



27 maps at this scale to cover the state. As we had no digitizer of our own we contracted with Computer Research, Inc., in Arvada, Colorado and had them ditize the following —

- Township corners
- Administrative areas - counties, cities, Indian Reservations, national forest, wildlife refugees
- Transportation Network-Highways, railroad and airports
- Utility Networks - Pipelines and powerlines

### System Expansion

As the years passed, we began to add sizeable computer files. In cooperation with US Geological Survey, we built a central water quality data storage and retrieval system which today houses a large share of Montana's water quality data including files from the state's Water Quality Bureau, the School of Mines & Geology and from the USGS. In cooperation with the Montana School of Mines, we added most of the state's wells in mid 1970's. Land ownership was added by encoding all state-owned land into the system. This was followed by encoding most federal land ownership. We had hoped to do this jointly with the Bureau of Land Management. However, there was little interest at the time but we did obtain the entire 1:120,720 color quadrangles map series from BLM and coded all federal parcels from the surface ownership edition. This was followed by adding the mineral ownership both state and federal in 1976. In 1977, we began working with the Air Quality Bureau of the Department of Health and began to add air quality data to the system.

One of our largest state agencies, the Department of Revenue, became interested in our mapping capabilities in the mid 1970's. They had begun to build a state land appraisal system and without our knowledge had manually digitized under contract all section corners in the state but had no way of knowing whether the corners were accurately located. It was about 1974 when the consultant observed our computer mapping capability and inquired whether we could map several townships as a demonstration. We did this and found that virtually every township in the state, had digitizing errors. Since that time, we have provided 8 - 10,000 computer drawn maps at the township level for the Department of Revenue. Today, we have a section file which is initially clean and accurate for perhaps, 50% of the state.

I mentioned that our Division's computer operation was entirely by batch mode in the early 1970's. The state acquired an IBM 360, Model 40 in 1970, upgraded to a 370-145 in 1973 and the present Model 158 was installed in 1975. We will convert to an IBM 3033 this Fall. Our Division acquired the first terminal, IBM 2741 in 1970 and we are currently utilizing an IBM 3278.

With the development of our graphics system in 1972, we began to feel a need for a graphics terminal. We added a Tektronix 4014, a small Tektronix flat bed plotter and a small microcomputer in 1976. Our graphics equipment is handled in remote batch mode on the 370 and is interactive on the microcomputer. The state recently switched to TSO and we hope to test our graphics equipment in an interactive mode later this year.

### State Procurement Procedures

In Montana, we have a central data processing facility which serves all agencies. The agencies have little or no voice in the selection of the state's mainframe computer. However, most do have terminals and the number of these has been growing rapidly in the last 5 years. At present, approximately 400 terminals are tied to the state's mainframe.

### Present Applications

The largest ongoing computer mapping application that we have, has been the Department of Revenue township mapping program. In the last 4 or 5 years, we have computer drawn perhaps 8-10,000 maps for the Property Assessment Division of the Department of Revenue. We map by computer at a scale of 1:24,000 all townships and sections on a county-by-county basis. These maps are batched from 2-300 at a time. They are used by the Department of Revenue to correct the section corner master file. This file is, in turn, used as base data for all private parcels in the state. The Department of Revenue is spending a large amount of money to locate accurately, each section in the state and our system is ensuring that accuracy.

A second application is the computer mapping for the US Forest Service of all state-owned lands within selected counties. The maps are produced for the Geometronics Division of the US Forest Service which uses them to identify state ownership for the standard 1:126,720 such maps on a forest-by-forest basis.

A third mapping program has been furnishing water quality interval maps. These maps were developed for the State Department of Health's Water Quality Bureau. Selected water quality perimeters such as iron, phosphates and nitrates are located and plotted at a scale of 1:1,000,000 for the entire state. State and county boundaries are included.