AACGM Background

In order to use AACGM properly, one must first call the C function AACGMInit() to load coefficients. Following this, one must actually do the conversion with the function AACGMConvert().

AACGMInit()

The role of AACGMInit() is to load the coefficients for the year the conversion is being done for. Coefficients are available for every fifth year, ie 1995, 2000, 2005, and so on. For any particular year, the coefficients for the closest possible lower year should be loaded. For example, the coefficients for the year 2000 should be loaded for the years 2000, 2001, 2002, 2003, 2004.

The loaded coefficients are then used to calculate magnetic coordinates.

The Bug

In October, Oleg Berngardt emailed Mike about a bug in the AACGM code. The bug is in fact real, and is in the AACGMInit() function. The routine originally looks like this:

```
int AACGMInit(int year) {
   char fname[256];
   char yrstr[32];
   if (year==0) year=DEFAULT_YEAR;
   sprintf(yrstr,"%4.4d",year);
   strcpy(fname,getenv("AACGM_DAT_PREFIX"));
   if (strlen(fname)==0) return -1;
   strcat(fname,yrstr);
   strcat(fname,".asc");
   return AACGMLoadCoef(fname);
}
```

This will only load the right file if the year is a multiple of 5 (the years we have coefficient files for). This is because ***fname***, the file name which the routine will try to open gets the value **${AACGM_DAT_PREFIX}*year*.asc.** The file won't be found for any year which is not a multiple of five, because we only have files for those years, and a default year will be used. This means that for any year not ending in 5, AACGMInit() loads coefficients for the year 2000.

Oleg provided a fix, which is as follows:

```
int AACGMInit(int year) {
   char fname[256];
   char yrstr[32];
   if (year==0) year=DEFAULT_YEAR;
   year=(year/5)*5;
   sprintf(yrstr,"%4.4d",year);
```

```
    strcpy(fname,getenv("AACGM_DAT_PREFIX"));
  if (strlen(fname)==0) return -1;
    strcat(fname,yrstr);
    strcat(fname,".asc");
    return AACGMLoadCoef(fname);
}
```

The added line simply rounds the year down to the closest multiple of 5 to load the right file.