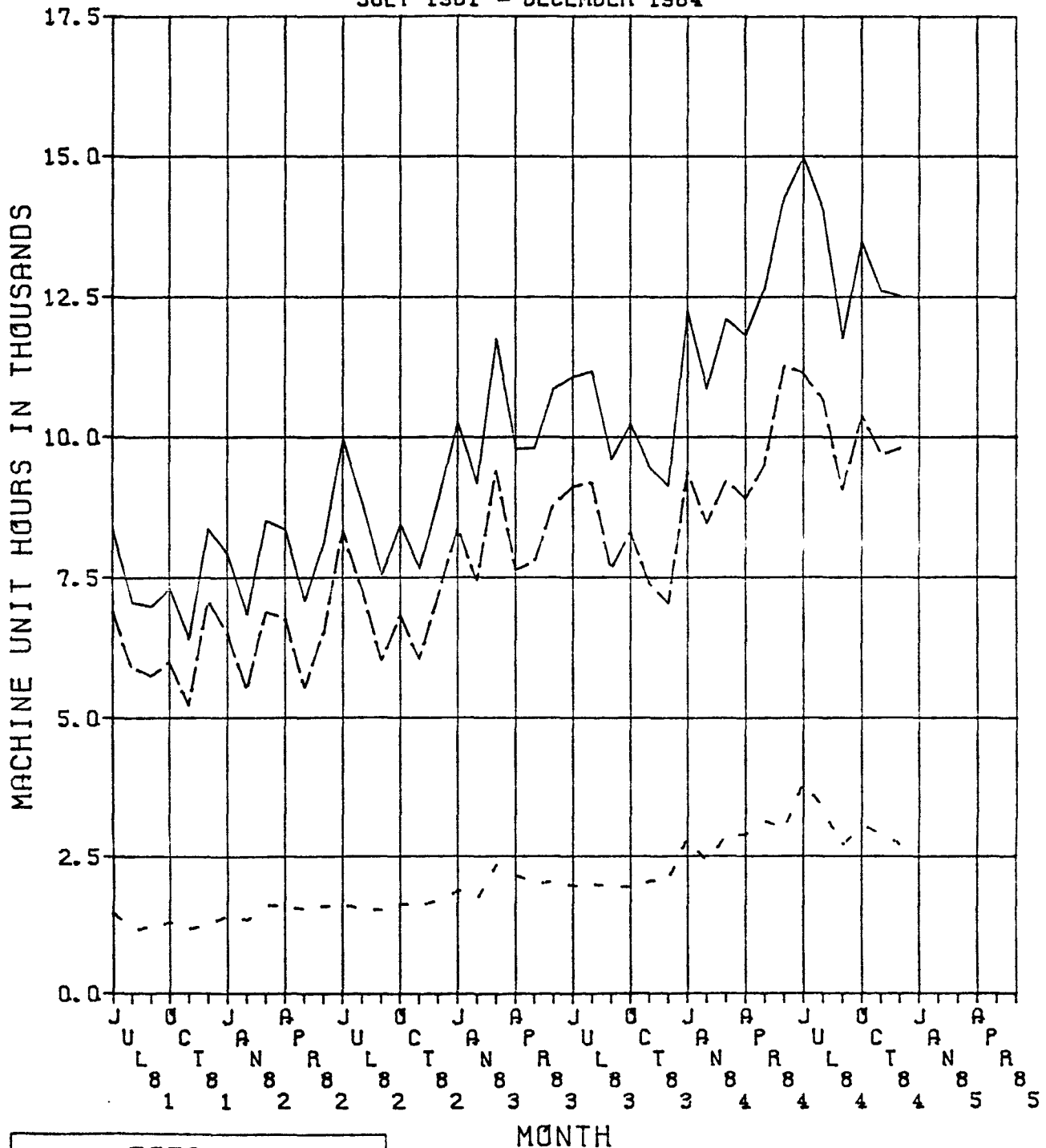


+	HOURLY PROGRAMMER COST
x	HOURLY MACHINE RATE

CENTRAL COMPUTER WORKLOAD

MACHINE UNIT HOURS

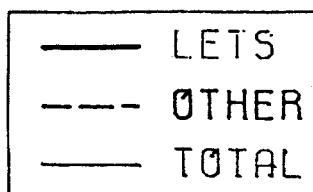
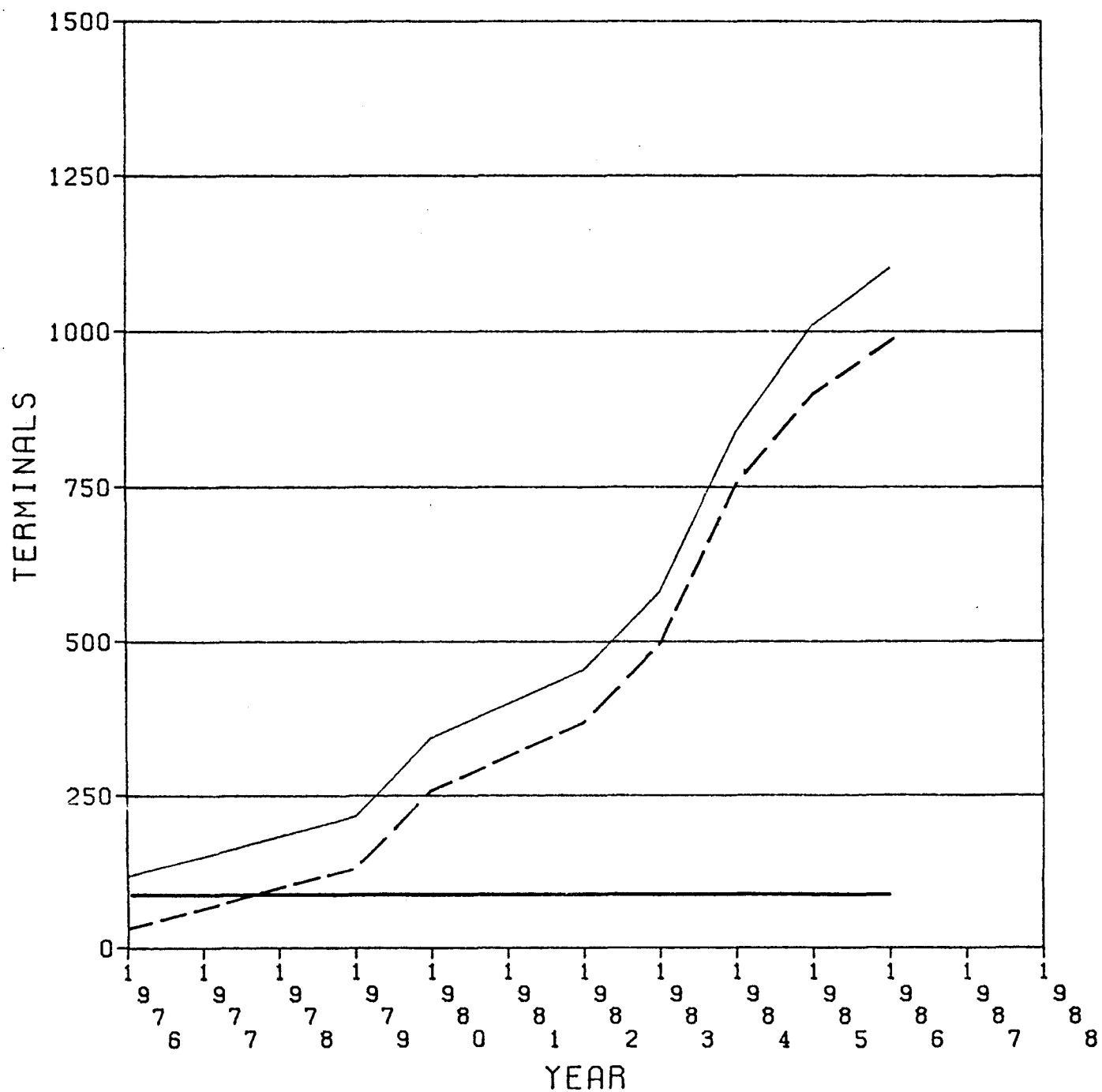
JULY 1981 - DECEMBER 1984



INFORMATION SERVICES DIVISION
DEPARTMENT OF ADMINISTRATION

DATA COMMUNICATIONS TERMINALS

INSTALLATIONS FROM 1976 - 1988



Subprogram 00074
Central Computer and Network Operations

Services Provided

- o Mainframe computer processing 24-hours a day, 7-days a week including: Batch Processing; Time Share Option (TSO); Transaction Processing (CICS); Remote Job Entry (RJE); Text Processing (ATMS); Legislative Bill Drafting (ALTER); and End-user Computing (Spreadsheets, etc.).
- o Network control and management for a data network with over 1000-terminals and numerous distributive processors.
- o Data entry and word processing including text transmission.
- o Problem resolution.
- o Technical support including: software specialist expertise in operating systems (MVS); distributive systems (IBM 8100's); database management systems (IDMS); data communication systems (VTAM, NCP, CICS, etc.).
- o Records Management including: microfilming; computer output microfilming (COM); records storage (paper documents and magnetic media); and records management coordination on a statewide basis.

Significance of Department of Justice (DOJ) Computer Project

A second mainframe was acquired in FY'85 to be utilized by the Department of Justice primarily for message switching. The conversion from the antiquated System-7 message switcher to the new system is on schedule to be operational by the end of FY'85. The second mainframe (an IBM 4381) will be moved to the National Guard Armory in FY'86.

There are several other benefits and ramifications related to this project.

1. Once the hardware is moved to the Armory, the State will have a viable disaster recovery capability in the event something would happen to the system in the Mitchell Building.
2. The project involves a consolidation of data networks which greatly enhances the opportunity for data communications from nearly every county seat in the state.
3. The mainframe in the Mitchell Building will provide backup for DOJ message switching.
4. All justice applications will be moved to the 4381 in the Armory which helps ISD in two ways:

- a.) provides better utilization and income for the system configured large enough to realistically provide disaster recovery for all critical state applications;
- b.) moves a substantial amount of work off of the main computer which relieves some of our capacity problems due to excessive growth. Placement of all DOJ applications on one system also enhances the availability of all information files accessed by the LENS system.

Analysis of Subprogram 00074, Central Computer and Network Operations Current Level Budget Needs

1. Personal Services - one FTE to be transferred to the Department of Justice.
2. Supplies and Materials (2200)

The LFA figure should be increased each year of the biennium to allow for growth as follows:

	<u>FY'86</u>	<u>FY'87</u>
Computer paper (2226)	\$ 32,056	\$ 70,540
Misc. DP supplies (2245) (including tapes, printer ribbons, plotter paper, etc.)	13,668	18,422
Microfilming supplies (2239)	<u>9,423</u>	<u>15,077</u>
	\$ 55,147	\$104,039

3. Communications (2300)

The LFA base was adjusted for inflation creating a surplus of \$8,450 in FY'86 and \$21,119 in FY'87.

4. Travel (2400)

The LFA figure, which was based solely on the FY'84 base, needs to be increased to accommodate in-state travel for distributive computer and data communications technical support and out-of-state for increased training for database technical support that was not part of the FY'84 base and training on new software products as follows:

	<u>FY'86</u>	<u>FY'87</u>
In-state travel	\$ 4,898	\$ 4,966
Out-of-state travel	<u>3,902</u>	<u>6,263</u>
	\$ 8,800	\$11,229

5. Rent (2500)

The LFA figure should be adjusted each year of the biennium as follows:

	<u>FY'86</u>	<u>FY'87</u>
Software needed for growth and improved services	\$ 65,000	\$ 62,500
Software inflation which exceeds standard inflation (i.e., actual software inflation is 16%)	30,000	88,445
LFA is too high on building rent (2527)	(10,237)	(9,483)
Apparent worksheet error	<u>(3,438)</u>	<u>(568)</u>
LFA should be increased:	\$ 81,793	\$140,884

6. Other Expenses (2800)

The LFA figure should be increased to cover registration and educational fees associated with the out-of-state travel needed in Technical Services as follows:

	<u>FY'86</u>	<u>FY'87</u>
Registration and Education fees	\$ 3,750	\$ 5,660

7. Inflation (9999)

The LFA did not apply the proper inflation for "Leased Line Service" which constitutes a major portion of our communications (2300) base. This has been discussed with Cliff Roessner with the understanding that it will be straightened out. A simple solution is to use the executive base and the executive inflation factor for communications.

8. Equipment (3106)

In fiscal '87 the LFA did not include \$38,612 in our base because we didn't have it recorded on the form properly. Cliff Roessner has indicated that he would recommend that it be included.

AGENCY:6101 DEPARTMENT OF ADMINISTRATION
PROGRAM:INFORMATION SERVICES DIVISION
CONTROL:00074 CENTRAL COMPUTER OPERATIONS

BUDGET COMPARISONS
LFA vs. OBPP
CURRENT LEVEL

BUD074CL 1-29-85

DESCRIPTION	FY 84	OBPP FY 86	LFA FY 86	DIFF. FY 86	OBPP FY 87	LFA FY 87	DIFF. FY 87
FTE	82.45	82.45	82.45		82.45	82.45	
1100 SALARIES	1,527,285	1,618,856	1,624,212	5,356	1,620,711	1,626,124	5,413
1400 EMPLOYEE BENEFITS	289,731	224,594	224,594	0	225,642	225,642	0
1500 HEALTH INSURANCE		94,800	94,800	0	94,800	94,800	0
1600 VACANCY SAVINGS		(77,530)	(75,032)	2,498	(77,646)	(75,073)	2,573
1800			6,707	6,707		6,739	6,739
TOTAL LEVEL	1,817,016	1,860,720	1,875,281	14,561	1,863,507	1,878,232	14,725
2100 CONTRACTED SERVICES	28,380	29,985	31,438	1,453	17,309	13,748	(3,561)
2200 SUPPLIES & MATERIALS	296,461	322,061	266,786	(55,275)	371,133	266,786	(104,347)
2300 COMMUNICATIONS	90,812	219,697	228,147	8,450	246,698	267,817	21,119
2400 TRAVEL	19,418	28,218	19,418	(8,800)	30,647	19,418	(11,229)
2500 RENT	587,584	822,060	740,267	(81,793)	939,211	798,327	(140,884)
2700 REPAIR & MAINTENANCE	409,190	466,139	466,154	15	527,005	526,870	(135)
2800 OTHER EXPENSES	192,716	138,168	134,418	(3,750)	65,290	59,630	(5,660)
2900 GOODS PURCH FOR RESAL	9,696	6,031	9,697	3,666	6,935	9,697	2,762
TOTAL LEVEL	1,634,257	2,032,359	1,896,325	(136,034)	2,204,228	1,962,293	(241,935)
9999 INFLATION		89,677	21,872	(67,805)	118,892	42,295	(76,597)
TOTAL W/INFLATION	1,634,257	2,122,036	1,918,197	(203,839)	2,323,120	2,004,588	(318,532)
3100 EQUIPMENT	1,035,174	1,123,977	1,123,977	0	671,331	632,719	(38,612)
3400 INTANGIBLE ASSETS				0			0
TOTAL LEVEL	1,035,174	1,123,977	1,123,977	0	671,331	632,719	(38,612)
4200 BUILDINGS	765			0			0
TOTAL PROGRAM	4,487,212	5,106,733	4,917,455	(189,278)	4,857,958	4,515,539	(342,419)
2% CUT		(102,135)		102,135	(97,159)		97,159
TOTAL PGM LESS CUT	4,487,212	5,004,598	4,917,455	(87,143)	4,760,799	4,515,539	(245,260)
06522 CENTR DATA PROCESSING	4,477,516	5,004,598	4,917,455	(87,143)	4,760,799	4,515,539	(245,260)
TOTAL PROGRAM	4,477,516	5,004,598	4,917,455	(87,143)	4,760,799	4,515,539	(245,260)

Subprogram 00074 - Central Computer and Network Operations
Modified Requests

1. Modified request for workload increases in computer usage and processing:

FY'86 \$681,756
FY'87 \$963,571
100% Proprietary fund (Computer Services)

This request breaks down as follows:

	<u>FY'86</u>	<u>FY'87</u>
A. Facility Modification		
60 Hz UPS Replacement due to poor reliability and difficult to maintain spare parts no longer available from manufacture.	\$ 85,000	\$ 0
B. Database software on disaster recovery system	170,000	6,000
C. Disk space expansion needed for growth (very conservative estimate)	50,000	50,000
D. Mainframe computer system replacement. IBM-3081 in December, 1985.		
	<u>FY'86</u>	<u>FY'87</u>
6 mo. @ \$53,925/mo.	\$323,500	
12 mo. @ \$53,925/mo.		\$647,100
Savings in current level from trading in the existing IBM-3033	(304,410)	(152,206)
	\$ 19,190	\$494,894
E. Equipment Pool		
Establish an equipment pool with micros and terminals that can be rented out to agencies. 15-20 units per year.	50,000	75,000
F. Teleprocessing Equipment to tie together University System computers and provide a better interface with the central mainframe	70,000	100,000
G. Productivity Software for the central mainframe software products are available to make programmers and other professionals more productive	208,000	208,000

H. One FTE in Technical
Services Section is needed
to support the complex system
to provide disaster recovery
and routine backup of the
Justice system

29,666

29,666

Total Computer Services
Modified Request

\$681,756

\$963,571

2. Modified Request for workload increase to improve records management programs in the State. Requesting two FTE's funded by the General Fund to provide much greater involvement with the agencies to establish improved records management practices throughout State government and avoid the loss of vital records.

FY'86 2-FTE's @ \$44,193
FY'87 2-FTE's @ \$44,210
100% General Fund

AGENCY:6101 DEPARTMENT OF ADMINISTRATION
PROGRAM:07 INFORMATION SERVICES DIVISION
CONTROL:74001 WORKLOAD INCREASE

BUDGET COMPARISONS
LFA vs. OBPP
MODIFIED LEVEL

BUD74001 1-29-85

DESCRIPTION	OBPP FY 86	LFA FY 86	DIFF. FY 86	OBPP FY 87	LFA FY 87	DIFF. FY 87
FTE	3.00			3.00		
1100 SALARIES	60,774		(60,774)	60,774		(60,774)
1400 EMPLOYEE BENEFITS	8,791		(8,791)	8,820		(8,820)
1500 HEALTH INSURANCE	3,600		(3,600)	3,600		(3,600)
1600 VACANCY SAVINGS	(2,926)		2,926	(2,927)		2,927
TOTAL LEVEL	70,239	0	(70,239)	70,267	0	(70,267)
2200 SUPPLIES & MATERIALS	2,500		(2,500)	2,500		(2,500)
2400 TRAVEL	1,000		(1,000)	1,000		(1,000)
2500 RENT	200,000		(200,000)	200,000		(200,000)
TOTAL LEVEL	203,500	0	(203,500)	203,500	0	(203,500)
9999 INFLATION	8,120		(8,120)	8,120		(8,120)
TOTAL W/INFLATION	211,620	0	(211,620)	211,620	0	(211,620)
3100 EQUIPMENT	444,090		(444,090)	725,894		(725,894)
TOTAL PROGRAM	725,949	0	(725,949)	1,007,781	0	(1,007,781)
2% CUT	(14,519)		14,519	(20,156)		20,156
TOTAL PGM LESS CUT	711,430	0	(711,430)	987,625	0	(987,625)
01100 GENERAL FUND	43,309		(43,309)	43,325		(43,325)
06522 CENTRAL DATA PROCESSI	668,121		(668,121)	944,300		(944,300)
TOTAL PROGRAM	711,430	0	(711,430)	987,625	0	(987,625)

Subprogram 00078
Systems Development

Services Provided

The Systems Development Bureau is responsible for planning, designing, developing and supporting application systems (computer programs) for State agencies.

An hourly rate is charged for the services provided by the Project Development Section. The Database Design and Administration Section provides services at no charge. Their 5-FTE section is funded through the computer rate.

Projected Workload

Historically, the workload for the Systems Development Bureau exceeds the resources available to do the work.

Development or ongoing support (maintenance) is anticipated from the departments of: Administration; Agriculture; Revenue; State Lands; Labor and Industry; Health; Fish, Wildlife and Parks; the State Auditor's Office; Secretary of State; and the Public Service Commission.

In addition, the following agencies are dependent on database support and assistance: Departments of Highways; Livestock; Institutions; Social and Rehabilitation Services; Justice; Natural Resources and Conservation; and the Legislative Council.

Analysis of Subprogram 00078, Systems Development current level budget needs

1. Communications (2300)

The LFA figure should be increased each year of the biennium to cover advertisement for position vacancies as follows: \$960 in FY'86 and \$1,732 in FY'87.

2. Travel (2400)

The LFA figures which are based on the FY'84 base, only need to be increased to reflect the additional needs of the Database group, which was a separate subprogram in FY'84 and the increased needs for training in general as follows: \$7,978 in FY'86 and \$8,017 in FY'87.

3. Repair and Maintenance (2700)

The LFA amounts should be increased by \$478 in FY'86 and \$1,151 in FY'87 to equal the executive figure which is based on actual maintenance contract costs for existing equipment.

4. Other Expenses (2800)

LFA figures should be increased to cover educational costs and registration fees associated with the out-of-state travel mentioned above. Increase the LFA by \$10,498 in FY'86 and \$10,498 in FY'87.

5. Equipment (3100)

An IBM PC is needed in the Database Section in order to implement and provide support for micro to mainframe linkages. \$12,096 is needed in FY'86. \$5,206 is needed in FY'87 to add two terminals to the Project Development Section in order to improve productivity.

6. Intangible Assets (3400)

\$1,000 is needed in FY'86 and \$500 in FY'87 for software on the LISA microcomputer.

AGENCY:6101 DEPARTMENT OF ADMINISTRATION
PROGRAM:INFORMATION SERVICES DIVISION
CONTROL:00078 SYSTEMS DEVELOPMENT

BUDGET COMPARISONS
LFA vs. OBPP
CURRENT LEVEL

BUD078CL 1-29-85

DESCRIPTION	FY 84	OBPP FY 86	LFA FY 86	DIFF. FY 86	OBPP FY 87	LFA FY 87	DIFF. FY 87
FTE	23.00	23.00	23.00		23.00	23.00	
1100 SALARIES	563,934	631,933	631,996	63	632,890	632,953	63
1400 EMPLOYEE BENEFITS	105,518	93,601	93,601	0	94,061	94,061	0
1500 HEALTH INSURANCE		27,600	27,600	0	27,600	27,600	0
1600 VACANCY SAVINGS		(30,125)	(29,798)	327	(30,182)	(29,817)	365
1800			9	9		9	9
TOTAL LEVEL	669,452	723,009	723,408	399	724,369	724,806	437
2100 CONTRACTED SERVICES	21,573	2,726	2,726	0	2,737	2,726	(11)
2200 SUPPLIES & MATERIALS	12,670	16,061	16,061	0	16,111	16,061	(50)
2300 COMMUNICATIONS	6,378	11,168	10,208	(960)	11,940	10,208	(1,732)
2400 TRAVEL	9,617	17,595	9,617	(7,978)	17,634	9,617	(8,017)
2500 RENT	22,727	13,710	18,035	4,325	13,847	18,035	4,188
2700 REPAIR & MAINTENANCE	2,953	7,518	7,040	(478)	8,191	7,040	(1,151)
2800 OTHER EXPENSES	5,069	15,097	4,599	(10,498)	15,097	4,599	(10,498)
2900 GOODS PURCH FOR RESALE				0			0
TOTAL LEVEL	80,987	83,875	68,286	(15,589)	85,557	68,286	(17,271)
9999 INFLATION		3,347	3,343	(4)	4,305	6,665	2,360
TOTAL W/INFLATION	80,987	87,222	71,629	(15,593)	89,862	74,951	(14,911)
3100 EQUIPMENT	1,206	12,096		(12,096)	5,206		(5,206)
3400 INTANGIBLE ASSETS		1,000		(1,000)	500		(500)
TOTAL LEVEL	1,206	13,096	0	(13,096)	5,706	0	(5,706)
4200 BUILDINGS				0			0
TOTAL PROGRAM	751,645	823,327	795,037	(28,290)	819,937	799,757	(20,180)
2% CUT		(16,467)		16,467	(16,399)		16,399
TOTAL PGM LESS CUT	751,645	806,860	795,037	(11,823)	803,538	799,757	(3,781)
06522 CENTRAL DATA PROCESS.	751,645	806,860	795,037	(11,823)	803,538	799,757	(3,781)
TOTAL PROGRAM	751,645	806,860	795,037	(11,823)	803,538	799,757	(3,781)

Subprogram 00078, Systems Development
Modified Request

Spending authority to contract for programming and systems services is requested to augment the bureau's development staff. This alternative is more efficient than adding FTE's to accommodate an increasing workload.

FY'86	\$103,834
FY'87	\$109,025
100% Proprietary Fund (Computer Services)	

AGENCY:6101 DEPARTMENT OF ADMINISTRATION
PROGRAM:07 INFORMATION SERVICES DIVISION
CONTROL:78001 CONTRACT PROGRAMMING

BUDGET COMPARISONS
LFA vs. OBPP
MODIFIED LEVEL

BUD78001 1-22-85

DESCRIPTION	OBPP FY 86	LFA FY 86	DIFF. FY 86	OBPP FY 87	LFA FY 87	DIFF. FY 87
FTE						
2100 CONTRACTED SERVICES	99,840		(99,840)	104,832		(104,832)
TOTAL LEVEL	99,840	0	(99,840)	104,832	0	(104,832)
9999 INFLATION	3,994		(3,994)	4,193		(4,193)
TOTAL W/INFLATION	103,834	0	(103,834)	109,025	0	(109,025)
TOTAL PROGRAM	103,834	0	(103,834)	109,025	0	(109,025)
2% CUT	(2,077)		2,077	(2,181)		2,181
TOTAL PGM LESS CUT	101,757	0	(101,757)	106,845	0	(106,845)
06522 CENTRAL DATA PROCESSI	101,757		(101,757)	106,845		(106,845)
TOTAL PROGRAM	101,757	0	(101,757)	106,845	0	(106,845)

Subprogram 00075
Information Center

Services Provided

- o User assistance (when you have a problem or just a question and you don't know who to ask, call the Information Center. They will either help you directly or direct you to the right place.)
- o Training for users of products on the central mainframe and for users of microcomputers.
- o Technical support for microcomputers and word processing systems.
- o Consulting on office automation needs assessments, system selection and implementation planning.

	<u>FY'83</u>	<u>FY'84</u>	<u>FY'85</u>
Number of classes taught	24	71	100-120
Number of students	349	771	1000-1200

Analysis of Subprogram 00075, Information Center Current Level Budget Needs

1. Supplies and Materials (2200)

The FY'84 base should be increased by \$19,735 which makes it \$20,993. This problem, resulting from reorganization, was discussed with Cliff Roessner and he agrees. The FY'84 base should then be increased by \$9,265 in FY'86 and \$9,351 in FY'87 for increased video tape educational courses making the total for each year equal to the executive recommendation.

2. Travel (2400)

The FY'84 base doesn't reflect the total staffing of the Information Center. The LFA figures should be increased by \$2,730 in FY'86 and \$2,730 in FY'87 to allow for five trips per year for training of our trainers (total staff of Information Center is 9).

3. Rent (2500)

LFA figure is apparently based on the wrong square footage. The right figure is 2,023 square feet times \$2.97 = \$6,008 for FY'86 and FY'87.

4. Repair and Maintenance (2700)

The LFA figures should be increased by \$2,804 in FY'86 and \$5,688 in FY'87 to cover equipment maintenance that was not reflected in the current level base because it has only recently come off of warranty.

5. Other Expenses (2800)

The LFA figure should be increased by \$2,430 in FY'86 and \$2,430 in FY'87 to cover educational costs and registration fees associated with the out-of-state travel mentioned above.

6. Inflation (9999)

Inflation should be adjusted to reflect any increases granted in the above items.

7. Equipment (3100)

Authority is needed to purchase the following equipment for the Information Center.

<u>Training</u>	<u>FY'86</u>	<u>FY'87</u>
Training room furniture, enhance. etc.	\$ 4,510	\$ 2,020
Presentation equipment	9,460	0
Training PC's (computer based training)	4,000	18,600
<u>Micro Support</u>		
Expand existing micros	7,000	10,000
Multi-user micro	30,000	0
Advanced PC		10,000
"Personal" PC's		
(portable, MacIntosh, etc.)	<u>11,000</u>	<u>8,000</u>
	\$65,970	\$48,620

8. Intangible Assets (3400)

Software must be purchased for evaluation. \$15,000 is needed in FY'86 and \$17,000 in FY'87.

AGENCY:6101 DEPARTMENT OF ADMINISTRATION
PROGRAM:07 INFORMATION SERVICES DIVISION
CONTROL:00075 INFORMATION CENTER

BUDGET COMPARISONS
LFA vs. OBPP
CURRENT LEVEL

BUD075CL 1-29-85

DESCRIPTION	FY 84	OBPP FY 86	LFA FY 86	DIFF. FY 86	OBPP FY 87	LFA FY 87	DIFF. FY 87
FTE	9.00	9.00	9.00		9.00	9.00	
1100 SALARIES	139,911	207,360	207,360	0	207,881	207,881	0
1400 EMPLOYEE BENEFITS	29,810	30,724	30,724	0	30,902	30,902	0
1500 HEALTH INSURANCE		10,800	10,800	0	10,800	10,800	0
1600 VACANCY SAVINGS		(9,955)	(9,923)	32	(9,983)	(9,930)	53
1800				0			0
TOTAL LEVEL	169,721	238,929	238,961	32	239,600	239,653	53
2100 CONTRACTED SERVICES	323	30,435	30,412	(23)	25,440	25,415	(25)
2200 SUPPLIES & MATERIALS	1,258	30,258	1,258	(29,000)	30,344	1,258	(29,086)
2300 COMMUNICATIONS		5,448	6,077	629	5,448	6,515	1,067
2400 TRAVEL	2,503	5,233	2,503	(2,730)	5,233	2,503	(2,730)
2500 RENT	9,506	6,008	3,240	(2,768)	6,069	3,240	(2,829)
2700 REPAIR & MAINTENANCE	2,004	4,808	2,004	(2,804)	7,692	2,004	(5,688)
2800 OTHER EXPENSES	2,298	4,728	2,298	(2,430)	4,728	2,298	(2,430)
2900 GOODS PURCH FOR RESALE		25,000	25,000	0	25,000	25,000	0
TOTAL LEVEL	17,892	111,918	72,792	(39,126)	109,954	68,233	(41,721)
9999 INFLATION		4,554	405	(4,149)	4,856	903	(3,953)
TOTAL W/INFLATION	17,892	116,472	73,197	(43,275)	114,810	69,136	(45,674)
3100 EQUIPMENT		65,970	0	(65,970)	48,620	0	(48,620)
3400 INTANGIBLE ASSETS		15,000		(15,000)	17,000		(17,000)
TOTAL LEVEL	0	80,970	0	(80,970)	65,620	0	(65,620)
4200 BUILDINGS				0			0
TOTAL PROGRAM	187,613	436,371	312,158	(124,213)	420,030	308,789	(111,241)
2% CUT		(8,727)		8,727	(8,401)		8,401
TOTAL PGM LESS CUT	187,613	427,644	312,158	(115,486)	411,629	308,789	(102,840)
06522 CENTR DATA PROCESSING	187,613	427,644	312,158	(115,486)	411,629	308,789	(102,840)
TOTAL PROGRAM	187,613	427,644	312,158	(115,486)	411,629	308,789	(102,840)

Subprogram 00073
Resource Management/Administration

Services Provided

- o Administration of the Information Services Division.
- o Control, coordination and planning for statewide data processing and information services. Authority transferred from the Governor's Office to the Department of Administration in 1983. Ref: 2-17-501, MCA.

Note: Approximately \$25,000,000 spent by State agencies each year on data processing. Ref: Statewide Information Systems Plan, Volume I, page 45.

Analysis of Subprogram 00073, Resource Management/Administration Current Level Budget Needs

1. Supplies and Materials (2200)

The LFA figure should be increased by \$4,840 in FY'87 to provide for the preparation of the Statewide Information Systems Plan which needs to be completed every two years.

2. Travel (2400)

The LFA figures need to be increased by \$2,562 in FY'86 and \$2,562 in FY'87 to allow for participation in national associations such as NASIS and GUIDE and to provide training for administrative staff.

3. Other Expenses (2800)

The LFA figures need to be increased by \$3,297 in FY'86 and \$3,297 in FY'87 in order to pay for memberships in national and local (Montana Data Processing Association) associations and provide for educational fees associated with the out-of-state travel mentioned above.

AGENCY:6101 DEPARTMENT OF ADMINISTRATION
PROGRAM:07 INFORMATION SERVICES DIVISION
CONTROL:00073 RESOURCE MGT/ADMIN

BUDGET COMPARISONS
LFA vs. OBPP
CURRENT LEVEL

BUD073CL 1-31-85

DESCRIPTION	FY 84	OBPP FY 86	LFA FY 86	DIFF. FY 86	OBPP FY 87	LFA FY 87	DIFF. FY 87
FTE	7.00	7.00	7.00		7.00	7.00	
1100 SALARIES	146,491	179,595	179,633	38	179,633	179,671	38
1400 EMPLOYEE BENEFITS	26,700	26,231	26,231	0	26,456	26,456	0
1500 HEALTH INSURANCE		8,400	8,400	0	8,400	8,400	0
1600 VACANCY SAVINGS		(8,569)	(8,463)	106	(8,579)	(8,472)	107
1800			5	5		5	5
TOTAL LEVEL	173,191	205,657	205,806	149	205,910	206,060	150
2100 CONTRACTED SERVICES	18,966	37,097	37,497	400	10,800	10,800	0
2200 SUPPLIES & MATERIALS	6,239	6,078	6,238	160	11,078	6,238	(4,840)
2300 COMMUNICATIONS	27,860	6,357	5,857	(500)	6,357	5,857	(500)
2400 TRAVEL	2,722	5,284	2,722	(2,562)	5,284	2,722	(2,562)
2500 RENT	7,620	6,730	7,620	890	6,798	7,620	822
2700 REPAIR & MAINTENANCE	278	643	643	0	677	643	(34)
2800 OTHER EXPENSES	4,210	6,925	3,628	(3,297)	6,925	3,628	(3,297)
2900 GOODS PURCH FOR RESALE				0			0
TOTAL LEVEL	67,895	69,114	64,205	(4,909)	47,919	37,508	(10,411)
9999 INFLATION		1,869	984	(885)	2,516	2,238	(278)
TOTAL W/INFLATION	67,895	70,983	65,189	(5,794)	50,435	39,746	(10,689)
3100 EQUIPMENT	1,748	5,000	5,000	0	1,000	1,000	0
3400 INTANGIBLE ASSETS				0			0
TOTAL LEVEL	1,748	5,000	5,000	0	1,000	1,000	0
4200 BUILDINGS	1,225			0			0
TOTAL PROGRAM	244,059	281,640	275,995	(5,645)	257,345	246,806	(10,539)
2% CUT		(5,633)		5,633	(5,147)		5,147
TOTAL PGM LESS CUT	244,059	276,007	275,995	(12)	252,198	246,806	(5,392)
06522 DATA PROCESSING	244,059	276,007	275,995	(12)	252,198	246,806	(5,392)
TOTAL PROGRAM	244,059	276,007	275,995	(12)	252,198	246,806	(5,392)

Subprogram 00200
Telecommunications

Services Provided

- o Operation of the State Telephone System including: switches (PBX's); management system; local networks; equipment maintenance; and a variety of transmission links (i.e., DDD, WATTS and dedicated lines).
- o Design and development of telecommunication systems including: local network configurations; switches; transmission links for telephone and data transmission, radio base stations and repeaters.
- o Technical service and support for data transmission facilities.
- o Radio frequency coordination and assignment including statewide mutual aid frequencies.
- o Planning and coordination of statewide telecommunications in general, including: public safety communications systems; improved network services; and assistance for local governments.

Accomplishments

- o The State Telephone Network (STN) involving the installation of state-owned PBX's and 12,000 telephones in state offices became operational. This project has already saved the state approximately \$736,000 in 1984.
- o The State Telephone System (STN) increased in cost by more than 60% during 1983 and 1984. In order to counteract these increases, the state reconfigured the STN in 1983 to minimize the impact of the increases on state agencies.
- o A strategy for addressing the long-term transmission needs of the state has been formulated in conjunction with the recently established Telecommunications Policy Advisory Council. This strategy will produce a blueprint for addressing our transmission needs in time for the 1987 Legislative Session when implementation plans will be presented.
- o The Telecommunications Bureau has been given specific responsibility for management of the State's data transmission facilities. This change greatly enhances our ability to assure maximum cost effectiveness of data transmission services.
- o Plans are in place to complete the conversion of low-band radios to high-band for all state agencies. Our challenge for the coming biennium will be to assist local government with their radio conversion needs since only about 60% of them are converted to high-band.

**TELEPHONE SYSTEMS COST SAVINGS
"BIG FOUR" REPLACEMENT PROJECT**

<u>LOCATION</u>	<u>ACTUAL 1984</u>	<u>PROJECTED NEXT 2 YRS</u>	<u>PROJECTED YRS 4-10</u>	<u>TOTAL</u>
Eastern Montana College	(\$1,260)	(\$16,640)	\$ 459,860	\$ 441,960
Montana State University	85,590	102,720	2,339,280	2,525,590
University of Montana	112,920	205,910	2,436,950	2,755,780
Missoula Forester	(340)	(1,740)	43,290	41,210
State Capitol Complex	<u>540,920</u>	<u>1,165,460</u>	<u>11,342,810</u>	<u>13,049,190</u>
TOTAL PROJECT	\$735,830	\$1,455,710	\$16,622,190	\$18,813,730

ASSUMPTIONS:

- 1) New system maintenance charges were inflated 10% annually.
- 2) Replaced Centrex equipment costs were increased 10% annually.
- 3) Bell access charges were increased 15% annually.
- 4) Agency equipment payments are reduced to maintenance and access only in the 10th year.

MONTANA

STN
TIE LINE

SL-1 NODE
SL-1 MAIN PBX
CONVENTIONAL

INTERMACHINE TIE LINES
ACCESS TIE LINES

TIE LINE

INTERMACHINE TIE LINES
ACCESS TIE LINES

SL-1 NODE
SL-1 MAIN PBX
CONVENTIONAL
MAIN PBX

TELEPHONE NETWORK

● COMPUTER CENTER

CONCENTRATOR

----- ESD 8100 NET

DATA NETWORK

Overview of Total Budget Package for Telecommunications, Subprogram 00200

Telecommunications is funded 100% from the Telecommunications Proprietary Account which is managed separately from the Computer Services Proprietary Account by the Information Services Division.

The preliminary budget work for Telecommunications was done prior to reorganization in late May of 1984 and prior to the establishment of the Telecommunications Advisory Council in August. Since new management is now in place, and a strategic direction resolved, we reviewed the original budget requests (i.e., current level and modified) very carefully and made significant changes to support our firm directional commitment.

The LFA report identified an issue involving \$48,000 budgeted each year for maintenance of a local area network - we agree that these figures are unsupported. The LFA report also questioned our intent to utilize \$50,000 in FY'86 for consulting work. Our current level budget has been reconfigured to provide enough savings to allow consideration of a new requirement to hire a consultant to assist the state with the completion of the long-term transmission project prior to the 1987 Legislative Session. The projected consulting fee is \$200,000 over the biennium. Current level savings can provide most of this as follows:

	<u>FY'86</u>	<u>FY'87</u>
Contracted Services (2100)	\$50,000	\$ 25,000
Communications (2300)	<u>48,000</u>	<u>48,000</u>
	\$98,000	\$ 73,000
 Total amount for biennium:		 \$171,000

The remaining \$29,000 is requested as part of our original modified request that is now reworked to incorporate this need and scaled down slightly at the bottom line.

Analysis of Subprogram 00200, Telecommunications Current Level Budget Needs

1. Contracted Services (2100)

The LFA figures should be increased as follows:

	<u>FY'86</u>	<u>FY'87</u>
Consultant for long-term transmission project	\$ 98,000	\$ 73,000
Maintenance of frequency coordination database files	<u>6,400</u>	<u>6,400</u>
	\$104,400	\$ 79,400

2. Travel (2400)

The LFA figures which reflect only the FY'84 base need to be increased by \$3,939 in FY'86 and \$3,939 in FY'87 in order to accommodate our real

training needs. Note: In FY'84, training and out-of-state travel were limited due to the criticality of the cut-over of the new telephone system.

3. Other Expenses (2800)

The LFA figures need to be increased by \$3,657 in FY'86 and \$3,657 in FY'87 to cover educational costs and registration fees associated with out-of-state travel mentioned above.

AGENCY:6101 DEPARTMENT OF ADMINISTRATION
PROGRAM:07 INFORMATION SERVICES DIVISION
CONTROL:00200 TELECOMMUNICATIONS

BUDGET COMPARISONS
LFA vs. OBPP
CURRENT LEVEL

BUD07200 1-29-85

DESCRIPTION	FY 84	OBPP FY 86	LFA FY 86	DIFF. FY 86	OBPP FY 87	LFA FY 87	DIFF. FY 87
FTE		15.39	15.39		15.39	15.39	
1100 SALARIES	303,882	372,516	372,624	108	372,902	373,010	108
1400 EMPLOYEE BENEFITS	56,919	53,969	53,969	0	54,210	54,210	0
1500 HEALTH INSURANCE		18,000	18,000	0	18,000	18,000	0
1600 VACANCY SAVINGS		(17,779)	(17,677)	102	(17,864)	(17,687)	177
1800			457	457		459	459
TOTAL LEVEL	360,801	426,706	427,373	667	427,248	427,992	744
2100 CONTRACTED SERVICES	37,803	146,446	41,677	(104,769)	118,448	38,677	(79,771)
2200 SUPPLIES & MATERIALS	12,073	12,073	12,073	0	12,073	12,073	0
2300 COMMUNICATIONS	3,440,442	3,525,442	3,525,442	0	3,500,442	3,525,442	25,000
2400 TRAVEL	6,299	10,238	6,299	(3,939)	10,238	6,299	(3,939)
2500 RENT	19,270	19,793	19,270	(523)	19,942	19,270	(672)
2700 REPAIR & MAINTENANCE	1,044	815	815	0	815	815	0
2800 OTHER EXPENSES	2,425	6,082	2,425	(3,657)	6,082	2,425	(3,657)
TOTAL LEVEL	3,519,356	3,720,889	3,608,001	(112,888)	3,668,040	3,605,001	(63,039)
9999 INFLATION		427,838	408,837	(19,001)	668,869	736,902	68,033
TOTAL W/INFLATION	3,519,356	4,148,727	4,016,838	(131,889)	4,336,909	4,341,903	4,994
3100 EQUIPMENT	6,212			0			0
TOTAL 1000/2000/3000	3,886,369	4,575,433	4,444,211	(131,222)	4,764,157	4,769,895	5,738
2% CUT		(91,509)		91,509	(95,283)		95,283
TOTAL LESS CUT	3,886,369	4,483,924	4,444,211	(39,713)	4,668,874	4,769,895	101,021
9500 LEASE PARTICIPATION NOTES		1,789,736	1,789,736	0	1,797,236	1,797,236	0
TOTAL PROGRAM	3,886,369	6,273,660	6,233,947	(39,713)	6,466,110	6,567,131	101,021
06526 COMMUNICATIONS	3,886,369	4,483,924	4,444,211	(39,713)	4,668,874	4,769,895	101,021
06544 LEASE PARTICIPATION CERTIF		1,789,736	1,789,736		1,797,236	1,797,236	
TOTAL PROGRAM	3,886,369	6,273,660	6,233,947	(39,713)	6,466,110	6,567,131	101,021

Subprogram 00200, Telecommunications
Modified Request

1. Personal Services

Our original modified request approved by OBPP was for four FTE's. We have reduced the request to 3-FTE's, \$68,186 in FY'86 and \$68,225 in FY'87. Funding is 100% Proprietary (Telecommunications).

The three FTE's are needed to support an increasing workload. They will be utilized as follows:

- a.) Telecommunications Analyst - previously approved by the Legislative Finance Committee and in our FY'85 budget. Used as key project manager in major projects.
- b.) Radio Engineer - needed to improve public safety communications between state and local governments. This position will be used to assist locals with their high-band conversion needs.
- c.) Secretary - needed to support increased staff and to assist Bureau Chief with administration of contracts. Existing staff is dedicated full-time to word processing.

2. Contracted Services (2100)

An additional \$29,000 is needed to establish a biennium appropriation for \$200,000 to hire a consultant to assist us with the development of a long-term transmission proposal. Funding is 100% Proprietary (Telecommunications).

3. Communications (2300)

\$1,275,012 is requested in FY'86 and FY'87. This amount represents what the Universities and other agencies are (were) paying directly to vendors. This request is for pass-through spending authority only for the Telecommunications Proprietary Account. The request breaks down as follows:

a.) University local service & equip.	\$ 468,180
b.) University long-distance	228,420
c.) University one-time charges	46,170
d.) 800 numbers statewide	103,930
e.) Dedicated network services	138,312
f.) Maintenance agreements (Centel)	290,000
	<u>\$1,275,012</u>

Items a, b and c have already been approved by the Legislative Finance Committee and are in our FY'85 budget.

AGENCY:6101 DEPARTMENT OF ADMINISTRATION
PROGRAM:07 INFORMATION SERVICES DIVISION
CONTROL:02001 STATE-PBX

BUDGET COMPARISONS
LFA vs. OBPP
MODIFIED LEVEL

BUD02001 1-29-85

TELECOMMUNICATIONS

DESCRIPTION	OBPP FY 86	LFA FY 86	DIFF. FY 86	OBPP FY 87	LFA FY 87	DIFF. FY 87
FTE	3.00		(3.00)	3.00		(3.00)
1100 SALARIES	58,789		(58,789)	58,789		(58,789)
1400 EMPLOYEE BENEFITS	8,637		(8,637)	8,678		(8,678)
1500 HEALTH INSURANCE	3,600		(3,600)	3,600		(3,600)
1600 VACANCY SAVINGS	(2,840)		2,840	(2,842)		2,842
TOTAL LEVEL	68,186	0	(68,186)	68,225	0	(68,225)
2100 CONTRACTED SERVICES	2,561		(2,561)	27,561		(27,561)
2200 SUPPLIES & MATERIALS	776		(776)	776		(776)
2300 COMMUNICATIONS	1,275,012		(1,275,012)	1,275,012		(1,275,012)
2400 TRAVEL	1,341		(1,341)	1,341		(1,341)
2500 RENT	4,470		(4,470)	4,470		(4,470)
2700 REPAIR & MAINTENANCE	233		(233)	233		(233)
2800 OTHER EXPENSES	558		(558)	558		(558)
TOTAL LEVEL	1,284,951	0	(1,284,951)	1,309,951	0	(1,309,951)
9999 INFLATION	118,343		(118,343)	187,294		(187,294)
TOTAL W/INFLATION	1,403,294	0	(1,403,294)	1,497,245	0	(1,497,245)
3100 EQUIPMENT	1,496		(1,496)			0
TOTAL PROGRAM	1,472,976	0	(1,472,976)	1,565,470	0	(1,565,470)
2% CUT	(29,460)		29,460	(31,309)		31,309
TOTAL PGM LESS CUT	1,443,516	0	(1,443,516)	1,534,161	0	(1,534,161)
06526 COMMUNICATIONS	1,443,516		(1,443,516)	1,534,161		(1,534,161)
TOTAL PROGRAM	1,443,516	0	(1,443,516)	1,534,161	0	(1,534,161)

Exhibit #2
2/15/85

STATE OF MONTANA

TELECOMMUNICATIONS



REPORT '85

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EXECUTIVE SUMMARY

1983 and 1984 represent two of the most volatile years in the history of telecommunications. In this two year span the industry's largest corporation, AT&T, divested itself of its regional Bell operating companies and the telecommunication's equipment marketplace was deregulated. It is safe to say that, as a result, the industry has taken on an entirely new look.

During this same time, the State completed the installation of 11 state owned PBX's (Private Branch Exchange) which resulted in the replacement of over 12,000 telephones in state offices. This replacement project termed the "Big Four", saved the State approximately \$736,000 in 1984, and was a major step towards improving telecommunications systems statewide. Several other replacement projects are scheduled for 1985 and 1986.

The State Telephone Network (STN) increased in cost by over 60% during 1983 and 1984. To counteract these increases the State reconfigured the STN in 1983 and now has the capability to continually monitor the STN to reduce network costs.

Long term network planning has taken place with the involvement of the Telecommunication's Policy Advisory Council (TPAC) appointed by the Director, Department of Administration. TPAC recommended that bids for the stabilization of short-term network costs be developed and published by the Department in 1985. Furthermore, TPAC asked for long-term network alternatives to be developed during FY86 and 87 by the Department and an advisory council with the assistance of a third party telecommunications consultant. Alternatives and recommended solutions developed during the biennium are to be presented to the 1987 Legislative Assembly.

Montana's Data Communications Network (DCN), like the STN, has increased in cost by over 60% during 1983 and 1984. Similarly, data circuit growth is projected to be 25%-35% per year in addition to a doubling of terminals. In 1985 the DCN will be reconfigured to incorporate the Law Enforcement Network to include regional data concentrators which will help minimize circuit costs. Additionally, spending authority to link the university campus computers together to share software and spare storage has been requested for the biennium.

In 1983 and 1984, Montana made steady progress in the area of land-mobile radio communications. During that time, several state and local agencies converted their radio systems from low-band frequency to high-band frequency equipment. State agencies' plans and budgets project a continuation of high-band frequency conversion. The Highway Patrol, the Highway Department, and the Fire Suppression Bureau projects are the major conversion projects for the biennium.

INTRODUCTION

The report Telecommunications Plan 82 defined the strategies set by the State to respond to the divestiture of AT&T and the advent of the new multivendor marketplace. Telecommunications Report 85 is the sequel to that report and describes the major telecommunications activities that occurred in 1983 and 1984, and the current major telecommunications planning objectives for the State.

In May, 1984 the Communications Division of the Department of Administration was consolidated as a Bureau within the new Information Services Division. The Telecommunications Bureau prepared Telecommunications Report 85 in January 1985 consistent with the strategies and objectives for information systems planning described in the document Statewide Information Systems Plan, published in December 1984 by the Information Services Division.

Copies of the Telecommunications Report 85 may be obtained by writing:

Telecommunications Bureau
Room 222, Mitchell Bldg.
Helena, MT 59620

TELEPHONE SYSTEMS AND EQUIPMENT

In December of 1982, the State and the Montana University System collectively entered into an agreement with Centel Business Systems for the replacement of the existing telephone systems at the following locations:

Eastern Montana College, Billings
Montana State University, Bozeman
University of Montana and State Forester, Missoula
State Capitol Complex and Satellites, Helena

This major project, termed the "Big Four," initiated the installation of 10 State-of-the-Art PBX's comprised of over 12,000 instruments, all systematically cutover and interconnected by the State Telephone Network (STN).

The "Big Four Project" was completed in December 1983 and represents the single most important step taken by the State of Montana to improve voice communications and stabilize costs. As a result the State is better prepared to respond to the future complexities of developments in the telecommunications field.

"Big Four" Operation and Savings

1984 was the first full year of operation of the State's new telephone systems. Throughout the first year each PBX demonstrated its flexibility to accommodate changes in the number of operating stations. Three of the "Big Four" PBX's grew an annual rate of 4% while a multitude of changes to feature availability and location of phones were made by full-time on site technicians. From an operations standpoint, the "Big Four" PBX's have proven their reliability and have done so at considerable savings to the State.

In 1983 an aggregate cost savings of \$11 million to \$20 million was projected over the 10-year useful life of the "Big Four" systems. Whereas first year total project savings was projected to range from \$562,000 to \$886,000, actual equipment savings for 1984 was approximately \$736,000. Estimates for the next 9 years (remaining economic life of the equipment) can be found in Exhibit 1. Total project savings is now projected to be \$18 million through 1993.

The "Big Four" project also included the establishment of a Network Control Center (NCC) in Helena. The NCC serves the State in three major ways:

- provides traffic engineering data to monitor STN usage.
- provides call accounting (telephone billing) of calling activity on the STN.
- provides remote diagnostics of STN PBXs.

More importantly the NCC provides the state with the information to optimize long-distance facilities for the STN, which translates into savings for state agencies. As a result of information from the NCC, orders have recently been

placed with Mountain Bell and AT&T to "fine tune" the STN. These changes will result in savings of approximately \$7,000 per month at current tariffs.

Other Replacement Projects - 1983 and 1984

The installation of the "Big Four", and its satellite PBX's, has been followed by a series of telephone replacement projects that included new PBX's at the Warm Springs and Galen campuses of the State Hospital; the School for the Deaf and the Blind in Great Falls; and Cascade County Human Services in Great Falls. Several small key systems in many state offices have also been installed. A list of all replacement systems is outlined below:

<u>LOCATION</u>	<u>AGENCY</u>	<u>EQUIPMENT TYPE</u>
Billings	Eastern Montana College	SL-1 LE PBX
	Probation and Parole	Encore Key System
Bozeman	Montana State University	SL-1 XL PBX
Butte	Bureau of Mines and Geology	Omega Key System
Deer Lodge	Registrar's Office	Omega Key System
Dillon	Western Montana College	SL-1 LE PBX
Great Falls	Agricultural Extension	Omega Key System
	Highway Department	Omega Key System
	Highway Patrol	Omega Key System
	Job Service	Omega Key System
	Northern Montana College Extension	Omega Key System
	School for Deaf and Blind	SL-1 M PBX
	SRS-Cascade County Human Services	Mitel SX200 PBX
Hamilton	Job Service	Omega Key System
	SRS-Ravalli County Human Services	Omega Key System
Helena	Consumer Council	ITT1A2 Key System
	Department of Military Affairs, Armory	SL-1 MS PBX
	Department of Military Affairs, Fort Harrison	SL-1 M PBX
	Department of Natural Resources	SL-1 M PBX
	Department of Revenue, Liquor Warehouse	ITT1A2 Key System
	Department of State Lands, Forestry	Tie Key System
	Higher Education	SL-1 M PBX
	Highway Department	SL-1 LE PBX
	Justice Building	Horizon Hybrid Systems
	Mountain View School	Tie Key System
	Publications and Graphics	Omega Key System
	State Capitol Complex	SL-1 XL PBX
	Workers' Compensation Division	SL-1 M PBX
Kalispell	Agricultural Extension	ITT1A2 Key System
	National Guard Armory	ITT1A2 Key System
	SRS-Flathead County Human Services	Mitel SX200 PBX
Missoula	Department of State Lands, Forestry	SL-1 M PBX
	Department of Revenue	Omega Key System
	Life Skills Center	Tie Key System
	University of Montana	SL-1 XL PBX
Polson	Job Service	Tie 1A2 Key System

Virtually all of these replacements were found to save the respective agencies money when compared to leasing of its previous equipment. A major reason for those savings is fixed equipment costs.

Overall, during 1983 and 1984, 34 new phone systems were installed in state offices representing over 12,000 phones.

Future Replacement Projects - 1985 and 1986

Several other replacement projects are scheduled for 1985 and 1986. In addition to a number of small systems, two major projects include the State Prison in Deer Lodge and Northern Montana College in Havre. Under consideration for replacement are the Pine Hills School for Boys in Miles City and the Boulder River School, pending 1985 legislative action. Also, Montana College of Mineral Sciences and Technology in Butte is considering the purchase of its existing leased PBX.

A major on-going project is the community wide small system replacement project. The intent of this project is to systematically replace equipment, where appropriate, a community at a time. Helena was completed in 1984. Eleven separate agency offices in Billings will be bid in early 1985. After Billings, State offices in Missoula, Great Falls, Butte, Bozeman, Kalispell, and Havre will be evaluated on a community wide basis.

Telephone equipment replacements that cannot meet this schedule will be handled on a case-by-case basis. Whereas economies of scale can often be achieved if many systems can be bid at one time, many requests for new equipment require immediate response for agencies that are in the process of moving, remodelling or expanding.

In all replacement projects the State uses the competitive procurement process to acquire replacement equipment. This process has proven that the different telecommunications companies in Montana can provide adequate service at a low cost to the State.

**TELEPHONE SYSTEMS COST SAVINGS
"BIG FOUR" REPLACEMENT PROJECT**

<u>LOCATION</u>	<u>ACTUAL 1984</u>	<u>PROJECTED NEXT 2 YRS</u>	<u>PROJECTED YRS 4-10</u>	<u>TOTAL</u>
Eastern Montana College	(\$1,260)	(\$16,640)	\$ 459,860	\$ 441,960
Montana State University	85,590	102,720	2,339,280	2,525,590
University of Montana	112,920	205,910	2,436,950	2,755,780
Missoula Forester	(340)	(1,740)	43,290	41,210
State Capitol Complex	<u>540,920</u>	<u>1,165,460</u>	<u>11,342,810</u>	<u>13,049,190</u>
TOTAL PROJECT	\$735,830	\$1,455,710	\$16,622,190	\$18,813,730

ASSUMPTIONS:

- 1) New system maintenance charges were inflated 10% annually.
- 2) Replaced Centrex equipment costs were increased 10% annually.
- 3) Bell access charges were increased 15% annually.
- 4) Agency equipment payments are reduced to maintenance and access only in the 10th year.

STATE TELEPHONE NETWORK

In its simplest form, Montana's State Telephone Network (STN) is comprised of three types of facilities:

1. TELPAK point-to-point circuits (eg. Helena to Missoula)
2. WATS circuits (Wide Area Telephone Service)
3. DDD circuits (Direct Distance Dialing)

All three of these circuit types have historically been provided by Mountain Bell. During 1983 and 1984 a series of MAJOR changes took place that have had a serious impact on the low cost operation of the STN:

- A. All three circuit types were divided between Mountain Bell and AT&T in 1984 as a result of the AT&T divestiture.
- B. TELPAK Point-to-Point circuit costs increased 46% in 1983 and 32% in 1984.
- C. WATS circuits became "usage" measured (versus bulk billed) in 1983.
- D. AT&T filed for the elimination of its TELPAK circuits in 1983.

Combined, these factors have increased the cost of providing the STN by more than 60% over the 1982 rates. To further complicate the issues, network usage continues its upward trend and the demand for high speed data grows and grows.

To counteract these factors and to address the long-term direction for network services, the State has taken the following steps:

- Reconfigured the STN.
- Intervened against the elimination of TELPAK.
- Established an Advisory Council to assist the State in long-term direction issues.
- Began the preparation of a bid for short-term (2-3 years) network services.

Each of these is addressed separately below.

STN Reconfiguration

Prior to the "Big Four" telephone switch replacement project, the STN was a "Star-Hub" arrangement, which utilized Helena as the "Hub" of the network. That is, a call originating from a network community other than Helena was first routed to Helena and then onward to its destination. This inefficient usage of the network was eliminated when the STN was reconfigured during the 1983 "Big Four" project (see Exhibit 2).

The STN utilizes Electronic Switched Network (ESN) software. ESN provides alternate routing for long-distance calling and allows flexibility in network design. Additional ESN benefits include:

1. Centralized management control of long-distance facilities.
2. Overall telecommunications cost reductions through more efficient use of STN facilities.

3. Increased reliability of communications facilities.
4. Simplified maintenance and administration of facilities.

TELPAK Rate Case Intervention

In November, 1983, AT&T Communications filed with the Montana Public Service Commission (PSC) to eliminate the State's TELPAK tariff effective January, 1985. The Department of Administration formally filed intervention testimony in September 1984.

TELPAK, a bulk discount offered to large users, has been the backbone of the STN since 1975. Known as "the last good deal in telecommunications", TELPAK rates have historically been low and stable until 1982 when a 46% increase was granted by the PSC (effective in January of 1983). Much has happened to the tariff since that time, (see Exhibit 3). Even with these dramatic increases, TELPAK remains less expensive compared to the regular tariff for comparable service.

Rate case intervention formally presents to the PSC the State's case against pending network cost increases, and can help minimize current networks costs.

Telecommunications Policy Advisory Council

In August, 1984 the Department of Administration appointed a Telecommunications Policy Advisory Council (TPAC) to assist with an overall broad-based review of the telecommunications issues facing the State and to aid in making policy and strategic direction recommendations. The Department does have statutory responsibility to assess the overall telecommunications needs of state government, and to establish definitive telecommunications policy and strategic direction. However, as a result of the far reaching cost and service consequences of telecommunications direction and policy decisions, the Department solicited the advice of the Council.

The objectives of the Council were to:

1. Identify and assess the needs related to data and voice communications of state government agencies, the university system, local governments and other political subdivisions.
2. Define the scope of network services. Who should the Department of Administration serve? What services should be provided?
3. Review the use of current telecommunications services by the State and the future of those services.
4. Review the costs of current network services and where those costs are going.
5. Review the alternatives facing the State and make recommendations on the directions and action to be taken.

After exposure to the numerous network user needs and presentations by the Department and various members of the vendor community, the Council made recommendations addressing short-term and long-term issues.

Long-Term TPAC Recommendations

1. That the Governor establish a Telecommunications Advisory Council for the 1986-87 biennium to interact with the Department of Administration in addressing the long-term telecommunications direction of the State.
2. That the Department of Administration be empowered to seek appropriations from the 1985 Legislature to contract with an outside telecommunications consultant to work with the above Advisory Council and the Department to:
 - o Conduct a detailed identification, assessment and analysis of network needs.
 - o Design network alternatives to address the needs.
 - o Assist in preparation of documents to solicit alternative network proposals for solutions.
 - o Assist in evaluation of network proposals.
 - o Assist in preparation of recommendations to be presented with the Advisory Council to the 1987 Legislature.

Short-Term RFP

While the TPAC concurred that 1985 and 1986 should be used to accomplish the long-term recommendations, some immediate action should be taken to stabilize network costs. As a result, the TPAC recommended that the Department proceed immediately with a Request for Proposals (RFP) for short-term agreements for STN facilities. These agreements should be 2-3 years in duration and must be renewable annually.

Mountain Bell and AT&T have expressed to the State and the TPAC a willingness to enter into such agreements. The benefits of short term agreements will be to fix short-term rates by moving them away from the regulatory arena, provide improved flexibility for STN growth and offer alternatives to TELPAK in the event of its elimination.

MONTANA

LINE
FIGURATION

INTERMACHINE TIE LINES
ACCESS LINES

INTERMACHINE TIE LINES
ACCESS TIE LINES

SL-1 NODE
SL-1 MAIN PBX
CONVENTIONAL
MAIN PBX

**CHRONOLOGY OF EVENTS
RELATING TO
THE TELPAK TARIFF**

1980-----18.8% rate increase, effective in early 1981.

1981-----Tariff offering was "grandfathered".

1982-----Bell requested 53.3% rate increase.
February

1982-----Letter received from Bell warning of possible
December elimination of the TELPAK tariff in early 1984.

1982-----PSC ruled on February rate request and granted
December Bell a 46% rate increase.

1983-----46% rate increase became effective.
January

1983-----Bell requested 16.8% rate increase.
March

1983-----As part of the 1/1/84 divestiture, AT&T requested an
November interim TELPAK tariff with a 20% rate increase and
elimination of the offering effective 1/1/85.

1983-----PSC granted AT&T an interim tariff with a 15% rate
December increase.

1983-----PSC ruled on the March rate request and granted Bell
December a 4% rate increase.

1984-----Divestiture split the TELPAK tariff into one
January offering by Mountain Bell and another by AT&T
Communications.

1984-----15% AT&T and 4% Mountain Bell rate increases
January became effective.

1984-----AT&T granted an additional interim rate increase
May of 17.1%

DATA COMMUNICATIONS NETWORK

Montana's Data Telecommunications Network (DCN) provides long distance data circuits to State offices throughout the State. The DCN is comprised of point-to-point circuits leased from Mountain Bell and AT&T. Many of these point-to-point circuits are available under the same TELPAK tariff used for the State Telephone Network (STN).

Like the STN, the cost of providing the DCN circuits is now 60% higher than the same circuit cost in 1982. Similarly, the pending elimination the AT&T TELPAK tariff could further increase these circuit costs.

In addition to rising costs, the demand for data communications is increasing at a drastic rate. The DCN has grown from a handful of terminals in 1975 to more than 1,000 today. The ratio of information workers to workstations has changed from 50:1 in 1970 to 20:1 in 1980, and is projected to be 1:1 by 1990. Considering the magnitude of future demand the DCN will need to grow 25% - 35% annually.

The major issue to be considered by the new Advisory Council on Telecommunications (see page 8) is the complexity of the future data communications environment in the State. Any network alternatives defined in the future must consider the requirements for high-speed digital data transfer needed to better position the State to deal effectively with the impact of the "Information Age".

To address the increasing pressures of cost and technical growth in data communications, the Information Services Division plans to implement the following projects during 1985 and 1986.

1. Redesign the DCN to incorporate the Law Enforcement Network and provide data access points at statewide locations.
2. Convert Capitol complex terminals to local access hookup.
3. Enhance dial-up security.
4. Coordinate asynchronous multiple host networking capability among the universities.
5. Consolidate all data communications expenditures through the Telecommunications Bureau Revolving Account.

Each of these projects is addressed in detail below.

DCN Reconfiguration

The single most important undertaking in teleprocessing during the next few years is the consolidation of the DCN with the Department of Justice data communications network. The 1983 Legislature authorized the Department of Justice to replace its aging System/7 message switching system. The DOJ opted

make recommendations to protect the mainframe from unauthorized dial-up access.

Asynchronous System Network

The major computing activities in the State of Montana are centered in Helena and the university campuses. At present, there is no facility that allows communications between the DEC mainframes at the university campuses. There are limited communications between the campuses and the IBM host in Helena. This lack of data transfer capability poses many problems to the universities. Foremost, the universities cannot currently share their computing resources. Software expenditures run in the tens of thousands of dollars, and there is the potential to minimize the purchase of duplicate software if a high-speed intercampus data link were provided.

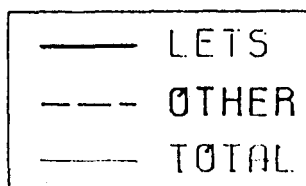
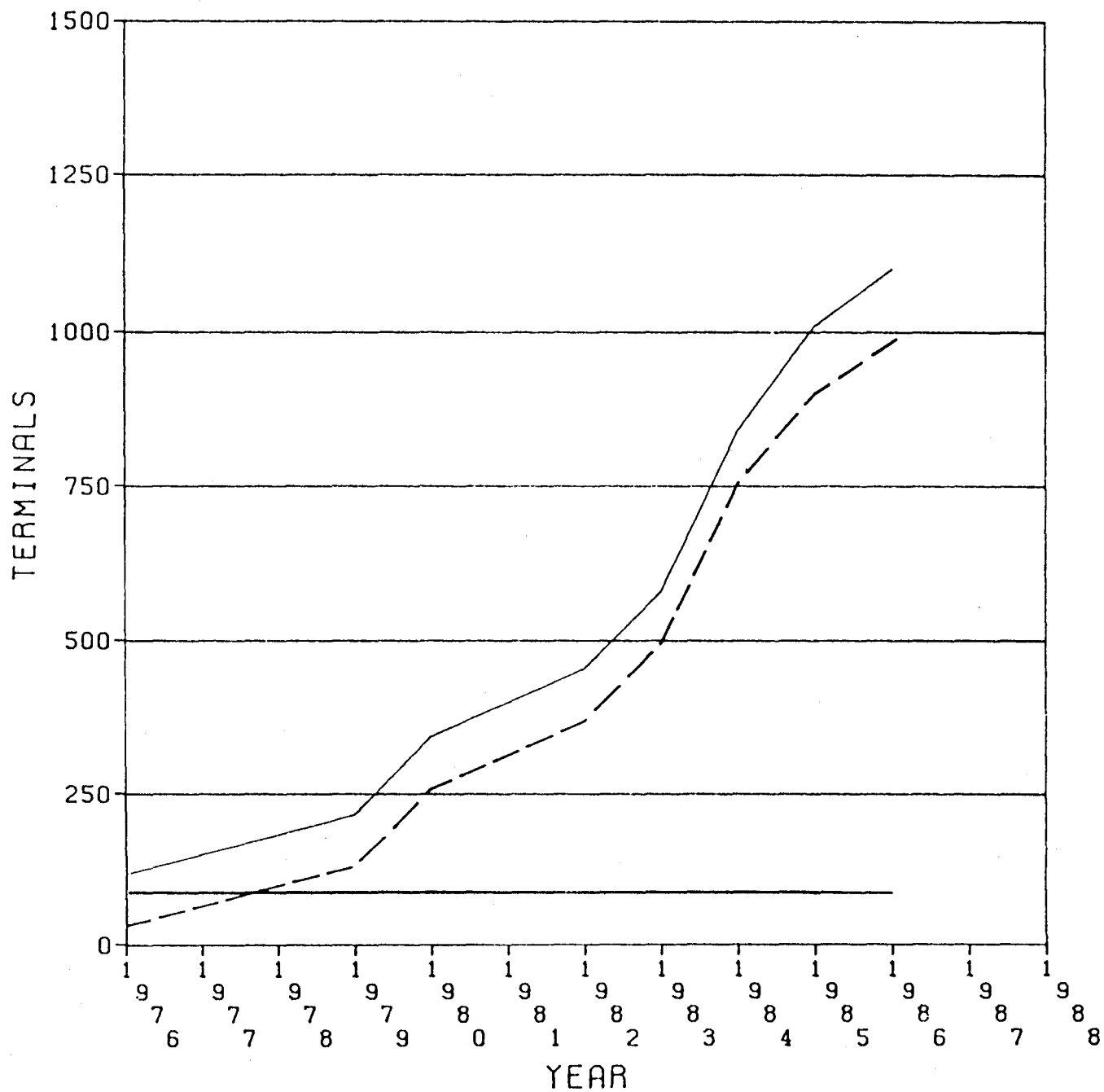
One solution under review is the sharing of currently leased communication facilities available between each campus and the host computer facility in Helena (for SBAS data entry). These lines could be shared (multiplexed) and used to form the heart of a inter-University communication network. By placing intelligent switching equipment at each University campus and in Helena, all the campuses could be linked together. Data files could be readily exchanged, excess capacity could be shared and access to specialized software could be realized. Appropriations to fund this project have been requested for the FY86-87 biennium.

Consolidate Expenditures

Currently, many agencies pay the costs of data circuits directly. As a result of this it is often difficult to estimate accurate statewide expenditures. Consequently, the Department has requested spending authority for the consolidation of these expenditures through the Telecommunications Bureau Revolving Account.

DATA COMMUNICATIONS TERMINALS

INSTALLATIONS FROM 1976 - 1988



PROPOSED DATA COMMUNICATIONS NETWORK

COMPUTER CENTER

PROPOSED
DATA COMMUNICATIONS
NETWORK

December 1984

EXHIBIT 5

COMPUTER CENTER

9600 BPS
4800 BPS

CONCENTRATOR

--- 2400 BPS
--- ESD 8100 NET

PUBLIC SAFETY COMMUNICATIONS PLANNING

In 1983 and 1984, Montana made steady progress in the area of land-mobile radio communications. During that time, several state and local agencies converted their radio systems from low-band frequency to high-band frequency equipment. State agencies' plans and budgets project a continuation of high-band frequency conversion. The Highway Patrol, the Highway Department, and the Fire Suppression Bureau projects are the major conversion projects for the next biennium.

Frequency utilization planning has progressed with a new Statewide Frequency Plan and a Continuous Tone Coded Squelch Signaling Plan. A Dual Tone Multi-Frequency (DTMF) Plan for emergency medical services agencies has been kept up to date and in place.

The Statewide Mutual Aid Frequencies Program has continued to evolve with the use of 154.070 (Fire) and 153.905 (Inter-governmental/Inter-agency) now permitted in base stations, as well as portables. A Mutual Aid User's Handbook and Directory is currently being developed to identify all mutual aid frequency users.

During the biennium the Land Mobile Radio Users' Advisory Council has met six times to discuss needs and develop plans for two-way radio users throughout the state. This council has reviewed and commented on all aspects of frequency utilization during the last eighteen months.

The frequency usage database has been computerized making frequency coordination more accurate and less time consuming. The Telecommunications Bureau also has the capability now to run intermodulation programs to evaluate the compatibility of multiple frequencies at one site.

State Agency High-Band Conversions

The 1983 Legislature authorized all state agency radio users to begin converting to the high-band frequency spectrum during FY 84 and 85. Due to system size and available resources, the Department of Highways and the Highway Patrol planned on a four-year transition. Highway and Highway Patrol plans have featured maximum site sharing and coordination among other participating departments. These major systems promote statewide interagency communications through access to statewide mutual aid channels.

Essential to the success of conversion is the direction in which local agencies, primarily county sheriffs and municipal police departments, move in adopting similar conversions. A proposal for state financial support for conversion for local agencies was made to the 1983 Legislature, but was not approved. The alternative is for local agencies to make the transition using available local resources.

An examination of the trend in local government indicates that conversion to high-band is accelerating (see Exhibit 6). At the present time, 16 county sheriff departments operate high-band or a combination of high and low-band systems, while 7 are now planning to convert to high-band. Most police

departments are low-band. All ambulances and hospitals are high-band, and 72% of the fire departments are high-band. It is now estimated that full local government conversion to high-band would cost approximately \$5.5 million (see Exhibit 7).

Interim measures to assure interagency communications are required during conversion. Agencies converting to high-band, but requiring communications with local low-band users continue to carry both low and high-band equipment in mobile vehicles. Low-band equipment can be phased out as more local agencies convert to high-band. In cases where state field personnel must exclusively or primarily deal with local agencies on low-band, new low-band equipment must be purchased, if required by lack of available equipment or equipment which is obsolete or inadequate.

The basic assumption during high-band conversion is that as state agencies convert and as local agencies realize the benefits of high-band, a statewide conversion to high-band will take place. To help this effort along, and to improve interagency communications in the interim, the Telecommunications Bureau will research the effectiveness of co-locating state owned high-band base stations with locally owned low-band equipment at strategic locations. By cross patching these systems, communications may be improved as total high-band conversion takes place.

During FY 84 and 85 \$1,900,000 was budgeted for State conversion projects and other land-mobile radio expenditures. FY 86 and 87 state agency budget requests (pre-executive planning process) total to \$2,344,242. Appendix A itemizes these requests by Department.

Frequency Coordination

Frequency assignments are based on information made available from the requests for frequency coordination, and user/vendor input. Frequency coordination or an engineering study is required by Federal Communications Commission Rules as part of the application process. (Section 90.175 Frequency Coordination Requirements).

During 1983 and 1984, the Telecommunications Bureau coordinated over 350 frequency applications for state and local government users.

Frequencies are assigned to reduce interference and to make the most effective use of the available spectrum. Stations receiving or causing harmful interference are expected to cooperate and resolve problems by mutually satisfactory arrangements. If the licensees are unable to do so, the Federal Communications Commission may impose restrictions including specifying the transmitter power, antenna height, hours of operation, or area of operation of the stations concerned.

During 1983 and 1984 a computer database has been established that provides for more accurate and less time consuming frequency coordination. It has been invaluable by more quickly responding to numerous and various questions concerning interference, licensing and planning.

Similarly, a program has been developed which can detect the possibility of intermodulation interference occurring among a specific group of frequencies present at one site or in close proximity to one another. This aids in choosing frequencies as well as sites for radio systems.

Overall, high-band frequency coordination has been progressing smoothly with few interference problems. Cooperation among radio user and sound engineering continue to be the key to successful frequency utilization.

Detailed procedures relating to frequency coordination have been developed by the Telecommunications Bureau. Specific information about frequency coordination may be found in Appendix B.

Mutual Aid Frequency Development

The adoption of statewide high-band mutual aid frequencies make it possible for any agency to talk with any other on the high-band frequency spectrum. Many agencies, because of the scarcity of personnel and the need for coordination of resources, find combined efforts via radio communications to be of value. Fish and Game Wardens, for example, can assist in a variety of law enforcement emergencies in addition to their normal duties.

The State of Montana has been authorized by the Federal Communications Commission to operate four mutual aid radio networks to provide common channel access to all public agencies in Montana. These four network frequencies are 153.905 MHz, 154.070 MHz, 155.475 MHz, and 155.790 MHz. All users of these frequencies must receive a permit from the Telecommunications Bureau, Information Services Division, Department of Administration. Other frequencies are designated as specific use or mutual aid frequencies. These are 155.280 MHz, 155.325 MHz, 155.340 MHz, and 155.385 MHz for Emergency Medical Services; and 155.160 MHz and 155.220 MHz for Search and Rescue.

A Mutual Aid Directory and Handbook is being developed by the Telecommunications Bureau and will be available for distribution in early 1985. General contents of this directory will include:

- o purpose of mutual aid frequencies.
- o list of the frequencies currently licensed to the Department of Administration.
- o description and nature of use of each frequency.
- o policies governing use.
- o procedures for procuring State Permits for authorization of use.
- o directory of agencies statewide that have entered into cooperative agreements to use the mutual aid frequencies.
- o individual user call signs and identifiers.

Appendix B, Land Mobile Radio Frequencies, Policies and Procedures, defines the rules and regulations for application and use of Montana Mutual Aid frequencies.

Other Public Safety Communications Projects

9-1-1

Since 1968, the federal government and telephone companies have recognized "9-1-1" as the universal emergency assistance telephone number. In 9-1-1 systems, a caller needing help may reach a Public Safety Answering Point from which help is directly dispatched or dispatched through a relay system. Many states outside of Montana use the 9-1-1 system.

9-1-1 legislation will be addressed by the 1985 Montana Legislature. If this legislation passes, the Department of Administration, will be the overall coordinating agency in assisting in the development and implementation of local 9-1-1 systems throughout the state.

Surplus Low-Band Radio Equipment

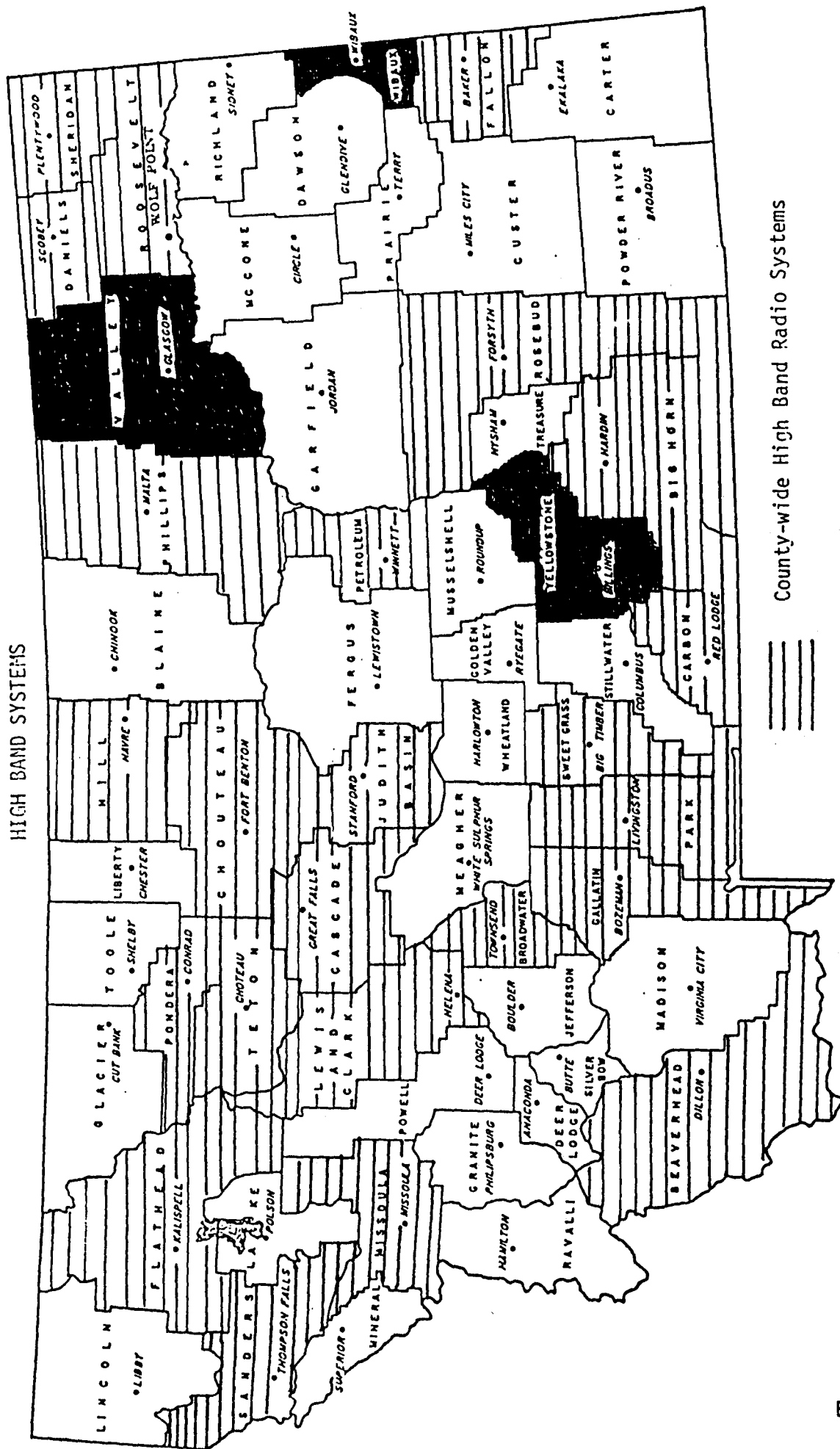
As local governments and state agencies convert from low-band radio frequencies to the high-band spectrum, some state agencies will be left with surplus low-band equipment. During 1985, the Telecommunications Bureau will design a system whereby surplus low-band radios may be made available to other agencies.

State and Local Government Coordination

As State and local governments proceed with their individual plans in public safety communication areas, coordination between the various parties become more and more important. The Telecommunications Bureau will work with all entities to help ensure coordination to improve the effectiveness of the systems being implemented.

LOCAL LAW ENFORCEMENT

HIGH BAND SYSTEMS



County-wide High Band Radio Systems

Local Town High Band Radio System Only,
Not County-wide

**ESTIMATED COSTS OF HIGH BAND
CONVERSION FOR LOCAL GOVERNMENT AGENCIES**

<u>RADIO SERVICE</u>	<u>MOBILES</u>	<u>BASE STATIONS</u>	<u>CONTROL STATIONS</u>	<u>MOBILE RELAYS</u>	<u>PORTABLES</u>
Police (all local law enf)	1,750 \$2,450,000	140 \$322,000	30 \$69,000	30 \$66,000	450 \$405,000
Local Government	610 \$ 854,000	30 \$ 69,000	5 \$11,500		50 \$ 45,000
Special Emergency	240 \$ 336,000	30 \$ 69,000	5 \$11,500		25 \$ 22,500
Equipment Subtotal	2,600 \$3,640,000	200 \$460,000	35 \$80,500	30 \$66,000	525 \$472,500
Installation (17%)	\$ 802,230				
	<u>TOTAL CONVERSION COSTS</u>		\$5,521,230		

NOTES:

- 1) Equipment prices taken from the State Term Contract T.C. 897-85-A:
 - mobiles @ \$1,400 each
 - base/control @ \$2,300 each
 - mobile relays @ \$2,200 each
 - portables @ \$900 each
- 2) These figures represent the conversion of all equipment (low-band) currently found in the State's user license database.

APPENDIX A

LAND MOBILE RADIO PROGRAMS FY86-87COST SUMMARY

<u>Department</u>	<u>Radio Equipment</u>	<u>Personnel and Operating Expenses</u>
Administration		2,160.00
Commerce	10,000.00	4,780.00
Fish, Wildlife & Parks	7,200.00	
Governor's Office	4,000.00	
Highways	799,534.00	60,000.00
Historical Society		720.00
Institutions	24,270.00	28,080.00
Justice	500,249.00	655,021.00
Livestock	4,400.00	10,026.00
Lands	95,390.00	83,210.00
Military Affairs	13,000.00	8,000.00
Public Service Commission	2,000.00	1,150.00
Revenue		452.00
University System	30,600.00	
Subtotals	<u>\$1,490,643.00</u>	<u>\$ 853,599.00</u>
Biennium Total		\$2,344,242.00

Department of Administration

	<u>F.Y. '86</u>	<u>F.Y. '87</u>	<u>Total</u>
<u>F.T.E.'s</u>			
<u>Rentals</u>	\$1,080.00	\$1,080.00	\$2,160.00
<u>Installation & Maintenance</u>			
<u>Equipment Purchases</u>			
		Total	\$2,160.00

The Department of Administration rents a paging answering service for \$90 per month to contact computer technicians after regular hours and over the weekend.

Department of Commerce

Aeronautics Division

	<u>F.Y. '86</u>	<u>F.Y. '87</u>	<u>total</u>
<u>F.T.E.'s</u>			
<u>Rentals</u>	\$ 390.00	\$ 390.00	\$ 780.00
<u>Installation & Maintenance</u>	\$2,000.000	\$2,000.00	\$ 4,000.00
<u>Equipment Purchases:</u>			
20 air-to-ground transceivers	\$5,000.00	\$5,000.00	<u>\$10,000.00</u>
		Total	\$14,780.00

The \$5,000 in F.Y. '86 and F.Y. '87 for air-to-ground transceivers is a matching fund for monies from local communities on a 50/50 basis. It is budgeted for air-to-ground transceivers at \$1,000 apiece. These transceivers (base stations) will be used to replace old equipment; while some are for new stations depending on community demand.

The rental request is for a paging answering service through Capital Answering Service.

Department of Fish, Wildlife and Parks

Parks Division

	<u>F.Y. '86</u>	<u>F.Y. '87</u>	<u>Total</u>
<u>F.T.E.'s</u>			
<u>Rentals</u>			
<u>Installation and Maintenance</u>			
<u>Equipment Purchases:</u>			
6 mobile radios	\$7,200.00		<u>\$7,200.00</u>
		Total	<u>\$7,200.00</u>

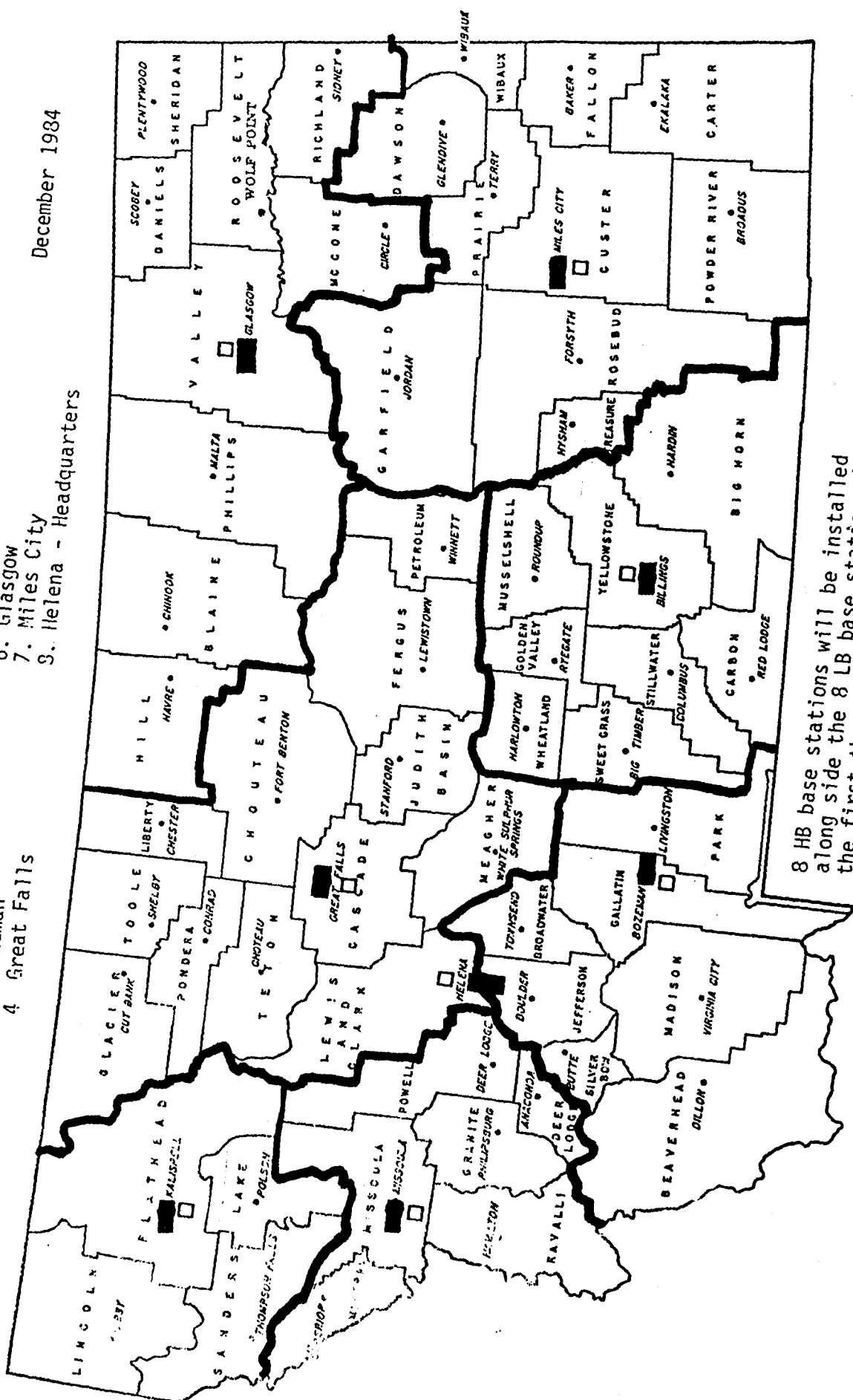
The Parks Division is the only F,W & P division reporting equipment requests during the next biennium. Maintenance funds are drawn from within each division's operational budget if needed. The Law Enforcement Division will purchase eight base stations, ten mobiles and ten portables in FY85 to finish their conversion to high-band.

FISH, WILDLIFE AND PARKS LAND/MOBILE SYSTEM

- 1. Kalispell
- 2. Missoula
- 3. Bozeman
- 4. Great Falls

- 5. Billings
- 6. Glasgow
- 7. Miles City
- 8. Helena - Headquarters

December 1984



- Regional Boundaries
- Current LB Base Stations
- Proposed HB Base Stations

8 HB base stations will be installed along side the 8 LB base stations in the first three months of 1985. The 8 LB base stations will remain in place and in use.

Governor's Office

	<u>F.Y. '86</u>	<u>F.Y. '87</u>	<u>Total</u>
<u>F.T.E.'s</u>			
<u>Rentals</u>			
<u>Installation and Maintenance</u>			
<u>Equipment Purchases</u>	\$2,000.00	\$2,000.00	\$4,000.00
		Total	\$4,000.00

The Governor's Office has budgeted \$4,000 over the next biennium for purchase of new equipment.

The Governor has a critical need to be able to receive communications at all times. He establishes communications, while out of the Helena area, through various public safety agencies (local law enforcement, Highway Patrol, etc.). The two-way radio system is intended for use when a telephone is unavailable, or when law enforcement entities need to be reached.

The Governor's current two-way radio system enables reception of signals, but because of its low power, cannot be used to transmit long distances. This is particularly critical when the Governor is at an isolated location without telephone service, such as at an outdoor event or en route to a location via automobile.

The proposed system provides for amplifiers and antennas which will extend both reception and transmission in the automobile. This proposed system approximately doubles reception while in the automobile and increases transmission from approximately 5 to 45 miles. Conditions, such as poor weather, terrain and atmosphere may adversely affect reception and transmission. The tuned heliflex antenna, attached to the portables while away from the automobile, will improve reception to some degree.

Use of both low-band and high-band radios is recommended. Most counties have low-band base stations in use. However, some counties have abandoned low-band for high-band. The Governor will be provided with lists of available frequencies throughout the State, but it is also recommended that the Governor communicate with local and state law enforcement regarding his radio communications system so that these agencies will be prepared to interact with the Governor through appropriate radio bands.

The proposed system enables reception of a signal at a remote location while away from the automobile. Upon receiving a message, the Governor or a staff person would return to the car to transmit a message if the portable away from the car is unable to reach the party to be called. Portables do have basic limitations, but this system would be a significant improvement over the existing system.

Department of Highways

	<u>F.Y. '86</u>	<u>F.Y. '87</u>	<u>Total</u>
<u>F.T.E. 's</u>	11	11	
	\$ 5,000.00	\$ 5,000.00	\$ 10,000.00
	\$ 22,000.00	\$ 22,000.00	\$ 44,000.00
<u>Rentals</u>	\$ 3,000.00	\$ 3,000.00	\$ 6,000.00
<u>Installation and Maintenance</u>			
<u>Equipment Purchases</u>	\$419,768.00	\$379,766.00	\$799,534.00
		Total	\$859,534.00

The \$799,534 for equipment purchases is for inventoriable items only. The eleven F.T.E.'s represents one more than current level. The \$10,000 is for overtime pay for personnel. The \$44,000 is for one additional technician that will increase F.T.E. requirement to 11. Vehicle rentals account for the \$6,000.

The Department of Highways has just finished converting the Glendive District. The Wolf Point District is yet to be converted from low-band to high-band. This Highways system of high-band regional base stations and mobile relays will be shared with other non-law enforcement state agencies and will provide for regional dispatching capabilities. Conversion to high-band in eastern Montana should be completed in the summer of 1985. Western Montana will be converted in F.Y.'86 and F.Y.'87, thus the budget request of \$780,000.

The Department of Highways will also share their mobile relay sites with local communities to minimize costs at the local level.

Department of Highways
High-Band Conversion - Phase One
Current status through FY85

The 1983 Legislature approved appropriations, for the first half of the Departments high-band conversion in the following amounts:

FY 84	399,337
FY 85	<u>399,266</u>
Biennium Total	798,603

This amount was originally projected to complete installation of the Great Falls Division which was the original pilot study area and totally convert the Havre, Miles City, Glendive, Wolf Point, and Lewistown Divisions and partially complete the Billings Division.

Currently Great Falls, Havre, Miles City and Glendive Divisions are complete with the exception of a few local bases to be installed in select section shops. The Wolf Point mobile relays and the antenna system of the main base/control stations along with a few mobile relays have been installed. All of the equipment for the Lewistown and Billings Divisions has been received or ordered at this time. All equipment for the GVW section (mobiles and scale house bases) is currently being ordered for the above divisions.

Present status of expenditures leave approximately \$235,000 as of December 1, 1984. Current equipment orders reduce this figure to approximately \$106,000. Of this figure most will be allotted to the equipment to supply the needs of the GVW section and some of the local section shop bases.

The current balance will probably take this conversion phase further than originally projected allowing complete installation of the Billings Division prior to July 1, 1985.

The remaining Divisions of this phase are projected to be completed as follows:

Wolf Point	5-1-85
Lewistown/Billings	7-1-85

Notes:

- A. The current methods of converting individual divisions base systems evolved greatly from the first divisions. Rather than completely change a division within a short period of approximately two weeks, Highways currently installs the mobile relays and select mobiles allowing these few units to become accustomed to the operating characteristics of the system for an extended time period. This also allows them to determine the effectiveness of the existing mobile relay locations and their coverage before committing to final removal of the low-band radios and installing the main control/base radio and all other mobiles.

- B. All sites have been used on a shared basis where possible with the Highway Patrol. Highways personnel have assisted in the installation of several sites.

The Highways Department is planning on connecting their systems to the Highway Patrol dispatch centers when they become operational. This will enable better direct communications between the agencies and will provide possible year-round 24 hour monitoring of the Highway systems.

- C. The Department has been including means by which each District headquarters office also will be able to access and control the outlying Division(s) radio system. This eliminates the need for additional personnel to monitor the radio system and collect road condition data after hours and on weekends. So far this appears to be very cost effective.
- D. The Department airplane will soon be equipped with a radio capable of operating on all Highway and Highway Patrol channels. More Motor Pool cars will soon be equipped with the new radios. Planning & Survey's two Helena based units have been equipped with radios.
- E. An emergency portable mobile relay unit has been assembled and is available for emergency replacement of any Highway or Patrol mobile relay unit which may fail. This unit is only the size of two shoe boxes and is capable of operation on battery backup and solar operation if necessary. This unit would also be capable of enhancing operation in emergencies where spot communications is required to extend coverage quickly and easily. This unit also greatly aids the survey of potential radio sites for determination of coverage.
- F. An operational manual including station locations, channel & tone access combinations and operating protocols is currently being assembled and should be available along with the next "Call Book" for distribution in early spring.

Department of Highways
High-Band Operation Outline

The high-band conversion at this point seems to have been quite successful. Although a change of this magnitude is sure to be full of bugs, they have not been insurmountable. The Department has had to stop and evaluate the systems several times and make some changes. The overall design of the systems has been flexible enough to accommodate this.

All new division base/control radios are being designed using standard factory parts. They are engineered in-house as no vendor provides the multiple function capabilities which are required for operations. These units are engineered to be controlled remotely using any commonly available resource such as normal voice grade telephone circuits, standard radio links, and microwave or a multiple of these carriers. There are typically six functions available within each unit. These functions include: The statewide general base to base (mobile) channel, the individual division channel direct base to mobile, three separate localized mobile relays, and the old low-band radio. The low-band function will be phased out giving a spare function.

The most notable achievement of the new systems seems to be the super-extended range within localized areas between vehicles via the mobile relays. This feature provides the heart of the design.

The use of a "mobile only" frequency provides a much needed short range direct connection between mobiles which does not interfere with other base to mobile communications. This channel is common statewide.

The common mutual aid channel has not been used between agencies too extensively, but has been there when necessary. Originally in the older style radios of the Great Falls division, range was extremely short due to the narrow band-width of the radios. Through special tuning procedures, this effect is being greatly minimized. The new radios installed in subsequent division have not been plagued with this problem.

The ability to utilize multiple frequencies and tones to give localized coverage to the division offices is very valuable.

The District headquarters are being equipped to control the other divisions within their district. They are able to control the complete radio system, remotely record local road information to the distant division's local road report answering machines and through a line transfer device receive the local calls directly to the District headquarters after hours. This eliminates up to 1 FTE per outlying division. (Winter radio/phone monitoring position.)

This map of Montana displays county boundaries and names. It also indicates the locations of current mobile relay stations (marked with triangles) and current base/control stations (marked with squares). The map includes numerous place names, such as LIBBY, BUTTE, MISSOULA, and SPOKANE, and shows the state's geographical features and county divisions.

The Bozeman, Butte, Missoula, and Kalispell Divisions are planned for High Band conversion in F.Y.'s '86-'87. The Lewistown and Billings Divisions are planned for High Band conversion by June 30, 1995.

○ Local Gross Vehicle Weight Scales Proposed
 □ Local Maintenance Proposed
 ■ Local Maintenance Current

- ☐ Local Gross Vehicle Weight Scales Proposed
☐ Local Maintenance Proposed
☒ Local Maintenance Current

Historical Society

	<u>F.Y. '86</u>	<u>F.Y. '87</u>	<u>Total</u>
<u>F.T.E.'s</u>			
<u>Rentals</u>	\$360.00	\$360.00	\$720.00
<u>Installation and Maintenance</u>			
<u>Equipment Purchases</u>			
		Total	<u>\$720.00</u>

The Historical Society uses a paging answer service from Capital Answering Service to contact security personnel.

Department of Institutions

	<u>F.Y. '86</u>	<u>F.Y. '87</u>	<u>Total</u>
Community Corrections			
<u>F.T.E.'s</u>			
<u>Rentals</u>			
<u>Installation & Maintenance</u>	\$ 2,595.64	\$ 2,595.64	\$ 5,191.28
<u>Equipment Purchases:</u>			
3 LB mobile radios	\$ 6,457.80		<u>\$ 6,457.80</u>
Region III			
<u>F.T.E.'s</u>			
<u>Rentals</u>	\$ 480.00	\$ 480.00	\$ 960.00
<u>Installation & Maintenance</u>			
<u>Equipment Purchases</u>			<u> </u>
Missoula Life Skills Center			
<u>F.T.E.'s</u>			
<u>Rentals</u>	\$ 300.00	\$ 300.00	\$ 600.00
<u>Installation & Maintenance</u>			
<u>Equipment Purchases</u>			<u> </u>
Women's Life Skills Center			
<u>F.T.E.'s</u>			
<u>Rental</u>	\$ 363.50	\$ 363.50	\$ 727.00
<u>Installation & Maintenance</u>			
<u>Equipment Purchases</u>			<u> </u>
Swan River Youth Forests Camp			
<u>F.T.E.'s</u>			
<u>Rental</u>			
<u>Installation & Maintenance</u>			
<u>Equipment Purchases:</u>			
4 portable radios (hand-held)	\$ 3,720.00		
2 mobile radios HB	\$ 2,800.00		
1 base station	\$ 2,480.00		<u>\$ 9,000.00</u>
Boulder River School and Hospital			
<u>F.T.E.'s</u>			
<u>Rentals</u>			
<u>Installation & Maintenance</u>			
<u>Equipment Purchases:</u>			
2 LB portable radios			
(hand-held)	\$ 2,640.00		<u>\$ 2,640.00</u>
Montana State Hospital			
<u>F.T.E.'s</u>			
<u>Rentals</u>			
<u>Installation & Maintenance</u>	\$ 1,033.00	\$ 1,033.00	\$ 2,066.00
<u>Equipment Purchases</u>			<u> </u>

Mountain View School

F.T.E.'s

Rentals

<u>Installation & Maintenance</u>	\$ 802.53	\$ 802.53	\$ 1,605.06
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Equipment Purchases:

2 portable radios			
(hand held) HB	\$ 1,500.00		\$ 1,500.00
2 mobile radios	\$ 2,800.00		<u>\$ 2,800.00</u>

Pine Hills School

F.T.E.'s

Rentals

<u>Installation & Maintenance</u>	\$ 1,279.50	\$ 1,279.50	\$ 2,559.00
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Equipment Purchases:

1 LB portable radio			
(hand held)	\$ 800.00		\$ 800.00
1 LB mobile radio	\$ 984.00		<u>\$ 984.00</u>

Montana State Prison

F.T.E.'s

Rentals

<u>Installation & Maintenance</u>	\$ 7,185.00	\$ 7,185.00	\$14,370.00
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Equipment Purchases

Total			<u>\$52,350.14</u>
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All rental requests are for paging answering services utilizing beepers. At many institutions purchase of low-band equipment is necessitated by local communities' lack of high-band and the institution's need to communicate with them. Attempts will be made to utilize used low-band equipment from other state agencies when possible. This will prevent money from being spent on new low-band equipment. We eventually want to convert to high-band as it becomes feasible.

If the request for new high-band equipment is denied from Swan River Youth Camp then a request of \$1000 for maintenance and repair will be budgeted for the next biennium in its place. Swan River Youth Forest Camp needs high-band capabilities as soon as possible to provide communication with the Forestry Division in the Swan Valley, with whom they regularly send residents out to work.

Department of Justice

	<u>F.Y. '86</u>	<u>F.Y. '87</u>	<u>Total</u>
Criminal Investigation			
<u>F.T.E.'s</u>			
<u>Rentals</u>			
<u>Installation & Maintenance</u>	\$ 500.00	\$ 500.00	\$ 1,000.00
<u>Equipment Purchases:</u>			
3 mobile radios	\$ 6,549.00		\$ 6,549.00
1 repeater	\$ 11,000.00		\$ 11,000.00
5 portable radios (20 watt)	\$ 17,500.00		\$ 17,500.00
5 portable radios (hand-held)	\$ 9,000.00		\$ 9,000.00
	<u>\$ 44,549.00</u>	<u>\$ 500.00</u>	<u>\$ 45,049.00</u>
Driver Services			
<u>F.T.E.'s</u>			
<u>Rentals</u>			
<u>Installation & Maintenance</u>	\$ 35.00	\$ 35.00	\$ 70.00
<u>Equipment Purchases</u>			
	<u>\$ 35.00</u>	<u>\$ 35.00</u>	<u>\$ 70.00</u>
Fire Marshal			
<u>F.T.E.'s</u>			
<u>Rentals</u>			
<u>Installation & Maintenance</u>	\$ 60.00	\$ 60.00	\$ 120.00
<u>Equipment Purchases:</u>			
8 mobile radios HB	\$ 11,575.00		\$ 11,575.00
	<u>\$ 11,635.00</u>	<u>\$ 60.00</u>	<u>\$ 11,695.00</u>
Highway Patrol			
<u>F.T.E.'s</u>	\$ 77,950.00		\$ 77,950.00
	\$ 159,050.00	\$ 229,280.00	\$ 388,330.00
	\$ 23,250.00	\$ 36,525.00	\$ 59,775.00
	\$ 38,988.00	\$ 56,934.00	\$ 95,922.00
<u>Rentals</u>			
<u>Installation & Maintenance</u>	\$ 15,927.00	\$ 15,927.00	\$ 31,854.00
<u>Equipment Purchases:</u>			
40 HB mobile radios	\$ 48,300.00	\$ 48,300.00	\$ 96,600.00
HB mobile radios/new positions	\$ 19,320.00	\$ 16,905.00	36,225.00
Equipment to complete HB			
conversion (see attached detail)	<u>\$155,900.00</u>	<u>\$155,900.00</u>	<u>311,800.00</u>
Subtotal	<u>\$538,685.00</u>	<u>\$559,771.00</u>	<u>\$1,098,456.00</u>
Biennium Total			\$1,155,270.00

In this next biennium the Fire Marshall's Bureau will convert to high-band.

The Highway Patrol will complete its high-band conversion in the '86-'87 biennium. The \$77,950 under F.T.E.'s is to purchase contractor's service to

implement the high-band conversion project. The eleven F.T.E.'s in F.Y.'86 and five additional F.T.E.'s in F.Y.'87 are new positions to staff Regional Communications Centers. The \$388,330.00 is for salary, the \$59,775.00 is for overtime and the \$95,922.00 is for employee benefits.

The contractor's services request is based upon 25% of the amount for equipment needed to convert the western half of Montana to high-band. Like the Department of Highways the Highway Patrol should complete their conversion during this next biennium; nevertheless, more resources are needed to ensure implementation is timely and coordinated.

The Highway Patrol is on schedule with its high-band conversion project. All but three mobile relays scheduled for fiscal year 1984 installation are operational. The remaining three installations, one mobile relay near Jordan, one southeast of Baker, and one south of Plentywood, have been postponed until further evaluation of the existing system coverage is complete. The site will soon be picked for the relay south of Plentywood.

At this time the Patrol has fourteen mobile relays in operation covering an area stretching from Glacier County in the west to Sheridan County in the East and to Powder River County in the south. There are no relays at Hysham Hills or at Forsyth.

The Bozeman area installation is near completion. The remote control panel needed in Bozeman to control the Eaglehead Mtn. relay is in place. One more repeater needs to go in northeast of Bozeman to complete this area.

Work began on the Billings area during the summer of 1984. The Billings project includes three mobile relays, a base station at Sacraifice Cliffs and a UHF control link. The repeaters are in place at Red Lodge and at Big Timber. One more repeater is needed between Billings and Roundup. Eventually a repeater will be needed near Hardin to fully cover this district.

The Patrol requested two additional relays to fill in the areas not covered by the fiscal year 1984 installations. One mobile relay is requested south of Sidney and has yet to be installed. The second one is for Sweetgrass County east of Big Timber and is in place, though the squelch tone needs to be changed. Pending the results of the Wolf Point area mobile relay system evaluation, two relays might be relocated from the Jordan and Plentywood sites.

Fiscal Year 1986 and remaining F.Y.'85 installations are being planned west of the Divide. Butte is planned for the spring of 1985 with Missoula and Kalispell planned to follow during the summer of 1985 and spring of 1986.

Some operational problems remain to be solved. The Highway Patrol relay system at Gore Hill (Great Falls) is causing interference with other Highway Patrol relays in the area. A UHF link will be installed from the Helena central dispatch to replace the mobile relay with a remote base station. The mobile relay at Gore Hill will be moved to Choteau to separate the mobile relays in the Great Falls areas which should eliminate the interference. Also, in this geographic area a repeater is needed at the Hudson Bay Divide and is in the planning stages.

HIGHWAY PATROL

Radio Equipment Purchases Detail:

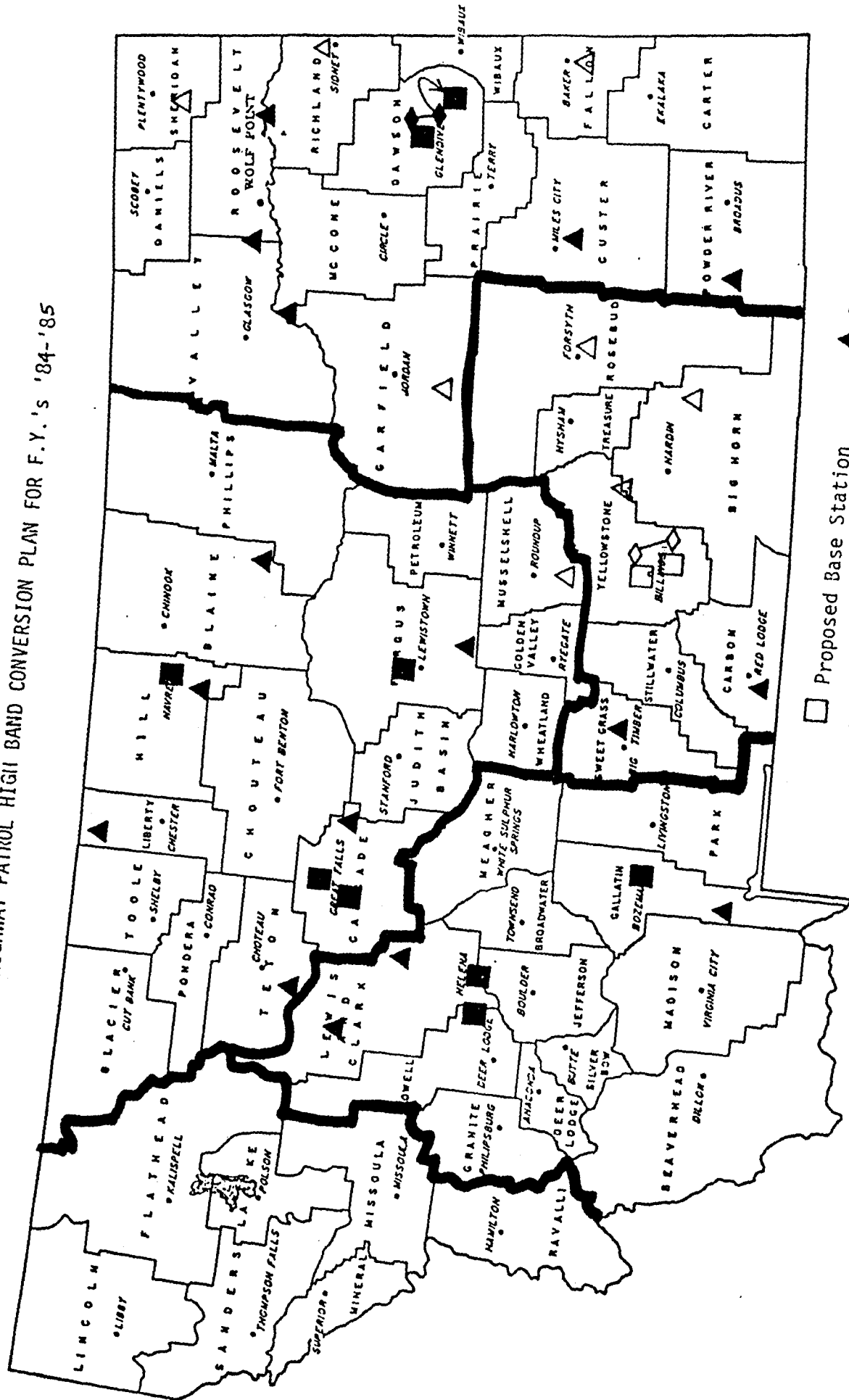
F.Y. '86 - F.Y. '87

<u>Locations</u>	<u>Item</u>	<u>Approx. Cost</u>
Libby	VHF Repeater	\$ 2,400
	VHF Antenna	240
	Duplexer	833
	100 ft. TX Line	112
	Miscel.	50
Eureka	VHF Repeater	2,400
	VHF Antenna	240
	Duplexer	833
	100 ft. TX Line	112
	Miscel.	50
Big Mtn	VHF Repeater	2,400
	VHF Antenna	240
	Duplexer	833
	100 ft. TX Line	112
	Miscel.	50
Kalispell	VHF Base Station	2,300
	UHF Base Station	2,500
	VHF Antenna	240
	UHF Antenna	150
	100 ft. TX Line	150
	Miscel.	100
	Tower	2,000
Lake Side	VHF Base Station	2,300
	UHF Base Station	2,500
	VHF Antenna	240
	UHF Antenna	150
	100 ft. TX Line	112
	Miscel.	100
Plains	VHF Repeater	2,300
	VHF Antenna	240
	VHF Duplexer	833
	100 ft. TX Line	112
	Miscel.	100
TV Mtn	VHF Base Station	2,300
	UHF Base Station	2,500
	VHF Antenna	240
	UHF Antenna	150
	100 ft. TX Line	112
	Miscel.	100

Missoula	VHF Base Station	2,300
	UHF Base Station	2,500
	VHF Antenna	240
	UHF Antenna	150
	100 ft. TX Line	112
	Miscel.	100
University Mtn	VHF Repeater	2,400
	VHF Antenna	240
	Duplexer	833
	100 ft. TX Line	112
	Miscel.	50
Union Peak	VHF Repeater	2,400
	VHF Antenna	240
	Duplexer	833
	100 ft. TX Line	112
	Miscel.	50
Philipsburg	VHF Repeater	2,400
	VHF Antenna	240
	Duplexer	833
	100 ft. TX Line	112
	Miscel.	50
Hamilton	VHF Repeater	2,400
	VHF Antenna	240
	Duplexer	833
	100 ft. TX Line	112
	Miscel.	50
Dillon	VHF Repeater	2,400
	VHF Antenna	240
	Duplexer	833
	100 ft. TX Line	112
	Miscel.	50
Ennis	VHF Repeater	2,400
	VHF Antenna	240
	Duplexer	833
	100 ft. TX Line	112
	Miscel.	50
Livingston	VHF Repeater	2,400
	VHF Antenna	240
	Duplexer	833
	100 ft. TX Line	112
	Miscel.	50
Butte	VHF Base Station	2,300
	UHF Base Station	2,500
	VHF Antenna	240
	UHF Antenna	150

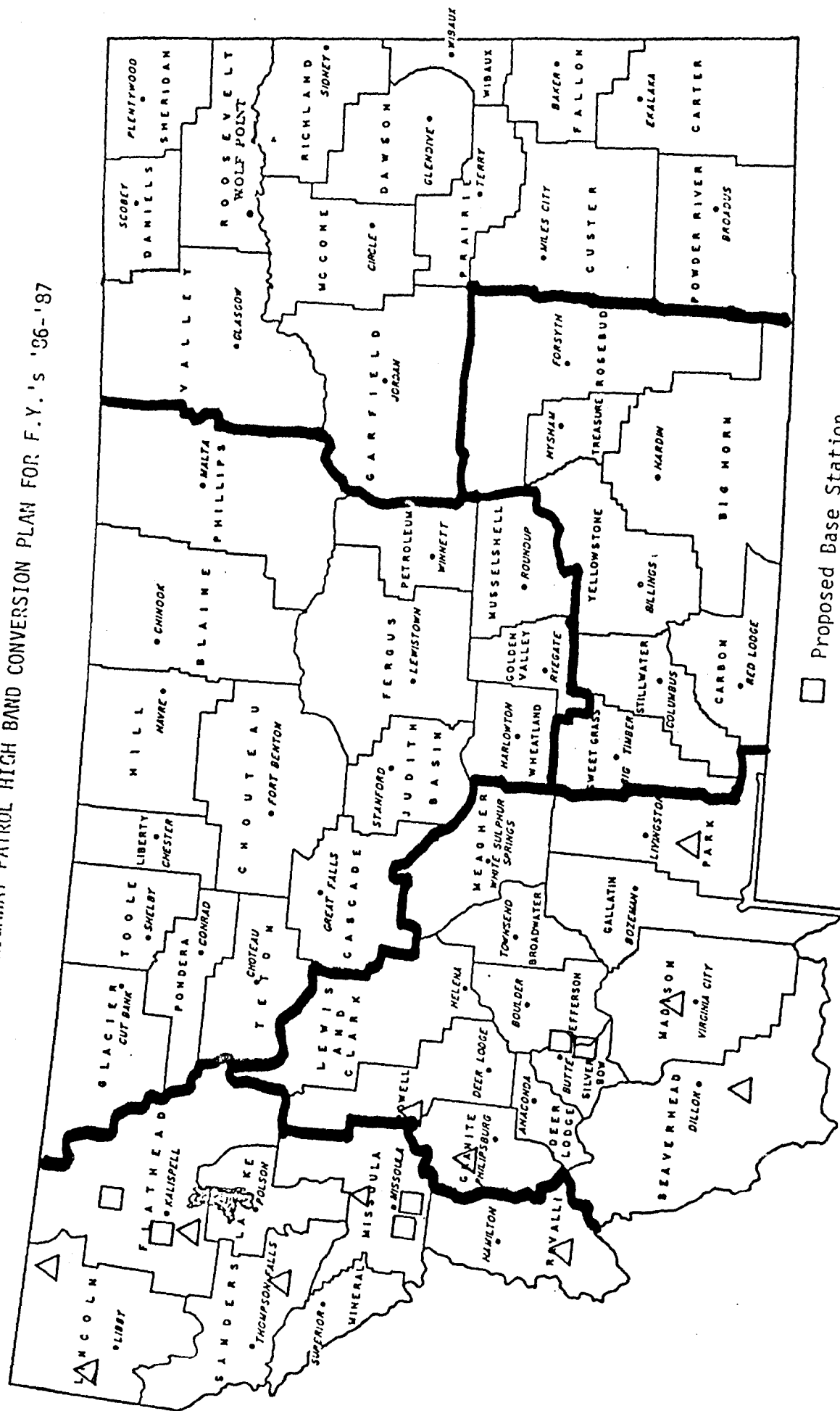
	100 ft. TX Line	112
	Miscel.	100
XL Heights	VHF Base Station	2,300
	UHF Base Station	2,500
	VHF Antenna	240
	UHF Antenna	150
	100 ft. TX Line	112
	Miscel.	100
		<u>\$ 74,400</u>
Helena	Control Console	20,000
Missoula	Control Console	20,000
Helena	Test Equipment	<u>10,000</u>
	TOTAL	\$124,000
10	Pager Units	\$ 3,000
20	Hand Held Portables	20,000
5	Towers	10,000
3	Interface Panels	4,500
60	Mobile Units	144,900
	Miscellaneous Hardware	<u>5,000</u>
	Total	187,400
		<u>124,400</u>
	GRAND TOTAL	\$311,800

CURRENT HIGHWAY PATROL HIGH BAND CONVERSION PLAN FOR F.Y.'s '84-'85



- Proposed Base Station
- Current Base Station
- △ Proposed Mobile Relay
- ▲ Current Mobile Relay
- ↔ Telephone Control Link
- ◇ UHF Control Link

HIGHWAY PATROL HIGH BAND CONVERSION PLAN FOR F.Y.'s '86-'87



- Proposed Base Station
- △ Proposed Mobile Relay Station

Department of State Lands

Forestry Division

	<u>F.Y. '86</u>	<u>F.Y. '87</u>	<u>Total</u>
<u>F.T.E.'s</u>			
<u>Rentals</u>			
<u>Installation and Maintenance</u>			
<u>Equipment Purchases:</u>			
4 base stations HB	\$ 4,800.00	\$14,500.00	\$ 19,300.00
36 portable radios HB	\$20,640.00	\$28,310.00	\$ 48,950.00
28 mobile radios HB	\$33,200.00	\$19,600.00	\$ 52,800.00
5 repeater/mobile relays HB	\$18,500.00	\$10,500.00	\$ 29,000.00
misc. equipment HB	\$18,250.00	\$10,300.00	\$ 28,550.00
		Total	\$178,600.00

The Fire Suppression Bureau of the Forestry Division is expanding coverage areas and improving existing communications capabilities of their existing statewide high-band system. \$30,500 of the F.Y.'86 proposed budget will be used by the Fire Suppression Bureau along with \$19,100 of the F.Y.'87 monies.

The Kalispell field office needs \$17,390 in F.Y.'86 and \$19,100 in F.Y.'87 for mostly replacement of current older equipment and expanded coverage in the region.

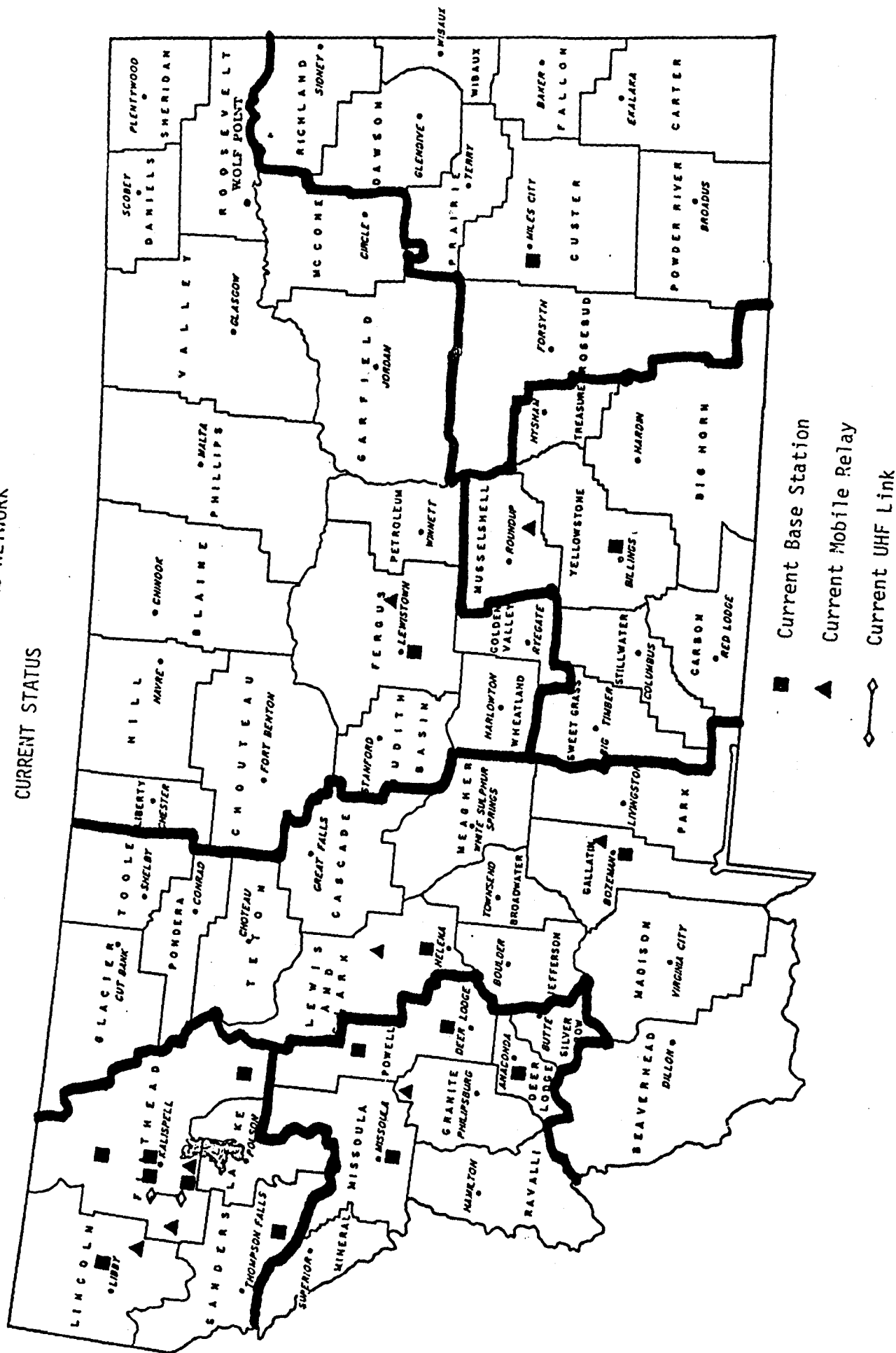
The Missoula region will use \$30,500 in F.Y.'86 and \$22,900 in F.Y.'87 to replace old HB equipment and improve some coverage in the Clearwater and Anaconda units.

The Helena area will use \$4,100 F.Y.'86 funds and \$11,000 in F.Y.'87 to replace old radios and extend coverage in Beaverhead, Madison, and southern Jefferson Counties for fire suppression purposes.

The Lewistown region needs \$7,400 in F.Y.'86 and \$3,610 in F.Y.'87 to improve NELO's support to the 10 counties in the Cooperative Fire Control Program.

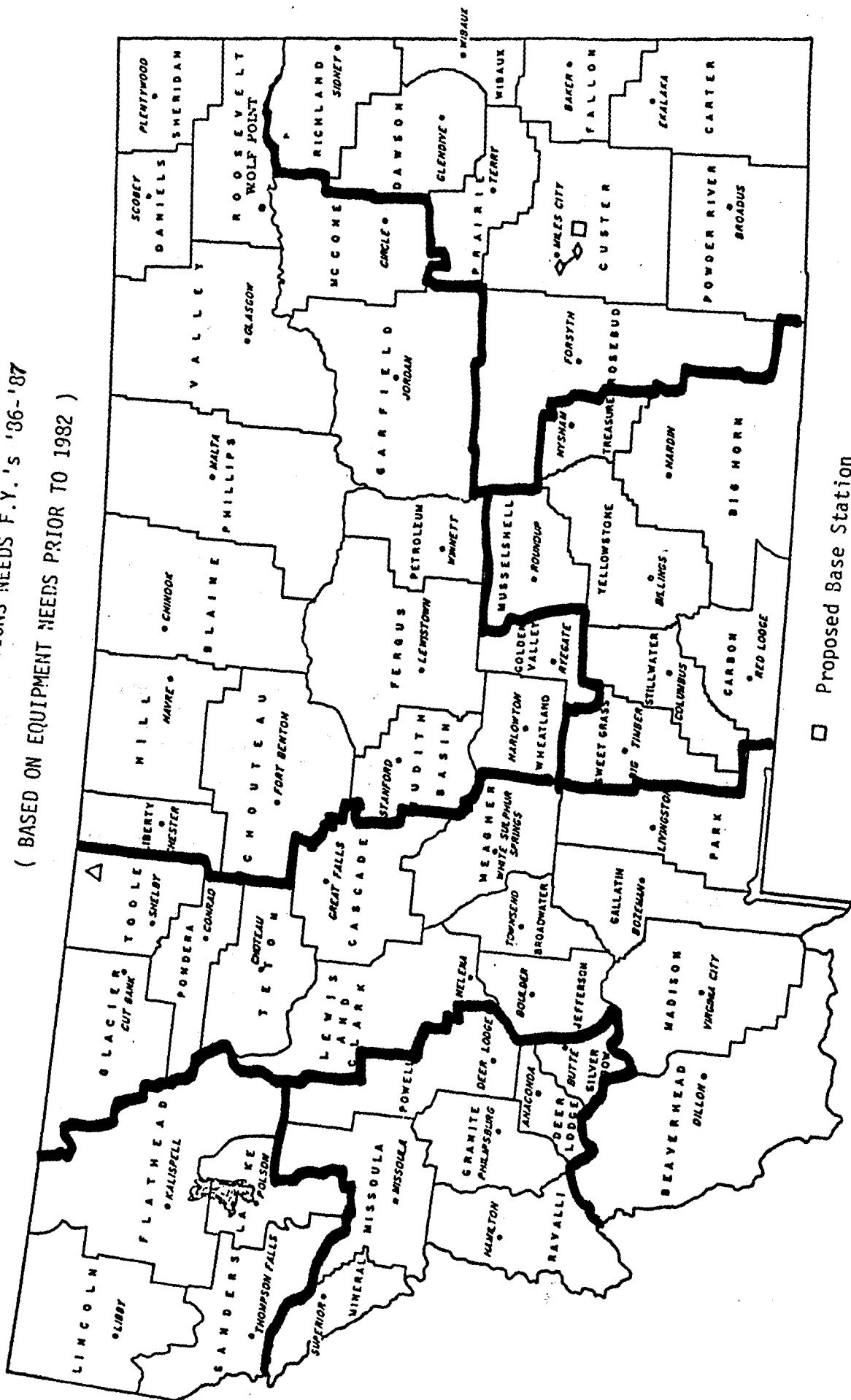
The remaining biennium requested monies will be used to upgrade and replace old equipment in the Miles City region and develop a mobile relay system in the northern portion of the area for fire suppression activities.

CURRENT STATUS

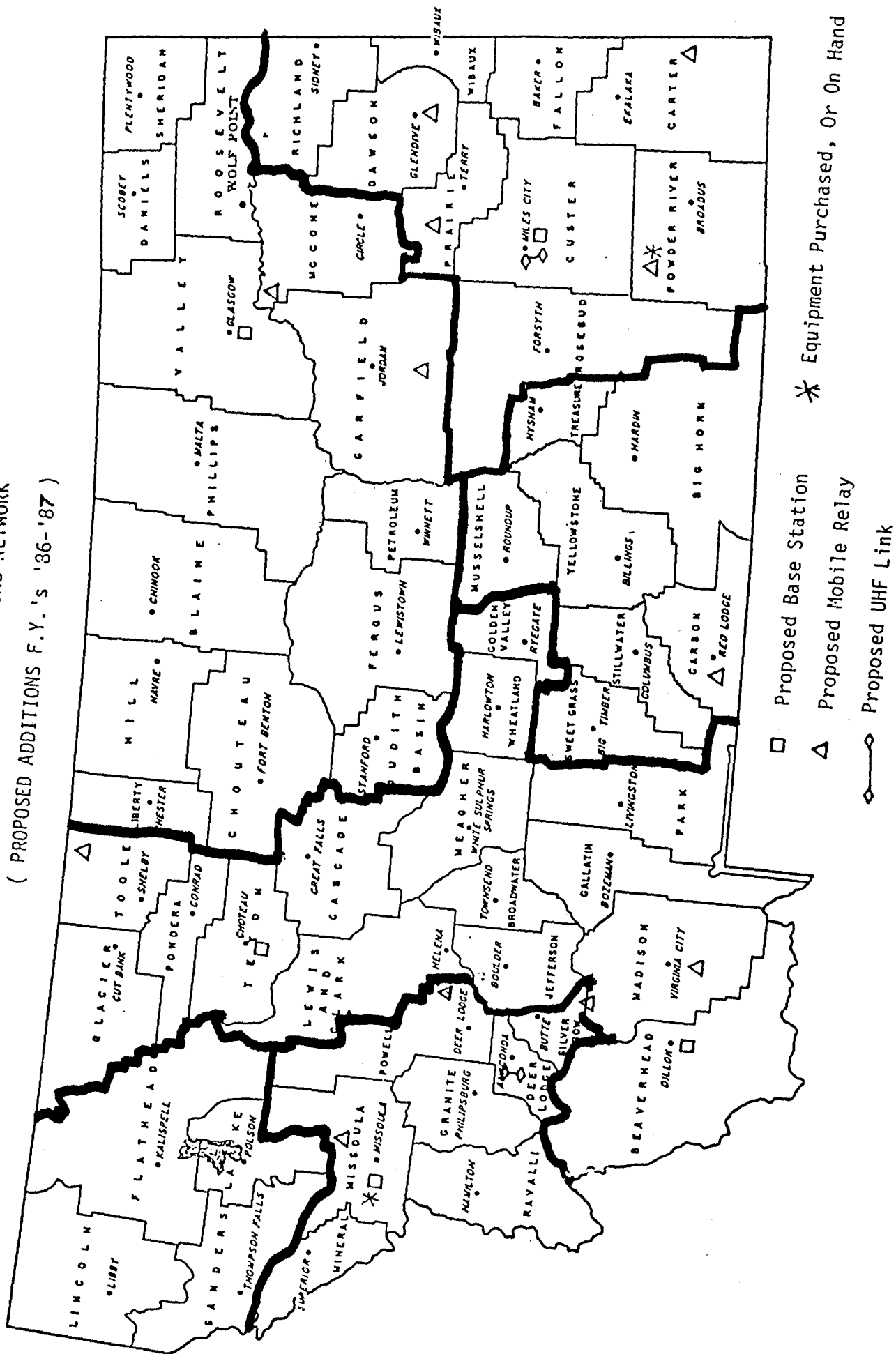


LANDS DEPARTMENT

PROPOSED COMMUNICATIONS NEEDS F.Y.'s '86-'87
(BASED ON EQUIPMENT NEEDS PRIOR TO 1982)



(PROPOSED ADDITIONS F.Y.'s '86-'87)



Department of Livestock

	<u>F.Y. '86</u>	<u>F.Y. '87</u>	<u>Total</u>
<u>F.T.E.'s</u>			
<u>Rentals</u>			
<u>Installation and Maintenance</u>	\$ 5,013.00	\$ 5,013.00	\$10,026.00
<u>Equipment Purchases:</u>			
2 helicopter radios	\$ 2,200.00	\$ 2,200.00	<u>\$ 4,400.00</u>
		Total	\$14,426.00

The Department of Livestock has 25 mobile units equipped with both low-band radios and high-band radios. As each officer in the Brands Enforcement Division must cover three counties on the average, they need both low and high-band capabilities to communicate with the counties that have converted to high-band and those still remaining on low-band. These officers use the Highway Patrol's mobile relays when necessary. The low-band radios can be dropped when those local agencies that the officers need to communicate with convert over to high-band frequencies.

Department of Military Affairs

	<u>F.Y. '86</u>	<u>F.Y. '87</u>	<u>Total</u>
Army National Guard Headquarters <u>F.T.E.'s</u>			
<u>Rentals</u>			
Installation & Maintenance	\$ 2,500.00	\$ 2,500.00	\$ 5,000.00
<u>Equipment Purchases</u>		\$ 6,000.00	<u>\$ 6,000.00</u>
D. & E. S. Division <u>F.T.E.'s</u>			
<u>Rentals</u>			
Installation & Maintenance	\$ 1,500.00	\$ 1,500.00	\$ 3,000.00
<u>Equipment Purchases</u>	\$ 3,500.00	\$ 3,500.00	<u>\$ 7,000.00</u>
		Total	<u>\$21,000.00</u>

Both the Installation and Maintenance and the Equipment Purchases budgets for the Disaster and Emergency Services Division are half federal monies and half state general fund monies. The \$6,000 for equipment purchases in F.Y. '87 for the Army National Guard Headquarters is for one 200 WATT HF single sideband base station. The equipment purchases for Disaster and Emergency Services in F.Y. '86 and '87 are for radio supplies and minor equipment, not for inventoriable items.

Public Services Commission

	<u>F.Y. '86</u>	<u>F.Y. '87</u>	<u>Total</u>
<u>F.T.E.'s</u>			
<u>Rentals</u>			
<u>Installation and Maintenance</u>	\$ 800.00	\$ 350.00	\$1,150.00
<u>Equipment Purchases</u>			
2 mobile radios	\$2,000.00		\$2,000.00
4 mobile radios	federally funded		
3 mobile radios			federally funded
		Total	<u>\$3,150.00</u>

The two new mobile radios in FY86 are dependent upon the approval of two new F.T.E.'s and automobiles. The four mobile radios in FY86 and the three mobile radios in FY87 are being purchased by federal funds.

Department of Revenue

	<u>F.Y. '86</u>	<u>F.Y. '87</u>	<u>Total</u>
<u>F.T.E.'s</u>			
<u>Rentals</u>			
<u>Installation & Maintenance</u>	\$ 226.00	\$ 226.00	\$ 452.00
<u>Equipment Purchases</u>			
		Total	<u>\$ 452.00</u>

The Revenue Department is currently using fifteen low-band radios. They have not requested high-band equipment as they can still communicate with the local law enforcement agencies; however, as more and more local law enforcement agencies convert to high-band and drop their low-band capabilities it will dictate that the Revenue Officers and Medicaid Fraud Officers do the same.

University System

	<u>F.Y. '86</u>	<u>F.Y. '87</u>	<u>Total</u>
Montana State University			
<u>F.T.E.'s</u>			
<u>Rentals</u>			
<u>Installation and Maintenance</u>			
<u>Equipment Purchases:</u>			
4 Portable radios HB		\$4,000.00	\$ 4,000.00
Eastern Montana College			
<u>F.T.E.'s</u>			
<u>Rentals</u>			
<u>Installation and Maintenance</u>			
<u>Equipment Purchases:</u>			
4 Portable radios HB	\$4,000.00		\$ 4,000.00
Northern Montana College			
<u>F.T.E.'s</u>			
<u>Rentals</u>			
<u>Installation and Maintenance</u>			
<u>Equipment Purchases:</u>			
3 Pagers HB	\$ 400.00	\$ 200.00	\$ 600.00
2 Veh. mob. radios HB	\$1,000.00	\$1,000.00	\$ 2,000.00
2 Hand held radios HB	\$1,000.00	\$1,000.00	\$ 2,000.00
Western Montana College			
<u>F.T.E.'s</u>			
<u>Rentals</u>			
<u>Installation and Maintenance</u>			
<u>Equipment Purchases:</u>			
2 Base stations HB	\$4,500.00		\$ 4,500.00
4 Veh. mob. radios HB	\$1,000.00	\$3,000.00	\$ 4,000.00
4 Portable radios HB		\$4,000.00	\$ 4,000.00
University of Montana			
<u>F.T.E.'s</u>			
<u>Rentals</u>			
<u>Installation and Maintenance</u>			
<u>Equipment Purchases:</u>			
1 Veh. mob. radio HB	\$1,000.00		\$ 1,000.00
5 Portable radios HB	\$1,000.00		\$ 1,000.00
1 Remote control radio HB	\$ 500.00		\$ 500.00
10 Pagers HB	\$2,000.00		\$ 2,000.00
Montana Tech			
<u>F.T.E.'s</u>			
<u>Rentals</u>			
<u>Installation and Maintenance</u>			
<u>Equipment Purchases:</u>			
1 Hand held radio HB		\$1,000.00	\$ 1,000.00
Biennium Total			\$30,600.00

The portable radios for Montana State University are for the student security group and to replace old equipment. They plan two for each of these categories (student security and replacement group).

Pending sufficient funding the portable radios for Eastern Montana College will be distributed as such: three for the Physical Plant Dept. and one for the Security Patrol.

Additional pagers are needed for new personnel in Northern's Physical Plant Department. Additional mobile and portable items needed for improved physical plant communications capabilities.

The radio equipment requests for Western Montana College are for the Security and Maintenance Departments and for communications with the Birch Creek Outdoor Education Campus which should be complete by late summer 1985.

The University of Montana's radio equipment requests break down as follows: one base station, three vehicular mobile radios, eleven portable radios, and two remote control stations are for the Security Patrol; ten portable radios, four remote control stations, and ten pagers are for the Physical Plant Department; and one remote control stations for the Yellow Bay Biological Station.

Montana Tech intends to buy one new hand held radio (HB) in FY 87 for physical plant personnel. They contract out their security needs.

APPENDIX B

STATE OF MONTANA
LAND-MOBILE RADIO FREQUENCIES
POLICIES AND PROCEDURES

- I. Purpose: To provide guidelines for the effective management of high-band (VHF) frequencies in use by Montana Public Safety agencies and to provide methods for developing efficient use of the Public Safety frequency spectrum.
- II. Scope: The Land Mobile Radio Plan concerns the effective management and efficient use of Public Safety frequencies in Montana. The Plan sets the guidelines for frequency allocations for Public Safety Services as defined in Section 90 of the Federal Communications Commission Rules and Regulations: Local Government Radio Service, Section 90.17; Police Radio Service, Section 90.19; Fire Radio Service, Section 90.21; and Subpart C, Special Emergency Radio Service.
- III. Responsibilities:
- A. The Federal Communications Commission (FCC) is the final approving authority for Public Safety applications.
- B. The Department of Administration, Telecommunications Bureau has the responsibility for coordinating Public Safety frequency use in Montana. Through the Association of Public Safety Communications Officers, (APCO) the Telecommunications Bureau recommends to the FCC the conditions of authorization for each Public Safety applicant.
- IV. Emergency Mutual Aid Frequencies

The State of Montana has been authorized by the FCC to operate four mutual aid radio networks to provide common channel access to all public agencies in Montana. In the three functional areas of law enforcement, local government and emergency medical services (EMS), the State has established guidelines for use of the mutual aid channels.

A. Mutual Aid Channels

The Department of Administration is the FCC licensee for the mutual aid frequencies listed below. Users need only secure a State Permit to operate on these frequencies.

1. 153.905 MHz - Interagency/Intergovernmental
2. 154.070 MHz - Fire Service
3. 155.475 MHz - National Law Enforcement
4. 155.790 MHz - Statewide Law Enforcement Interagency

Permits may be requested from the Telecommunications Bureau, Room 222, Mitchell Building, Helena, Montana, 59620.

B. Interagency/Intergovernmental

153.905 MHz - This frequency is the mutual aid frequency that all two-way radio stations authorized to communicate in the Public Safety and Special Emergency Radio Services are authorized to operate on after a permit has been issued to the user by the Telecommunications Bureau. Though this frequency is designated by the Federal Communications Commission as a mobile only frequency it may be used in base stations on a secondary basis in section 173(h), part 90, chapter 1, title 47, of the Code of Federal Regulations. In most cases this base station use will be secondary to the same organizations mobile units and used only in emergency situations; therefore, it should be compatible. We recommend that all Public Safety and Special Emergency Radio Service users, utilizing high-band frequencies get a permit and use this frequency.

C. Law Enforcement

155.475 MHz - This frequency is regulated by the Federal Communications Commission as a nationwide law enforcement emergency within the parameters of a state plan. Our plan designates this as our law enforcement mutual aid frequency to be used in emergency situations only, and we recommend that all law enforcement agencies get a permit and use this frequency, if they are operating on high-band frequencies. This frequency may be used in base stations as well as in mobile units.

155.790 MHz - This frequency is the statewide law enforcement frequency for Montana. This frequency can be used as an inter-service common channel between all law enforcement agencies in the state. Routing inter-agency communications are not authorized on this channel. It is designed for the sheriffs to speak to the police chief, the campus security, the Highway Patrol, the Fish, Wildlife and Parks enforcement officer and all other law enforcement entities. We recommend that all law enforcement agencies authorized to communicate in the Police Radio Service and operating on high-band frequencies, get a permit for this inter-agency channel and use it. This frequency also is for use in base stations as well as mobile units.

D. Fire

154.070 MHz - This frequency is the statewide fire coordinations mutual aid frequency for inter-agency on site coordination of fire fighting resources. All agencies authorized to communicate in the Fire radio service are advised to use this frequency after securing a permit from the Telecommunications Bureau. Like 153.905 MHz, 154.070 MHz is a mobile only frequency that may be used in base stations on a secondary basis to the mobile use (Section 173(h), Part 90, Chapter 1, Title 47).

E. Emergency Medical Services Frequencies Plan

155.280 MHz - This frequency is a channel designated only for use between ambulances and hospitals. It is so designated statewide. It should not be used for dispatching of personnel or paging.

155.325 MHz - This frequency is for Emergency Medical Services (EMS) Region 2 (see Annex 1) dispatch communications; ambulance to dispatch center and paging of EMS personnel only. The paging here is only for personnel that are quick response personnel to the scene of an accident of injury.

155.340 MHz - This frequency is reserved for ambulance to hospital communications on a regional level. It may be put in a mobile relay site a higher elevation or greater power to communicate with ambulances that are approaching from outlying areas. The 155.280 MHz is reserved for local ambulances.

155.385 MHz This frequency is for EMS Region 1 (Western) and Region 3 (Eastern) dispatch communications; ambulance to hospital and paging of EMS personnel only. The paging here is only for personnel that are quick response personnel to the scene of an accident of injury.

To use the frequencies listed below applications must be made to the Federal Communications Commission. These four frequencies are designated for use in both base stations and mobile radio units.

155.280 MHz Statewide for Local Ambulance to Hospital
155.325 MHz Central Region Dispatch Communications and Paging
155.340 MHz Statewide for regional Ambulance to Hospital
155.385 MHz Eastern and Western Regions Dispatch Communications
 and Paging

F. Search and Rescue

155.160 MHz - This frequency is to facilitate on-the-scene coordination of search and rescue operations, the Federal Communications Commission has designated 155.160 MHz as the national search and rescue frequency. The Special Emergency Radio Service frequency 155.160 MHz is in use in North Dakota, South Dakota, Wyoming, and Idaho.

155.220 MHz - This frequency is to be used as the primary frequency for all search and rescue operations in Montana. Additional frequencies should be requested as needed.

To use the frequencies listed below, applications must be made to the Federal Communications Commission. These two frequencies are designated for used in both base stations and mobile radio units.

155.160 MHz National Search and Rescue, on site coordination
155.220 MHz Statewide Search and Rescue Primary Channel

155.160 MHz, 155.200 MHz, 155.475 MHz, 155.790 MHz, 154.070 MHz, 153.905 MHz, 155.325 MHz, and 155.385 MHz should be used with open squelch. 155.340 MHz and 155.280 MHz should be used with the appropriate Dual Tone Multi-Frequency (DTMF) code as per the state plan (see Annex 2).

V. Mutual Aid Frequency Management and Administration

A. Management:

The mutual aid frequency management program relies on shared and cooperative use of all frequencies in the Public Safety and Special Emergency Radio Services. To obtain this goal the State of Montana will provide access to the State Mutual Aid Network on a controlled basis to allow full utilization of each mutual aid frequency by regulating access while encouraging full participation of Public Safety and Special Emergency agencies on a statewide basis. Access will be controlled to insure adequate frequency loading in a specific area and to insure that all Public Safety and Special Emergency agencies have at their disposal the full resources available to protect the safety and/or property of the people of Montana.

B. Administration:

State emergency frequencies are administered by the Telecommunications Bureau, Department of Administration, located in the Sam W. Mitchell Building, Room 222, Helena, Montana, 59620. (406) 444-2586.

1. Procedure

Any public safety agency desiring to utilize a frequency licensed to the State of Montana will be required to enter into a cooperative agreement with the State of Montana and provide the following documentation:

- a. The Chairperson of the County Commissioners, Chief Executive of a Municipality, County Sheriff, City Chief of Police, City or County Fire Chief, DES Coordinator, or similar officer of an agency desiring use of a frequency will send an application for State Permit to the Telecommunications Bureau.
- b. The requesting agency will certify that it meets all eligibility requirements as specified by the Federal Communications Commission under Part 90, Section 90.17(a), 90.19(a), 90.21(a), and 90.421(a), (b), (c).
- c. The requesting user will provide a complete list of the radios using State emergency frequency(ies). The list shall include:

Base and Mobiles - Type, model and serial number of the radio with the number of channels in operation and each frequency or set of frequencies installed.

Hand Held Portables - Type, model and serial number of channels in operation and each frequency or set of frequencies installed.

- d. The agency will assure that these frequencies will be installed only in radios owned or exclusively controlled by the requesting agency and the equipment complies with all applicable F.C.C. Rules and Regulations, Volume 5, Part 90.
- e. The requesting agency will provide its assurance that it will comply with all applicable F.C.C. rules, regulations, Volume 5, Part 90, for the cooperative use of a State emergency frequency.

The State will provide each approved user with a cooperative agreement for use of the frequencies in question. The cooperative agreement for use of the frequencies will be signed by an authorized representative of the Telecommunications Bureau and the authorized agent of the requesting agency.

All applications submitted in accordance with these policies will be processed within 30 days.

2. Eligibility

Requesting agencies must meet the eligibility criteria for each frequency requested.

a. Police Emergency Frequency

- (1) The agency must be duly sworn and authorized to perform law enforcement duties as are established by State statutes and local ordinances with full police powers and responsibility for life and property in their jurisdictional area.
- (2) All law enforcement agencies requesting use of the police emergency frequencies, 155.475 MHz and 155.790 MHz in base, mobile or portable radios must provide a written statement demonstrating eligibility and assuring full compliance under F.C.C. Rules Sections 90.19(a) and 90.421 and State regulations pertaining to this agreement.

b. Interagency/Intergovernmental Emergency Frequency

- (1) The agency must be a county, city, town or similar political subdivision as established by State

statutes. The agency may submit applications on behalf of other entities providing public safety services within their jurisdiction (e.g. school bus contractors, search and rescue, wrecker service).

- (2) All applicants requesting use of the interagency/intergovernmental emergency frequency in base, mobile or portable radios must provide a written statement demonstrating eligibility under the applicable F.C.C. Rule Section, Part 90 and assuring full compliance with 90.421, and State regulations pertaining to this agreement.

c. Fire Emergency Frequency

- (1) The agency must be a county, city, town or similar political subdivision or persons or organization charged with specific fire protection activities as established by State statutes and/or local ordinances.
- (2) All fire protection agencies requesting use of the fire emergency frequency in base, mobile, and/or portable radios must provide a written statement demonstrating eligibility under F.C.C. Rule Section 90.21(a) and assuring full compliance with 90.421 and State regulations pertaining to this agreement.

VI. State Rules and Regulations

- A. No section of the State's land-mobile frequency policy or its subsequent procedure should be construed to imply that the State has the authority to assign or license a frequency currently licensed to the State of Montana, nor should this procedure be interpreted as providing the State with any regulatory power over these frequencies, other than those specific control functions the State is obligated to accept as a licensee.
- B. The following functions will be allowed when using State emergency frequencies provided said functions are included as an integral part of the approved cooperative agreement and its appendices;
 1. Emergency cross channel patch through a device approved by the Telecommunications Bureau.
 2. Emergency telephone patch through a device approved by the Telecommunications Bureau.
- C. All users must operate in total compliance existing F.C.C. rules and regulations and State of Montana rules, regulations, laws, and administrative policies.

- D. All agencies will confiscate all crystals or frequency elements for the frequencies authorized under its cooperative agreement when a radio is phased out of service or is no longer in the control of the agency. Under no circumstances will crystals or frequency elements be left in a radio no longer under the agency's control. The agency will provide written notification (to include the radio type, model number, and serial number) to the Telecommunications Bureau within 30 days of the radio being phased out of service or no longer in the control of the agency.
- E. If mobile radios or hand held portables authorized under cooperative agreements are transferred to a new vehicle, agency, or person, written notification of such transfer must be provided to the Telecommunications Bureau by the cooperating agency within three months of the date transfer.
- F. All agencies installing new radios using State Emergency Frequency will notify and receive approval from the Telecommunications Bureau prior to the radio being placed in service. The written notification shall include:
- Base and Mobiles - Type, model number and serial number of the radio together with the type and license number of the vehicle in which it is installed.
- Hand Held Portables - Type, model number and serial number of the radio, together with the name of the agency or person to whom the radio is assigned.
- G. Communications on State emergency frequencies are limited to the following:
1. Emergency communications between law enforcement agencies from various jurisdictions. (155.790 MHz)
 2. Emergency or administrative communications by itinerant law enforcement officials when away from their normal jurisdiction (155.790 MHz and 155.475 MHz).
 3. Command and control communications by supervisory personnel in situations where public safety agencies from multiple jurisdictions are responding to an emergency (152.905 MHz).
 4. Urgent administrative communications between public safety agencies where no other means of communication is readily available (153.905 MHz).
- H. Enforcement of all rules established for State emergency frequencies is essential if frequency usage is to be effective. All agencies are encouraged to report violations of established rules to the Telecommunications Bureau.

Reported violations will be reviewed by the Telecommunications Bureau and a warning letter sent to the manager of the offending agency, outlining all pertinent details of the reported violations. The agency will also be advised that its cooperative agreement is subject to cancellation, as proper operation was one of the commitments made prior to obtaining permission to using the frequency. Warning letters will require a written reply to the Telecommunications Bureau within ten days of receipt, detailing what action the agency has taken to prevent future violations.

If an agency repeatedly violates the rules established for use of State emergency frequencies it's cooperative agreement will be cancelled.

- I. Authorization covered under this policy can be immediately terminated upon verification of any infraction of the State of Federal Rules or Regulations with a copy of the cooperative agreement cancellation sent to the F.C.C. Enforcement Division. Upon written notification from the Telecommunications Bureau terminating its authorizations, the agency will cease all operations on State emergency frequencies and remove the frequency elements from their radios.

VII. Frequency Assignment

Frequency assignments are made based on information made available from the F.C.C., requests for frequency coordination, and user/vendor input. Frequencies assigned to the land mobile radio systems in the Public Safety Radio Service are available on a shared basis only and cannot be assigned for the exclusive use of any licensee.

Frequencies are assigned to reduce interference and to make the most effective use of the available spectrum. Stations receiving or causing harmful interference are expected to cooperate and resolve problems by mutually satisfactory arrangements. If the licensees are unable to do so, the Federal Communications Commission may impose restrictions including specifying the transmitter power, antenna height, or area or hours of operations of the stations concerned.

Frequency coordination or an engineering study is required by F.C.C. Rules as part of the applications process. (Section 90.175 Frequency Coordination Requirements.) Frequency coordination is performed in accordance with Part III of the Associated Public Safety Communications Officers Frequency Coordinations System Manual.

VIII. Tone Code Squelch Assignments

Continuous Tone Coded Squelch Signaling (CTCSS) will be employed to protect high-band systems from co-channel interference. CTCSS prevents the inadvertent access to a radio receiver by a co-channel user.

The tone code assignments by county in Hz are as follows:

Beaverhead	146.2	McCone	151.4
Big Horn	107.2	Meagher.	107.2
Blaine	114.8	Mineral.	156.7
Broadwater	100.0	Missoula	146.2
Carbon	114.8	Musselshell.	131.8
Carter	114.8	Park	114.8
Cascade.	141.3	Petroleum.	100.0
Chouteau	131.8	Phillips	156.7
Custer	167.9	Pondera.	100.0
Daniels.	141.3	Powder River	156.7
Dawson	146.2	Powell	114.8
Deer Lodge	107.2	Prairie.	156.7
Fallon	100.0	Ravalli.	151.4
Fergus	162.2	Richland	114.8
Flathead	123.0	Roosevelt.	131.8
Gallatin	192.8	Rosebud.	151.4
Garfield	162.2	Sanders.	162.2
Glacier.	107.2	Sheridan	107.2
Golden Valley.	151.4	Silver Bow	100.0
Granite.	141.3	Stillwater	156.7
Hill	107.2	Sweet Grass.	162.2
Jefferson.	156.7	Teton.	151.4
Judith Basin	114.8	Toole.	162.2
Lake	107.2	Treasure	162.2
Lewis and Clark.	203.5	Valley	162.2
Liberty.	156.7	Wheatland.	167.9
Lincoln.	151.4	Wibaux	107.2
Madison.	167.9	Yellowstone.	146.2

CTCSS assignments pertain to those frequencies assigned to the applicants. Mutual aid frequencies will not be tone guarded. Additional tones are available for use by any Public Safety Agency. Coordination for a specific tone through the Telecommunications Bureau will reduce the likelihood of harmful interference caused by distant co-channel stations.

IX. Interference Analysis

It is the goals of the State Radio Plan to allocate frequencies in such a way as to reduce interference while conserving spectrum. Several types of interference are described below. Each has a "technical fix" and should be assumed as necessary to effective system operations.

A. Definitions

Interference is either "harmful" or "nuisance". Harmful interference is defined as that which captures a receiver and thereby repeatedly interrupts or prevents communications.

Nuisance interference is not usually considered by the frequency coordinator during the interference analysis. Nuisance interference does not capture a receiver but can be heard and is therefore an

annoying, unpleasant nuisance. This type of interference is easily resolved by the use of continuous tone or digitally coded squelch.

All new systems should be installed with tone squelch as assigned in Section VI. Existing systems receiving such nuisance interference should be retrofitted with squelch controls as assigned in Section VI.

B. Categories of Interference:

1. Co-channel interference results from unwanted signals on an assigned frequency. Such signals usually are the result of either unforeseen propagation characteristics of a signal, causing it to be received by another user, or by an unforeseen propagation phenomena causing users assigned to the same channel to interfere.
2. Adjacent-channel interferences is caused by signals near the assigned frequency which have sufficient signal strength to overcome the selectivity characteristic of the receiver. These signals are most often the result of geographic proximity of an assigned adjacent channel transmitter. Adjacent channel interference is usually limited to co-site situations or those in which transceivers are located within a few miles of each other.
3. Intermodulation interference is the result of mixing together of two frequencies of their harmonics. This type of interference can often be recognized by the fact that the interference may cease in the middle of a conversation when one of the attending transmitters ceases transmitting.

C. Interference Reports

The State of Montana has no jurisdiction over Public Safety Radio Stations operating in Montana other than State agencies. A general rule to follow in interference resolution is: "the last stations on the air corrects the problem". Reports of harmful interference should be filed directly with the Federal Communications Commission, Seattle Regional Office (206) 442-7653. The Telecommunications Bureau will provide technical assistance, but can not file the report for the aggrieved party.

X. Statewide Frequency Allocation

- A. Purpose: The purpose of frequency allocation is to provide for the future systematic planning and assignment of high-band frequencies in the Police and Local Government Radio Services to State and local government entities in Montana.
- B. General: Each county is assigned a set of high-band frequencies in the Police Radio and Local Government frequency spectrums. Frequency A is a transmit frequency for a high power mobile relay or

base station. Frequency B is the Base-mobile simplex frequency for a low power base for localized transmission. Frequency B will be formally assigned to only those system of 40 watts or less, and unity gain antennas. Frequency B can be assigned to a county as its secondary channel and the primary channel for a municipality or other tax district within the county.

A mobile only frequency is assigned to each county as a mobile relay access frequency from a fixed-base control or mobile units. This would be called Frequency C.

The plan will remain valid as long as it is recognized by our neighboring states' coordinators. Also, it is a flexible plan that will change with needs and circumstances.

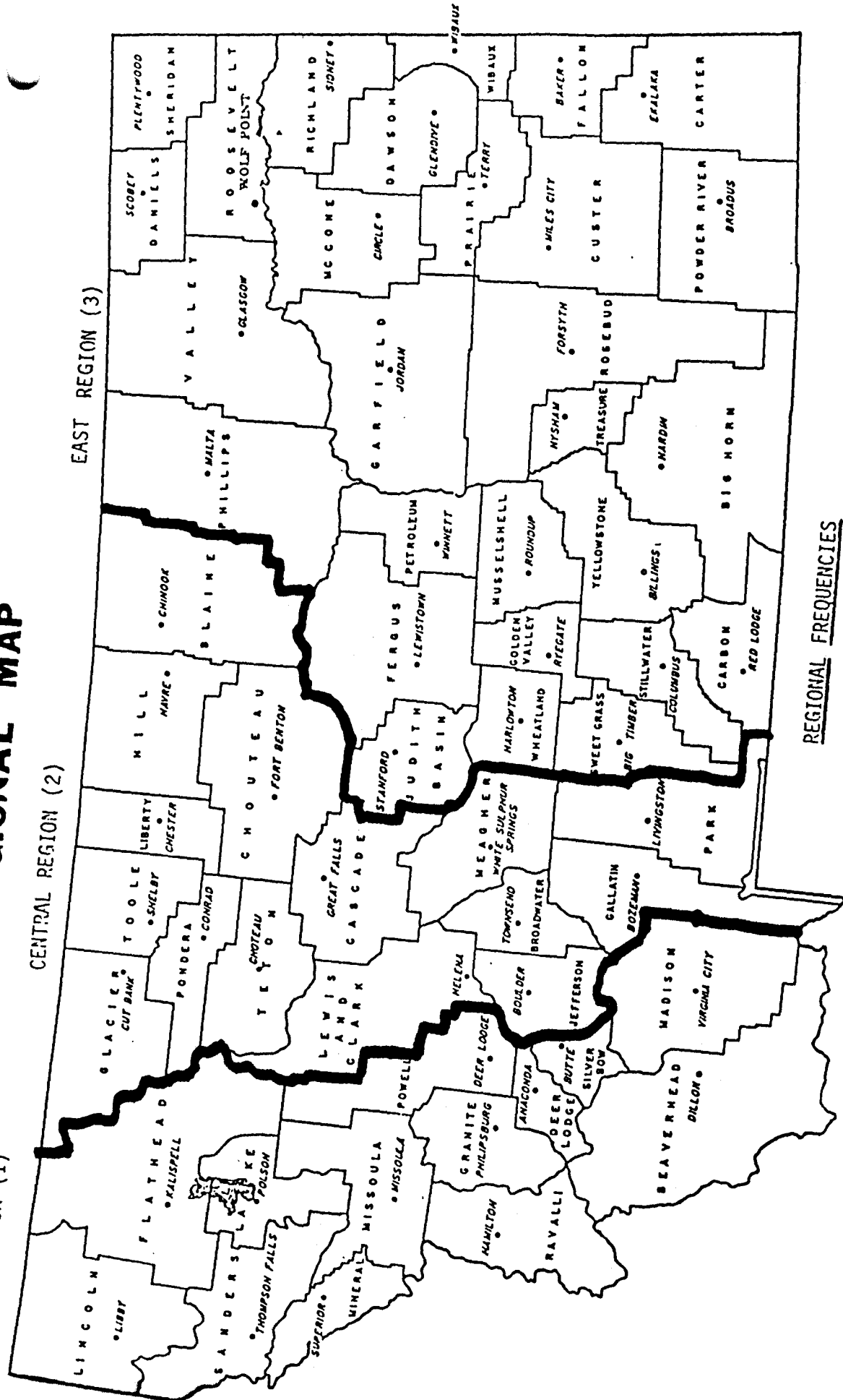
Annex 3 and Annex 4 show frequencies that have been planned for the indicated counties in the Police Radio Service and in the Local Government Radio Service. The counties left blank currently have licensed frequencies in the respective radio services and thus none have been reserved for those counties. Other frequencies are available for all 56 counties in both radio services as needed and justified.

EMS REGIONAL MAP

WEST REGION (1)

CENTRAL REGION (2)

EAST REGION (3)



REGIONAL FREQUENCIES

- Ambulance to Hospital Regional Frequencies
- 155.385 MHz East and West Regional Frequency
 - 155.325 MHz Central Regional Frequency
 - 155.280 MHz Ambulance to Hospital Statewide

EMERGENCY MEDICAL SERVICES DTMF CODE ASSIGNMENT

	DTMF CODE
<u>AREA I</u>	
St. John's Lutheran Hospital, Libby	010
North Valley Hospital, Whitefish	020
Kalispell Regional Hospital, Kalispell	030
St. Joseph Hospital, Polson	040
St. Luke Community Hospital, Ronan	050
Clark Fork Valley Hospital, Plains	060
Holy Family Hospital, St. Ignatius	070
<u>AREA II</u>	
Granite County Hospital, Phillipsburg	075
Communications Dispatch Center, Missoula	0911
St. Patrick's Hospital, Missoula	078
Missoula Community Hospital, Missoula	079
Seeley Lake Clinic, Seeley Lake	080
Mineral County Hospital, Superior	081
Daly Memorial Hospital, Hamilton	082
Powell County Memorial Hospital, Deer Lodge	083
Missoula General Hospital, Missoula	084
<u>AREA III</u>	
Madison Valley Hospital, Ennis	183
St. James County Hospital, Butte	184
Silver Bow General Hospital, Butte	185
Community Hospital of Anaconda	186
Barret Hospital of Dillon	187
Galen State Hospital, Galen	189
Ruby Valley Hospital, Sheridan	190
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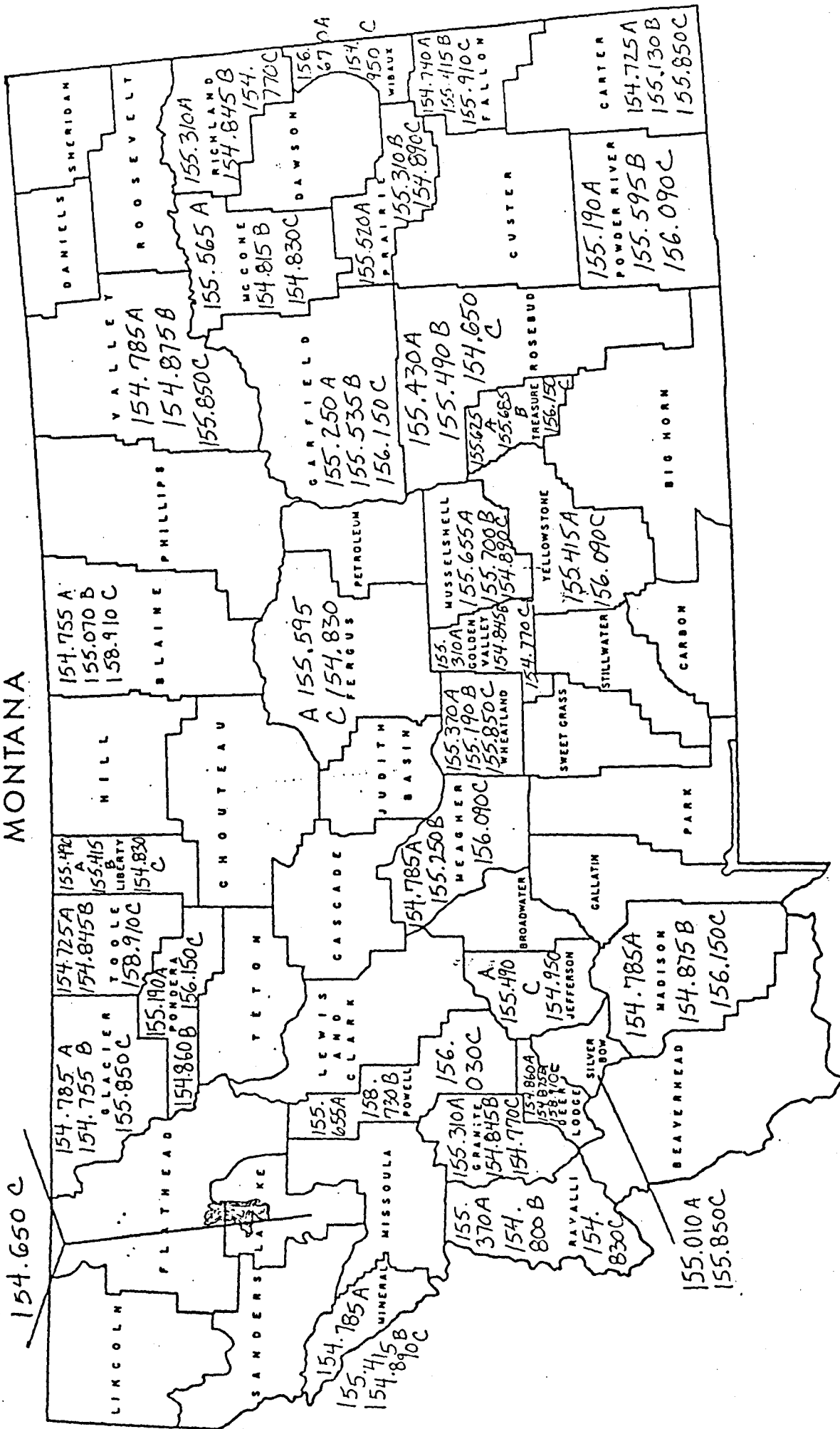
Trinity Hospital, Wolf Point

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