

## REVISED CONCEPT AND STATUS OF ISPRS MULTILINGUAL DICTIONARY

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### ABSTRACT:

The Concept of the "Multilingual Dictionary for Photogrammetry and Remote Sensing" was presented in 1982 (Mainz) and updated in 1984, 1988 and 1992. The dictionary will comprise independent Glossaries from each of the participating (now 17) Language Groups, which have to be connected by Index numbers. After publication of the first edition of the (preliminary) German Glossary in 1993 it seemed necessary to revise the concept in order to make its use more comfortable and handy, in spite of the continuously growing amount of entries due to technical progress.

### RESUME:

Le concept pour le "Dictionnaire Multilingue en Photogrammétrie et Télédétection était présenté en 1982 (Mainz) et mis à jour en 1984, 1988 et 1992. Le dictionnaire se composera de Glossaires indépendants de chaque Groupe Linguistique participant (à présent 17) qui seront raccordés par Numéros d'Index. Après la publication de la première édition du Glossaire Allemand provisoire en 1993, il paraît nécessaire de réviser le concept pour rendre son usage plus confortable et maniable en dépit de l'augmentation continue d'entrées à cause du progrès technique.

### ZUSAMMENFASSUNG:

Das Konzept für das "Mehrsprachige Wörterbuch für Photogrammetrie und Fernerkundung" wurde 1982 (Mainz) vorgestellt und 1984, 1988 und 1992 fortgeführt. Das Wörterbuch wird aus (unabhängigen) Glossaren von jeder teilnehmenden Sprachengruppe (z. Z. 17) bestehen, die über Indexnummern miteinander verbunden werden. Nach der Veröffentlichung der ersten Ausgabe des (vorläufigen) Deutschen Glossars 1993 schien es angebracht, das Konzept dahingehend zu revidieren, daß das Wörterbuch trotz ständig wachsender Stichwortzahl wegen des technischen Fortschritts bequemer und handlicher im Gebrauch wird.

### 1. INTRODUCTION

"Multilingual Dictionary for Photogrammetry and Remote Sensing", as the official title is (for daily use: ISPRS Dictionary), shall be presented again in order to encourage the old and potential new participants to accelerate work by a partially revised concept and by the offer of technical assistance.

The importance for our professional world represented by ISPRS of such a Dictionary cannot be emphasized enough in view of modern communication, such as Internet, Retrieval-Systems and specially of Computer-Translation. This can never function before somebody has collected the necessary information and data under professional aspects. So the appeal aims at all colleagues interested, but specially at

the representatives of ISPRS to support, more than before, the efforts for Our Dictionary, the visiting-card for our society.

### 2. STATUS OF WORK

#### 2.1 History 1980-1996

At the 1980 Congress in Hamburg Wolf published preliminary glossary of about 1200 English Terms (Entries and Definitions) which was to be extended by a German and French translation to a "Trilingual Dictionary".

At the 1982 Mainz Symposium the Working group VI-3 (Terminology) was established and also the concept of a Multilingual Dictionary extensible at any time with respect to the

inclusion of further languages as well as to new Entries was accepted (Lindig, 1982). In 1984, the American Society of Photogrammetry published its "ASP-Dictionary" (Rabechevsky, 1984) with 1700 Terms and Definitions in English on the basis of Wolf's paper (Wolf, 1980) including preliminary Equivalents in French, German, Italian, Portuguese, Spanish and Russian.

In 1988 (2nd edition 1990), the Polish Language Group published a five-language Dictionary on Photogrammetry and Remote Sensing" with 2250 Terms and Definitions in Polish including Equivalents in English, French, German and Russian on the basis of the "ASP-Dictionary".

In 1993, the German Language Group published its Glossary as part of the Multilingual Dictionary with 4150 Terms and Definitions including preliminary Equivalents in English and French.

## 2.2 Present membership of WG VI-3

At the Symposium in Mainz 11 Language Groups (LGs) could spontaneously be created, which increased to 17 by 1996, as Annex 3 shows. Nearly all major languages are represented, each spoken by more than 50 million people. Still outstanding are unfortunately Italian, Indonesian and Korean, which are cordially invited to join the WG VI-3.

Each Language Group can decide if it wants to produce its own Glossary by independent collection or translate it from other ones already existing (now German or Polish, later English or French).

## 2.3. Present Activities of the Language Group

In spite of the initial enthusiastic start of work its progress is now absolutely unsatisfactory. A questionnaire distributed to all Language Groups was returned by one Language Group only. Specially regrettable is the fact that the "Key-Language" English, which is absolutely necessary for the linkage of "Exotic" languages, does not make any remarkable progress. So, not much can be reported. Proposals for an acceleration of work are outlined in Par. 2.4.

1. **German:** As the 1<sup>st</sup> edition of the German Language Volume was published in 1993, the LG concentrated activities intensively on the improvement of its dictionary. Special attention was given to the inclusion of numerous new terms of Remote Sensing including the exact coordination with the revised German standards called DIN, which have recently been completed. The experiences made with this work resulted in some changes of the guidelines outlined in Par. 4.

.2. **Polish:** The LG is going to prepare a new edition of its Glossary extending the present number of Entries from 2900 to planned 4200 with open deadline.

.3. **Spanish:** Recently the Spanish Society of Cartography, Photogrammetry and Remote Sensing asked the publisher of the German Dictionary (a copy already sent) for participation in the WG-activities, perhaps by translation. The WG VI-3 expects new impulses to the S-LG.

## 2.4 Proposals for an Acceleration of Work

### .1 Substitution of missing English Data

Since most LGs (without German knowledge) are waiting for English data in order to bring forward their own Glossary, perhaps by preliminary translation, the chairmen of WG IV-3 offer the following assistance:

a) The English Entry List (preliminary produced by D-LG and therefore with question marks) Par. 3.7) has about 60-80 % of terms with terminological origin from Latin or Greek, which are nearly identical with the German Equivalents, which means that they can be understood without interpretation of German Definitions. After marking these terms and distribution of those lists (optional via Floppy Disc) the other LGs can start or continue preliminary translations.

b) A second step can be taken for the remaining 20 - 40 % of terms, for which the coordination needs Definitions. WG IV-3 delivers a rough translation of the German Definitions in a kind of "Pidgin English". This may make it possible to understand these Definitions without knowledge of the German language and to find the relevant term and Definition in one's own language.

c) Later, the WG IV-3 would be prepared (if necessary) to take step b for all Definitions.

## .2 Technical assistance

In spite of a tight budget the President of IfAG (publisher of the German Dictionary) has shown his goodwill to help those LGs (upon request) which have problems in printing and bookbinding their Glossaries, also in non-latin script, if the original data to be printed can be delivered.

## .3 Financial assistance

If a LG signalises that the collection of original data is completed but funds for publication are missing, the President of Commission VI together with WG VI-3 should try to mobilize a considerable subsidy from ISPRS in order to promote this task very important for the society's reputation.

### 3. BASIC CONCEPT OF ISPRS DICTIONARY

Since 1982 (Lindig, 1982) 10 Fundamental Principles were the guidelines for the work at the ISPRS-Dictionary. They remained unchanged as to the basic ideas in spite of some updatings due to current experiences. But besides this fact the WG is so flexible to accept all individually styled Glossaries and terminological publications as (preliminary) part of the ISPRS-Dictionary (Par. 3.2) if they fulfill at least the Minimum-Conditions (Par. 3.5) to be equipped with Index-Numbers (preferably in steps of 10.

Nevertheless, the WG would appreciate it if the following up-to-date guidelines were largely fulfilled.

#### 3.1 Entire technical field

On the one hand, all terms used in theory and practice of the whole field of Photogrammetry and Remote Sensing including its geodetic applications, e.g. cadastre, architecture, etc. with relevant surveying of ground control must be included. On the other hand, the range of work has to be limited, in order to avoid boundless growth, to some of the main terms of nongeodetic applications, e.g. geology, etc.

In order to split the work within a LG for the purpose of contributions and revisions by

specialised Advisors, the whole field should be separated into some subfields, e.g. Photography, Cartography, Topography, etc. which can appear in the final edition as "Domains" in the Cross-References for easier use of the Dictionary and structuration for computer-search via simple SF-Numbers to remain detectable in the Entry-Lists (Par. 3.3). (Annex 1)

#### 3.2 Separate language volumes

For each language to be included in the ISPRS-Dictionary, now and in the future, one separate Glossary inclusively its Entry-List (Part 1) should be produced. An unlimited extension to all languages needed or even dialects can be guaranteed by this method. In addition to this, a special Reference Booklet (Part 2) has to be created which will contain only the Index-Numbers (Par. 3.5) sorted sequentially according to the alphabetic order of the relevant language. But each published Dictionary can serve as a preliminary language volume of the ISPRS-Dictionary.

#### 3.3 Entry-lines with Index-Numbers as a base for Entry-List

For each Entry having been defined as Term or its synonyms will be stored in alphabetical order, containing at least according to relevant grammar:

- entry
  - Gender or Type
  - Distinction for Homonyms
  - Notes (e.g. 2nd gender, Language Region, Origin, obsolete, historical)
  - Index-Number (par. 3.5)
- Optionally can be added in the production phase
- Source Code(s)
  - Subject Field Number

These Entry-lines printed alone furnish the components for the very important Entry-List serving as indispensable list of contents for entering the Glossary.

#### 3.4 Term-paragraphs with definitions

Each Term-paragraph begins and ends with "" in the first column for a computer-usable structure. It is headed by its

- Entry-line (Par. 3.3) followed by

- Cross-References: "better:", "also:", "see:", "compare:", "contrary:", "composition:" and "domain"
- Definition
- Equivalents (preliminarily known, but which can be finally cancelled if a Reference Booklet exists or is replaced by the existing foreign Index-Number). (Annex 2)

### 3.5 Index-Numbers in steps of 10 (Minimum-Condition)

After all Entries stored at a certain time have been sorted in alphabetical order, each is assigned a sequential number with a 0 (zero) in the last position, resulting in Index-Numbers in steps of 10. It is obviously the easiest way to insert new Entries at any later time without affecting the indexing. Therefore, this is the Minimum-Condition of Dictionary-Work which will make possible the connection between all Language Volumes.

### 3.6 Mother tongue and professionals

Each colleague engaged in the activities of WG VI-3 should fulfill at least two essentials:

- He should be a professional expert in the technical field or at least in some subfields, and
- Idiom of Language Group is his mother tongue.

Two further requirements are desirable:

- He should understand at least one of the Official Languages of ISPRS as Coordination Language,
- Some advisors should live in different language regions (e.g. Austria, Germany, Switzerland) for considering regional synonyms.

### 3.7 Foreign-to-native-language translation

For the reliability and quality of the Dictionary it is indispensable to coordinate the definitive Equivalents exclusively from the foreign language to the respective mother tongue. If, in the opposite, in the working phase anybody else has to introduce foreign terms, these should be understood as proposed Preliminary Equivalents formally provided with an interrogation mark (?) (even two, if they are very doubtful) which can be eliminated by mother-tongue-experts only.

### 3.8 Modern computer technique

It is evident that these principles can work only by extensive use of EDP for all compilation operations as acquisition, storage, sorting, coordination, correction and fair output of information. So it may quasi be a further essential that each Language Group has available at least a Personal Computer with an efficient text processing program (editor), a minimum of 10 mbytes, hard disk and floppy disk input/output.

### 3.9 Standard digits for Index-Numbers

The Index-Numbers appearing anywhere in the Glossary, entry-Lists and Reference-Booklet have to be printed exclusively in standard digits (0, 1, 2, ...9), which can be used, understood and produced world-wide. Additionally, in the Reference-Booklet the headings of the columns - each representing a language - have to be printed as Language-Symbols according to ISO-Standard (Annex 3).

### 3.10 Decentralized use of characters for each language

The texts of the Glossaries, specially those not belonging to a language using Latin characters, are to be produced in their own country where key boards, displays and printers with a set of their special characters are available. Then, no problems will arise from orthography, reading and correction of printing errors and avoiding any transliteration.

By this decentralisation of the work each LG decides individually on the number of copies to be printed.

## 4. REVISED CONCEPT

Resulting from the experiences gained by the preparation of the 1st edition of the German Glossary and its intended improvements for the 2nd edition some changes in the German guidelines (Lindig, 1992, Par. 4) were decided upon in order to tighten the Glossary, but to extend the German Entry-List. Since the amount of entries is continuously growing due to the technical progress, the voluminosity of the dictionary should remain handy in spite of more comfort of use. But the 10 Fundamental Principles of Par. 3 shall remain valid in any case.

## 4.1 Treatment of Synonyms

Up to now all synonyms had (Par. 3.3) their own Entry-line and Term-paragraph in the Glossary. But only for the Preferred Synonyms (LP) the latter one was complete with Definition and Equivalents. The Secondary-Synonyms (SS) contained the only important information: better: = name of PS - but occupied at least five lines in the Glossary.

In future, the PS only will have its own Term-paragraph in the Glossary and the remaining synonyms (SS) will appear only with their Entry-line, in the Entry-List not with their former (now cancelled) Index-Number, but with that from the PS marked with a star (\*). For example: (each at its alphabetic place)

9250\* blackening curve\* (SS)  
9250 characteristic curve (PS)  
9250\* density curve \* (SS)  
9250\* gradation curve\* (SS)

## 4.2 Treatment of Composed Terms

A lot of composed terms (mostly of Adjective and Noun) whose parts are separately defined give no new information and Equivalents but occupy much space in the Glossary. In future, they will disappear there but remain detectable in the Entry-List with the Index-Number plus \* of their main part. Both parts have in their Term-paragraph the Cross-reference: Composition: name\*

## 4.3 Treatment of Contrary Terms

Similarly, as Synonyms and Compositions shall be treated the Contrary Terms, which are necessary for the complete information but do not need their own Term-paragraph and definition. They appear in the Entry-List with the Index-Number of their counterpartners, and there under Cross-reference Contrary: name\*

## 4.4 Thesaurus-Arrangement

Already at the beginning of the WG work it was discussed if in the Glossary the terms are to be arranged in the hierarchical Thesaurus-Arrangement (TA) or in the alphabetical Lexicon-Arrangement (LA). In spite of some disadvantages, specially with regard to computer translation, retrieval systems and systematic researches the Lexicon-Arrangement was accepted due to its easier production and

use. As the German Standard (DIN) which is completely incorporated into the Glossary is ordered in TA and as this information should not be lost, the Cross-references

- see: for hierarchically dominating terms and  
- compare: for hierarchically subordinated terms

enable the user with a computer to simulate Thesaurus access.

## 4.5 Some minor changes

### .1 Broken writing

All composed terms will appear in the Entry-List in two forms:

- Original form: i. e. "composed term"

- Broken form: "term, composed.\*"

the second one again with the Index-Number (plus\*) of the Original form in the Glossary appears in the Entry-List only, furnishing also a kind of TA (Par. 4.4).

### .2 Obsolete names

It seemed practicable for terms nowadays no more used, which nevertheless should be included in the Dictionary for the understanding of old literature, to introduce for these terms (mostly synonyms) not one but two remarks:

- "obsolete" for all those ones which are lingually no more used.

- "historical" for all those ones which were connected with ancient techniques, methods or instruments.

### .3 Abbreviation-List

Nowadays even a professional is not able to understand the headline of a paper due to the tremendous number of abbreviations or acronyms. Therefore, the dictionary should receive, besides the Glossary and Entry-Lists, a special Abbreviation-List with Index-Numbers referring to the long form in the Glossary.

## 4.6 Revaluation of Entry-List

Most of the a.m. activities (Par. 4) will result in an extended vocabulary in the Entry-List of the Glossary language. So it is indispensable to enter the Entry-List before using the Glossary. Therefore, it must be placed in the Dictionary directly after the Introduction and before the Glossary, while

the other Entry-Lists of Equivalentents will remain at the end.

#### 5. FINAL REMARKS

Some samples have been attached (Annexes 1, 2) to make clearer, due to limited space, the outlined proposals. Much more shall be shown and explained at the oral presentation including some figures about the relation between Term-paragraphs in the Glossary and Entries in the Entry-Lists.

#### 6. BIBLIOGRAPHY

Lindig, G.: Multilingual Dictionary for Photogrammetry and Remote Sensing. Int. Archive of Photogrammetry Vol.24, P.VI pp. 98-108, Mainz 1982

Lindig, G.: Status of Multilingual Dictionary (ISPRS) Int. Archive of Photogrammetry and Remote Sensing Vol. 25, P.A-6 pp. 199-208, Rio de Janeiro 1984

Lindig, G.: Status 1987 of ISPRS Dictionary, Int. Archive of Photogrammetry and Remote Sensing, Vol 27, P.B-6 pp. 98-107, Kyoto 1988

Lindig, G.: ISPRS Multilingual Dictionary, General Status and Progress of German Language Group, Archive of Photogrammetry and Remote Sensing, Vol. 29, P.B-6 pp. 328-333

Lindig, G.: German Technical Dictionary, Photogrammetry and Remote Sensing, Institut für Angewandte Geodäsie, Frankfurt a.M. 1993

Rabchevsky, G.: Multilingual Dictionary of Remote Sensing and Photogrammetry, The American Society of Photogrammetry, Falls Church, Virginia 1984

Sitek, Z.: Five Lingual Dictionary of Photogrammetry and Remote Sensing, Wydawnictow, Krakow 1990

Wolf, P.R.: Tri-lingual Glossary of Photogrammetry Terms, Int. Archive of Photogrammetry Vol 23, P.B-10 pp. 199-311, Hamburg 1980

#### Annex 1

#### Subject Fields with SF-Numbers

General Photogrammetry	01
Non-geodetic Applications	02
Mathematics	11
Error Theory	12
Adjustment Calculus	13
Terrestrial Control Survey	21
Cadastre	22
Land Consolidation	23
Imaging Techniques	31
Optics	32
Flight Operations	33
Photography	41
Laboratory Work	42
Analog Image Processing	43
Restitution	51
Field Check	52
Cartography	53
Topography	61
Map Revision	62
Terrestrial Photogrammetry	71
Close Range Photogrammetry	72
Special Applications	73
Digital Image Processing	81
Electronic Data Processing	82
Automation	83
Remote Sensing	91
Interpretation	92
Physics	93

<p>aberration n                  also: image defect*                  compare: coma, focal planes                  contrary: model deformation                  domain: Physics                  Def: At the optical imaging/ with systems of lenses/ or mirrors appearing errors/, which result in a non-point-forming reunion of conjugated rays/: aperture error/ or spherical aberration, chromatic aberration/, astigmatism/, curvature of field/, distortion/, coma/.                  D:Abbildungsfehler, Aberration, Linsenfehler (obsollet)                  F:aberration, défaut dû à une aberration?</p>	<p>60</p>
<p>abscissa n                  contrary: ordinate                  domain: Mathematics                  Def: In a system of two-dimensional, rectangular/ coordinates/ the distance of a point from the ordinate/ axis/(y) measured parallelly to the axis of abscissa/. At geodetic/ coordinates/ it is generally the (to the north counted) northing/; in the systems of mathematics and photogrammetry/ it is (to the right counted) X-value.                  D:Abszisse                  F:abscisse?</p>	<p>70</p>
<p>absolute atmospheric humidity n                  also: absolute humidity*                  contrary: relative humidity                  domain: Physics                  Def: Density of the steam in the air.                  D:(absolute) Luftfeuchte, (absolute) Luftfeuchtigkeit                  F:humidité absolue?</p>	<p>80</p>
<p>absolute flight altitude n                  also: flight altitude*, absolute flying height*,                  (flying) height above sea level*                  see: surface of reference                  compare: altimeter                  contrary: relative flying altitude, (flying) height above ground*                  domain: Imaging Technics                  Def: Flying altitude/ above the surface of reference/ at sea level.                  D:Flughöhe über NN (D), absolute Flughöhe (A), Flughöhe über Meer (CH)                  F:altitude de vol (absolue)?</p>	<p>90</p>
<p>absolute orientation n                  also: space orientation*                  see: orientation (6), two-step-orientation                  compare: elements of absolute orientation, elements of relative orientation, elements of exterior orientation, angle of tilt, rotation angle of model, model connection, model rotations, model orientation, mismatch, ground control                  contrary: relative orientation                  composition: analog absolute orientation*, numerical absolute orientation*                  domain: Restitution                  Def: As a part of the exterior orientation/ the space orientation/ of the model/ by the aid of ground control/. It determines the scale/ and the position of this model in the superior coordinate system/.                  D:absolute Orientierung                  F:orientation absolue?</p>	<p>100</p>
<p>absorbance n                  also: absorbtion</p>	<p>110</p>

Dummy-page of English Entry-List

Index	English Entries	D, F, Pl Indice	SF
10	Abbe's coefficient?	D: 60, F:nnn, Pl:nnn	32
20	Abbe's comparator principle?	D: 40, F:nnn, PL:nnn	32
30	abbr.?	D: 365, F:nnn, Pl:nnn	53
40	(abbr. for "small-scale topographic map")??	D:42155, F:nnn, Pl:nnn	53
50	abbreviation?	D: 370, F:nnn, Pl:nnn	53
60	aberration?	D: 140, F:nnn, Pl:nnn	32
70	abscissa?	D: 900, F:nnn, Pl:nnn	11
80	absolute atmospheric humidity?	D: 675 ,F:nnn, Pl:nnn	93
90	absolute flight altitude?	D: 14900, F:nnn, Pl:nnn	33
90*	absolute flying height*?	D: 14900, F:nnn, PL:nnn	33
80*	absolute humidity*?	D: 675, F:nnn, Pl:nnn	93
100	absolute orientation?	D: 680, F:nnn, Pl:nnn	51
110	absorbance?	D: 720, F:nnn, Pl:nnn	32
120	absorbing filter?	D: 750, F:nnn, Pl:nnn	31
130	absorbance?	D: 760, F:nnn, Pl:nnn	91
110*	absorbtion*?	D: 720, F:nnn, Pl:nnn	32

Language Groups  
ISPRS Dictionary

Annex 3

(Status: Dec.1995)

N°	Language		Chief Editors	
	Abb	Name	Name	Address
1	Ar	Arabic	N. AL-HOMAID	Research Institute, University of Petroleum and Minerals Dharan, Saudi Arabia
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6	G	Greek	P. AGOURIS	ETH Hoenggerberg CH-8093 Zürich, Switzerland
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