REPUBLIC OF TOGO DGC:DIRECTION GENERALE DE LA CARTOGRAPHIE

THE STUDY ON ESTABLISHMENT OF TOPOGRAPHIC DATABESE IN TOGO

Final Report (Manuals)

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JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

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Introduction

This manual is about the indoor technology transfer ("Aerial triangulation", "Digital plotting", "Digital compilation", "Map symbolization", "Digital data structurization") in this project. In consideration of technical levels of the DGC members who attended the indoor technology transfer, this manual was prepared with emphasises on following main points.

- · A basic operation for those who use the softwere for the first time
- An operation about basic work at each stage of map making in this research
- It plays a role as a guideline for searching an official manuals of each softwewre (Due to its tremendous amount of information, the official manual is not suitable for inexperienced users to look up some basic operations)
- · Visualizing each settings and inputting procesure by capturing screen image

This manual was prepared within an exercise of each indoor technical transfer. Some extra components are added into the manuals when everybody gets stuck on certain points during the exrcise.

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Aerial Triangulation

Chapter 1 Aerial Triangulation

Open LPS(ERDAS Imagine)



1-1 Aerial Triangulation for Aerial photos

1-1-1 Work Flow of Aerial Triangulation for Aerial photos



Figure 1 Basic Work Flow of Aerial Triangulation

1-1-2 Block Setting

(1) Open New Block

Open LPS



Create New Block (Project)

a LF	PS Project Manager		
File	Edit Process Tools Help		
	New		72
	Open		F
	Save	CHI+S	1
	Save Asin		

Input Block name (EX: "togo-at-tr2")

File			
Look in: 🚞	TR2-2	- 🖻 💣 🕷 🖹	
DEM			OK.
ie-ate			Cancel
🚺 lema trai	ning.blk	1	Help
test-ota.	лык Ik		
		1	Recent.
		0	Goto
F ile	togo-at-tr2		
File name:		- 11 141	

(2) Select Camera Type (See 1-4 for "Camera Setting")

Select "Frame Camera" for "analogue camera".

Geometric Model Category:	DK.
	00
Geometric Model:	Cancel
(Rame Camera Digital Camera Video Camera (Videography) Non-Metric Camera	Help

Select Horizontal Coordinate System after clicking "Set" in "Standard" tag, then select "UTM WGS 84 North" as "Categories" and select "UTM Zone 31" as "Projection"

Reference Coordinate System	2 Projection Chooser	
Horizontal Projection: Geographic (Lat/Lon) Set.	Pri Categories UTM WGS 84 Noth	Гок
Datum: Wits 84 Specify a Ho Horizontal Units: Degrees Vertical Vertical Spheroid: WISS 84 Set Vertical Datum: WISS 84	Projection UTM Zane 21 (Barge 50V - 54W) UTM Zane 23 (Barge 54V - 46W) UTM Zane 23 (Barge 54V - 46W) UTM Zane 23 (Barge 44W - 42W) UTM Zane 26 (Barge 54V - 46W) UTM Zane 26 (Barge 54V - 36W) UTM Zane 26 (Barge 54V - 36W) UTM Zane 26 (Barge 54V - 36W) UTM Zane 27 (Barge 54V - 36W) UTM Zane 27 (Barge 54V - 36W) UTM Zane 27 (Barge 54V - 36W) UTM Zane 27 (Barge 54V - 36W) UTM Zane 27 (Barge 54V - 36W) UTM Zane 27 (Barge 54W - 36W) UTM Zane 27 (Barge 54W - 36W) UTM Zane 26 (Barge 56W - 15W) UTM Zane 27 (Barge 56W - 15W) UTM Zane 27 (Barge 56W - 15W) UTM Zane 37 (Barge 56W - 16W)	Eancel
Venical Units Ingless	UTM 20m 31 (Rend) 0, tep UTM 20m 31 (Renge 12 - 21 - 21 UTM 20m 33 (Renge 12 - 196) UTM 20m 33 (Renge 12 - 196) UTM 20m 53 (Renge 24 - 306) UTM 20m 53 (Renge 36 - 426) UTM 20m 63 (Renge 36 - 426) UTM 20m 63 (Renge 46 - 546) UTM 20m 63 (Renge 46 - 546) UTM 20m 63 (Renge 46 - 546)	Help

Select Vertical Coordinate System (Spheroid: WGS84, Datum: EGM2000), then "OK"

Reference Coordinate System	1		
Horizontal Projection: UTM Projection: UTM Set Datum: WGS 84 Horizontal Units: Meters Vertical Vertical Spheroid: WGS 84 Vertical Datum: WGS 84 Vertical Datum: WGS 84 Vertical Datum: Set LSR: (Unknown) Projection Secify a Vertical Coordinate System for this block file	Spheroid Name: WGS 94 Datum Name: WGS 94 Datum Name: WGS 94 Datum Name: WGS 94 Distant Mathematical Spheroid Sp	G. Britain 1936 (UK) (MRE) G. Britain 1936 (UK) (MRE) (To WGS 84 1] i-doediscar Argoenians 1934 [To WGS 84 1] i-doediscar Argoenians 1934 [To WGS 84 1] i-doediscar 1956 (MRE) (MRE) al (MRE) al (MRE) (To WGS 84 2) ase D atum (Azores) [MRE) (Brunoi and East Malaysia) (MRE) 10 30 30 30 30 30 30 30 30 30 3	Cancel Help

Click "Next" and Input Flight Height as 5,000m then "OK".

	Set Frame-Specific Information:	
Rotation System:	Omega, Phi, Kappa 👻	. dk
Angle Units:	Degrees	Previous
Photo Direction:	Z-axis for normal images	Nest
	in the second se	Cancel
Average Flying Heig	ht (meters):	Help
Import Interior C	rientation Parameters if available	
Sensor Name;	Default Wild 🔹 Edit Camera New Camera	
Imr	ort Exterior Orientation Parameters	

1-1-3 Import Images

Click "Add frame" and move into the work Folder and after choosing "Files type", select images.



1-1-4 Interior Orientation

(1)Camera Setting

Go to Interior Orientation

File Edit Process	Tools He	elp					
	0	$\langle \Phi \rangle$	Δ	Z	2	B	 Ø
Block - togo-at- E D Images	Show an	nd edit	frame	prope	rties		
Orthos							

Create Camera file

Sensor	Interior Orientation Ex	erior Information	
	Image File Name:	c39_3103.tif	OK
		Attach View Image Edit All Images	Previous
	Block Model Type:	Frame Camera	Next
	Carrier Martin	Default Ville and Edit Company Man Company	Cancel

Input "Name", "Focal length", "Principal Point(x,y)" from Camera calibration file
in "General" tag.

Camera Name: RC30-to	ga		OK
Description: Camera file for	pr training	Camera name	Save
Focal Length (mm):	152.1600		Load
Principal Point xo (mm)	0.0150	÷	Cance
Principal Point vo (mm):	0.001		Help

Input "Fiducial Coordinates" in "Fiducials" tag (In case of Frame Camera).



Input "Distortions" (In case of Frame Camera). And "OK"



(2) Interior Orientation

Go to "Interior Orientation" tag and set the direction of all images.

iensor	Interior Orientation	Exterior In	formation						
F	iducial Orientation		Viewer Fiducial L	ocator:	50 - 0	100	Unsolved		DK
yĴ	y¥ €Ţy €	Îx (50 2 0	100			Previou
			IN IN I				1	-	1.100.000
Edit.	All Images		Auto Loc	ate	Apply	Reset	Solve		Next
Edit. Point #	All Images	Image X	Auto Loc	Film X	Apply Film Y	Reset	Solve Residual Y		Next Cance
Edit. Point #	All Images	Image X	Auto Loc	Film X. 105.998	Apply Film Y -106.000	Reset Residual X. 0.000	Residual Y 0.000		Next Cance
Edit. Point #	All Images	Image X	Auto Loc	Film X 105,998 -105,999	Apply Film Y -106.000 -105.999	Reset Residual X 0.000 0.000	Residual Y 0.000 0.000		Next Cance Help
Edit, Point #	All Images	Image X	Auto Loc	Film X 105,998 -105,999 -106,000	Abbly Film Y -106,000 -105,999 106,002	Residual X 0.000 0.000 0.000	Solve Residual Y 0.000 0.000 0.000		Next Cance Help



Open Interior Orientation Viewer on the first image.

ensor Interio	r Orientation	Exterior Info	rmation					_	
Fiducia	l Orientation:	_	Viewer Fiducial L	ocator: 🔆	50 _ 0	1 100	Unsolved		OK.
y x	× v	×			50 - 0	100			_
× •	The state of the s				- U	100		-	Previou
Edit All Ima	ages		Auto Loc	ate	Apply	Reset	Solve		Previou
Edit All Ima	ages Color I	mageX	Auto Loc	rate	Apply Film Y	Reset Residual X	Solve Residual Y		Previou Next Cance
Edit All Ima Point # >	ages	mageX	Auto Loc	Film X 105.998	Apply Film Y -106.000	Reset Residual X 0.000	Solve Residual Y 0.000		Previou Next
Edit All Ima Point # > 1 > 2	ages	mageX	Auto Loc	Film X 105.998 -105.999	Apply Film Y -106.000 -105.999	Reset Residual X 0.000 0.000	Solve Residual Y 0.000 0.000		Previou Next Cance Help



4 continue from Fiducial 2 to 4.

After the observation of all 4 points, If the result clear the tolerance(0.03mm), go next.

(In this case, 7.3 microns is less than 0.03mm=30 microns)



Continue Observation of fiducials for all remaining images. In case of automatic "Interior Orientation", one image must be observed and the direction of images must be checked.



After, "Automatic Interior Orientation", click "Accept".

Automatic Interior Orientation	Automatic Interior Orientation
Locate Fiducial Marks for	Locate Fiducial Marks for
 Current Frame Active Frames Unsolved Frames All Frames 	 Current Frame Active Frames Unsolved Frames All Frames
Correlation Coefficient Threshold: 0.850	Correlation Coefficient Threshold: 0.850
Set correlation coefficient threshold for fidual matching	

1-1-5 GCP Observation and Tie points Observation

Go to Points measurement tool



Select "Stereo" (Stereo-view work) or "Classic" (Mono (Split)-view work).



Click "Add" to input new GCP



Input "Point ID" with number, "Description" with character, Type as "Full", X, Y, Z coordinate of GCP. Then continue input of all points.

-			1 ¹ 1		-	and the second	t L		10.10 3
Point #	Point ID	>	Description	Туре	Usage	Active	X Reference	Y Reference	Z Reference
1	101	۲	GCP1	Full	Control	~	291322.000	840240.000	299.000

If a text file of "GCP" exists as below, import the file by" Import points" icon.

gcp-text.txt - Notepad		
File Edit Format View Help		
101 291322.000000 102 297057.000000 103 289987.000000 104 294212.000000	840240.000000 299.000000 839879.000000 250.000000 830571.000000 226.000000 330077 000000 300.000000	Mark Import/Export Points
105 293466.000000	835135.000000 380.000000	Import Export
		Select point source: Cancel
		ASCII File (*.txt) Help LPS Block File (*.blk)
	+∄ Z Z□ A Save	Select option:
		Reference Points (3D)
	Import or export points	Reference Points (2D)

Then all GCP shall be observed manually. In case a GCP locates on 6 images, 6 images must be observed.



<GCP1>



X: 291322.0, Y: 840240.0, Z: 299.0



<GCP2>



X: 297057.0, Y: 839879.0, Z: 250.0



<GCP3>





X: 289987.0, Y: 830571.0, Z: 226.0

1-14

<GCP4>



X: 294212.0, Y: 830077.0, Z: 300.0



<GCP5>



X: 293466.0, Y: 835135.0, Z: 380.0



1-16

1-1-6 Tie points Observation

(1)Manual Tie points measurement

Add tie points (Type: None, Usage: Tie) and measure on image one by one same as GCP.



(2) Automatic Tie points measurement

Click "Automatic tie properties" and go to "Distribution" tag, then click "View Graphic"".

	$ \begin{array}{c} \searrow + \searrow & \boxtimes & \searrow \\ & & & & & & \\ & & & & & \\ & & & &$	Add Delete Close rties oave	Automatic Tie Point Generation Properties
Sector 1			Starting Column: 1191 🗧 Starting Line: 1191 🗧

			Display units:
			Pixel Row/Column Percentage
			Starting Column: 1191 0 Starting Line: 1191 0 1191 11
			Column Increment: 4724 128 111 Line Increment: 4726 128 111 11
	🜌 Au	tomatic Tie Point Generation	Properties
	Gen	aral Strategy Distribution	
Ok	Find	Points With: O Default Distribut Intended Num. of Points/P Starting Column: 1191 Column Increment: 4724	ion Opefined Pattern View Graph attern: 1 E E Keep All Points Starting Line: 1191 Line Increment: 4726

Check result and "Close" then added tie points can be seen in the point measurement window.

Row #	Image ID	Image Name	Number of Intended Points	Number of Found Points	Number of Patterns	Point Success Rate % P	÷	Benort
1	1	c39_3103	9	12	9	100.00		
2	2	c39_3104	9	10	9	100.00	E	Close
3	5	c41_3052	9	10	9	100.00		Contraction of the local division of the loc
4	6	c41_3053	9	11	9	100.00		Help
Average	Point Succes	ss Rate (%):	100.00 Average Patte	em Success Rate (%):	69.44	,		

Image	*	ZRe	Y Reference	Reference	Active	Usage	Туре	Description	>	Point ID	Point #
					~	Tie	None			215	20
					~	Tie	None			216	21
1					~	Tie	None			217	22
					*	Tie	None			218	23
	-				~	Tie	None			219	24
	E				*	Tie	None			220	25
					~	Tie	None			221	26

1-1-7 Block Adjustment

Check Result

Go to "Triangulation Properties".

"Image resolution" etc. Then click "Run" or click.



Set Adjustment Parameter in "General" tag and "Point" tag. Tolerance depends on "Flight height",

△ icon.

Aerial Triangulation General Point Interior Exterior Advanced Options **DK** Aerial Triangulation - 28 10 Maximum Iterations: 4 General Point Interior Exterior Advanced Options 0K 0.0100 4.6 Convergence Value (meters): Image Point Standard Deviations (pixels) : Bun Compute Accuracy for Unknowns x: 0.33 * Image Coordinate Units for Report + Update Pixels y: 0.33 Accept GCP Type and Standard Deviations (X,Y: meters, Z: met Report. Same weighted values ype: Cancel 2.000000 Z: 4.000000 Help 2.000000

Triangulati Total Imag	on Iteration Conve e Unit-Weight RM	rgence: SE: (Yes 0,9962	Close	Click here to know th
Control P	Point RMSE:	Check P	oint.RMSE;	Update	uetaii.
Ground X:	1.7409 (5)	Ground X:	0.0000 (0)	Accept	
Ground Y:	1.3109 (5)	Ground Y:	0.0000 (0)	Report.	
Ground Z:	2.7336 (5)	Ground Z:	0.0000 (0)	Review.	
Image X:	0.7639 (10)	Image X:	0.0000 (0)	Help	
Image Y:	0.4884 (10)	Image Y:	0.0000 (0)		

The Study on Establishing Topographic Database in Togo Technology Transfer Manuel

		3 X		1 A						
t t	he i he i	no. of maximal	iterati correc	on =4 tion of :	the st the obj	andaro ect po	l error Dints =	= 0.996 0.0000	2 3	
image	ID 1 2 5 6	X 290920 293556 293692 290693	The 8 .8590 .0525 .2085 .9061	exterio: Ys 831864. 831847. 837651. 837669.	r orien 5082 3574 3121 3986	tation Zs 5165 5159 5167 5173	n param s .0447 .2196 .1557 .5832	eters ONEGA -0.1230 0.5766 0.0286 0.2973	FHI KAPPA 0.6387 0.7092 0.8458 0.7286 -0.0278 -178.6925 -0.1397 -178.7566	
	The imag	interi ge ID 1 2 5 6	or orie f(mm 152.16 152.16 152.16 152.16	mtation) 00 00 00 00	paramet xo(mm) 0.0150 0.0150 0.0150 0.0150	ers of	f photo yo(mm 0.001 0.001 0.001 0.001		Exterior Orientatio Result.	on
7 Point 10 10 10 10	The 1 ; ID)1)2)3)4)5	residua 1.0 -1.4 2.9 -1.6 -0.9	ls of t X 737 072 145 029 782	he contro r¥ 1.8355 0.3744 0.6809 -1.9152 -0.9756	ol poin -3 -3 3 3	ts rZ .6422 .1697 .4275 .9323 .0227				
1		a 0.0 1.7	X 000 X 409 CES 3.661	aY -0.0000 mY 1.3109 0 1 5	-0 2 1E90 0230	aZ .0000 mZ .7336		RMSE	rror of GCP.	
The c Point 10	liffe ID	erence r 1.0	of inte X 758	rsected a r¥ 1.8573	and mea 1	sured rZ .6204	contro) points		

1-2 Aerial triangulation for ALOS Satellite Images

1-2-1. Create Project (Block File) for Satellite



Newly Input a filename.



Set "Horizontal Coordinate System" Ellipsoid as "WGS84", Projection as "UTM Zone 31N"



Set "Vertical Coordinate System" EGM 2008.

Block Property Setup	2			
leference Coordinate System	_			
Horizontal	DM	Elevation Into C	ihooser	
Projection: UTM Set.	Previous			
Datum: WGS 84	higol			
Horizontal Units: Meters	14081	Spheroid Name:	WGS 84	✓ L UK
Vertical	Cancel		E ser ser	
Vertical Scheroid W/GS 94	Help	Datum Name:	WGS 84	~
Ventual Spherold, wide of		- 1 A A A	Old Hawaiian (MRE)	Cancel
Venucar Darum, Wd3 64	ecity a Vertical C	Elevation Units:	Oman (MRE) Ord, Survey G, Britain 1936 (UK) (MBE)	L Liste
Venical Linits moters			PNEOS 90	
Import Set LSR (Unknown) Projection	T I		PDSGAR 94 Pitcaim 2006 To WGS 84 11	
			Posiciones Geodesicas Argentinas 1994 [To WGS 841]	
Average Elevation (meters): 0.00		1	Puerto Rico (MRE)	
Specify a Vertical Coordinate System for this block file			Qatar National (MRE) BAE98	
			RBAF 1991	
		and the second second	ISID/MIT 92	n
		Row # Image ID	ST87 Duvea	
		and the second second	Southwest Base Datum (Azores) (MRE)	
			Timbalai 1948 (Brunei and East Malaysia) (MRE)	
		100	WGS 84	-
			WGS 84(G730) WGS 84(G873)	
			WGS 84(orig)	
			Wake-Eniwetok 1960 (MRE) World Wide 1-Migute Geord Height (EGM/2008)	
			World Wide 15-Minute Geoid Height (EGM96)	

Input Average Elevation

🖋 Block Property	Setup		
Reference Coordinate Sy	stem		
Horizontal			ОК
Projection: UTM		Set	Playious
Datum: WGS 84			10-11
Horizontal Units:	/leters	~	IVext
Vertical			Cancel
Vertical Spheroid: WGS Vertical Datum: WGS) 84) 84	Set	Help
Venical Units met	Set LSR (Unkno	wn) Projection	
Average Elevation (me	iters):	300.00	
Average ground height i	n meters		

1-2-2. Import Image files

Click "Image import button" and "set file type" as "ALOS PRISM JAXA CEOS (VOL-ALPSM*)"



Choose file until all necessary images are imported.

Image File Name		
File		
Look in	Cancel LPS Project Managers trd, also at bik Ele Edit Process Tools Hele @ @ @ @ @ @ @ @ @ @ @ @ @ @ @ @ @	Display Mode ⊙ Map Space ○ Imae Space
File name: VOL:ALPSMN259263420-01B1N Files of type: ALOS PRISM JAXA CEOS (VOL:ALPSM*) greyscale : 16000 Rows x 14496 Columns x 1 Band(s)	ast desmited	928342756161_k 92834256161_k 92834256161_k 92834256161_k 92834256161_k 92834256161_k 92834256161_k 92834256161_k 92834256161_k 92834256161_k 92834256161_k 92834256161_k 92834256161_k 92834256161_k 92834256161_k 92834256161_k 928342561616156161_k 928342561616161610000000000000000000000000000
	Row # Image ID Description > 1 1 2 2	Image Name Active Pyr. Int. Ext. DTM Ortho Onlin 110018/11 data/vol-alpsm/259263420-o1b1

1-2-3. GCP Observation

Click "Point Measurement Tool" and Choose Classic one.

🖋 LPS Project Manager: tr4_alos_at.blk	
<u>F</u> ile <u>E</u> dit <u>P</u> rocess <u>T</u> ools <u>H</u> elp	🖉 Select Point Measurement Tool 🛛 🛛 🗙
□ Image: Block - tr4_alos_at.bl Image: Start point measurem	Which type of Point Measurement tool would you like to use?
	🔘 Stereo Point Measurement Tool
	Classic Point Measurement Tool
	OK Cancel Help
	Don't ask me this question again.

Add a GCP by "Add "Button.



	and art and				in the second	2 and	at star		and the state of the state
Point #	Point ID	>	Description	Туре	Usage	Active	X Reference	Y Reference	Z Reference
1	1001	Þ	GCP1	Full	Control	~			
	\bigwedge					\geq			
Pt num	ber	Р	t Name	Set "Fu	11"	Set	"Control"		

Then Input "X", "Y", "Z" of GCP

	- Andar	1		4					and the second
Point #	Point ID	>	Description	Туре	Usage	Active	×Reference	Y Reference	Z Reference
1	1001	Þ	GCP1	Full	Control	~	289293.000	982816.000	390.000

$<\!\!\text{GCP1:}$ x, y, z = 289293m, 982816m, 390m >

Add point and input "ID", "Description" \to "Type", "Usage" \to input coordinates \to Observe point





 $<\!\!\text{GCP4:}$ x, y, z = 321203m, 1006362m, 345m >

1-2-4. Tie Points Measurement (Automatic)

Click "Automatic tie Properties" for setting strategy.



Set preferable layout of "Tiepoints" by View Graphic then "OK".



Click "Automatic tie Process" and after processing, check result.

Image ID Image ID <td< th=""><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th>Add</th><th>5</th><th></th><th>2</th><th>÷</th><th></th></td<>								Add	5		2	÷	
Save o Tie Summary Image ID Image ID Image Name. Number of Intended Points Number of Found Points Number of Patterns Point Success Rate % Patt								Delete Close		8	▲ 2₀	₽ Z	(1) (1) (1) (1) (1) (1) (1) (1)
Heip 1 1 ann/259263420 o1b 16 19 16 100.00 2 2 samb259263475 o1b 16 19 16 100.00	Repo	Success Rate % Patt 100.00 100.00	lumber of Patterns Point 16 16	Number of Found Points 19 19	er of Intended Points 1 16 16	mary Image Name Numb Issmp259263420-o1b Issmb259263475-o1b	o Tie Sun ‡ Image IC 1 1 2 2	Help	8		<u>I</u> ,	CÎ.	2

1-2-5. Adjustment (Calculation)

Click "Triangulation properties" button for setting parameters.

- C V Trian	gulation	×
Add General Delete Ground F Save Help	Point Exterior Advanced Options ³ oint Type and Standard Beviotiens IX Y: meters, Z: meters) Type: Same weighted values X: 1.000000 Y: 1.000000 2 2.500000 C Advanced Options Y: 1.000000 C Advanced Options Y: 1.000000 C Y: 1.000000 Y: 1.00000 Y: 1.000000 Y: 1.000000 Y: 1.00000 Y: 1.000000 Y: 1.000000 Y: 1.00000 Y: 1.000000 Y: 1.00000 Y: 1.00000 Y: 1.00000 Y: 1.00000 Y: 1.00000 Y: 1.00000 Y: 1.000000 Y: 1.00000 Y: 1.000000 Y: 1.000000 Y: 1.00000	Run Accest Report Cancel Help

Click "Perform Triangulation" button for RUN "AT".

If the error is not acceptable, click "Report" to check wrong points.

Re-measure the point and continue until the error becomes acceptable then "Accept".

$ \begin{array}{c c} \bullet & \bullet \\ \hline \bullet \\ \hline \bullet & \bullet \\ \hline \bullet \\ $	Triangulation Triangulation Ite Total Image Un Control Point Ground X: 2: Ground Y: 5: Ground Z: 4. Image X: 0: Image Y: 2.	rn Summary eration Converge it-Weight RMSE t RMSE: 3795276 (4) 2602110 (4) 0165734 (4) 7087396 (8) 5831122 (8)	ence: Check I Ground X: Ground Y: Ground Z: Image X: Image Y:	Yes 365308 Point RMSE: 0.0000000 (0) 0.0000000 (0) 0.0000000 (0) 0.0000000 (0)	Close Accept Report Review Help	
Editor: Intresult_obsets Dir. C:> Doctore Directore Eile Edit View Find Help Image: Directore Image: Directore Image: Directore Image: Directore Image: Directore 1020 0.0000 0.0000 0.0000 0.0000 10020 0.0000 10000 0.0000 10000 0.0000 10000 0.0000 10000 0.0000 10000 0.0000 0.0000 0.0000 10000 0.0000 10000 0.0000 10000 0.0000 10000 0.0000 10000 0.0000 10000 0.0000 100000 100000 10000<	0.0000 0.0000 0.0000 0.0000	Triangulat	tion Summary			×
Control and check point residuals in meters: type pid rx [meters] ry [meters] gcp 1001 3.0722 3.44 gcp 1002 2.4168 6.42 gcp 1003 -1.6033 -5.51 gcp 1004 -2.1906 -5.51	rs] rz[mete 560 5.6 182 3.6 142 -4.0 095 -0.9	Triangulation Total Image	Iteration Converge Unit-Weight RMSE:	nce: Yes : 0.28653	08	Close
Image points and their residuals: image pid image_x image_y 1 1001 2381.8862 13864 9547 1 1002 10833.4881 13691.0289 1 1002 2222.4291 2222.0494	residual_x -0.1702 -0.0470 0.5271	Ground X: Ground Y: Ground Z: Image X:	2.3795276 (4) 5.2602110 (4) 4.0165734 (4) 0.7087396 (8)	Ground X: 0.1 Ground Y: 0.1 Ground Z: 0.1 Image X: 0.1	D000000 (0) D000000 (0) D000000 (0) D000000 (0)	Report Review Help
		Image Y:	2 5831122 (8)	Image Y: 0.1	נחז הההההה	

Save and Close



Bigger error is showed by longer line(Blue one).



Chapter 2 DTM and Orthophoto Creation

2-1 DTM and Orthophoto Creation



Figure 2 Basic Work Flow of DEM and Orthophoto Creation

2-2 DTM Setting

Active images which are necessary for this work then click "DTM Extraction".



Choose "Classic ATE".



Select type (DEM, TIN, Shape, ASCII) then set folder and file name for output.

Also input Cell size (DEM interval) of output.

After above setting, Click "Advanced Properties"

Dutput (ype:	DEM		-	Background V	alue: Default	+	ОК
Jutput Form:	() Single	Mosaic 😐 In	dividual File	s			Run
Jutput Prefix	pakoun_	dem_052[0.img		• 6			Batch
							Cancel
Cell Size	X: 25.00)	Y: 25.	00	meters	•	Help
	🗌 Make	Pixels Square					
🖉 Use Adap	otive ATE		Stop at Py	amid: 0			
Set the rang	e from:	globaldem2.	ip2	• 6			
DEM accura	юу	25.00	a n	neters			
Z Search Ra	ange Min:	179.00	Max:	492.00	meters		
				(Advanced Prop	erties	>

<Go "General" Tag>

Check the "Coordinate System" and Set Area of "DEM" by Upper Left XY, Lower Right XY. If you need "Contour line" at a same time, Check "Create Contour Map" (a contour line shape file over the same area as DEM will be created automatically).

Horizontal Projection: UTM Horizontal Spheroid: WGS 84 Zone Number: 31 Horizontal Datum: WGS 84 Horizontal Units: meters - Set.	DTM Extent Impo Concert (m ground space) UL x: 291322.0000 Impo Concert LR x: 294212.0000 Y: 840240.0000	UL Y
Vertical Spheroid: WGS 84 Vertical Datum: World Wide 1-Minute Geold Height (EGM2008 Vertical Units: meters T Set	Band Band Hep	0f
Create DTM Point Status Dulput Image Reduce DTM Correlation Area by Trim the DTM Border by	Crute Contour Map Contour Interval: 20.00	DEM

LR X

Y

<Go "Image Pair" Tag>

Check Image pairs which are used for DEM creation. Then "OK".

General	Imag	ge Pair	Area Sel	ection	Accurac	y See	Data						
Recalcu	late	pairs (with overla	ap over	50	%	Show	Active C	Inly] 📉 🔯		VA	
Row #	>			Image	Pair Na	ne		Active	Overlap %	Image Detail	DTM Status	<u>^</u>	OK.
	11	c39_31	03_c39_3	3104			_	~	64.827	100%			
1	2	c39_31	104_c39_3	3105					63.806	100%			Cano
	3	c41_30	051_c41_3	3052				1	60.601	100%			(Contractor
	4	c41_30	052_c41_0	3053				4	59.950	100%			10000
2-3 DTM Creation

< "RUN" DTM Extraction>

When the "RUN" icon is clicked, the process is start and the calculation needs time (depends on the "Area", "Image volume", "Cell Size", etc).

Output Type:	DEM			Background V	alue: Default	*	ОК
Output Form:) Single	Mosaic 🥥 In	dividual File	s			Run
Output Prefix:	pakoun_i	dem_0520.img		• 🗟			Batch Ru Cancel
Cell Size	× 25.00)	Y: 25.	00.	meters	•	Help
🔽 Use Adapti	ve ATE		Stop at Py	ramid: 0			
Set the range	from:	globaldem2.	ip2	* 🗳			
DEM accurac	y	25.00	-n	neters			
Z Search Ran	ige Min:	179.00	Max:	492.00	meters		
					Advanced Prop	erties	

After Extraction of DEM, The created DEM appears.



The created DEM can be seen also in "ERDAS Imagine".

Right click on "2D View #1" then select "Open Raster Layer" and choose the DEM files.





About seeing "Contour line", " Open Vector Layer" in above window.

File	Vector Options		
Look i	n: 🔄 DEM	- 🖻 📸 🛞	
	koun_dem_0520c39_3103_c39_3104_contour.shp		OK
te:	st_0520c39_3103_c39_3104_contour.shp		Cancel
		1	Help

+ Come Manage + Come Manage → A Grow + → A Grow + → KasyTrace	Data	Kaster Vecto
N 🔤 🥥 🐖 🔒 Lack Insert Geometry	÷	Text
Contents	ąχ	2D View #1_pakou
ZD VIEW #1	0641_3(16 CAS

Chapter 3 Orthophoto Creation

3-1 Ortho Rectification

In this work, Each images shall be ortho rectified one image by one image.

Choose an image which are necessary for this work then click "Ortho Resampling Process".

Hie Edit Process Toels Hele		
	2 8 8 0	
- 📷 Block test ofa 2 blk - 🙀 🎦 Images	Start ortho resampling process	_
 By Other By Other Set outry dam, BC003, 5321,000, 5554, 590 patisang dam, BC0043, 590, e41, 5951, eng 	지역 마 마 방 수	
	а, ^{.00} . а/	
	四 e35_3104w 通	
	8 ⁰ 0 0	
	Bore B (Inage II) Descriptory () Act	time P
	1 1 d/w.w/w/b/22/23/33/3104/w 2 b d/w/w/b/22/23/33/3104/w	
	3 1 d Apis/Wh/2/20:33,2105.94 4 4 d d Apis/Wh/2/20:43,3051.94	
	5 5 d /acs/at/02/041_305234 6 6 d /acs/at/02/041_30518	

Set folder and file name for output.

Choose DTM format and DTM file

Input "Output Cell size" (GSD of Ortho Image) and area by Upper Left XY ,Lower Right XY.

Then go "Advanced" Tag and set "Overlap threshold" if necessary.

After above setting, Then "OK".

eneral Decede Adversed	
Input File Name: c39_3104.lif Active Area: 100.0%	DK
Dutput File Name: (*.img) ditrioc35_5104.iing DTM Source: DEM Verical Unit. meters	Cancel
DEM File Name pakoun_dem_0520c39_3103_c39 Ftopenes	Help
Output Cell Sizes X: 2.50000000 Y: 1250000000 T: 10000000 T: 100000000 T: 1000000000 T: 1000000000 T: 10000000000	Ortho Resampling
ULY: 835135.00000000	Resampling Method: Billinear Interpolation
Output rows: 2024 columns: 1157 Recalculate	Dverlap Threshold: 20.0% 👘 🗇 Dutput Ignore Value: 0.00000 👘 🖪
	Set Inclusion Polygons Set Inclusion Polygon Name Matching.
Add., Add Multiple., Delete Alian Pixels	
Add Add Multiple Delete Align Pixels	lochosov Poygov Fle Name (ao) 🔹 😰 📑
Add. Add Multiple Delete Align Pixels Pow # Input Image Name > Active Output Image Name Active Area Incl 1 c39_3104.tif	Inclusion Polygon File Name april Projection: UTM Spheroid: WGS 84 Zone Number: 31 Datum WGS 84

After the processing (ortho image creation is 100% finished), "close" the window.

low	Process Title	State	Progress	
1 eWksp	ace			
2 blockto	ol			
3 resamp	le c39_3104.tif to orthoc39_3104.img	DONE - Click Dismiss to Remove	100%	
4 resamp	le c39_3104.tif to orthoc39_3104.img	Performing Resampling	16%	

Continue the same process on the other images necessary.

File Edit Process Tools Help		
	Z Z B 🖸 🖉	
Book ten de 286 B		General Hescale Advanced Input File Name: c41_3052.tif Active Area: 100.0% IDK Output File Name: (*img) otthoc41_3052.img IBate DTM Source: DEM Ventral Units meters IDM
		Dutput Cell Sizes X: 2:50000000 Y: 2:50000000 meters: ULX: 291322:00000000 ILRX: 294255:31245178 Image: Control of the control
	Row 8 Image ID Description d 1 1 d	Active Pyr bet Ext DTM Ode A

Check the result (in LPS or ERDAS Imagine).



File Home	Manage Data	Raster	Vector	Terrain	Toolba
Contents Metadata Informat	Select + +7 Inquire + Measure + ion	Copy Paste Edit	Fit to Frame	Reset	P • P P P • P P ?:? 1:668
Contents	₽×	CLASS N	/A - "orthoc4	1_3052.img	g ⁱⁱⁱ - Country:
Retnever	99_3104.img d				and the second se

3-2 Ortho Mosaic

Click "Start Ortho Misaicking process"



Choose "block file" in "MosaicPro" window and check "Use Entire (all) image" in "Image Area Options" tag. Then "OK"

osaicPro (No File)	
Edit View Process Help	
	Li at La
Add Images	Add Images
File Image Area Options	File Image Area Options
Look in: TR22	QK Crop Area By: OZ Percent Cancel Leip Compute Active Area Leip Template ADI (common for all images) Leip Individuel ADI Becent Autoressociate Multiple ADI Files Goto Single Aggregate Shapefile Single ADI File
File pame: test-ota-2 blik Files of type: LPS Block File (*,blk)	Crop Area: 0.1002



Click "Set output Option". Set area and Cell size if necessary.



Select Nove Select Select Pib Chose Help

Click "Run the Mosaic Process" then choose folder and name for output image and "OK".



After finishing the Mosaic, check result (mosaicked image) in the "ERDAS Imagine".



=(| m)

mone 3104/252

4 Files, 0 Subdirectories: 2 Matches: 923702616k Bytes Free

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le vierie

Digital Plotting

Chapter 2-1 Digital Plotting Software Manipulation

1-1 Microstation Basic Manipulation



Figure 1 Basic Work Flow of Digital Plotting

1-1-1. Seed file setting (Scale, Grid, etc)

Open Microstation V8i, and File -> New



Choose work directory and input file name, then "OK".

lew		
<u>D</u> irectory		
Files:	Directories:	N
togo_standard	D:¥togo¥work_kogu¥se	ed hie¥
	D:¥	
	🗁 work_kogu 🖻 seed file	
File Type:	Drives:	Cancel
MicroStation DGN Files [*.dgn]	🛛 🖨 D:	V Help
Show File Icons		
Seed File		
	101	



Setting -> Design file

Select "Working Unit" and set as follow, then "Edit"

- Format : MU
- Master Units : Meters
- Sub Units : Millimeters





Set Resolution then "Save Setting" From File.

Idvanced Unit Settings		Eile Edit Element Settings	Tools Utilities Workspace Window Help Ctri+N
Unit Type: Distance		Ciose Save Save	CHI-W CHI-S
1000 per M	eter 💌	1 Conserver 2 Save Settings 3 Save Settings 3 Save Settings 9 For July Project Explorer)译集译 OthFF
Working Areas (each axis)		4 1 Heterences	
Total: 9007199255	Kilometers	Publish i-modeL. Z Import Export	•
Solids: 10.000000	Kilometers	Print Preview Print Print Print Organizer	Ctri+P
state recordey. To set meter		Associa <u>te</u> Properties	Alt+Enter
	Cancel	Protection Send	•

Save DGN File.

Save As		
Directory		-
Files togo_standard.dgn	Directories: D.¥togo¥work_kogu¥seed file¥	
[togo_standard.dgn	 D.¥ Chago Work_kogu P seed file 	<u>DK</u>
Select Format To Save:	Drives:	Cancel
MicroStation V8 DGN Files [*, dgn]	🗐 D: 💉	Options

1–1–2. Cell File Setting (setting file for "symbols" defined in the "SYMBOLIZATION SPECIFICATION".)

Open MicroStation V8i



File/new



Choose work directory and input name of "New Cel file"

New		
Directory Files togo_cel		Diflogo#work_kogu#ce# Diflogo#work_kogu#ce# Diflogo Work_kogu En cel
File <u>Type</u> :	_	Drives:
MicroStation DGN Files [*.dgn]	×	D: Help
Show File I <u>c</u> ons Seed File ¥WorkSpace¥system¥seed¥ne	ew_seed	dile.

< Exercise (3002 Building)>

(1) Open Level Manager



(2) Create New level



(3) Set "layer 3002" as Active



- (4) Draw Shape
- ① Place Smartline
- 2 Toggle Accudraw
- ③ Input 1(mm) as "Y" Direction
- ④ Input 1(mm) as "X" Direction
- (5) Input 1(mm) as "X" Direction
- (6) Snap to start point





(5) Hatch inside the Drawn Shape

Select "Hatch area" and Set "Spacing "as 0.1 then click on the target. And click window (to decide).



- (6) Set Origin (Origin Point)
- ① Snap setting "shift"
- ② Draw a "Diagonal line"
- ③ insert point (Midpoint of the "Diagonal line")





(7) Registration

Element \rightarrow Cells, then Select Directory and input name.





1-1-3. RSC (Resource) File Setting (setting file for "line type(color, style, weight)" defined in the "SYMBOLIZATION SPECIFICATION".)

Open MicroStation V8i



File \rightarrow new, then Choose work directory and input name of "New RSC file"



Element -> Line Styles -> Edit, then select the created file.



Edit -> Crate -> Stroke Pattern

Style	<u>C</u> reate	Name	1	
Nar	Deiete	Stroke Pattern	cription.	X
Duplicate	Point	code 0		
	<u>L</u> ink:	Compound	code 1 code 2	
	Snappable	Internal Lin	e code 3	1
	P <u>h</u> ysical			

< Exercise 1 (1001 Boundary between countries)>

(1) Open "Line Style Editor", then Edit -> Crate -> Name Open Level Manager

ile	Edit			
Style	<u>C</u> reate I	Name		
Nar	Delete	Stroke Pattern	cription	
	Duplicate	Point	code 5	
1	Link	Compound	code 6	
-		Is Internal Lin	e code 7	
	 Snappable 			
-	Physical	hew stroke compon	ient	
Strok Lepe	e Pattern Attribute Shift: Distance titions: Unlimited	0.000000	Single Segment	
Strok <u>R</u> epe Strok	e Pattern Attribute Shift Distance tititions: Unlimited te Pattern	000000.0	Single Segment	
Strok <u>R</u> epe Strok	e Pattern Attribute Shift: Distance titions: Unlimited	20000000000000000000000000000000000000	Single Segment	
Strok	e Pattern Attribute Shift: Distance tititons: Unlimited	S 0.000000 C	Single Segment	
Strok	e Pattern Attribute Shift Distance Unlimited e Pattern		Single Segment	
Strok	Le Pattern Attribute Shift Distance Unlimited Le Pattern		Single Segment	
Strok	Length Fried		Single Segment	

(2) Input newly "Style Code" as 1001 and Select "Stroke" as Line Type.

Name Type Description [00] Internal Line code 5 Internal Line code 6 \$25 Stroke new stroke component 1001 new stroke component Stroke Pattern Attributes 0.000000 Shift: Distance Prepetitions: Unlimited		Description	Type		CVC-
1001 Internal Line code 5 Internal Line code 6 Stroke new stroke component 1001 new stroke component Stroke Pattern Attributes Shift: Distance Unlimited Instruct		Line code 5	ALC: NOT A DOMESTIC ALC: NOT A DOMESTIC ADDRESS OF A DOMESTICA ADDRESS OF		Name
Internal Line code 6 Stroke Pattern Attributes Shift: Distance V 0.000000 Single Segme		Enio 0000 0	Internal		1001
Stroke Pattern Attributes Shift: Distance V 0.000000 Single Segme		Line code 6	Internal		
Internal Line code 7 1001 new stroke component Stroke Pattern Attributes Shift: Distance O.000000 Single Segme Repetitions: Unlimited O		new stroke component	Stroke		
1001 new stroke component Stroke Pattern Attributes Shift: Distance CO00000 Single Segme	1	Line code 7	Internal		-
Stroke Pattern Attributes Shift: Distance I 0.000000 Single Segme Repetitions: Unlimited I		omponent	ew stroke co		1001
			<u>Nilu</u>	ns: Unlimited	Repetitions:
Stroke Pattern				attern	Stroke Patte
	dd		_		
	lete	Del	-		-
Dela	_	Dur - with None	- (fmr	gl/r Fixed	Lengt
Lengtr Freed 1900000 - with Mine	-			แกะ: เรื่อก	Stroke Type
Lengl/ Fixed (100000) - With Mone	EGQ	Stat: 0.0000		Theorem Consumer	and a new come that he was

- (3) Create Pattern
- ① 1 st Dash (Line: 2.0mm)
- ② 1 st Gap (Space: 0.6mm)
- ③ 2 nd Dash (Line: 0.3mm)
- ④ 2 nd Gap (Line: 0.6mm)
 - ① Click "Add", then Choose "String Type" as "Dash" and input 2.0 in "Length"

Name		S	
	Туре	Description	1
1001	Internal	Line code 5	
	Internal	Line code 6	
	>> Stroke	new stroke comp	ionent
	Internal	Line code 7	
1001	new stroke	component.	
Stroke Pattern		30	
6			A 1.1
			Add Delete
Length:	Fixed 2.0	00000	Add Delete
Length:	Fixed 2.0 Dash	100000 M3	Add Delete

2 Click "Add", then Choose "String Type" as "Gap" and input 0.6 in "Length"

Chiles	Community		
orgies	Components		1
Name	Туре	Description	~
1001	Internal	Line code 5	
	Internal	Line code 6	
	>> Stroke	new stroke component	
	Internal	Line code 7	×
1001	new stroke c	omponent	
- 45.54	11 1.0000000000000000000000000000000000	No Katalan	
	0.4		
	8		
Stroke Pattern Attribu Shift: Distanc	ites :e 🔽 0.0000	00 🔲 Single Segme	nt.
Stroke Pattern Attribu Shift: Distanc Repetitions: Unlimite Stroke Pattern	ites ie 💌 0.0000 id 💌 10	00 Single Segme	nt
Stroke Pattern Attribu Shift: Distanc Repetitions: Unlimite Stroke Pattern	ites re 💌 0.0000 rd 💌 0	00 Single Segme	nt
Stroke Pattern Attribu Shift: Distanc Repetitions: Unlimite Stroke Pattern	ites .e <u>v</u> 0.0000 .d <u>v</u> 0 2	0 Single Segme	ent d
Stroke Pattern Attribu Shift Distanc Repetitions: Unlimite Stroke Pattern	ites e <u>v</u> 0.0000 ed v 0 2	0 Single Segme	int d
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Stroke Pattern Attribu Shift: Distanc Repetitions: Unlimite Stroke Pattern Length: Fixed Stroke Type: Gap		00 Single Segme	nt d

Styles	Compo	nents			
Name	Тур	e	Description		~
1001	Inte	rnal	Line code 5		_
NIE RO.	Inte	mal	Line code 6		
	>> Stro	ike	new stroke ci	omponen	
	Inte	rnal	Line code 7	1.00	×
1001	new st	roke con	nponent		
	a		2		
Stroke Pattern	Attributes	000000		A. Ören	
Stroke Pattern S <u>h</u> ift: [<u>R</u> epetitions:]	Attributes Distance V Jnlimited V	000000	Sir	ngle Segri 1	nent
Stroke Pattern S <u>h</u> ift: [1 <u>R</u> epetitions:] Stroke Pattern	Attributes Distance 💙 🖸 Jnlimited 💙	000000] D Sir	ngle Segr 1	nent
Stroke Pattern S <u>h</u> ift: <u>I</u> Bepetitions: <u>I</u> Stroke Pattern	Attributes Distance 🗸 🕻 Jnlimited 🗸	000000		ngle Segri 1	hent
Stroke Pattern Shift: I Repetitions: I Stroke Pattern	Attributes Distance 🖌 🖸 Jnlimited 🗸	.000000		ngle Segn 1 A	nent dd
Stroke Pattern Shift: T Repetitions: U Stroke Pattern	Attributes Distance 💙 🛛 Jnlimited 💙	1.000000 i	_2 _2	ngle Segr 1 A	nent dd
Stroke Pattern Shift: T Repetitions: U Stroke Pattern	Attributes Distance V [Jnlimited V]	000000	_2 _2	ngle Segri 1 De	nent dd
Stroke Pattern Shift: [Repetitions:] Stroke Pattern] Length:	Attributes Distance V C Jnlimited V C	000000	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	ngle Segn 1 De None	dd lete
Stroke Pattern Shift T Repetitions T Stroke Pattern Length: Stroke Type	Attributes Distance V C Jnlimited V	0.000000	2 2 Width: Star	ngle Segn 1 De None t 0.000	dd lete

3 Click "Add", then Choose "String Type" as "Dash" and input 0.3 in "Length"

4 Click "Add" , then Choose "String Type" as "Gap" and input 0.6 in "Length"

📕 Line Style Edito	r E. ¥work	kogu¥rsc¥to.	
<u>File E</u> dit			
Styles	Components	_	
Name	Tupe	Description	~
1001	Internal	Line code 5	
1000	Internal	Line code 6	-
	>> Stroke	new stroke com	ponent
	Internal	Line code 7	Y
1001	new stroke o	omponent	
Carlos and an annual a			
Stroke Pattern Attribute	s		
Shift: Distance	0.0000	00 🗌 🔲 Single	Segment
Repetitions: Unlimited	V 0		
			1
Stroke Pattern		0	_
0		2	-
		-	Add
-		-	Delete
Length Fixed	× 0.60		100
Challes Turses Care	0.00		0.000000
Sticke Type. Gab		A regio	0,000000
Invert at: Mone		t Endi	0.000000
Corners: 3		Dash Cags; Cl	osed

Save RSC(Resource) file.

< Exercise 2 (4202 Planting fence)>

- Cerate Line Stroke_component: Input newly "Style Code" as "4202_str" and input"4202_str" as Component.
- (2) Click "Add", then Choose "String Type" as "Dash" and input 2.5 in "Length"

📕 Line Style I	ditor [. ¥work_kogu¥rsc¥to 📃 🗖 🔀
<u>File</u> <u>E</u> dit	
Styles	Components
Name	Type Description
1001 4202_str	Compound new compound comp
1	>> Stroke 4202_str
-	Stroke new stroke component
(4202_str)	(4202_str)
Stroke Pattern At Shift: Dis <u>R</u> epetitions: Uni	ributes ance I.000000 Single Segment mited I
Length: E Stroke Lype D Invert at: N Corners: 3	Add Delete 250000 Width: None Start 0.000000 Delete Start 0.000000 Uasn Lags: Closed

(3) **Cerate Line Point_component:** Draw "Nip-line", with a length 2.0mm to Y direction. And put insert point on "midpoint".



2-1-13

- (4) Edit -> Create ->Point, Then input name as "4202_poi" and Input "4202_poi" as Component.
- (5) Click "Create" and click "OK" in "Create Point Symbol" window.



(6) Click "Base Stroke Pattern" and choose "4202_poi" as stroke. Then click "OK" in "Create Point Symbol" window.





(7) Click "Base Stroke Pattern" and choose "4202_str" in "Base Stroke Pattern" window.

(8) Click "Select" Button and choose "4202_poi" in "Create Point Symbol" window. And Select "4202 point-stroke pattern".

Select Point Symbol	📕 Line Style I	ditor [¥work kogu¥rsc¥to 📳	📕 Line Style !	Editor [¥work_kogu¥rsc¥to 📳 🔤 🗙
N 4:2 4201-poi 4202-poi	Eile Edit Styles Name 1001 4202_poi	Components Type Description Compound new compound comp Compound new compound comp Point 4202_poi 4202_poi Point	Lile Eolt Styles Name 1001 4202_poi	Components Type Description Compound new compound comp Compound new compound comp Point 4202_poi Point new point component 4202_poi Point
QK Cancel	Base Stroke	Pattern 4202_str	Base Stroke	Pattern 4202_str Vertex End Color: Element V Justify: Center V Weight: Element V X Offset: 0.000000
		Andle Create		Partial: Origin ✓ Y offset: 0.000000 ✓ Clip Partial Rotation: Relative ✓ ✓ Allow Stretch Angle: 0.000000 Select Remove Create

- (9) Create Line component : Edit ->Create -> Stroke Pattern, then Select "4202_poi" as Name" and input "4202_line" as component.
- (10) "Add", then Choose "String Type" as "Dash" and input 2.5 in "Length"

Styles	Components		
Name	Туре	Description	1
1001	Compound	new compound comp	
4202_poi	Stroke	4202_line	
	Point	4202_poi	
-	Point	new point component	V
4202 poi	(4202 line)	1	
Stroke Pattern Attrib Shift: Distan Benetitions: Unlimit	utes ce 💉 0.000000) Single Segme	ent
Stroke Pattern Attrib Shift: Distan Repetitions: Unlimit Stroke Pattern 0	utes ce V ed V	Single Segme	ent
Stroke Pattern Attrib Shift: Distan Repetitions: Unlimit Stroke Pattern 0 Length: Fixed	utes ce V 0.000000 ed V 0	Single Segme 2 3 Add Dele	ent d

(11) Edit -> Create -> Compound, Click "Insert" and Select "4202_poi" and "4202_line". Then
 "OK"

Gelect Co	mponent			A Line St	vle Edito	r [¥work]	agu¥rsc¥to 📳	
Turne	Descriptions	_		<u>File</u> dit			-	
Type	Line code 5	_		Styles		Components		
Internal	Line code 6			Name		Туре	Description	٨
nternal	Line code 7	1		1001		Compound	new compound comp	
Point	4202_poi	2	100	4202_poi		Compound	new compound comp	J.
Point	new point component	1-	3			Stroke	4202_line	
Stroke	4202_line			-		Point	4202_poi	v
Stroke	4202_Sti	ht	v	4202_poi		new compound	d component	
	ОК	Cancel		Sub-Compo	nents	Dentition		
_			-		Choko	1202 line		-
				0.000000	Point	4202_ine 4202_noi		
				<u>O</u> ffset:		Inser) 1]
								100

(12) Input "4202" as Name and input "4202" as Component. Then Edit ->link. After that, File -> Save.

Style	Create >	Components		
Nar	Delete	Type	Description	1
100	Duplicate	Compound	new compound comp	
420	LINE IN	Compound	4202	
-	Link	Stroke	4202_line	
	Snannahle	Point	4202_poi	×
1		1		Ŧ
1 Sub-Cor		1		ł
1 Sub-Cor Offset	nponents Type	Description		1
1 Sub-Cor Offset 0.00000	nponents Type 10 Stroke	Description 4202_line	<u></u>	+
Sub-Con Offset 0.00000 0.00000	nponents Type 10 Stroke 10 Point	Description 4202_line 4202_poi		+

(13) File -> Import -> MicroStation Resource File (RSC), then Select Code name and click "Import".

Line Style Edit	or [¥work_kogu¥rsc¥to 🔚 🗖 🔀
<u>File</u> <u>E</u> dit <u>N</u> ew Open <u>C</u> lose Manage	Type Description Stroke new stroke component Stroke new stroke component
Import	AutoCAD Line Style File (LIN)
Export From Den	MicroStation Resource File (
<u>S</u> ave Save <u>A</u> s	Red indicates duplicate names
Fxit	Vame
Stroke Pattern Attribut	es 1001
Shift: Distance Repetitions: Unlimited	e ₩ 0,000000
Stroke Pattern	
Length: Fixed	2.000000 Width: Nor
Stroke Type: Dash	Start: 0
Invert at: None	End: 0
Corners: Break	Dash Caps: Clos

1-2 Microstation and LPS and Pro600

1-2-1. LPS Setting

(1) Open LPS 2011



(2) File -> New, Input new file name

Elle Edit Process Tools Help	Greate N	ew Block File	
New. Open Save Save As	Look in:	∎ mic_pro_test 🔽 💽 🔁 🛞 🛞	<u>O</u> K Cancel
Import SOCET SET Project Export To SOCET SET Project. Register SOCET SET Project(s)			Help
Glose	G.		Goto
<u>1</u> h:/togo/microstation_projects/togo_micro.blk <u>2</u> d:/togo/alos_at/togo_kogure.blk			
Exit	Ci File name:	test	
	Files of type:	LPS Block File (*.blk)	
	0 Files, 0 Su	bdirectories, 0 Matches, 270455960k Bytes Free	

(3) Model Setup

Geometric Model Category: Rational Functions Geometric Model IKONOS

Geometric Model Categ	ory:	-
Rational Functions	×	OK
Geometric Model:	C	Cancel
IKONOS NITF RPC QuickBird RPC ORBIMAGE RPC CARTOSAT RPC RESOURCESAT RPC ALOS RPC WorldView RPC DPPDB IND High Res RPC GeoEye RPC YOMPCAT DPC		Help

(4) Coordinate System Setup

Click "Set" for Horizontal Setting and go to "Standard" tag.

Select "UTM WGS 84 North" from "Categories" and Select Zone 31 as "Projection".

Block Property Setup	×	
Reference Coordinate System Horizontal Projection: Geographic (Lat/Lon) Datum: WGS 84	DK Providus Projection Chooser	×
Horizontal Units: Degrees Vertical Vertical Spheroid: WGS 84 Vertical Datum: WGS 84 Vertical Units: meters Import Set LSR (Unknown)	Standard Custom Categories UTM WGS 84 North Projection UTM Zone 23 (Range 48W + 42W) UTM Zone 24 (Range 42W + 36W) UTM Zone 25 (Range 30W + 24W) UTM Zone 25 (Range 30W + 24W) UTM Zone 27 (Range 42W + 18W) UTM Zone 28 (Range 12W - 6W) UTM Zone 28 (Range 12W - 6W) UTM Zone 30 (Range 6W - 10) UTM Zone 31 (Range 6W - 10) UTM Zone 33 (Range 6E - 12E) UTM Zone 33 (Range 72 - 18E) UTM Zone 33 (Range 42E - 30E) UTM Zone 36 (Range 30E - 36E) UTM Zone 38 (Range 42E - 48E) UTM Zone 38 (Range 42E - 44E) UTM Zone 38 (Range 42E - 46E) UTM Zone 4 (Range 152W - 155W) UTM Zone 40 (Range 54E - 60E)	Cancel Help

Click "Set" for Vertical Setting and go to "Standard" tag.

Horizontal		ОК
Projection: UTM	84	t) Previous
Horizontal Units:	Meters	Nex
(artian)	DALMAR	Cancel
Vertical Spheroid: V Vertical Datum: V Vertical Units	/GS 84 /GS 84	Help
Import	Set LSR (Unknown) Projection	

Select "WGS 84 North" from "Spheroid Name" and Select "World Wide 1-Minute Geoid Height {EGM2008} "as "Datum Name". Then click "OK".

Spheroid Name:	WGS 84		*	
Datum None:	World Wide 1-Minute Ge	oid Height (EGM2008)		
Elevation Units:	meters 💌	Elevation Type: hei	ght 💌	Can
				He

🖉 Block Proper	ty Setup	
Reference Coordinate	System	
Horizontal	(ОК
Projection: UTM	Set	Previous
Datum: WGS	84	Neik
Horizontal Units:	Meters	
Vertical		Lancel
Vertical Spheroid: V	VGS 84	(Help
Vertical Datum: V	Vorld Wide 1-Minute Geoid Height (EGM2008)	
Import	Set LSR (Unknown) Projection	

(5) Import Images

Click "Import Frame" Button.



Select "TIFF" format from "File of type".

Image File Name	
File	
Look in: 🔄 B5 🛛 🔽 🔁 🖄 🛞	
ALPSMB095743500.tif	<u>ok</u>
ALPSMB143423505.01 ALPSMIN143423450.01	Cancel
ALPSMB203103515.tif ALPSMN203103460.tif	Help
ALPSMB203103520.0F ALPSMIN203103465.0F	
ALPSMF149423395.tif	Recent
ALPSMF203103405.tif	<u>G</u> oto
ALPSMF203103410.tif	
File name:	
Files of type: TIFF	
50 Files, 0 Subdirectories, 15 Matches, 270455960k Bytes Free	

(6) Image setting

Click "Pry.", Then Choose "All Images Without Pyramids" to create pyramid file. Then "OK"

Compute Pyramid Layers Orther Compute Pyramid Layers Orther Compute Pyramid Layers Orther Or			
Consect Co	Z Z B 🛛 Ø		
	Compute Pyramid Layers Generate Pyramid Layers For: One Image Selected All Selected Images OAll Images (All Images (Febuid Al)) (OK) Cancel Hep	Hep	
Row # Image ID Description > Image Name Active Int. Ext. DTM Onto D	ID Description > Image Name Active	Active	~
1 1 hr/togo/kusan/alos/test/alpsmi095743390.tii 🗸 🖬 🖬 🖬 👘	🕨 h:/togo/kusan/alos/test/alpsmf095743390.tif 🗸 🗾	nf095743390.ni 🖌 🖌 🚾 🚾 🚾 🚾	

Click "Int.", Then Select RPC file in "RPC Coefficients" corresponding to imported image in "IKONOS Frame Editor". And set 500m in Mean elevation.

Image File Name:	alpsmb044543505, tif	OK.
	Attach View Image	Previous
Block Model Type:	IKONOS	Next
RPC Coefficients:	alpsmb044543505_rpc_opt.txt 🗸 🗸	Cancel
Elevation (meters):	Min: -157.000 🚔 Max: 6157.000 🚔	Help
	Mean: 500 Apply Mean To All	

(7) Save Block file

Edit Process Tools Belp Now Open Save Oisplay Mode Save Oisplay Mode Open Save Oisplay Mode Expert 10 SOCET SET Project. Oimage Space Expert 10 SOCET SET Project. Image Display Mode Close Oil-D 1 hr/toop/microstation_projects/toop_microbk Image Display Mode 2 d/toop/aloog toop toop toop toop Oil-D 1 hr/toop/microstation_projects/toop_microbk Eit Eit Cit+X Save Block File As The Points File Image D Look jrt mic_pro_test Seed Seed	
Aev. Save Coll-S Save Coll-S Save Coll-S Save Block File As File Cok jn: mic_pro_test Rew # mage D p 1 1/2 2	
Import SOCET SET Project. Register Socet Set Register Set Register Socet Set Register Set Register Socet Set Register	
Inder SOCET SET Project. Register SOCET SET Project. Register SOCET SET Project. Slose OtHD Lin/Joeo/Inicrostation.projects/toeo_microbik Ecit OtHX Save Block File As File Look jn: mic_pro_test Rew # Image ID D 1 1 2 2	
Close OtHD Ltr/dogo/microstation_projects/togo_microblk 2 d/dogo/alos_st/dogo/alos_st/dogo/microblk 2 d/dogo/alos_st/dogo/alos_st/dogo/microblk 2 d/dogo/alos_st/dogo/microblk 2 d/dogo/microblk 2 d/	Q
h/togo/microstation_projects/togo_microstation_projects/togo_microstation_projects/togo_microstation_projects/tog	Sus
Exit OHX dependence 7/43300.18 dependence 7/43300.18 Save Block File As File Look jn: Imic_pro_test Seed Bow# Image ID D 1 1 1 2 2	
Save Block File As File Look jn: mic_pro_test Image ID Image ID 1 1 2 Image ID	
File Look in: mic_pro_test seed	
Look jn: Image ID 1 1 2	
Row # Image ID D 1 1 2 2]
Row # Image ID D 1 1 2 2	<u> </u>
Row # Image ID D 1 1 2 2 	<u>Cancel</u>
	Help
	Recent
	Goto
	<u></u>
File name: togo_test	
Files of type: LPS Block File (*.blk)	1 1
1 Elec 1 Cub discussion O Manahara 2000200446 Butter Elec	

1-2-2. Stereo Plotting Function(Pro600 Setting)

(1) Click "Start Feature Collection Application" Button.



(2) Click "New" and go to work Directory, then input file name. And "OK".

<u>File Directory</u>	rairager			
Files: togo_pro600	Directories: H:¥togo¥mic_pro_te:	st¥ Dpan		
	H:¥ Togo mic_pro_test seed	New PRO600 Project	Directories: H:¥togo¥mic_pro_test¥ H:¥ togo mic_pro_test c_ seed	
List Files of <u>Type</u> : PR0600 Projects [*.pr] M Prives:	File Tupe:	Drives:	<u>D</u> K Cance
		PRO600 Projects [*.prj]	Эн:	Help
		Seed File ¥All Users¥Application Data¥ERDAS¥f	PR0600¥projseed¥	<u>S</u> elect

(3) Go to "Design files" tag, and Click "Add/Remove File".

ile name	Add/Remove File
	Delate Fila

(4) Choose "togo_standard.dgn", then click "Done".

Files:	Directories:	
	D:¥togo¥work_kogu¥seed file¥	
togo_standard.dgn	D:¥ togo work_kogu seed file	
		7 Done Cancel
List Files of Lype:	Drives:	Help
".dgn		Пор
Files in groject	/	-
D:¥togo¥work_kogu¥seed file¥	ogo_standard.dgn	Add

PRO600 Project: H.¥togo¥mic_pri	o_test¥togp_pro600.prj		
Design files Project files Project parame	eters Initial view Tolerances 0600¥library¥DemoV8.rsc 0600¥library¥DemoLibV8.cel		
DGN Seed File¥ERDAS¥PF	PRO600 Library Eile Directory Files Togo_pro600_library.rsc	Directories: D:¥togo¥work_kogu¥setteing¥	
 Open DGN File Save P	togo_pro600_library.rsc	D:¥ togo work_kogu setteing	
	List Files of <u>Type</u> :	Drives:	
	PRUBUU Feature Libraries (*.rsc)	D:	Teh

(6) Click "Cell Library", then Choose "togo_cell_library.cel".

PRO600 Project: H:¥togo¥mic_pro	_test¥togp_pro600.prj		
Design files Project files Project paramet	iers Initial view Tolerances 1986		
	Cell Library		
DUN Seed File #ERUAS#FR	<u>File Directory</u>		
Ground Points	Files	Directories:	
	togo_cell_library.cel	D:¥togo¥work_kogu¥setteing¥	
	togo_cell_library.cel	 D:¥ ➡ togo ➡ work_kogu ➡ setteing 	
Open DGN File Save Pr			
	List Files of <u>Type</u> :	Drives:	
	MicroStation Cell Libraries [*.cel]	🔁 D: 💌	Help

(7) Click "DGN Seed File",	then Choose "Togo_DGN	_seed_file".	
PR0600 Project: H:¥togo¥mic_pro_tes	t¥togp_pro600.prj		
Design files Project files Project parameters	Initial view Tolerances		
Cell Library H:¥togo¥mic_pro_test	File Directory		
DGN Seed File	Files togo_DGN_seed_file.dgn	Directories: D:¥togo¥work_kogu¥setteing¥	
<u>Ground Points</u>	logo_DGN_seed_file.dgn togo_standard.dgn	 D:¥ ➢ togo ➢ work_kogu ➢ setteing 	_
Open DGN File Save Project	List Files of Type: MicroStation DGN Files [*.dgn]	Drives:	QK Cancel <u>H</u> elp

(8) Go to "Project parameters" tag, and input 50000 in Mapping scale.

Design files	Project files	Project parameters	Initial view	Tolerances	4 1
Map	oping scale:	50000			
<u>C</u> ont	our interval:	1.000			
	Units: (Metric 💌			

(9) Go to "Initial view" tag, and input 1000 in Scale.



(10) Go to "Tolerance" tag, and input values as follow.

Snap <u>r</u> adius:	5.000	1	
S <u>q</u> uaring:	2.500		
(11) Go to "Stream parameters" tag, and input values as follow. PRO600 Project: H¥togo¥mic_pro_test¥togp_pro600.pr) Project parameters Initial view Tolerances Stream parameters Delta: 1.000 Angle: 1.000 Area: 20.000 Dpen DGN File Save Project Cancel

(12) Click "Save Project", and click "Open DGN File".

PRO600 Project: H:¥togo¥mic_pro_test¥ Design files Project files Project parameters Init File name H!¥togo¥mic_pro_test¥seed#togo_syoki.dgn	roep.pro600.prj al view Tolerances 🔅 🔅		
Open DGN File Save Project	Delete F P RO600 Design file File nar H¥togo	Project: H:¥togo¥mic_pro_te s Project files Project parameters ne ≄mic_pro_test¥seed¥togo_syoki.dgn	est¥toep_pro600.prj
		n DGN File	Cancel

1-2-3. Microstation Setting

(1) PRO600 \rightarrow Library \rightarrow New



(2) Input scale as 50000 in "Pro600 Library Manager" window.

PROG	600 Libra	ry Mana	ser					
ile Ed	li <u>t R</u> esour	ces Cata	loe	_				
Library: Sort by:	D:¥togo¥v Code num	vork_kogu# ber 🔽	togo_a.r <u>U</u> nits:	sc Metric		le: 50000	\supset	
Type (Code Leve	el Color	Style	Weight D	escription	F	Properties	Size

(3) Entry Line Code Library.

Click "Create" Button and input Line codes (Left: minimum code in consecutive code, Right maximum code in consecutive code)

In case of 1001, 1002, 1003, 1004: Input min(1001) in left and input max(1004) in right



Click "Edit" and input values as follow to define Lines, Then click "Next".



(4) Entry Cell Code Library.

Click "Create" Button and input Cell codes.

Þ	\$ PRC	0600	L ibr ar y	Manae	ien						X
	<u>F</u> ile E	di <u>t</u> B	esources	s Cata	oe.						
	Library	y: D:¥I	togo¥wor	k_kogu¥	togo_a.i	ISC					
	Sort by	cod	le number	~	<u>U</u> nits:	Metric	v	Scale:	50000		
	Туре	Code	Level	Color	Style	Weight	Descri	ption	Properties	Size	^
1	Line	1004	1004	ByLvI	ByLvI	ByLvl	1004				
	Line	2001	2001	ByLvI	ByLvI	ByLvI	2001				
	Line	2002	2002	ByLvI	ByLvI	ByLvI	2002				
1	Line	2003	2003	ByLvI	ByLvI	ByLvI	2003				
	Line	2004	2004	ByLvI	ByLvI	ByLvI	2004				
	Line	2005	2005	ByLvl	ByLvI	ByLvI	2005				
	Line	2006	2006	ByLvI	ByLvI	ByLvI	2006				
	Line	2007	2007	ByLvI	ByLvI	ByLvI	2007				
	Line	2101	2101	ByLvI	ByLvI	ByLvI	2101				
	Line	2102	2102	ByLvI	ByLvI	ByLvI	2102				~
	-	Edit		Find	70	Cre.	ate	De	lete	Done	
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1			P	R0600	Grea	ite Libr	ary E	intries			
				Ŀ	ext code	s from:		tre	1		
				7	ell code	e from	2201	to l	2202		
				-	ion code	is nom.	2201	2005	LEUL		
				Ŀ	ne code	is from:		(0)			
				<u>S</u> ha	pe code	s from:	_	to:			
				MultiLi	ne code	is from:		to:			
				1	Ok			Cance			
				ļ	<u>O</u> r			Leance			

Click "Edit" and input values as follow to define Symbol with 1.0 Scale.

🔛 PRO600 Library Ma	nager							
<u>File Edit R</u> esources C	ata <u>l</u> og							
Library: D:¥togo¥work_ko	gu¥togo_a.	rsc						
Sort by: Code number 👻	<u>U</u> nits:	Metric	~	Sc <u>a</u> le:	50000			
Ivpe Code Level Co	lor Style	Weight	Descrip	tion	F	roperties	Size	~
Line 2002 2002 By	Lvi ByLvi	ByLvl	2002					
Line 2003 2003 By	Lvi ByLvi	ByLvI	2003					
Line 2004 2004 By	LVI BYLVI	ByLVI	2004					
Line 2005 2005 By	LVI BULVI	Bul vi	2005					
Line 2007 2007 By	LvI ByLvI	ByLvl	2007					
Line 2101 2101 By	LvI ByLvI	ByLvl	2101					
Line 2102 2102 By	Lvi ByLvi	ByLvI	2102					
Cell 2201 2201 By	Lvi ByLvi	ByLvl	2201	_	2	201	1.0	-
Cell 2202 Default By	LVI BYLVI	ByLvi	NewEn	try			1.0	M
Edit	ind	Crea	ate		Delete		Done	
				-	0.01010		0010	_
111				_	-	1000		
PA PROSID	Symbol L	Detmite	00		-			
Common attri	outes					- 1		
Code:	2202		Autos	snap: /	As is 📑	~		
Description:	2202							
Command:	Collect Sy	mbols						
<u>L</u> evel:	(2202)		4	F	Match			
Color:	ByLev	el	×	-	matori			
	CONTINU	OUS BUL	v					
Weight		(1) Bul a	~					
weight.	<u> </u>	(1) Dyce	-			_		
Symbol attribu	utes		1	-				
C <u>e</u> ll name:	2202							
Scale:	1.00							
Rotation:	0.00							
Relative to:	GroundX							
Text code:	0							
Level mode:	Relative	¥.		ootheia	ht code			
						- 1		
Nevt	Preu		Save		Cancel			
L TTEN	Liev		2476		Cancer			

1-2-4. Open work file for Digital Plotting

(1) Open LPS2011, File -> Open..



(2) Go to D:/jica/PLOT/plot_TR1/projects.

Image: The state Image: The state Imag
tere tere tere tere tere tere tere tere
DuTAPANT2[E1 D

(3) Select "Jica_tr1.blk", then OK

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And	Picers B	Reck File Name File Lock n protect File	Display Mode # Map Space Image Space Image Space Image Space Image Space The Parts T	

Application" (4) Click "Start Collection Feature Button. And 0pen "jica_Tr1_PR0600_projects.prj".

Block - jica_tr1.blk	0.4				Display 1	Mode		
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				Hand States and Annual States and Annual States and	2 Imag	e Evtente	sm	
			: Febrages	4767	3590 (il	C LAIGHES		
			1		V Imag	elDs		
			ale and 17	open/2592632	Cont	rol Points 🛆		
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				olipeni/203103570.ill				
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	Row # 1 2 3 4 5	1 2 3 4 5	•	image rkame dr./jica/plot/plot_it1/images/b1/alpsmb1476734 dr./jica/plot/plot_it1/images/b1/alpsmb1476735 dr./jica/plot/plot_it1/images/b1/alpsmb1476735 dr./jica/plot/plot_it1/images/b1/alpsmb1476735	PRO600 Project Manage <u>File Directory</u> Files:	er Directones	\$	\sim
	Row #	1 2 3 4 5 6		mage name d./jica/plot/plot_th1/images/b1/apemb1476734 d./jica/plot/plot_th1/images/b1/apemb1476735 d./jica/plot/plot_th1/images/b1/apemb1476735 d./jica/plot/plot_th1/images/b1/apemb1476735 d./jica/plot/plot_th1/images/b1/apemb1476735	PRO600 Project Manage File Directory Files: PO600 project pt	Directories	: IOT\sist TB1\amiest\	Open
	Row # 1 2 3 4 5 5 6 7	1 2 3 4 5 6 7		dirige.diplot/plot_th1/images/bil/apimb1476734 dirige.diplot/plot_th1/images/bil/apimb1476735 dirige.diplot/plot_th1/images/bil/apimb1476735 dirige.diplot/plot_th1/images/bil/apimb1476735 dirige.diplot/plot_th1/images/bil/apimb1476733 dirige.diplot/plot_th1/images/bil/apimf1476733	PRO600 Project Manage <u>File Directory</u> Files: RO600_project.prj	er Directones D;\jica\Pl	: LOT\plot_TR1\project\	<u>Open</u>
	Row # 1 2 3 4 5 6 7 8	1 2 3 4 5 6 7 8		dijica/plot/plot_t1/imager/hare dijica/plot/plot_t1/imager/h1/apimb147673 dijica/plot/plot_t1/imager/h1/apimb147673 dijica/plot/plot_t1/imager/h1/apimb147673 dijica/plot/plot_t1/imager/h1/apimb147673 dijica/plot/plot_t1/imager/h1/apim1147673 dijica/plot/plot_t1/imager/h1/apim1147673	PRO600 Project Manage <u>File Directory</u> Files: RO600_project.ptj	er Directones D;∖jica∖Pl	: LOT\plot_TR1\project\	
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(5) Select "teamA" or "teamB" select Open DGN FILE.

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Period

Chapter 2-2 Digital Plotting Work Manual

1-1 Work Flow of Digital Plotting



Figure 1 Basic Work Flow of Digital Plotting

1-2 Plotting method of each Feature

(1) Road

Basically, the order of plotting goes form major class to minor class.

About the classification of road, result of Field Identification and existing map shall be referred.

- Trace paved roads (2001, 2002) -> Unpaved major roads, unpaved second road (2003, 2004)
- Track roads, Footpaths (2006, 2007) -> Roads under construction (2005)
- (2) Railroad and their Structures

About the classification of functional / un functional railway, result of Field Identification shall be referred.

• Railway (2020, 2102) -> Structures (2201, 2202, 2203)

(3) Buildings

When public buildings are plotted, the result of Field Identification shall be referred for their attributes.

- Small Buildings (3002) -> Large Buildings (3001)
- Build up Area (3010)

(4) Water Bodies

About the classification of rivers, existing map shall be referred.

- Lakes, Ponds, Mares (5001, 5004) -> Structures for water body (5204, 5305)
- Rivers (5101, 5102, 5103)

(5) Vegetation and their boundary

About the classification of vegetations, height of trees, color and size on images, relation to water body shall be referred.

(6) Spot heights

Spot height (7302) must be put on the crossroad, somewhere higher then other, lower than other with an interval of 4cm on the map.

(7) Contour lines

Contour lines must be plotted to express the shape of ridge and river.

Digital Compilation

Chapter 3 Digital Compilation Work Manual

1-1. OUTLOOK OF GIS DATA PREPARATION BY BENTLEY MAP

<CONTENTS >

- 1-1-1. DATA EDITING
- 1-1-2. POLYGON TOPOLOGY CREATION
- 1-1-3. POLIGON CREATION
- 1-1-4. CONTOUR RETOUCHING
- 1-1-1 After the stereo plotting, the data will be subjected to the preparation for GIS data which is called "DATA EDITING" works.

Main procedure of the "DATA EDITING "

(1)Data separation which is separated from the stereo plotted data into LINE, POINT and 3D FEATURES.

The data separation works might be used "Select by attributes" commands, "Save as" and "Layer manipulation".

"Save as"

"Layer manipulation"

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- LINE data are for roads, rivers, limits, scaled buildings, etc.
- POINT data are for houses and remarkable symbols which are schools, churches, markets and so on.
- 3D FEATURS data are for contours, control points and spot heights, etc.

Scale |

_ 🗆 🗙

(2)Converting the line data to 2D whose is 0m elevation.

As for converting 0m might be used "AZ=0" key in commands, tentative click by mouse and Scale Z value 0.0000001.

"AZ=0" key in commands

	Method: Active Scale
The second s	X Scale: 1.000000
	Y Scale: 1.000000
	Z Scale: 0.0000001
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	Use Fence: Inside
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• The line data should be converted to 0m elevation attributes.

(3)Connecting line

For Connecting line might be used "Connect line network" commands or using ArcGIS Arc tool Box in "Dissolve. For the partial connecting might be used "Create Complex Chain" with check in \square "Simple Geometry.

"Connect line network"

"Create Complex Chain"

Toronton Disability XI	📕 Create Complex Chain	_ 🗆 🗙
	Method: Manual Max Gap: 0.0010	<u>-</u>
Connect Linework	Simplify geometry	

- When Bentley MAP is used, the operation must be done with one by one layer in order to avoid unexpected merging between layers.
- Before connecting line, the "Shape" elements, "Complex chain" and "Complex Shape" should be dropped.

(4)Splitting at intersections

By using "Segment Linear Elements" command could be split line at once. Before using this commands might be placed fence. "Segment Linear Elements"



The line data should be split at intersections.

(5)Detecting the errors (Data cleaning)

When detecting the errors might be used "Find Gap, "Find Dangle" commands. Before using this commands might be placed fence.

"Find Gap"



"Find Dangle"



- The small gaps whose distance less than 0.2mm-0.3mm on the map could be fixed under "Repair all" mode. If using large number of the tolerance value under the "Repair all" mode would bring to be changed inappropriate elements shape.
- When the tolerance value of errors detection should consider into the map scale. In case of large scale map should be entered small value.
- When using the large tolerance value would be detected many number of the error.
- When detecting the dangles might be flagged all line's tips which are starting or ending of line.

(6)Retouching the errors (Data cleaning)

After detecting the errors should be carried out retouching each error. For retouching works, might be used "Trim", "Extend", "Modify elements", "Add, Remove vertex" or any other functions of modify commands.



- As for the retouching errors might be required cartographical judgments and "eye checking"
- The error which is judged to not require retouching with cartographical judgments might be called "correct error" or "OK error".
- For example of "The OK error"; when the Dangles errors are detected starting or ending of points which is case of river, road and so on. As for the Gap errors are found short segments which are shorter than the tolerance value. It should be connected with next line.
- After retouching the errors should repeat works of "4" to "6" until it will not be detected the errors other than "the OK error".
- Without this Data cleaning works the line, polygon data for GIS could not be create. The Data cleaning works is so hard that it will make you feel too troublesome. However it could not be avoided to make GIS data.

1-1-2 After the Data cleaning, the data will be carried out preparation for GIS data which is called "POLIGON TOPOLOGY CREATION" works.

Main procedure of the "POLYGON TOPOROGY CREATION"

(1)Cell separation which is distinguished cells for using the Polygon topology.

The Cell separation might be used "Level Display", "Save as" and Layer manipulation.

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- After saving file for the Polygon making, the unnecessary Cells which are point features symbols are deleted.
- In the Polygon making, the cells are called centroids
- A polygon must have a centroid inside of itself that is called the Polygon Topology.

(2)Validate topology

"Validate Topology" might be placed Fence. After detecting the errors could save the results. Text size for the Validation results might be used in "Place Text" window. "Place Text"

"Vall	idate	Top	olo	av"
				31



- Text size for the detected errors might be visible size, which is depending on map scale, for example 30m-50m.
- The results of Validation will show the texts and lines which are coming from edge of each uncorrected polygon topology entry.

(3)After the Validate topology will carry out the retouching results of validation.

As for the validation "Texts" which are meaning type of topology errors. By using image reference "Raster Manager" could identify appropriate vegetation, land cover for appropriate a certain area.

Raster Manager : 1 of 1 listed			
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- **multA:** There is nothing not much.
- **MultC:** it will be many errors. There is two or more "centroid" in the area.



• **noA:** When it marks line inside feature which the area is incomplete, it will have to enclose for the "centroid"



• **noC:** When there is not any "centroid" into the area.



- **unuB:** It appears that the line of the boundaries of polygon is incomplete, so that the polygon is not formed.
- The following case often happens.



• However, the line and centroid looks like to be completed apparently



• If the portion of a circle is zoom in....Being such as this....However, such an error will be detected from finished data cleaning data.



- When the retouching the errors might be required to draw line or modify again.
- When the retouching the errors might be referenced "Orthophoto image"

	Outlook of data extraction from enhanced ALOS image
Feature	Appearance
Road	Improved and paved road are straight line and its edges are clear with uniform width. In case of inferior roads which are track and such like, it has mincing winding shape with unclear edge and straightens.
River	River looks like black bold line. In case of savanna area, it is having besides trees or bush that looks like bold black line. When the river got dry, the besides vegetation cannot be seen or it looks like spares dots or so on.
Swamp	Swamp area's appearance is black and gray area, of which center is black outer and gradually becoming gray towards outer. The edge is naturally dissipating.
Lake, ponds	When one feature is containing water or moister, its appearance looks like black from image. Perennial lake or pond have a certain clear edge other hand seasonal is unclear. In case of artificial reservoir, it has clear edge or surrounded track which is used for maintenance. Fish pond or hatchery, salt bet looks like tiled uniform rectangles or polygons.
Cultivation	Cultivation has patched mosaic texture such like half random pattern. Swidden cultivation is having black patched mosaic texture after burnt.
Bush or spars trees	Difficult to be extracted, because trees height cannot be identify from the Orthophoto.
Forest	Always black and covered with tree's crown, the texture is like rough carpet, however it is difficult to distinguish from low tree and bush. Because trees height cannot be identified from the Orthophoto.
Rice field	Rice field appearance is as unified rectangle and if contained water it is black, when after harvesting or resting the field are showing gray color. In case of large field, it has track which is also called "course way" for maintaining the field and working.
Dwelling area	Dwelling areas which are town, village such like are white color or light gray because of the fact that the ground has not vegetation and that the area has been developed for building houses. Commonly these areas are rotating by road junction or along main road or community road which is daily used by dwelling people.
Building	It is too hard to identify each house, In case of large building or some of big facility which consist of many big building, it is possible to extract under fine image condition.

(4)Repeat the Validate Topology

After retouching the errors should repeat works of "3" until it will not be detected the errors.

- In case of the Polygon topology error validation has not exception such like "OK" • errors.

Without these Polygon topology validation works, polygon data for GIS could not be create. The Polygon topology validation works is so hard that it will make you feel too troublesome. However it could not be avoided to make GIS data.

1-1-3 After the Polygon topology creation, the data will be subjected to the preparation for GIS data, which is called "POLIGON CREATION" works.

Main procedure of the "POLYGON TOPOROGY CREATION"

(1)Make sure to validate topology then the data should save as for the Polygon creation.

```
"Save as", "Select By Attributes" commands
"Select by attributes"
```

"Save as"



• After saving as for the polygon creation would be changed layering that is unified all line data with a certain layer for example "0_line".

(2)For example. Turn On 2 layers which are a "0_line" layer and a kind of centroid Layer 6003. "Place

Fence", "Create Shapes" commands





- After creating shapes, number of created shapes are shown at the bottom information window.
- The Polygon creation must show the line layer and target centroid layer.
- When showing 2 or more centroid layers it would be created showing layers shape in active layer at the same time.

1-1-4 After the stereo plotting, the elevation of separated contour data will be subjected to checking and retouching for GIS data

Main procedure of the "CONTOUR RETOUCHING"

(1)Finding incorrect contour elevation.

From "Window", "Views" commands then select "2" another view window whose name is "2" with Iso-metric view.

"Window", "Views" commands then select "2" another view



View "2" with Iso-metric view.



- These two views might arrange horizontal or vertical displacement.
- View 2 should rotate view front from "View Rotation".
- After "View Rotation" coming to front view, incorrect elevation contours could be easily found.

(2)Retouching to correct elevation

By using "CIVTOOLS" from Utilities in "MDL Applications". Incorrect one can be retouched to right one by "Set Element Elevation" From Utilities in "MDL Applications".

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- Select incorrect contour in the "Front view" then location of incorrect contour can be recognize in the "Top view" window with zooming out or in.
- Zoom in to the incorrect contour then select neighbor correct one which is continuing to in correct contour at starting or ending in order to verify correct elevation value.
- Enter the correct value in the "Set Element Elevation" then click wrong contour. For example when the right value is 440.0m.

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 Above-mentioned operation should be repeated until wrong contours would disappear in display.

1-2. LINE CONNECTING PROCEDURE

Before splits at the line intersection should connect any lines in each layer.

1-2-1 Line connecting procedure by ArcGIS and Level status setting back to the previous one.

(1)Your "dgn" file "Save as" .dwg file.

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(2)Select "dwg" from pull-dawn

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(3)Open ArcGIS, then add data which is saved "dwg" file



(4)Select your "dwg" file. Then click add



(5)It will add your "dwg" file



(6)Open dwg file in the table of contents then select Polyline layer





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(7)Click right bottom then proceed Export data

(8)Make sure to go your directory then give the mane to your SHP file and click "Yes".

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(9)Now adding, new SHP file which was saved from your DWG with one color



(10) Show arc Tool BOX from the menu bar.

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(12) Start Editing from editor tool bar, select your SHP file. Then click OK (*If you lost "Toolbar" you could find any "Toolbar" from Menu bar / Customize / Toolbars/ Then select them.*).



In case of this selected "Editor" from "Start Editing"



Start Editing ? × This map contains data from more than one database or folder. Please choose the layer or workspace to edit. ☑ [∞] Export_Output Ine_NB31-XX-3a_OJT_03062013.dwg Annotation Iine_NB31-XX-3a_OJT_03062013.dwg MultiPatch Iine_NB31-XX-3a_OJT_03062013.dwg Point Iine_NB31-XX-3a_OJT_03062013.dwg Polygon Ine_NB31-XX-3a_OJT_03062013.dwg Polyline Source Туре D:¥share¥!!_TOGO¥!!_TEAM_AB CAD Workspace D:¥share¥!!_TOGO¥!!_TEAM_AB Shapefiles / dBase Files About Editing and Workspaces OK Cancel

(13) Then select target SHP file which is Export Output. (example)

(14) Select Data Management Tools / Generalization / Dissolve then Open



(15) Dissolve window will open.("Input Features", "Output Features", "Dissolve Fields" must input by yourself)

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(16) In the Dissolve window, you can select you SHP file which is exported from "dwg".



(17) Make sure to go your directory then give the mane to your SHP file.(*As for SHP file naming cannot use; -, space, +, and so on. Under score*"_" *can use naming*)



(18) Dissolve Filed should be "Layer". Connect lines at once in same layer. Then click "OK" and "Close".



(19) Added dissolved SHP in your "Table of contents"







(21) Click right bottom then proceed "Export to CAD"

The "dwg" file versions are available many type, you can select appropriate one.

This time, 2004 might be recommended, then click OK.

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OK Cancel Environments << Hide Help	Tool Help

(22) After exporting to CAD, it will appear completed window then click close.



(23) You can see Exported dissolved dwg file in your table of Contents. After that, exit ArcGIS.



(24) Open the "exported dissolved dwg" by Micro station.

You might be aware of the dwg file changed only one color.



(25) From menu bar / Setting / Level / Manager, then" Level manager window" will appear.



Or click right button on "Level display window", then "Level Manager".

(26)	From menu	bar in the	Level Manager	/ pull-dawn /	Import
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(28) Level / Filter Import window will appear, then Click "Select all" and then click "OK"

L	evel/Filter I	mpo rt
	Name	Description •
	neat line	
	2002	
	2003	
	2004	
	2006	
	2007	
	2101	
	3001	
	5001	
	5003	
	5101	
	•	>
	<u> </u>	Cancer Select All Clear Selection

(29) Your dissolved dwg file color will change as previous looking

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Note: Closed lines such as polygons will become "shape" elements under this method. They might be dropped and connected before data cleaning.

(30) Then save as DGN file again.
1–2–2 Line connecting procedure by Bentley MAP function

(1)Make sure to show a layer in your current file. For example 2004.

When NEDT COX 24,047,09062013 and DD - WEDGHT Threat	ry Max VITI				
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(2)Place "Fence" with dragging in your display

Constant of the second state of the secon	R = 1 + 1		N.		
	alma day	-11		1907	

(3) Click "Connect Line network" from Topology Cleanup



(4) Then Click left button, and then right button.

Are for a forball of the second secon	
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After that, you can see the results of connected line numbers in the bottom left of Bentley MAP.

(5)This operation will be repeated to each layers. At the connecting, it must not show 2 or more layers, it will bring to merge between two layers.

Note: when the lines have elevation attribute such as contours, this method cannot be used ; Elevation value will be lost. Elevation value should be entered from "Element Information" window in "Geometry at Elevation"

📕 Element Information	
E- ₹ <selection></selection>	
📈 Line String: LineStrin	g Feature
ļ	
General	<u>^</u>
Description	Line String: LineString Feature
Level	7103
Color	🖾 ByLevel (251)
Line Style	🖾 ByLevel (7103)
Weight	🖾 ByLevel (1)
Class	Primary
Template	None
Transparency	0
Geometry	
Count	543
⊞ Segments	
Total Length	24077.5888
Elevation	190.0000
Extended	^
Model	Default
Last Modified	2013/05/31 21:46
Snaprable	Snappable
Modified	Not Modified
New	New
Locked	Unlocked
Thickness	0.0000
🗆 Line Style Parameters	
Scale	1.00000
Width Mode	None
Shift Mode	None
Corner Mode	From Line Style
Feature	~
Raw Data	
Element ID	495782
Size	6584

1-2-3 Line connecting procedure by Bentley Microstation

(1)Click Create complex chain from Group – Main task or Main – Main Task



(2)Create Complex Chain window will appear then check in ☑" Simplify geometry"

If without check in, the connected line will be complex chain elements.



(3)Click each segment from start with in turn.

You can connect each line segments or each smart line elements.



1-2-4 Another method of complex chain creation

(1)Check in ☑" Simplify geometry" and change method to Automatic



(2)Click "start segment" will be following the line.

Uline_NB31-XX-3a_0-JT_03062013 dg	D - VB DGN] - Bentley Map VBi
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R Drawing	
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G Create views (3D)	Method Automatic
J Sheet Composition	View Gop: 0.0010
9 Annotate	

Note: The connected line can keep elevation attributes under this method.

1-3. CONTOUR RETOUCHING

After "Stereo plotting", the contour data might have contained errors which are missed, jumped far away elevation attributes.

1-3-1 Contour retouching procedure by MDL Application "CIVTOOLS" in Micro station

(1)Open your contour line file.



(2)From menu bar / Window / Views then from the Pull-dawn / select "2" or any numbers.





(3)New view window which is "2" or your selected number's one will open.

(4)Arrange both windows sizing such as vertical or horizontal position as you like.

Then click "Fit view" in order to see all elements. Then "Save setting" or "Ctrl+F"



(5)Click "the View 2" window in order to turn active, then click "View Rotation: Front view.

You can easily understand strange shape contours which are having bad elevations then zoom in them part.

👿 View 2 - Front, Default - Zoom Scale = 1:85845	_ 🗆 ×
View Rotation: Front View	
- Y	
() X	



(6)Select a bad contour in your front window then click "Element Information" from menu bar then you can see the contours elevation in the "Element Information" window which is showing "-621010.5686 m" now.



(7)Turn the View 1 "Top view" window, you can see place of the contour line in Top view.



(8)From menu bar select / Utilities / pull-dawn / MDL Applications then" MDL "window will appear. And then select "CIVTOOLS" in Available Applications window. After that close "MDL" window.

MDL Applications are supplied by "Bentley website "or other website such as forum which are regarding CAD software whose are some of Free or Share soft.



1-3-2 How to retouch the bad elevation contours

(1)Select bad a contour from "Front view window", it will be selected "Top view window" as well.

You can see the position of bad contour in your "Top view window" now. Then tentative click on a right contour line which is connecting with bad contour line in order to know the "correct elevation"

In case of following Image, the correct elevation is 420.0000m, which can be see at the bottom information bar.



(2)Click "Set Element Elevation" from "CIVTOOLS" menu bar. "Set Element Elevation" window will be activated then you enter the number of the correct "Elevation" such as 420.00 give in previous procedure with "Tentative click". Then click on selected bad contour, which will change into the correct elevation.



(3)Then click on selected bad contour will change to the correct elevation. After changing the correct elevationn in" Front view".

	🛄 View 2 – Front, Default	_ U ×
可 View 2 - Front, Default		
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		•

- (4)Operation "1 to 3" should be repeated until coming to an end.
- (5)After retouching the bad contours, you can connect each contour if necessary. It might be reference with the line connecting procedure.
- 1-3-3 Other method to retouch the bad elevation contours.
 Note: this method cannot fix the intensity elevation errors which are likely
 -125261.235 and 7878945.435456 such as beyond the general nature.
 - (1)Select incorrect contour which is between upper and lower in "Front view", in this case 429.2340m, it can know in "Element Information"

Element Informa		■ View 2 - Front, Default 日・夏辛・ 青々らこ回回ン 前日日 好の実の	×
General	~		
Descention Level Color Line Style Weight Class Template Transparency	Line String 7102 ByLevel (36) ByLevel (Continuous) ByLevel (Continuous) Primary None O	0-0-0000-00000-00	
Geometry	^		
Count E Segments Total Length Elevation	16 653.7167 429.2340	-	
Extended	~	1	
Raw Data	*		

(2)Check correct elevation from connecting right contours. By using the "tentative click" on a right contour line which is 460m.



(3)Then you enter the correct elevation number such as 460m on "Element Information" in Geometry at Elevation window.

Element Information		● View 2 - F C → Q + +	itorit, Dofault.	1	42XG	_
General Descrittion Level Color Line Style Weight Class Template Transparency	Line String 7102 ByLevel (36) ByLevel (Continuous) ByLevel (1) Primary None 0			-D	0 0-00-	
Geometry						
Count Segments Total Length Elevation	16 653.7167 460.0000					
Extended	*					
Raw Data	*)	.				
						_

- (4)Operation "1 to 3" should be repeated until coming to an end.
- (5)After retouching the bad contours, you can connect each contour if necessary. It might be reference with the line connecting procedure.

1-4. OUTLOOK OF GEOGRAPHIC COORDINATE SYSTEM TRANSFORMATION BY BENTLEY MAP

1-4-1 Identify the Geo-Coordinate system in current works.

(1)Open a certain file in which geo-coordinate system will be transformed.

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(2)Select "Geographic" from menu bar then Click "Open as Toolbox".

🚰 togo_frame_final_utm31n.dgr	[3D - V8 DGN] - MicroSt	ation V8i
Eile Edit Element Settings	Tools ∐tilities Workspace § ✓ Attributes ✓ Primary Standard Main ✓ Tasks	
Print Preparation	Animation Base Geometry Cells Change Tracking	2 8 8 9
	Quorunate Systems Quives Quistom Linestyles Database Detailing Symbols Dimensions Eeature Solids	л да да д
	Geographic Groups Levels Manipulate Messure Multi-lines Batemine Batemine Dance Monostrine	Select Geographic Coordinate System Gobal Positioning System (OPS) Source Coordinate System (OPS) Source Coordinate System (OPS) Source Coordinate System (OPS) Source Coordinate Coordi
	Project Navigation Properties	😑 Open as ToolBox

(3)"Geographic" Tool box will appear. Select left button



(4)Click left button "Select Geographic Coordinate System"

1.	-			-	-
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	NP 51	3		10.00	H

(5)"Geographic Coordinate System window" window will come up.



(6)Click "From library"

Geographic Coordinate System	
同語が強いでは来	
From Library eographic Coordinate Sys	tem
Name: <none></none>	
Description	
Source:	

(7)Select current souse Coordination system from library.

In case of TOGO, WGS84 UTM31 might be selected because it covers almost entire TOGO area. Then Click OK.

prary Search	
B Favorites	Coordinate System
TUTM84-68N - WGS 1984 UTM, Zone 46 North, Meter WTM84-88N - WGS 1984 UTM, Zone 30 North, Meter WTM84-31N - WGS 1984 UTM, Zone 31 North, Meter WTM84-31N - WGS 1984 UTM, Zone 31 North, Meter WTM84-31N - WGS 1984 UTM, Zone 31 North, Meter WTM Starbard, S	Maxie UTM84-11N Descrip WGS 1884 UTM, Zone 31 North, Meter Project Universal Transverse Mercator Source Snyder, J.P. 1987, Map Projections - A Working Manual Units Meter UTM 2c 81 Hennisp Northern Minimu 00° 30°00.0000° W Meximu 01° 30°00.0000° S Meximu 04° 00°00.0000° S
⊞ Europe	Datum
Brie Middle East Brie North America Brie Oceania (Australia, New Zealand,)	Name WGS114 Desci World Geodetic System of 1984 Soure US Defense Mapping Agency, TR-835112-B, December 198
⊞ — South America ⊟ — World (UTM and others)	Ellipsoid
Bit Octoberging	Vanne WGS84 Desci World Geodetic System of 1994 Equet 8378137 Polar 6356752.8142 Eccer 8.08171913982986743 Sourc US Defense Mapping Agency, TR-8358.2–B, December 198

(8)"Geographic Coordinate System window" window will show selected coordination system's information. If you do not need the Geographic Coordinate System, it could be detach by click the most right icon.



Now your current file is identified : WGS84 UTM31.

1-4-2 Identify the Geo-Coordinate system for transformation of current works.

(1)Open "From Library"



(2)Select target geo-coordinate system. For example, WGS84 UTM zone30 because western part of TOGO is covered by UTM 30.

😑 🜔 WGS84	Coordinate System
- 🔀 UTM84-1N - WGS 1984 UTM, Zone 1 North, I	Dame UTM84-38N
UTM84-2N - WGS 1984 UTM, Zone 2 North, I	Descrip WGS 1984 UTM, Zone 30 North, Meter
- 😁 UTM84-3N - WGS 1984 UTM, Zone 3 North, I	Projecti Universal Transverse Mercator
UTM84-4N - WGS 1984 UTM, Zone 4 North, I	Source Snyder, J.P. 1987, Map Projections - A Working Manua
UTM84-5N - WGS 1984 UTM, Zone 5 North, I	Units Meter
LITMO4-DN - WGG 1904 UTM, ZORE D NORTH, I	UTM Zc 30
	Hemisp Northern
UTM84-9N - WGS 1984 UTM Zone 9 North L	Maximu 00° 20'00 0000 W
ITM84-10N - WAS 1984 LITM Zone 10 North	Minimu 01° 00'00 0000"S
IITM84-11N - WGS 1984 IITM Zone 11 North	Maximu 84° 00'00.0000" N
UTM84-12N - WGS 1984 UTM, Zone 12 North	
UTM84-13N - WGS 1984 UTM, Zone 13 North	Datum
UTM84-14N - WGS 1984 UTM, Zone 14 North	Name WGS114
- 🜐 UTM84-15N - WGS 1984 UTM, Zone 15 North	Descr World Geodetic System of 1984
- 🜐 UTM84-16N - WGS 1984 UTM, Zone 16 North	Sourd US Defense Mapping Agency, TR-8358.2-B, December 1
- 🜐 UTM84-17N - WGS 1984 UTM, Zone 17 North	Concession of the second s
- 🔁 UTM84-18N - WGS 1984 UTM, Zone 18 North	Ellipsoid
- 🔀 UTM84-19N - WGS 1984 UTM, Zone 19 North	Dame WGS114
- UTM84-20N - WGS 1984 UTM, Zone 20 North	Descr World Geodetic System of 1984
UIM84-21N - WGS 1984 UIM, Zone 21 North	Equat 6978197
UTM84-22N - WG8 1984 UTM, Zone 22 North	Polar 5356752,3142
UTM04-23N - WG0 1964 UTM, Zone 23 North ITM04-24N - W82S 1004 UTM Zone 24 North	Eccer 0.081819190920906743
TITM94-25N - W3S 1994 LITM Zone 25 North	Benefise mapping regency, in saver b, becember i
UTM84-27N - WGS 1984 LITM Zone 27 North	
UTM84-28N - WGS 1984 UTM, Zone 28 North	
UTM84-29N - WGS 1984 UTM, Zone 29 North	
- 🔁 UTM84-30N - WGS 1984 UTM, Zone 30 North	
- 😁 UTM84-31N - WGS 1984 UTM, Zone 31 North	
- 💮 UTM84-32N - WGS 1984 UTM, Zone 32 North	
- 🜐 UTM84-33N - WGS 1984 UTM, Zone 33 North	
- 💮 UTM84-34N - WGS 1984 UTM, Zone 34 North	
- 🔀 UTM84-35N - WGS 1984 UTM, Zone 35 North	
- 🔀 UTM84-36N - WGS 1984 UTM, Zone 36 North	
- 😁 UTM84-37N - WGS 1984 UTM, Zone 37 North	
- 📑 UTM84-38N - WGS 1984 UTM, Zone 38 North	
UTM84-39N - WGS 1984 UTM, Zone 39 North	
11 M84-40N - WGS 1984 UTM Zone 40 North T	1

(3)"Geographic Coordinate System Changed window" window will come up, then select button below. The current works will transform from UTM31 to 30 zone.

If you don't need to transform the current works select upper button. In this case the coordinate system is only assigned.

Geograp	ohic Coordinate System Changed
į	You have selected a different Geographic Coordinate System, UTM84-30N, for togo_frame_final_utm31n.dgn,Model. Are you correcting the Geographic Coordinate System, or reprojecting the data to a new Geographic Coordinate System?
	 Correcting the Geographic Coordinate System - do not reproject the data Reproject the data to the new Geographic Coordinate System
	<u>O</u> K Cancel

(4)Now changed UTM zone is selected as Geographic Coordinate System.

🔛 Geographic (_ [] X	
FC Q.	* 🗗 🗞 🖫	
Current	Geographic Coordinate S	ystem
Name:	UTM84-30N	
Description:	WGS 1984 UTM, Zone 30 No	rth, Meter
Source:	Snyder, J.P. 1987, Map Projec	tions - A Wor

(5)Click the most left button, the detail of current Geographic Coordinate System can be seen.

Geographic Coordinate System Properties	x
Coordinate System	^
Name UTM84-30N Descrip WGS 1984 UTM, Zone 30 North, Meter Projecti Universal Transverse Mercator Source Snyder, J.P. 1987, Map Projections - A Working Manual Unit Meter UTM Zc 30 Hemisp Northern Minimul 06* 30'00.0000" W Maximud 00* 30'00.0000" E Minimul 1* 00'00.0000" S Maximud 84* 00'00.0000" N	
Datum	^
Datum Name WGS84 Desc World Geodetic System of 1984 Sourd US Defense Mapping Agency, TR-8350.2-B, December 19	^
Datum Name WGS84 Desc World Geodetic System of 1984 Sourd US Defense Mapping Agency, TR-8350.2-B, December 19 Ellipsoid	^ 8 ^

Now your current file was transformed to WGS84 UTM30 from UTM31

1-4-3 Create the New Geo-Coordinate system.

(1)Select a Geographic Coordinate System from library for example "UTM84-31N" then right click "Copy"

🖉 Sele	t Geographic Coordinate System
Library	Search
and WC	3884
	UTM84-1N - WGS 1984 UTM, Zone 1 North, Meter
	UTM84-2N - WGS 1984 UTM, Zone 2 North, Meter
	UTM84-3N - WGS 1984 UTM, Zone 3 North, Meter
	UTM84-4N - WGS 1984 UTM, Zone 4 North, Meter
	UTM84-5N - WGS 1984 UTM, Zone 5 North, Meter
	UTM84-6N - WGS 1984 UTM, Zone 6 North, Meter
	UTM84-7N - WGS 1984 UTM, Zone 7 North, Meter
	UTM84-8N - WGS 1984 UTM, Zone 8 North, Meter
	UTM84-9N - WGS 1984 UTM, Zone 9 North, Meter
	UTM84-10N - WGS 1984 UTM, Zone 10 North, Meter
	UTM84-11N - WGS 1984 UTM, Zone 11 North, Meter
	UTM84-12N - WGS 1984 UTM, Zone 12 North, Meter
	UTM84-13N - WGS 1984 UTM, Zone 13 North, Meter
	UTM84-14N - WGS 1984 UTM, Zone 14 North, Meter
	UTM84-15N - WGS 1984 UTM, Zone 15 North, Meter
	UTM84-16N - WGS 1984 UTM, Zone 16 North, Meter
	UTM84-17N - WGS 1984 UTM, Zone 17 North, Meter
	UTM84-18N - WGS 1984 UTM, Zone 18 North, Meter
	UTM84-19N - WGS 1984 UTM, Zone 19 North, Meter
	UTM84-20N - WGS 1984 UTM, Zone 20 North, Meter
	UTM84-21N - WGS 1984 UTM, Zone 21 North, Meter
	UTM84-22N - WGS 1984 UTM, Zone 22 North, Meter
	UTM84-23N - WGS 1984 UTM, Zone 23 North, Meter
	UTM84-24N - WGS 1984 UTM, Zone 24 North, Meter
	UTM84-25N - WGS 1984 UTM, Zone 25 North, Meter
	UTM84-26N - WGS 1984 UTM, Zone 26 North, Meter
	UTM84-27N - WGS 1984 UTM, Zone 27 North, Meter
	UTM84-28N - WGS 1984 UTM, Zone 28 North, Meter
	UTM84-29N - WGS 1984 UTM, Zone 29 North, Meter
	UTM84-30N - WGS 1984 UTM, Zone 30 North, Meter
	UTM84-31N - WGS 1984 UTM Zone 31 North, Meter
	UTM84-32N - WGS Odd To Experitor
	UTM84-33N - WGS Mod to navornes Ih, Meter

(2)Then "Paste" into seed folder or own folder

Librar	V Search	
	Favorites	- 3
	- 📑 UTM84-46N - WGS 1984 UTM, Zone 46 North, Meter	
	UTM84-30N - WGS 1984 UTM, Zone 30 North, Meter	
	UTM84-31N - WGS 1984 UTM, Zone 31 North, Meter	
	🔁 TOGO Transverse Mercato - Transverse Mercator	
E-	seed	
		- 4
É.	Library	
E	Projected (northing, easting, ···)	

(3)After pasting, the copied" Geographic Coordinate System" is pasted as Copy-EPSG:32631 WGS 84 / UTM zone 31N.



(4)Select Copy-EPSG:32631 WGS 84 / UTM zone 31N from seed folder then right click "Edit Coordinate System Properties"

Library	Search		
	Favorites Favorites UTM84-46N - WGS 1984 UTM, Zone UTM84-30N - WGS 1984 UTM, Zone UTM84-31N - WGS 1984 UTM, Zone TOGO Transverse Mercato - Transverse seed	46 North, Meter 30 North, Meter 31 North, Meter erse Mercator	Coordin Name Descriptio Projection Source Units
	Copy-EPSG:32631 - WGS 84 / UTM TOGO Transverse Mercato - Trans Library Projected (northing, easting, ···) Definition	Copy Delete from Library Add To Favorites Edit Coordinate System Pro	operties
	Antartica Asia Central America and Caribbeans		Quadrant Minimum L Maximum

(5)"Edit Coordination System Properties" window will come up then you can modify the property of coordination. When modifying it, you should enter official authorized data into each window then click "OK" For example this time below window (this is not official). It might be used Datum "Point 58".

📕 Edit Geographic Coo	rdinate System×	
Coordinate System	^ ا	
Name Description Projection Source Units Central Meridian OriginLatitude Scale Reduction False Easting FalseNorthing Quadrant Minimum Longitude Maximum Latitude Maximum Latitude	TOGO TM Clark 80 / TM 30 Transverse Mercator DGC for large Scale mapping Meter 00° 30'00.0000" E 00° 00'00.0000" N 1 0 0 0 0 0° 00'00.0000" E 00° 00'00.0000" N 00° 00'00.0000" N 00° 00'00.0000" N	
Datum ^ Name No Datum Descrip No Datum, cartographically referenced directly to an ellipsoid. Source		
Ellipsoid ^ Name CLRK80 Descrip Clarke - 1880 Equato 6378249.145 Polar F Eccent 0.082483399191322693 Source US Defense Mapping Agency, TR-8350.2-B, December 1987		
Ok	Cancel	

Now the new Coordination System is registered in seed file then select new one after that click "OK"



(6)"Geographic Coordinate System Changed window" window will come up then select below button. The current works will transform UTM31 to TOGO TM.

If you don't need to transform the current works select upper button. In this case the coordinate system is only assigned.

Geograp	hic Coordinate System Changed
į	You have selected a different Geographic Coordinate System, TOGO TM, for togo frame_final_utm31n.dgn,Model. Are you correcting the Geographic Coordinate System, or reprojecting the data to a new Geographic Coordinate System?
	 Correcting the Geographic Coordinate System - do not reproject the data Reproject the data to the new Geographic Coordinate System
	<u>Q</u> K Cancel

(7)The current works file will be transformed to TOGO TM which is created as new geo coordinate system.

You can recognize the data have been changed in display.



After transforming the geo coordinate system it must be checked whether the data transformation results are appropriate or incorrect.

Period