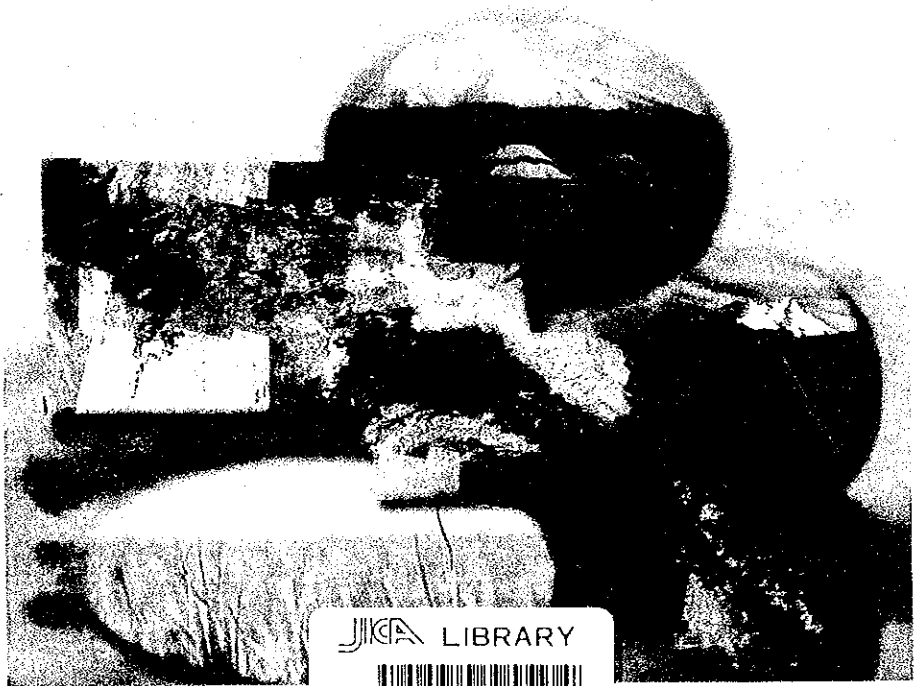


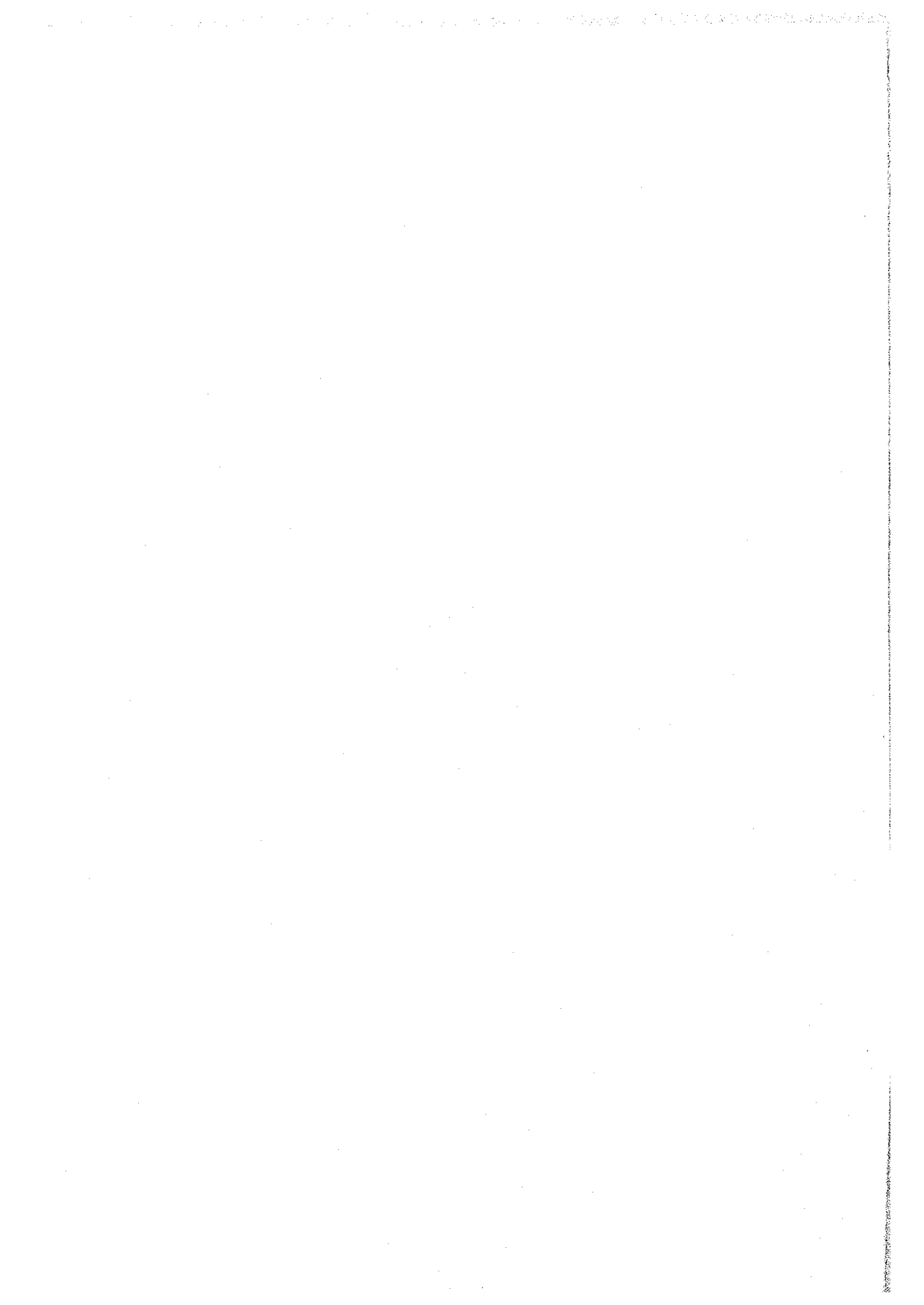
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Japan International Cooperation Agency (JICA)

**Agency of Republic of Kazakstan on
Land Resources Management**

SYSTEM MAINTENANCE MANUAL

**THE STUDY
ON
THE URGENT ESTABLISHMENT
OF
NATIONAL BASIC GEOGRAPHIC DATA
IN
SOUTHERN AREA
OF
THE REPUBLIC OF KAZAKSTAN**

February 2000

Aero Asahi Corporation



1158207(9)

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- 2. Geometric Correction of SPOT Satellite image by PCI software**
- 3. Out line of Digital Mapping**
- 4. Digital Mapping**
- 5. Land Cover Classification**

System Customizing

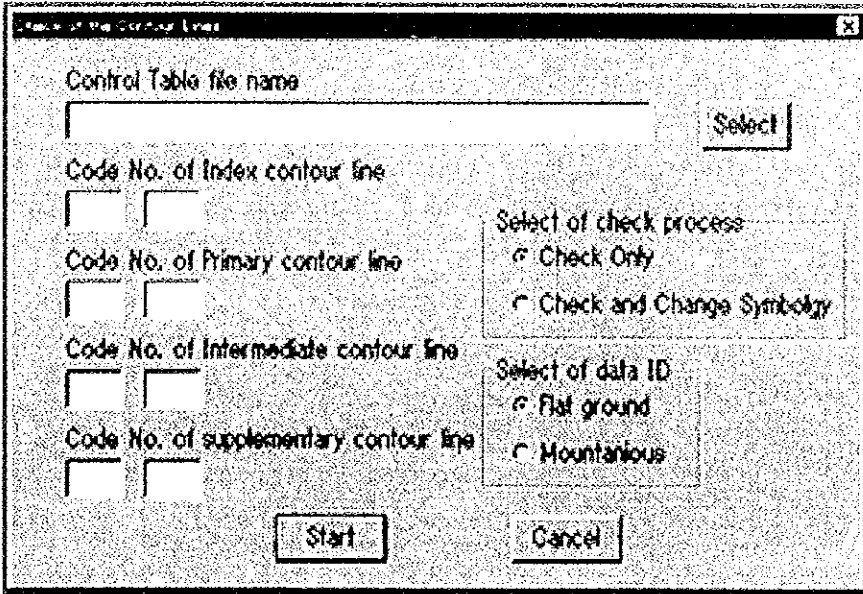
Contents

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Check symbology of contour line	
Cont_chk	Aero Asahi Corporation

[Input Procedure]

(1) Input each value.

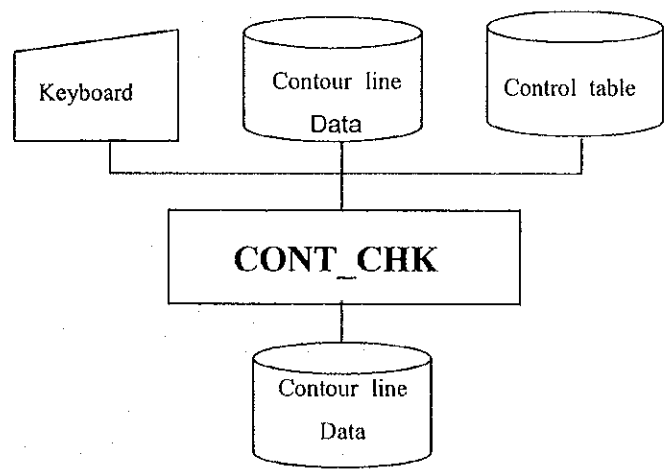


(2) Select cancel or start.

[Function]

Distinguish contour line type according to the contour line height. Symbology (line styles, colors and weight) of contour line is checked and corrected according to inputted code number and Control table.

Figure : Processing Outline



[Outline of Data Process]

1. Control Table

Input the Control table file name.

Data value and configure informations of each map data are described in control table individually.

In this program, a search key which was inputted as the code number, which decides the color, width, line style of the contour line and so on.

2. Code Number of Contour Line

Input the code number of contour line (Index contour line, Primary contour line, Intermediate contour line and Supplementary contour line).

According to the inputted code number, symbology of contour line is extracted from the control table.

The standard value is as follows;

Contour line type	Code number	
Index contour line	6201	1
Primary contour line	6201	2
Intermediate contour line	6201	3
Supplementary contour line	6201	4

3. Selection of the Processing.

Select either only check or check with correction.

Selection of the processing	Contents of the processing
Only check	Extract location of incorrect object
Check and correction	Extract incorrect object and correct

4. Selection of Data ID

Select either mountainous area or plain area.

Contour line interval is recognized with following data selection.

Data identification	An interval of contour line
Mountainous area	At an interval of 40m primary contour line, 200m index contour line
Plain area	At an interval of 20m primary contour line, 100m index contour line

5. Incorrect Object

As for the incorrect data which differ the contour line type from symbology, the record location of data is shown.

[Attention]

In this program, the contour line type is classified with the height of data. Therefore, in case the wrong height is given, it recognizes as incorrect object even if the symbology is correct.

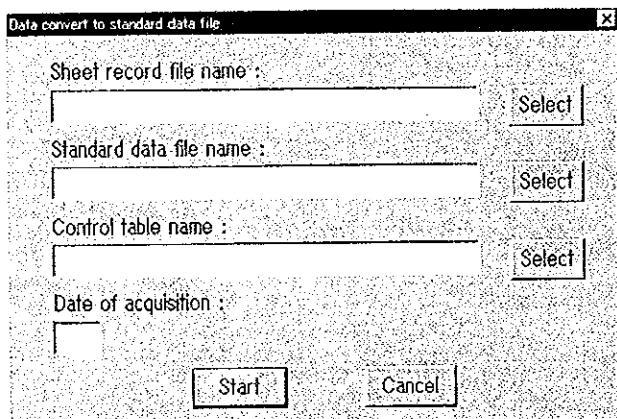
Preparation of Digital Mapping Standard File

MIP2SIN

Aero Asahi Corporation

[Input Procedure]

(1) Input each value



Dialog box titled "Data convert to standard data file" with the following fields and buttons:

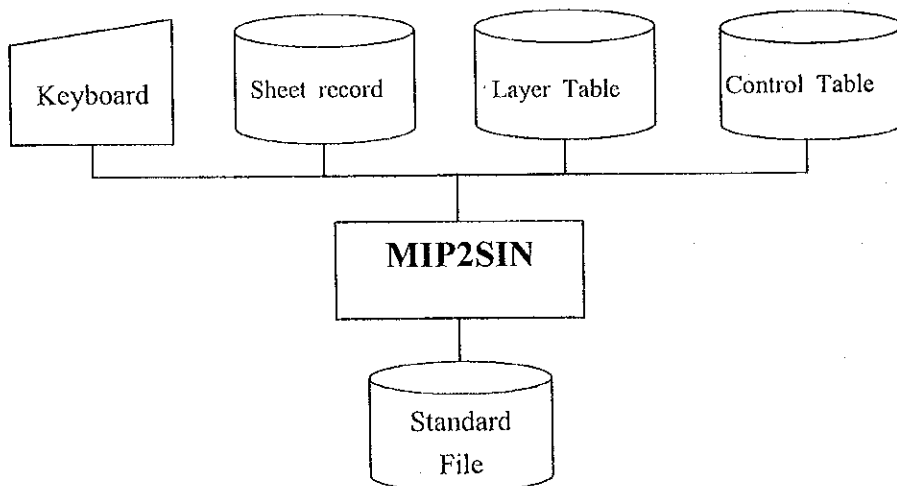
- Sheet record file name : [Text Field] [Select]
- Standard data file name : [Text Field] [Select]
- Control table name : [Text Field] [Select]
- Date of acquisition : [Text Field]
- [Start] [Cancel]

(2) Select cancel or start.

[Function]

Preparing Standard data file for national base map

Figure : Processing Outline



[Processing Outline]

1. Sheet Record File

Input the sheet record file name. Sheet record file is existing by each sheet, with various information of proper sheet.

2. Standard Data File

- (1) Conforms to digital mapping format (November, 1988) of National base map.
- (2) The file name is assumed to be "Sheet name .SIN"

3. Control Table

Input the control table file name. Control table is a file, where a variety of set value of each data type is described for each data.

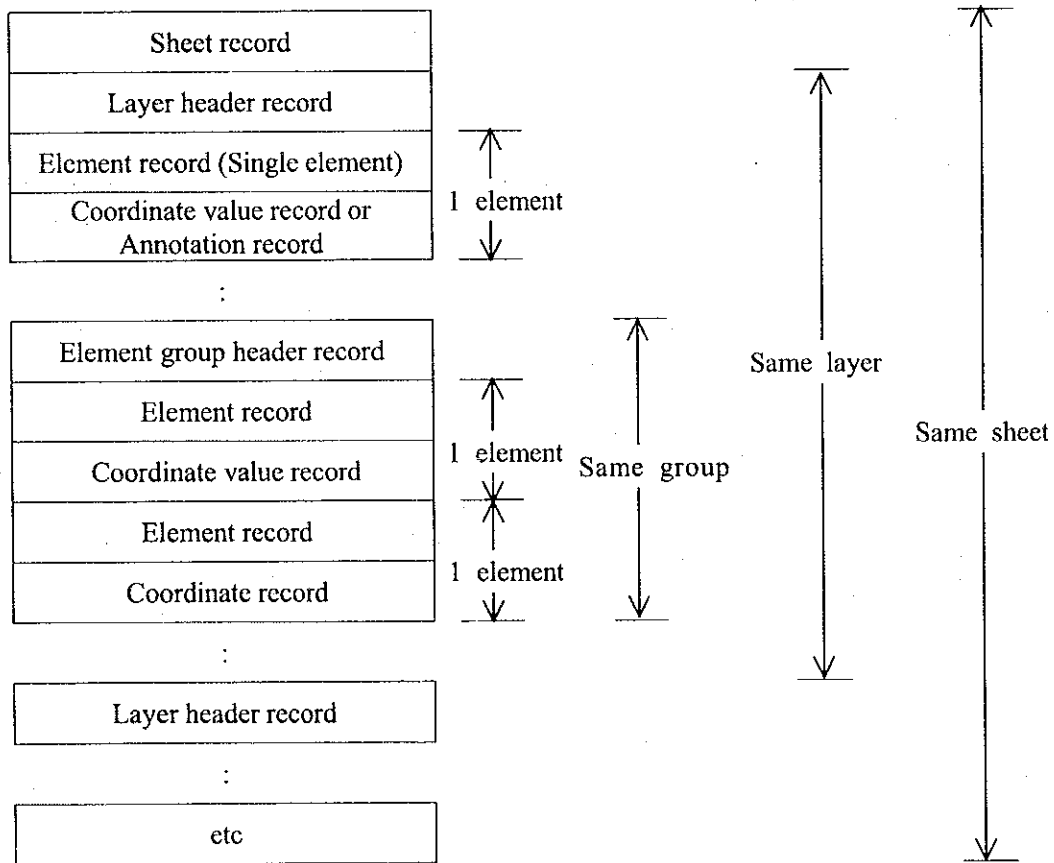
4. Classification Code

According to layer name and symbology of each object, classification code are extracted from control table.

5. Correction processing of Coordinates Row

For the line element, the following processing is done:
- Removal of point data, which have same coordinates.

6. Standard File Structure of Each Sheet



- According to the following field as a key, element records are sorted in ascending order.

- 1st key Classification code
- 2nd key Distinction
- 3rd key Record type

- Layer header and element group header appear between these element records.

7. Sheet Record

- (1) Acquire from sheet record file and set.
- (2) Set the numbers of layers, the numbers of elements and the numbers of records.

8. Layer header record

Summary information of layer code (Upper 2 column of classification code).

Item	Value
Record type	"H"
Layer code	Upper 2 column for classification code
Data item code	"00"
Element identification number	"0"
Classification level	"1"
Total number	Sum of Single element number(The element numbers of grouped record is not included)and the element grouped number.
Group	Group number included in the layer
Sheet – Attribute	Total number of each record type
Data Acquisition date	Key input value
Digitalized code	The most appearance at the value level of 10 in accuracy code

9. Element Group Header Record

Summary information on element group

Item	Value
Record type	"H"
Layer code	Classification code
Data item code	
Element identification number	"0"
Classification level	"2"
Total number	Element number included in the group
Group	"0"
Sheet - Attribute	Total number of each record type
Data Acquisition date	Key input value
Digitalized code	The largest value level of 10 in accuracy code

10.Element Record

Attribute of each element

Item	Value		
Record type	1 st byte	"E"	
	2 nd byte	"1"	Region (Shape) Pline (PolyLine) Only closed buildings.
		"2"	Line (Line) Pline (PolyLine)
		"3"	Ellipse (Ellipse)
		"4"	Arc (Arc)
		"5"	Point (Point) Point
		"6"	Point(Point) Direction
		"7"	Text (Text) Annotation, Elevation value
Layer code	Classification code which is held by figure element.		
Data item code	Classification code which is held by figure element.		
Element identification number	Attach number from 1 for each classification code.		
Layer level	Single element "2"		
	Element under group "3"		
Distinction	Distinction of attribute data which is included at figure element		
Real data code	"0"	Text (Text) Point	
	"2"	Line (Line)	
		Pline (PolyLine)	
		Region (Shape)	
		Text (text) Direction	
"4"	Text (Text) Elevation value		
Accuracy code	"11"	Classification code 7301--7311(GCP)	
	"56"	Classification code 1101--1107(Administration boundary)	
	Accuracy code of attribute data	Others	
Annotation code	"1"	Text (KANJI Text) Annotation	
	"2"	Text (text) Elevation value	
	"0"	Others	
Displacement code	Displacement code for attribute data which is held by figure element.		
Intermittent code	Intermittent code for attribute data which is held by figure element.		
Data number	"0"	Point (Point) Point	
	"2"	Point (Point) Direction	
	KANJI character number	Text (Text)Annotation	
	Text character number	Text (Text) Elevation value	
	Number of the tops	Line (Line)	
		Pline (PolyLine)	
Region (Shape)			
Record number	"0"	Point (Point) Point	
	64 byte/1record	Text (Text) Annotation	

		Text (Text) Elevation value
	6 tops/ 1 record	Line (Line)
		Pline (PolyLine)
		Region (Shape)
		Text (Text) Direction
Coordinates of Representative point	Text origin	Text (Text) Elevation annotation
	User origin	Text (Text) Point, direction
	(0,0)	Others
Attribute number	Elevation	Classification code 71xx (Contour line)
	Value of	Classification code 73xx (GCP)
	Attribute	Classification code 75xx (DTM)
	Data	
	"0"	Others
Attribute code	"0"	
Attribute data form	" "	(Normally, the attribute data is not prepared)
Data acquisition date	Data acquisition date of attribute data which is held by figure element.	
Annotation Style code	"1"	MINCYOU-style
	"2"	Gothic
	"3"	Text (Text) Elevation value
	"0"	Others

- Coordinates are relative from the left bottom of sheet. (Geodetic coordinates system)
- The unit of attribute value is mm.

11. Coordinate Value Record

- (1) 6 points are in 1 record.
- (2) The coordinate values are assumed to be relative from the left bottom of sheet.
- (3) (0,0) is set in the remaining field.
- (4) For the line
 - Extends over plural records when the number of the tops exceeds six(6).
 - Coordinates outside the sheet are replaced at the neat line and identified by tracing a line from outside coordinates towards the sheet, which crosses vertically.
- (5) In case of point
 - Set the coordinate value of text origin as the 1st point.
- (6) In case of direction
 - Set the coordinate value of text origin as the 1st point.
 - The coordinate values of the position which extended by 5mm on figure, are set at the direction of text as the 2nd point

Patterning

Miptng

Aero Asahi Corporation

[Input Procedure]

(1) Input each value.

Data convert to symbolized data

Output directory : _____

Sheet record file name : _____ Select

Control table name : _____ Select

Symbol patterning definition file name : _____ Select

Line patterning definition file name : _____ Select

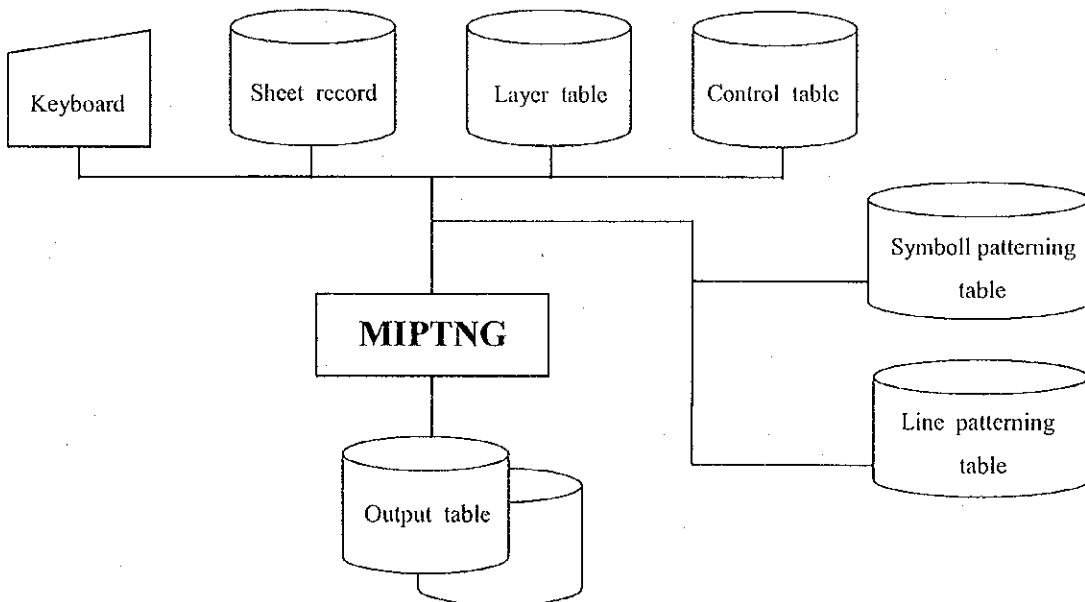
Start Cancel

(2) Select cancel or start.

[Function]

Perform a patterning for original map.

Figure : Processing Outline



[Processing Summary]

1. Sheet Record File

Input the sheet record file name. The sheet record file is existing for each sheet, with various information of proper sheet.

2. Control Table

Input the control table file name. Control table is a file where setting of each symbolization is described for each data.

3. Symbol Patterning Definition Table

Input the symbol patterning definition table name. Symbol patterning definition table is a file where the figure of symbol, which are put by symbolization, is described for each data.

4. Line Patterning Definition File

Input the line patterning definition file name. Line patterning definition file is a file, where the line patterning figure is described.

5. Symbolization Frequency

As for the frequency of symbolization, the frequency is regulated at the control tables and the frequency is 10 times or less to one object.

6. Acquisition of figure object

- (1) The figure object is acquired from the map file one by one.
- (2) In symbolization, the numerical value of the pen and the brush are recognized as key, which search from the control table. According to the acquired record numbers (maximum 10) to each object, the process is executed.
- (3) The objective figure and corresponding processing are as follows:

Figure element	Processing				
	Line patterning	Region patterning	Putting Symbol	Copy	Place as TureType
Point(Bitmap)					O
Point(TureType)				O	
Line	O		O	O	
Poly Line	O		O	O	
Region	O	O	O	O	
Text				O	

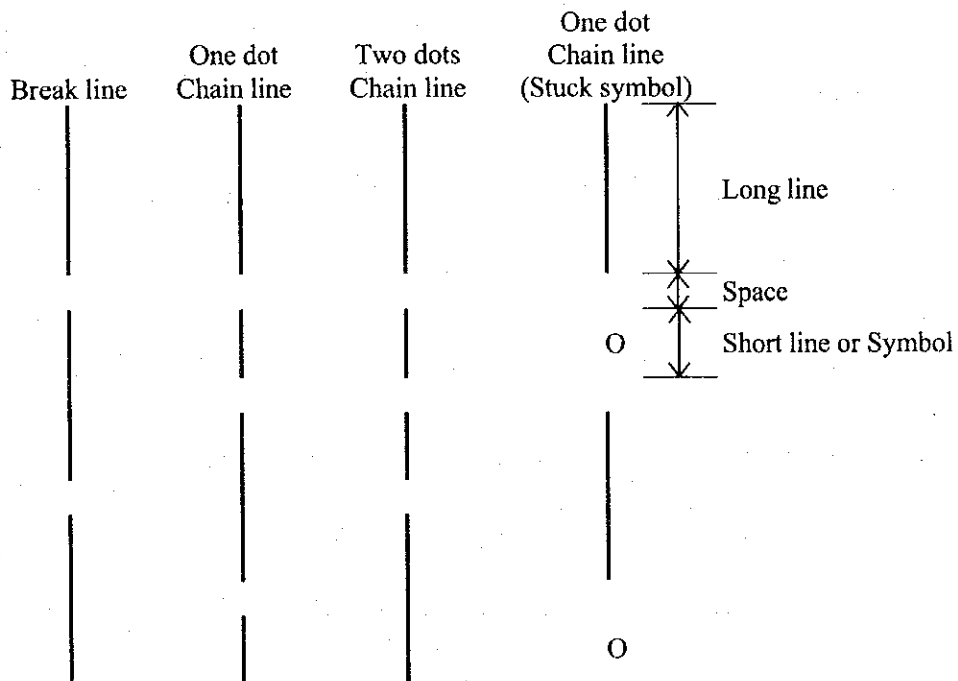
7. Symbolization of Line

(1) The relation between line type number and the processing are as follows.

Line type number	Pattern type	Figure
Under -2		Out of symbolization
-1		Simple copying
1-899	1	Line patterning / Break line
	2	Line patterning / One dot chain line
	3	Line patterning / Two dots chain line
	11	Line patterning / Break line (reduce edge)
	12	Line patterning / One dot chain line (reduce edge)
	13	Line patterning / Two dots chain line (reduce edge)
900-998		Line patterning / One point chain line (Short line is Symbols)
999		Change symbology and output by former coordinates

(2) The form is as follows:

The color, width and shape of the line are provided by the line patterning definition file.



8. Symbolization of Region

- (1) Refer to the item of symbolization of the line for symbolization of border line.
- (2) Region is not outputted when number 1 (non-display) is set at both outline linear and brush style.
- (3) Symbolization of Region is done by two methods, one is for symbol arrangement at the Region and another is arranging the lattice line at Region. Details are as follows:

- Symbol arrangement in Region

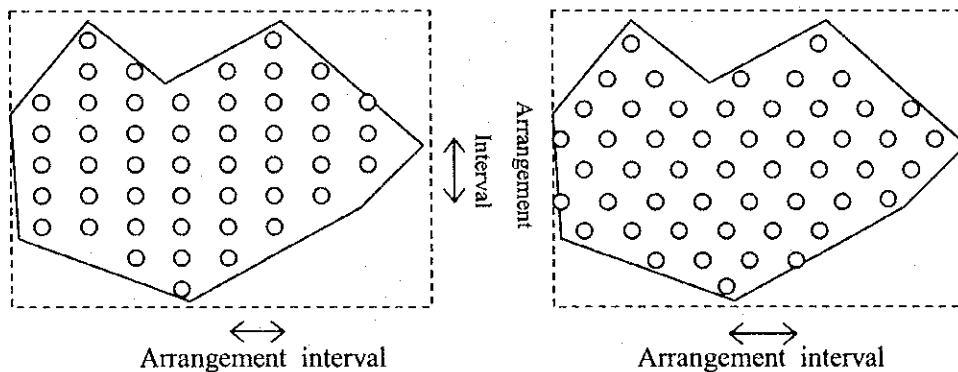
The arrangement interval and lattice interval value from the center of gravity position of Region and movement coefficient from the arrangement origin are tempered for the symbol arrangement inside a Region.

The arrangement interval in Region is changed by the area of region.

Moreover, when the arranged symbol position exists in a constant distance or less than the nearest tangent line, symbol is not arranged.

- (4) More than three symbols for passable saline land are arranged as a special case.

Ex.)



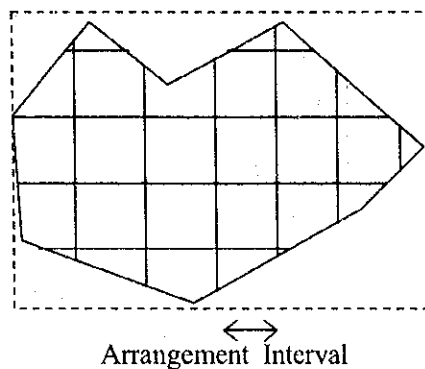
When lattice interval numerical
Value is 1

When lattice interval numerical
Value is 2

- Arranged lattice line in Region

From the minimum existence range of the coordinates, the arrangement interval is tempered for arranging the lattice line in the Region. This process is executed in the control table when the symbol file name is "none" and the line pattern ID number is 999.

Ex.)



9. Pasting the Symbol

- (1) Fixed size symbol is arranged to the line and the borderline of a Region by Symbolization of pasting the symbol.
- (2) The pasting interval and the start/end point position are calculated by dividing the regulated value of control table by [$*scale/1000$].

10. Symbol and Text Copy

- (1) Point data and text data are copied as it is.

11. Output Layer

Symbolized element is outputted to the layer provided by the control table. At this time, the output layer is able to select one from plural layers for each data types.

The numbers of output layer classifications are assumed up to 100.

The output layer of the pasting symbol is output to a fixed layer of "Pattern J".

Moreover, when the output layer specification part in the control table is a blank, the data of the proper code is output to "Pattern J" layer.

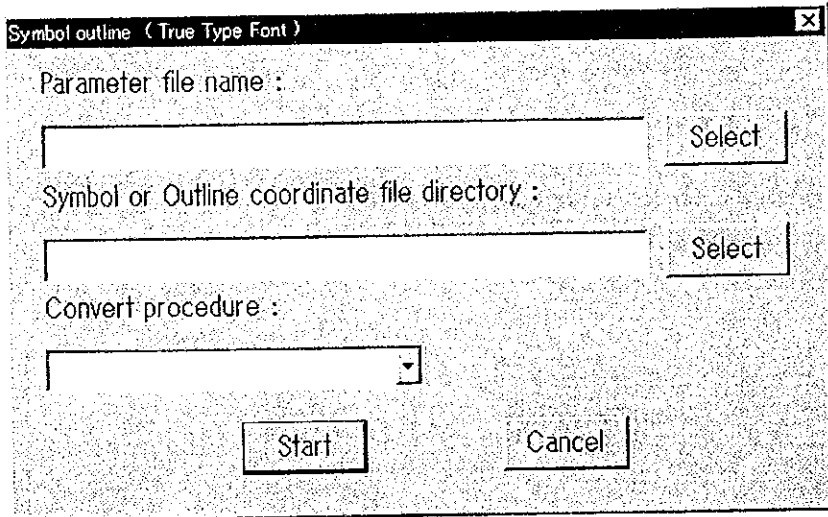
Out Line the True Type Font

Out lin.mbx

Aero Asahi Corporation

[Input Procedure]

1. Input each Value

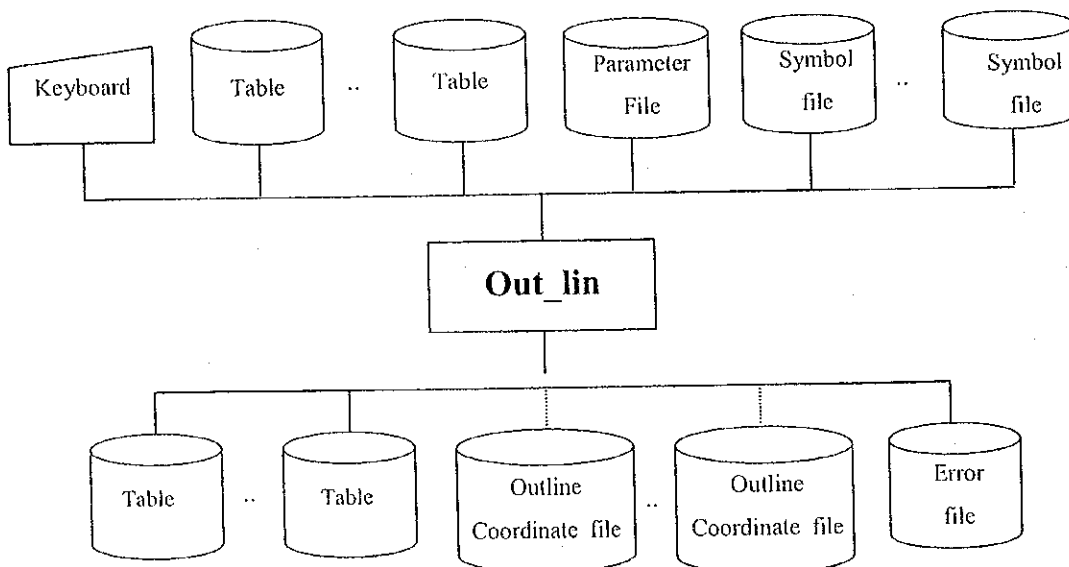


2. Select Start or Cancel

[Function]

Prepare the outlined coordinates file from the symbol coordinates file.
Arrange symbols in the layer into Region automatically. (Over writing)

Figure : Processing Outline



[Processing Summary]

1. Parameter File

Acquire following data for parameter file.

(The following values in the parameter file are acceptable in free format)

No	Recognition character	Format	Contents
1	SCALE	Left justified fixed character	Scale
		Free format	Map scale
2	FNT_NAM	Left justified fixed character	Regulate converting True Type Font.
		Free format	True Type Font name : (10 or less)
3	SYM_FIL	Left justified fixed character	Coordinate file name for use
		Free format	Font size : Symbol coordinate file name or Outline coordinate file name

*Note -- Space (plural is acceptable) is added between the font size and the file name.

2. Symbol File Directory

The Symbol file directory stores the symbol coordinate file or the outline coordinates file, which are used.

3. Converting Method

Converting method is as the following 2 methods.

(1) Generate from symbol coordinate file

After generating the outline coordinate file by converting from the CSV file, which becomes the former data, the pertinent symbol is replaced by Region automatically. This method is used when there is no outline coordinate file.

(2) Generate from outline coordinate file

Select this method when the outline coordinate file is prepared already.

4. Symbol Coordinate File Data

The format of Symbol coordinate data is as follows:

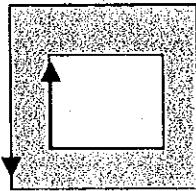
Record number			
1	"Type"	"X"	"Y"
2	1	X Coordinates	Y Coordinates
More than 3	1, 2, 3	X Coordinates	Y Coordinates

Explanation of "Type"
 1: Start point coordinate
 2: On-curve point
 3: Off-curve point

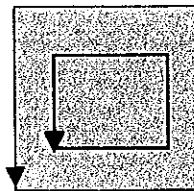
(*)However, the type of 2 and 3 are not taken into consideration at this time.

Also, when preparing the inside as empty, acquire the coordinates as the opposite direction of the adjoining outline.

Ex.)



Coordinate order which is able to empty the inside



Coordinate order which is not able to empty the inside

(*)The arrow indicates the direction of the rotation.

5. Outline Coordinates File Data

Coordinates data after the outline processing. The coordinates are converted under the consideration already based on the scale and symbol point number of MapInfo, which are possible to process to Region directly. The format is as follows:

Record number	Contents
1	"Symbol Coordinate Data File" (Fixed character)
2	Number of Regions, which composes pertinent symbol
3	"Coordinate data" (Fixed character)
4	Node = Digits of coordinate which composes Region
...	X, Y Coordinate values which above mentioned
n	Node = Digits of coordinate which composes Region
...	X, Y Coordinate values which above mentioned

6. Naming Rule of Symbol Coordinates File and Outline Coordinates File

The font name and the symbol code are allocated to the file name of the symbol coordinates file and the outline coordinates file. The file name follows to the following naming rules.

File name: font name - Code number. Extension

(*) Code number is the code of the object symbol (treble digits) on MapInfo.

Ex.) Kazafu_font-033.csv

Mid-055.cdn

Moreover, the extension of "csv" is for symbol coordinates file and the extension of "cdn" is for outline coordinates file. When the extension is not filled in the parameter file, the default extension is added automatically. Therefore in case the extension is differs from default, it is necessary to input extension. Moreover, the space input is not applied in the file name, therefore, instead of space, percent "%" are used.

Ex.) MapInfo Cartographic → MapInfo % Cartographic

7. Convert Method from True Type Font (TTF) to Region (RG)

According to the coordinates of TTF origin, RG, which composes the symbol, is arranged. In that case, the color of RG depends on the color of TTF. Moreover, it corresponds to the rotation of the sign.

The output method of this program is superscription save, therefore, if it is necessary to use, load the program after the original data is copied

Develop Index Point

PLT_FMK

Aero Asahi Corporation

[Input Procedure]

>PLT_FMK

Input each parameter in dialogue.

Path of file name or parameter file

Path of Sheet record file or file name

Path of output file or file name

Specification of upper left, upper right, bottom left and bottom right

Specification of coordinates system(Zone 11 or 12)

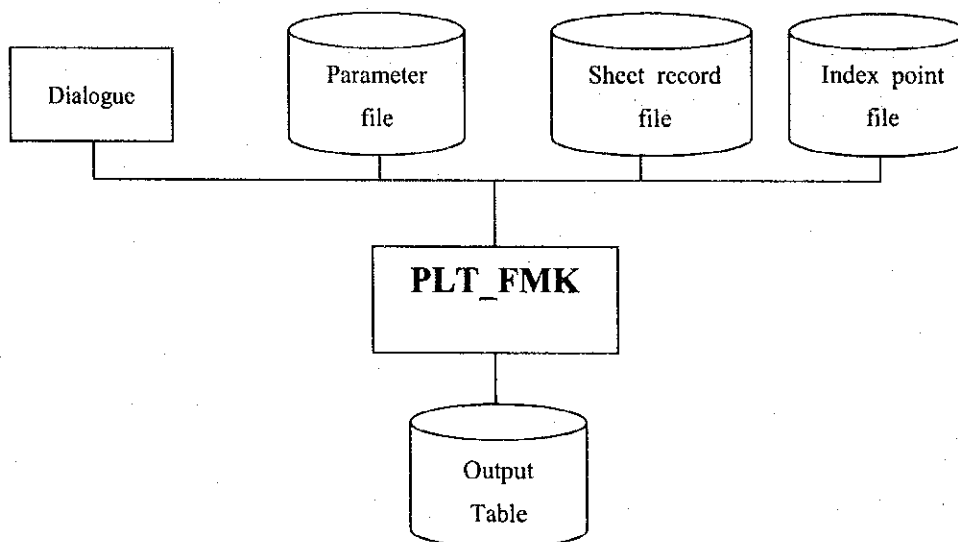
Push "START" key

>Index Point development is finished

[Function]

Index point coordinates, which corresponds within the range of the specified Sheet record file, is read from another index point file and outputs by file format (.tab) which is used in MapInfo.

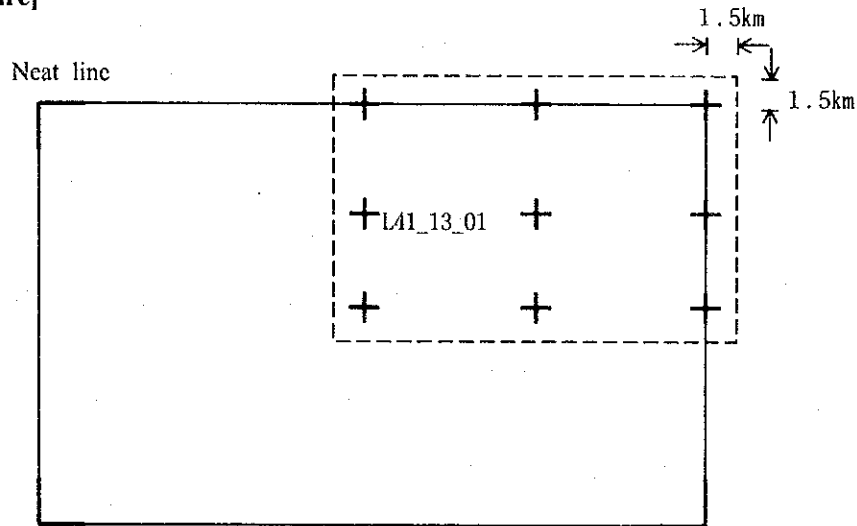
Figure : Processing Outline



[Processing Summary]

1. Specified range of image is using coordinates of sheet record file which are upper left, upper right, bottom left and bottom right, and differs by each image.
2. Only the matching code within the sheet record file (block number _ file number) and the above-mentioned index file of the range is applied.

[Processing Figure]



Example of Processing (Upper Right)

[Parameter File]

Standard input value is specified in the parameter file. Content of the Parameter file is described by the specified format at the next line of the recognition character.

No	Recognition character	Format	Contents
1	[INDEX_FILE]	Left justified fixed character	Regulate the index point file name.
		Free format integer number	Name of the index point file
2	[OUT_INFO]	Left justified fixed character	Regulate the index output information
		Free format integer number	Length, Color, Width and Shape of Index

[Processing Summary]

1. Index

The index is given in the cross by the specified length and has coordinates at the intersection.

The index, which should be output, are decided by specifying the index from the sheet record and the image position. A specific area is made by widening a range at 1.5km by the division of the sheet record into 2×2 .

2. Index File

The index file is prepared by the following format.

Specification: ASCII

Format: [Sheet name and index position number] [X coordinates (real number, m unit)] [Y coordinates (real number, m unit)]

The sheet name and the index position number are prepared by the following naming rules.

[Block number] _ [File number] _ [Index position number]

Ex.) L41_13_01

3. Index Position Number

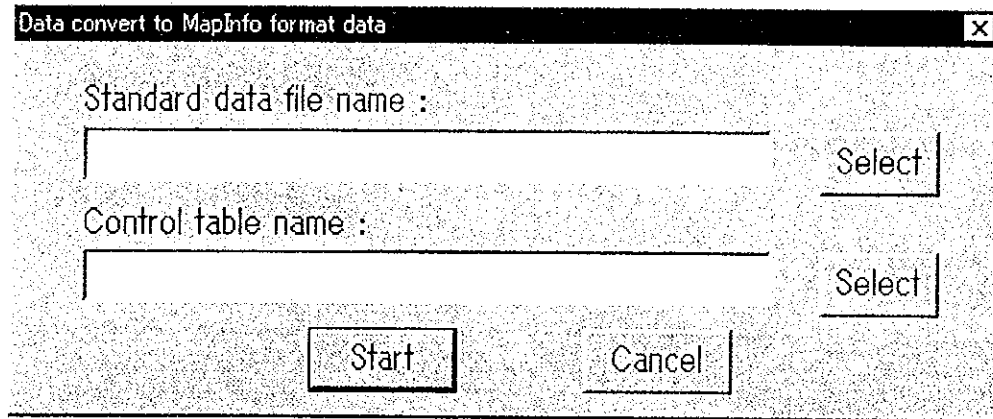
Index number is arranged to the right side of concerning index mark. Pay attention to following matters.

- The parameter files and the Index files are corresponded to free space, although, the tab is not used because it is unable to recognize, which the interval is opened by space.
- The output table can be over written, although the coordinates system is depending on the coordinates system when output table was prepared, therefore not to confuse the Zone 11 with Zone 12.
- The contents of each 1/200,000 and 1/100,000 parameter are different, therefore the parameter files, which corresponds, are prepared.

Conversion Standard Format Data to MapInfo Format Data	
SIN2MIP	Aero Asahi Corporation

[Input Procedure]

1. Input each value.

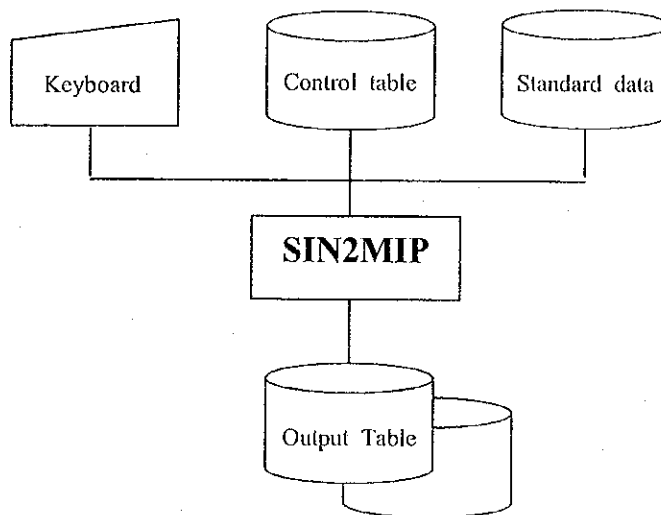


2. Select cancel or start.

[Function]

According to the control table, convert standard data file to MapInfo format file.

[Figure : Processing Outline]



[Processing Summary]

1. Control Table

By the Classification code and distinction in the standard data files, the output layer is extracted and determined from the control table.

Also, the symbology of element is regulated.

Classification code	Distinction	Output layer	Pen				
			Color (R)	Color (G)	Color (B)	Width	Shape
1:5	6:8	21:30	31:34	35:38	39:42	43:45	46:48
I5	I3	A10	I4	I4	I4	I3	I3
Brush							
Figure	Foreground Color(R)	Foreground Color(G)	Foreground Color(B)	Background Color(R)	Background Color(G)	Background Color(B)	
49:51	52:55	56:59	60:63	64:67	68:71	72:75	
I3	I4	I4	I4	I4	I4	I4	

2. Output Layer Table File

In case there are no output layer table files, it is prepared automatically.

3. Projection

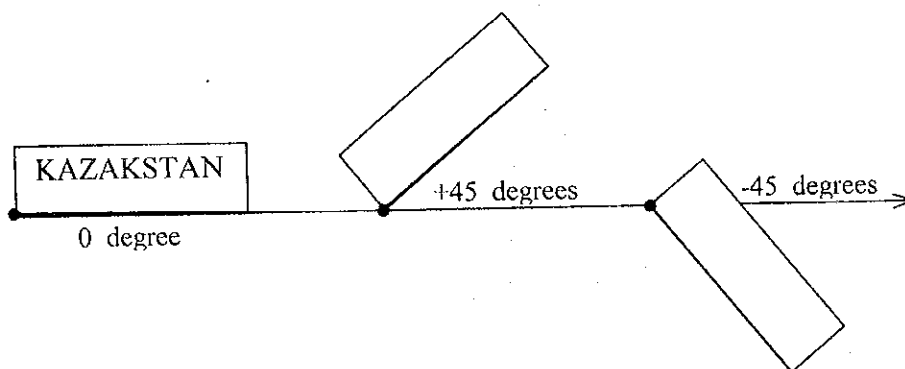
In case there are no output layer table files, the coordinates system is determined by the value of the sheet record in the standard data.

4. Output Scale Denominator

By the scale denominator, the size of annotation is determined.

5. Annotation

- (1) MapInfo is unable to accept to place the text in a vertical writing, therefore all texts are in left to right normal writing.
- (2) Angle is regulated within 180 to -180 degree based on X axe.
- (3) Angle of horizontal writing annotation is as follows:



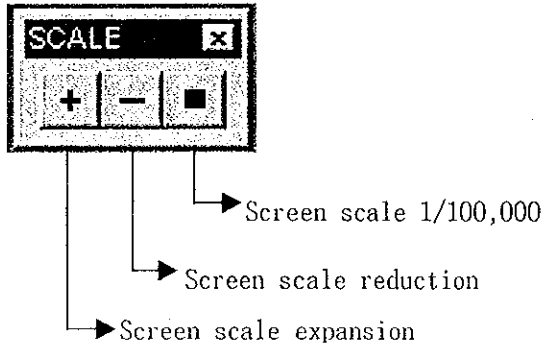
Edit Menu

Edit menu

Aero Asahi Corporation

[Figure]

1. Screen Scale Command



[Work Procedure]

1-1. Screen scale expansion (zoom in)

Function	The screen scale is expanded into the regulated scale
Input Procedure	1. Select from menu. 2. Display is expanded.
Note	Center of zoom is screen center.

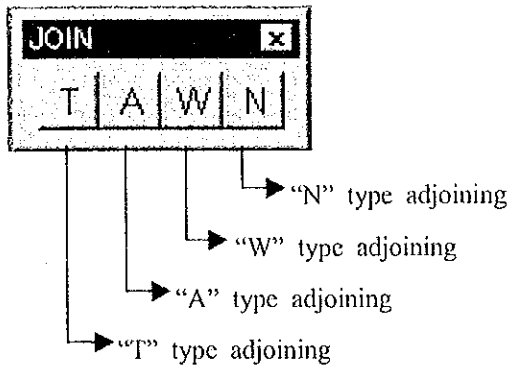
1-2. Screen scale reduction (zoom out)

Function	The screen scale is reduced into the regulated scale
Input Procedure	1. Select from menu. 2. Display is reduced.
Note	Center of zoom is screen center.

1-3. Screen scale of 1/100,000

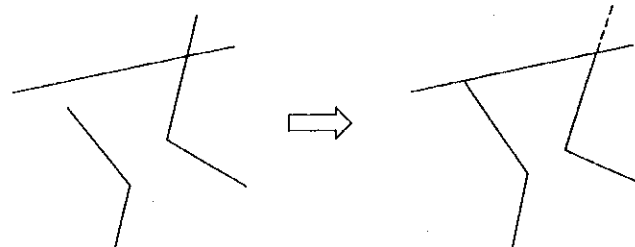
Function	The screen scale is changed into the scale of 1/100,000
Input Procedure	1. Select from menu. 2. Display is changed.
Note	Center of zoom is screen center.

2. Line Adjoining Command

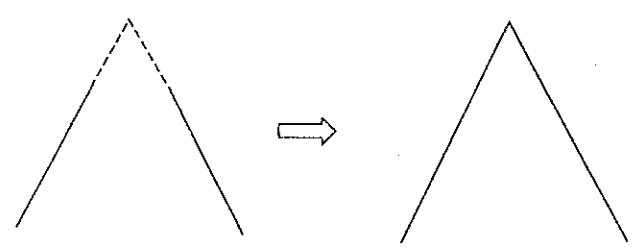


[Work Procedure]

2-1. "T" type adjoining

Function	Extend or shorten the line figure till another line figure.
Input Procedure	1. Select menu. 2. Select line to be edited. 3. Select the objective line.
Note	At the length extend, the edited figures are connected to the objective figure. In case the edited figure and the objective figure are crossing each other, the edited figure is shorten till the intersection point.
Examples	

2-2. "A" type adjoining

Function	Connecting two (2) edges of figures.
Input Procedure	1. Select menu. 2. Select one line. 3. Select the other line.
Note	Edges of two (2) lines are tied together by extending till the intersection point or depending on the scale.
Examples	

2-3. "W" type adjoining

Function	Connect two (2) edges at the middle point of figures.
Input Procedure	1. Select menu. 2. Select one line. 3. Select the other line.
Note	Edges of two (2) lines are tied together at the middle point of two edges.
Examples	

2-4. "N" type adjoining

Function	Connect by moving the edited figure edge to the objective figure edge.
Input Procedure	1. Select menu. 2. Select line to be edited. 3. Select the objective line.
Note	Connect each edge by moving the edited figure edge to the objective figure edge.
Examples	

Symbol Input Menu

KAZAK

Aero Asahi Corporation

[Input Procedure]

- (1) (At Menu bar) Symbol input—Select the group of input data item.
- (2) Select the type of each input data from tool box.

[Function]

Input each data.

[Processing Summary]

1. Program File Structure

It is structured by kazak.mb, Set_style.mb, Resident.dll, Institute.dll, Railroad.dll, Road.dll, Channel.dll, Relief.dll, Field.dll and Supplement.dll. (Basically, all files are stored in the same directory)

Program file name	Function
kazak.mb	Main program of Symbol input operation. Add "symbol input" menu for Kazakstan project in the menu bar of MapInfo.
Set_style.mb	Initialize set up for the symbol input.
Resident.dll	Icon display DLL for residential area layer
Institute.dll	Icon display DLL for facility layer of industry, production, agriculture, society and culture
Railroad.dll	Icon display DLL for railroad layer
Road.dll	Icon display DLL for road layer
Channel.dll	Icon display DLL for water part layer
Relief.dll	Icon display DLL for topographic layer
Field.dll	Icon display DLL for vegetation layer
Supplement.dll	Icon display DLL for additional layer

2. Program Icon

- (1) Prepare two types of bitmaps for one icon. Small icon as 18 x 16 and large icon as 26 x 24.
- (2) Prepare DLL for each layer which displays the icon. After this operation, compile a file by using Visual C++ Ver.5.0.
- (3) The set up of the icon ID starts from 201.
- (4) Used the icon ID inside the program, which is processed by using from the number 1 for each icon of each layer.

3. Attributes

Attributes are added as following, and only the contour lines and control points are input as height information.

Field name	ID
Types	integral number

For the items which needs the attribute information of height, the dialog of height is displayed to input the value.

4. Change of Object Style and Others

Change is possible by changing and compiling the initial set up program, Set_style.mb

5. Change of Icon DLL File Directory

Normally, DLL file directory is the same directory with program operation file. Although it can be changed by changing and compiling the initialize set up program, "Icon_path", which is inside the Set_style_mb.

6. Writing Layer

The data inputted by the menu is divided by the types and stored into each layers.

The way of opening the layer table file is as follows:

(1) In case layer table is already opened:

In case required table is at the same operation directory, open the existing table.

In case required table is not on operation directory, prepare and open the table which is adjusted as the same projection of background table.

(2) In case there are no opening table such as layer table or symbol input menu items:

Prepare a new file by following the orders by the displayed dialog.

At this moment, the projection must be selected.

7. Undo

The input data by the menu can be canceled by using the command "undo" in the edit menu bar of MapInfo.

Although, the data with the height attribute is unable to cancel by using the menu bar.

8. Help Message

Help messages of selected button are shown both on both situation bar and tool tip by placing cursor on the custom push button.

Recent select situation (about selected layer and item) is shown at the title bar on the Map window.

9. File Saving

The data input by the menu can be trashed at the moment of ending MapInfo. Therefore, to save the operation process, follow the ordinal operation method to save the file by selecting "file" which is inside the menu bar of MapInfo.

[Attention]

Change of Custom Symbol Directory

Normally, the directory including the custom symbol is C:\MapInfo\Custsymb, which is regulated by MapInfo. Although, MapInfo has a limitation of displaying symbol numbers, therefore, all of the added custom symbols are not able to be displayed. For this reason, the name of directory, which includes the MapInfo's custom symbol, is changed. Then the used symbols are replaced at the directory of C:\MapInfo\Custsymb.

Attribute Convert

Atr-cnv

Aero Asahi Corporation

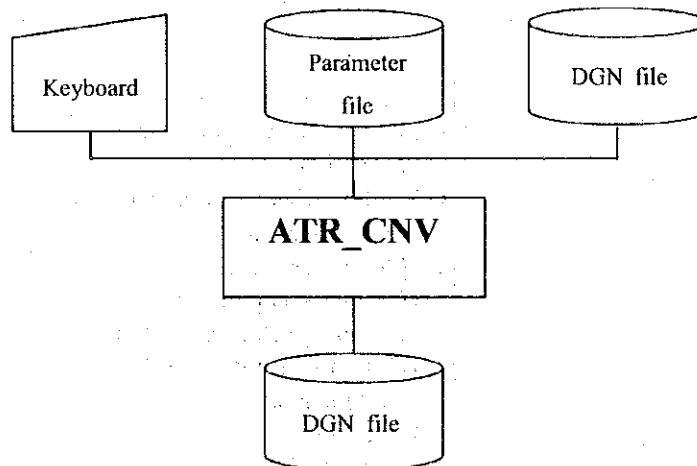
[Input Procedure]

```
>atr_cnv  
  Parameter file name  
  Input design file name  
  Element levels for convert  
  Input confirmation (Execute [a], Re-input [r], Exit<Enter>)  
>
```

[Function]

The attribute of the specified element with the parameter file is changed.

Figure : Processing Outline



[Processing Outline]

1. Object Element for Processing

The object for the processing is an element. Its element attribute is regulated by parameter files. Complex elements are out of processing.

2. Processing Selection

At the parameter file, in case of the -1 numerical value is set at the input code items, the item is excluded from the search items.

In case of the -1 numerical value is set at the output code items, the item is not converted from that of input items.

[Parameter File]

Contents are specified in the next line of the recognition character line.
 The line which starts by “;” or “C”, “c” is assumed as comment line.

No	Recognition character	Format	Contents
1	[ATR_TBL]	Free format integer number	Number of search information for object element
	- Written by Left justified fixed character - Regulate attributes of object elements	Free format integer number	1) Classification code 2) Distinction 3) User code 4) Accuracy code 5) Displacement code 6) Intermittent code 7) System area 8) User ID 9) Element ID 10) Acquisition year and month 11) Free area 12) Free area 13) Delete year and month 14) Free area 15) Blank code 16) Free area 17) Direction switch of height 18) Elevation 19) Output Classification code 20) Output Distinction 21) Output User code 22) Output Accuracy code 23) Output Displacement code 24) Output Intermittent code 25) System area 26) User ID 27) Element ID 28) Acquisition year and month 29) Free area 30) Free area 31) Delete year and month 32) Free area 33) Blank code 34) Free area 35) Direction switch of height 36) Elevation

Element Copy and Vove

ELE_COP

Aero Asahi Corporation

[Input Procedure]

>ele_cop

Parameter file name

Input design file name

Select process (0:copy, 1:move)

Object levels for copying

Output design file name

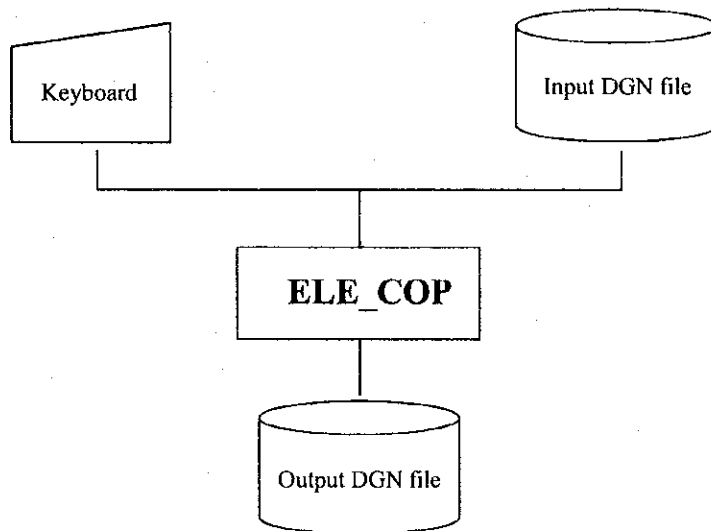
Input confirmation (Execute [a], Re-input [r], Exit<Enter>)

>

[Function]

Copy or move elements from input design file to output design file.

Figure : Processing Outline



[Parameter File]

Contents are specified in the next line of the recognition character line.
The line which starts by “;” or “C”, “c” is assumed as comment line.

No	Recognition character	Format	Contents
1	[ATR_TBL] - Written by Left justified fixed character - Regulate attributes of object elements	Free format integer number	Number of search information for object element
		Free format integer number	1) Classification code 2) Distinction 3) User code 4) Accuracy code 5) Displacement code 6) Intermittent code

[Processing Outline]

1. Object Element for Processing

The object for the processing is an element. Its element attribute is regulated by parameter files.
At the parameter file, in case of the -1 numerical value is set at the each code items, the item is excluded from the search items.

2. Output File

In case output file is not exists, output file is created automatically within the size, which is enough to store copied elements. Moreover, when the size of the output file is insufficient, the size of the file is set also automatically.

Adjoining between Sheets

JOINT

Aero Asahi Corporation

[Input procedure]

>JOINT

Regulate the element classification method

Processing selection

Joint method selection

Object sheet name

Sheet recognition character

Selection of regulation method of neat line data (0: ZREC, 1: DGN)

Sheet record file name (.ZREC) (*When selecting ZREC)

Frame data design file name (.DGN) (*When selecting DGN)

Level of neat line data (*When selecting DGN)

Left side neighboring sheet name (When not existing <CR>)

Left side neighboring sheet name (When not existing <CR>)

Above side neighboring sheet name (When not existing <CR>)

Right side neighboring sheet name (When not existing <CR>)

Below side neighboring sheet name (When not existing <CR>)

Joint object level

Fixed limit value (UOR)

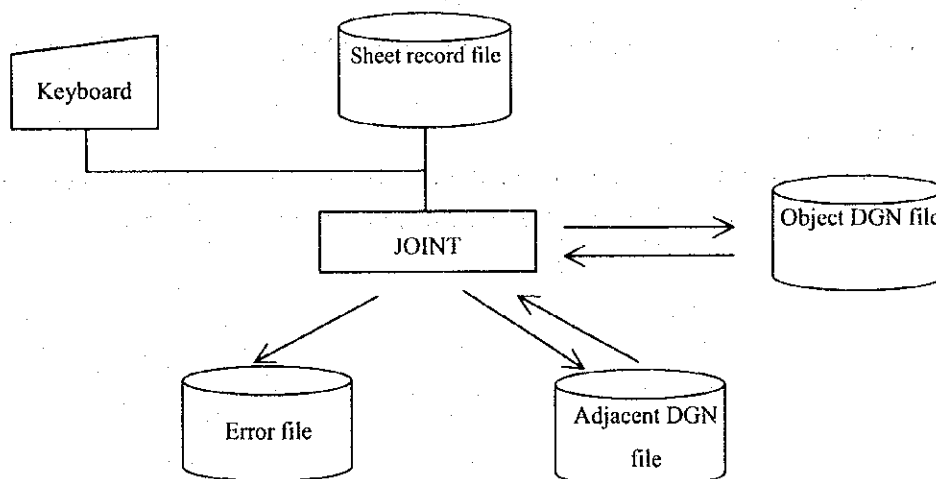
Input confirmation (Execute [a], Re-input [r], Exit<Enter>)

>

[Function]

Line data ending on the neat line of the object sheet is joined with the line data on the adjacent sheets. The error position coordinates are output to the error file (JOINT.ERR) when there is no confronted line confronted in the fixed limit value on Neat line.

Figure : Processing Outline



[Processing Summary]

1. Object Element for Processing

The object for processing is only the line data of TYPE3,4,12.

The level and the symbology (or classification code) are corresponded, and the joint distance under the fixed limit value is processed.

The object for processing is the line data whose start or end is corresponded with the neat line. Therefore, the object sheet and adjacent sheets are ended with editing completely, or the adjoining inspection for neatlines are completed.

2. Regulation of Element Classification Method

Select whether the classification of element is carried out depending on the file and levels or the classification code of data attributes.

3. Processing Selection

Select the processing with the following numerical value.

Input value	0	1
Processing content	Results are output at error file	Joint inspection and execution

4. Adjoining Method Selection

Select the adjoining method with the following numerical value.

Input value	0	1
Joint method	Middle point of object line and corresponding line (Move both lines)	Move object line to corresponding line

5. Frame Data Selection

Select the frame data file with the following numerical value.

Input value	0	1
Frame data type	Sheet record file (.ZREC)	Design file (.DGN)

6. Frame data design file

The recognized element type as the frame data are TYPE3, 4, 6, 12 and 14 at the specified level.

7. Fixed Unit Value

Input the maximum limit distance between the end of objective line data and corresponding line data. However, the unit is UOR, which differs in value by each individual design file setting.

8. Error Log File

The joint error position coordinates are output to the file "JOINT.ERR". This file does not affect the input value of the processing selection and is always prepared.

9. Topographic Map

Normally, the sheets of general maps are of rectangular shape, which topographic maps become a trapezoid shape from the width within the range of the sheet area. This Distinction is done by the neatline coordinates described in the sheet record file. If the input neatline coordinates are 2 points, it becomes rectangle, 4 points become trapezoid.

By specifying the frame data from design file, the joint processing is able to be done for the curve which becomes straight line approximately.

Preparing Standard Data

KKSIN

Aero Asahi Corporation

[Input Procedure]

>KKSIN

Parameter file name (KKSIN.PAR)

Sheet name

Sheet record file name (.ZREC)

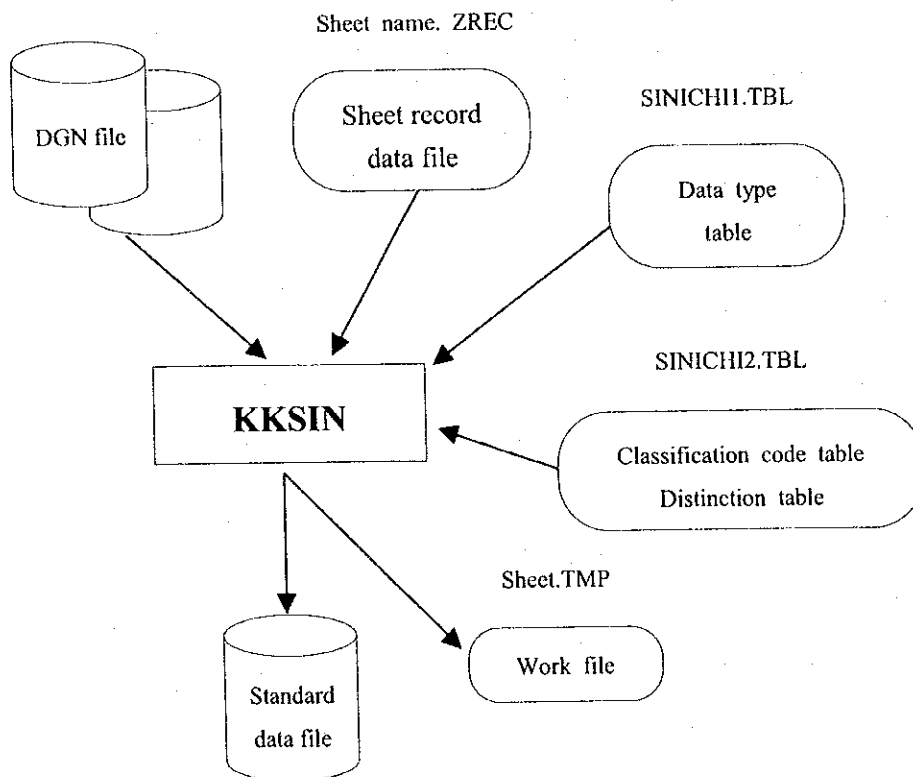
Input confirmation (Execute [a], Re-input [r], Exit<Enter>)

>

[Function]

Preparing Standard data file for national base map

Figure : Processing Outline



[Parameter File]

Contents are specified in the next line of the recognition character line.

The line which starts by “;” or “C”, “c” is assumed as comment line.

No	Recognition character	Format	Contents
1	DATA_TYPE	Left justified fixed character	Regulate the data type table
		IX,A	Name of data type table [SINICH1.TBL]
2	FILE_ID	Left justified fixed character	Regulate sheet combination and layer item of KANJI annotation
		II,A1,I : :	File ID number, File recognized character, Piling value of layer item
		II,A1,I	(6 or less)
3	XCLASS	Left justified fixed character	Regulate the definition method of the classification codes.
		IX,A	Distinction table[SINICH2.TBL] Or selection from attribute of classification code[A]
4	MAP_SCALE	Left justified fixed character	Regulate the scale denominator
		Free format integer number	Scale denominator
5	ACQUIRED_Yymm	Left justified fixed character	Regulate the Acquisition date
		Free format integer number	Acquisition date (ex.: 1996 June-> 9606)
6	SENGO	Left justified fixed character	Regulate the contrast relation between line weight and the line thickness.
		Free format integer number	Regulation number
		Free integer number	Line weight, line thickness
7	SYMBOL_TYPE	Left justified fixed character	Regulate the symbol data form
		A	Symbol data identification character [C:CELL, F:FONT]
8	SYMBOL_TABLE	Left justified fixed character	Regulate the input classification table
		A	Input classification table name[SYMBOL_W.TBL]
9	KANJI_LAYER	Left justified fixed character	Regulate the layer item of KANJI
		Free integer number	Layer number
10	ACQ_COD	Left justified fixed character	Regulate the digitalized code, which is the upper digit of accuracy code
		Free format integer number	Digitalized code
11	FIL_EXT	Left justified fixed character	Regulate the extension of graphic file
		A	Extension of graphic file

[Processing Outline]

1. Standard Data File

- (1) Conforms the digital mapping format (November, 1988) of National base map.
- (2) The file name is assumed as "Sheet name .SIN"

2. Input Design File

- (1) The sheet recognition characters are either from "A" – "F".
- (2) All extensions are assumed as ".DGN".
- (3) The number of files is assumed as six files or less (Acceptable as single).

3. Classification Code

Classification codes are inputted as follows from keyboard.

- Selected by extraction from distinction table [SINICHI2.TBL] and file/level.
- By the selection from attribute, the classification code is acquired from the attribute which belongs to each element.

3-1. Acquisition from Distinction table

	Layer item	Data item	Distinction	Others
Symbol (cell)	Upper 2 column of cell name	Below 2 column of cell name	0	
Annotation(KANJI cell)	81	Header Color	0	Either LV=20 or 21
Annotation(Wide KANJI)	81	Element Color		
Annotation(Text)	81	73	0	Only FL=F, LV=60, TP=17
Others (without Attribute)	Extraction from file number/level		0	
Others (with Attribute)	Extraction from file number/level		Attribute number 7	

3-2. Acquisition from attribute

	Layer item	Data item	Distinction	Others
Symbol (cell)	Upper 2 column of cell name	Below 2 column of cell name	0	
Annotation (KANJI cell)	Parameter file	Header Color	0	Piling value + element level
Annotation (Wide KANJI)	Parameter file	Element Color		
Annotation (Text)	Attribute Number 3	Attribute Number 4	Attribute Number 7	
Others (without Attribute)	The value existence is not admitted.			
Others (with Attribute)	Attribute Number 3	Attribute Number 4	Attribute Number 7	

4. Acquired Information from Attribute

The acquisition information from the attribute is the following "With Attribute". When the element in the Distinction table is not included attribute, it is "Without Attribute".

		With Attribute	Without Attribute	Others
Displacement code		Attribute Number 11	0	
Intermittent code		Attribute Number 12	0	
Accuracy code	Administration boundary:1101-1107	56	56	
	Ground control point:7301-7311	11	11	
	Others	Attribute Number 9	Value from Parameter file + Judgment value from scale	KANJI annotation is similar processing as without attribute
Attribute Number	Point symbol	Attribute Number 13,14	Range number 1[mm]	Only 3 dimensions
	Ground control Point: 7301-7312	Attribute Number 13,14	0	
	Contour line: 7101-7108	Attribute Number 13,14	Range number 1[mm]	
	Annotation (Without KANJI)	Attribute Number 13,14	Range number 1[mm]	Only 3 dimensions
	Others	0	0	
Acquired Date		Attribute Number 15	Key input value	

5. Dimensions

Dimensions are 2 or 3 dimensions.

2 dimension mode : The elevation value of ground control point (7301-7312) and contour line (7101-7108) are given attribute number.

3 dimension mode : In addition to above, the elevation value of the point of symbol, direction symbol and annotation are given attribute number.

6. Correction Processing of Coordinates Row

For the line element, the following processing is done:

- Removal of point data, which have same coordinates.

7. Grouping

The following elements are grouped, and the element records are output after the header record of element group.

(1) Element with equal values

- File identification number (In the same design file)
- Graphic group code

(2) When the classification code of each element is different in the same group, the classification code adopts a minimum value from elements of a grouping.

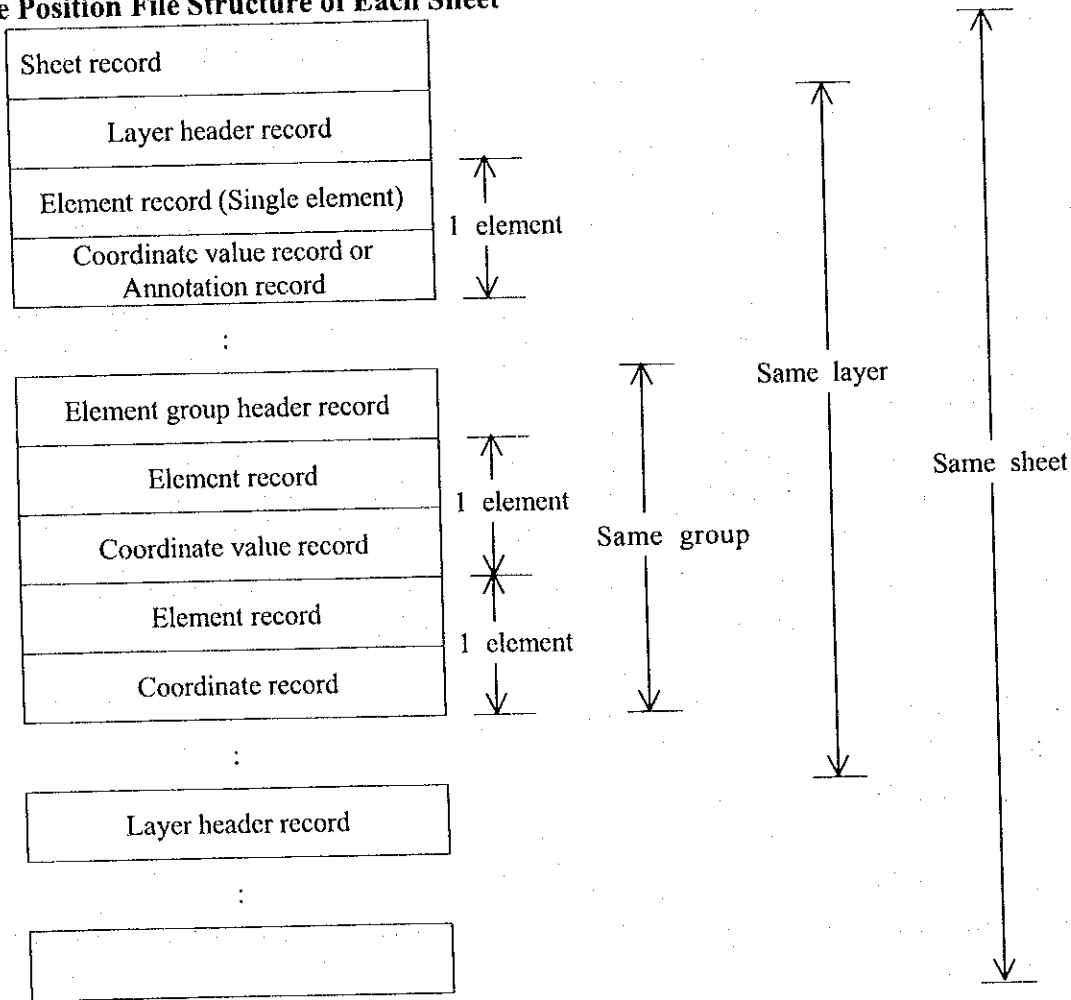
However, the group, which is only for building (classification code 30xx), assumes the maximum value of the element of grouping (Classification codes of group are the same, and do not make the group between the different classification codes).

- (3) The number of maximum digits of graphic group codes is 3 digits. (The fourth digit is the system reservation value.)
- (4) Even if a graphic group code is given, a single element does not form a group.
- (5) When the element becomes in subordinate position in the group, the classification code number 9999 is allocated.

8. Temporary File

In the processing, the sheet number .TMP file is prepared. After ending, it is deleted by interactive mode.

9. True Position File Structure of Each Sheet



- According to the following field as a key, element records are sorted in ascending order.

- 1st key Classification code
- 2nd key Distinction
- 3rd key Record type

- Layer header and element group header appear between these element records.

10. Sheet Record

- (1) Acquire from sheet record file and set.
- (2) Set the numbers of layer, the numbers of element and the numbers of record.

11. Layer Header Record

Summary information of layer code (Upper 2 column of classification code).

Item	Value
Record type	"H"
Layer code	Upper 2 column for classification code
Data item code	"00"
Element identification number	"0"
Classification level	"1"
Total number	Sum of Single element number(The element numbers of grouped record are not included)and the element grouped number.
Group	Group number included in the layer
Sheet - Attribute	Total number of each record type
Data Acquisition date	Key input value
Digitalized code	The most appearance at the value level of 10 in accuracy code

12. Element Group Header Record

Summary information on element group

Item	Value
Record type	"H"
Layer code	Classification code
Data item code	
Element identification number	"0"
Classification level	"2"
Total number	Element number included in the group
Group	"0"
Sheet - Attribute	Total number of each record type
Data Acquisition date	Key input value
Digitalized code	The most appearance at the value level of 10 in accuracy code

13. Element Record

Attribute of each element

Item	Value		
Record type	1 st byte	"E"	
	2 nd byte	"1"	Type 6(Shape)
			Type 4(Line string) Only closed buildings.
			Type12(Connect string) Only closed buildings.
		"2"	Type 3(Line)
			Type 4(Line string)
			Type12(Connect string)
"3"	Type15(Circle)		
"4"	Type16(Arc)		

		"5"	Type17(Text) Point
		"6"	Type17(Text) Direction
		"7"	Type17(Text) Elevation value
			Type 2(Cell) Annotation
			Type17(Text) Annotation
Layer code	Classification code which is held by figure element.		
Data item code			
Element identification number	Attach number from 1 for each classification code.		
Layer level	Single element "2"		
	Element under group "3"		
Distinction	Distinction of attribute data which is included at figure element		
Real data code	"0"	Type17(Text) Point	
	"2"	Type 3(Line)	
		Type 4(Line string)	
		Type 6(Shape)	
		Type12(Connect string)	
		Type17(text) Direction	
	"4"	Type 2(Cell) Annotation	
Type17(Text) Elevation value			
Type17(Text) Annotation			
Accuracy code	"11"	Classification code 7301--7311(GCP)	
	"56"	Classification code 1101--1107(Administration boundary)	
	Accuracy code of attribute data	Others	
Annotation code	"1"	Type 2(Cell) Annotation	
		Type17(Text) Annotation	
	"2"	Type17(text) Elevation value	
	"0"	Others	
Displacement code	Displacement code for attribute data which is held by figure element.		
Intermittent code	Intermittent code for attribute data which is held by figure element.		
Data number	"0"	Type17(Text) Point	
	"2"	Type17(Text) Direction	
	KANJI character number	Type 2(Cell) Annotation	
		Type17(Text)Annotation	
	Text character number	Type17(Text) Elevation value	
	Number of the tops	Type 3(Line)	
Type 4(Line string)			
Type 6(Shape)			
Type12(Connect string)			
Record number	"0"	Type17(Text) Point	
	64 byte/1record	Type 2(Cell) Annotation	
		Type17(Text) Annotation	
		Type17(Text) Elevation value	
	6 tops/1 record	Type 3(Line)	
		Type 4(Line string)	
Type 6(Shape)			

		Type12(Connect string)
		Type17(Text) Direction
Coordinates of Representative point	Text origin	Type17(Text) Elevation annotation
	User origin	Type17(Text) Point, direction
		Type17(Text) Annotation
	Cell origin (0,0)	Type 2(Cell) Annotation Others
Attribute number	Elevation Value of Attribute Data	Classification code 71xx (Contour line) Classification code 73xx (GCP) Classification code 75xx (DTM)
	"0"	Others
	Attribute code	"0"
	Attribute data form	" "
Data acquisition date	Data acquisition date of attribute data which is held by figure element.	
Annotation Style code	"1"	MINCYOU-style
	"2"	Gothic
	"3"	Type17(Text) Elevation value
	"0"	Others

- Coordinates of the representative point are relative coordinates (Geodetic coordinates system) from the left bottom of sheet.
- The unit of attribute value is mm.
- The element without attribute data is an error.

14. Coordinate Value Record

- (1) With 2 dimensions, 6 points are in 1 record, and with 3 dimensions, 4 points are in 1 record.
- (2) The coordinate values are assumed as relative coordinates from the left bottom of sheet.
- (3) (0,0) is set in the remaining field.
- (4) For the line
 - Extends over plural records when the number of the tops exceeds six(6).
 - Coordinates outside the sheet are replaced at the position on the neat line, identified by tracing a line from outside coordinates towards the sheet, which crosses vertically.
- (5) In case of point
 - Set the coordinate value of text origin as the 1st point.
- (6) In case of direction
 - Set the coordinate value of text origin as the 1st point.
 - The coordinates value of the position, which extended by 5mm on figure, is set on the direction of text as the 2nd point.

15. Annotation Record

Item	Value	
Horizontal and vertical code	"1"	Type 2(Cell) Judge from the inclination of the character and the direction of the character string in the case of annotation.
		Type 17 (text) Judge from the value of the attribute area in the case of annotation.
	"0"	Others
Direction of character	The inclination of cell or text Unit is degrees, and range is from -180 to 180.	
Character size	By regulate	Type 17(Text) Elevation value
	Text size of the 1 st character	Type 2(Cell) Annotation
		Type 17(Text) Annotation
Character interval	0.1mm	Type 17(Text) Elevation value
	Calculation from difference of first character position and the last character position and from text size	Type 2(Cell) Annotation
		Calculation from the value of attribute range
		Type 17(Text) Annotation
Annotation data	ASCII	Type 17(Text) Elevation value
	JIS KANJI	Type 2(Cell) Annotation
		Type 17(Text) Annotation

16. The Symbol Data Form

- (1) In case of cell symbol, the cell name becomes an classification code.
- (2) In case of font symbol, the classification code is extracted from classification table.

Node Matching

Nod5

Aero Asahi Corporation

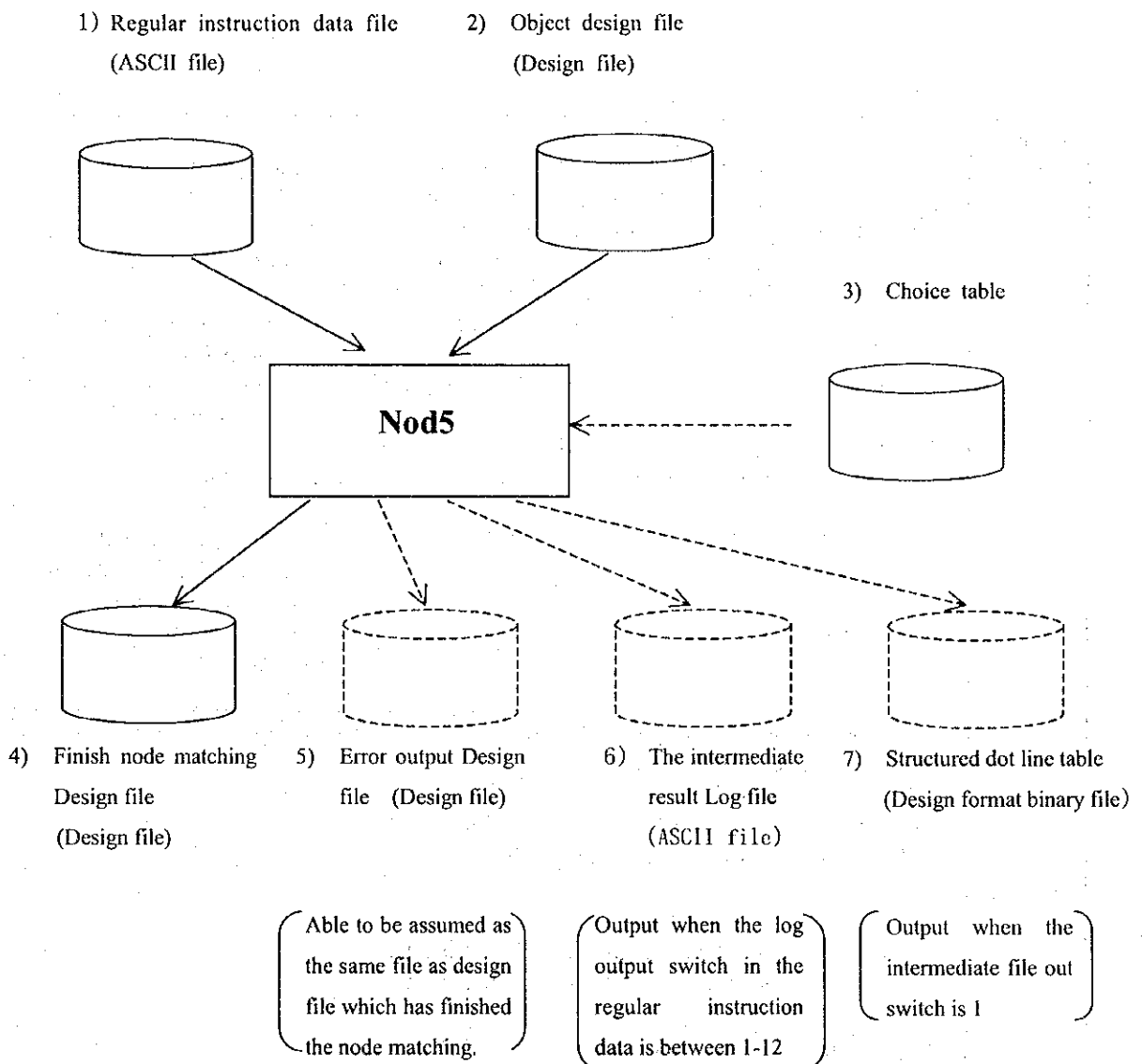
[Outline]

An automatic intersection calculation and an automatic node matching are done for line element in the design file.

[Content of processing]

Node matching of line and line string

Figure : Processing Outline



[I/O Preparation]

Input file

- 1) ASCII file includes regular instruction data file.
- 2) Design file requests node matching.
- 3) Choice table.

Output file

- 4) Design file outputs the result of node matching.
- 5) Error outputs design file which is for the output of round symbol at error part.
(It is possible to output at 1) by input data..)
- 6) When the intermediate log output is specified by input data, it is output.
The file name becomes the one that the extension of the input design file name was assumed as ".log".
- 7) Binary table file structures the point and the line data, if it is necessary.

Nod5

Operation Method	<p>Nod5</p> <p>Key in input DESIGN FILE NAME (def.= .dgn)> Input design file</p> <p>Key in output DESIGN FILE NAME (def.= .dgn)> Output design file</p> <p>Key in I/O strings or CHOICE FILE name (DEF= .TBL) or "ALL", "LINE"> Level of I/O selection *1</p> <p>Key in OUTPUT ERROR FILE name (DEF.= .err) ("=" ... OUTPUT DESIGN FILE OUT)> Regulation of error output file *2</p> <p>Key in CYU-KAN FILE OUT S.W(cr,0:not,1,2:print)> Intermediate file output switch *3</p> <p>When the intermediate file output switch is 1</p> <p>Key in work cyu-kan file name (def.= .wrk)> Intermediate file name</p> <p>Key in SHUJI DATA FILE name (DEF.= .DAT)> Other regular instruction Data which is included at Data file instruction *4</p> <p>Key in DISP. Control s.w(cr,no p.1,2:print)> Intermediate result print Control switch *5</p> <hr/> <p>*1 The method of specifying the I/O selection level is selected from the following.</p> <ol style="list-style-type: none"> 1) Level specifying = 1—63 2) Filter file specifying = *.tbl or **6 3) All element specifying = "all" 4) Only objects of element of line = "line" <p>*2 Specifying the error output file</p> <ol style="list-style-type: none"> 1) To output at output design file, "=" or cr is input. 2) If there is no file, it is generated automatically. <p>*3 Specifying the intermediate file output switch</p> <p>Output control of structured data file(Information data of point and line)</p> <p>cr, "0" = No output</p>
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"1" =Output(Operate by the program, men5)

*4 Instruct the data file name which includes the regular instruction data.
Refer to 'Instruction data manual' for the content. *7

*5 Instruct the control switch of output of intermediate result
0= Restricts to a minimum print.
1= A necessary intermediate result is printed.

*6 Data format of filter file(Column free, register -1 when no instruction)

Input element data						Output element data			
type	Complex	Level	Weight	Style	Color	Level	Weight	Style	Color
.
999									

(Data preparation sample)

-1 -1 60 -1 -1 2 -1 -1 -1 -1
999

Nod5

Sample of regular data	*7 (Data preparation sample)	
	0	Display switch
	0	Log output switch
	1	Line separation switch
	-1	Neatline level, Neatline process switch
	LANK1 1,32,50-63	
	LANK2 7,9,12	
	LANK4 51	Priority rank
	LANKEND	
	1000	Scale denominator (1/1000)
	0.001	Field length of 1UOR (m)
	0.5	Fixed limitation of matching displacement(mm)*8
	8.0	Important error diameter (mm)
	6.0	Standard error diameter(mm)
	1	Writing switch of design file
1	Output level, symbology switch	
2	Output element switch	
	*8 Fixed limitation of matching displacement(Specified by mm unit when digitizing the maps)	
	<ul style="list-style-type: none"> When intersection of element of Rank0 and Rank1 is calculated, the start/end point of line data are extended as the distance of limited displacement in the direction of the outside.(bunkatsu Sub-routing) The cut of start/end point of line data, such as in case of element rank0, rank1 which the edge line portion below the size of 1.8 times of limited displacement, and other rank element which the edge line portion smaller than limited displacement, are eliminated(ten ment sub-routing) 	

Operation Sample	None
Link	libsubc.a libais.a libmcs1.a libm.a libbsd.a Operated by -l option

Nod5

Operation Result	<p>If there is no error in data, finish in a normal way by displaying as execution sample.</p> <p>1) The node matched element is generated to the output design file.</p> <ul style="list-style-type: none"> • When the element of level rank is specified, the node is calculated and node is matched. • Though the I/O is selected, the element rank is not specified, it is copied in the form as it is. <p>2) When the intermediate file output is specified, the design form binary file of the specified file name is generated.</p> <p>3)The extension of the input design file name is output as ". log" which is the ASCII file, when there is specification of the output of the intermediate result log file of the regular instruction data.</p>
Error Message	<p>**** "cinfil" Nothing Error **** cinfil=[Input design file name] Content:No input design file. (It is stopped.) Action :The file name is wrong. Or, the directory is different.</p> <hr style="border-top: 1px dashed black;"/> <p>**** Shiji File Open Error **** File=[Instruction data file name] Content:Error appeared when it opens the instruction data file name. (It is stopped.) Action:The file name is wrong. Or, the directory is different.</p> <hr style="border-top: 1px dashed black;"/> <p>**** Level Lank Data Error **** Content:Specified rank data is not normal.(It is stopped.) Action :The rank specification data is examined and corrected.</p> <hr style="border-top: 1px dashed black;"/> <p>**** Log File Open Error **** File=[Log file name] Content:Error appeared at log file open when specifying the output log.(It is stopped.) Action :Ask the charge programmer or SE.</p> <hr style="border-top: 1px dashed black;"/> <p>**** Data su- Error **** nn=[the objective data number] Content:No object data at all.(It is stopped.)</p> <hr style="border-top: 1px dashed black;"/> <p>**** (get_design) nsen Limit Over Error **** nsen=[inputl line number] Content:The number of lines which became objects led from the design file exceeded the fixed limit of memory. Action:Ask the charge programmer or SE.</p>

<p>**** (get_design) nten Over Error **** nten=Input point number] Content: The number of points which became objects led from the design file exceeded the fixed limit of memory. Action : Ask the charge programmer or SE.</p> <hr/> <p>**** (llankr) Data Error **** **** [Rank data] Content: Error in the specified rank data in the specified data. (It is stopped.) Action : The rank specification data is examined and corrected.</p> <hr/> <p>**** (node_match) Work Table Over Error **** np=[Point of the matching coordinates] wwlim=[Fixed limitation of the match coordinate table] Content: The point of the match coordinates become table over. (It is stopped.) (At the moment of 1994.11.18, Over limitation is 500 point) Action: Ask the charge programmer or SE.</p> <hr/>
--

Nod5

<p>**** (node_match) Do-itsu Node Ten Over **** np=[Matching node point number] (Lim.=127 Ten) ***** "wds" o Chi-saku Shite Kudasai ***** Content: Matching position of node point which became more than 127 point (It is Stopped). Action: "wds" is smaller, and calculate again.</p> <hr/> <p>**** (node_match) Matching Node Table Over Error **** mten=[Fixed limitation of node matching table] Content : Total number of node point which exceeded the fixed limitation of node table. (It is stopped.) (1994. Nov.18th now under 180000 points) Action : Ask the charge programmer or SE.</p> <hr/> <p>**** (node_match) Matching Table Over Error **** jten=[Fixed limitation of pointer table of matching point] Content : The node matched points which exceeded the fixed limitation of pointer table of matching point. (It is stopped.) (1994. Nov.18th now under 280000 points) Action : Ask the charge programmer or SE.</p> <hr/> <p>**** (node_match) Dbl.Err. Seq.No.= [Sequential No.] np=[Point number of matched node point] x=[X coordinates value] x=[Y coordinates value] Content : Already matched with other point, although, processing the matching again with point which is still near, (Repetition matching error) and still continue the processing.</p> <hr/> <p>**** (sen_ment) Seq.No.Error **** No. = [Line sequential No.] wsenns(*)=[Line No.] wstnos(*)=[Pointer of start point] wednos(*)=[Pointer of end point] Ten No. = [number of order] wtentn(*)=[Point No.] wsentn(*)=[Line which includes this point No.]</p>

<p>**** (sen_ment) Error Stop **** werr=[Error number] Content : Error when the sequential No. of line and line No. are different.(It is an error which cannot be happen normally. It is stopped.) Action :Ask the charge programmer or SE.</p>
<p>**** (sen_ment) Ten Table Kiten Error **** Sen No.=[Line number] **** (sen_ment) Error Stop **** werr=[Number of error] Content : The mistake is found in the starting point code of the line.(It is an error which cannot be happen normally.) Action :Ask the charge programmer or SE.</p>
<p>**** (sen_ment) nsen Table Over Error **** nsen=[Line number] Content :The number of line have exceeded the limitation when during the maintenance of line table.(It stopped.) Action :Ask the charge programmer or SE.</p>
<p>**** (sen_ment) "ns".ne."nsenp" Error **** ns=[Last store counter of line] nsenp=[Line number after maintenance] Content : There is contradiction in the number of lines after maintenance.(It is stopped.) Action :Ask the charge programmer or SE.</p>
<p>**** (sen_ment) Last Point No. Error **** Content : During the maintenance of the start point/terminal point for line table maintenance, there was a numbering error.. (It is an error which cannot be happen normally. It is stopped.) Action :Ask the charge programmer or SE.</p>
<p>**** (sen_koten_get) Ko-Ten Zahyo- Table Over **** kten=[Number of intersection point] Content :During crossing point calculation, the number intersection point have exceeded the limitation of table. (It is stopped.) Action :Ask the charge programmer or SE.</p>
<p>** (sen_koten_get) ** kten No. limtbl Over Error Stop **** kten= Content :The number of intersection points to one line exceeded the fixed limitation.(It is stopped.) (1994.Nov.18th now, Limitation = 500 points) Action :Ask the charge programmer or SE.</p>

Nod5

	<p>**** (ten_ment) wkotnp(*) is Bad [Pointer which indicates points on point table for point maintenance] Content : When the node matching or the pointer on the point table, which is calculated the intersection point by the intersection calculation, is negative or larger than the point table number (nten). (It is an error which cannot be happen normally.)</p>
	<p>Action :Ask the charge programmer or SE.</p>
	<p>**** (ten_ment) nten Over Error **** nten=[Point number of point table] Content :The point number have exceeded and over came the table limit by the point table maintenance, after the node matching or intersection calculation. (It is stopped.) Action :Ask the charge programmer or SE.</p>
	<p>**** (ten_ment) bcodep(*) Error **** Content :There was an illegal flag at the line separation flag during point table maintenance, when after node matching or intersection calculation. (It is stopped. It is an error which cannot be happen normally.) Action :Ask the charge programmer or SE.</p>
	<p>**** (ten_ment) kl,nl,sn Error **** [kl,nl,ns] Content :At point table maintenance, there was a table error during the insertion point processing. (It is stopped.) kl : Insertion point counter (Intersection point number)(kten →0) nl : Point table load pointer (nten →0) ns :Point table store pointer (ntenp→0) (It is an error which cannot be happen normally.) Action :Ask the charge programmer or SE.</p>
	<p>**** (ten_ment) "ns" or "nl" is Bad **** ns=[ns] nl=[nl] Content :Error at store pointer "ns" or load pointer "nl" during point table maintenance. (It is stopped. It is an error which cannot be happen normally.) Action :Ask the charge programmer or SE.</p>
	<p>**** (ten_ment) wtentn Error **** nten=[Number of old point tables] n=[Counter at process calculating] Content :There is an count error while processing the point table maintenance. (It is stopped. It is an error which cannot be happen normally.) Action :Ask the charge programmer or SE.</p>
	<p>**** (ten_ment) wstnos(*) Error **** [Point table pointer of line start point] Content :There is an error when the line start point of line table is under 0 or above the point number of point table. (It is stopped. It is an error which cannot be happen normally.) Action :Ask the charge programmer or SE.</p>
	<p>**** (ten_ment) wednos(*) Error **** [Point table pointer of line end point] Content :There is an error when the line end point of line table is under 0 or above the Point number of point table. (It is stopped. It is an error which cannot be happen normally.) Action :Ask the charge programmer or SE.</p>
	<p>**** (sen_sepa) ntenm Zero Error **** Content :Error when the point table does not remain even one effective point</p>

	<p>while division processing of line after node matching or intersection calculation. (It is stopped.)</p> <p>Action :Ask the charge programmer or SE.</p>
--	--

Nod5

	<p>**** (sen_sepa) wstnos(*) Error **** [Point table pointer of line start point]</p> <p>Content :There is an error when the line start point of line table is under 0 or above the point number of point table. (It is stopped. It is an error which cannot be happen normally.)</p> <p>Action :Ask the charge programmer or SE.</p>
	<p>**** (sen_sepa) wednos(*) Error **** [Point table pointer of line end point]</p> <p>Content :There is an error when the line end point of line table is under 0 or above the point number of point table. (It is stopped. It is an error which cannot be happen normally.)</p> <p>Action :Ask the charge programmer or SE.</p>
	<p>**** (sen_sepa) nten Over **** ntenp=[Point number of point table]</p> <p>wntenl=[Upper bound value of point table]</p> <p>Content :While the division processing of line, the point number of point table exceeded the upper bound value. (It is stopped.)</p> <p>Action :Ask the charge programmer or SE.</p>
	<p>**** (sen_sepa) "ns" or "nl" is Bad **** ns=[ns] nl=[nl]</p> <p>Content :While the division processing of line, there was an error at load pointer "nl" of old point table and at store pointer "ns" of new table. (It is stopped. It is an error which cannot be happen normally.)</p> <p>Action :Ask the charge programmer or SE.</p>
	<p>**** (sen_sepa) wften Error **** ntenm=[Numbers of point tables except unnecessary point]</p> <p>n=[Counter while process calculating]</p> <p>Content :There was an error while in the division processing of the line. (It is stopped. It is an error which cannot be happen normally.)</p> <p>Action :Ask the charge programmer or SE.</p>
	<p>**** (second_syori) ntenm Zero Error ****</p> <p>Content :While the second point from the node matched start/end point is existing nearby the start/end points, an error which the point table did not remain even one effective point at the subroutine except the 2nd point. (It is stopped.)</p> <p>Action :Ask the charge programmer or SE.</p>
	<p>**** (second_syori) wstnos(*) Error **** [Point table pointer of line start point]</p> <p>Content :There is an error when the line start point of line table is under 0 or above the point number of point table. (It is stopped.)</p> <p>Action :Ask the charge programmer or SE.</p>
	<p>**** (second_syori) wednos(*) Error **** [Point table pointer of line end point]</p> <p>Content :There is an error when the line end point of line table is under 0 or above the point number of point table. (It is stopped.)</p> <p>Action :Ask the charge programmer or SE.</p>
	<p>**** (gomi_del) ntenm Zero Error ****</p> <p>Content :While the second point from the node matched start/end point is existing nearby the start/end points, an error which the point table did not remain even</p>

	<p>one effective point at the subroutine except the 2nd point. (It is stopped.)</p> <p>Action :Ask the charge programmer or SE.</p>
	<p>**** (gomi_del) wstnos(*) Error **** [Point table pointer of line start point]</p> <p>Content :There is an error when the line start point of line table is under 0 or above the point number of point table. (It is stopped.)</p> <p>Action :Ask the charge programmer or SE.</p>
	<p>**** (gomi_del) wednos(*) Error **** [Point table pointer of line end point]</p> <p>Content :There is an error when the line end point of line table is under 0 or above the point number of point table. (It is stopped.)</p> <p>Action :Ask the charge programmer or SE</p>

Nod5

	<p>**** (node_match_all) Work Table Over Error **** np=[Point number of matched coordinates]</p> <p>Content :The coordinates value stops during node matching when the point in a fixed limit exceeds 100 points (upper bound of the work table area).</p> <p>Action :Ask the charge programmer or SE.</p>
	<p>**** (node_match_all) Matching Node Table Over Error ****</p> <p>mten=[Number of node point which was node matched]</p> <p>Content :Error when the number of node point which was node matched, exceeds upper bound of match table (It is stopped.)(1994.Nov.18th now able 180000 points)</p> <p>Action :Ask the charge programmer or SE.</p>
	<p>**** (node_match_all) Matching Table Over Error ****</p> <p>jten=[Total of object point for node matching]</p> <p>Content :Total number of object point of node matching(Point which is adjacent to node. Match distance fixed limit or less) exceeds upper bound of match table. (1994. Nov. 18th now able 280000 points)</p> <p>Action :Ask the charge programmer or SE.</p>
	<p>**** (node_match_all) Dbl.Err.Seq.No.= [Sequence No. of point table]</p> <p>np=[Point number of matched node] x=[X Coordinates] y=[Y Coordinates]</p> <p>Content :Already matched with other points, although there was still a near point which processed for matching again.(Repetition matching error) (Continue still)</p>
	<p>**** (put_design) Cell Data Su- Huitchi Error ****</p> <p>Content :Error at element word number of cell data during writing at design file, which output the node matching results. (Continue still)</p>
	<p>**** (load_dgnd) File Naiyo- Error ****</p> <p>**** load_dgnd Error Stop ****</p> <p>Content :A file name which is not correct, was specified by loading the structured intermediate file.</p> <p>Action :The file name is wrong. Or, the directory is different.</p>

Data Conversion from Standard Format Data to MicroStation DGN Data

PLT_SIN

Aero Asahi Corporation

[Input Procedure]

> PLT_SIN
Log control
Input Parameter file name
Input True position data name
Input confirmation (Execute [A], Re-input [R], Cancel <enter>)
>

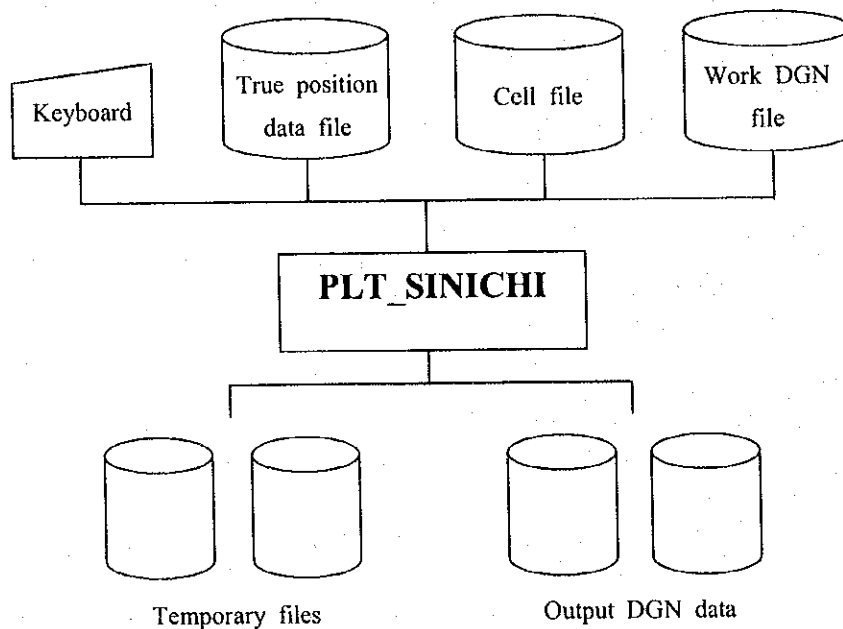
[Function]

According to the control table, it develops Microstation DGN file from digital mapping true position data.

[Operation Advice]

When a continuous enough empty area exists in the disk, it is effective to prepare both work design files and output design file automatically.

Figure : Processing Outline



[Parameter File]

Contents are specified in the next line of the recognition character line.

The line which starts by “;” or “C”, “c” is assumed as comment line.

No	Recognition character	Format	Contents
1	[SYMBOL_TABLE]	Left justified fixed character	Regulate the input classification table
		A	Classification table name[SYMBOL W.TBL]
2	[CELL_FILE]	Left justified fixed character	Regulate Cell data file
		A	Cell file name [CEL25.CEL]
3	[EXC_ID]	Left justified fixed character	Regulate head part of unused sheet name
		A	Head part of unused sheet name
4	[WORK_FILE]	Left justified fixed character	Regulate the work DGN file
		A	Work DGN file name [WORK.DGN]
5	[FREE_BLK]	Left justified fixed character	Regulate the open area for the output design file
		Free format integer number	Open area for the output design file
6	[SET_SYM]	Left justified fixed character	Regulate the selected number of element form
		Free format integer number	Selected number of element form
7	[ASC_DEL]	Left justified fixed character	Regulate whether delete the temporary file (* Impossible to delete at PC version.
		Free format integer number	Selected number for deleting the temporary file [0: Delete, 1: Remain]
8	[MAP_SCALE]	Left justified fixed character	Regulate the scale denominator
		Free format integer number	Scale denominator
9	[HO_GAN_SIZE]	Left justified fixed character	Regulate the size of gridline
		Free format integer number	Width and length interval of gridline (on scale)
10	[COM_SWICH]	Left justified fixed character	Regulate whether output features by complex shape
		Free format integer number	The selected number [0: Line and polygon, 1: Complex shape]
11	[KANJI_ORG]	Left justified fixed character	Regulate the origin of KANJI
		Free format integer number	The selected number of origin of KANJI
12	[SYMBOL_TYPE]	Left justified fixed character	Regulate the symbol data form
		A	Symbol data identification character [C:CELL, F:FONT]
13	[PLACE_MODE]	Left justified fixed character	Regulate whether generate height annotation text with GCP(Ground Control Point) symbols

		Free format integer number	Selected number [0:None, 1:Arrange]
14	[HYOU_FONT]	Left justified fixed character	Regulate the font number of elevation text
		Free format integer number	Font number
15	[KANJI_MODE]	Left justified fixed character	Regulate element type of KANJI annotation
		Free format integer number	Element type number [2: Cell KANJI, 17: Wide KANJI]
16	[WKNJ_FONT]	Left justified fixed character	Regulate font number of wide Kanji annotation
		Free format integer number	Wide Kanji font number
17	[FIL_EXT]	Left justified fixed character	Regulate the extension of graphic file
		A	Extension of graphic file

[Processing Outline]

1. Log Control

The processing situation is output as a message by the specified numerical value.

Specified Value	0	1- 3
Output Content	Not output	Output

2. Control Table

According to Classification code and Distinction of True position data file, output file and output level are extracted from Control table, and, specify Symbology of figure.

Classification code	Distinction	User code	Output file No.	Output Level	Selection 1			Selection 2		
					Color	Width	Type	Color	Width	Type
1:5	6:10	11:15	16:20	21:25	31:33	34	35	56:59	60	60
I5	I5	I5	I5	I5	I3	I1	I1	I3	I1	I1

3. Extraction of File/Level/Figure

There is a classification based on User code in the Control table, which exists one or more combination of the same Classification code and Distinction. Therefore, the file/level/symbology are adopted to the data which User code has a 0 in row or in case there is no 0. The data appears first.

Symbology can be selected from two types, or, all of the color, the width and the line type are given as 0 by 0 selections.

4. Cell File

Symbol is adopted.

5. True Position Data File

The file name and the sheet identification number in first record are matched.

6. Output Design File and Free Area

The output DGN file name is formed by adding the file identification character to the true position data file name.

In case there is no output DGN file, it is prepared automatically.

7. Head Part of unused Sheet Name

During the formation of output DGN file name, the part is reduced from the DGN file name by input head part of unused sheet name.

8. Work DGN File

To prepare the output DGN file automatically, it is copied under the consideration of free area amount, after output to the work DGN file temporarily.

9. Delete of Temporary File

Before starting the output of element to the output design file, the true position file is stored to the temporary file by ASCII form which prepared in classification of each output design file.

The temporary file name assumes the extension [.TMP] at the output design file name.

10. Output Scale Denominator

By the value of scale denominator, the size of annotation and grid line are determined.

11. Size of the Gridline

The neatline, gridline and title are output at each output files.

Interval of grid line is specified in the unit of mm on map scale. When both specified intervals in vertical and horizontal are 0.0, the output process of grid line is not done.

Item	Neatline	Gridline	Title	Grid value
Level	63	62	62	Non output

12. Output by Complex

For the line and face element which the coordinate number becomes above 101, it is able to be output as complex or line/face.

When it is complex, the attribute is given only to the complex header. Therefore, when decomposition/cutting and others for element are done, the attribute is lost.

When it is output as line/face. the attribute is given to all elements. At this time, each element maintains the same element recognition number, although when the data is updated, there is a problem if it maintains the old data of element identification number.

Select	Output	Attribute	Others
0	Division at line/face	Same element recognition number	Old element identification number is not maintained
1	Complex	Only header	No division

13. Incessant Element

Element, which holds the incessant flag, number 49, is inputted at the AAC regulation division (Attribute 20). In this case, it is able to correspond to form adjustment (SBLCHNG) without a special operation.

14. Elevation Annotation for GCP

In case of ground control point (GCP), the generation of numerical value is controlled by variable file, when it is generated, it is inputted automatically with the symbol at the right side as the manner by the following figure. (refer to fig.2)

- (1) The position of annotation generation is inputted at the right side of the symbol, which is assumed as 1 character.
- (2) The annotation font size is adopted as input font size which the value of line type width is taken from the regulated font size of annotation regulation table.

Items	Classification code	Regulate font size		Form	Line type	Input font Size	
		500 1000	2500 5000			500 1000	2500 5000
Triangle point	7301	2.0		Direct	0.1	1.9	
Bench mark	7302	2.0		Direct	0.1	1.9	
Traverse point	7303	2.0		Direct	0.1	1.9	
Public GCP Triangle Point	7304	2.0		Direct	0.1	1.9	
Public GCP Bench mark	7305	2.0		Direct	0.1	1.9	
Public GCP Traverse point	7306	2.0		Direct	0.1	1.9	
Elevation point without monument	7311	2.0		Direct	0.1	1.9	
Individual elevation point	7312	2.0	1.5	Select	0.1	1.9	1.4
Height of rock	7314	1.5		Select	0.1	1.4	
Height of comparison	7315	1.5		Select	0.1	1.4	

- (3) The type styles of the annotation are all in Gothic.

Type	Font	Weight
Standing	0	1
Right diagonal	3	1
Select	Arbitrary value	1

- (4) All the output levels are fixed at level 60 of the output file of a GCP.
- (5) The same code as the symbol is input to the attribute. (No altitude annotation code)
- (6) Attention

When inputting from the true position file to the inputted altitude annotation, it will be output doubly in addition with the amount. Therefore, it is necessary to add on the permission switch of the output.

15. Symbol Data

- (1) In case of cell symbol, the registered symbol as the same cell name of the expressed classification code, is inputted from the cell library.
- (2) In case of font symbol, the registered symbol as the number, regulated from the input classification list, is inputted from the font library.

Generation of Polygons from Line Object

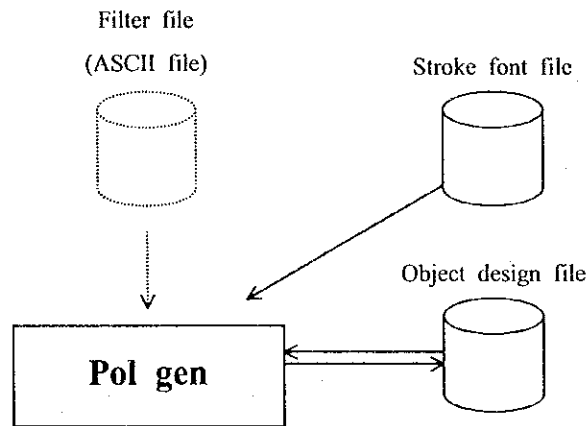
Pol_gen

Aero Asahi Corporation

[Outline of Function]

Input line elements (Line segment element, Continuous line segment), then output the face (compound figure).

Figure : Processing Outline



[Process Term]

None

[Operation method]

> pol_gen

- | | | |
|--|-----------|--|
| Input design file name | [def.dgn] | : design file name(Predetermined value of the dgn extension is .dgn) |
| Input approval value of distance length between node and node. | | : The joint tolerable quantity between node and node(UORs) |
| Input approval value of distance length between node and neatline. | | : The joint tolerable quantity between node and neatline (UORs) |
| Input the line level. (level, filter) | | : Extraction condition of line element(level list or Filter file) |
| Input the neatline face (type 6) level. | | : Level placing the face (polygon), structured for neatline. |
| Input the output level of right rotated. | | : Level placing the right rotated face |
| Input the output level of left rotated. | | : Level placing the left rotated face |
| Input the output level of face number. | | : Level placing the face number(character element) |
| Input the output level of error element. | | : Level placing the error display element |
| Input the length of the added user data. | | : User data length (word) added at face |
| Input ID of the added user data. | | : User data ID added at face |
| Input the level of bridge line. | | : Instruct the level of bridge line |
| Input the initialized value of face number. | | : Instruct the Initial value of face (Under 0 is assumed as 1) |

[Filter File]

Data type of filter file (column free, entry -1 when no designation)

Input shape element						Output shape element			
Type	Composite	Layer	Line width	Line type	Line color	Layer	Line width	Line type	Line color
999									

(Data preparation example)

-1 -1 60 -1 -1 2 -1 -1 -1 -1
999

Output shape element follows the attribute element of input shape element, which is disregard.

[Terms of Input Value]

- (1) Under the following condition, there is no processing for neatline.
 - Neatline face level ≤ 0 or neatline face level ≥ 64
 - No neatline face existed at the designated level
- (2) When the output level of right rotated face is not existing between $1 \leq \text{level} \leq 63$, the right rotate face is not output.
- (3) When the output level of left rotated face is not existing between $1 \leq \text{level} \leq 63$, the left rotate face is not output.
- (4) When the output level of face number is not existing between $1 \leq \text{level} \leq 63$, the face number is not output.
- (5) When the output level of error element is not existing between $1 \leq \text{level} \leq 63$, the error element is not output.
- (6) When the output level of bridge line is not existing between $1 \leq \text{level} \leq 63$, the bridge line is identified as no existence.
- (7) The length of user data are as follows:
 - Under (designated length + 3) and is multiple integral number of 4.
 - Longer than 144 is 144
- (8) ID of the user data is recommended to give a positive value (wrong 0) though it is arbitrary.
- (9) Presence of the bridge line:
 - Only No. 1 is processed as bridge line
 - Others are processed as a double use line by abnormal procession

[Processing Results]

(1) Input shape elements is:

- Designated extract terms (filter file or level list)

(2).Which is included at:

- Line division element (type 3)
- Continuous line division (type4)

(3).Additionally, the newline which is indicated as

- Polygon (type6)

is used, to output the processed results at the design file.

(4) Output figure element is:

- Composite figure(type14) ... Face
- Character element(type17) ... face number

(5) Composite figure header is:

- Line width=1(Right rotation face is 2)
- Line type=0(Solid line)
- Line color=2(Green)

(6).Although, the dependent figure element (all continuous line division) succeeds:

- Original element attribute

(7) If there is an injustice figure element, at the following items such as:

- Layer : designated value
- Line width=2
- Line type=0 (solid line)
- Line colour=3 (red)

(8) The condition mentioned above, is output as follows:

- Polygon (Type6) ... face tacking not possible, line overlay
- Oval element(type15) ... open node
- Character element(type17) ... summary of error

[Error Message]

Error message	Causes
Abnormal termination of change_opn	Mis-input of filter file name or mistake in description of filter record
Abnormal termination of ipr_opn	Mis-input of design file name
Abnormal termination of ipr_opn	Mis-input of design file name
Abnormal termination of ip_recele	Abnormal while input of figure element, ask the system manager.
Abnormal termination of ip_bcmplx	Abnormal at I/O function, not enough desk space
Abnormal termination of ip_ecmplx	Abnormal at I/O function, not enough desk space
Abnormal termination of ip_eldfpi	Abnormal at I/O function, not enough desk space
Abnormal termination of ip_lsdfpi	Abnormal at I/O function, not enough desk space
Abnormal termination of ip_shdfpi	Abnormal at I/O function, not enough desk space
Abnormal termination of ip_txdfpi	Abnormal at I/O function, not enough desk space
Abnormal termination of i4srch	Failure of tracking the face, possibility of bug
Memory acquisition failure	Not enough memory
Over limitation value of line element tracking	Tracking over 2000 line elements
Face number had over come the size of short	Limitation of face number is under 32767, injustice at initialize value of face number
Can not determined the location of the face number	Possibility of injustice manner at face

[Processing Contents]

1. Generation of Face

1.1 Generate right rotate face

Face is generated as field division model. Output figure element is all (even single face) composite figure. This is indicated at fig. 1.1

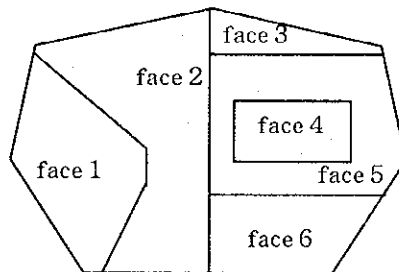


Fig. 1.1

1.2 Generate left rotate face

Face is generated as surrounding at the gathered right rotate face. At single face, same shape as right rotate face, but the coordinate order is opposite.

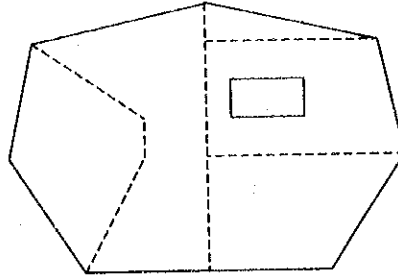


Fig. 1.2

1.3 Baggage face

To avoid the inclusion relation between face to face, the processing of baggage face is possible. Place the line element (bridge line) at the position which generate the relation of inclusion. Select "1" (With bridge line) at input parameter.

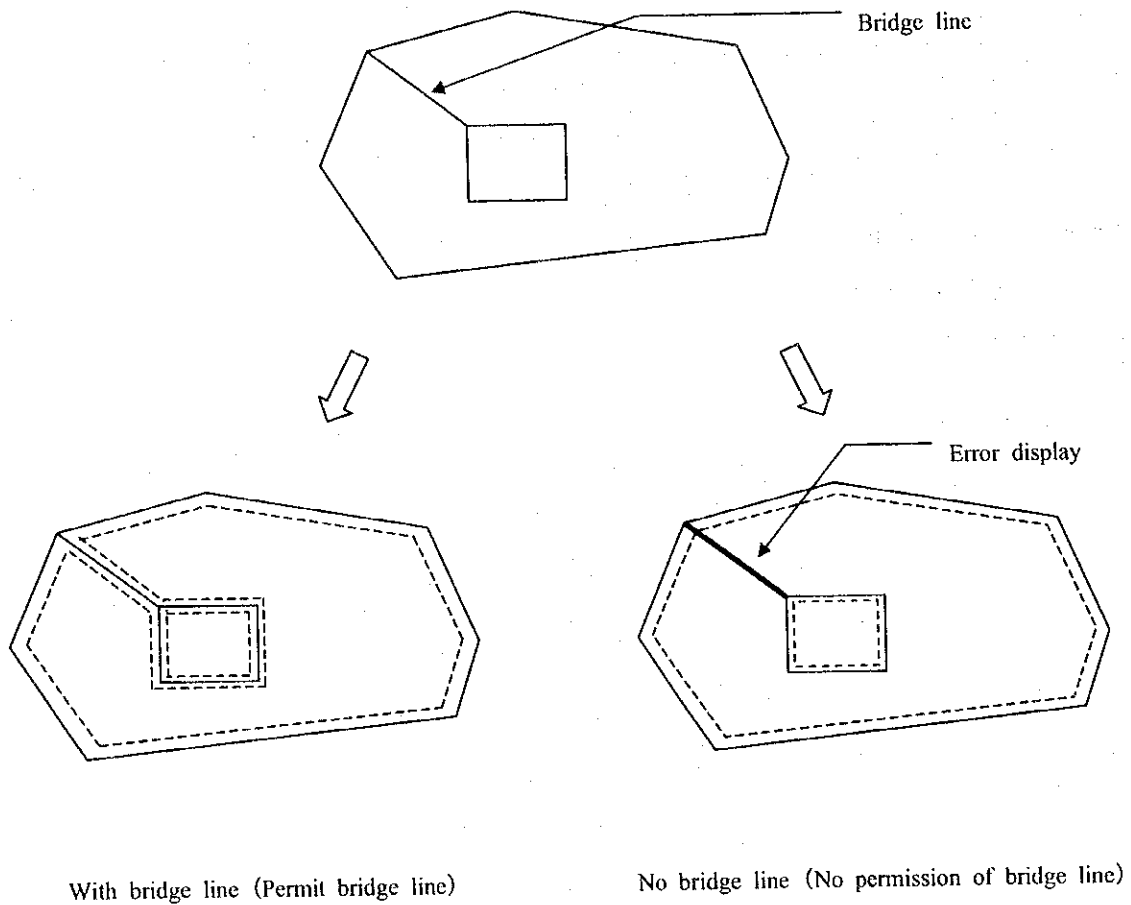


Fig.1.3

1.4 Tracking rule of line element

Start from voluntary line element, to track the line element which jointly hold nodes.

Coming back to the starting line element is the end.

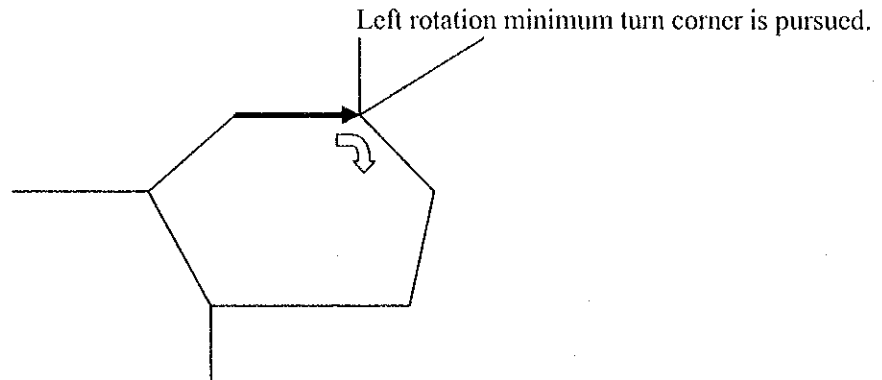


Fig. 1.4

2. Neatline Processing

2.1 Identification of neatline

The neatline is identified as existing range of polygon, which exists at the designed level as neatline.

When the shapes are not in horizontal, the figure of neatline and polygon does not fit.

Also, if there are several polygons, the last polygon is selected.

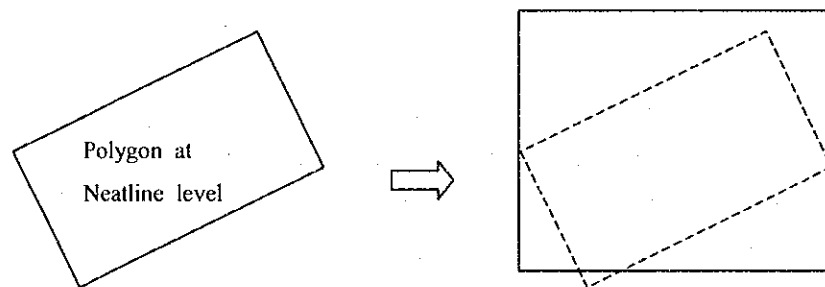


Fig. 2.1

2.2 Near existing node from neatline

Node point existing nearby the neatline is moved along the vertical line which drops on the crossing coordinate. The neatline is divided at the dropped vertical line point.

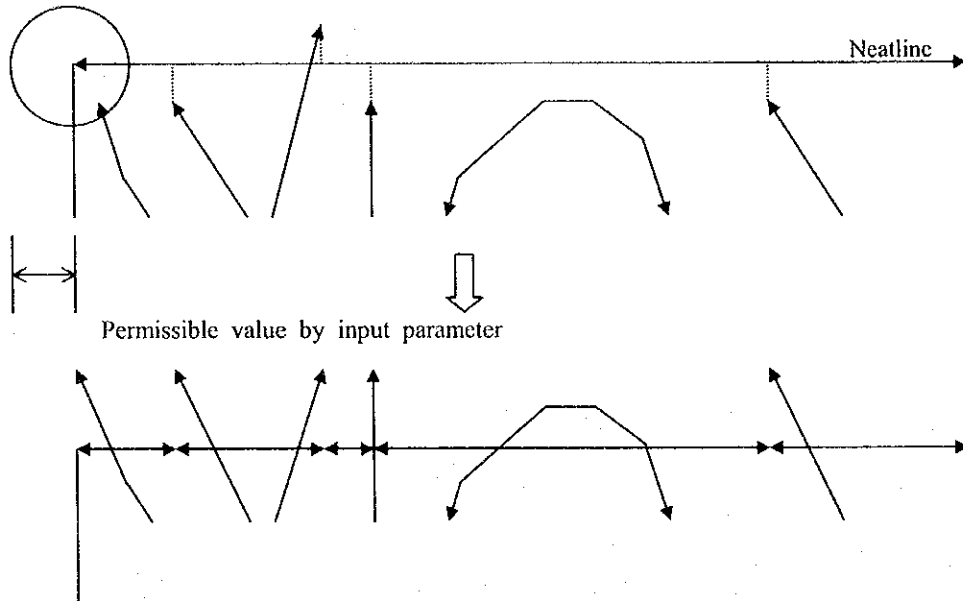


Fig. 2.2

3. Face Number

For each generated right rotate face, only one face number is placed as font element. This is the sequence starting from the given initial value.

3.1 Generating position

Generating the position of face number is follows:

- Y: The Y coordinate of center gravity point for face (This is determined at first)
- X: The middle point of the largest width in the face
- Justification is CC (center center)

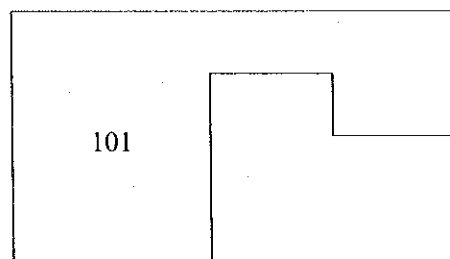


Fig. 3.1

- The height of font element is $1/320-1/500$ of long square which indicates the field.

3.2 Generation order

8 capitation of the entire area, and ascending orders of X coordinates in the same belt from the belt in bottom to the belt in top.

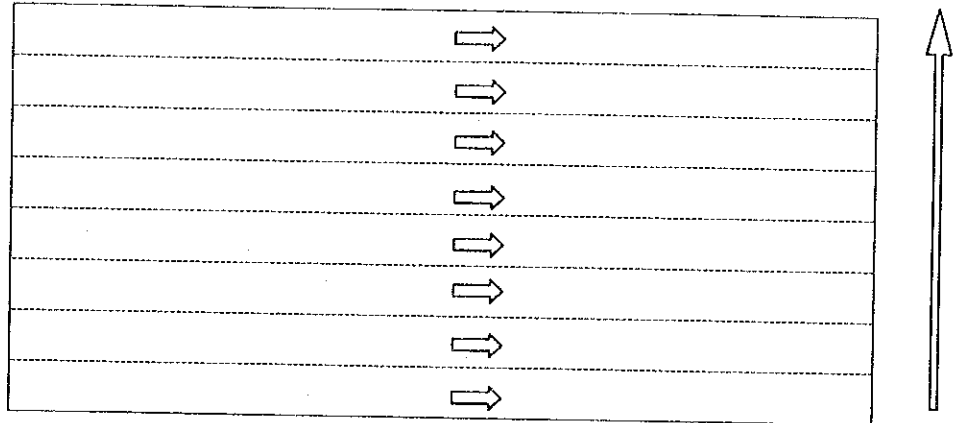


Fig. 3.2

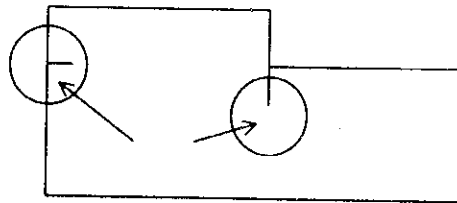
4. Injustice Shape Element

When no face was structured, error display for figure element is placed to reply for each situation.

4.1 Processing the stopping line (whisker)

The stopping line (whisker) is an error, and output as error display shape.

This is shown at fig 4.1



Whisker

Fig. 4.1

4.2 Processing of overlapping line

The error display figure is output as an error when line information in the same direction is suitable while pursuing. This is shown at fig. 4.2

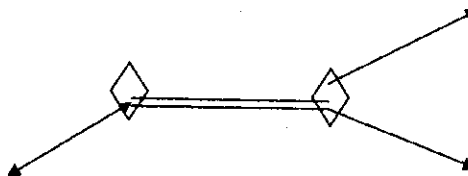


Fig. 4.2

4.3 Processing of line where face is not divided

The line which does not separate the face, which is output as error by the error display figure. This is shown at fig 4.3 This is only for “no bridge line” situation.

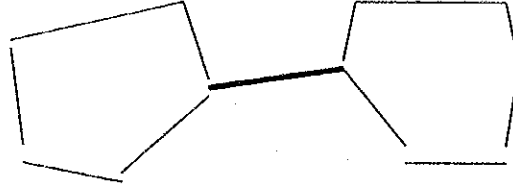


Fig. 4.3

4.4 Processing of line where face cannot be pursued

The line where face cannot be pursued, which is output the error display figure as an error. This is shown at fig 4.4.

As for this immediate cause, the existence of the twist in other places or the existence of the overlapping line, etc. are the causes.

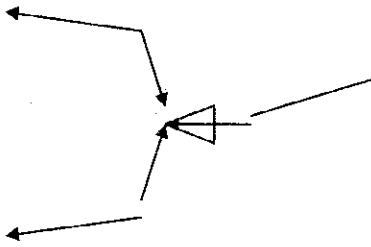


Fig. 4.4

Resolution Expansion Cutting of TIFF Image

EXTIFF

Aero Asahi Corporation

[Input Procedure]

>extiff

Selection of cutting out order (cut only, cubic convolution)

In case select Cut only, select zoom ratio (1x, 2x)

Name of input TIFF image

Name of output TIFF image

Address of upper left pixel of cut out area. (Pixel, Line)

Address of down right pixel of cut out area. (Pixel, Line)

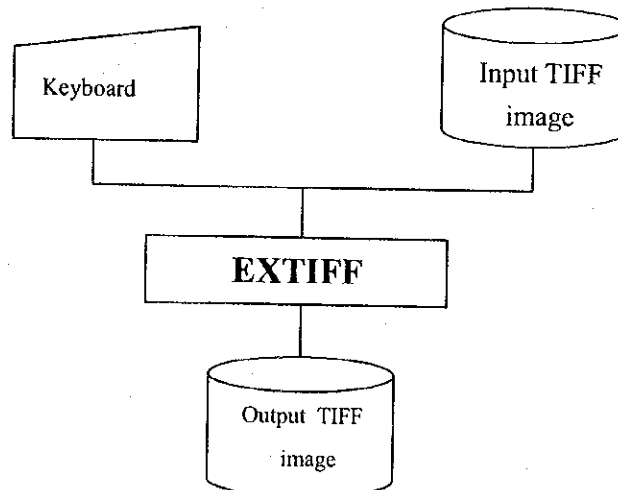
Input confirmation

>

[Function]

The regulated coverage of TIFF image is cut out and prepare new TIFF image. The cut out is selected either 2 manner, one by only cut out and second by cubic convolution interpolation. During process by only cut out, the zoom ratio is selected.

Figure : Processing Outline



[Operation Summary]

Expansion method and expansion rate of resolution

- Only cut out
The expansion rate is selected. (1 time or 2 times compared with length and breadth)
- 1-2 Cubic convolution interpolation
Two times compared with length and breadth.

Preparation of Map Orientation Residual List

SETCK (Set up Check)

Aero Asahi Corporation

[Input Procedure]

> SETCK

Ground control point file

Sheet record file (MAX 30)

Residual list file

Threshold value

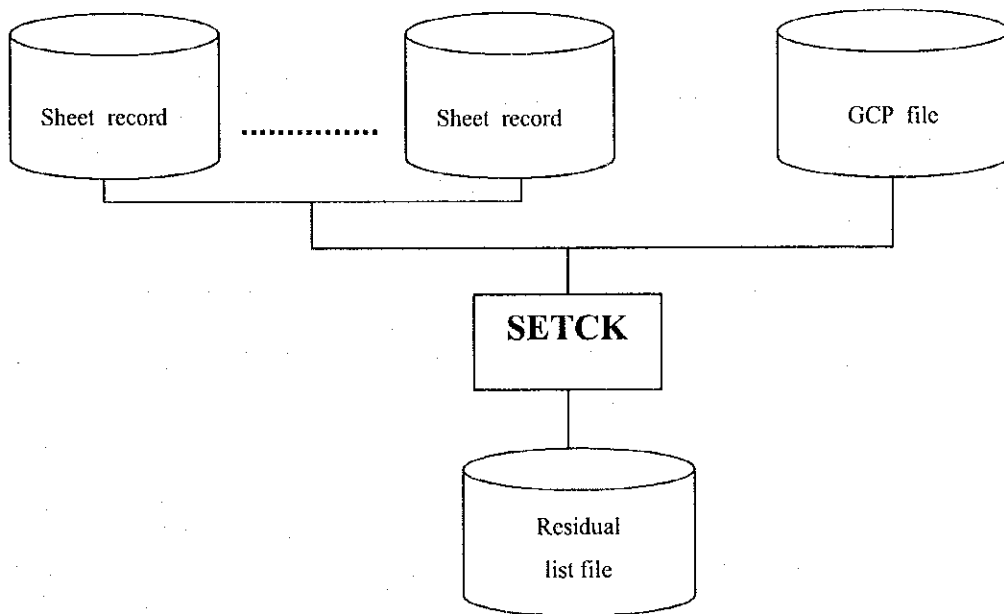
Input confirmation (Execute [a], Re-input [r], STOP [another key])

> PROGRAM STOP

[Function]

To provide a list of residual after map orientation for raster data from existing map, which is digitized on display with MapInfo.

Figure : Processing Outline



[Processing Summary]

1. Sheet Record File

- The sheet record file is a file of sheet record, which is the part of Sheet file of DM standard format. The DM standard format is regulated by the official survey operation regulation from Ministry of Construction of Japan.

2. Ground Control Point (GCP) File

- The GCP file, which was input as a point of GCP position, identified by map control of the existing raster map.
- The GCP position follows only the sheet record of four corners.
- 4 points of GCP position is inputted in the file. Order of input is in any order.
- The format of file is MIF.
- The unit of coordinates is only [m] [Cm] [mm].

3. Thresh Holding Value

- The thresh holding value is a value to decide whether the residual of GCP are in which quality.
- Unit is the same as the coordinate unit of sheet record file.
- The standard of thresh holding value is recommended as 2 pixel of existing digitized resolution.

4. Residual List File

The format of residual list file is as follows:

Sheet record file name	Sheet coordinates		Residual			Judgment
	X	Y	dx	dy	dxy	
Bottom Left corner						
Bottom Right corner						
Upper Left corner						
Upper Right corner						

- The judgments are based on the difference between thresh holding value and residual vector. When it is larger [NG], and under is [OK].

Level Slice of TIFF Image

Img_res (image resolve)

Aero Asahi Corporation

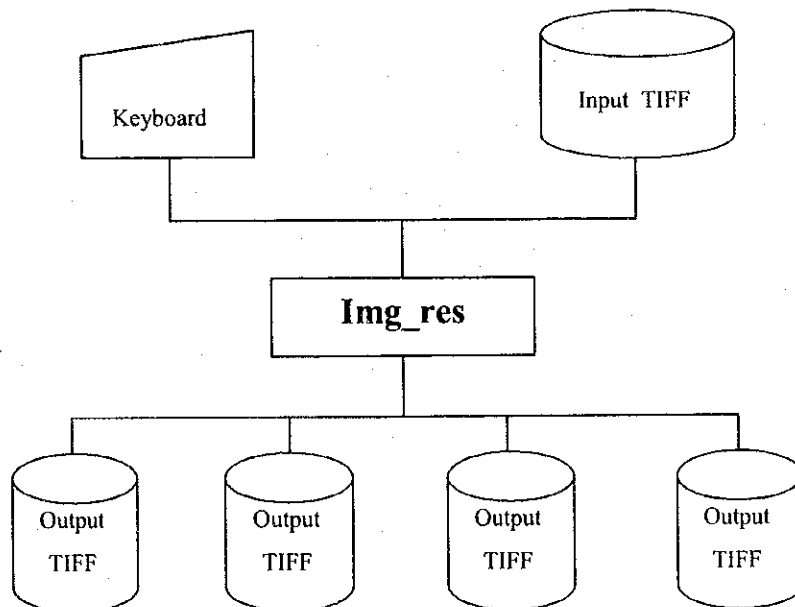
[Input Procedure]

- > Img_res
 - Input TIFF file name
 - Input Parameter file name
 - Input confirmation
- >

[Function]

1. The object TIFF files is 8bit 256 color files.
2. According to the input range of brightness value, level slice is processed.
3. Pixels within the regulated brightness value in the input TIFF file, it is exported to the output TIFF file.

Figure : Processing Outline



[Parameter File]

1. Range of Brightness Value

(1) Input the amount number of level slice at the first line, which is the output file number.

(2) Input of the range of level slice is as follows:

- In case output pixels in the brightness value of 10~20.....10-20
- In case output pixels in the brightness value of 255..... 255-255

2. Format of Image File

The image is 8 bit grayscale image or 8bit color image, therefore the image type is regulated as follows:

- 8 bit grayscale image..... 0
- 8 bit color image..... 1

[Processing Summary]

1. Input TIFF file

- 8 bit TIFF file

2. Parameter File

- Input the range of brightness value of level slice and the format of input image file.

3. Output TIFF File

- The same number of TIFF files is prepared as the number of input range of the brightness value.
- Background color for the 8 bit color image output file is white color (255), without any influence from the value of brightness.
- Background color for the grayscale image output file is as follows.

The range of level slice	The brightness value of background
Including 0	255
Including 255	0

[Control Table]

Item	Format	Contents
Classification code	I5	Code number of each map symbol
Number of figure	I3	Distinction code number in order to divide map symbols
Data type	1XA2	Indicate character of object data type Polygon: RG, Line: LN, PolyLine: PL, Point: PT
Permission of data type	1X8I1	Permission value of object data type (1:let, 0:no) From left side: polygon, line, circle, arc, point, point with direction, Annotation, attribute
Input layer name	A10	Input layer name of object data
Pen color (R)	I4	Red color value of line and polygon (0-255)
Pen color (G)	I4	Green color value of line and polygon (0-255)
Pen color (B)	I4	Blue color value of line and polygon (0-255)
Pen width	I3	Line width value of line and polygon Point value * 10 + 10
Pen style	I3	Line style value of line and polygon figure
Brush style	I3	Brush style value of inside of polygon
Foreground color of Brush & text (R)	I4	Foreground red color value of inside of polygon (0-255)
Foreground color of Brush & text (G)	I4	Foreground green color value of inside of polygon (0-255)
Foreground color of Brush & text (B)	I4	Foreground blue color value of inside of polygon (0-255)
Background color of Brush & text (R)	I4	Background red color value of inside of polygon (0-255)
Background color of Brush & text (G)	I4	Background green color value of inside of polygon (0-255)
Background color of Brush & text (B)	I4	Background blue color value of inside of polygon (0-255)
Font name	A20	True Type font name of text and symbol, and so on
Text size	I4	Size of text and symbol, and so on
Symbol file name	A8	Custom bitmap symbol file name (Excluding extension)
Symbol color (R)	I4	Red color value of each symbol data. (0-255)

Symbol color (G)	I4	Green color value of each symbol data (0-255)
Symbol color (B)	I4	Blue color value of each symbol data (0-255)
True Type symbol Form Code	I3	Character code of True Type symbol
True Type symbol Style Code	I4	Style value of True Type symbol
ID number of line Pattern	I4	<p>Identification number of line pattern (Use to extract line pattern from line patterning definition file)</p> <p style="text-align: right;">Less than -2</p> <p>: Out of patterning</p> <p style="text-align: right;">-1</p> <p>: Only copy</p> <p style="text-align: right;">999</p> <p>: Patterning by MapInfo standard style</p> <p style="text-align: right;">More than 900</p> <p>: Patterning line object with symbol</p>
Interval (Line)	F5	<p>Patterning interval of line data (in scale)</p> <p>Interval to next line, a case of curve patterning to polygon (in scale)</p>
Start & end position	F5	<p>Patterning start position of line data (in scale)</p> <p>Length of cycle, a case of curve patterning to polygon (in scale)</p>
Generate direction	I3 A3	<p>Direction value of generating symbol on line (1:180, 0:-90, other:0)</p> <p style="text-align: right;">SI</p> <p>: Make curve patterning to horizontal direction</p> <p style="text-align: right;">CO</p> <p>: Make curve patterning to vertical direction</p>
ID number of	I4 F4	<p>Identification number of symbol on line (Use to extract symbol on line from symbol patterning definition file)</p> <p>Width of curve, a case of curve patterning to polygon (in scale)</p>
Interval (Polygon)	F5	Interval of putting symbols into polygon (in scale)
Cross stripe interval	I2	<p>Adjustment value of putting symbols into polygon.</p> <p>Place style of symbols is changed according to this value</p>
Moving factor	I2	Moving factor from placement origin
Output layer name	A10	Output layer name of object data
Output pen color (R)	I4	Red color value of output line and polygon (0-255)

Output pen color (G)	I4	Green color value of output line and polygon (0-255)
Output pen color (B)	I4	Blue color value of output line and polygon (0-255)
Output pen width	I3	Line width value of output line and polygon Point value * 10 + 10
Output pen style	I3	Line style value of output line and polygon
Output brush style	I3	Brush style value of inside of output polygon
Foreground color of Brush (R)	I4	Foreground red color value of inside of output polygon (0-255)
Foreground color of Brush (G)	I4	Foreground green color of value inside of output polygon (0-255)
Foreground color of Brush (B)	I4	Foreground blue color value of inside of output polygon (0-255)
Background color of Brush (R)	I4	Background red color value of inside of output polygon (0-255)
Background color of Brush (G)	I4	Background green color value of inside of output polygon (0-255)
Background color of Brush (B)	I4	Background blue color value of inside of output polygon (0-255)

[Control Table of Line Pattern]

Item	Format	Contents
Cont	I5	Identification number of line type. (Extract from control table) 1-899 : Line 900-998 : Line and mark
Ksw	I5	Identification number of line style. (1-13) A higher rank digit 0: Without cut out of line edge 1: With cut out of line edge A lower rank digit 0: solid line 1: broken line 2: dot line 3: two dot line In case of above number (Cont) is greater than 900, fix a dot line.
S1	F5	Length of long line. (On map)
S2	F5	Interval between line and line. (On map)
S3	F5	Length of short line or size of mark. (On map)
S_ID	I5	Identification number of mark on line. (Use for extracting from patterning file of mark on line)
L_RC	I5	Red color value of output line. (0-255)
L_GC	I5	Green color value of output line. (0-255)
L_BC	I5	Blue color value of output line. (0-255)
L_WT	I5	Value of output line width. (Point value * 10 + 10)
L_LC	I5	Value of output line style.

[Control Table of Mark on Line]

Item	Format	Contents
[Identification number of mark]	A	A number of mark on line. (Number, which is extracted from control table file of mark on line)
Mark Pattern		Mark patterning of above mentioned number. Form of this part is based on MIF file of MapInfo.

**Geometric Correction
of
Satellite Image by PCI Software**

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