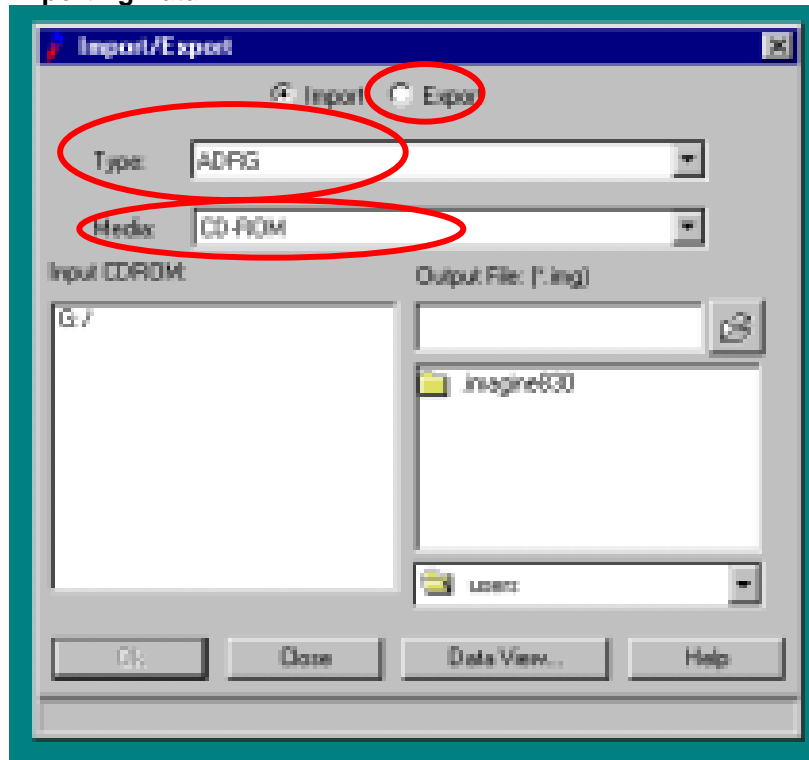## 8.   TOPIC 8   DATA EXPORT

8.1.   Data sources

- LANDSAT IMAGINE FILE

8.2.   Procedure

Use the same module (i.e. Import/Export) as used for Importing SPOT Data. In the **IMPORT** box select the **EXPORT** button and then select suitable **output format** and **Media type**.
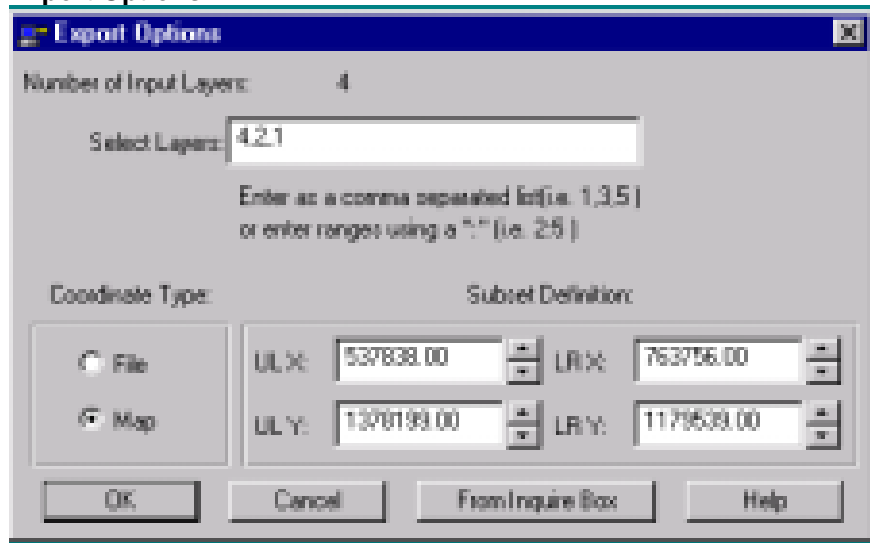
Figure 8-1   Exporting Data

In the Output box fill the output file name in the working directory then click OK

Figure 8-2   Output File Name

If necessary, need to change the Export Option parameters; the window will have following parameters.

Figure 8-3   Export Options

After setting all, click OK, the export process will automatically start.

## 9. TOPIC 9 RECTIFICATION OF SCANNED AERIAL PHOTO

9.1. Data format

There are different formats of scanned files such as JPG, TIF... The scanned files as graphical file without any geo-reference. To transfer the scanned files into the real wold coordinate, the rectification process should be used. Using **IMAGINE PROGRAM** for rectification of the scanned files can be done. For this, the scanned file should be converted into imagine (.img) format.

9.2. Converting from TIF into IMAGINE format

*1   Click the **Import** button, then change the parameters as indicated in the following window:*

Figure 9-1   Converting from TIF into IMAGINE Format

Type the output file name
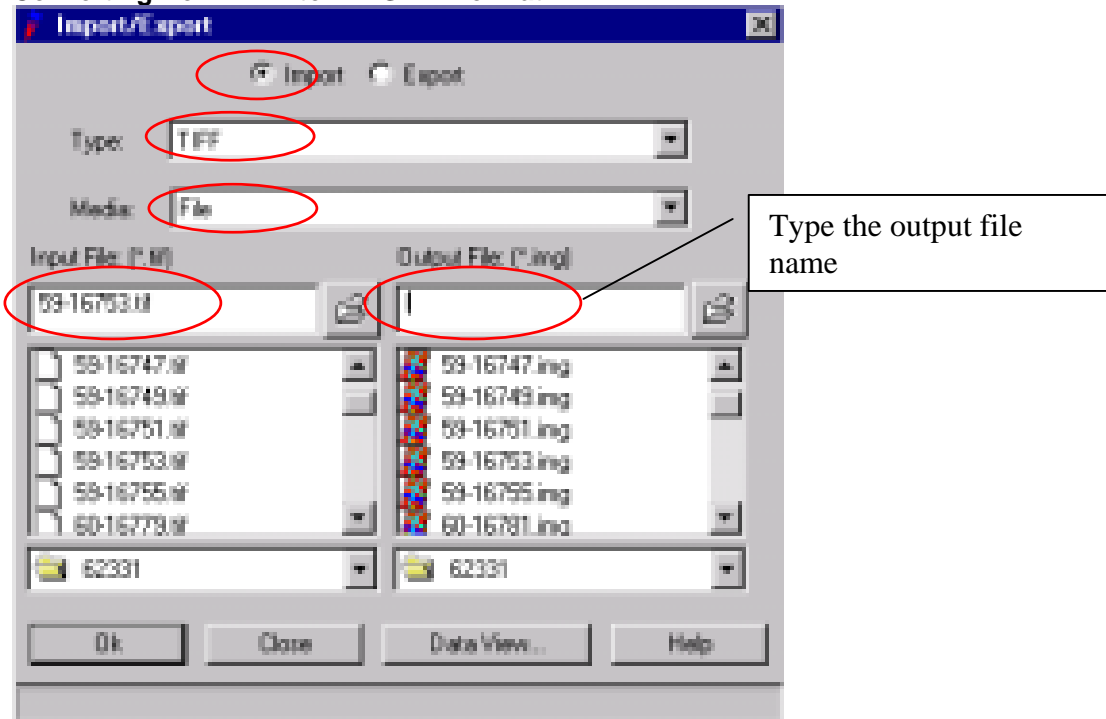
*2   Click **OK***

3   Open the View and file name. Then check the image information. If the image is rectified the projection Info box will display the values. If not rectified, the value will not be displayed.

Figure 9-2   ImageInfo, Map Info
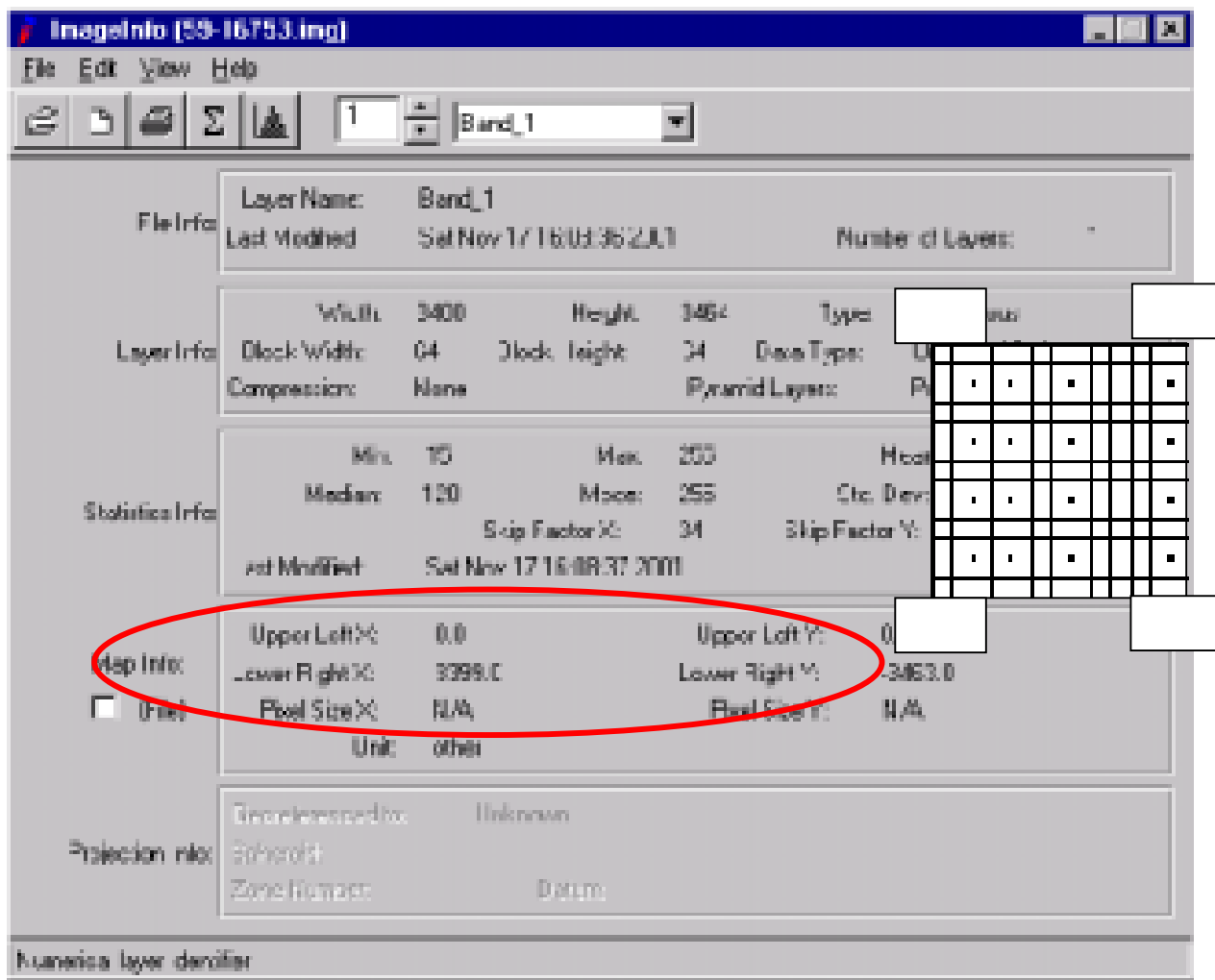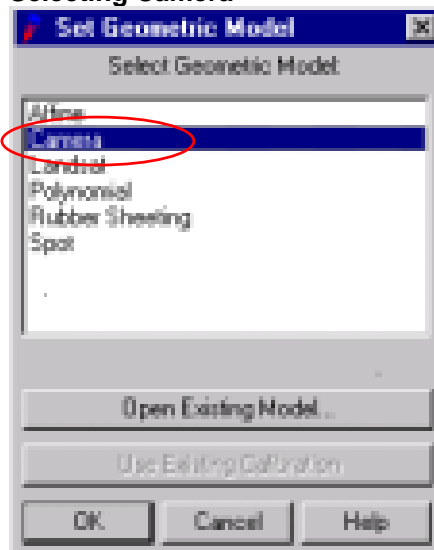

9.3.   Image rectification

1   In the view window click Raster button then click Geometric Correction

**Figure 9-3**   **Select Geometric Correction**

2   *The **Set Geometric Model box** will be displayed. For this exercise, the **Camera** be selected, then Click **OK,** the **Camera Model Properties** will be displayed.*

**Figure 9-4**   **Selecting Camera**

3   *Click **OK** of the **Set Geometric Model box**, **Camera Properties box** will display Click **General** button. Change the parameters as indicated in the following window:*

**Figure 9-5   Camera Model Properties**
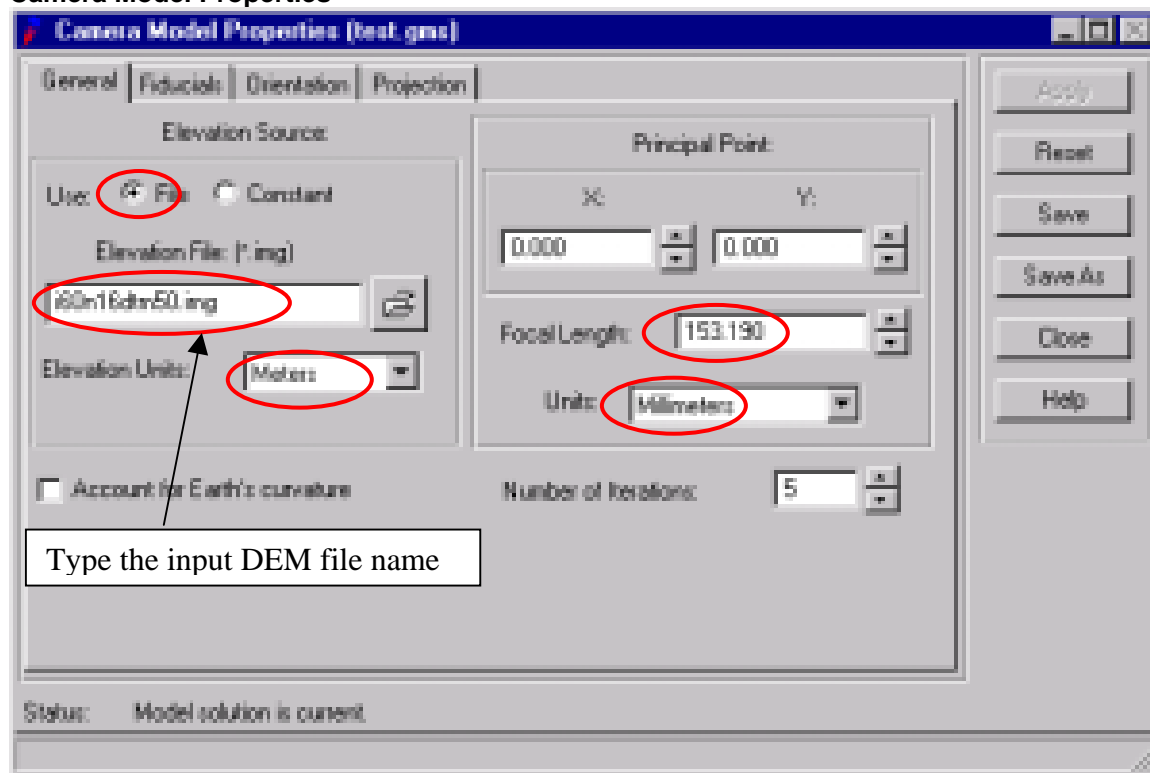
4   *Be careful of Focal Length. It is depend on aerial camera model.   Click*
        Fiducials *button then take the Fiducial points.*

**Figure 9-6**   **Camera Model Properties, Fiducials**
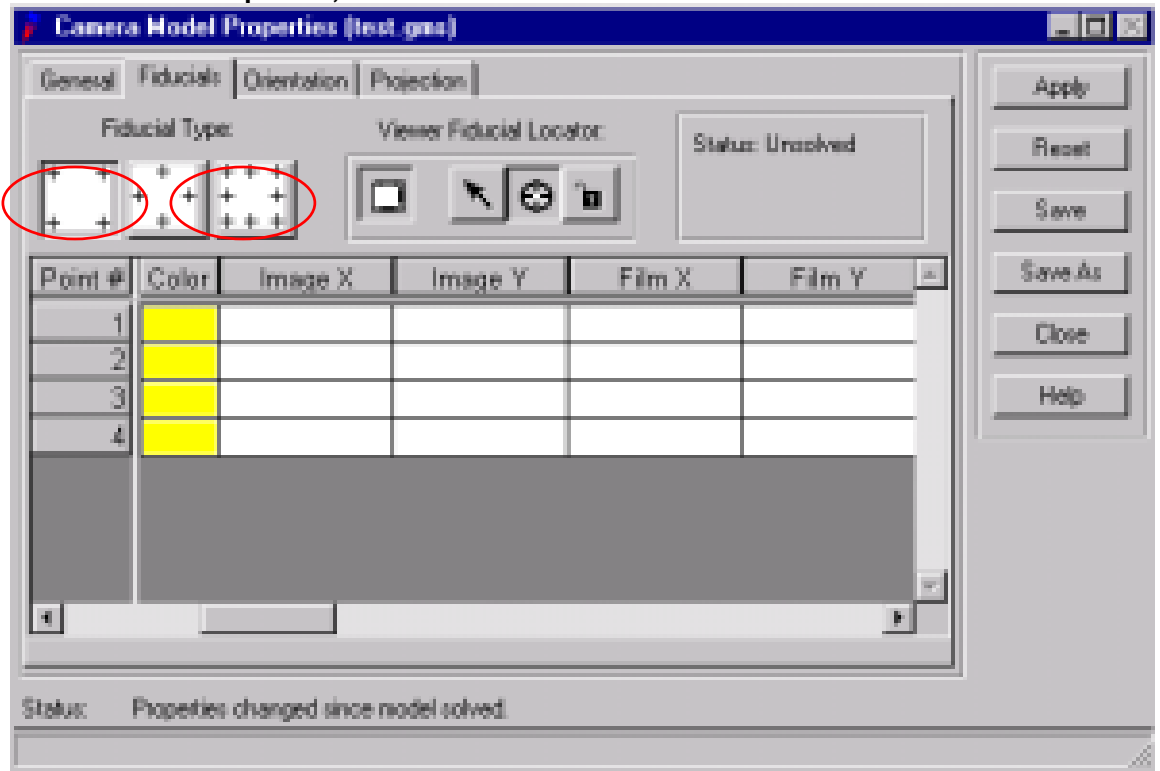
5   *Select the* **Fiducial Type** *then click the* **View Fiducial Location** *as indicated in the bellowing window. Then* **Viewer Selection Instructions** *will display Click aerial photo on viewer.*

Figure 9-7   **Viewer Selection Instructions**
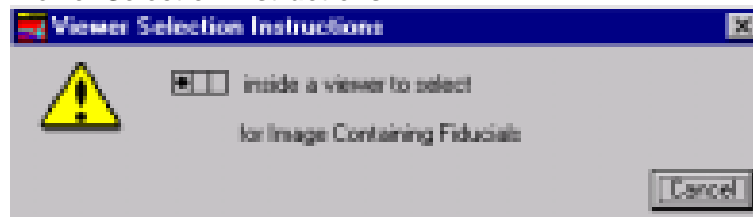
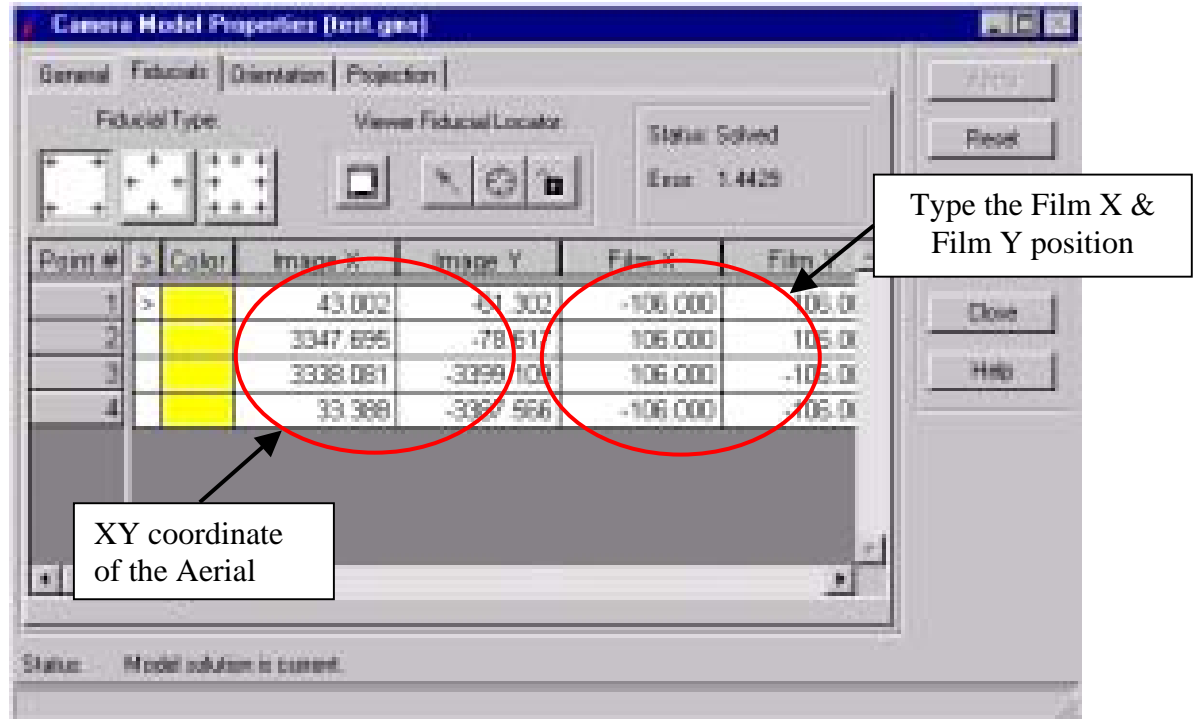*6*   ***Magnify Viewer*** *will display.*

Figure 9-8   **Magnifying Fiducial Point**

Fiducial Point

Fiducial Point
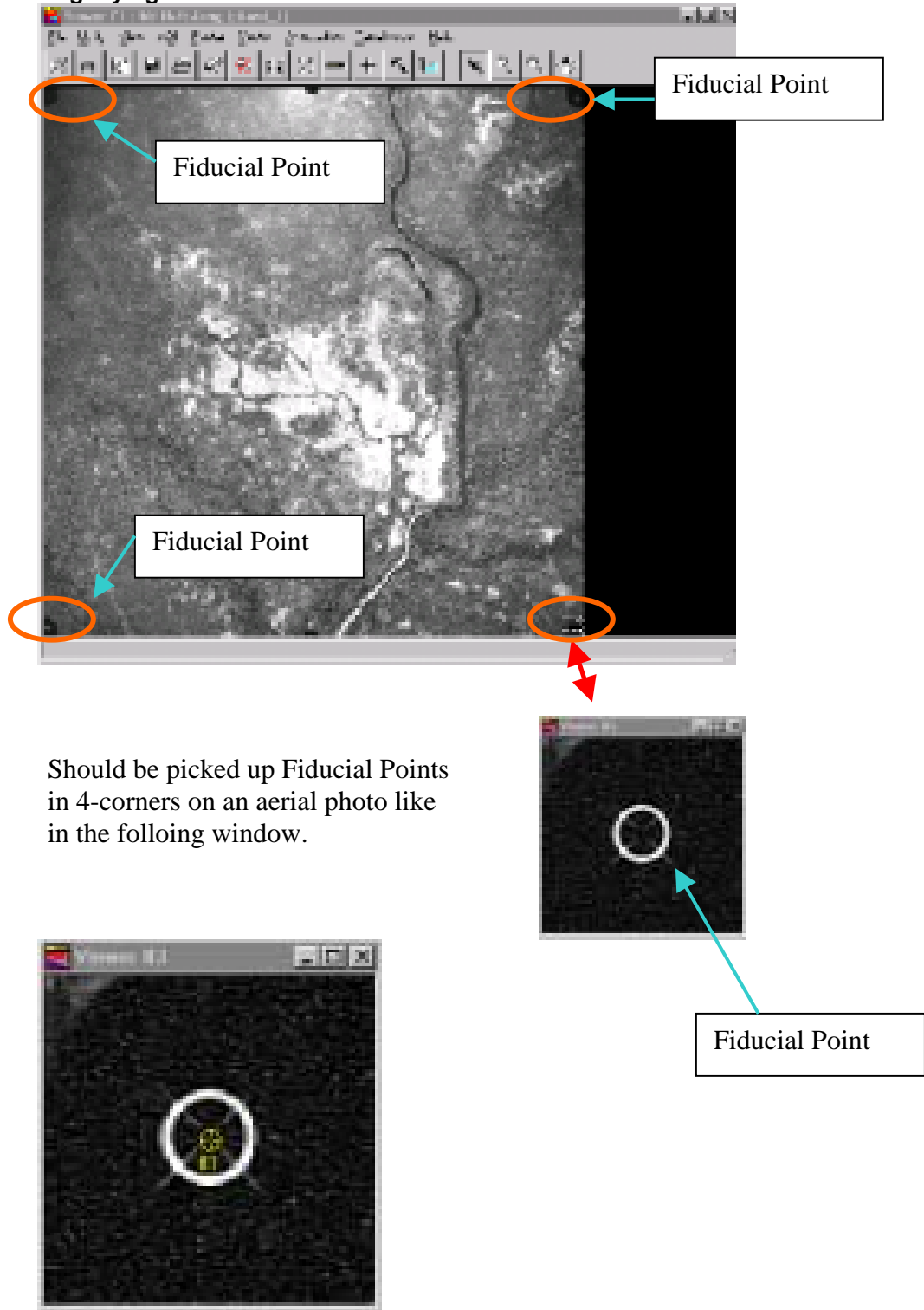
Fiducial Point

Should be picked up Fiducial Points
in 4-corners on an aerial photo like
in the folloing window.

Fiducial Point
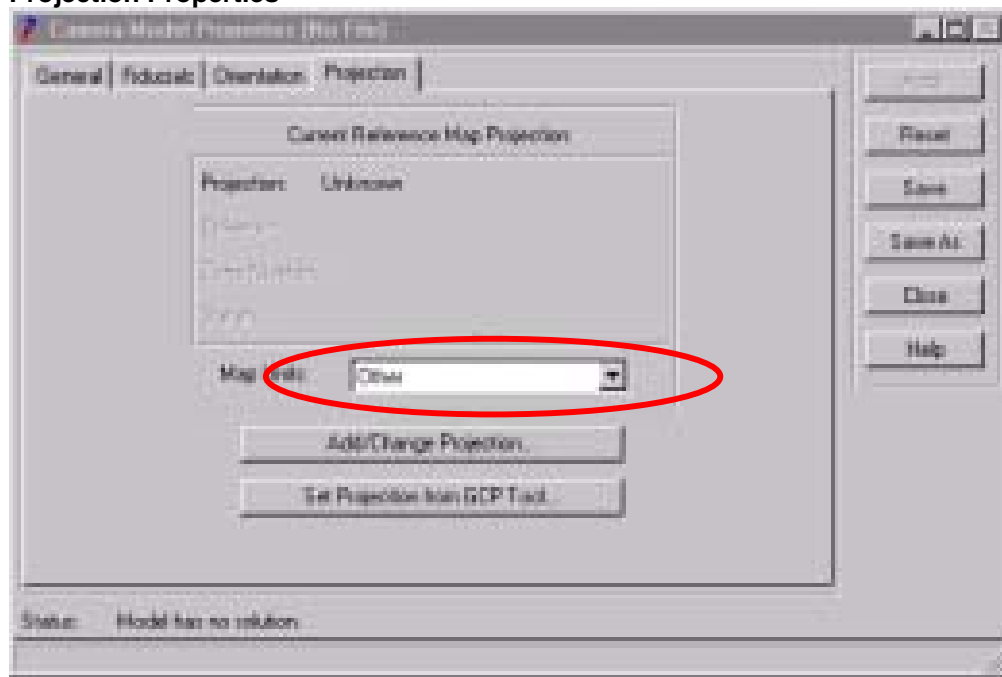
> *7   After picked up Fiducial Points, type the **Film X and Film Y** position.*

Figure 9-9   Film X and Film Y Positions

> *8   Click **Projection** button then **Add/Change Projection** button to change the*
> *project properties.*

Figure 9-10   Projection Properties

9   In the **Projection Chooser** box click **Custom** button the change the parameters of the projection. For the study, the **PARAMTERS** was set up as the following.

Figure 9-11   Projection Chooser Parameters
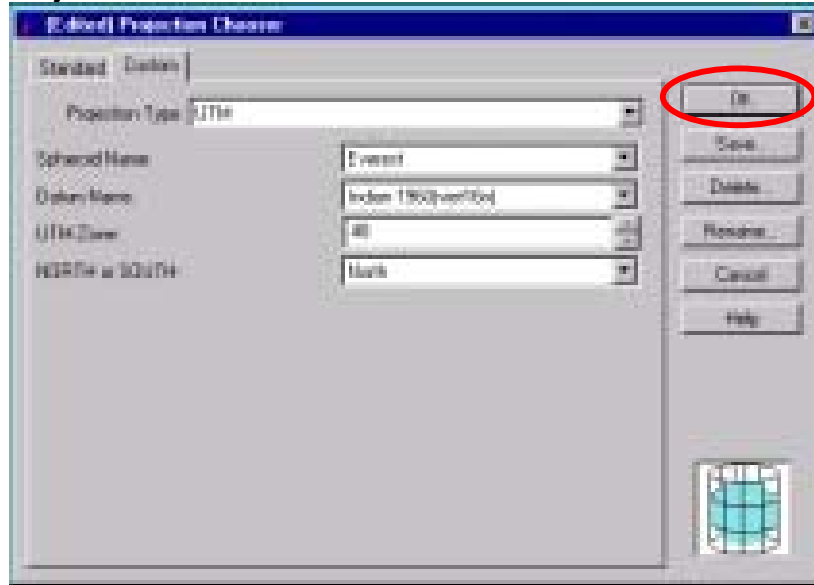
10   Click **OK** button then Click Apply button in following window. And click Close button.

Figure 9-12   Apply Projection

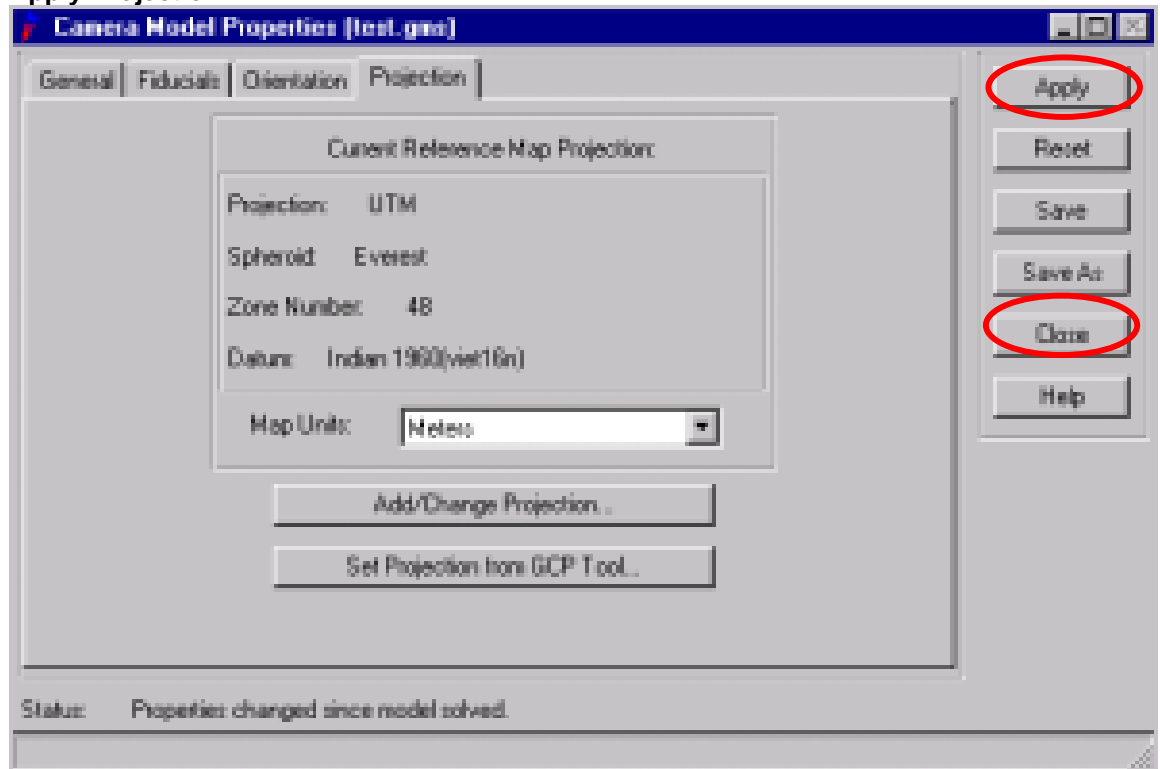*11   11- GCP Tool Reference Setup will display Click Existing Viewer then Click OK button.*

Figure 9-13   GCP Tool Reference Setup

Click here to open the Input Box
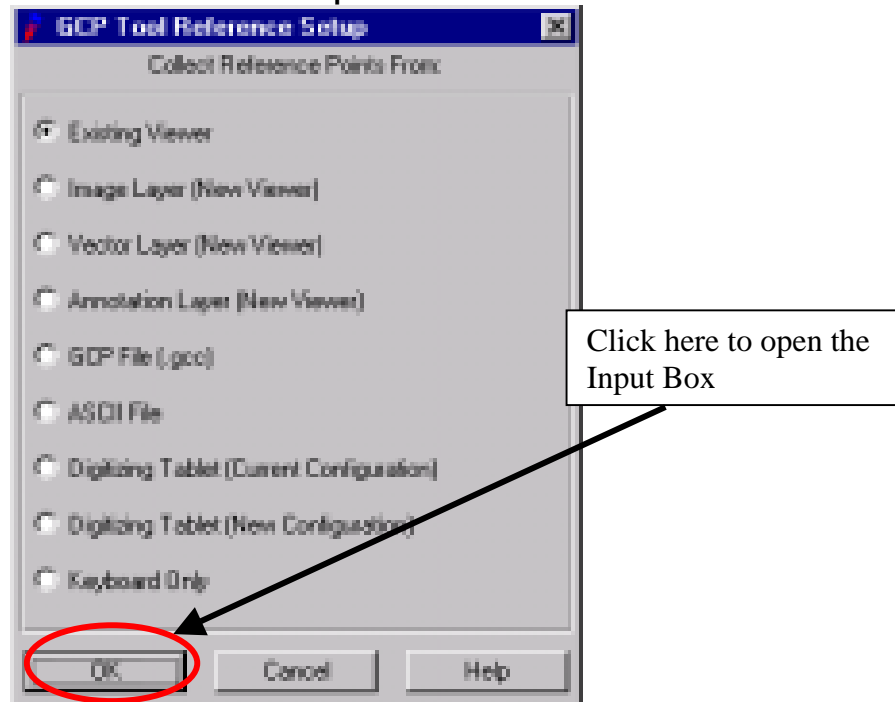
*12   Then **Viewer Selection Instructions** will display Click reference SPOT Ortho Image on viewer.*

Figure 9-14   Viewer Selection Instructions

*13   **Reference Map Information** will display, you should check the Map Projection then Click **OK** button.*

Figure 9-15   Reference Map Information

Click here to open the GCP Tool
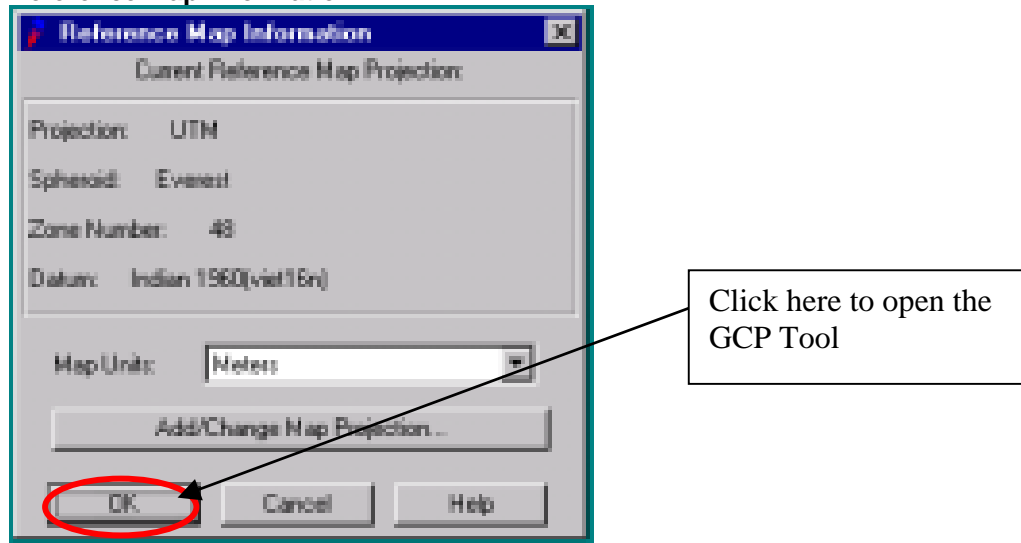
Figure 9-16   The Input Box (GCP Tool)

Click here to see the Error calculation, after finished putting control points on the aerial photo of a View.
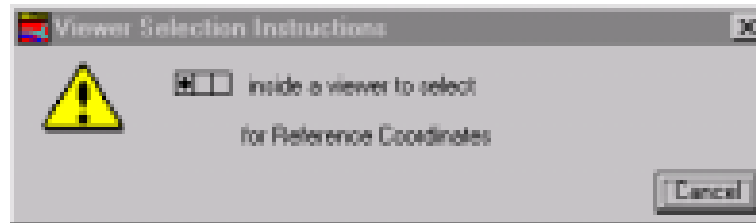
Click here then put the control point's location on the aerial photo and

The result of Error calculation

Coordinate of control point that putting on the Aerial Photo Image of a View.

Real world coordinate of control point is called coordinate of reference point on the SPOT Ortho Image of a View.

> *FOR FURTHER INFORMATION CLICK HELP !!!!*
> *or SEE "LANDSAT IMAGE RECTIFICATION"*

9.4.   How does it pick up ground control points (GCPs)

To pick up the ground control points from the Aerial Photo Image and SPOT Ortho Image, it should be looked for the reference location such as the intersection

point of roads, bridge location alone the road etc. As shown in the following example, where the road intersection was not visible, the GCP was picked up even from the meandering point of river. This was done by using SPOT Ortho Image as reference data to the Aerial Photo Image.   It's same as "Landsat Image Rectification". (See following examples)

Figure 9-17   GCP Selection (Example 1)

Aerial Photo Image

SPOT Ortho Image

Location of control points on the Aerial Photo Image without

Coordinate of reference point was picked up from SPOT Ortho Image
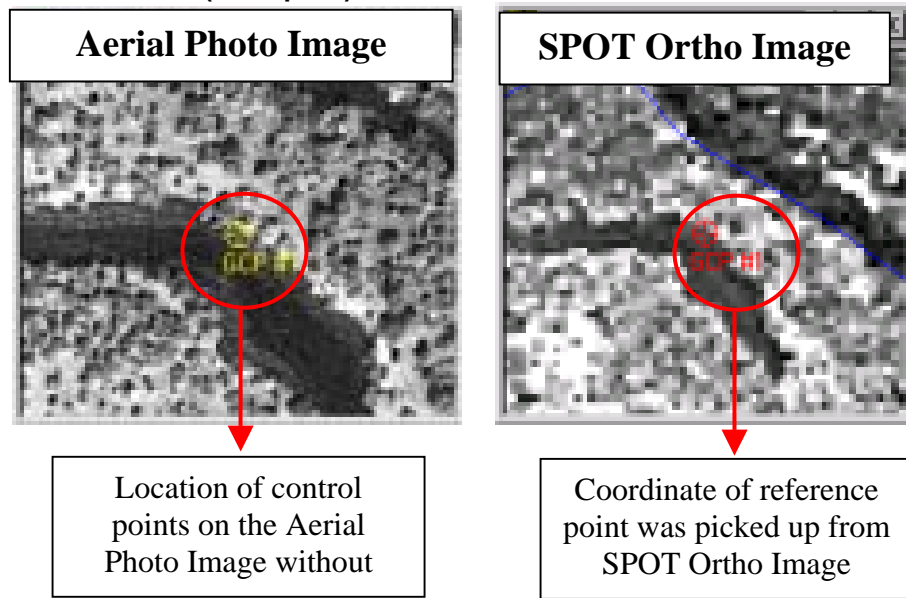
Figure 9-18   GCP Selection (Example 2)

Aerial Photo Image

SPOT Ortho Image

Figure 9-19   GCP Selection (Example 3)

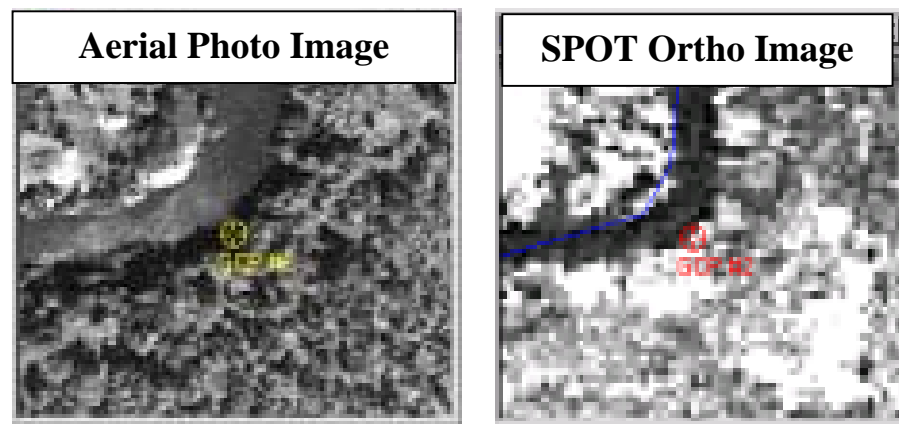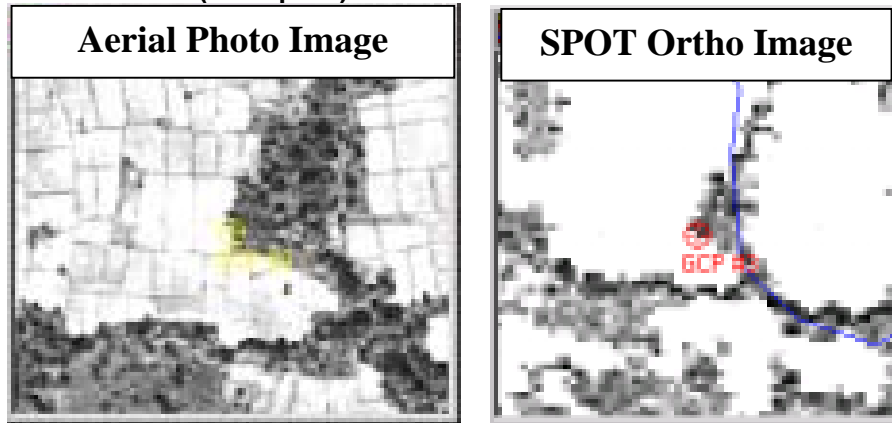| **Aerial Photo Image** | **SPOT Ortho Image** |

It should take GCP so as not concentration in same aria. See the example by the following image.

Figure 9-20   Location of GCPs

Figure 9-21   GCP Tool

The result of Error calculation display here **!!**

Coordinate of control point that putting n the Aerial Photo Image of a View.

Real world coordinate of control point is called coordinate of reference point on the SPOT Ortho Image of a View.
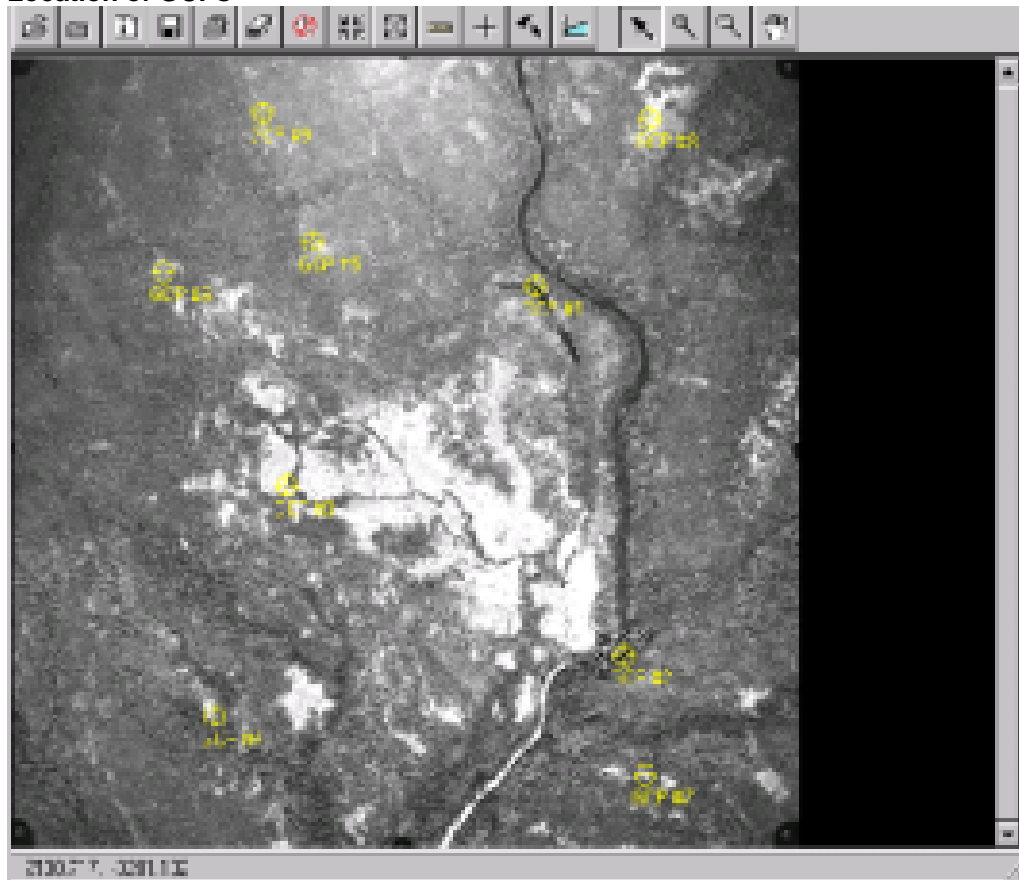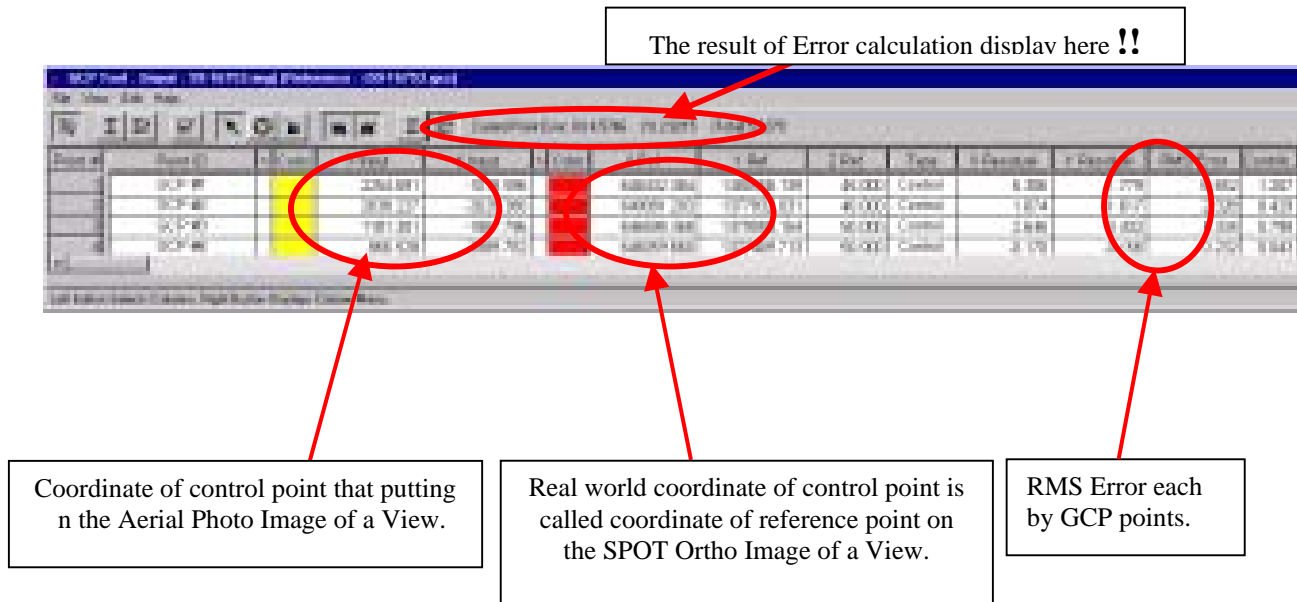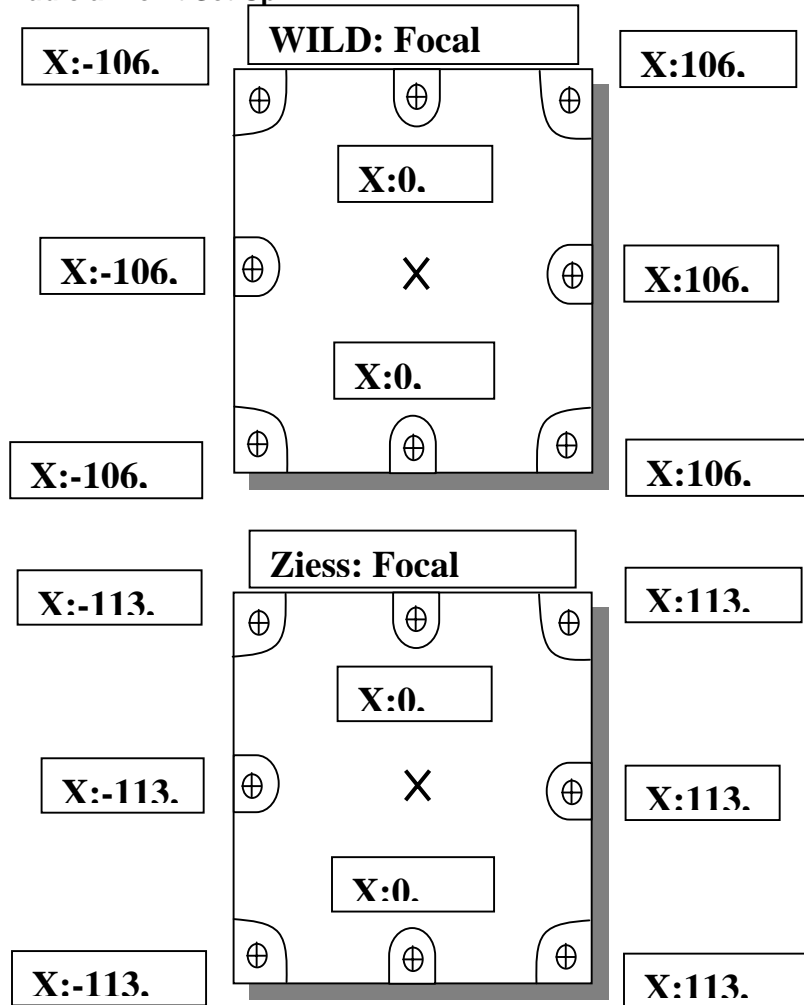
RMS Error each by GCP points.

Note:
Camera Model:
In this case, we have a two type Camera Model that is WILD and Ziess.
Focal Length is depended on the Camera Model such as WILD and lance type.
Fudicial Point of the Aerial Photo depends on the camera model. The X Film and Y Film Position of Fudicial Point was set up as the following:

Figure 9-22   Fudicial Point Set Up

	WILD: Focal	
X:-106.		X:106.
	X:0.	
X:-106.	⊕ ✕ ⊕	X:106.
	X:0.	
X:-106.		X:106.

	Ziess: Focal	
X:-113.		X:113.
	X:0.	
X:-113.	⊕ ✕ ⊕	X:113.
	X:0.	
X:-113.		X:113.

For Ground Control Point (GCP):

GCP can be picked up from the original topographic map and its grid coordinate, if it is available.

GCP can be extracted from the intersection point of roads, bridge location alone the road or landmark point.

If the road intersection, bridge location alone the road or landmark point was not visible, the GCP can be picked up even from the meandering point of river.

The GPS points survey can be used as GCP.

For Accuracy:

The accuracy is depended on the source and scale of the data need.

The low less of value of Error calculation indicated more accuracy.
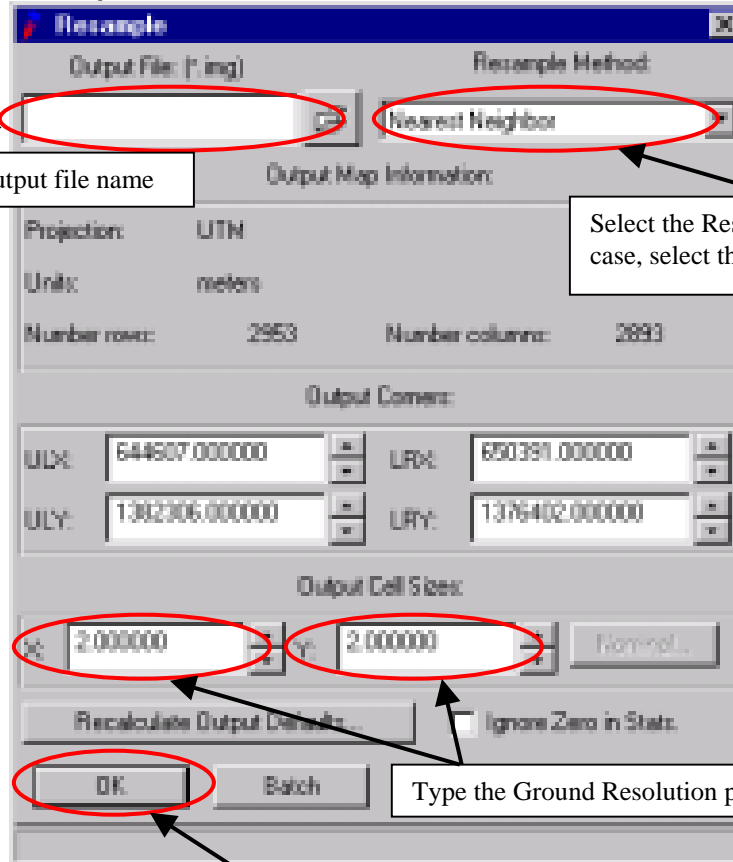
9.5.   Output file

Figure 9-23   Resample Icon

Click this ICON to open
Resample Properties box

Click **Rectify ICON, Resample Properties box** will display set the parameter as indicated in the following windows, Then Click **OK** button.

Figure 9-24   Resample

Type the output file name

Select the Resample Method. In this case, select the Nearest Neighbor.

Type the Ground Resolution per 1 pixel

Click here to rectify processing

The output file is imagine format (*.img) with (*.rrd) file. These file can be displayed in IMAGINE, ARCVIEW or ARC/INFO (NT) program. The image will be displayed with the reference coordinate system.
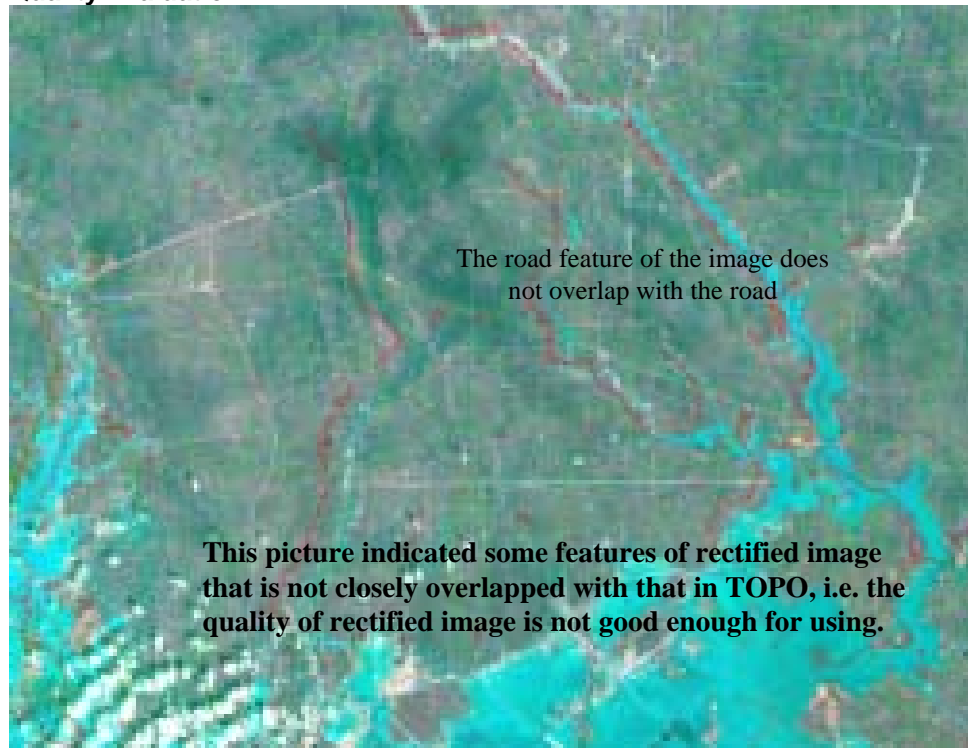
9.6.   Quality evaluation

The quality of rectification is depended on the amount of Ground Control Points and their distribution on the Aerial Photo Image. The rectification should be done several times to get the good quality of rectified image. The following pictures indicated some features of rectified image in combination with the base data.

**Figure 9-25   Quality Evaluation 1**

The road feature close to overlap

Figure 9-26   Quality Evaluation 2

The road feature of the image does not overlap with the road

This picture indicated some features of rectified image that is not closely overlapped with that in TOPO, i.e. the quality of rectified image is not good enough for using.

Using swipe to check the quality of the result

1   Overly the Aerial Ortho Photo Image (rectified image) on the SPOT Ortho Image (reference image) that the GCP were picked up on the same Viewer.

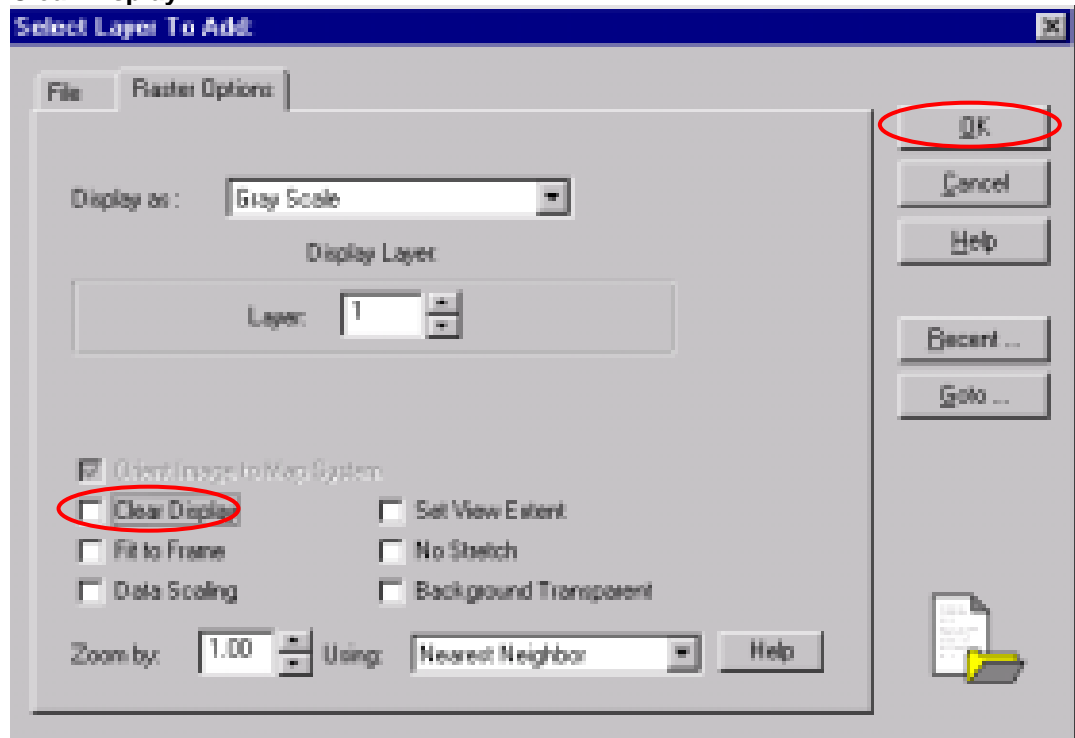*2   Select the Aerial Ortho Photo Image then Click the **Raster Options** button.*

Figure 9-27   Raster Option
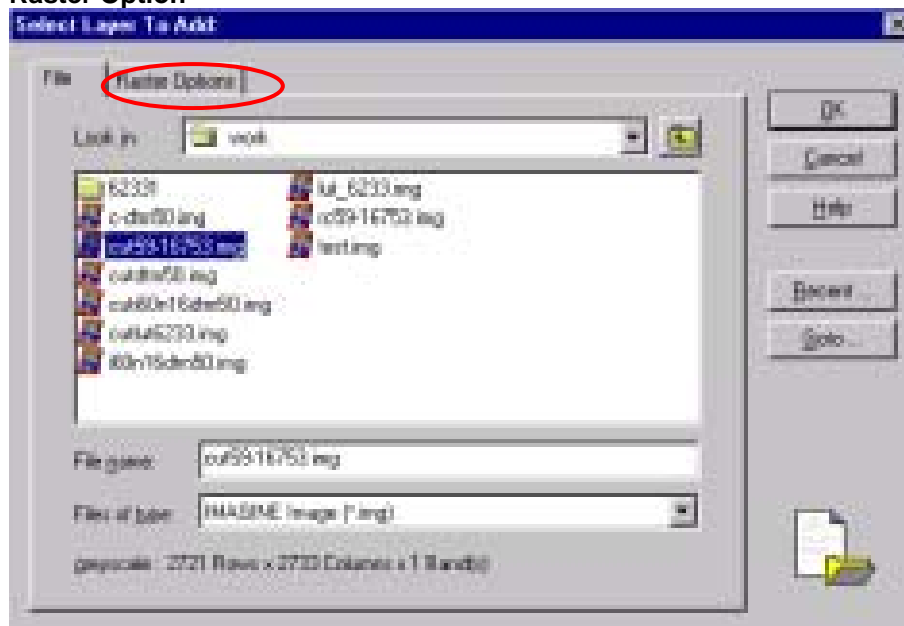
3   The **Clear Display** doesn't check mark as the following then Click **OK** button.

Figure 9-28   Clear Display

4   Click the **Utilities** button then select the **Swipe** button to check the overlap feature between Aerial Ortho Photo Image and SPOT Ortho Image as following windows:
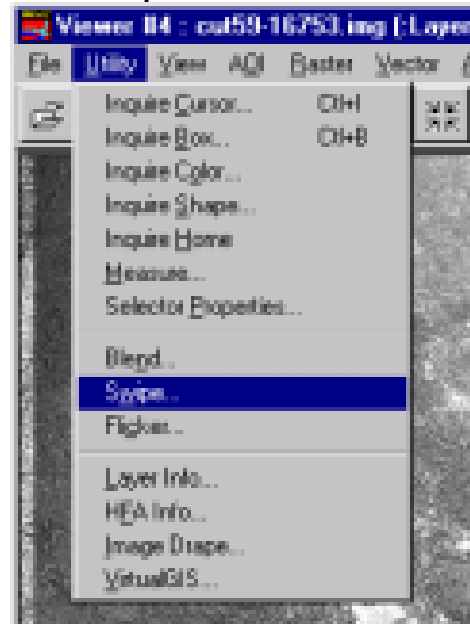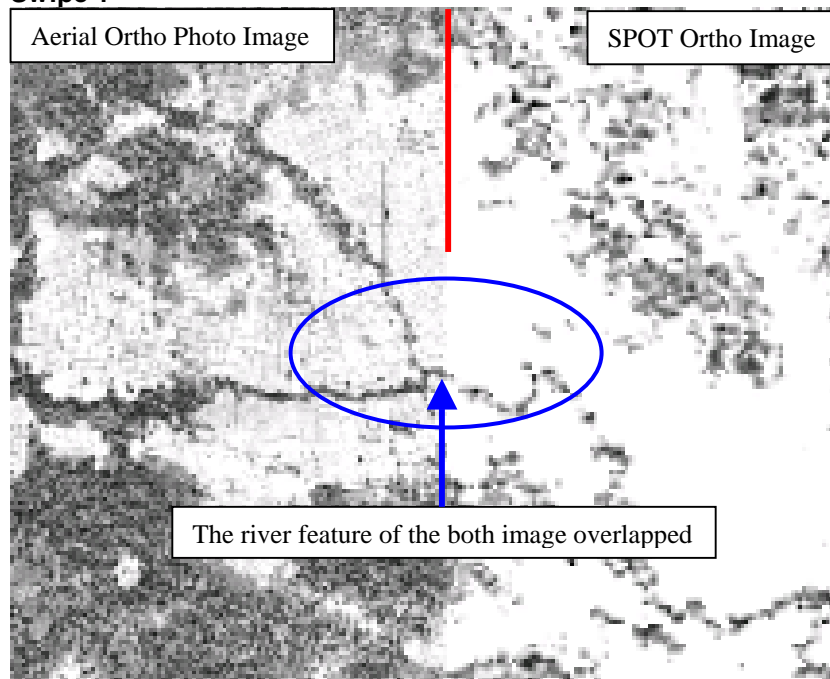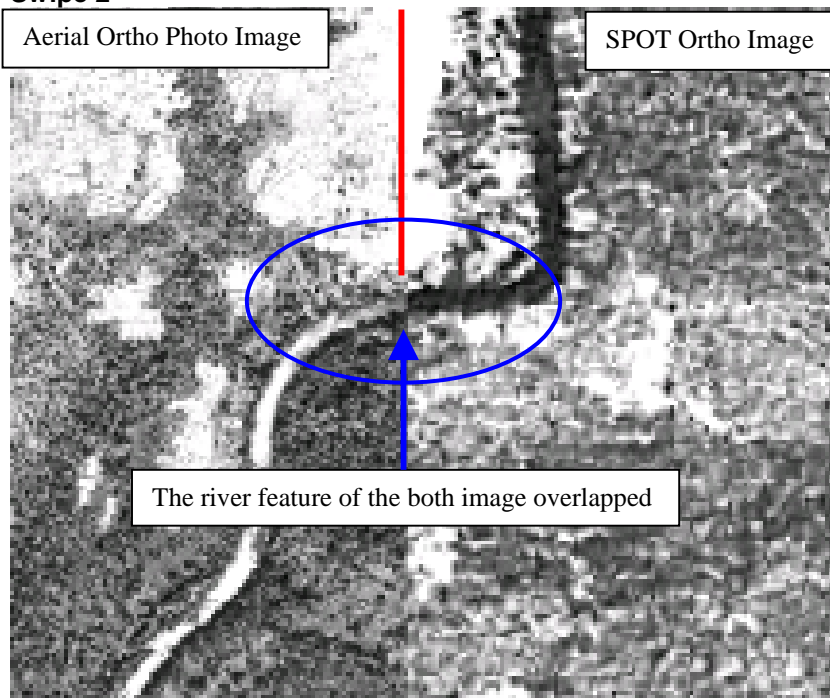
Figure 9-29   Select Swipe

Figure 9-30   Swipe 1

Aerial Ortho Photo Image

SPOT Ortho Image

The river feature of the both image overlapped

Figure 9-31   Swipe 2

Aerial Ortho Photo Image

SPOT Ortho Image

The river feature of the both image overlapped

<u>**Using geo-link to check the quality of the result and calculate the shifting X and Y (ΔX; ΔY)**</u>

5   *Open the **rectified image** in a viewer and the **base map** in other viewer.*
6   *Click the **right mouse**, then Click **Geolink** button.*

Figure 9-32   Geolink

7   *Click the **right mouse**, then click **Inquire Cursor** button, move the cursor to the location that needed to be check.*
8   *Copy the X and Y values from the image and base map at the same location.*
9   *Calculate the ΔX; ΔY.*

Figure 9-33   Changing X, Y Values

Click here to change the X, Y values of other Viewer
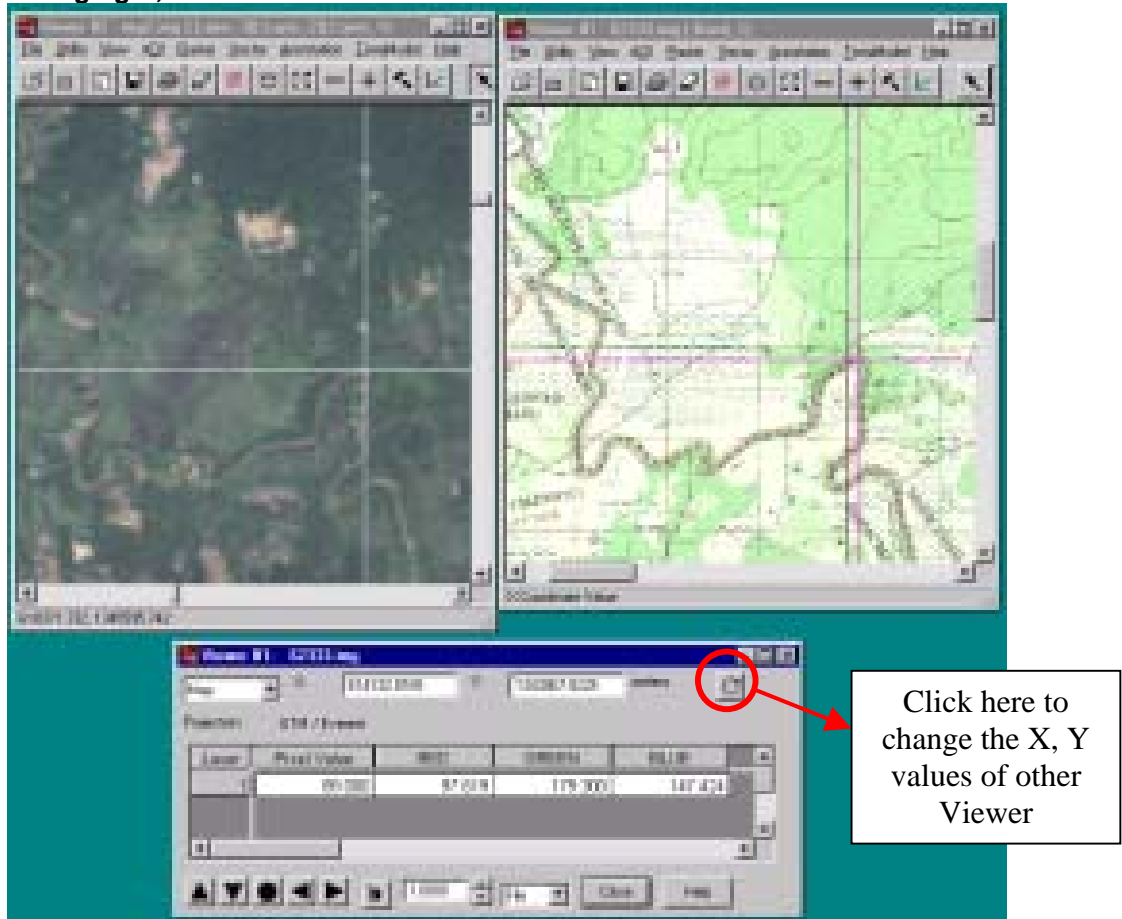
> *Note:*
> *If the values of ΔX; ΔY are closed to ZERO the rectification result is better.*
> *When the values of ΔX; ΔY are higher, the GCPs distribution needs to be checked and more appropriate GCPs need to be added, then run resampling again.*

9.7. Image Clipping (Subsetting)

After rectified image, we need clipping square in the internal image for view the each image using ArcView. Because we can't see under image when image is overlapped, if remain the black area on the image.

Using Inquire Box

*1   Open the image **Viewer**.*
*2   Click the **Right Mouse** then Click **Inquire Box** to insert the inquire box on the image Viewer.*

Figure 9-34   Inquire Box
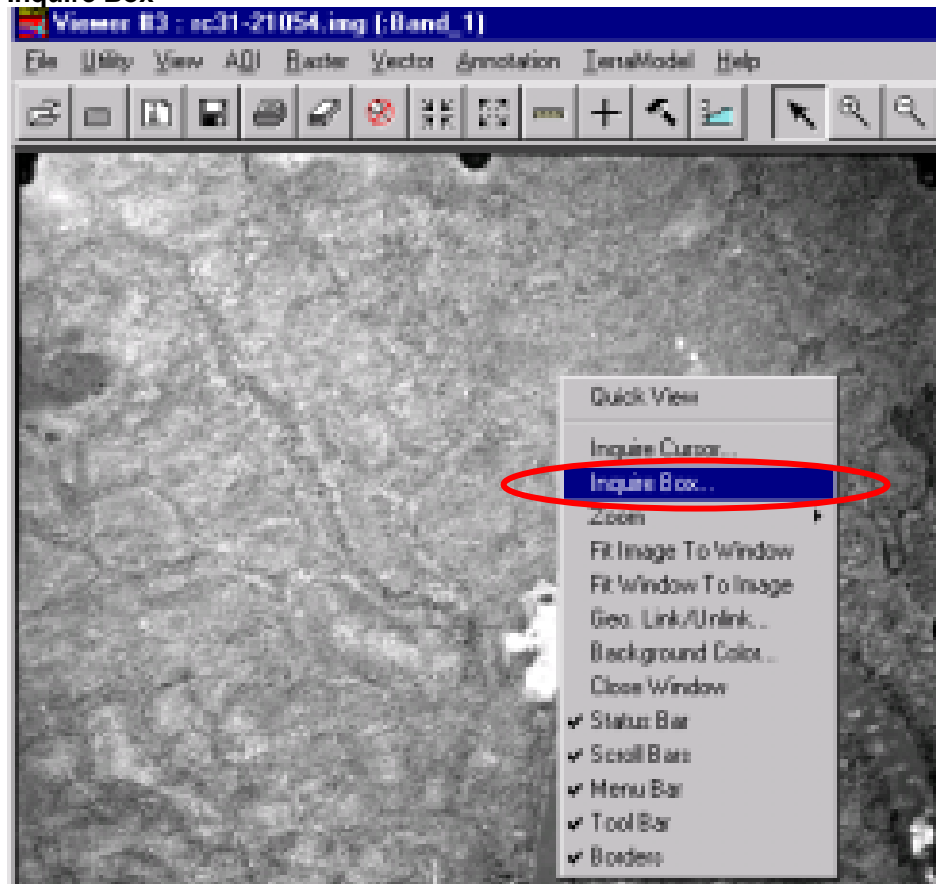
> *3   Will be displayed the **inquire box** on the image Viewer and the **Inquire Box Tool**.*
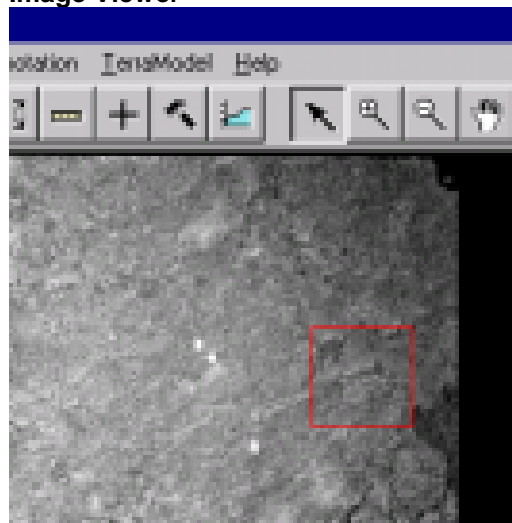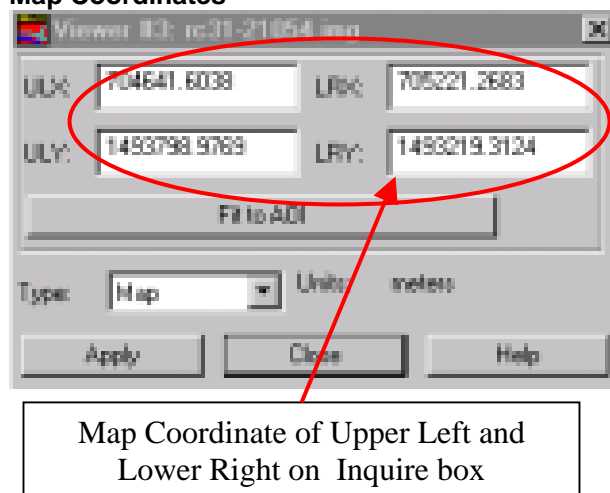
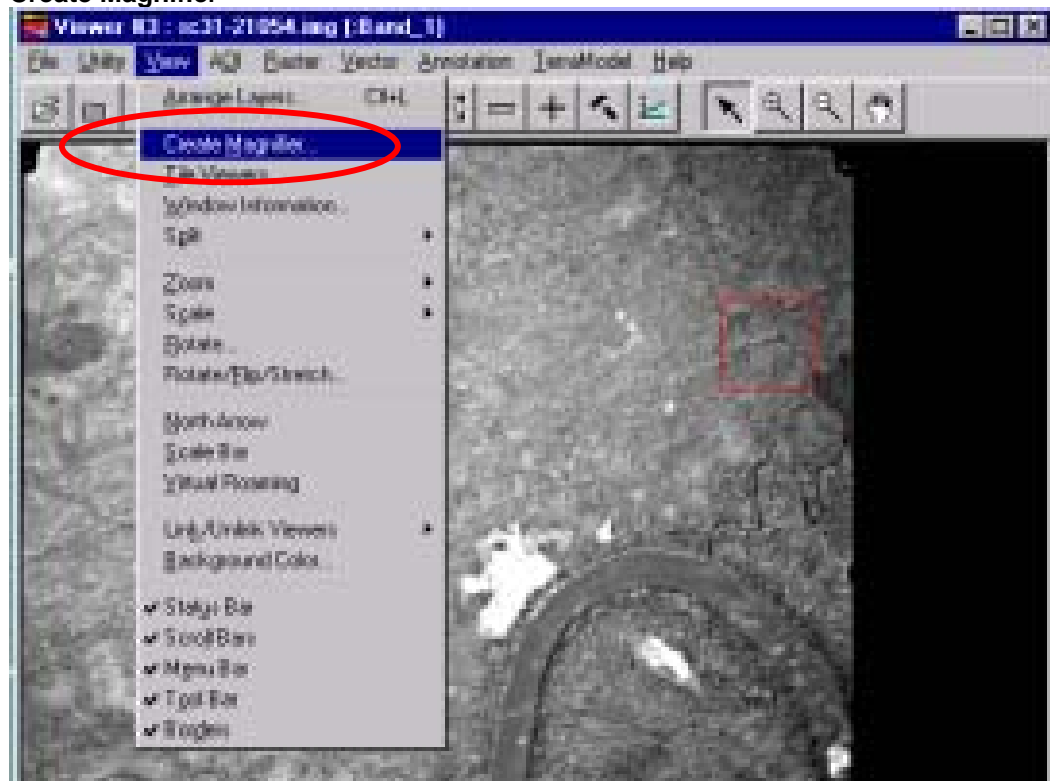**Figure 9-35   Image Viewer**


Figure 9-36   Map Coordinates

Map Coordinate of Upper Left and Lower Right on Inquire box

4   *Click the **View** of the top menu then Click the **Create Magnifier** to create zoom up window.*

Figure 9-37   **Create Magnifier**

> 5   *Will be displayed the **Magnified Viewer** then move the **inquire box line** on the image Viewer while seeing the **Magnified Viewer** such as following window:*

Figure 9-38   **Magnified Viewer**

Should be care inquire box line within internal image area.
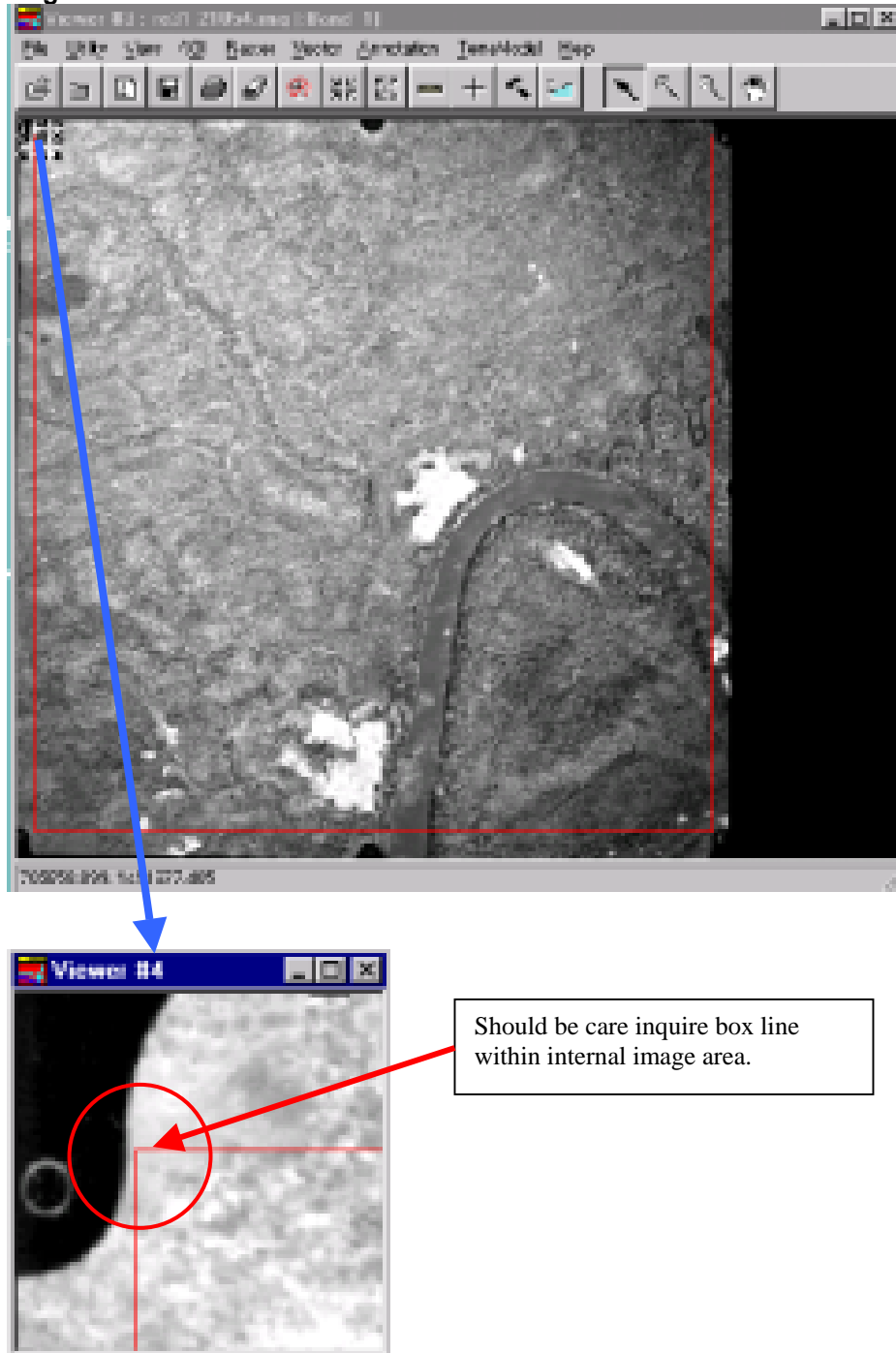
> 6   *Click on the **Interpreter ICON** then Click on the **Utilities Tool** and Click on **Subset Tool**, in the **Subset Box** fill in the parameters then Click **OK** button for image clipping processing.*

Figure 9-39   Image Clipping (Subsetting)

Type the input file name about after rectified image

Type the output file name

Click the From Inquire Box button