

## About this chapter

In this chapter you will find further useful information as follows:

Appendix A: ordering products

Appendix B: troubleshooting, frequently asked questions

Appendix C: additional information about the satellites and their products

Appendix D: remote sensing terminology

Appendix E: storing Quick Looks on your hard disk

Appendix F: DESCW files

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## Appendix A: Ordering Products

### Data available through DESCW:

#### *ERS and ENVISAT missions*

A new data policy has been put in place for the ERS-ENVISAT missions with the objective to maximise the beneficial use of ERS-ENVISAT data and to stimulate a balanced development of Science, Public Utility and Commercial Applications, consistent with the mission objectives.

As a result the conditions of distribution of ERS and ENVISAT data are directly related to the foreseen use of the data:

- **Category 1 use** refers to research and applications development in support of the mission objectives, including research on long term issues of Earth System Science, research and development in preparation for future operational use, certification of receiving stations as part of the ESA functions, and ESA internal use.
- **Category 2 use** refers to all other uses, which do not fall into Category 1 use, including operational and commercial use.

The data distribution falling under Category 1 use will be provided by ESA after a peer review of submitted proposals. Please contact the ESA Earth Observation Missions Help Desk (EOHelp, see below) for further details.

Furthermore, all Announcements of Opportunity related to Earth Observation, released by ESA can be found on the web pages at the following web sites:

[earth.esa.int](http://earth.esa.int) (under Mission & Programs)

[www.esa-ao.org](http://www.esa-ao.org)

The distribution of ERS and ENVISAT data falling under Category 2, for commercial and operational use, will be provided via the commercial ESA appointed Distributing Entities. Please contact the ESA EOHelp for the contact addresses.

#### *Landsat*

Eurimage S.p.A. has:

- worldwide exclusive distribution rights for data from ESA stations
- worldwide distribution of all other archived data
- distribution agreements with the other International Ground Stations

Address: Eurimage Customer Service  
via E.D'Onofrio 212  
00155 Rome, Italy  
e-mail [info@eurimage.com](mailto:info@eurimage.com)  
Web site <http://www.eurimage.com>  
Telephone +39 06 40694 302 /3 /4  
Fax +39 06 40694 305

*JERS-1*

Eurimage is the official distributor of data for users in Europe, North Africa and the Middle East.

**ESA Earth Observation Missions Help Desk (EOHelp)**

e-mail [eohelp@esrin.esa.it](mailto:eohelp@esrin.esa.it)  
Web site <http://earth.esa.int>  
Telephone +39 06 94180 777  
Fax +39 06 94180 272  
Address: ESA ESRIN  
Via Galileo Galilei  
00044 Frascati  
(Rome)  
Italy

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## Appendix B: Troubleshooting

### *Quick Look not displayed (message "insert CD named.....")*

This message appears when DESCW cannot find the required CD. This could be due to the wrong Quick Look CD being inserted in the CD-ROM drive, or because the defined directory is wrong. Check in **the Quick Look Directory** option of the **Define Menu** to check the directory currently defined. For example, for a Landsat CD-ROM the path to enter is X:\ where X is your CD-ROM letter, and **not** X:\L5\_TM\

### *Data are not updated*

The inventory files, downloaded from the server, need to be updated. Copy the updated file into your DESCW directory and follow the instructions in chapter 1 to update the inventory files.

### *The search filters do not seem to be working*

Make sure that in the Mission Window you have not only selected a mission, but have also clicked on **Add** to add it to the list of included missions in the upper part of the window.

### *Certain acquired scenes do not appear in DESCW*

The DESCW data archives are extracted from ESA's archives, discarding, for the ERS missions, all the scenes with more than 30% of missing lines. In this way only reliable data are shown.

### *No scenes are retrieved when a small user area is defined*

If the user area is too small, DESCW may have trouble in identifying the scenes that cover the area. Try again with a slightly larger area. The search area function is optimised for speed and in some cases may retrieve scenes just outside the defined area.

### *Scenes that are partially visible in the Zoom Window are not printed*

When printing, some clipping between the screen and the paper output can take place. Check with the Print Preview option that your search will be printed correctly.

### *Cannot load a previously saved area or parameter*

Areas and parameters saved with older software versions may not be compatible. The format used has been changed.

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## Appendix C: Satellites, Products & World Reference systems

Full details about the satellites, sensors, missions, products and prices, together with links to other relevant sites, can be found at:

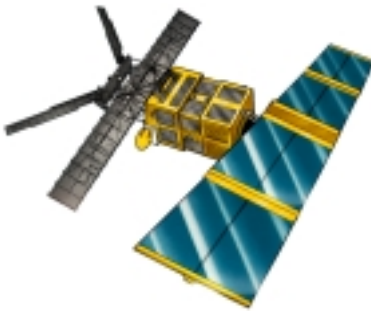
<http://www.eurimage.com>

and further information, as well as DESCW and other software, at:

<http://earth.esa.int>

### ERS-1 and ERS-2

The ERS-1 satellite was launched by ESA in July 1991, ERS-2 in April 1995. ERS-1 ended its operations on the 10<sup>th</sup> of March 2000. They are the first European satellites devoted entirely to remote sensing in a polar orbit.



The satellite payload consists of:

- SAR - Synthetic Aperture Radar in C band operating in wave and image mode
- WSC - Wind SCatterometer
- RA - Radar Altimeter
- ATSR - Along Track Scanning Radiometer
- GOME - Global Ozone Monitoring Experiment (ERS-2 only)
- PRARE - Precise Range and Range-rate Equipment (ERS-2 only)

The ERS-1 mission is split into several phases with different repeat cycles, optimised for different applications.

Orbit type	polar
Altitude	785 Km
Orbit period	100.34 min
Orbit inclination	98.49

Orbits per day	14.3
SAR polarisation	Vertical
SAR incidence angle	23°
SAR pixel size	12.5 x 12.5m (3 looks)
ATSR pixel size	1 Km

ERS-2 has a fixed repeat cycle of 35 days, and has followed ERS-1 tracks with one day's delay.

## Available SAR products

### RAW

This provides raw SAR telemetry data corresponding to one frame of data acquisition (16 seconds) with all auxiliary data necessary for data processing. It is provided for expert users interested in full SAR data processing.

### PRI

The Precision Image is a multi-look (speckle-reduced), ground range, system corrected image. It is the product applicable to most remote sensing applications.

### GEC

This is a multi-look (speckle-reduced), ground range, system-corrected image. It is precisely located and rectified onto a map projection, but not corrected for terrain distortion. It is a high-level product applicable to most imaging radar remote sensing applications where geo-reference is important.

### GTC

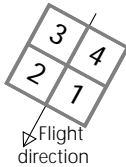
This is the highest level SAR image product and is intended for customers interested in remote sensing applications in terrain with significant relief and where the geo-reference is important. It is a multi-look (speckle-reduced), ground range, system corrected image, precisely located and rectified onto a map projection and corrected for terrain distortion from a Digital Elevation Model. It is available only for areas where a DEM of adequate precision is available at the production facility.

### SLCI

This product provides SAR data after pre-processing, but retains every sample as complex data. The product is single-look (i.e. no speckle reduction by multi-look processing), and in slant range.

## SLCQ

This product has the same characteristics as the SLCI but covers only a quarter scene. The numbering of the quadrants is indicated below:



## Data from International Ground Stations

ERS data are acquired by many Ground Stations in different parts of the world. Data from ESA stations are automatically archived at PAFs and are quickly available to users.

Some data from International Ground Stations are also archived at ESA PAFs. In the Mission Window, choosing the option “Only Data Archived at ESA” means the data found by the search will be already checked and available within the normal delivery time.

## Product codes

### Synthetic Aperture Radar products

- SAR.RAW Annotated Raw Data
- SAR.PRI Precision Image
- SAR.GEC Ellipsoid Geocoded Image
- SAR.GTC Geocoded Terrain Corrected Image
- SAR.SLCI Single Look Complex Image
- SAR.SLCQ Single Look Complex Image

### Radar Altimeter products

- ALT.FDC Fast Delivery Copy
- ALT.OPR Ocean Product

### Wind Scatterometer products

- WSC.FDC Fast Delivery Copy

### SAR Wave Mode products

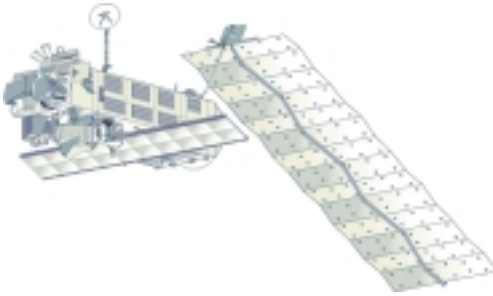
- SWM.FDC Fast Delivery Copy

### Along Track Scanning Radiometer products

- ATS.BT Brightness Temperature Image
- ATS.SST Sea Surface Temperature
- ATS.PST Spatially Averaged Sea Surface Temperature

## ENVISAT

The ENVISAT-1 satellite will be launched by ESA in June 2001. ENVISAT-1 is a multi-disciplinary mission, and its science and application objectives continue and extend those of the ERS-1 & 2 missions.

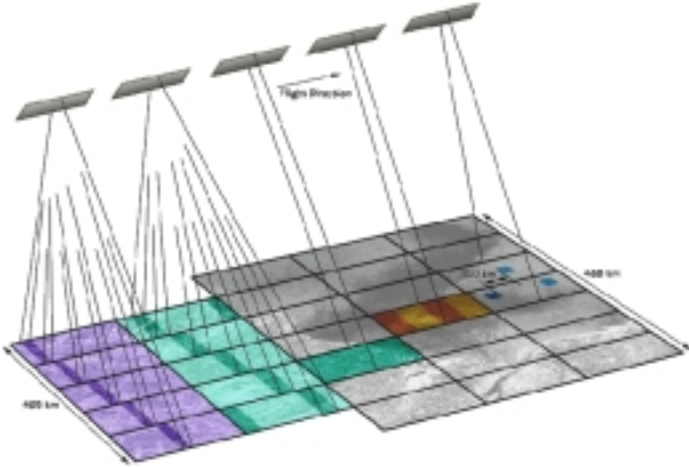


### Satellite payload:

There are two radar instruments, three spectrometers of different types and measurement characteristics, two different radiometers, broad and narrow band, the first high-resolution spaceborne interferometer for long term observation and two instruments for range measurements.

ASAR	Advanced Synthetic Aperture Radar
AATSR	Advanced Along Track Scanning Radiometer
DORIS	Doppler Orbitography and Radiopositioning Integrated by Satellite
GOMOS	Global Ozone Monitoring by Occultation of Stars
MERIS	Medium Resolution Imaging Spectrometer
MIPAS	Michelson Interferometer for Passive Atmospheric Sounding
MWR	Microwave Radiometer
SCIAMANCHY	Scanning Imaging Absorption Spectrometer for Atmospheric Cartography
RA-2	Radar Altimeter 2
Orbit type	Polar
Altitude	799.8
Orbit Period	100.59
Orbit Inclination	98.55°
Orbits per Day	14.3
Orbits in Cycle	501

## ASAR



ASAR has five mutually exclusive modes of operation that can be classified in two categories:

- Global Mission, for Global Monitoring and Wave modes with low data rate and hence an operation capability up to 100% of the orbit.
- Regional Mission, for Narrow Swath Modes (Image and Alternating Polarisation) and Wide Swath with high data rate and operation time, limited, when the Data Relay Satellite is used, by the instrument up to 30 minutes per orbit (including 10 minutes in eclipse), or by Ground Station visibility.

### *ASAR Image mode*

In Image Mode the ASAR will generate high spatial resolution products (30 m) similar to the ERS SAR. It will image one of the seven swaths located over a range of incidence angles spanning from 15 to 45 degrees in HH or VV polarisation.

### *Wide Swath mode*

In the Wide Swath Mode the ScanSAR technique is used providing images of a wider strip (405 km) with medium resolution (150 m) in HH or VV polarisation. The total swath consists of five subswaths and the ASAR transmits bursts of pulses to each of the subswaths in turn in such a way that a continuous along-track image is built up for each subswath.

### *Alternating Polarisation mode*

Instead of scanning between different elevation subswaths, the Alternating Polarisation Mode (co-polar) scans between two polarisations, HH and VV, within a single swath. In addition there are two cross-polar modes, where the transmit pulses are all H or all V polarisation, with the receive chain operating alternatively in H and V as in the co-polar mode.

### **ARTEMIS Data Relay Satellite**

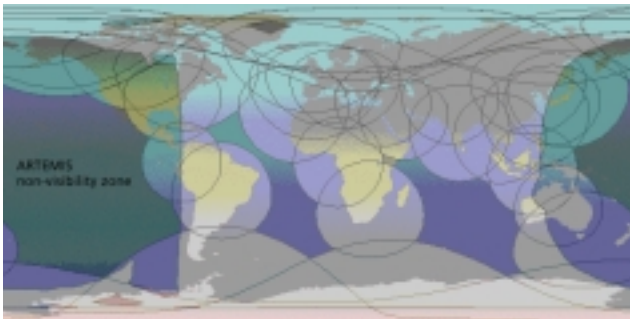
ARTEMIS (Advanced Relay and Technology Mission Satellite) is being developed for testing and operating new telecommunications techniques.

At present, satellites in low orbit like ERS-2 rely on either, a global network of ground stations to provide high-rate data down-links, or use an on-board recorder. But, as information requirements and the number of missions grow, this approach is becoming expensive, and in some situations technically unfeasible.

ARTEMIS, scheduled for launch in 2001, should overcome the problem, relaying data from the remote sensing satellites to ground.

High and low rate data, including recorder playback, can be received under the Artemis coverage, using the on-board Ka-band transmit terminal and data reception with the User Earth Terminal (UET) at ESRIN.

The map shows the available direct X-band downlink stations, together with the coverage of ARTEMIS.



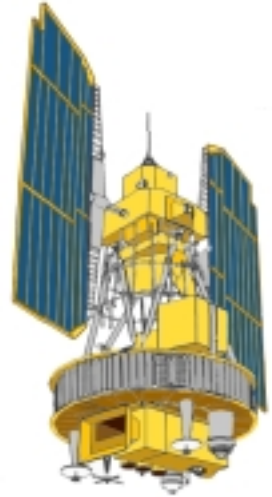
## Landsat 1,2 and 3

These missions, launched by NASA from 1972 (acquired by ESA from 1974) had two imaging systems: the Multispectral Scanner (MSS) and the Return Beam Vidicom (RBV), similar to a video camera.

The operational period of the satellites are:

- Landsat 1 from July 1972 up to June 1978
- Landsat 2 from January 1975 up to February 1982
- Landsat 3 from March 1978 up to March 1983

Orbit type	sun-synchronous, near-polar
Altitude	917 km
Orbit period	103 min
Orbit inclination	98.9°
Orbits per day	14
Repeat cycle	18 days
Scene size	185 x 172 km
Earth coverage	between 81 N and 81 S



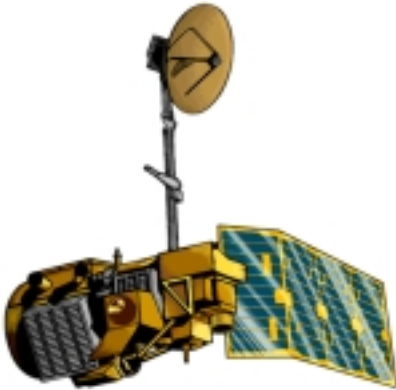
The RBV instrument, composed of three independent cameras, did not achieve the popularity of the MSS sensor due to large variation in the signal quality. The resolution was 80 meters.

The MSS sensor collected radiometric data in 4 spectral bands (5 bands on Landsat 3) with a resolution of 80x80 m (240x240 m for band 8).

<i>Band</i>	<i>Spectral range (micron)</i>
4	0.5 - 0.6
5	0.6 - 0.7
6	0.7 - 0.8
7	0.8 - 1.1
8	10.4 - 12.6 (Landsat 3 only)

## Landsat 4 and 5

Launched by NASA, respectively in July 82 and March 1984, Landsat 4 and 5 have two imaging systems: the Multispectral Scanner (MSS) and the Thematic Mapper (TM). Both satellites are currently on orbit, but Landsat 4 stopped sending data to the Ground Stations in September 1985 due to a failure in the transmission system.



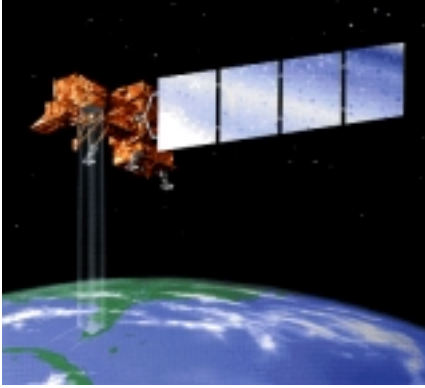
Orbit type	sun-synchronous, near-polar
Altitude	705 km
Orbit period	98.9 min
Orbit inclination	98.252°
Orbits per day	14
Repeat cycle	16 days
Scene size	185 x 172 km
Earth coverage	between 81 N and 81 S

The TM sensor of Landsat 5 collects radiometric data in 7 spectral bands with a resolution of 30x30 m (120x120 m for the thermal IR band).

<i>Band</i>	<i>Spectral range (micron)</i>
1	0.45 - 0.52
2	0.52 - 0.60
3	0.63 - 0.69
4	0.76 - 0.90
5	1.55 - 1.75
6	10.40 - 12.50
7	2.08 - 2.35

## Landsat 7

Launched by NASA in April 1999, Landsat 7 has only one imaging system: the Enhanced Thematic Mapper (ETM+), an improved version of the Landsat 4 and 5 Thematic Mapper.



All the orbital parameters are identical to Landsat 5, the orbit has been selected with a difference of 8 days (mid cycle) with respect to Landsat 5 in order to maximize the coverage. In addition Landsat 7 has:

On-board recorder    560 GBits (around 100 scenes)

Downlink                3 gimbaled x-band (8.2 GHz) antennas at 150 Mbps

The ETM+ sensor of Landsat 7 collects radiometric data in 7 spectral bands with a resolution of 30x30 m (60x60 m for the thermal IR band) plus a Panchromatic band with 15x15 m.

<i>Band</i>	<i>Spectral range (micron)</i>
PAN	0.52 - 0.90
1	0.45 - 0.52
2	0.52 - 0.60
3	0.63 - 0.69
4	0.76 - 0.90
5	1.55 - 1.75
6	10.40 - 12.50
7	2.08 - 2.35

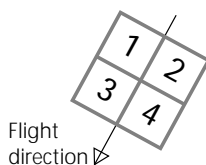
## Available TM and ETM+ products :

### *Full scene (183 x 172 km)*

A standard full scene is nominally centred on the intersection of a path and row (the actual image centre can vary by up to 20 km). For floating scenes the placement along the path is chosen by the user (giving the path number and the latitude of the centre). See in the reference chapter how to compute a Landsat floating scene.

### *Quarter scene (94.5 x 88 km)*

ESA TM and ETM+ data are available in quadrants, numbered according to the diagram below. For floating quarter scenes the placement along the path and row is chosen by the user giving the latitude and longitude co-ordinates of the centre. See in the reference chapter how to compute a Landsat quarter floating scene.



### *Mini scene (54.6 x 54.6 km)*

ESA digital TM and ETM+ data are available also as mini scenes covering a 16th of a full scene. The placement along the path and row is chosen by the user as for quarter scenes. See in the reference chapter how to compute a Landsat mini floating scene.

### *Micro scene (25 x 25 km)*

ESA digital TM and ETM+ data are available also as micro scenes covering a 64th of a full scene. This product is designed for on-line transmission for projects in near-real time. The placement along the path and row is chosen by the user as for mini scenes.

### *Processing level*

All the above products are available as:

- RAW
- Radiometrically corrected
- System corrected (radiometrically + geometrically path oriented)
- Map oriented



Japanese Earth Remote Sensing Satellite

Launched by NASDA in February 1992 JERS-1 ended its operation on 12 Oct 1998. It carries optical and radar instruments.

- SAR in L band
- VNIR sensor

The satellite was operated by RESTEC.

Orbital type	sun-synchronous, near-polar
Altitude	570 Km
Orbit period	98.9 min
Orbit inclination	98.252°
Orbits per day	14
Repeat cycle	44 days
Scene size	75x75 Km

Carried on the JERS-1 satellite the SAR sensor had:

polarisation	HH
incident angle	35°
pixel size	18 x18 m (3 looks)

The VNIR instrument operated with 18x24 meters resolution on 3 bands:

<i>Band</i>	<i>Spectral range (micron)</i>
1	0.52 to 0.60
2	0.63 to 0.69
3	0.76 to 0.86

Note: currently only the ESA acquisitions are available on DESCW

**JERS-1 reference systems**

RESTEC has defined two reference systems for the JERS-1 mission:

- 1 The Ground Reference System (GRS)
- 2 Reference System for planning (RPS)

As these systems are very complicated to use, we have prepared a separate system that will enable you to determine a JERS-1 scene identifier from the information provided by DESCW.

### *Ground Reference System (GRS)*

The Ground Reference System was created for end-user use, and is a worldwide grid co-ordinate system with almost equal grid spacing over the Earth's surface, consisting of paths (ranging from 1 to 659) and rows. The distance between two adjacent grid points is around 60 Km. The JERS-1 mission provides data only from the descending passes, both for SAR and OPS. An orbit comprises 600 rows, from which only rows 142 to 438 are available for SAR scenes and 152 to 449 for OPS scenes.

All path numbers are in use at mid latitudes but as the distance from the Equator increases the overlap reduces the need to use all paths. Thus, in the South and North latitude zones only the odd path numbers are used (i.e. 1, 3, 5 ...659), while in the polar zones only about one in five paths are used.

Furthermore, while the paths in the three central zones run along the satellite's inclined track, in the polar zones they are parallel to the meridian.

Thus, a typical GRS descending path starts at the North Pole and runs parallel to the meridian until it reaches the boundary of the north polar zone; it then turns at an angle to the satellite track, which it follows through the three mid-latitude zones until the boundary with the south polar zone, where it turns due South again until reaches the South Pole.

To obtain the SAR coverage is more complicated because RESTEC has not made a SAR acquisition pass calendar. The user needs to locate his area of interest on the RESTEC GRS maps, find the nearest GRS grid node on the map, shift about 4 cm eastwards on the map (ignoring the instructions in the map legend, which are incorrect) and identify the corresponding path. Unfortunately, the scene location accuracy can not be guaranteed to be better than 25 Km.

### *Reference System for Planning*

In the Reference System for Planning, a scene is identified by taking the path along which the point of interest lies and measuring the angle between the location of the satellite (during the acquisition of the area of interest) and the ascending node (the point where the satellite path crosses the Equator), measured from the centre of the Earth in the plane of the satellite path. As the satellite is inclined from the meridian this angle will always be a little

greater than the latitude of your point of interest.

All 659 paths are available at all latitudes, following the angle of the satellite's track between the poles.

#### *DESCW JERS-1 reference system*

We have decided not to implement the RESTEC systems, either for SAR or OPS scenes, because of the number of inconsistencies, particularly at higher latitudes. Instead we have implemented a new reference system, similar to that used for ERS missions, merging the two RESTEC systems and using the DESCW definition of 7,200 nodes along the orbit path.

To determine the PATH, we have used the RPS system of 659 paths (1-659).

The scenes are numbered from 8 to 7,196 for the whole orbit. The GRS ROW number is calculated from the DESCW SCENE number (the reverse calculation is provided for your assistance should it prove necessary).

$$\text{GRS\_ROW} = (\text{DESCW\_SCENE} - 8) / 12 + 1$$

$$\text{DESCW\_SCENE} = \text{GRS\_ROW} - 1 * 12 + 8$$

The main difference is that the PATH in DESCW refers to the satellite's subtrack (as for ERS missions) and not to the geographical location of the scene (as in the RESTEC system). That means that in DESCW the OPS scenes have the same RESTEC PATH number (coincident with the RESTEC OPS Path or Track), but a different PATH number in comparison with the RESTEC GRS system, while the SAR scene acquired at the same time will have the same DESCW track.

For example, from the ERS satellites, a scene of Rome has a different path number, depending on whether the scene was acquired from a left, nadir, or right-looking instrument; from the JERS-1 satellite (RESTEC System) a scene of Rome has the SAME path number, regardless of whether the instrument that acquired was on the left, nadir or right-looking, and so regardless of the track followed by the satellite at the moment of acquisition.

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## Appendix D: Remote Sensing Terminology

This appendix explains some of the keywords used in this manual. See the Eurimage and ESA/ESRIN web pages for more information and examples.

### Acronyms

AATSR	ENVISAT Advanced Along Track Scanning Radiometer
ASAR	ENVISAT Advanced Synthetic Aperture Radar
ATSR	ERS–1 or ERS–2 Along Track Scanning Radiometer
ERS–1 & 2	European Remote Sensing satellite
ESA	European Space Agency
ETM+	Enhanced Thematic Mapper (Landsat 7)
EOSAT	Operators of Landsat 5
FTP	File Transfer Protocol
GEC	ERS SAR GECoded image
GOME	Global Ozone Monitoring Experiment
JERS–1	Japanese Earth Remote Sensing satellite
MERIS	ENVISAT Medium Resolution Imaging Spectrometer
MSS	MultiSpectral Scanner (Landsat 1 - 5)
NASA	U.S. National Aeronautics and Space Administration
NASDA	National Space Development Agency of Japan
PAF	ESA Processing and Archiving Facility
PRI	ERS SAR PRecision Image
QL	Quick Look (or Browse Image)
RESTEC	Operators of JERS–1
SAR	Synthetic Aperture Radar
Swath	Scene width (across track)
TM	Thematic Mapper (Landsat 4 and 5)
USGS	U.S. Geological Survey (operators of Landsat 7)
VNIR	JERS–1 Visible and Near Infrared Radiometer
WRS	World Reference System

## Acquisition Date

Note that in 24 hours the satellite describes several orbits: about 14 orbits per day for ERS-1 & 2, ENVISAT and Landsat 5; 15 orbits per day for JERS-1.

## Acquisition Time

Two different acquisition times are shown in DESCW: the computed ones and the actual acquired ones. The computed times are shown in the Scene List Window and in the Scene Detail Window with a precision of one minute, while the actual acquired ones are displayed with the Quick Look.

## Cloud Coverage

For optical missions it is important to know the weather conditions during the acquisition. This is given through the percentage of cloud coverage on the image. This parameter is given as 4 cloud cover values: one for each quadrant. A 0 means cloud free conditions (up to 10 percent of clouds) while 9 means over 90 percent cloud coverage.

If some lines are missing in a quadrant a “-” sign is shown in place of the Cloud Coverage figure.

The values are given for, in order, the Rear Left, Rear Right, Front Right and Front Left quadrant according to the satellite orbit.

Radar satellites can see through clouds, so this parameter is not used.

## Collection

It is now possible for some missions to select, from the “Missions and Filters” Window, the specific collection to work on. Collections are sub-sets of the inventory of a mission, chosen for specific characteristics (e.g. a particular coverage, the availability of products, etc.).

To create a users’ own collection:

- create for the concerned mission the required inventory file in the ASCII Interchange Format (see format specification in Appendix G)
- assign to this file a mnemonic name with the extension “.dat” and store it in the `CLLMMMSm` mission related directory (see below)
- convert this file in binary format using the `IF2BIN.EXE` application located in the `DESCW` directory or using the “**Convert Int. Format to Binary**” option of the **Collection** item of the **File menu**

To be noted that the header record of the binary file must be properly filled-in. In particular, it shall contain in the correct place the mission & sensor and

the assigned file name. If the assigned file name exceeds 8 characters, only the first 8 characters must be put.

Collections are selected by the user during an interaction through the Mission Dialogue Window. The system positions itself to the `CLLMMSm` sub-directory (where `MMMSm` is the mission-sensor-mode described in Appendix F) related to the selected mission, e.g. `c111n7t_` for Landsat 7. The user may also choose another directory, which is then used in all following accesses to the file.

Remember that, due to the internal characteristics of the DESCW binary files, a collection must be mono-mission. If you save a search as Interchange Format (through the **Create Interchange Format File(s)** option of the **Collection** item of the **File menu**) the software automatically saves the search in different files, one for each mission, and puts them in the related `CLL*` directory.

## Cycle and Phase

The cycle is the period, in orbits or days, before the satellite will repeat exactly the same coverage.

Landsat 1, 2 and 3 had a fixed 18 day repeat cycle with 251 orbits.

Landsat 4, 5 and 7 have a fixed 16 day repeat cycle with 233 orbits.

JERS-1 had a fixed 44 day repeat cycle with 659 orbits.

ERS-1 had 6 different phases with different cycles:

- Phase A, B, D with 3 day cycle      24 orbits per cycle
- Phase C and G with 35 day cycle    501 orbits per cycle
- Phase E and F with 168 day cycle   2411 orbits per cycle

Note that Phase B and D have the same coverage; between phase E and F there is a latitude shift of 8 Km.

ERS-2 has a fixed 35 day repeat cycle with 501 orbits.

ENVISAT has a fixed 35 day repeat cycle with 501 orbits coincident with ERS-1 and ERS-2.

<i>Mission</i>	<i>Phase</i>	<i>Tracks/Cycle</i>	<i>Days/Cycle</i>	<i>From / To</i>
ERS-1	A	43	3	25 Jul 91 / 10 Dec 91
ERS-1	B	43	3	28 Dec 91 / 30 Mar 92
ERS-1	C	501	35	14 Apr 92 / 21 Dec 93
ERS-1	D	43	3	23 Dec 93 / 14 Apr 94
ERS-1	E	1784	168	14 Apr 94 / 28 Sep 94
ERS-1	F	1784	168	28 Sep 94 / 18 Mar 95
ERS-1	G	501	35	21 Mar 95 / 10 Mar 00
ERS-2		501	35	21 Apr 95 -
ENVISAT		501	35	June 2001 (planned)
Landsat 1		251	18	23 July 72 / 1 June 78
Landsat 2		251	18	22 Jan 75 / 25 Feb 82
Landsat 3		251	18	5 Mar 78 / 31 Mar 83
Landsat 4		233	16	16 July 82 -
Landsat 5		233	16	1 Mar 84 -
Landsat 7		233	16	15 Apr 99 -
JERS-1		659	44	Feb 92 / 12 Oct 98

## Ground Stations

The Ground Station receives and records data transmitted by a satellite. Usually data can be acquired only if the satellite is in view of a station, as it is impossible to store data on-board (except for ENVISAT which uses a Data Relay Satellite and on-board recorder to achieve global visibility).

If the Grid is turned on in the Zoom Window, the Ground Station coverage is displayed. Note that the areas drawn are the maximum station coverage, and scenes near the border lines may not be acquired.

For stations that operate on a campaign basis, the visibility for ERS missions is shown independently of whether the Stations are operating or not. Check the Station Availability Window to see the campaign periods.

For the Landsat missions the Ground Station is also the production site. For Landsat 7 the stations of Svalbart and Poker Falls (Alaska) are used only to downlink data from the on-board recorder.

Ground Station IDs and the missions they cover are listed over the page.

<i>ID</i>	<i>Name</i>	<i>Country</i>	<i>Landsat</i>	<i>ERS</i>
<i>ESA Stations</i>			5	7
FS	Fucino	Italy	•	•
KS	Kiruna	Sweden	•	•
MS	Maspalomas	Spain	•	•
<i>EOSAT Stations</i>				
GD	Goddard	Maryland (USA)	•	
NF / NO	Norman	Oklahoma (USA)	•	
<i>Foreign Stations</i>				
AF	Fairbanks	Alaska		•
AS	Alice Springs	Australia	•	•
BE	Beijing	China	•	•
CA	Cordoba	Argentina	•	•
CO	Cotopaxi	Ecuador	•	•
CU	Cuiaba	Brazil	•	•
DB	Dubai	United Arab Emirates	•	
ED	Sioux Falls (EDC)	United States	•	
GH	Gatineau	Canada	•	•
HA	Hatoyama	Japan	•	•
HO	Hobart	Australia	•	•
IN	Pare Pare	Indonesia		•
IR	Tel Aviv	Israel		•
IS	Islamabad	Pakistan	•	
JK	Jakarta	Indonesia	•	
JO	Johannesburg	South Africa		•
KU	Kumamoto	Japan		•
MA	Matera	Italy		•
ML	Malindi	Kenya		•
MM	MacMurdo	Antarctica		•
NZ	Neustrelitz	Germany	•	•
PH	Prince Albert	Canada	•	•
PT	Pretoria	South Africa	•	
SA	Rhyad	Saudi Arabia	•	•
SE	Hyderabad /Shadnadar	India	•	•
SG	Singapore	Singapore		•
SY	Syowa	Antarctica		•
TF	O'Higgins	Antarctica		•
TH	Bangkok	Thailand	•	•
TO	Tromsoe	Norway		•
TW	Taipei	Taiwan		•
WF	West Freugh	Great Britain		•
<i>Portable Stations</i>				
BK	Bishkek	Kirgizstan		•
LI	Libreville	Gabon	•	•
KB	Kitab	Uzbekistan		•
NA	Nairobi	Kenya	•	•
UB	Ulan Bator	Mongolia		•

## PAF

Processing and Archiving Facility, where ERS data are stored and processed.

There are 4 PAFs:

- F-PAF located in Brest (France). Only LBR production
- D-PAF located in Oberpfaffenhofen (Germany). SAR and Altimeter Products
- I-PAF located in Matera (Italy). SAR and Mediterranean LBR products
- UK-PAF located in Farnborough (United Kingdom). SAR and ATSR products

## Quality Parameter (ERS)

Information about the quality of the unprocessed data for the ERS SAR acquisition is given with a range of 3 possible values (High, Medium or Low) and the information of the presence of missing lines (more than 5 %) is coded by displaying the quality character in small capitals.

## Frame or Row

An orbit is split into several standard frames. The size and the location of the frame depend on the satellite. For a given mission, the same frame or row number means that scenes have the same Latitude.

The ERS-1 & 2 and ENVISAT orbits are split in 7,200 nodes and 400 are used to identify the SAR frames through the node closest to the frame centre. Therefore, the identifiers of two adjacent frames differ by 18 nodes. The first frame starts at the Equator and is identified by node 9, the last one in the ascending part of the orbit. For ATSR, two adjacent frames differ by 90 nodes, and the first is number 45.

The Landsat reference system splits the orbit in 248 frames, starting near the North Pole. The first frame is number 1 and each is increased by one.

The JERS-1 orbit is split as for ERS (see JERS world reference systems paragraph), but the frames are smaller, so globally there are 600 frames of which only the descending ones are available.

The standard swath sizes are (range or across track direction):

ERS SAR	100 km
ERS ATSR	500 km
Landsat	183 km
ENVISAT ASAR Narrow Swath	100 km
ENVISAT ASAR Wide Swath	>400 km
ENVISAT AATSR	500 km
ENVISAT MERIS	1150 km

## Status

For the Radar missions the satellite must be programmed to acquire data. As there is a constraint on acquisition time due to the available electric power, only a certain number of scenes per orbit can be acquired.

It is possible to acquire a scene only if the satellite is in view of a Ground Station in order to transmit the data through high rate links.

The possible status for the scenes is:

- *Available* - when the data have already been acquired and stored in the receiving stations or in a PAF
- *Planned* - when the data are planned for acquisition
- *Visible* - when the scene is not yet planned but could be planned following a user request

For Optical missions only Available and Visible status are currently provided.

## Satellite pass

A satellite orbit is split in two parts:

- the ascending pass
- the descending pass

The ERS satellite has the following scheme:

Equator	North Pole	Equator	South Pole	Equator
9	1791	3609	5391	7191
— ascending	— —	descending	— —	ascending

Where the numbers are the standard scene numbers.

For Landsat missions the path starts near the North Pole: with this definition all the rows from 1 to 119 are descending (day passes) while from 120 to 248 (night passes) are ascending.

## Track or Path

After one complete cycle the satellite starts to acquire the same scenes over again as it covers the same track on the Earth. Each repeat cycle has an internal number of orbits called Track (or Path for the Landsat mission); the tracks have the property of always covering the same area.

In the ERS missions the track numbers follow the orbit numbers (e.g. if track 1 corresponds to orbit 202, track 2 will correspond to orbit 203).

In the Landsat missions the tracks are geographically defined: the first track

corresponds to the most eastern orbit, and the second one is the adjacent one towards the West. Within one cycle there are 233 tracks (paths) for Landsat 4, 5 and 7 while there are 251 tracks for Landsat 1, 2 and 3.

In the JERS-1 mission the tracks are geographically defined (as in Landsat 5). Within one cycle there are 659 tracks.

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## Appendix E: Storing Quick Looks on your Hard Disk

If you wish to access the Quick Looks from a hard disk and not from the CD-ROM, you should first copy the Quick Looks data from the CD-ROM(s), maintaining the CD-ROM structure, and then identify your hard-disk directory to DESCW as described below.

### The data on the Quick Looks CD-ROM is organised as follows

Names in **BOLD** are directories, lower case letters indicate variables in filenames.

<b>DESCW_CD.EXE</b>	Setup file
<b>CD_LABEL</b>	e.g. L5QL0038 Volume label file, containing the volume label in the format: mmQLnnnn, where: mm = mission id (e.g. L5 = Landsat) nnnn = volume identifier (0001, 0002, etc)
<b>ll_sss</b>	e.g. L5_TM Quick Look directories for satellite and sensor, where: ll = 2-char satellite acronym (e.g. L5, E2) sss = 3-char sensor acronym (e.g. TM, SAR)
<b>IMAGES</b>	Quick Look image directory
	<i>Short name convention</i>
<b>sIyyymmdd.ttt</b>	e.g. FI950116.191 s = Station (Fucino, Kiruna, Maspalomas) I = File type (I = Image) yyymmdd = Acquisition date ttt = Track number
	<i>Landsat long name convention</i>
<b>TMn_Tttt_Ss_yyyymmdd_JPEG</b>	eg: TM5_T187_S1_19950116_JPEG
<b>ETMn_Tttt_Ss_yyyymmdd_JPEG</b>	eg: ETM7_T21_S1_19991016_JPEG
	t t t = Track number (variable length) s = Station code (Fucino = 1, Kiruna = 2, Maspalomas = 3, Neustrelitz = 108) yyyyymmdd = Acquisition date
	<i>ERS long name convention</i>
<b>MMnSp_ooooo_ffff_ffff_ss_BRW.JPG</b>	e.g. ER2S-_025900_3339_3339_MS_BRW.jpg
	MMnSm = Mission-sensor-mode (see App. F) ooooo = Orbit (fixed length: 6 digits) ffff = 1 <sup>st</sup> and last frame of the segment (fixed length: 4 digits) ss = 2-char station ID (see previous definition)

**INFOFILE**

Cloud cover / information data directory  
 The files have the same structure of the image ones.  
 So:

*Short name convention*

`sCyymmdd.ttt` e.g. FC950116.191  
 C = File type (C = Cloud Cover)

*Landsat long name convention*

`TMn_Tttt_Ss_yyyyymmdd_CLOUD` eg: TM5\_T187\_S1\_19950116\_CLOUD  
`ETMn_Tttt_Ss_yyyyymmdd_CLOUD` eg: ETM7\_T21\_S1\_19991016\_CLOUD

*ERS long name convention*

`MMnSp_ooooo_ffff_ffff_ss_BRW.INV`  
 e.g. ER2S-025900\_3339\_3339\_MS\_BRW.INV

For example, to create a directory to contain all of the Landsat 5 Quick Looks for one year on your hard disk (you would need at least 6GB of disk space but your access to Quick Looks would be faster), take the following steps:

Create a directory in the root of your chosen drive (e.g. D: /My\_L5\_97).

In this directory create the following structure:

**CD\_LABEL** Volume label file.  
**11\_sss** Quick Look directories per satellite and sensor  
 11 = satellite acronym (eg L5 for Landsat)  
 sss = sensor acronym (eg TM, SAR)  
**IMAGES** Quick Look image directory  
**INFOFILE** Auxiliary files directory

From the CD-ROMs copy the contents of the L5\_TM\IMAGES and the L5\_TM\INFOFILE directories into their corresponding directories on the hard disk.

Edit the `CD_LABEL` file with a text editor and insert your own CD Label in place of that copied from the CD-ROM (e.g. MY\_L5\_97); you can use any label but it must be 8 characters in length.

The files that links the inventory entries to a specific CD-ROM are within the collection DESCW sub-directories (e.g. for Landsat 7 the file is in the LN7T-subdirectory) with a name that contains the Mission-Sensor-Mode identification and the letters "CD" (e.g. for Landsat 7 is EI\_LN7T\_CD.LOC), containing records that show the range of orbit numbers contained in each CD. You need to create a customised version of this file with a single entry for each receiving station that will link the first and last orbits for the period

of your directory with the CD\_LABEL that you created in the previous step and your new Quick Look directory. To obtain the orbit information use the Mission Window; by selecting the required period for the required satellite, DESCW automatically tells you the start and end orbit numbers. It is an ASCII file (editable with any word processor, as Windows NOTEPAD or WRITE) where each field is separated from the next by at least one space. There is an header line, that for the CD it is always set to #, and a number of records with the following format:

Start Orbit No. (up to 6 digits)  
End Orbit No. (up to 6 digits)  
Start Frame No. (up to 4 digits)  
End Frame No. (up to 4 digits)  
Start Date (YYMMDD)  
End Date (YYMMDD)  
Station Id (two character ID, see previous table)  
CD Label (8 alphanumeric – no spaces)  
CD Name (11 alphanumeric – no spaces)  
Trail #

The frame number is needed only if start and end orbit are different, otherwise should be set to 0 (zero).

Note that CD Name is the name that will be displayed if DESCW cannot find the hard disk directory.

For instance for a directory containing all 1997 Landsat 5 images, the EI\_LN5T\_CD.LOC contents could be:

```
#  
68265 73580 0 0 970101 971231 FS MYL51997 L5_97_ARC #  
68265 73580 0 0 970101 971231 KS MYL51997 L5_97_ARC #
```

This file should be placed in the related DESCW collection sub-directory on your hard disk, replacing the original version of the file (save a copy of the original file in case you want to go back to using the CD-ROMs).

If you want to create a multi-mission CD-ROM you can, but you need to create a location file for each mission, assigning the same CD label and name.

Define the directory you have created (e.g. D:\MY\_L5\_97) as the Quick Looks Directory in DESCW, using the option on the Define Menu.

You will now be able to access the directory of Quick Looks on your hard



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## Appendix F: DESCW Files

### Setup files

#### *On-line full installation*

DESCWSET.EXE	Setup executable
DESCWSET.W02	Setup volume 2
DESCWSET.W03	Setup volume 3
DESCWSET.W04	Setup volume 4
DESCWSET.W05	Setup volume 5
DATA.EXE	New inventories (weekly updated)
THEMATIC.EXE	Thematic Maps
README.TXT	Setup instructions

#### *On-line upgrade installation*

DESCW_UP.EXE	Setup upgrade from previous version
--------------	-------------------------------------

#### *On CD-ROM*

DESCW_CD.EXE	Setup
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### DESCW directory structure

The DESCW structure is organised with 8 sub-directory types according to the type of data. Not all the directories are automatically created during the installation procedure by the software: some of them are created (automatically) by DESCW only if and when needed.

The subdirectories are:

#### *Directory      Content*

- INVNTORY      Inventory files
- MISNDATA      Mission related parameters and data files needed by the software
- MAP              Layers files of the Zoom Window map and Thematic Maps
- USERDATA      Is where you can save your searches, areas, etc .
- COLLECTION    There is one directory for each Mission-Sensor
- QUIKLOOK      Used by DESCW to save the on-line retrieved Quick Looks
- IMAGES           Used by DESCW to save the on-line retrieved full resolution images
- DATABASE       Used to store the Image-text database

Please note that the DATA.EXE file already contents the sub-directory

information, so expand it in the DESCW base directory and not in the INVENTORY one.

### **Name convention: Mission-Sensor-Mode**

Many file names in DESCW contain the Mission-Sensor-Mode indication. This group of 5 characters is composed by:

- Mission        3 characters containing also the mission number, if any (e.g. ER1)
- Sensor         1 character (e.g. S for SAR, T for Thematic Mapper)
- Mode            1 character, for ERS-1 indicates the phase, for tandem data the baseline interval and for ENVISAT the swath mode

If any character is not relevant it is substituted by an underscore “\_”  
 For example “ER1SA” is ERS-1 satellite, SAR sensor, phase A, while “LN7T\_” will be Landsat 7, Thematic Mapper sensor.

#### *Missions:*

ERS-n	ERn	where n = 1, 2
ERS-n Tandem	ETn	where n = 1, 2
JERS-1	JR1	
Landsat-n	LNn	where n = 1, 2, 3, 4, 5, 7

#### *Sensors:*

ATSR	A
SAR	S
TM, ETM+	T
MSS	X
VNIR	V

#### *Modes:*

ERS-1 Phases	p	where p = A, B, C, D, E, F, G
ERS Tandem	b	where b = 1, 2, 3, 4, 5, 6, 7
Envisat ASAR	s	where s = 1, 2, 3, 4, 5, 6

## Inventory Files

These are the files you will find in the DESCW directory once DESCW has been installed (if downloaded from on-line, after the explosion of the DATA.EXE). All the files are binary coded in order to improve the search performance. By default the following files are present in the \INVENTORY sub-directory:

ER1ApINV.BIN	ERS-1 ATSR phase C/D/E/F/G inventory file (where p is the phase)
ER1SpINV.BIN	ERS-1 SAR phase A/B/C/D/E/F/G inventory file (where p is the phase)
ER2A_INV.BIN	ERS-2 ATSR inventory file
ER2S_INV.BIN	ERS-2 SAR inventory file
ET1AbINV.BIN	ERS-1 SAR Tandem phase C/G inventory file (where b is the baseline interval number)
ET2SbINV.BIN	ERS-2 SAR Tandem inventory file (where b is the baseline interval number)
ER1__BAO.BIN	ERS-1 consolidated ("old") baseline inventory file
ER2__BAO.BIN	ERS-2 consolidated ("old") baseline inventory file (updated once a year)
ER2__BAN.BIN	ERS-2 "new" baseline inventory file (updated weekly)
LNnX_IYY.BIN	Landsat (where n is the satellite number) MSS inventory files for year yy
LNnT_IYY.BIN	Landsat (where n is the satellite number) TM (or ETM) inventory files for year yy
JR1V_IYY.BIN	Landsat 7 VNIR inventory files for year yy
JR1S_INV.BIN	Landsat 7 SAR inventory file

Note that for ERS only scenes with less than 30% of missing lines are stored in the DESCW inventory files.

## Mission dependent Files

These files are stored in the \MISNDATA sub-directory and are used by DESCW for computing date and times, mission visibility coverages and standard scene co-ordinates. The number, format and size of these files can vary. Removing or modifying these files might cause software malfunctions.

## Map Files

These files are stored in the \MAP sub-directory and are of two types:

### *Zoom Window map layers:*

COAST8X.MAP	Coastal map file (where x is the resolution: <b>v</b> ery low, <b>l</b> ow, <b>h</b> igh)
COAST8X.PNT	Coastal pointers file
POLI8X.MAP	Political boundaries map file
POLI8X.PNT	Political boundaries pointers file
DRSHO8X.MAP	Lakes and large river segments map file (CD only)



DRSHO8X.PNT	Lakes and large river segments pointers file (CD only)
DRRIV8X.MAP	Rivers map file (CD only)
DRRIV8X.PNT	Rivers pointers file (CD only)

### *Thematic Maps:*

CLOUDIN.THM	Mean annual cloudiness map
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HOTSPOTS.THM	Yearly average number of "hot spots" map
PRECIPIT.THM	Mean annual precipitation map
TNDMXXXX.THM	Density of ERS Tandem for the xxxx baseline range map (from xxxx of this file to xxxx-1 of next file)
USERXX.THM	Three empty thematic map files
VEGETAT.THM	Vegetation type map

## Auxiliary Files

The following files are stored in the DESCW main directory:

BYNAME.ALS	Towns and Countries area definitions
COLDEF.USR	Colour user settings
COVERAGE.DAT	Ground Station visibility circles
DESCW.HLP	DESCW help file
DESCW_IF.PDF	DESCW Interchange Format file specifications
DWNLD.EXE	Images download application
ER___CAM.DAT	ERS Station availability campaigns
ER___PLN.DAT	ERS ascending availability planning
IF2BIN.EXE	Interchange Format to BINARY converter application
LAYERS.DSK	Map layers description file
*.DLL	Runtime libraries
NEWS.USR	"What's new" file
SERVER.USR	Server information file
TIPS.TXT	Tip of the day file
TOWNS.DAT	Capitals/Towns file
USER.USR	User settings file

## The IF2BIN application

This application, located in the DESCW directory, can be used to generate DESCW binary files starting from an Interchange Format file (see App.F). If launched from a windows explorer a Command Prompt dialogue will be displayed asking you to enter the input and output filename.

If the application is launched giving also the input file name as parameter (e.g. "if2bin edc\_ln7t.dat") the information of the header and the percentage of work done are also shown. This option is useful especially in the instance of errors, as it gives some information about when the generation aborted and allows you to check if the header information are correct.

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## Appendix G DESCW file format specifications

### Area File Format

*For polygonal or quadrilateral areas*

Area name (optional)

Number of vertices

Lat Long (first vertex in degrees.minutes)

. . .

Lat Long (last vertex in degrees.minutes)

e.g.

Malta

4

36.00 14.21

35.52 14.35

35.48 14.32

35.54 14.21

*For circle areas*

Area name (optional)

1

Lat Long (centre co-ordinates in degrees.minutes)

Radius (in Km)

e.g.

Rome Italy

1

41.50 12.30

50

### Custom Area File Format

This format is used for the "by name" area loading. The file contains the Towns and Countries area definitions, in ASCII, with a format very similar to the area file but:

- each area is on one line only (values separated by a space or a tab)
- the line starts with a S if it is a Country/State or with a T if it is a Town

For example:

S Colorado 4 41.03 -109.06 40.54 -102.01 36.56 -102.01 37.01 -109.03

### TOWNS.DAT **File Format**

The file containing the city names is written in ASCII with the following format:

Latitude    Longitude    City\_name

where:    -90 < Lat <90

          -180 < Long <180

City\_name must be preceded by the "`" character (used as map pointer).

Each field should be separated by, at least, one blank space.

### **User Request File Format (ur extension)**

A User Request is made up of one or more user request names, each one followed by one or more areas. It is an extension of the Custom Area file format and you can load more \*.ur files at a time.

#URID    User Request Identification

#AREA    Area Name    Vertices No. ... (as Custom Area File Format)

e.g.

#URID My\_project2000

#AREA KLAG 1 46.38 14.03 25

#AREA Lodi 4 45.27 9.30 45.05 9.58 45.01 9.44 45.14 9.16

The User Request Identification should not have spaces (i.e. one word only)

See the files `ursamp1.ur`, `ursamp2.ur` and `ursamp3.ur` as examples available in the `\USERDATA` sub-directory.

### **Interchange File Format**

This file type is at the base of the creation of personal collections and inventory files. A DESCW Interchange File is an ASCII file composed of a header, which contains general information, and Segment Data records. All field lengths are fixed for a faster import. A small application (used by DESCW but usable also as an independent application) named `IF2BIN.EXE` allows you to convert this file into a DESCW binary inventory file (collection).

### Header (100 Bytes)

All the field values shall be in ASCII; fields are separated by one blank. All information in fields shall be left aligned and padded with blanks.

<i>Field</i>	<i>Length</i>	<i>Example Values</i>
File ID	8.3 Chars	ER2S_JAN.DAT
Satellite name	8 Chars	ERS2
Sensor name	3 Chars	SAR
Data quality field length in bits	2 Chars	16
First orbit in the file	5 Chars	14113
First orbit date	yyyymmdd	19980101
Last orbit in the file	5 Chars	14556
Last orbit date	yyyymmdd	19980131
Generation date	yyyymmdd	19980814
Generation site	3 Chars	ESA
Reserved for future use	29 blanks	

where:

- File ID: is the name of the file with the extension. The maximum file length (without extension) is 8 character: if the file name is longer the name in the header must be truncated.
- Satellite and Sensor name: is the name of the satellite or sensor without spaces, scores or underscores (e.g. ERS2, Landsat5)
- Data quality field length in bits: default value is 16 bits and it is used by IF2BIN.EXE to generate the binary file
- Generation date: when the file is created the generation date shall be copied from the corresponding source file.

### Segment Data Records

The information on each single scene is stored in a data record. Each record field is separated by a blank and each record is terminated with a line feed (`\n`). All the fields should have a value. When a field is not applicable, a "0" (or as many as zeros as the field length) must be entered in numeric fields, a N (New) in the Type field, or "\*\*\*" (stars) in the Archiving Location field.

- Mandatory fields

<i>Field</i>	<i>Means</i>	<i>Length &amp; type</i>
Type	Indicates if the record is <b>New</b> , a <b>Replacement</b> or a <b>Deletion</b>	1 char
MSm	Mission-Sensor-Mode (see App. F)	5 chars
Date	Acquisition Date of the scene	yyyymmdd
Orbit	Absolute orbit number (with leading zeros)	6 digits
Frame	Standard frame number (with leading zeros)	4 digits
Delta Frame	Used to identify shifted scenes. Note that this information is ignored in the binary conversion	2 digits
Station	Acquisition Station (for the list see App. D)	2 chars
Arch. Loc.	Archiving Location for ERS (i.e. PAF). The acronyms are: CPRF = CP, D-PAF = DP, I-PAF = IP, UK-PAF = UP	2 chars
Quality	(ERS SAR only) Value ranges from 0 (best) to 9.	1 digit
Missing lines	(ERS SAR only) Percentage of missing lines in the scene (range from 00 to 99)	2 digits
CC	Percentage / 10 value of the Cloud Coverage during the acquisition (optical missions only)	4 digits
Q/L	Indicates if a Quick Look is available	1 digit (bool)
Prod	Indicates if an higher level product is available off the shelf	1 digit (bool)
Spare 1	Reserved for future expansions. Currently set to 0	TBD
Spare2	Reserved for future expansions. Could be used to indicate the Track. Currently set to 0	TBD
Spare 3	Reserved for future expansions. Currently set to 0	TBD
Spare 4	Reserved for future expansions. Currently set to 0	TBD
Spare 5	Reserved for future expansions. Currently set to 0	TBD

- Optional fields

NW Lat	North West corner latitude co-ordinate in degrees and hundredths (not minutes)	sdd.cc
NW Long	North West corner latitude co-ordinate in degrees and hundredths (not minutes)	sddd.cc

## Location File Format

As seen in Appendix E, the files that link the inventory entries to a specific CD-ROM are within the collection sub-directories (e.g. for Landsat 7 the file is in the `L7T_` subdirectory) with a name that contains the Mission-Sensor-Mode identification.

The location files are used within DESCW, not only to find the Quick Look on a CD-ROM, but also to locate Quick Looks and Full Resolution images at the remote servers, like Eurimage's EiNet. It is an ASCII file where each field is separated from the next one by at least one space. There is an header line (that for the CD is always set to #) that contains the leading part of the Quick Look or Full Resolution image name, followed by a number of records with the following format:

<i>Field</i>	<i>Means</i>	<i>Length and Type</i>
Start Orbit	Absolute start orbit No.	up to 6 digits
End Orbit	Absolute start orbit No.	up to 6 digits
Start Frame	First frame No. of the segment	up to 4 digits
End Frame	Last frame No. of the segment	up to 4 digits
Station Id	Station identification, see App. D	2 chars
Type	Quick Look / Image type	1 digits
Location	Location code or CD Label	up to 8 chars (no spaces)
Name	Location name or CD nick name	up to 11 chars (no spaces)
Trail	Trailing part of the filename	up to 16 chars

where:

- Header: if there is no leading name part the “#” character is used
- Orbit Start and Orbit End: are used only if all the scenes from the Start Frame number of the Start Orbit to the End Frame of the End Orbit are present at this location
- Start Frame and End Frame: indicate the internal frame number along the orbit (e.g. for ERS from 0 to 399). Must be both set to 0 (zero) if all the acquired frames of the orbit are available at this location and Orbit Start differs from Orbit End
- Station ID: in the file there is one line for each acquiring station
- Type: used by DESCW to display the correct viewer. The supported types are:
  - 0 – Strip Short Names format (CD default)
  - 1 – Strip Long Names format (ESA default)

2 – ERS Spaceborne Radar Imagery CD-ROM

3 – ERS Reference CD-ROM

4 – JPEG (on-line default)

5 – other graphic extensions (opens a shell)

- Location: DESCW uses this information to know if it is an on-line location (numeric ID) or local (CD-ROM or hard-disk)
- Name: this is the field displayed to the user in the "Select Quick Look Source" Window
- Trail: if there is no trailing name part the "#" character is used

For example for the GEC collection on ImageDB (Browse and Full Resolution Image) the location file is:

GEC-----

```
16739 16739 135 135 KS 5 2 ImageDB MR-.zip
16739 16739 135 135 KS 4 2 ImageDB QL-.jpg
16739 16739 138 142 KS 5 2 ImageDB MR-.zip
16739 16739 138 142 KS 4 2 ImageDB QL-.jpg
```

etc.

Another example: EiNet Landsat 7 Browse Images. Because all the acquired scenes from orbit 1511 to 4572 have a Browse Image on the EiNet server the file will be:

.big

```
1511 4572 0 0 FS 4 1 EiNet #
1511 4572 0 0 NZ 4 1 EiNet #
```

etc .

## Thematic Maps Format

The thematic map files contain a Header and Map Data (see below), written one after the other. The size of the uncompressed map file is 4,148,200 bytes.

### Header

The header will be 1000 bytes long and will contain the following fields:

<i>Field</i>	<i>Length and Type</i>	<i>Example</i>
File Name	12 chars	Vegetat.thm
Generation date	yyyymmdd	19990514
Thematic Map Name	25 chars	Vegetation
Rows	5 digits	1440
Columns	5 digits	2880
Resolution (mdeg)	5 digits	125
Bits per value	2 digits	8
Active categories	2 digits	9
Classification criteria	60 chars	Vegetation type ...
Category0 name	20 chars	Non-land areas
... ..	...	...
Category31 name	20 chars	Tropical forest
Reserved	195 chars	Blanks

Notes:

- All values shall be in ASCII coding, each field separated by one blank character
- The numeric fields shall be right aligned and shall have as many leading blanks as necessary
- The alphanumeric fields shall be left aligned and shall have as many trailing blanks as necessary

### Map Data

The map data contains as unsigned binary numbers the values related to the  $1/8 * 1/8$  degree cells of the rectangular map projection of the Earth. The cell values are stored sequentially in rows (one row for each latitude step) from  $+90^\circ$  to  $-90^\circ$  latitude. Within each row the cells' values are stored sequentially in longitude from  $-180^\circ$  to  $+180^\circ$ . In total there are 1440 rows (latitude values), each one with 2880 columns (longitude values), resulting in a size of 4,147,200 bytes. Each binary value provides the type or value of the Category corresponding to that Earth cell.



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