Standard Summary Project Fiche for the Transition Facility

1. Basic Information
1.1. CRIS Number: 2004/006-270.06.03
Twinning Light EE04-IB-AG-03
1.2. Title: Creation of orthophotos for Land Parcel Identification System
1.3. Sector: Agriculture
1.4. Location: Estonia

2. Objectives
2.1. Overall Objective:

Effective implementation of CAP support measures in Estonia with the support of a fully functioning Integrated Administration and Control System (IACS).

Project purpose:
Land Parcel Identification System (LPIS) under IACS is fully operational based on up to date orthophotos.

2.3. Justification

NPAA 2002-2003

Chapter 7: Agriculture: “In April 2002 the preparation of Aerial photos will be completed. Orthophotos will be ready by the end of 2002. This activity was originally planned for Spring 2001 but was postponed by one year due to the unsuitable weather conditions. Hence the postponing of deadline of digitalization of field massifs until 2003. The digitalization is continued on the basis of existing orthophotos and six out of fifteen counties are planned to be digitalized by May 2002.

2003 Comprehensive Monitoring Report from the Commission on Estonia’s Progress towards Accession

Chapter 7: “With regard to the Integrated Administration and Control System (IACS), Estonia has made good progress so far, but much remains to be done if Estonia is to have a fully functioning system by accession. Digitalization of orthophotos remains to be finalized. Estonia must ensure that state aid measures in the field of agriculture are brought in line with the acquis at the time of accession.”

3. Description

3.1. Background and justification:

Upon signing the Europe Agreement the Republic of Estonia has agreed to adopt the whole acquis communautaire on the date of accession to the European Union starting from May 1st, 2004. The agricultural sector in the EU is highly regulated in the framework of CAP. The objectives of the CAP are achieved by supporting the EU farmers with a number of measures and protecting them against the influence of the world markets. The CAP is implemented through different mechanisms: (1) market
regulation (including intervention measures); (2) direct payments; and (3) rural development measures.

In the EU the whole administration of the CAP is supported by Integrated Administration and Control System (IACS). IACS is a system for administration and control of EU finances, direct payments according to regulations 3508/92/EEC and 2419/2001/EEC. The main elements of IACS are:

- computer database;
- common identification system and register of land parcels;
- common registration system of animals and the register;
- applications for grants;
- integrated control system.

Council Regulation (EEC) No 3508/92 of 27 November 1992 establishing an integrated administration and control system for certain Community aid schemes foresees in its Article 4:

The alphanumeric identification system for agricultural parcels shall be established on the basis of land registry maps and documents, other cartographic references or of aerial photographs or satellite pictures or other equivalent supporting references or on the basis of more than one of these elements.


1. An area aid application shall contain all information necessary to establish eligibility for the aid, in particular:

   (b) particulars permitting identification of all agricultural parcels on the holding, their area expressed in hectares to two decimal places, location, use, whether the agricultural parcel is irrigated, and the aid scheme concerned;

Ortho-photos form the basic data for creating LPIS. So far mainly aerial photos have been used as the basis for orthophotos in Estonia. They have been photographed over several years and therefore are not consistent. Right now most of the photo images that are used, have been taken during 1996-2002. The most recent photos that cover approximately ½ of the territory of Estonia were made in the framework of the Phare project ES 0008.01. The LPIS, which was ordered in the framework of the same project, is currently being used in Agricultural Registers and Information Board (ARIB). The other half of the territory was covered with previously taken images. However, most of the already existing old images are outdated and not accurate enough for the purposes of IACS in order to fit the EU requirements for the land parcel register.

IACS needs accurate basis for the validation of data on applications for support. According to the IACS requirements, land parcels register must be based on electronic map of high accuracy (1 pixel exceeding 1 m) and application of Geographical Information System (GIS).

Data must be renewed in every 5 years because of possible changes in the land parcel structure. Member States of the EU have used digitalized orthophotos for achieving
the required accuracy and updating the data. The requirement to renew the orthophotos after every 5 years is also one of the main purposes for applying to this project, after which the whole territory of Estonia is covered with digitalised orthophotos of necessary quality.

Land parcel register cannot be fully utilized according to the EU requirements on IACS before covering the rest of the territory of Estonia with new orthophotos, digitalizing photos and development of alpha-numeric database. This kind of project also results in closer co-operation between ARIB and Land Board, as both of them are the users of the images. Currently The Land Board is the owner of the general national register, the Land Cadastre. Thus, the efficient co-operation between Land Board and ARIB is of great importance. The institutions have already collaborated during previous Phare projects. Last images taken by Land Board date back to 1999. The objective of the maintenance of the Cadastre is to register information in the Cadastre reflecting the value of land, the natural status of land and the use of land, and to ensure the quality of such information and that it is preserved and made available to the public. Ortho-photos will be used mainly by ARIB, and Land Board will receive a copy of the entire database formed after the end of the project.

The project will ensure the continuous harmonization to EU standards and measures. Well functioning and requirements fulfilling IACS (and therefore also LPIS) would benefit the overall institution building in the network of ARIB.

The processing of orthophotos also creates a need for additional investment under this project. Since the optical resolution of the orthophotos increases, there is also a linear increase in the size of data files for which graphic workstations are needed. Entire landscape of Estonia has been divided into graphic map sheets with sizes of 25 km². When the resolution of a photo is 0.6 m per pixel, the size of the image file is approximately 400MB. Since the part of processing of orthophotos will be performed in ARIB, powerful computer equipment is required for that. The reason why the processing is needed is, that the photos made during different flights do not fully match with each other and need to be processed. There is also a need to perform a quality control on the orthophotos that are received from the contractor. This includes the comparison of different raster and vector materials. Furthermore, the indexation for the LPIS system is performed and transported into the file server from removable media with the help of graphic workstations.

Software licenses have to be procured for the usage of database based on orthophotos additional software. Since the number of users will increase, additional software licenses will be needed. There is a need to do additional geo-info processing of created images in ARIB, therefore it is essential to procure additional software licenses. The software is used to image vector and raster info in LPIS and to control the subsidies via graphics of LPIS, whereby the quality of the control would improve considerably.

File server extension (with backup device) and database server extension should also be procured, installed, tested and fully functioning. The existing database will be updated with new images. Additional images consume more space than currently available. Therefore, to maintain the existing level of high speed and quality, additional file server extension needs to be implemented. Approximately 1000 new photos will be made in the course of the project. Every photo is 400 MB .tif and 50 MB .ecw fail, which demands 0.5-0.6 TB disc capacity. It is also important to guarantee the fast
availability of the data and the preservation of the data through security measures that expand the need for additional capacity of software.

Created images will have to comply with the general standards set by the EU. Therefore thorough expertise and quality control is needed to guarantee the desired outcome. This activity includes twinning as main provider of expertise.

**Technical procedure of procurement of orthophotos**

ARIB together with Estonian Land Board (LB) prepare technical specifications, whereas LB will offer technical data for stereo-mapping. The tendering will follow with a company contracted that performs aerophotos and orthophotos, whereas LB will provide technical data for flights (GPS, the data on state geodetical network). Then the company will proceed with flights and making the aerophotos that will be followed by development of film. After the development of film comes the first quality control. The company provides flight technical information (GPS and mark of the film) and additionally a sample of a developed film. This control will be completed simultaneously by LB and an independent company that performs the control. This control is necessary to identify major mistakes in flights that might result in new flights. At the same time the company, making the flights, proceeds with scanning of films and making the orthophotos. The area will be divided into 3 parts and for each part the orthophotos together with the films are presented as soon as each area is ready for Estonian partners. The original films will be presented to LB for archiving and both, ARIB and LB will get the digital copies of the orthophotos.

After that the LB will start with stereo-mapping and reports the mistakes found to ARIB in the course of secondary control.

ARIB will present the orthophotos to the controlling company, who will prepare a comprehensive report.

Orthophotos’ creation process control work is very complicated, needs very high-level experience and must be independent. Thus, quality control cannot be provided only by ortophotos producer himself. Although additional quality control will be provided by ELB, an independent and focussed body is vital for ensuring the high quality of the orthophotos and compliance with the EU requirements. ARIB specialists will provide final product control in cooperation with twinning experts.

This is followed by digitalisation, resulting in digitised base parcels. ARIB’s main function is to use the orthophotos on the administration of area aid support payments. For that ARIB brings out the map for each farmer and the farmer draws his fields on the map. ARIB performs cross-checks on all applications to find overlaps on base parcels. The applications are not digitalised on the orthophotos. Therefore, ARIB does not have any major capacity to digitalise all the base parcels as they are only able to perform corrections in base parcels.

The role of ARIB is to coordinate the establishment of the technical conditions for tenders and to assist the companies that conduct the tenders in receiving the initial data to carry out necessary works. ARIB also organises the technical control of the aero- and orthophotos. The controllers of a Registers and Control Department in ARIB, who are responsible for maintenance and control of GIS system, also have to
inspect the ordered control works in the future. Therefore, they must have a good knowledge of the process of producing the aerophotos (including aerotriangular works, planning of flights, the cameras and films used, scanning, digital treatment of aerophotos and the administration of graphic files). Due to this, the training, foreseen under twinning on creation of orthophotos and maintenance process, is necessary for 10 persons.

As a result of the study tours and the trainings carried out by the twinning experts, the specialists in ARIB will be able to control the process of producing and the quality of digital orthophotos. The trainings will include all aspects of the procedure of making the photos, implementing them, using special image processing software and performing an effective quality control. The trained specialists shall continue the control function of the digital orthophotos under ARIB in the future.

In the institution building component, the task of the Project leader is reporting and co-ordination of the project (including the tendering process). In addition, the project leader is responsible for the procedure of hiring experts and other technical tasks.

Preparation of the tender documentation should start by May 2004 in order to launch the tender at the same time as the twinning light, thereby accelerating the implementation of the project. Support from the Phare 2002 PPTMF is available for this purpose.

Short-term expert 2 is responsible for quality control issues helps to draft a detailed plan for the quality control management in ARIB system. The expert also analyses the possible quality problems that the Land Board has discovered in a report.

Considering the nature of the project, no NGO-s were consulted during the project preparation process. The project aims at institution building at the central government level and the NGO-s are not seen as directly benefiting or having a role in the project’s activities.

3.2. Linked activities:

<table>
<thead>
<tr>
<th>Project no</th>
<th>Name</th>
<th>Amount EUR</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>ES 0008.01</td>
<td>Development of Agricultural Support System Administration”</td>
<td>1 980 000</td>
<td>On-going</td>
</tr>
<tr>
<td>2002/000-579.05.03</td>
<td>Development of Agricultural Information System</td>
<td>3 381 000</td>
<td>On-going</td>
</tr>
</tbody>
</table>

3.2.1. Phare 2000 project no ES0008-1 “Development of Agricultural Support System Administration”

The main objective of the project was to prepare the agricultural administration for its responsibilities in implementing the CAP, by helping to develop the ARIB, the main institution responsible for the administration of CAP mechanisms and national support schemes.

Connecting points:
- Under the project about 23 000 km² were covered with EU compliant orthophotos;
• Creating Geographical Information System, which is currently working, based on MapX client and ORACLE database;
• Procuring necessary hardware and software: four graphic workstations (technically today regular PC-s), file server for digital orthophotos and database server with ORACLE software.

Budget for the project: 1.98 MEUR  
Project duration: December 2002 - December 2003

3.2.2 2002/000-579.05.03 Development of Agricultural Information System

The expected results of the project are:
1. Installation of functioning Integrated Administration and Control System (IACS) for administering CAP direct support measures and its connections with agriculture environment area based measures of regulation No. 1257/1999.
2. Information system established for veterinary control purposes for the animal identification and movement control.

Direct connection to current project is using orthophotos for identifying animal location places – veterinary holdings. This is the most effective way to identify where agricultural animals are located in timeline. Also the orthophotos created under current project will be the basis for administering CAP direct support measures.

Implementation time is 2003-2004.

The budget is € 1.363.700 for twinning, € 1.800.000 for software development and € 217.300 for IT equipment.

3.3 Results

3.3.1. 8 employees of ARIB, who will be responsible for the operations of LPIS (IACS), able to efficiently use and control orthophotos(contract 1)

3.3.2. Aerial photos of the marked areas delivered, of controlled quality (contract 2)  
The exact areas will be defined during the feasibility study.

3.3.3. Orthophotos fulfilling EU requirements for LPIS covering 23 000 km² are created according to the requirements set by the EU administrative guidelines and thus cover the rest of the areas that need to be updated with new images (remaining areas other than in project ES0008.01). (contract 2)

3.3.4 Quality control of the orthophotos creation process performed (contract 3)

3.3.5 Operative LPIS fed with necessary ortho-photos (23 000 km²) of high quality produced (contract 1)

3.4. Activities:

3.4.1. Contract 1: Twinning light package (8 consecutive months) 55 000 EUR (TF 47 000 EUR, co-financing 8 000 EUR)
3.4.1.1 **MS Project Leader:** Input: 10 working days over 8 consecutive months (4 visits, TF 10 000 EUR).

**Tasks:**
- Co-ordination of work of team members;
- Reporting;
- Overall coordination of project activities and short term experts inputs with back-office support;
- Evaluation of the progress of the project;
- Controlling and approval of the documentation prepared by the Short-Term experts;
- Preparation of an overall training plan
- Organising the study tour.

**Profile:**
- Higher education;
- Thorough knowledge of EU administrative and legislative guidelines;
- At least 5-year working experience with the LPIS based on orthophotos or at least 5-year experience of participating in the production process of orthophotos;
- Expert must be employed in the field of orthophotos production or LPIS utilization at the present time;
- Excellent computer skills;
- Working languages- excellent fluency in English.

3.4.1.2 **Short-term expert 1** in technical aspects of creating orthophotos  
Technical adviser: 20 working days over 8 consecutive months (4 visits, TF 12 000 EUR).

**Tasks:**
- Supporting on technical aspects for creating orthophotos;
- Organising necessary preliminary work for making of aerial photos;
- Participating in tenders evaluation committee
- Coordination of making orthophotos;
- Reporting to the project manager.

**Profile:**
- Higher education;
- At least 5-year working experience with the LPIS based on orthophotos or at least 5-year experience of participating in the production process of orthophotos;
- Expert must be employed in the field of orthophotos production or LPIS utilization at the present time;
- Working languages- excellent fluency in English.

3.4.1.3 **Short-term expert 2** in technical quality control of ortophotos  
Technical adviser: 20 working days over 8 consecutive months (4 visits, TF 12 000 EUR).
Tasks:

- Teaching and organizing study tour for ARIB staff concerning:
  - Technical control of the film used for aerial photos;
  - Control of the visual quality of the aerial photos;
  - Quality control of the orthophotos according to the technical documentation underlying the tendering;
- Comparison of the results of quality control with the quality control performed by the Land Board;
- Supporting in the technical aspects of creating orthophotos;
- Reporting to the project manager.
- Drafting a detailed plan for the overall quality control management in ARIB system

Profile:

- Higher education;
- At least 5-year working experience with the LPIS based on orthophotos or at least 5-year experience of participating in the production process of orthophotos;
- Expert must be employed in the field of orthophotos production or LPIS utilization at the present time;
- Working languages- excellent fluency in English, Estonian is recommended;
- Experience in quality control of orthophotos.

3.4.1.4 Study tour: 8 participants, 5 days, 17 000 EUR (TF 9 000, co-financing 8 000)

The Phare 2000 project did not include training for staff dealing with digital orthophotos. However, according to ARIB experience in the project it was concluded that quality control must be done effectively and also controls must be controlled. Study tour will be organized for the employees of ARIB to increase the knowledge and capacity in the field of making aerial photography, orthophoto production, quality control and using LPIS.

Study tour consists of two parts:

1. Study tour to twinning partner country (4 persons – 5days)
   - Overview about LPIS and IACS;
   - Orthophotos development process;
   - Maintaining digital orthophotos and vector information;
   - Image processing software tools;
   - Visiting company dealing with aero- and orthophoto production and digitalization.

2. Study tour for visiting JRC (4 persons – 5 days)
   - Overview about legislation changes;
   - Quality checking of Ortho Imagery;
   - Data controlling methods;
   - Updating Base Parcel data.
The main aim of the study tour will be providing the participants with the possibility to monitor the operative usage of LPIS and IACS in supporting the direct support payments system. Special training for using image processing software on a professional level must be done. The experience of ARIB is not yet sufficient to guarantee the most effective management of the whole process of producing aerial and orthophotos in their subsequent fields (supervision of quality control, using LPIS) as there has been no previous training in the aforementioned specific areas for ARIB.

ARIB will be responsible for the coordination of the study tour. There will be 8 ARIB specialists participating in the study tour. Study tour will last approximately 5 days. Travelling costs of the participants of the study tour will be covered from national co-financing.

3.4.2. Component 2: contract(s) for aerial and orthophotos 350 000 EUR (262 000 EUR TF, 88 000 co-financing)

The cost and implementing arrangements for component 2 (number and nature of contracts) of component 2 will be specified on the basis of the feasibility study. The current price estimation is based on similar tenders from the Phare 2000 project no ES0008-1, where the work amount and the area covered was approximately the same (total 357 650 EUR, out of which the aerial photos cost 162 150 EUR and orthophotos 195 500 EUR).

3.4.2.1 Marking ground control points.

This includes marking necessary boundaries on the ground for areas that need to be covered with new updated images. When ground control points are marked with white plastic, areas that need to be covered with aerial photos are easily located during the flights. When the aerial images are taken, they will be placed to right positions in the graphic workstations according to the marked boundaries.

3.4.2.2 Making flights for aerial photography.

Flights are made to create images of the marked areas. This activity includes booking the flights and crew with relevant competence. Aerial photos will be used as the bases for creating orthophotos.

3.4.2.3 Creating orthophotos.

Aerial photos will be processed in workstations equipped with necessary tools and orthophotos will be created. This activity includes locating the necessary equipment and staff and processing the taken images.

3.4.3 Contract 3: Service contract for expertise and quality control of orthophotos creation process (20 000 EUR TF)

3.4.3.1 Carrying out expertise and quality control of orthophotos creation process

Created images will have to comply with the general standards set by the EU. Therefore thorough expertise and quality control is needed to guarantee the desired outcome. Preliminary quality control will be performed under twinning.
Since Land Board is going to be one of the beneficiaries of the project, they will also have to conduct an additional quality control.

The cost of contract 3 will be specified on the basis of feasibility study. ARIB needs two experts to perform the quality control. One of the experts controls the process on sight and evaluates the quality of the films (approximately 10 days). The other expert performs the quality control of the orthophotos (~2% of the photos, approximately 30 working days). The price calculation is based on previous experiences of ARIB and common expert fees of quality controllers.

3.5. Lessons learned:

On general management, in the Interim Evaluation Report No IE.EE.AGR.02.043 prepared by EMS, Estonia stated the following recommendations:

Chapter 4 Recommendation 4.1.7:

- The Ministry of Agriculture should introduce closer and more formal monitoring of all projects and alert the Ministry of Finance and the EC Delegation of any inconsistencies in their implementation. Immediate action should be taken, if necessary, to re-allocate funds within the project budget and within the Program.
- The Ministry of Agriculture and the Ministry of Finance should enforce the contingency of Phare/TF assistance concerning co-operation of the agencies in the agriculture sector to ensure regular and efficient information exchange, prevent the misunderstanding and time loss. (See below)

Based on the negative experience of the previous project (2000 IACS Phare project), we find it vital to avoid delays in the project. Such delays may occur due to the lack of human or financial resources, lack of dedication or essential misunderstandings of the project activities.

Therefore, 2 persons are additionally hired already in MoA to monitor the overall activities of the PHARE projects and provide technical assistance for project management. A Steering committee will be formed at the start of the project activities and quarterly reports presented to ensure the identification of the problems at the early stage enabling to find solutions in time. The Steering committee will also make all proposals and decisions concerning the possible re-allocation of funds.

Project activities will be revised according to the results of the independent feasibility study (ready by March), which will ensure the relevance and efficiency of the project. The feasibility study experts will also review the preliminary technical specifications of the equipment, which will help to start the procurement procedures right at the start of the project avoiding the delays.

Project audit will be completed at the end of the project to evaluate the project results.

The following problems occurred during the implementation of 2000+ project on orthophotos that need to be taken into account in this particular project:

- There is mismatch of EU compliant orthophotos already in 2004 because there is no plan for regular renewal of orthophotos over Estonia; (see part 8 on sustainability for plan for future renewal)
• There can be flight restrictions on Russia-Estonia borderlands. Lots of paper work must be done before flights and there is a possibility to cover those areas with satellite images of some accuracy;
• Estonian Land Board does not have enough specialists for effective quality control, this work must be done by experts;
• Tenders for aerophotos and orthophotos must be joined, this option gives possibility to resolve problems made in flight times, as there is months split between these two jobs and some necessary information can be lost;
• ARIB must educate specialists to have good understanding about aerowe images processing works and data provided by tender winners that is also foreseen in the study tour of the particular project.

4. Institutional Framework

The Ministry of Agriculture will be the Estonian co-ordinator of the project. The direct beneficiary is the Agricultural Registers and Information Board (ARIB). The project implementation will take place with the help of ARIB. ARIB will also be the owner of the database. Some cooperation will take place between ARIB and Land Board. Both ARIB and the Land Board will benefit from the upgraded database that fits the regulations of the EU facilities. Land Board will receive a copy of the images and database and will perform an additional quality control.

ARIB is an agency under the Ministry of Agriculture. The main tasks of ARIB are to administrate SAPARD and national agricultural subsidies, after accession to act as a paying agency for EU direct payments, to keep the registers concerning agricultural and other databases, processing and analysing the data. ARIB is also responsible for the development of the Integrated Administration and Control System (IACS) and Market Regulations measures.

For digital orthophoto management ARIB uses specialists from geo-informatics unit (4 specialists) and from the field register unit (6 specialists). Thus, altogether there are 10 persons working with the orthophotos which is a sufficient number of workforce to manage the digital orthophotos.

The Estonian Land Board was established in 1990 for the implementation of the land policy of the Government of Estonia. The Estonian Land Board (ELB) is responsible to the Minister of Environment for the maintenance of the Land Cadastre, coordination and execution of land reform in the conformity with valid laws, supervision, organisation and co-ordination of the activities in the field of land consolidation, land assessment, geodesy, cartography, geographical information. The Land Board also manages contracts for cadastral and geodetic surveys, and for topographic mapping.

5. Detailed Budget (to be revised after the results of feasibility study to be completed in March 2004)

<table>
<thead>
<tr>
<th>Contract 1: Twinning light package</th>
<th>Transition Facility Support</th>
<th>Total TF(=I+IB)</th>
<th>National Cofinancing*</th>
<th>IFI* TOTAL</th>
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<td>ARIB</td>
<td>47 000</td>
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<td>STE 1: Technical aspects of creating orthophotos</td>
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<td>STE 2: Technical quality control</td>
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<td>Study tour</td>
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<td><strong>Component 2:</strong> Service contract for aerial and orthophotos</td>
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<td>Contract 3: Service contract for expertise and quality control of orthophotos creation process</td>
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<td>Contract 4: Procurement of equipment (parallel co-financing)</td>
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<td>Extending image file service and procurement of necessary equipment</td>
<td>105 000</td>
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<tr>
<td>Procurement of graphic workstations</td>
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<td><strong>Contract 5:</strong> Digitalizing base parcel borders in the database (parallel co-financing)</td>
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<td><strong>Total</strong></td>
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<td>329 000</td>
<td>286 000</td>
<td>615 000</td>
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The amounts of co-financing indicated in the table correspond to cash co-financing. In addition, in kind contributions from the Estonian administration for a good implementation of the twinning may be detailed in the terms of reference.

The co-financing expenses will be monitored by the beneficiary and the NAO. For the earmarked co-finance, a clear and verifiable set of costs will be provided (ex ante confirmation by the MoF of exact budget lines and re-confirmation before each contract within either of the two components) and ex post for each project and at an aggregate level for each budget line. Flow and stock data on co-finance will be submitted quarterly for steering committees and to the CFCU and on a half-yearly bases to the Sector Monitoring Working Group.

The beneficiary, together with the NAO, commits to sound financial management and control.

**National co-financing**

<table>
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<th>National co-financing</th>
<th>2005</th>
<th>Total</th>
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<tr>
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<tr>
<td>Total national co-financing</td>
<td>286 000</td>
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</table>
National co-financing will be used for Contract 1 (twinning light package) for the study tour where travel expenses of the trainees will be covered from parallel co-financing. For contract 2 joint co-financing will be used.

Additional activities are needed for successful results of the current project. Not eligible under TF but important for this project, several services and equipment will be provided from national parallel co-financing:

Contract 4: Procurement of equipment (150 000 EUR parallel co-financing):
Extending image file server and procurement of necessary equipment (105 000 EUR)

Because of the growth in data volumes additional backup device has to be procured for the file server. Also the database server will be upgraded for the usage of extended database.
The existing database will be updated with new images. Additional images consume more space than currently available. Therefore, to maintain the existing level of high speed and quality, additional file server extension needs to be implemented. Approximately 1000 new photos will be made in the course of the project. Every photo is 400 MB .tif and 50 MB .ecw fail, which demands 0.5-0.6 TB disc capacity. It is also important to guarantee the fast availability of the data and the preservation of the data through security measures that expand the need for additional capacity of software. The system also needs some additional equipment i.e back-up devices, UPS and high-speed switch.

- Procuring graphic workstations (35 000 EUR)

Processing taken images and creating orthophotos requires special graphic workstations. These stations need to be ordered and provided with suitable equipment. ARIB specialists in registers department must do some of the processing of photos themselves, since photos taken during different flights do not match directly with each other. There is also a need to perform a quality control on the orthophotos that are received from the contractor. This includes the comparison of different raster and vector materials. Workstations must be specially designed for CAD works with Intel Titanium or RISC 1-2 processors, 64-bit processing performance and capacity, minimum 1 GB DDR SDRAM, with SCSI hard disks and 1 GB network card. Workstation configuration must include 2 monitor supported graphics card for professional 2D/3D works.

- Procuring software licenses (10 000 EUR)

Licenses are procured for the usage of database based on orthophotos additional software. Since the number of users will increase, additional software licenses will be needed. There is a need to do some additional processing of created images in ARIB, therefore it is essential to procure additional software licenses. Software must allow desktop image processing and analysis and must include full set on image display, enhancement and manipulation tools. ARIB specialists can use this software tool also for processing satellite images will be used in border areas or remote sensing.

Contract 5: Digitalizing base parcel borders in the database (40 000 EUR parallel co-financing)
Base parcel border will be digitalized, updated and usable in the database for administering CAP measurements for the direct payments support system to farmers.
ARIB specialists have experience about digitalization and they will make quality control about digitalization process. Digitalization must be done in large area. Approximately 150,000 base parcels must be digitalized or checked in short time period.

6. Implementation Arrangements

6.1 Implementing Agency

The CFCU will be the Implementing Agency responsible for tendering, contracting and accounting. Responsibility for the technical preparation, implementation and control will remain with the beneficiary institution.

ARIB will carry the responsibility for the technical preparation, implementation and control. ARIB will also be the beneficiary of the project.

**PAO:**
Mr. Renaldo Mändmets  
Ministry of Finance  
Deputy Secretary General  
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15006, TALLINN  
Ph. +372 6113 545  
[Renaldo.mandmets@fin.ee](mailto:Renaldo.mandmets@fin.ee)

**PO:**  
Mr. Olavi Petron  
Ph. +372 6256 255  
[olavi.petron@agri.ee](mailto:olavi.petron@agri.ee)  
Deputy Head of Department of Public and Foreign Relations  
Ministry of Agriculture  
Lai 39/41  
15056 TALLINN

**Project manager** will ensure the timely and satisfactory performance of the beneficiary institution and coordination of the project activities.

**Project manager:**
Mr. Teet Eomäe  
Head of Registers Department  
Agricultural Registers and Information Board  
Narva mnt. 3, TARTU  
Ph. +372 7371 239  
[Teet.Eomae@pria.ee](mailto:Teet.Eomae@pria.ee)

A Steering Committee will be set up, chaired by the Vice Chancellor of the Ministry of Agriculture. The members of the Committee will be officials of Ministry of Agriculture and ARIB and representatives from the Ministry of Finance, a representative from the European Commission as appropriate, CFCU, Land Board.
Project Steering Committee will meet quarterly and discuss the project activities. Project activities will be approved at least once in 3 months to discuss the progress of the project.

6.2 Twinning

The direct beneficiary of the twinning light package is ARIB in Estonia.

**Estonian Project leader (should be higher level):**
Jaanus Hämmal
Councilor
Estonian Agricultural Registers and Information Board
Narva mnt. 3, TARTU
Phone: +372 7 371200
Fax: +372 7371201
E-mail: Jaanus.Hammal@pria.ee

**Estonian project manager:**
Mr. Teet Eomäe
Head of Registers Department
Agricultural Registers and Information Board
Narva mnt. 3, TARTU
Ph: +372 7371 239
E-mail: Teet.Eomae@pria.ee

6.3. Non-standard aspects

No non-standard aspects are foreseen.

6.4. Contracts

Expected number of contracts: 3 with TF financing and 2 from parallel co-financing (as shown in detailed budget, section 5). The exact number of contracts might be revised on the basis of the recommendations of the feasibility study.

**Contract 1.** Twinning light package
Total budget for the contract 57 000 EUR (TF 47 000, national co-financing 8 000 EUR).

**Contract 2.** Service contract for aerial and orthophotos.
Total budget for the contract is 350 000 EUR (TF 262 000 EUR, joint co-financing 88 000).

**Contract 3.** Service contract for expertise and quality control of orthophotos creation process
Total budget for the contract is 20 000 EUR (TF 20 000 EUR)

**Contract 4.** Procurement of equipment (parallel co-financing).
Total budget for the contract is 150 000 EUR.

**Contract 5.** Digitalizing base parcel borders in the database (parallel co-financing).
Total budget for the contract is 40 000 EUR.
7. Implementation Schedule

7.1 Start of tendering/call for proposals
June 2004
(Feasibility study and project specifications will be ready in March 2004).

7.2 Start of project activity
October 2004

7.3 Project Completion
September 2005

8. Sustainability

As the establishment of the CAP administration (including fulfilling all the requirements) is one of the prerequisites for EU accession, the project outcome is sustainable. Financial sustainability will be guaranteed and Estonian Government will cover future maintenance and operation costs of the existing database through ARIB’s general budget. An appropriate number of staff is employed by ARIB to implement the project and carry on with necessary activities arising from the project. For digital orthophoto management ARIB can use specialists from geo-informatics unit (4 specialists) and from field register unit (6 specialists).

Regarding the regular updating of orthophotos, the Land Board is currently considering to procure digital camera to provide orthophotos to all the state agencies who need them. The principal decision for this is made and the Land Board is preparing the technical specifications for the camera. However, ARIB still has to perform supervision over the quality control of the final product in the future for the usage of orthophotos for agricultural purposes.

Replacing orthophotos with satellitephotos is theoretically possible. However, according to ARIB’s analysis the satellite photos of the same quality are much more expensive than orthophotos. During the implementation of the PHARE 2000+ project, ARIB ordered satellitephotos of the border areas as the Russian Federation did not give permission to fly in these areas. Still, the possibility ought to be considered by the feasibility study expert. Also, the Board of Border Guard has been interested in the usage of the satellite photos in the border areas.

12. Conditionality and sequencing

Conditionality
Activities to be carried out before the commencement of the project:

Feasibility study completed in March 2004. A further evaluation of the necessary budget (up to the maximum foreseen in the fiche) for the investment components will be carried out on the basis of the results of a feasibility study when available. Any additional cost will be borne on national co-financing. Contracts 2 and 3 are conditional upon the results of the feasibility study.

Sequencing
1. By May 2004, detailed terms of reference and tender dossiers for contracts 1, 2 and 3 should be prepared. The 2002 Phare PPTMFTechnical assistance is available for this purpose.

1. Twinning must start before other activities, as some advice is needed in the preparation of technical specifications for aerial and orthophotos. It should carry on until all contracts are tendered.
2. Aerial photos must be ready before the orthophotos can be made.
3. After the orthophotos are completed, additional equipment must be procured to maintain quick availability of photos and guarantee security measures.

**ANNEXES TO PROJECT FICHE**
1. Logical framework matrix in standard format
2. Detailed implementation chart
3. Contracting and disbursement schedule by quarter
4. Reference to feasibility /pre-feasibility studies
5. List of relevant Laws and Regulations
6. Structural scheme of MoA and ARIB
7. Technical specifications and indicative prices of the equipment
## LOGFRAME PLANNING MATRIX FOR *Creation of orthophotos for Land Parcel Identification System*

<table>
<thead>
<tr>
<th>Program name and number:</th>
<th>Contracting period expires: 15/12/2006</th>
<th>Disbursement period expires: 31/12/2007</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total budget:</strong> 615 000 EUR</td>
<td><strong>TF budget:</strong> 329 000 EUR</td>
<td></td>
</tr>
</tbody>
</table>

### Overall objective

**Effective implementation of CAP support measures in Estonia via development of Integrated Administration and Control System (IACS).**

<table>
<thead>
<tr>
<th>Objectively verifiable indicators</th>
<th>Sources of Verification</th>
<th>Assumptions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compliance with the relevant EU directives and administrative regulations. Operative database for administering direct payments support system.</td>
<td>• Progress Report by the Commission. • Official statistics and reports.</td>
<td>• Good co-operation between ARIB and Land Board. • Availability of resources in terms of equipment and staff of ARIB</td>
</tr>
</tbody>
</table>

### Project purpose

**Land Parcel Identification System (LPIS) under IACS is fully operational based on up to date orthophotos.**

<table>
<thead>
<tr>
<th>Objectively verifiable indicators</th>
<th>Sources of Verification</th>
<th>Assumptions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Aerial photos covering 23 000 km² are taken. 2. Orthophotos are processed and database updated for the usage of ARIB and Land Board. 3. IT systems for data processing and digitalization are extended.</td>
<td>• Project reports. • External audit report. • Existing database reports.</td>
<td>• Good co-operation between ARIB and Land Board. • Availability of resources in terms of equipment and staff of ARIB</td>
</tr>
</tbody>
</table>

### Results

<table>
<thead>
<tr>
<th>Objectively verifiable indicators</th>
<th>Sources of Verification</th>
<th>Assumptions</th>
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</tbody>
</table>
3.4.1.1 MS Project Leader:
- Co-ordination of work of team members;
- Reporting;
- Overall coordination of project activities and short term experts inputs with back-office support;
- Evaluation of the progress of the project;
- Controlling and approval of the documentation prepared by the Short-Term experts;
- Preparation of an overall training plan
- Organising the study tour.

3.4.1.2 Short-term expert 1 - Technical aspects of creating orthophotos:
- Supporting in the technical aspects on creating orthophotos;
- Organising necessary preliminary work for making of aerial photos;
- Coordination of making orthophotos;
- Reporting to the project manager.

3.4.1.3 Short-term expert 2 - Technical quality control of orthophotos:
Teaching and organizing study tour for ARIB stuff concerning:
- Technical control of the film used for aerial photos;
- Control of the visual quality of the aerial photos;

<table>
<thead>
<tr>
<th>Contract 1: Twinning light package (8 months)</th>
<th>TF</th>
<th>Estonia</th>
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</thead>
<tbody>
<tr>
<td>MS Project Leader: Input: 10 working days over 8 consecutive months</td>
<td>47 000 EUR</td>
<td>8 000 EUR</td>
</tr>
<tr>
<td>STE 1: 20 working days over 8 consecutive months</td>
<td>12 000</td>
<td></td>
</tr>
<tr>
<td>STE 2: 20 working days over 8 consecutive months</td>
<td>12 000</td>
<td></td>
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</table>

Estonia 8 000 EUR

Suitable experts found.
- Quality control of the orthophotos according to the technical documentation underlying the tendering;
- Comparison of the results of quality control with the quality control performed by the Land Board;
- Supporting in the technical aspects of creating orthophotos;
- Reporting to the project manager.
- Draft a detailed plan for the overall quality control management in ARIB system

3.4.1.4 Study tour: 10 participants, 7 days

<table>
<thead>
<tr>
<th>Audit</th>
<th>Reserve</th>
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<tr>
<td>9 000</td>
<td>8 000</td>
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</table>

**MS Project Leader is responsible for organizing the study tour**

3.4.2. Contract 2: Service contract for aerial and orthophotos

- 3.4.2.1. Marking ground control points.
- 3.4.2.2. Making flights for aerial photography.
- 3.4.2.3. Creating orthophotos.

3.4.3. Service contract for expertise and quality control of orthophotos creation process

- 3.4.3.1 Carrying out expertise and quality control of orthophotos creation process

<table>
<thead>
<tr>
<th>Contract 4: Procurement of equipment (parallel co-financing)</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Extending image file server and procurement of necessary equipment</td>
</tr>
<tr>
<td>- Procuring graphic workstations</td>
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<tr>
<td>- Procuring software licenses</td>
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<thead>
<tr>
<th>Contract 5: Digitalizing base parcel borders in the database (parallel co-financing)</th>
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<tbody>
<tr>
<td>40 000</td>
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<tr>
<td>Preconditions</td>
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<tr>
<td>---------------</td>
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<tr>
<td>2. Preparation of detailed project documentation by ARIB.</td>
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</table>
## TIME IMPLEMENTATION CHART

**Project N°: ES**
**Project Title: Creation of orthophotos for Land Parcel Identification System**

<table>
<thead>
<tr>
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<th>2004</th>
<th>2005</th>
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<tbody>
<tr>
<td><strong>Contract 1: Twinning light</strong></td>
<td>TTTTC</td>
<td>I II I I</td>
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<tr>
<td><strong>MS Project Leader</strong></td>
<td>I I</td>
<td>I I</td>
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<tr>
<td><strong>Short term expert 1</strong></td>
<td>I I</td>
<td>I I</td>
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<tr>
<td><strong>Short term expert 2</strong></td>
<td>I I</td>
<td>I I</td>
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<tr>
<td><strong>Study tour</strong></td>
<td>I</td>
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<tr>
<td><strong>Audit</strong></td>
<td>I</td>
<td></td>
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<tr>
<td><strong>Contract 2: Service contract for aerial and orthophotos</strong></td>
<td>TTTTC</td>
<td>C I I I I I I I</td>
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</tbody>
</table>
| **Contract 3: Service contract for expertise and quality control of orthophotos creation process** | TTTTC | C I I I I
CUMULATIVE CONTRACTING SCHEDULE

Project No: Project Title: Creation of orthophotos for Land Parcel Identification System

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<thead>
<tr>
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<tr>
<td>Contract 1:</td>
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<td>Twinning light</td>
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<td>package</td>
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<td>Contract 2:</td>
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<td>Service</td>
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<td>contract for</td>
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<td>aerial and</td>
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<td>orthophotos</td>
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<td></td>
<td>47 000</td>
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<td>262 000</td>
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</table>
### Contract 3: Service contract for expertise and quality control of orthophotos creation process

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<tr>
<td>TOTAL</td>
<td>47 000</td>
<td>309 000</td>
<td>329 000</td>
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<tr>
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<td>20 000</td>
<td>20000</td>
<td>20000</td>
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TOTAL: 329 000
**Project No:**
**Project Title:** Creation of orthophotos for Land Parcel Identification System

<table>
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<tr>
<th>Date</th>
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<tr>
<td></td>
<td>31.03</td>
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<tr>
<td>Contract 1: Twinning light package</td>
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<tr>
<td>Contract 2: Service contract for aerial and orthophotos</td>
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<tr>
<td>Contract 3: Service contract for expertise and quality control of orthophotos creation process</td>
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<tr>
<td>TOTAL</td>
<td>39 200</td>
<td>196 700</td>
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</table>
The Feasibility study will be ready in March 2004

Expected results of the feasibility study:
Feasibility study for the current project including gap analysis prepared and presented.

Requested services
Feasibility study should include:

- Overview of the utilization of ortophotos available at present.
- Recommendations on the need for replacing ortophotos not corresponding to EU requirements and determination of the whole area that needs replacing.
- Recommendations for timetable of field works, aerial photography works and image processing.
- Overview of EU minimum requirements and recommendations for workable technical parameters of aerial photography and image creation, based on the requirements.
- Assessment of the costs for the new aerial photos and development of ortophotos according to EU requirements, including digitalizing base parcel borders in the database (contracts 2 and 3 of the project fiche and contract under co-financing on digitalising base parcels borders).
- Assessment for the need for additional equipment in ARIB (file server extension, back-up devices, etc. including graphic workstations and software licenses) and evaluation of the related cost (contract 4 of the project fiche and contracts under national co-financing) based on an assessment of all equipment already available in ARIB.

Gap analysis should indicate the need to carry out works for supply, processing and administration of the new photos by comparing the existing situation with future requirements.
5.6. LIST OF RELEVANT LAWS AND REGULATIONS

Project N°: ES
Project title: Creation of orthophotos for Land Parcel Identification System

The complete package of agriculture and rural life financing regulations adopted in June 1999 will enable the candidate countries harmonise their legislation and re-organised corresponding institutions while developing their readiness based on a more secure legislative basis. The new regulations, related to agriculture financing and establishing a Paying Agency are the following:

EC No 1258/1999 Financing of the common agricultural policy
EC No 1257/1999 Support for rural development from the European Agricultural Guidance and Guarantee Fund (EAGGF)
EC No 1260/1999 General provisions on the Structural Funds
EC No 1266/1999 Coordinating aid to the applicant countries in the framework of the pre-accession strategy
EC No 1268/1999 Support for pre-accession measures for agriculture and rural development in the applicant countries of central and Eastern Europe in the pre-accession period (SAPARD regulation)

IACS regulations:

EC No 3508/92 Establishing an integrated administration and control system for certain Community aid schemes
Annex 7

Indicative technical specifications and prices of the equipment to be procured

Graphical workstation (~9 000 EUR)

- Processor: one or two 2 processors: 1.5GHz with 6MB cache, or 1.3GHz with 1.5MB on-chip L3 cache, for 64-bit processing performance and capacity
- Chipset: Chipset with 6.4GB/sec of system bus bandwidth; 78ns open page memory latency; and AGP graphics - maximizes the performance of the 2 processor
- Memory: maximum of 24GB of DDR SDRAM accommodates large CAD models and designs
- Storage: maximum of 438GB Ultra320 SCSI storage for fast access to files and applications
- Graphics: must fit design requirements from professional 2D to high-end 3D
- Manageability: redundant hot-plug fans (tower only); redundant power supplies; hot-plug disks; remote management features
- Flexibility: deploy as a node in a graphics cluster, then redeploy later as a deskside graphics workstation

Equipment:

Extending image file server (75 000 EUR)
* Integrated Lights-Out Management
* Dual 2.8 GHz Processors with 512 KB level 2 ECC cache
* 2GB (expandable to 6 GB) of 2-way interleaved-capable PC2100 DDR SDRAM running at 200 MHz, with Advanced ECC capabilities and Online Spare capabilities
* Integrated Smart Array 5i Plus Controller with optional Battery-Backed Write Cache
* Three available 64-bit PCI-X slots, including two hot pluggable 100 MHz slots and one 133 MHz slot
* Two NC7781 PCI-X Gigabit NICs (embedded) 10/100/1000 WOL
* Support for up to six 1” Wide Ultra3/Ultra 320 SCSI hot plug hard drives or for five hot plug hard drives and one AIT hot plug tape drive

http://h71016.www7.hp.com/dstore/MiddleFrame.asp?page=config&ProductLineId=450&FamilyId=1157&BaseId=8004&oi=E9CED&BEID=19701&SBLID=,&AirTime=False

Network equipment
- 1GB switch + 5 network PC cards and installation (1000 EUR)
- High-bandwidth, multilayer Gigabit Ethernet switch with 24 ports
Other equipment
- UPS for server (1500 EUR)
  Rack optimized UPS, 2880VA, 2700 Watt), Low Voltage
  

- UPS for workstations (600 EUR) 4 units for graphical workstations
  

- Backup device (14 000 EUR)
  High capacity device with tape cartridge loader
  
  http://h71016.www7.hp.com/dstore/ctoBases.asp?FamilyId=1535&ProductLineId=450&LowBaseId=&LowPrice=&oi=E9CED&BEID=19701&SBLID=&printPage=1

- Necessary equipment concerning different existing old fashioned graphical workstations
  (12 900 EUR)