

# GP190

GP190\_SCRIPT\_CATALOGUE – XTF,  
JSF, SGY CREATE P1/190, TRACK-  
PLOTS AND COORDINATES CATALOGUE

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## 1. Overview and requirements

There are follow tasks:

- Read XTF (SSS-data) or SGY (SBP data) file from folder;
- Create and save to disk P1/90 files for equipment's position;
- Create and save to disk coordinate catalogue file;
- Draw track-plots in MatLab window;
- Create AutoCAD script with track-plots (to drag-and-drope in AutoCAD software).

The **gP190\_Script\_Catalogue.m** script is described below for tasks decision.

The follow XTF-files are used as a survey data for gP190\_Script\_Catalogue.m:

[http://ge0mlib.com/g/example/ET4200\\_xtf.zip](http://ge0mlib.com/g/example/ET4200_xtf.zip)

Start script gP190\_Script\_Catalogue.m with command same to

```
>> {'Xtf','c:\ET4200_xtf\'};gP190_Script_Catalogue.m;
```

The follow JSF-files are used as a survey data for gP190\_Script\_Catalogue.m:

[http://ge0mlib.com/g/example/ET4200\\_jsf.zip](http://ge0mlib.com/g/example/ET4200_jsf.zip)

Start script gP190\_Script\_Catalogue.m with command same to

```
>> {'Jsf','c:\ET4200_jsf\'};gP190_Script_Catalogue.m;
```

The follow SGY-files are used as a survey data for gP190\_Script\_Catalogue.m:

[http://ge0mlib.com/g/example/ET3200SX512i\\_sgy.zip](http://ge0mlib.com/g/example/ET3200SX512i_sgy.zip)

Start script gP190\_Script\_Catalogue.m with command same to

```
>> {'Sgy','c:\ET3200SX512i_sgy\'};gP190_Script_Catalogue.m;
```

There will be need follow functions sets:

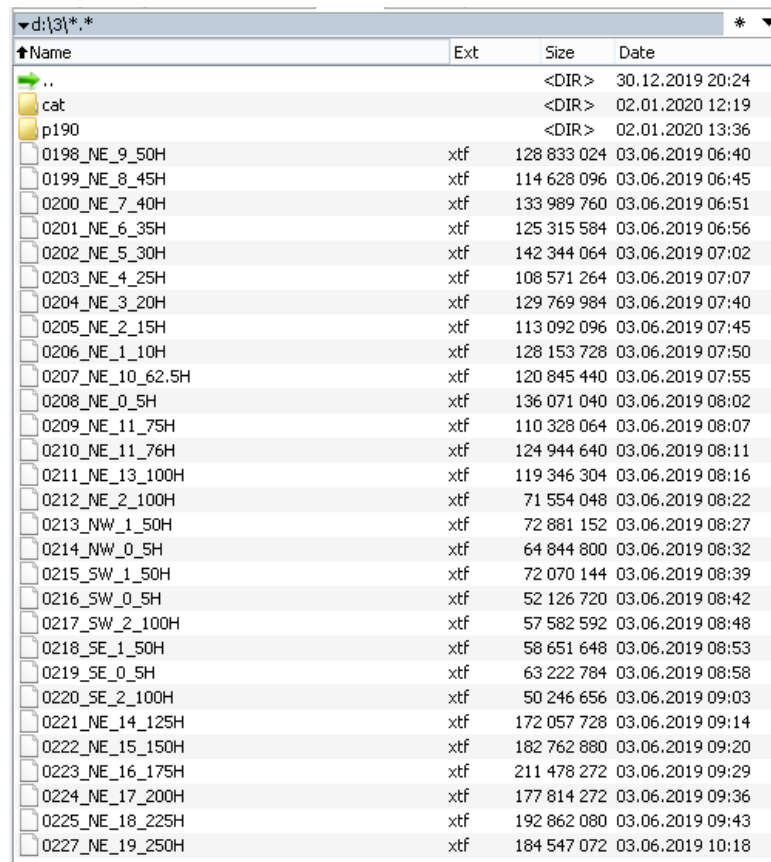
- gXtf to read XTF-files in dataset variables,
- gJsf to read JSF-files in dataset variables,
- gSgy to read SGY-files in dataset variables,
- gNav to create coordinates transformations,
- gP190 to convert DTEN-fields to P190,
- gAcad to write AutoCAD script-file,
- gMap to draw track-plots in MatLab.

The functions were tested in MatLab R2015b.

## 2. XTF-files

0) =====

There is the folder with XTF-files (*Figure 2.1*):



| Name             | Ext   | Size        | Date             |
|------------------|-------|-------------|------------------|
| ..               | <DIR> |             | 30.12.2019 20:24 |
| cat              | <DIR> |             | 02.01.2020 12:19 |
| p190             | <DIR> |             | 02.01.2020 13:36 |
| 0198_NE_9_50H    | xtf   | 128 833 024 | 03.06.2019 06:40 |
| 0199_NE_8_45H    | xtf   | 114 628 096 | 03.06.2019 06:45 |
| 0200_NE_7_40H    | xtf   | 133 989 760 | 03.06.2019 06:51 |
| 0201_NE_6_35H    | xtf   | 125 315 584 | 03.06.2019 06:56 |
| 0202_NE_5_30H    | xtf   | 142 344 064 | 03.06.2019 07:02 |
| 0203_NE_4_25H    | xtf   | 108 571 264 | 03.06.2019 07:07 |
| 0204_NE_3_20H    | xtf   | 129 769 984 | 03.06.2019 07:40 |
| 0205_NE_2_15H    | xtf   | 113 092 096 | 03.06.2019 07:45 |
| 0206_NE_1_10H    | xtf   | 128 153 728 | 03.06.2019 07:50 |
| 0207_NE_10_62.5H | xtf   | 120 845 440 | 03.06.2019 07:55 |
| 0208_NE_0_5H     | xtf   | 136 071 040 | 03.06.2019 08:02 |
| 0209_NE_11_75H   | xtf   | 110 328 064 | 03.06.2019 08:07 |
| 0210_NE_11_76H   | xtf   | 124 944 640 | 03.06.2019 08:11 |
| 0211_NE_13_100H  | xtf   | 119 346 304 | 03.06.2019 08:16 |
| 0212_NE_2_100H   | xtf   | 71 554 048  | 03.06.2019 08:22 |
| 0213_NW_1_50H    | xtf   | 72 881 152  | 03.06.2019 08:27 |
| 0214_NW_0_5H     | xtf   | 64 844 800  | 03.06.2019 08:32 |
| 0215_SW_1_50H    | xtf   | 72 070 144  | 03.06.2019 08:39 |
| 0216_SW_0_5H     | xtf   | 52 126 720  | 03.06.2019 08:42 |
| 0217_SW_2_100H   | xtf   | 57 582 592  | 03.06.2019 08:48 |
| 0218_SE_1_50H    | xtf   | 58 651 648  | 03.06.2019 08:53 |
| 0219_SE_0_5H     | xtf   | 63 222 784  | 03.06.2019 08:58 |
| 0220_SE_2_100H   | xtf   | 50 246 656  | 03.06.2019 09:03 |
| 0221_NE_14_125H  | xtf   | 172 057 728 | 03.06.2019 09:14 |
| 0222_NE_15_150H  | xtf   | 182 762 880 | 03.06.2019 09:20 |
| 0223_NE_16_175H  | xtf   | 211 478 272 | 03.06.2019 09:29 |
| 0224_NE_17_200H  | xtf   | 177 814 272 | 03.06.2019 09:36 |
| 0225_NE_18_225H  | xtf   | 192 862 080 | 03.06.2019 09:43 |
| 0227_NE_19_250H  | xtf   | 184 547 072 | 03.06.2019 10:18 |

*Figure 2.1* Xtf-files list

1) =====

Set navigation datum for coordinate's transformation (see gNav manual):

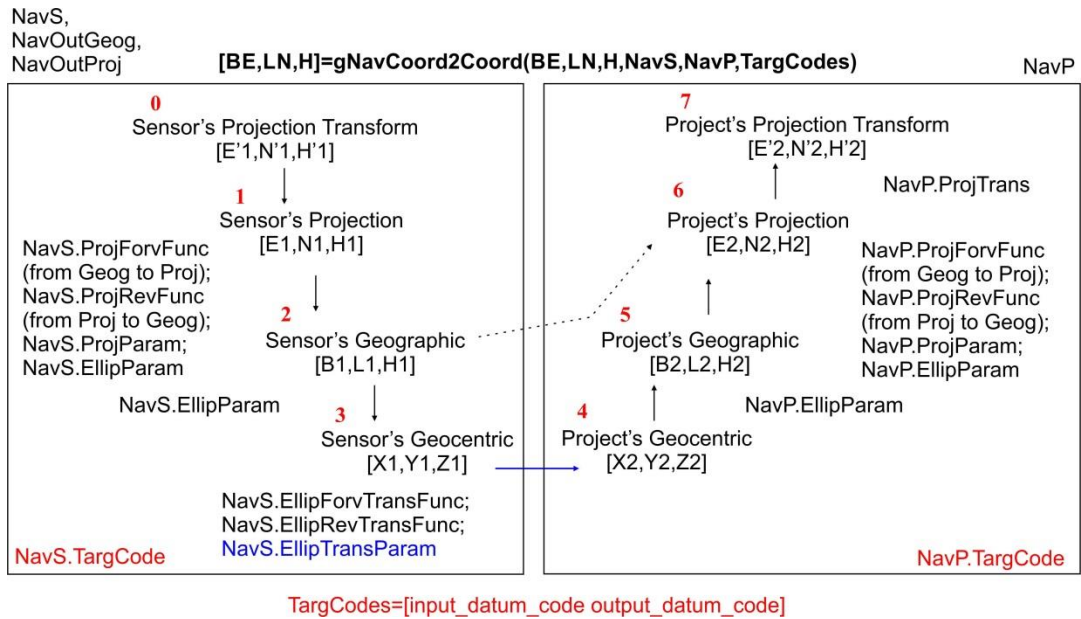
```
>> NavS=struct('TargCode',2);
```

```
>> NavP=struct('EllipParam',[6378137 0.0818191908],'ProjParam',[0 141 0.9996 500000 0],
```

```
'ProjForvFunc','gNavGeog2ProjUtm','ProjRevFunc','gNavProjUtm2Geog','TargCode',6);
```

The NavS (sensor's datum) includes Target Code "2" – coordinates in Geographic (*Figure 2.2*).

The NavP (project's datum) includes Target Code "6" – coordinates in XY-Projection, includes transformation parameters (includes transformation from ellipsoid\_1 to ellipsoid\_2).



**Figure 2.2** Coordinates re-calculation from ellipsoid\_1 to ellipsoid\_2 (red numbers are values for Nav.TargCode field)

2) =====

Create Dataset (see gXtf manual):

```
>> [XtfHead,Head,Data]=gXtf000DatasetImport('d:\3\','',[0,[],[]], 'HPingNumber', 'HShipYcoordinate', 'HShipXcoordinate', NavS, NavP, []);
```

All file-headers from folder d:\3\ were read to variables XtfHead and Head (**Figure 2.3**).

```
>> [XtfHead, Head, Data]=gXtf000DatasetImport('d:\3\','',[0,[],[]], 'HPingNumber', 'HShipYcoordinate', 'HShipXcoordinate', NavS, NavP, []);
d:\3\0198_NE_9_50H.xtf
Rec: 0=XTF_HEADER_SONAR (Sidescan data), Num: 5500 [ SubCh: 0, Num: 5500; ChFollow: 2, Num: 5500 ]
d:\3\0199_NE_8_45H.xtf
Rec: 0=XTF_HEADER_SONAR (Sidescan data), Num: 6092 [ SubCh: 0, Num: 6092; ChFollow: 2, Num: 6092 ]
d:\3\0200_NE_7_40H.xtf
Rec: 0=XTF_HEADER_SONAR (Sidescan data), Num: 7121 [ SubCh: 0, Num: 7121; ChFollow: 2, Num: 7121 ]
d:\3\0201_NE_6_35H.xtf
Rec: 0=XTF_HEADER_SONAR (Sidescan data), Num: 6660 [ SubCh: 0, Num: 6660; ChFollow: 2, Num: 6660 ]
d:\3\0202_NE_5_30H.xtf
Rec: 0=XTF_HEADER_SONAR (Sidescan data), Num: 7565 [ SubCh: 0, Num: 7565; ChFollow: 2, Num: 7565 ]
d:\3\0203_NE_4_25H.xtf
Rec: 0=XTF_HEADER_SONAR (Sidescan data), Num: 4635 [ SubCh: 0, Num: 4635; ChFollow: 2, Num: 4635 ]
d:\3\0204_NE_3_20H.xtf
Rec: 0=XTF_HEADER_SONAR (Sidescan data), Num: 5540 [ SubCh: 0, Num: 5540; ChFollow: 2, Num: 5540 ]
d:\3\0205_NE_2_15H.xtf
Rec: 0=XTF_HEADER_SONAR (Sidescan data), Num: 4828 [ SubCh: 0, Num: 4828; ChFollow: 2, Num: 4828 ]
```

**Figure 2.3** MatLab window screenshot: the SSS message readed, show the ping numbers, subchannel and channel numbers

The **Table 2.1** shown the field-names for Head(1) variable, which includes information-headers data for file 0198\_NE\_9\_50H.xtf. If last parameter of gXtf000DatasetImport-function includes the path to pts-file (xy-coordinates and depth) then field 'WaterDepth' will be created; it is includes water depth below SSS.

Table 2.1 Head(1) variable fields for XTF-file

|   |   |   |
|---|---|---|
| HMessageType: 0                         | HShipGyro: [1x5500 double]              | HFishPositionErrorCode:                 |
| HSubChannelNumber: 0                    | HShipYcoordinate: [1x5500 double]       | HOptionalOffsey: [1x5500 double]        |
| HMessageNum: [1x5500 double]            | HShipXcoordinate: [1x5500 double]       | HCableOutHundredths: [1x5500 double]    |
| HYear: [1x5500 double]                  | HShipAltitude: [1x5500 double]          | HReservedSpace2: [6x5500 double]        |
| HMonth: [1x5500 double]                 | HShipDepth: [1x5500 double]             | CChannelNumber: [2x5500 double]         |
| HDay: [1x5500 double]                   | HFixTimeHour: [1x5500 double]           | CDownsampleMethod: [2x5500 double]      |
| HHour: [1x5500 double]                  | HFixTimeMinute: [1x5500 double]         | CSlantRange: [2x5500 double]            |
| HMinute: [1x5500 double]                | HFixTimeSecond: [1x5500 double]         | CGroundRange: [2x5500 double]           |
| HSecond: [1x5500 double]                | HFixTimeHsecond: [1x5500 double]        | CTimeDelay: [2x5500 double]             |
| HHSeconds: [1x5500 double]              | HSensorSpeed: [1x5500 double]           | CTimeDuration: [2x5500 double]          |
| HJulianDay: [1x5500 double]             | HKP: [1x5500 double]                    | CSecondsPerPing: [2x5500 double]        |
| HEventNumber: [1x5500 double]           | HSensorYcoordinate: [1x5500 double]     | CProcessingFlags: [2x5500 double]       |
| HPingNumber: [1x5500 double]            | HSensorXcoordinate: [1x5500 double]     | CFrequency: [2x5500 double]             |
| HSoundVelocity: [1x5500 double]         | HSonarStatus: [1x5500 double]           | CInitialGainCode: [2x5500 double]       |
| HOceanTide: [1x5500 double]             | HRangeToFish: [1x5500 double]           | CGainCode: [2x5500 double]              |
| HReserved2: [1x5500 double]             | HBearingToFish: [1x5500 double]         | CBandWidth: [2x5500 double]             |
| HConductivityFreq: [1x5500 double]      | HCableOut: [1x5500 double]              | CContactNumber: [2x5500 double]         |
| HTemperatureFreq: [1x5500 double]       | HLayback: [1x5500 double]               | CContactClassification: [2x5500 double] |
| HPressureFreq: [1x5500 double]          | HCableTension: [1x5500 double]          | CContactSubNumber: [2x5500 double]      |
| HPressureTemp: [1x5500 double]          | HSensorDepth: [1x5500 double]           | CContactType: [2x5500 double]           |
| HConductivity: [1x5500 double]          | HSensorPrimaryAltitude: [1x5500 double] | CNumSamples: [2x5500 double]            |
| HWaterTemperature: [1x5500 double]      | HSensorAuxAltitude: [1x5500 double]     | CMillivoltScale: [2x5500 double]        |
| HPressure: [1x5500 double]              | HSensorPitch: [1x5500 double]           | CContactTimeOffTrack: [2x5500 double]   |
| HComputedSoundVelocity: [1x5500 double] | HSensorRoll: [1x5500 double]            | CContactCloseNumber: [2x5500 double]    |
| HMagX: [1x5500 double]                  | HSensorHeading: [1x5500 double]         | CReserved2: [2x5500 double]             |
| HMagY: [1x5500 double]                  | HHeave: [1x5500 double]                 | CFixedVSOP: [2x5500 double]             |
| HMagZ: [1x5500 double]                  | HYaw: [1x5500 double]                   | CWeight: [2x5500 double]                |
| HAuxVal1: [1x5500 double]               | HAttitudeTimeTag: [1x5500 double]       | CReservedSpace: [2x5500x4 double]       |
| HAuxVal2: [1x5500 double]               | HDOT: [1x5500 double]                   | GpsKP: [1x5500 double]                  |
| HAuxVal3: [1x5500 double]               | HNavFixMilliseconds: [1x5500 double]    | GpsDay: [1x5500 double]                 |
| HAuxVal4: [1x5500 double]               | HComputerClockHour: [1x5500 double]     | GpsTime: [1x5500 double]                |
| HAuxVal5: [1x5500 double]               | HComputerClockMinute: [1x5500 double]   | CompTime: [1x5500 double]               |
| HAuxVal6: [1x5500 double]               | HComputerClockSecond: [1x5500 double]   | GpsE: [1x5500 double]                   |
| HSpeedLog: [1x5500 double]              | HComputerClockHsec: [1x5500 double]     | GpsN: [1x5500 double]                   |
| HTurbidity: [1x5500 double]             | HFishPositionDeltaX: [1x5500 double]    | GpsH: [1x5500 double]                   |
| HShipSpeed: [1x5500 double]             | HFishPositionDeltaY: [1x5500 double]    |   |



3) =====

Set navigation datum for coordinate's transformation in P1/90 files (see gP190 manual):

```
>> NavOutGeog=struct('EllipParam',[6378137 0.0818191908],'ProjParam',[0 141 0.9996 500000 0],
'ProjForvFunc','gNavGeog2ProjUtm','ProjRevFunc','gNavProjUtm2Geog','TargCode',2);
>> NavOutProj=struct('EllipParam',[6378137 0.0818191908],'ProjParam',[0 141 0.9996 500000 0],
'ProjForvFunc','gNavGeog2ProjUtm','ProjRevFunc','gNavProjUtm2Geog','TargCode',1);
```

4) =====

Convert DTEN-fields from Head variable (GpsKP, GpsDay, GpsTime, GpsE, GpsN, GpsH) to P190Head and PHead variables, which include P1/90 structure data.

```
>> [P190Head,PHead]=gP190DTEN2P190(XtfHead,Head,NavP,NavOutGeog,NavOutProj,'
d:\3\p190\P190_Header.txt','S',' ','1','1','');
```

The Header for P1/90 takes from d:\3\p190\P190\_Header.txt file ([Table 2.2](#)); we used dummy-header from UHR-survey data. The PHead variable contents (MatLab window screenshot) shown in [Figure 2.4](#).

*Table 2.2* Dummy header for P1/90 files

|                                  |  |
|----------------------------------|--|
| H0100 Survey area                | ###, #####                                   |
| H0102 Vessel details             | #####  |
| H0103 Source details             | Sleeve Gun 4x40cu inch                       |
| H0104 Streamer details           | GeoEel (solid, 192 channels)                 |
| H0200 Survey date                | June 2019                                    |
| H0201 Tape date                  | ## June 2019                                 |
| H0202 Tape version               | UK00A P1/90                                  |
| H0300 Client                     | ENL  |
| H0400 Geophysical contractor     | #####  |
| H0500 Positioning contractor     | #####  |
| H0700 Positioning system         | Veripos LD3S                                 |
| H0800 Shotpoint position         | Center of Cluster                            |
| H1000 Clock time                 | GMT 0.0 hours                                |
| H1400 Geodetic Datum: Survey     | WGS84 WGS 1984 6378137.000<br>298.2572235630 |
| H1700 Vertical datum             | Current sea surface by Echo Sounder          |
| H1800 Projection                 | UTM Zone 54N                                 |
| H2000 Grid unit                  | 1 International Metre 1.00                   |
| H2001 Height unit                | 1 International Metre 1.00                   |
| H2002 Angular unit               | 1 Degrees                                    |
| H2200 Central Meridian           | 141 00 00.000 W                              |
| H2301 Grid Origin                | 0 00 00.000 N                                |
| H2302 Grid coordinates at Origin | 500000.00 E 0.00 N                           |
| H2401 Scale factor               | 0.9996                                       |
| H2600 Water depth                | Current sea surface by Echo Sounder          |

| Fields | RecordId | Spare1 | VesselId | SourceId | OtherId | Spare2 | PointNum      | WaterDepth    | GpsDay        | GpsTime       | LineName       | GpsLat        | GpsLon        | GpsE          | GpsN          |
|--------|----------|--------|----------|----------|---------|--------|---------------|---------------|---------------|---------------|----------------|---------------|---------------|---------------|---------------|
| 1      | 'S'      |        | '1'      | '1'      | ''      | ''     | 1x5500 double | 1x5500 double | 1x5500 dou... | 1x5500 dou... | 0198_NE_9_5... | 1x5500 dou... | 1x5500 dou... | 1x5500 dou... | 1x5500 dou... |
| 2      | 'S'      |        | '1'      | '1'      | ''      | ''     | 1x6092 double | 1x6092 double | 1x6092 dou... | 1x6092 dou... | 0199_NE_8_4... | 1x6092 dou... | 1x6092 dou... | 1x6092 dou... | 1x6092 dou... |
| 3      | 'S'      |        | '1'      | '1'      | ''      | ''     | 1x7121 double | 1x7121 double | 1x7121 dou... | 1x7121 dou... | 0200_NE_7_4... | 1x7121 dou... | 1x7121 dou... | 1x7121 dou... | 1x7121 dou... |
| 4      | 'S'      |        | '1'      | '1'      | ''      | ''     | 1x6660 double | 1x6660 double | 1x6660 dou... | 1x6660 dou... | 0201_NE_6_3... | 1x6660 dou... | 1x6660 dou... | 1x6660 dou... | 1x6660 dou... |
| 5      | 'S'      |        | '1'      | '1'      | ''      | ''     | 1x7565 double | 1x7565 double | 1x7565 dou... | 1x7565 dou... | 0202_NE_5_3... | 1x7565 dou... | 1x7565 dou... | 1x7565 dou... | 1x7565 dou... |
| 6      | 'S'      |        | '1'      | '1'      | ''      | ''     | 1x4635 double | 1x4635 double | 1x4635 dou... | 1x4635 dou... | 0203_NE_4_2... | 1x4635 dou... | 1x4635 dou... | 1x4635 dou... | 1x4635 dou... |
| 7      | 'S'      |        | '1'      | '1'      | ''      | ''     | 1x5540 double | 1x5540 double | 1x5540 dou... | 1x5540 dou... | 0204_NE_3_2... | 1x5540 dou... | 1x5540 dou... | 1x5540 dou... | 1x5540 dou... |
| 8      | 'S'      |        | '1'      | '1'      | ''      | ''     | 1x4828 double | 1x4828 double | 1x4828 dou... | 1x4828 dou... | 0205_NE_2_1... | 1x4828 dou... | 1x4828 dou... | 1x4828 dou... | 1x4828 dou... |
| 9      | 'S'      |        | '1'      | '1'      | ''      | ''     | 1x5471 double | 1x5471 double | 1x5471 dou... | 1x5471 dou... | 0206_NE_1_1... | 1x5471 dou... | 1x5471 dou... | 1x5471 dou... | 1x5471 dou... |
| 10     | 'S'      |        | '1'      | '1'      | ''      | ''     | 1x5159 double | 1x5159 double | 1x5159 dou... | 1x5159 dou... | 0207_NE_10...  | 1x5159 dou... | 1x5159 dou... | 1x5159 dou... | 1x5159 dou... |
| 11     | 'S'      |        | '1'      | '1'      | ''      | ''     | 1x5809 double | 1x5809 double | 1x5809 dou... | 1x5809 dou... | 0208_NE_0_5H   | 1x5809 dou... | 1x5809 dou... | 1x5809 dou... | 1x5809 dou... |
| 12     | 'S'      |        | '1'      | '1'      | ''      | ''     | 1x4710 double | 1x4710 double | 1x4710 dou... | 1x4710 dou... | 0209_NE_11...  | 1x4710 dou... | 1x4710 dou... | 1x4710 dou... | 1x4710 dou... |

Figure 2.4 MatLab window screenshot: the PHead variable contents for files from 1 to 12

5) =====

Write P1/90 structures to files:

```
>> gP190Write('d:\3\p190\',P190Head,PHead,1,'NNMMM');
```

The folder with P1/90-files is shown in Figure 2.5. The P1/90-file content is shown in Figure 2.6. The water depth set in zero, because field 'WaterDepth' is absent.

| Name             | Ext | Size    | Date             |
|------------------|-----|---------|------------------|
| ..               |     |         |                  |
| 0198_NE_9_50H    | 190 | 452 968 | 02.01.2020 13:36 |
| 0199_NE_8_45H    | 190 | 501 512 | 02.01.2020 13:36 |
| 0200_NE_7_40H    | 190 | 585 890 | 02.01.2020 13:36 |
| 0201_NE_6_35H    | 190 | 548 088 | 02.01.2020 13:36 |
| 0202_NE_5_30H    | 190 | 622 298 | 02.01.2020 13:36 |
| 0203_NE_4_25H    | 190 | 382 038 | 02.01.2020 13:36 |
| 0204_NE_3_20H    | 190 | 456 248 | 02.01.2020 13:36 |
| 0205_NE_2_15H    | 190 | 397 864 | 02.01.2020 13:36 |
| 0206_NE_1_10H    | 190 | 450 590 | 02.01.2020 13:36 |
| 0207_NE_10_62.5H | 190 | 425 006 | 02.01.2020 13:36 |
| 0208_NE_0_5H     | 190 | 478 306 | 02.01.2020 13:36 |
| 0209_NE_11_75H   | 190 | 388 188 | 02.01.2020 13:36 |
| 0210_NE_11_76H   | 190 | 439 356 | 02.01.2020 13:36 |
| 0211_NE_13_100H  | 190 | 419 758 | 02.01.2020 13:36 |
| 0212_NE_2_100H   | 190 | 161 130 | 02.01.2020 13:36 |
| 0213_NW_1_50H    | 190 | 164 082 | 02.01.2020 13:36 |
| 0214_NW_0_5H     | 190 | 146 206 | 02.01.2020 13:36 |
| 0215_SW_1_50H    | 190 | 162 278 | 02.01.2020 13:36 |
| 0216_SW_0_5H     | 190 | 117 916 | 02.01.2020 13:36 |
| 0217_SW_2_100H   | 190 | 130 052 | 02.01.2020 13:36 |
| 0218_SE_1_50H    | 190 | 132 430 | 02.01.2020 13:36 |
| 0219_SE_0_5H     | 190 | 142 598 | 02.01.2020 13:36 |
| 0220_SE_2_100H   | 190 | 113 734 | 02.01.2020 13:36 |
| 0221_NE_14_125H  | 190 | 421 070 | 02.01.2020 13:36 |
| 0222_NE_15_150H  | 190 | 447 146 | 02.01.2020 13:36 |
| 0223_NE_16_175H  | 190 | 517 092 | 02.01.2020 13:36 |
| 0224_NE_17_200H  | 190 | 435 092 | 02.01.2020 13:36 |
| 0225_NE_18_225H  | 190 | 471 746 | 02.01.2020 13:36 |
| 0227_NE_19_250H  | 190 | 451 492 | 02.01.2020 13:36 |
| P190_Header      | txt | 1 968   | 30.12.2019 22:56 |

Figure 2.5 P1/90-files list



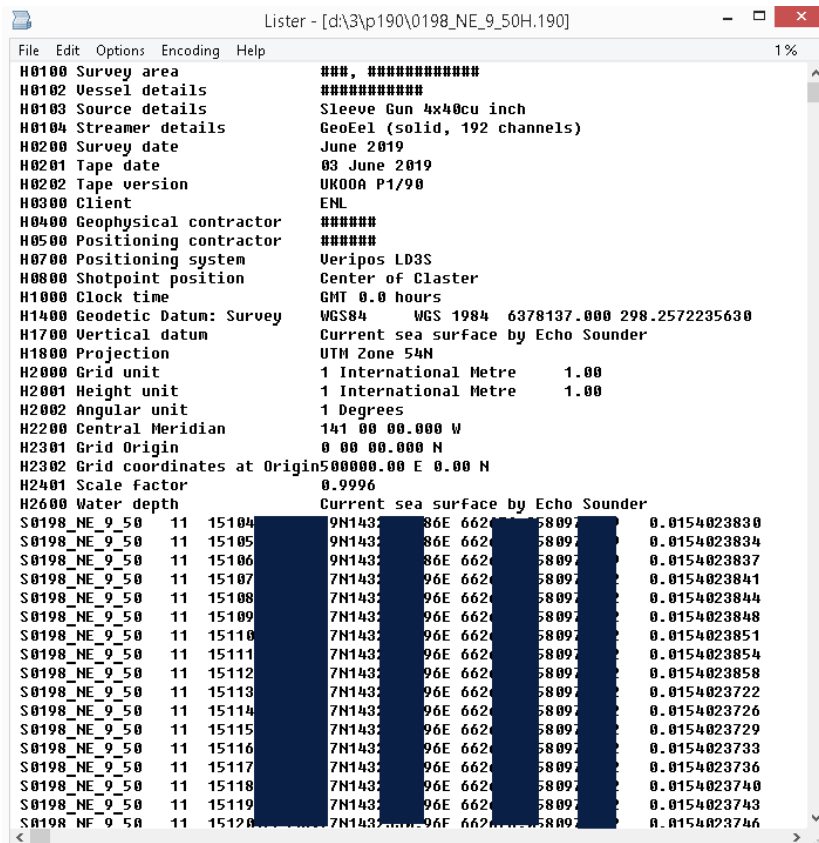


Figure 2.6 P1/90-file data

6) =====

Write P1/90 structures data to coordinate-catalog file (Figure 2.7):

```
>> gP1902Cat(P190Head,PHead,'d:\3\cat\zzz.txt','Ex2019y',10);
```

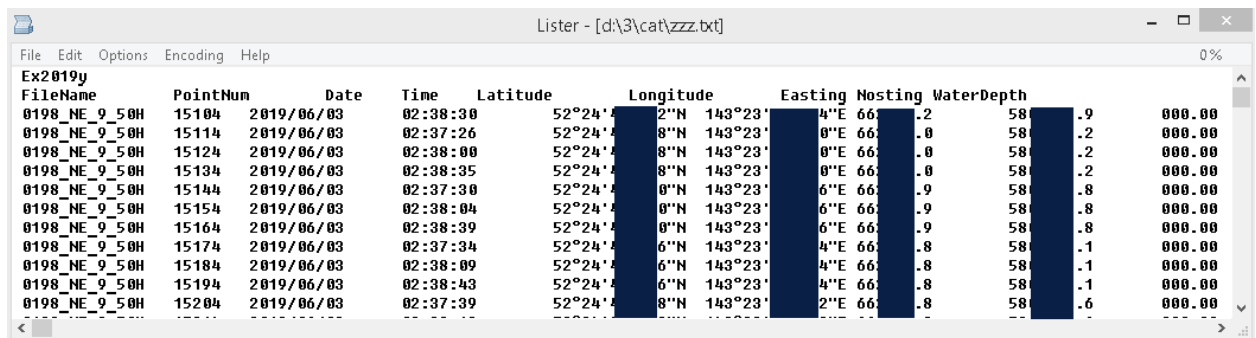


Figure 2.7 Coordinate-catalog file data

The columns names or additional header 'Ex2019y' was set in function parameters.

The pings step for coordinate-catalog file was set 10.

7) =====

Convert variable PHead to poly-line structure and draw structure in MatLab figure (Figure 2.8).

```
>> PL=gP1902PL(PHead,'-b');
```

```
>> gMapPLDraw(100,PL);axis equal; gMapTickLabel(100,'%1.1e',8);
```





**5) =====**

Write P1/90 structures to files:

```
>> gP190Write('d:\8\ET4200\p190\',P190Head,PHead,1,'NNMMM');
```

**6) =====**

Write P1/90 structures data to coordinate-catalog file:

```
>> gP1902Cat(P190Head,PHead,'d:\8\ET4200\cat\zzz.txt','Ex2019y',10);
```

**7) =====**

Convert variable PHead to poly-line structure and draw structure in MatLab figure.

```
>> PL=gP1902PL(PHead,'-b');
```

```
>> gMapPLDraw(100,PL);axis equal; gMapTickLabel(100,'%1.1e',8);
```

**8) =====**

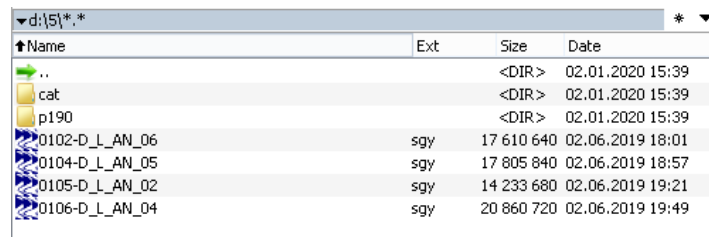
Create AutoCAD script file from polyline structure.

```
>> gMapPL2AcadExport('d:\8\ET4200\cat\SBP_.scr',PL,[7 0 0 0 3],[1 1000],[6 0 5000 0],2,1,1);
```

## 4. SGY-files

0) =====

There is the folder with SGY-files (*Figure 4.1*):



| Name           | Ext   | Size       | Date             |
|----------------|-------|------------|------------------|
| ..             | <DIR> |            | 02.01.2020 15:39 |
| cat            | <DIR> |            | 02.01.2020 15:39 |
| p190           | <DIR> |            | 02.01.2020 15:39 |
| 0102-D_L_AN_06 | sgy   | 17 610 640 | 02.06.2019 18:01 |
| 0104-D_L_AN_05 | sgy   | 17 805 840 | 02.06.2019 18:57 |
| 0105-D_L_AN_02 | sgy   | 14 233 680 | 02.06.2019 19:21 |
| 0106-D_L_AN_04 | sgy   | 20 860 720 | 02.06.2019 19:49 |

*Figure 4.1* Sgy-files list

1) =====

Not set the navigation datum for coordinate's transformation because coordinates in SYG-files in XY-projection.

2) =====

Create Dataset (see gSgy manual):

```
>> [SgyHead,Head,Data]=gSgyDatasetImport('d:\5\','',[,],[,],[,],TraceSequenceFile','GroupX','GroupY',[,],[,],[,]);
```

3) =====

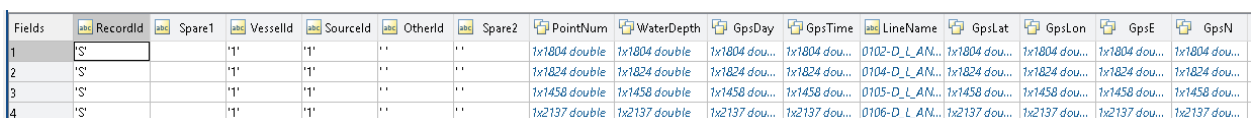
Set navigation datum for coordinate's transformation in P1/90 files:

```
>> NavP=struct('EllipParam',[6378137 0.0818191908],'ProjParam',[0 141 0.9996 500000 0],
'ProjForvFunc','gNavGeog2ProjUtm','ProjRevFunc','gNavProjUtm2Geog','TargCode',6);
>> NavOutGeog=struct('EllipParam',[6378137 0.0818191908],'ProjParam',[0 141 0.9996 500000 0],
'ProjForvFunc','gNavGeog2ProjUtm','ProjRevFunc','gNavProjUtm2Geog','TargCode',2);
>> NavOutProj=struct('EllipParam',[6378137 0.0818191908],'ProjParam',[0 141 0.9996 500000 0],
'ProjForvFunc','gNavGeog2ProjUtm','ProjRevFunc','gNavProjUtm2Geog','TargCode',1);
```

4) =====

Convert DTEN-fields from Head variable (GpsKP, GpsDay, GpsTime, GpsE, GpsN, GpsH) to P190Head and PHead variables, which include P1/90 structure data (*Figure 4.2*).

```
>> [P190Head,PHead]=gP190DTEN2P190(SgyHead,Head,NavP,NavOutGeog,NavOutProj,'
d:\5\p190\P190_Header.txt','S',' ',' ','1','1',' ');
```



| Fields | RecordId | Spare1 | Vesseld | Sourceld | Otherld | Spare2 | PointNum      | WaterDepth    | GpsDay        | GpsTime       | LineName       | GpsLat        | GpsLon        | GpsE          | GpsN          |
|--------|----------|--------|---------|----------|---------|--------|---------------|---------------|---------------|---------------|----------------|---------------|---------------|---------------|---------------|
| 1      | 'S'      |        | '1'     | '1'      | ''      | ''     | 1x1804 double | 1x1804 double | 1x1804 dou... | 1x1804 dou... | 0102-D_L_AN... | 1x1804 dou... | 1x1804 dou... | 1x1804 dou... | 1x1804 dou... |
| 2      | 'S'      |        | '1'     | '1'      | ''      | ''     | 1x1824 double | 1x1824 double | 1x1824 dou... | 1x1824 dou... | 0104-D_L_AN... | 1x1824 dou... | 1x1824 dou... | 1x1824 dou... | 1x1824 dou... |
| 3      | 'S'      |        | '1'     | '1'      | ''      | ''     | 1x1458 double | 1x1458 double | 1x1458 dou... | 1x1458 dou... | 0105-D_L_AN... | 1x1458 dou... | 1x1458 dou... | 1x1458 dou... | 1x1458 dou... |
| 4      | 'S'      |        | '1'     | '1'      | ''      | ''     | 1x2137 double | 1x2137 double | 1x2137 dou... | 1x2137 dou... | 0106-D_L_AN... | 1x2137 dou... | 1x2137 dou... | 1x2137 dou... | 1x2137 dou... |

*Figure 4.2* MatLab window screenshot: the PHead variable contents for files from 1 to 4

5) =====

Write P1/90 structures to files:

```
>> gP190Write('d:\5\p190',P190Head,PHead,1,'NNMMM');
```

6) =====

Write P1/90 structures data to coordinate-catalog file (Figure 4.3):

```
>> gP1902Cat(P190Head,PHead,'d:\3\cat\zzz.txt','Ex2019y',10);
```

| FileName       | PointNum | Date       | Time     | Latitude   | Longitude   | Easting | Northing | WaterDepth |
|----------------|----------|------------|----------|------------|-------------|---------|----------|------------|
| 0102-D_L_AN_06 | 1        | 2019/06/02 | 14:56:52 | 52°27'37"N | 143°40'27"E | 681.0   | 581.4    | 000.00     |
| 0102-D_L_AN_06 | 11       | 2019/06/02 | 14:56:54 | 52°27'36"N | 143°40'26"E | 681.2   | 581.7    | 000.00     |
| 0102-D_L_AN_06 | 21       | 2019/06/02 | 14:56:55 | 52°27'36"N | 143°40'26"E | 681.2   | 581.7    | 000.00     |
| 0102-D_L_AN_06 | 31       | 2019/06/02 | 14:56:57 | 52°27'30"N | 143°40'20"E | 681.9   | 581.7    | 000.00     |
| 0102-D_L_AN_06 | 41       | 2019/06/02 | 14:56:58 | 52°27'33"N | 143°40'23"E | 681.9   | 581.6    | 000.00     |
| 0102-D_L_AN_06 | 51       | 2019/06/02 | 14:57:00 | 52°27'39"N | 143°40'29"E | 681.4   | 581.4    | 000.00     |
| 0102-D_L_AN_06 | 61       | 2019/06/02 | 14:57:01 | 52°27'35"N | 143°40'25"E | 681.2   | 581.1    | 000.00     |
| 0102-D_L_AN_06 | 71       | 2019/06/02 | 14:57:03 | 52°27'34"N | 143°40'24"E | 681.7   | 581.1    | 000.00     |
| 0102-D_L_AN_06 | 81       | 2019/06/02 | 14:57:05 | 52°27'39"N | 143°40'29"E | 681.4   | 581.6    | 000.00     |

Figure 4.3 Coordinate-catalog file data

7) =====

Convert variable PHead to poly-line structure and draw structure in MatLab figure (Figure 4.4).

```
>> PL=gP1902PL(PHead,'-b');
```

```
>> gMapPLDraw(100,PL);axis equal; gMapTickLabel(100,'% 1.1e',8);
```

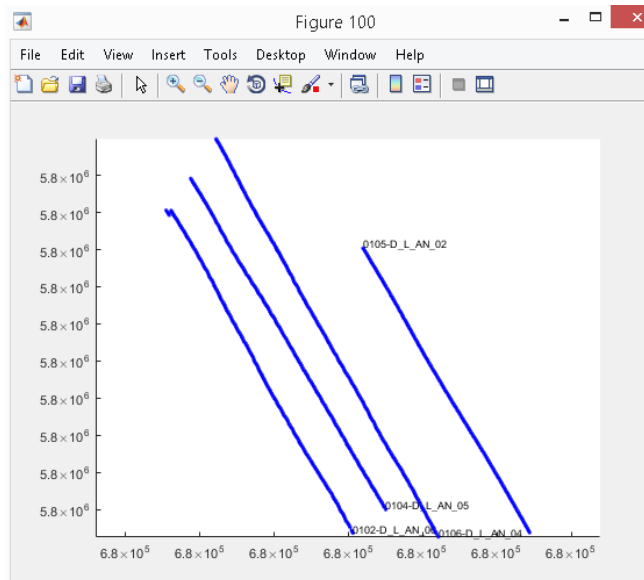


Figure 4.4 MatLab figure: survey lines track-plots

8) =====

Create AutoCAD script file from polyline structure (Figure 4.5).

```
>> gMapPL2AcadExport('d:\5\cat\SBP_.scr',PL,[7 0 0 3],[1 1000],[6 0 5000 0],2,1,1);
```



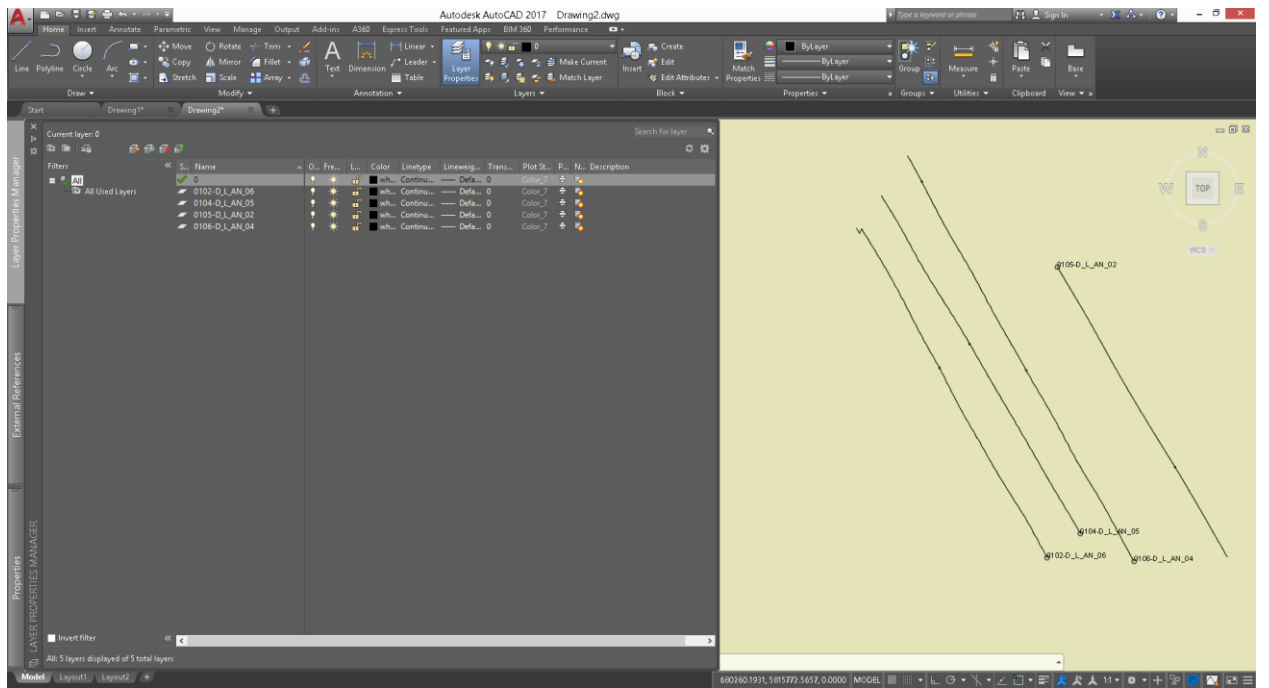


Figure 4.5 AutoCAD window screenshot: script's drag-and-drop result