LAND OWNED BY FVCC

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PRESENTED TO: BOB BEALL AND CLASS
ABSTRACT

The parcel of land which I chose for my project is located in the corner directly East of the present college campus, and Grandview drive. The parcel is approximately 36 acres in size and lies in the South East ¼ of section 31 Township 29 N Range 21 W PPM.

The Instrument used to complete this project was a Thales Mobile Mapper CE accurate within 1-5 meters. The programs used to create the map were provided by FVCC. The reason for this map is to put the knowledge learned in class to practical use and to display our work and knowledge to future prospective employers.

The information used in this project was taken from many different sources and is cited in the following pages.
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INTRODUCTION

The objective of this project is to map the 36 acres of land to the east of the FVCC campus, which is located directly east of the FVCC’s logger’s sports arena. The college has a parcel of land that adjoins the present campus. I plan to map out this parcel with a mobile mapping device and create a map, which would aid any one interested in exploring, or buying the property.

The reason for this map is to aid any person, which does not have professional experience, to find and locate the boundaries of the land. Many people know it is there, but they have no idea of where the actual boundaries and extent of those boundaries lie.

I am going to map all the corner property pins and give detailed description of where they are located, as well as GPS coordinates so any one with a GPS unit can find them. I will also map any pins that lie on the boundary of the property. I will map any other significant land marker of importance. I will try to find any thing of significance, such as any large rocks or a certain trees to help people find those points on the ground.

MATERIALS AND METHODS

To begin my project I look up the location of my mapping site on the Flathead GIS site. I typed in the address and found the Section, Township and Range of the parcel of land. From that information I looked up all the C.O.S. numbers in the section. I took those numbers and looked up each C.O.S. until I found the one pertaining to my project. With the help of the C.O.S., #14935, took small hot pink flags out and mark the locations of each property corner. (See figure 5) The reason for this was to make sure that if it snowed, before I could map the project, I still would be able to find the positions of the corners.
Next I took a notebook and jotted down all the possible points of interest I might want to include in my data dictionary. The reason for this is to maximize the efficiency of the mapping process. If you collect an adequate amount of information you cut the time in the field in half.

I took the data from the field and created a data dictionary using GPS Pathfinder Office. It is a program that is made available to students by the college. Then I used a program called Electadata Converter to covert the data dictionary to a shape file. Once I had all my files in the appropriate format I loaded them into the Mobile Mapper CE.

The next phase in mapping was to plan for the best time to start my mapping project. There are certain times which are better then others, due to the geometry of the satellites, how many satellites are available and the range of PDOP’s. To obtain this information I used a feature in GPS Pathfinder Office called Quick plan. What Quick plan does is it takes information from a current almanac, downloaded off the internet, and it creates a graph with the number of SV’s (space vehicles) and the number of PDOP’s (Position Dilution Of Precision) at any give time through out the day. For the best mapping results the number of SV’s should be higher and their geometry should be well balanced. The PDOP’s should be lower then six. (See figure 1) There are settings in the MMCE you can set that will not allow you to map if the PDOP’s are higher then six, which I did set just in case.

After I had every thing in place I proceeded to map my project. The first thing to do when beginning a mapping project, this is very important, is to make sure the MMCE is collecting raw data. Raw data is the information used to differentially correct the mapping data when you use the post processing method. There are other methods, but I won’t go into that today.

I began on the southwest corner of the property. I set my MMCE to use averaging when collecting single points. This increases the accuracy of the positions on the map. I walked along each fence line collecting their positions and when I came to a property
corner, I would collect each position. I proceeded around my project in this fashion until it was complete. It took approximately two hours to finish my project. When all my data was collected in the field I stopped collecting raw data. The time it took to collect data was a sufficient time. The reason being, when mapping data GPS data you intend to differentially correct To get the best results possible one should have at least 45 minutes of raw data to work with.

With all my raw data and field data loaded into the computer I could proceed in creating a map. I used a program called Mobile Mapper office to upload my data into. Then I used CORS data, obtained from the site (http://www.ngs.noaa.gov/CORS/) to differentially correct my data. What this program does is take the CORS which is in the respective time slot as the raw data I collected and compares it to the raw data. Any errors it finds in the raw data file it automatically corrects, which gives me the best data for the map. (See figure 4)

RESULTS AND DISCUSSION

The map produced with the post processing came out quite well. There were some things I had to manually change. One of the things I had to correct manually was the fence running along side of the woods. The map showed the fence running just inside of the edge of the woods, when in reality it ran just along side it. To change this I used a program called Arc view, with this program I used the verities editor and change the location of the line.

With Arc view I could underlay the map with an orthophoto, which I obtained from the Montana State Library. (http://nris.state.mt.us/). (See figure 3). This resulted in a map that would be easy to follow and less confusing to the average viewer. As you can see on the left hand side of the map it shows where the college campus is. This might serve as a good starting point for the viewers or potential buyers.
I also created a map which was underlain with a 7 ½ minute quad map. This would aide the viewer who was experienced in reading topographical maps. (See figure 2). For the viewers benefit I have included the C.O.S. which pertains and encompasses the area of my project. This COS gives detailed bearings and distances to every property pin.

All maps created in Acreview are in a Montana state plane coordinate system. (NAD 83 Datum). This means all the maps are projected in state plane 83 projection. To get the data I collected to be compatible with the maps I had to make sure they were all projected correctly so the map would be created correctly.

CONCLUSION

I feel this project came out quite well. The data was easy to collect, and it was a great location for my project. I picked this location because all the resources which I needed to complete my project were so close at hand.

Most of my time was spent planning and preparing for mapping and learning how to use all of the resources available to me. Once all the plans were in place the mapping turned out to be an easy and enjoyable task. I have never done a project like this before, so I enjoyed the experience it provided for me. I am sure it will aid me in my future career.
Mission planning projection for the time of mapping

Status
Point: PROJECT
Lat 48:14:0 N  Lon 114:18:0 W
Date: Thursday, November 10, 2005
Threshold Elevation 15 (deg)
# SVs able to track: Not Used
Almanac: CURRENT.SSF 10/20/2005
Time Zone 'Pacific Std USA' -8:00
Sampling Rate: 10 Minutes
27 Satellites considered: 1 2 3 4 5 6 7 8 9 10 11 13 14 15 16 18 19 20 21 22 23 24 26 27 28 29 30
Figure 1

Project overlaid with KAL. Quad map

Figure 2
Project overlaid with Ortho photo

View 1
Figure 3

Project before differential correction

Project after differential correction
C.O.S. PARTAINING TO MAPPING PROJECT

NOTE: CIRCLED PROPERTY PINS

Figure 4

SURV 275   LAND OWNED BY FVCC   DON W. MILLER   PG 12

Figure 5
RECOMENDATION

This mapping project was very helpful in the sense of putting the material learned in the class room to practical use. When given the proper tools and the correct knowledge, projects of this magnitude and greater magnitude can be done with ease.

I recommend when doing a project like this plan on spending most of your time planning and researching your project. It will make the time you spend on your project more enjoyable and less frustrating.

Also do not get behind or ahead of schedule. If you get behind it makes it difficult to do a proper job. On the other hand do not get too far ahead, because you learn vital information along the way. For example I went out and mapped half of my project only to find out later I needed to be collecting raw data at the time of mapping. This resulted in remapping all of the work that I had completed.

As Bob Beall stressed in class, the way you structure your data is very important. The way you store your data is also important as well. Correct data structure will enhance your project, it will make it easier to work with, and your efficiency will increase.
Work cited

Flathead county GIS web site.
http://www.co.Flathead.mt.us/gis/

CORS data site.
http://www.ngs.noaa.gov/CORS/

Montana state library
http://nris.state.mt.us/

COS plat
CD’s obtained from Dave Dorsett