Ocean Profile Data Format

The format used for the delivery of the data is moderately complex since it provides information in addition to the actual observations. Software is provided to help read the format. The data format makes use of a number of international codes to describe the data and how they were collected. International vessel call sign tables and ship platform names are also provided.

The data are organized in the following manner. A 'Station' record always appears first followed by one or more 'Profile' records. All records are of variable length, with the exact number of fields to be found being provided in the record.

The 'Station' Record

The 'Station' record is built of a number of components. The first component always has a fixed number of fields and is always present. This component provides information about the location and time of the station, information about how the data were received and the number of repeats of other components found in the 'Station' record.

The second component provides information about the number of profiles measured at the station, whether or not a profile is a duplicate of another, higher resolution copy, and some information about the accuracy and precision of the variables measured. The deepest depth of each profile is recorded here. Because of limitations of records lengths on some computers, profiles are broken into a number of segments. Each segment has up to 1500 depth-variable pairs. There are as many repeats of this component as required to describe all profiles present. The actual number of profile records associated with a station is the sum of the number of segments of each profile.

The third component carries information about other variables measured at the station, such as winds, air temperature, and so on. The measurements are expressed as numeric values. A code table is used to indicate the variable measured. There are as many repeats of this component as required to describe all numeric variables present.

The fourth component carries information about other variables measured at the station but which are recorded as alphanumerics. Such measurements as Beaufort winds, QC tests executed, etc. are to be found here. There are as many repeats of this component as required to describe all alphanumeric variables present.

The last component records the processing history of the station. It provides information about who carried out which actions against what variable and when. If values have been changed, the original value is stored in this component. There are as many repeats of this component as required to describe all the processing that has taken place on the station.

Suppose that a temperature and a salinity profile were collected at a station. Suppose also that there were observations every meter to 3500 m depth. Suppose also that wind speed and direction were measured, that the Beaufort wind speed was recorded and that the station had 5 different actions taken against it. The layout of the station record is then as follows.

ComponentContents

1	Station location, time and other information.
2	Two repeats of profile information, one for temperature and one for salinity.
3	Two repeats, one for each of wind speed and direction.
4	One repeat for the Beaufort code.
5	Five repeats of the history information, one to describe each action taken against the record.

The 'Profile' Record

There may be one or more 'Profile' records associated with each station record. The associated 'Profile' records always follow immediately after the station record to which they are linked.

There are two components to a 'Profile' record. The first always has a fixed number of fields and is always present. This component provides a repeat of the station location and time. It identifies the profile type and segment of that profile. It indicates if depths or pressures are recorded and how many depth-variable pairs are to be found.

The second component records the depth and measured variable as well as quality control flags that have been applied at each depth. There are as many repeats of this component as required to describe all depths (pressures) measured in the profile.

For the example data collection described above, the layout of the profile records is as follows.

ComponentContents

1	Station location, time, profile and segment identifiers.
2	Up to 1500 repeats of depth-variable information and associated quality control flags.

File Organization

For the above example, the organization of a data file would be as follows.

RecordContents

1   'Station' record saying both TEMP (temperature) and PSAL (salinity) profiles are present and that both of these consist of 3 segments (3500/1500 = 3 segments).
2   'Profile' record consisting of segment 1 (depths 0-1499m) of the temperature profile.
3   'Profile' record consisting of segment 2 (depths 1500-2999m) of the temperature profile.
4   'Profile' record consisting of segment 3 (depths 3000-3500m) of the temperature profile.
5   'Profile' record consisting of segment 1 (depths 0-1499m) of the salinity profile.
6   'Profile' record consisting of segment 2 (depths 1500-2999m) of the salinity profile.
7   'Profile' record consisting of segment 3 (depths3000-3500m) of the salinity profile.

Format Description

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 Field       Field  Starting  Justify   Field
 Name        Size   Position  Left      Description
                              Right

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 MKey        char*08  01       L        Sort Key
 One_Deg_sq  char*08  09       R        MEDS geographic 1 degree square
 Cruise_ID   char*10  17       L        Radio call sign + year for real time
                                          data or NODC reference number for
                                          delayed mode data.
 Obs_Year    char*04  27       L        Century and year of observation
 Obs_Month   char*02  31       L        Month of Observation
 Obs_Day     char*02  33       L        Day of Observation 01-31
 Obs_Time    char*04  35       L        Time of Observation
 Data_Type   char*02  39       L        Instrument type or type of IGOSS radio
                                          message
 Iumsgno     char*12  41       R        A unique identifier used by MEDS
                                           in their processing
 Stream_Source char*01 53      L        A field used by MEDS to track if
                                           the data are new or have been
                                           retrieved from its archives.
 Uflag       char*01  54       L        Record update action
 Stn_Number  char*08  55       R        MEDS Station Number for real-time data,
                                           or cruise consec number for delayed
                                           mode data.
 Latitude    char*08  63       R        Decimal degrees
                                           (+ = north, - = south)
 Longitude   char*09  71       R        Decimal degrees
                                           (+ = west, - = east)
 Q_Pos       char*01  80       L        Station Position Quality
 Q_Date_Time char*01  81       L        Date-Time Quality
 Q_Record    char*01  82       L        Worst Quality flag in the station
 Up_Date     char*08  83       L        Date of last action on record
 Bul_Time    char*12  91       L        Time bulletin was placed on GTS
 Bul_Header  char*06  103      L        GTS bulletin header
 Source_ID   char*04  109      L        GTS node which placed message on the GTS
 Stream_Ident char*04 113      L        Source and type of data
 QC_Version  char*04  117      L        Version of the QC program used.
 Data_Avail  char*01  121      L        Data Availability
 No_Prof     char*02  122      R        Number of Parameter profiles in station
 Nparms      char*02  124      R        Number of Surface Parameter groups
 Nsurfc      char*02  126      R        Number of Surface Codes groups
 Num_Hists   char*03  128      R        Number of History groups


   Profile Information; repeats No_prof (1-30) times
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No_Seg        char*02   01   R   Number of Profile Records in the profile
Prof_Type     char*04   03   L   Type of data in profile
Dup_flag      char*01   07   L   'Y'indicates this station duplicates
                                   another of higher quality.
Digit_Code    char*01   08   L   Data Digitization method
Standard      char*01   09   L   Standards to which the observations were
                                   made
Deep_Depth    char*05   10   R   Depth (m) of the deepest observation in
                                   the profile.


     Surface Parameter Group; repeats Nparms (0-30) times

Pcode         char*04   01   L   Parameter - GF3 or User code.
Parm          char*10   05   R   Measured surface parameter value.
Q_Parm        char*01   15   L   Parameter Quality


     Surface Codes Group; repeats Nsurfc (0-30) times

SRFC_Code     char*04   01   L   Parameter - GF3 or User code.
SRFC_Parm     char*10   05   L   Surface code
SRFC_Q_Parm   char*01   15   L   Parameter Quality


     History Group; repeats Num_Hists (0-100) times

Ident_Code    char*02   01   L   Organization which created the record
PRC_Code      char*04   03   L   Computer program which modified the
                                   station and created a history group)
Version       char*04   07   L   Version of the above program
PRC_Date      char*08   11   R   Date of action (YYYYMM)
Act_Code      char*02   19   L   Action performed on parameter
Act_Parm      char*04   21   L   Parameter code of changed
                                   parameter
Aux_ID        char*08   25   R   Locator (e.g. depth) of changed
                                   parameter
Previous_Val  char*10   33   R   Value of parameter before change

                    Profile Record

MKey          char*08   01   L   Sort Key
One_Deg_Sq    char*08   09   R   MEDS geographic 1 degree square
Cruise_ID     char*10   17   L   Radio callsign + year for real-time data
                                   or NODC reference number for delayed
                                   mode.
Obs_Year      char*04   27   L   Century and year of observation
Obs_Month     char*02   31   L   Month of Observation
Obs_Day       char*02   33   L   Day of Observation 01-31
Obs_time      char*04   35   L   Time of Observation
Data_Type     char*02   39   L   Instrument type or type of IGOSS radio
                                   message
Iumsgno       char*12   41   R   MEDS field - not used
Profile_Type  char*04   53   L   Type of data in the profile
Profile_Seg   char*02   57   L   Profile segment number of this record
No_Depths     char*04   59   R   Number of Depth/Pressure values in this
                                   record
D_P_Code      char*01   63   L   Depth/Pressure code

     Parameter Group; occurs No_Depth (1-1500) times

Depth_Press   char*06   01   R   Depth or Pressure value
Depres_Q      char*01   07   L   Depth/Pressure quality
Prof_Parm     char*09   08   R   Measured parameter value
Prof_Q_Parm   char*01   17   L   Data Quality
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