

AGENCY FOR INTERNATIONAL DEVELOPMENT PROJECT AUTHORIZATION AND REQUEST FOR ALLOTMENT OF FUNDS PART I		1. TRANSACTION CODE <input checked="" type="checkbox"/> A ADD <input type="checkbox"/> C CHANGE <input type="checkbox"/> D DELETE	PAF 2. DOCUMENT CODE 5
3. COUNTRY/ENTITY SAHEL REGIONAL/UPPER VOLTA		4. DOCUMENT REVISION NUMBER <input type="checkbox"/>	
5. PROJECT NUMBER (7 digits) 697-0426 <input type="checkbox"/> 625-0913 <i>for review</i>		6. BUREAU/OFFICE A. SYMBOL AFR	B. CODE <input type="checkbox"/> 06
7. PROJECT TITLE (Maximum 40 characters) <input type="checkbox"/> Regional Remote Sensing/Upper Volta		8. EST. PERIOD OF IMPLEMENTATION YRS. <input type="checkbox"/> 0 <input checked="" type="checkbox"/> 5 <input type="checkbox"/> 0 YRS. <input type="checkbox"/>	
9. PROJECT APPROVAL DECISION <input checked="" type="checkbox"/> A APPROVED <input type="checkbox"/> D DISAPPROVED <input type="checkbox"/> DE DISAUTHORIZED			

10. APPROVED BUDGET AID APPROPRIATED FUNDS (\$000)

A. APPROPRIATION	B. PRIMARY PURPOSE CODE	PRIMARY TECH. CODE		E. 1ST FY <u>77</u>		H. 2ND FY <u>78</u>		K. 3RD FY <u>79</u>	
		C. GRANT	D. LOAN	F. GRANT	G. LOAN	I. GRANT	J. LOAN	L. GRANT	M. LOAN
(1) FN	7545	876		750		1101		1210	
(2)									
(3)									
(4)									
TOTALS				750		1101		1210	

A. APPROPRIATION	N. 4TH FY <u>80</u>		O. 5TH FY <u>81</u>		LIFE OF PROJECT		11. PROJECT FUNDING AUTHORIZED (ENTER APPROPRIATE CODE(S)) 1 = LIFE OF PROJECT 2 = INCREMENTAL LIFE OF PROJECT	A. GRANT	B. LOAN
	C. GRANT	P. LOAN	R. GRANT	S. LOAN	T. GRANT	U. LOAN			
(1) FN	766		497		4,324				
(2)									
(3)									
(4)									
TOTALS	766		497		4,324				

C. PROJECT FUNDING AUTHORIZED THRU FY 81

12. INITIAL PROJECT FUNDING ALLOTMENT REQUESTED (\$000)

A. APPROPRIATION	B. ALLOTMENT REQUEST NO.	
	C. GRANT	D. LOAN
(1) FN	750	
(2)		
(3)		
(4)		
TOTALS		

13. FUNDS RESERVED FOR ALLOTMENT

TYPED NAME (Chief, SER/FM/FCD)  
Jean McColl

SIGNATURE \_\_\_\_\_

DATE \_\_\_\_\_

14. SOURCE/ORIGIN OF GOODS AND SERVICES

000  941  LOCAL  OTHER 935

15. FOR AMENDMENTS, NATURE OF CHANGE PROPOSED

FOR PPC/PIAS USE ONLY	15. AUTHORIZING OFFICE SYMBOL	17. ACTION DATE MM DD YY	18. ACTION REFERENCE (Optional)	ACTION REFERENCE DATE MM DD YY

AGENCY FOR INTERNATIONAL DEVELOPMENT

PROJECT PAPER FACESHEET

1. TRANSACTION CODE

A

A ADD  
C CHANGE  
D DELETE

PP

2. DOCUMENT CODE

3

3. COUNTRY/ENTITY

SAHEL REGIONAL/UPPER VOLTA

4. DOCUMENT REVISION NUMBER

5. PROJECT NUMBER (7 digits)

625-0913

6. BUREAU/OFFICE

A. SYMBOL  
AFR

B. CODE  
 06

7. PROJECT TITLE (Maximum 40 characters)

Regional Remote Sensing/Upper Volta

8. ESTIMATED FY OF PROJECT COMPLETION

FY  8  1

9. ESTIMATED DATE OF OBLIGATION

A. INITIAL FY  7  7

B. QUARTER  4

C. FINAL FY  8  1

(Enter 1, 2, 3, or 4)

10. ESTIMATED COSTS (\$000 OR EQUIVALENT \$1 - )

A. FUNDING SOURCE	FIRST FY			LIFE OF PROJECT		
	B. FX	C. L/C	D. TOTAL	E. FX	F. L/C	G. TOTAL
AID APPROPRIATED TOTAL	633	117	750	3484	840	4324
IGRANT	633	117	750	3484	840	4324
ILOAN						
1. France	341	61	402	1850	213	2063
2. Canada	324	29	353	4857	533	5390
HOST COUNTRY	-	811	811	-	1161	1161
OTHER African Donors				763	726	1489
TOTALS	1298	1018	2316	10954	3473	14427

11. PROPOSED BUDGET APPROPRIATED FUNDS (\$000)

A. APPROPRIATION	B. PRIMARY PURPOSE CODE	PRIMARY TECH. CODE		E. 1ST FY <u>77</u>		H. 2ND FY <u>78</u>		K. 3RD FY <u>79</u>	
		C. GRANT	D. LOAN	F. GRANT	G. LOAN	I. GRANT	J. LOAN	L. GRANT	M. LOAN
(1) FN	7545	876		750		1101		1210	
(2)									
(3)									
(4)									
TOTALS				750		1101		1210	

A. APPROPRIATION	N. 4TH FY <u>80</u>		O. 5TH FY <u>81</u>		LIFE OF PROJECT		12. IN-DEPTH EVALUATION SCHEDULE
	D. GRANT	P. LOAN	R. GRANT	S. LOAN	T. GRANT	U. LOAN	
(1) FN	766		497		4,324		<div style="border: 1px solid black; padding: 5px; display: inline-block;">           MM YY            0 6 7 8         </div>
(2)							
(3)							
(4)							
TOTALS		766		497		4,324	

13. DATA CHANGE INDICATOR. WERE CHANGES MADE IN THE PID FACESHEET DATA, BLOCKS 12, 13, 14, OR 15 OR IN PRP FACESHEET DATA, BLOCK 12? IF YES, ATTACH CHANGED PID FACESHEET.

1 1 = NO  
2 = YES

14. ORIGINATING OFFICE CLEARANCE

SIGNATURE

TITLE

DATE SIGNED

MM DD YY

15. DATE DOCUMENT RECEIVED IN AID/4. CP FOR AID/4. DOCU. MENTS, DATE OF DISTRIBUTION

MM DD YY

CORRECTIONS TO REGIONAL REMOTE SENSING  
UPPER VOLTA PROJECT PAPER

- PAF - Part I - Change Primary Purpose Code from 7545 to 754S
- Page 2 - At second line from bottom, add "and" before "reproduction"
- Page 12 - In top line, add after "budgeted" in "Phase I"
- Page 12 - At end of fourth line from the top, add "2969 of 8/9/77"
- Page 14 - At end of fourth line from the bottom, add "305012 of  
12/31/75"
- Page 38 - Change Year 2 Operating Costs for Canada from "45" to "52"  
and total from "160" to "167"
- Annex D-1 - Opposite item #2, delete "and" after (a) and substitute  
"yes".
- Annex E - page 2 - top line add period after "essential" and delete  
remainder of sentence
- Annex E - photographic Engineer job description - Third line from  
bottom - add period after "essential" and delete remainder of  
sentence.

TABLE OF CONTENTS

SAHEL REGIONAL/UPPER VOLTA  
Project Paper

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Part I:	A) Project Summary and Recommendation.....	1-2
	B) Description of Project.....	2-4
	C) Summary Findings.....	5-7
	D) Project Issues.....	7-12
Part II:	A) Project Background.....	13-16
	B) Detailed Description.....	16
Part III:	A) Project Analysis.....	17-27
	B) Financial Analysis.....	27-30
	C) Social Analysis.....	30-32
	D) Economic Analysis.....	33
Part IV:	A) Implementation Arrangements.....	33-35
	B) Implementation Plan.....	35
	C) Evaluation Plan.....	35-36
	D) Conditions, Covenants and Negotiating Status.....	36

ANNEXES

A-1.....	PRP Proposal Message
A-2.....	Message on Paris Meeting of Technical Committee
B-1.....	Itemized Equipment List
B-2.....	Map of Geographic Coverage of Upper Volta
B-3.....	Drawing of Photo Lab
C.....	Logical Framework
D-1.....	Project Checklist
D-2.....	Standard Item Checklist
E.....	Job Descriptions for U.S. Experts
F.....	Draft of Project Description to be Used in Project Agreement
G.....	Borrower/Grantee Application for Assistance

17

## Part I. Project Summary and Recommendation

### NOTE:

This Project Paper has been prepared in parallel with the Report of the Technical Committee to Define a Regional Remote Sensing Center at Ouagadougou, Upper Volta, (included as Attachment A). As noted below, the Technical Committee is composed of representatives and consultants to the U.S., Canada, France, Upper Volta and the Economic Commission for Africa (ECA). The Technical Committee Report describes in detail all aspects of the Center, and thus serves the purpose of many of the sections of the Project Paper. Where full discussion is provided in the Report, only a brief summary is given herein. Wherever additional analysis is required, these are presented in the Project Paper. The reviewer should thus familiarize oneself with the Technical Committee Report, and view it as an integral part of this Project Paper.

### A. Recommendation

It is recommended that A.I.D. approve contributions totalling \$1.851 million to cover its portion of Phase I costs of a multi-donor project to establish a Regional Remote Sensing Center in Upper Volta as proposed in this project paper. The A.I.D. contribution to the first two year phase of this project (about 44% of total first phase costs of \$4.2 million) would finance U.S. consultant services, equipment, supplies and materials, limited architectural design and construction, and a portion of local staff salaries. Total life of project funding for the five year project, assuming favorable decision

by the donors to proceed to Phase II, is \$4.324 million, or 30% of total project costs of \$14.4 million.

It is recommended that a technical assistance contract with a U.S. firm be let by AID/W to implement A.I.D.'s contribution to the project. The grantee is the Government of Upper Volta but the recipients of the technical assistance will be up to 30 African countries which are expected to benefit from the activities of the regional center.

- Grant (Phase I) \$1,851,000
- Code 941 and 935 waivers to permit limited procurement of equipment and supplies
- waiver to permit contractor to employ a limited number of non-U.S. personnel

B. Description of the Project

The proposed project, to be located in Ouagadougou, Upper Volta, is aimed at enhancing African capabilities to utilize satellite derived data for development purposes and to permit a major region of Africa to have direct access to Landsat and other satellites. The project involves two major phases.

Phase I of approximately two years in duration, consists primarily of technical assistance, training and related activities utilizing existing Landsat data (plus data from Landsat III when it is launched). It involves establishment of a regional Center with facilities for bi-lingual training, data handling reproduction and user assistance services for the countries of Africa. An early and

important element of the program would be an effort to "sensitize" high level African officials and managers to the benefits of satellite-derived data for development planning.

The land and physical infrastructure for the project, a former French satellite tracking station, will be donated by the Government of Upper Volta (GOUV). Some additions to this facility will be required as the project expands. In addition, Phase I will involve coordinated contributions by the U.S., France, and Canada for experts, equipment, materials and local costs. During Phase I, Canada will carry out studies to determine the socio/economic feasibility and cost effectiveness of proceeding to Phase II. Other critical criteria affecting a Phase II decision will be the development of an appropriate African regional institution to take responsibility for the project and to seek African sources for its long term financing. An in-depth evaluation of the project is planned to be held in June 1978 and a second will take place, if necessary in early 1979.

Assuming a favorable decision, in Phase II a satellite reception station would be added to the program. It would have the capability to receive and record data from NASA's Landsat series of satellites as well as other satellites such as METEOSAT. It would further have the capability for processing the data onto magnetic tapes and to images of the scenes transmitted by the satellites. In other words, all of West Africa plus adjacent areas within 3,000 kilometers of Ouagadougou (see map, Annex B2) would have direct access to the satellite, via the receiving station, which would furnish repetitive coverage of their

countries every eighteen days.

Phase II would comprise the last three years of the five year project. It would include a continuation of the functions initiated in Phase I including training, outreach services and the completion of the training of the Center's African staff. Phase II would also see the growth of local financing for the program through donations and payments for Center services. Canada would finance the receiving station and many of the related technical assistance costs, while the U.S. and France would continue the same types of assistance made available in Phase I. Expatriate staff would phase out as they were replaced by African counterparts.

End of project status would see a functioning African Regional Center, staffed by about 20 African professionals and technicians, capable of providing coverage of West Africa every eighteen days (clouds permitting) and distributing images of such coverage expeditiously to all users, upon request. The Center would have the capability for training 17-32 technical and professional persons per year in the applications of remote sensing to their various technical disciplines, and to assist African development agencies to carry out 3-4 major projects using remote sensing as a key tool. It would serve as a "center of excellence" capable of providing information and guidance to numerous visitors, serving as a resource for research, and generally acting as a catalyst for enhancing the capability of African governments to utilize satellite imagery as a tool for addressing their agricultural development, resource management and physical planning problems.

C. Summary Findings

This project has been under study and development over a period of two years. It has been elaborated and designed by an international team of experts and program officials from the U.S., France, Canada, Upper Volta and ECA. Technical, financial and administrative issues have been reviewed, discussed and resolved within the Technical Committee mentioned above.

In addition, prior to the formation of the Technical Committee, the project concept has been endorsed by an A.I.D. sponsored team of experts (Review of Landsat Remote Sensing Plans and Proposals for Africa, 30 October 1975) which also served as the substitute Project Review Paper, by an ECA-sponsored Technical Mission which toured Africa in February-March 1976, and by a resolution of the Member States of the ECA indicating African support for a Ouagadougou Center (Report of the inter-governmental meeting, 28 September - 1 October 1976, Doc. No. E/CN. 14/NRD/HENV/2). All participating parties are prepared and anxious to move ahead immediately with implementation of the project.

Although the long term institutional arrangements for the project are in the process of being formulated, workable and effective interim arrangements are in place and will permit the early implementation of Phase I of the program. Pending the creation and establishment by the African countries concerned of an appropriate African institution, Upper Volta, as the host country for the project, is establishing a national remote sensing agency to provide African jurisdiction for the project. The three donors, through their collaboration in the Technical Committee,

have worked out a coordinated program of assistance which is satisfactory to Upper Volta. The donors will conclude bi-lateral project agreements with the GOUV through which their respective contributions will be made available.

Day-to-day coordination of the program in the field during Phase I will be carried out by an Interim Director of the Center (to be appointed by the GOUV) and his Deputy (to be appointed by Canada). Canada has been asked to help coordinate donor inputs because it will make the predominant external investment in the program (assuming the receiving station goes forward), i.e. 37% of total project costs.

During Phase I, the Technical Committee composed of the three donors, the GOUV and ECA will continue to meet from time to time. Now, however, its functions will be those of program coordination and review of implementation rather than project design.

Once an appropriate and legally acceptable African regional institution has been established (the target date for this event is June 1978) the functions and assets of the GOUV agency will be transferred to the new institution. A.I.D.'s Project Agreement with the GOUV will specify that such transfer of A.I.D.'s contribution will be subject to the written approval of A.I.D. This will assure that the new vehicle for running the program will meet essential criteria for program and legal viability.

The U.S. will implement its contribution to the program through a contract, to be competitively awarded, with a private company specializing in the utilization of remote sensing technology for resource manage

ment. The contractor will have responsibility for providing technical personnel, arranging training of African personnel in the U.S. and all other aspects of the U.S. contribution except that portion which is donated to the GOUV for local costs.\* The head of the U.S. contract team will work under the immediate direction of the Center's Director and his Deputy and will harmonize the team's work with the expatriate teams to be provided by France and Canada. He will also be responsible for keeping CDO/Ouagadougou fully informed of project activities. Thus the CDO's role will ordinarily be more one of liaison than management. However, the CDO would be expected to intervene with the Center's Director and his Deputy in the event of problems concerning the U.S. team or on matters relating to contract or Project Agreement provisions. AID/W backstopping of the project would be provided by AFR/DR.

As indicated in the statutory checklists(attachment<sup>Annexes D-1 and D-2</sup>\_\_\_\_), the project meets all applicable statutory criteria.

D. Project Issues

The following issues have been raised concerning the Upper Volta Regional Remote Sensing Center project, either at the PRP review stage, or during the meetings of the Technical Committee.

1. Is the data derived from remote sensing technology of sufficient significance and relevance to African development problems as to warrant AID participation in the proposed project?

This question has been positively addressed by the Economic

\* The procurement of equipment will be carried out by the contractor or by Procurement arrangements with the African American Purchasing Center.

Commission for Africa in its study carried out following the PRP review, and indirectly by the high degree of importance and priority assigned to the implementation of remote sensing capabilities by the African states in various actions and resolutions (see the Technical Committee Report, ref. A,C,D,H). More recently, a study prepared by the National Academy of Science strongly endorsed A.I.D. encouragement of remote sensing technology for applications in its development programs and for increasing African capabilities in the technology. In addition, development programs have already begun to incorporate satellite remote sensing in their program plans, including such initiatives in Africa as the Onchocerciasis Free-Area Planning Project. There is a strong consensus that remote sensing technology is highly significant and relevant to development problems of Africa.

2. Is AID prepared to utilize non-U.S. personnel if sufficient U.S. expertise with French proficiency is not available?

With<sup>the</sup> inclusion of Canada as a donor participant in the project, the total number of U.S. personnel needed with French proficiency is reduced. Nevertheless, the number of U.S. remote sensing specialists with fluency in French is so limited that it may be necessary to hire one or two non-U.S. nationals in exceptional circumstances. Therefore, it is recommended that the contractor be authorized to hire up to two non-U.S. experts, subject to A.I.D. concurrence that such actions are necessary to accomplish project objectives.

3. Are the African countries prepared to finance the recurring costs of the facilities, after donor assistance has phased out?

The resolutions taken by the African states regarding remote sensing, the pending establishment of an African Remote Sensing Council to be supported by member nations, and the high level of interest accompanying and following the AIDSAT demonstrations, all indicate the growth of support given to this technology by the Africans.

Table 1 on page 11 of the Technical Committee Report indicates an approach the Center might take toward financial viability within a five year time frame. The projection assumes the growth of member states contributing membership fees to the Center from three in year two (1979) to twelve in year six (1983) and an increase in annual fees from \$20,000 per member to \$60,000. It also assumes a growth in revenues from contract work on development projects performed by the Center -- a good portion of such revenues would undoubtedly be financed by donors.

Whether these projections turn out to be realistic will depend on a number of factors including (a) the success of the "sensitization effort" to increase high level African awareness of remote sensing potential, (b) the Center's "track record" of delivering beneficial, high visibility products during its early years of operation, (c) the effectiveness of the regional institution (and its Director) to manage the program.

If these challenges are successfully met, it is believed that there is an excellent possibility that the Center can be financially viable by 1983. On the other hand, the donors should be prepared to anticipate unforeseen contingencies that could retard the growth of African support (e.g. another widespread drought).

In the event that external funding for recurrent costs after Phase II becomes an issue, AID/AFR has taken the position that it would be prepared to consider financing (with French and Canadian participation) such costs, subject to the results of an evaluation of the program which would include the status and prospects of the program's financial viability, including the likelihood of growing African support.

4. Can a satisfactory institutional structure be established to serve as the legal, financial and managing entity for the Center, and what will be the relationship of this entity to a future African Remote Sensing Council?

As is discussed in the "Project Background" section below, the design of the Upper Volta project has proceeded in parallel with ECA efforts to establish a Pan African remote sensing program and an African Remote Sensing Council, recommended by a conference of African countries in Addis Ababa in September 1976 and endorsed by the ECA's Council of Ministers in Kinshasa in March 1977. A constitution for the Council was drafted in Nairobi in January, 1977 and will be reviewed and acted upon at a meeting of plenipotentiaries to be convened in Ouagadougou in February, 1978.

Earlier, there was some concern that the ECA Secretariat, acting under the "mandate" of the Kinshasa resolution, might complicate the efforts to work out satisfactory interim arrangements for establishing the Upper Volta project, or that the Remote Sensing Council, when it is formed, might claim to assert a management role for the Upper Volta center.

These issues appear to have been largely resolved at the July meeting of the Technical Committee. New language on institutional arrangements was agreed upon in the report of the Technical Committee, which specifically endorses the establishment of a regional body to manage the Upper Volta center, and that this should be done expeditiously (see Section 2.1.3). It also acknowledges that the Upper Volta center should operate "within the framework of the coordinating policy functions of the African Remote Sensing Council".

Thus the roles of the two bodies appear to be developing along complementary paths, the Upper Volta center being essentially an operational institution serving a delineated group of countries, and the Council providing policy guidance and inter-relating the work of the Upper Volta center with other centers in Africa, such as the one that has been established in Nairobi.

5. Is AID prepared to provide waivers for code 935 (free world) and code 941 (U.S. and Africa) procurement on a limited portion of project commodities to achieve project objectives?

Code 935 procurement is required to carry out project objectives in three circumstances:

- (a) \$315,000 has been budgeted for the procurement and shipment of equipment for Phase I project operations. Most of the items involve photographic and image interpretation equipment for the photo laboratory and the image interpretation facility. Up to \$75,000 will be required for the purchase of European items which are clearly superior to American products (in the cases of some lenses and cameras) or whose more ready availability and shorter delivery time will permit them to be on hand in conformance with project implementation schedules.

- (b) \$175,000 has been budgeted for the design and construction of additions to the ex-French facilities (photo laboratory, additional office space and space for the center's archives). As indicated in Ouagadougou, construction materials are available in Upper Volta (except sand) and 90% of construction costs represent items which must be imported from other African countries or Europe (about 75% and 15% respectively). Therefore code 941 procurement is requested for up to \$130,000 for construction costs and code 935 procurement is requested for an additional \$30,000.
- (c) \$165,000 has been budgeted for Phase I operating costs consisting of materials and supplies (films, chemicals, film paper, etc.) and for equipment spare parts and maintenance items. In the case of some photographic supplies and chemicals, these items have a very short shelf life. Also, since many of the chemicals are caustic, they cannot be shipped by air. Therefore, it will be necessary to order some of the film processing chemicals and the films in small but frequent batches from Europe. In addition, spare parts will be required for the non-U.S. equipment referred to above. Code 935 procurement will therefore be required for up to \$75,000 for supplies, materials and spare parts.

To summarize, a code 935 waiver will be required for up to \$180,000 for equipment, supplies and spare parts and a code 841 waiver will be required for an additional \$130,000 for construction materials.

Part 2 - Project Background and Detailed Description

A. Background

In its FY 1977 Annual Budget Submission of July 1975, the Country Development Office for Upper Volta included a PID entitled "West Africa Regional Remote Sensing Center." The purpose of the proposed project was "to strengthen CIEH's (Inter-African Committee for Hydraulic Studies) technical programming office through the formation of a remote sensing center" whose goal was "to integrate remote sensing information and techniques with long-term natural resource management programs for the Savannah region".

In the course of considering the original PID it became increasingly apparent that the CDO/Ouagadougou proposal was but one of several proposals of varying vintages and supported by a variety of national and international agencies. As a result the Bureau for Africa undertook a review of remote sensing plans and proposals for the continent as a whole. It was decided that a team should be formed to "explore with other interested donors and agencies the various options open to the U.S. for making a constructive contribution to enhance the availability of remote sensing information in Africa and to develop African capabilities to interpret and utilize such information at both the regional and national levels, taking into consideration existing and planned receiving stations".

The team performed its study during October 1975. The conclusions of the study made it clear that Africans were becoming increasingly aware of and interested in the benefits that might accrue to them by the application of remote sensing technology and that it was as opportune time for A.I.D. to become involved in this field to a far greater extent that had been true in the past.

The study team also made specific recommendations concerning possible opportunities for AID involvement in specific projects. Foremost among these was a recommendation for support for a proposal presented by France. This proposal was predicated on the fact that the French government had taken the position that it was prepared under certain circumstances to support the French Space Agency (Centre National d'Etudes Spatiales or CNES) to have the facilities of the existing CNES satellite tracking station in Upper Volta converted to a Landsat receiving and processing station. The station would also serve as a center for training of Africans to operate the facilities, and for user training and sensitization of government officials.

At the team's meetings with the French in Paris and in subsequent talks it was clear that a French decision to provide "important" support to the CNES proposal depended upon (a) African support of the proposal and (b) participation in the project by other donors. Canada, UNDP and the U.S. were specifically mentioned.

The correlation between the CNES proposal and the original PID, and the opportunity to coordinate the two efforts to achieve a significantly more comprehensive program, were obvious. The report of the A.I.D. technical team, with recommendations for expanding the scope of training and adding user assistance functions at the center, was thus accepted in December 1975 as a PRP substitute for the West Africa Regional Remote Sensing Center project. An approval message was sent to Upper Volta in December (State attached as Annex A-1 ) and the project was included in the FY 1977 C.P.

Another function of the team's mission was to attend an ECA-sponsored meeting in October 1975 which drew up the terms of reference for an ECA

technical mission to recommend a remote sensing program for the entire African continent. ECA's interest in remote sensing had its origins in a January 1975 Resolution of its Council of Ministers which urged the Secretariat to recommend a comprehensive program. It was argued, with some justification, that before the U.S. and France attempted with other donors to work out a project with Upper Volta, ECA should be given the opportunity to play the leadership and coordinating role that its Council of Ministers had enjoined.

Therefore, in February-March of 1976, an ECA-led technical mission, including experts furnished by A.I.D., CIDA, FAC and FAO visited a number of countries in Africa. In its report "The Role of Remote Sensing in Africa" the mission endorsed the Upper Volta project as an important and critical component of a larger program to give Africans a capability to receive and use satellite remote sensing data. The recommendation was endorsed by an Inter-governmental meeting of African nations which met in Addis Ababa in September 1976.

These actions led the development agencies of France, Canada, and the United States to meet in Ottawa in January 1977 to define a multi-donor program to establish a Regional Remote Sensing Center in Ouagadougou. At this meeting Canada agreed to become a major participant in the program. The meeting also established a Technical Committee to develop a detailed design and implementation plan for such a Center. The Committee had representation from the three donor countries, Upper Volta, and ECA and has met in Ouagadougou in March, at Ann Arbor in May and in Paris in July.

The report of that Committee is included as Attachment A, and serves as the basis for this Project Paper.

B. Detailed Description

A complete and detailed description of the project for establishing a Regional Remote Sensing Center at Ouagadougou is given in the Technical Committee Report, Attachment A. Special attention should be given to sections 2.1, 2.4 and 3.1 through 3.6 of the Report.

Part 3 - Project Analysis

A. Technical Analysis

1. Appropriate Technology

Many studies have been conducted on the utility and appropriateness of remote sensing technology, specifically satellite data, for developing countries. Reference K and L\* are A.I.D. funded studies which address these questions, in relation to Africa. A more recent and general study by the National Academy of Sciences "Resource Sensing from Space" strongly endorses the appropriateness of the technology and urged A.I.D. to greatly expand its program in that field, including the establishment of regional centers.

The following section, taken from the PRP, presents a summary of applications and potential utility of the technology.

LANDSAT Capability and Limitations:

LANDSAT observes the intensity of solar reflected radiation from all cloud free areas of the earth every 18 days. Each image has approximately 110 square miles of the earth's surface. The observations are made in four wavelength bands ("colors") and can achieve a resolution of 80 square meters. The data are available in the form of computer tapes and images.

From black and white or color images, one can readily distinguish water, vegetation, variations within and differences among vegetation patterns, bare soil, and differences in soil color. Using the spatial patterns of color and their changes with time, scientists can convert these data to produce cartographic and thematic maps.

The core issue in remote sensing is the accuracy with which one can classify terrain features and the degree of subcategorization, i.e. to

\* See Appendix I of Technical Committee Report

what level can one subdivide the vegetation classification. Specifically, how well can one recognize natural vs. cultivated vegetation of forest vs. non-forest, identify a specific crop type or tree species, or determine the edible biomass in range lands. As one might guess, the answer to these questions is governed by the level of effort one is allowed to put on the problem. The optimum solution may require the use of information from multiple LANDSAT passes, multi-stage sampling techniques, auxiliary ground data, historical data, computer processing facilities, etc.

A country with a well developed information data base from conventional sources (like the U.S.) often must use sophisticated computerized data processing techniques to extract new and useful information from LANDSAT. A country with little or no information base can, however, extract useful and important information from LANDSAT with unsophisticated techniques. In some cases, depending upon environmental conditions and/or development programs within the country, it may be highly cost effective for a developing country to also employ sophisticated LANDSAT data processing techniques.

#### LANDSAT Applications in Africa:

Maps. Many African countries lack accurate or up-to-date maps of much of their territory. The images of LANDSAT can be used directly as uncorrected photomaps. LANDSAT is also useful in updating existing maps. With established ground control points and computer processing to remove residual geometric distortions, 1:250,000 scale maps can be produced.

Vegetation. Vegetation and vegetation density can be determined by direct observation. Using photointerpretation techniques, distinctions can be made among forest, natural vegetation, cultured vegetation and barren

land. Using sampling techniques involving aircraft and/or ground observation (ground truth), one can often further subdivide these classifications. Using computer processing techniques, improved sub-classification may be possible and quantitative estimates of vegetation cover and biomass can be obtained.

Soil. Variations in soil colors can be visually observed. Delineation of these patterns together with ground observations can yield soil association maps, useful for agricultural planning and resource development.

Water. Surface water is readily distinguished in band seven of the satellite's scanner. The tone in other bands are indicative of water depth and degree of suspended solids. Computer processing allows one to quantify sediment load and water depth. Soil moisture can be measured using computer techniques.

Geologic Mapping. The tonal patterns produced by topographic relief, soils, vegetation, and water can be used to generate geologic maps. Color can be used to identify oxides associated with minerals.

The foregoing derived information is highly applicable in the following types of development programs.

Range Land Management: Monitoring biomass to prepare plans to prevent overgrazing or to open up new areas.

Forest Management: Measurement of the area and rate of depletion can be used to plan control measures.

Infestation Control. Locust, tsetse fly, bark beetles, screw worms, and other insects which reduce crop yield or debilitate man have specialized breeding habitat requirements which can be monitored by LANDSAT and/or meteorological satellites. Eradication energies can then be directed to

these areas which can be associated with a given set of moisture, temperature, and vegetation conditions.

Desertification: LANDSAT can be used to observe changes in desert extent. In addition, theories and global meteorological models have been developed which indicate that there may be a biophysical feed back mechanism which links overgrazing to reduced rainfall. Evaluation of this model with LANDSAT data may be possible.

Watershed Management: LANDSAT can monitor the area of surface water. In addition it can monitor many parameters used in a watershed model which affect water-run-off and evaporation e.g: vegetation cover, soil moisture, and soil association.

Land Capability: Among other factors, land capability is dependent upon soil and rainfall. Often the natural, climax vegetation is indicative of the land capability. LANDSAT can observe both vegetation and soil association.

Crop Inventory and Forecasting: LANDSAT is best for large scale farming, as large fields can be directly observed and measured. In small scale farming such as found in most of Africa, multi-stage sampling techniques could be used, in a system which would probably be significantly better than the current systems employed by most African countries.

Manual VS Automated Information Extraction: As previously indicated, information can be extracted from LANDSAT using either photointerpretation and/or computer processing techniques. In some cases, similar results can be obtained by either method. Others may best be accomplished by visual interpretation while still others must be done using computers.

Facilities for photointerpretation are relatively inexpensive. With current state of technology, a human interpreter is far superior to computers

in extracting and using shape information. Manual interpretation has also proven to be cost effective in many large area general surveys. Assisting the human interpreter with various non-computer equipment, such as a density slicer for quantitative color analysis, has also proven effective.

In computer analysis, the signals from each scene point (pixels), 80X80 meters are analyzed. The signals in electrical form have more precision than the tones in a photographic image and thus more accurate analysis is possible with the computer. Once a satisfactory classification is determined by the computer, only simple bookkeeping is required to present the results in summary statistics, e.g. acres of water in a given country or watershed. Computer analysis of large areas in reasonable time requires a substantial investment in a special purpose digital computer with an interactive display. The maintenance and operation of such a system requires high technology not presently available in Africa. Initially, such processing should be done by contractors outside Africa.

Observation of Dynamic Environmental Factors: Much of the activity in the Sahel and other areas of West Africa involves dynamically varying parameters such as vegetation, water, and infestations.

To effectively monitor such events, a regional LANDSAT ground receiving station is required for timely collection and distribution of such data. Much of the required analysis can be done using photo-interpretation of images supported by ground truth.

Previous Experience:

Developing countries throughout the world have already utilized LANDSAT

data on an initial basis for many of the types of projects mentioned above. A.I.D. has sponsored, through a small grant program, some of these efforts and the results have been highly encouraging. For example, in Bangladesh LANDSAT imagery has been used to delineate and determine the acreage of new land currently emerging in a large delta area. With this information, settlement and agricultural production of these areas can be rapidly planned. In Zaire, satellite imagery has been used to locate the source of pollutants which were contaminating drinking water supplies in a major river, and has also been used to locate economically important forest tracts in the eastern mountain region. This sort of experience by many organizations has led to the recognition of remote sensing as a potentially valuable tool in development programs for many parts of the world.

Assessment:

The conclusion drawn from the studies and discussion presented above is that satellite remote sensing data is highly applicable to the problems of developing countries. It represents a high technology which is appropriate to both the needs and capabilities of the region. As indicated earlier, however, the technology is not dependent on sophisticated and complex computer analysis of the data, but lends itself to relatively unsophisticated visual analysis of the imagery, complemented by ground truth investigations. The latter is the approach emphasized in the present project.

## 2. Design Assessment

If one grants that remote sensing technology is appropriate to the region covered by the country the question remains whether the Regional Center detailed in this paper is reasonable in terms of design to meet its goals, and in terms of cost.

The general design of the Ouagadougou Center - with its training, user assistance, data reproduction, and data reception functions - is common to many such centers in the U.S. and elsewhere. It follows the design recommended by the E.C.A. Technical Mission (ref. C)\* and includes the important user assistance and high level sensitization programs.

The initial emphasis on manual and visual interpretation techniques is consistent with the level of sophistication and detail currently required for development activities in West Africa. Much of the region has no up-to-date base maps, and inventories of basic land resources are few and not comprehensive. These are the types of basic information which are directly amenable to interpretation from remote sensing imagery by manual and visual techniques. In addition, the teaching manual and visual interpretation will facilitate the integration of the technology into the ongoing activities of user agencies much more rapidly than high level computer technology, since it is much closer to the types of activities currently undertaken by these agencies, and thus more readily acceptable. Demonstrations of computer processing applications, probably by contract to foreign firms,

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\* See Appendix I of the Report of the Technical Committee

and investigation of potential capabilities which could be developed in this area, are included as the program progresses.

The quantity and types of interpretation equipment, reproduction facilities, etc. are scoped to serve their support function to the training and user assistance activities as effectively as possible. (See Appendices 3.1 to 3.3 of the Technical Committees Report.) In all cases, modern, easily usable equipment is specified. Untried or highly specific equipment has been avoided, as have the more complex, higher volume machines, such as automatic film processors. Although these may well be added as the Center expands and increases its workload, the potential difficulties in maintenance and operation in the Ouagadougou environment legislated in favor of high quality simple equipment.

The scoping and detailing of the Center was performed by a team of Canadian, French, U.S. and U.N. experts highly knowledgeable in the field and experience in using the equipment and running similar types of operations in their countries. Costs have been taken from suppliers catalogues and other direct sources, and operating expenses are based upon experiences at other user centers and the estimated workload of the Ouagadougou Center. The costs are consistent with those presented in the A.I.D. report (PRP substitute) and other studies.

The preliminary design and plans for the photo laboratory, which the U.S. will finance, have been reviewed by REDSO/WA and final construction plans and cost estimates will also be reviewed by REDSO prior to the award of a local contract.

### 3. Conclusion

It is felt that the technical design of the Ouagadougou Center, as presented in this Project Paper and the accompanying Technical Committee Report is sound and reasonable. The technology to be introduced is appropriate to the needs and constraints of the region, and has been scoped to effectively meet the goals of the program. The types of equipment and costs are reasonable and appropriate to the size and level of activity to the Center.

### 4. Environmental Evaluation

The project proposes to develop within the region a capability to utilize satellite imagery in the planning and implementation of resource management and development programs. Development planning and implementation imply that the satellite imagery will be used to exploit natural resources with concomitant environment effects.

The area covered by the Center is vast, encompassing roughly 26.5 million square kilometers. It includes the Sahara Desert, the Sahel region, and coastal tropical forest environments where large diversity of natural resources are found here.

The nations covered by the Center view these natural resources as a source of wealth to be utilized to improve the well being of the people, who are in many cases subsistence farmers and herdsmen without access to medical care, educational facilities, and alternative employment opportunities. Increasingly, the rural population is migrating to urban areas which are ill prepared to accept them.

These conditions stimulate pressure to exploit the natural resources. But these resources, and the environment which they constitute, are a precious entity in themselves and must be wisely managed and used, not only for the present, but for future generations. To this end, the best possible tools for developing comprehensive, coordinated plans for the utilization of these resources must be used.

LANDSAT imagery is one of these tools. Its use will help plan, directly and indirectly, projects which may have significant environmental impacts. Examples are the extraction of mineral deposits, harvesting of commercially-significant forest, increased grazing pressures on savannah prairies, and the construction of major new roads. The general result of the use of satellite data should be a reduction of the adverse impacts of any particular project. In many cases, the data can be used to increase knowledge of current adverse practices, such as overgrazing. By supplying overall information on a specific resource or geographic region, the long-term as well as short-term impacts of a particular development plan can be assessed.

The use of satellite imagery to create beneficial environmental effects, or limit adverse effects, is dependent upon the initiative and abilities of the user. From this standpoint, then, the satellite data itself is neutral. The fact that its use can lead to beneficial effects, whereas the lack of information can and generally does lead to poorer management decisions, with unexpected and possibly severe adverse environmental impacts, indicates that the LANDSAT imagery should be regarded as a positive tool for the protection of the environment.

Based on these considerations, it is recommended that a Threshold Decision be made that the project will not have a significant effect on the environment and, therefore, a Negative Determination is appropriate.

B. Financial Analysis

1. Recurrent Budgetary Analysis

Section 5 of the Technical Committee Report presents a complete series of tables showing project costs on an annual basis and sources of financing. These tables were extensively revised and updated at the July meeting of the Technical Committee. The figures for Phase I are considered to sound and realistic, not only from the standpoint of cost calculations but of the financing that will be forthcoming. The figures for Phase II are necessarily more approximate estimates. They will be revised and updated in connection with the review of the program that is planned at the end of Phase I.

Section 2.3 of the Report discusses financial issues associated with the Center and recommends an approach for developing African financing of the Center's recurrent costs. A scenario for generating income for the Center with the aim of near financial self support by the end of Phase II (from membership fees charged to participating countries by the Center and revenues earned from contract services performed by the Center) is presented in section 2.3.3 of the Report. It is the belief of the African members of the Technical Committee that the projection is realistic. In any case, this matter will be a major element in the evaluation, or evaluations, which will be conducted

prior to an AID decision as to whether further financing would be desirable after the completion of Phase II (see Project Issues section above).

## 2. Cost Effectiveness Analysis

A program of this nature does not lend itself to the usual methods of economic analysis. The costs of the program can be readily identified, but the benefits are long term, difficult to quantify and for the most part are secondary benefits derived through the development programs which will be associated. Extensive cost/benefit studies have, however, been performed for remote sensing applications in general. Several have focussed on developing countries (ref. K, L)\* These studies concluded that the potential benefits to be derived from the utilization of remote sensing technology were large and could easily justify the costs of operating Centers such as that proposed for Ouagadougou.

Direct benefit-savings from the program are anticipated for African development projects, as the use of remote sensing can reduce their operational costs. Not only can there be direct cost savings from the use of satellite technology, but it will also often afford an increase in project effectiveness, and even make some currently unjustifiable projects feasible. For example, one can assess the benefit of LANDSAT data utilization by comparison with a conventionally carried-out project. The costs for obtaining aerial photography for part of the Black Volta River basin are available. These averaged out

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\* See Appendix I of Technical Committee Report

at about \$13 per square mile. Interpretation costs will range from \$12-30 per square mile. LANDSAT data acquisition is about \$.02 per square mile while data processing, on the other hand, costs about \$1 per square mile. The photography offers much more detailed information, and more types of information than the satellite data. In almost all cases, however, such detail is not required over an entire region, but only over specific areas of interest. The LANDSAT data can be used to help identify these areas, while providing the general information needed for the entire region. Aerial photography can then be obtained over the desired specific areas, with resulting decreases in overall cost. For example, if a 22,000 square mile watershed is to be investigated, aerial photographic costs, including interpretation, would be \$660,000. If LANDSAT is used to map the basin, at a cost of \$22,440, and then selected areas (such as dam sites, habitation areas, or potential irrigation projects ) totalling one half of the basin, or 11,000 square miles, are covered with aerial photography, the total cost would also allow completion of the general land inventory much faster, (one or two months instead of years) than would the use of aerial photography and field surveys.

This example, along with similar ones contained in the references, indicate that remote sensing technology can be effectively utilized to reduce costs and increase the productivity of available capital for development projects like those envisioned or underway in the West Africa region. These savings represent indirect benefits to the population of the region from remote sensing, along with more direct

benefits from increased resource utilization, productivity, etc., as discussed in the Economic Analysis, part 3.D.

The question of cost-effectiveness thus becomes one of whether the proposed project is the best way to achieve these savings through remote sensing. Several other possible means could be proposed, ranging from total aerial surveys to retention of the status quo but none of them is felt to be as effective a solution as the proposed project. Section 3.6 of the Technical Committee Report discusses the specific rationale for the reception station, and sections 3.4 and 3.5 present the case for the proposed training and user assistance functions.

### 3. Summary

Based upon the above findings, it is concluded that the proposal project is financially sound, and based upon a firm and comprehensive financial analysis.

#### C. Social Analysis

##### Beneficiaries

The beneficiaries of the program may be conceived as falling into four categories. Included are: (a) high level officials and managers who are made aware of the benefits of the technology (b) the cadre of technicians and specialists trained directly by the program; (c) those groups, specifically the staffs of the national development agencies who acquire and utilize the technology, will become beneficiaries as the use of the technology increases throughout West Africa; (d) ultimately, through the benefits of the development projects themselves,

the aggregate population of the entire region.

A major objective of the endeavor is to increase exposure to and availability of remote sensing techniques for use as development tools. An estimate as to the expected numbers of trained technicians and the various levels of proficiency is shown below:

DIRECT BENEFICIARIES OF TRAINING PROGRAM

Year:	1	2	3	4	5	Total
Sensitization:	90	90	90	90	90	450
Trained in Basic Remote Sensing:	12	24	24	24	24	108
Trained in Advanced Applications:	5	5	8	8	8	34

The user agencies themselves become beneficiaries as the technology is adopted in their development programs on a broader scale. These agencies will become responsible for and profit from the application of the newly learned skills.

The major concern of the program, obviously, is to ultimately improve the conditions of the population of the countries served by the Center. This will only be accomplished through the development programs themselves. For example, remote sensing imagery can be applied to hydrological studies of the area for assisting in detection of the amount of water available at a specific location, as well as an indication of the most appropriate usage of grazing territories, which is of particular concern to this region. Remote sensing techniques could also be used for forest inventory, evolving a practice of long-term management for firewood. Increasingly efficient utilization of geologic resources

would also be made based upon remote sensing imagery, which would advance the overall economic viability of the concerned countries.

Generally, therefore the key to the program is the establishment of remote sensing applications within the development programs of various national and inter-state agencies. The new techniques will then make projects possible that were not previously available and improve the efficiency and effectiveness of current programs, leading to a positive overall social impact.

#### Roles of Women

The extent to which this program addresses the question of increasing women's participation in the development process remains not clear. As one of the donors, however, the U.S. can and will insist that greater attention is given to this subject. Certainly one step that the U.S. plans to take is to encourage the inclusion of qualified women in the training and application programs.

#### Location

The Sahel has been identified as the initial focal point within the comprehensive target area. The Remote Sensing Center at Ouagadougou will be well situated with respect to the Sahel and the rest of the region. In addition, the Ouagadougou location will facilitate coordination with other previously established organizations, including the Inter African Committee for Hydraulic Studies and the Interstate School for Rural Equipment Engineers. This co-location will increase both technical advantages and the potential for cooperative programs.

D. Economic Analysis

The economic impacts of the proposed project have been discussed earlier in part 3.B. above, Financial Analysis. References I and J,\* to which the reviewer is referred, present detailed and rigorous economic evaluations of the technology of remote sensing and its utility to developing countries.

Part 4 - Implementation Arrangements

A. Administrative Arrangements

The administrative arrangements for the project are discussed in Section 2.1 of the Technical Committee Report. In order to permit the timely initiation of the program, i.e. October, 1977, the project will be initiated under interim arrangements. These interim arrangements will involve coordinated bi-lateral agreements between the host country, Upper Volta, and the three donors to finance their respective contributions to the program. Upper Volta will establish a national remote sensing agency (probably within the Ministry of Public Works) which will be the interim custodian of project facilities (to be located at the ex-French satellite tracking station which has been made available to the project by Upper Volta). Thus initially, the regional center will be a Voltaic entity, headed by an interim Voltaic Director. The Deputy Director of the Center will be provided by Canada and he will assist the Director in managing the Center and coordinating donor inputs, including the three teams of advisors to be provided by the three donors. The Center will be legally qualified to own property, hire personnel (the custodial and support staff will be provided by Upper Volta) and receive

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\* See Appendix I of Technical Committee Report

and disburse funds for local operating costs. During the interim phase, the Technical Committee will continue to meet to review progress and coordinate inputs.

At the earliest practical date, - June 1978 is the target- the Voltaic Center will be succeeded by a regional body, composed of member countries wishing to join the Center and governed by a multi-national governing board. The Regional Center will be regulated by a charter or constitution providing for the powers, rights, priveleges and immunities of multi-national bodies, and setting forth conditions for membership, etc. Such a charter would probably be accompanied by an agreement between the Center and Upper Volta, setting forth the rights, priveleges and immunities that the government grants to the Center. African financial support for the Center will broaden through the collection of membership fees. The Interim Director will be succeeded by a permanent Director. Canada will continue to supply the Deputy Director who will become the Manager of the ground station if the project enters Phase II.

In addition, if an African Remote Sensing Council is formed in early 1978, as planned, the Center and the Council will at some future time probably conclude an agreement setting forth the relationships between the two institutions and the means for interrelating their activities. The draft constitution of the Council, which is a Pan African body, endows the Council with policy, coordinating and harmonizing functions.

The internal organization of the Center is fully described in Section 2.4 of the Technical Committee's report. Included in this

organization is a Liaison Committee composed of donor representatives, Center officials and a representative of the Remote Sensing Council.

B. Implementation Plan

Section 2.6 of the Technical Committee Report summarizes implementation arrangements and Figure 3 of the Report<sup>(pg. 23)</sup> diagrams the critical events for the implementation of Phase I of the project.

As noted above, the program will be implemented through complementary inputs by the three donors and coordinated by the Center's Director and Deputy Director. The U.S. contribution will be implemented by a U.S. contractor, selected competitively, who will have responsibility for providing the agreed upon personnel, arranging the training of African personnel in the U.S., and procuring project equipment, or providing the specifications for such procurement by a procuring agency. If the project can be authorized and FY 1977 funding obligated, it should be possible to select a contractor and start equipment procurement by December 1977 or January 1978. Canadian and French personnel and equipment are expected to begin arriving as early as October 1977.

C. Evaluation Plan

Section 2.5 of the Technical Committee's report discusses the evaluation functions that will be carried out by each of the Center's major activities. In addition, at the July meeting of the Committee, a provision for in-depth evaluation was agreed to. Specifically, it was agreed that such evaluations, including the use of experts not associated with the Center, should be carried out at least once every two years

and that the first such evaluation would take place prior to the end of Phase I. The first evaluation may take place as early as June 1978 to review the prospects for moving into Phase II of the program.

D. Conditions, Covenants and Negotiating Status

As a result of the four meetings of the Technical Committee and the completion of its report, all outstanding issues relating to the scope and design of the project have been resolved, and the project is ready for authorization and the obligation of funds.

In regard to conditions precedent to initial disbursement, the following are recommended (in addition to the standard ones):

- (a) establishment of a national remote sensing agency acceptable to the U.S.;
- (b) assurances acceptable to the U.S. that the ex-French facilities will be made available to the project and that the funding pledged by Upper Volta will be forthcoming;
- (c) Evidence satisfactory to the U.S. that the French and Canadian contributions are available.

A condition precedent to further disbursement should be the appointment of an interim Director (this is not needed at the outset since the interim Director's functions can be performed by the Chairman of the Voltaic Remote Sensing Council, but it should not be long delayed).

In addition, the agreement should include a covenant that Upper Volta will use its best efforts to form a regional remote sensing organization at as early a date as feasible.

TABLE I  
TOTAL FINANCING FOR FIVE YEARS

		(\$ 000)		
		PHASE 1	PHASE 2	PHASE 1 & PHASE 2
U.S.	Short-Term Experts	30	90	
	Expatriate Salaries	947	1175	
	Capital Costs	490	63	
	Operating Costs	255	934	
	African Salaries	77	-	
	Contingencies	52	205	
	TOTAL	1851	2473	4324
France	Short-Term Experts	130	190	
	Expatriate Salaries	480	750	
	Capital Costs	60	100	
	Operating Costs	141	212	
	African Salaries	-	-	
	TOTAL	811	1252	2063
Canada	Short-Term Experts	70	-	
	Expatriate Salaries	160	840	
	Capital Costs	20	3200	
	Operating Costs	150	600	
	African Salaries	20	60	
	Studies	120	150	
	TOTAL	540	4850	5390
Upper Volta	Short-Term Experts	-	-	-
	Expatriate Salaries	-	-	-
	Capital Costs	780	69	
	Operating Costs	43	69	
	African Salaries	86	183	
	TOTAL	909	252	1161
Others	Operational Costs	50	713	
	African Salaries	28	698	
	TOTAL	78	1411	1489
TOTAL		4189	10,238	14,427

TABLE II  
DONOR FUND ALLOCATION  
PROPOSED ANNUAL EXPENDITURE

<u>USA</u>	1		2		3	4	5
	<u>FX</u>	<u>LC</u>	<u>FX</u>	<u>LC</u>			
Short-Term Experts	-	-	30	-	30	30	30
Expatriate Salaries	375	-	572	-	677	309	189
Capital Costs	200	70	115	105	21	23	25
Operating Costs	56	10	115	74	382	339	213
African Salaries	-	37	-	40	-	-	-
Contingencies	2	-	40	10	100	65	40
<b>TOTAL</b>	<b>633</b>	<b>117</b>	<b>872</b>	<b>229</b>	<b>1210</b>	<b>766</b>	<b>497</b>
<u>FRANCE</u>							
Short-Term Experts	50	-	80	-	70	60	60
Expatriate Salaries	200	-	280	-	350	240	160
Capital Costs	60	-	-	-	-	50	50
Operating Costs	31	61	22	27	92	70	50
<b>TOTAL</b>	<b>341</b>	<b>61</b>	<b>382</b>	<b>27</b>	<b>512</b>	<b>420</b>	<b>320</b>
<u>CANADA</u>							
Short-Term Experts	35	-	35	-	-	-	-
Expatriate Salaries	80	-	80	-	280	280	280
Studies	120	-	-	-	-	-	150
Capital Costs	20	-	-	-	3200	-	-
Operating Costs	69	19	45	10	200	200	200
African Salaries	-	10	-	10	30	20	10
<b>TOTAL</b>	<b>324</b>	<b>29</b>	<b>160</b>	<b>20</b>	<b>3710</b>	<b>500</b>	<b>640</b>
<u>UPPER VOLTA</u>							
Existing Facilities	-	750	-	30	-	-	-
Operating Costs	-	20	-	23	19	23	27
African Salaries	-	41	-	45	57	61	65
<b>TOTAL</b>	<b>-</b>	<b>811</b>	<b>-</b>	<b>98</b>	<b>76</b>	<b>84</b>	<b>92</b>
<u>OTHER</u>							
Operating Costs	-	-	50	-	200	200	313
African Salaries	-	-	-	28	148	208	342
<b>TOTAL</b>	<b>-</b>	<b>-</b>	<b>50</b>	<b>28</b>	<b>348</b>	<b>408</b>	<b>655</b>

43

Remote Sensing



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DRAFTING UNIT 01

PAGE 01 STATE 305012

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ORIGIN AID-39

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AFR/CWR: FGILBERT  
IO/CMD:LKAHN (INFO)  
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AIDAC

E.O. 11652: N/A

TAGS: ECA, TSPA

SUBJECT: WEST AFRICA REGIONAL REMOTE SENSING CENTER  
PARIS FOR HELMAN, ADDIS ABABA FOR WILSON

REFERENCE: REPORT OF A.I.D. REMOTE SENSING TEAM 10/30/75.

1. AFR EXECUTIVE COMMITTEE FOR PROJECT REVIEW (ECPR) MET  
ON DECEMBER 19 TO REVIEW REFERENCED REPORT AND RELATED  
DOCUMENTS INCLUDING REVISED BUDGET. MAIN RESULT OF MEETING  
WAS TO APPROVE OPTION TWO OF REPORT'S MAJOR RECOMMENDATION  
(SEE PAGES 41-42) AND TO AGREE TO TREAT REPORT AND SUBJECT

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43



Department of State **TELEGRAM**

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PAGE 02 STATE 305012

PID AS HAVING THE STATUS OF A PRP FOR BUDGETING AND CP PURPOSES. IN OTHER WORDS, A.I.D. S STRONG PREFERENCE WITH RESPECT TO PARTICIPATION WITH THE FAC ON THIS PROJECT IS TO PROVIDE ASSISTANCE IN TRAINING AFRICANS IN THE TECHNOLOGY AND IN ASSISTING ON USER APPLICATION. TEAM REWORKED BUDGET FOR OPTION TWO AND IT IS NOW IN NEIGHBORHOOD DOLS 3 MILLION FOR FIVE YEAR PROJECT. ECPR ASKED FOR ADDITIONAL BUDGET REVISIONS WHICH WILL BE MADE SHORTLY PRIOR TO COMPLETING ESTIMATE FOR CP PURPOSES. LOCUS OF CENTER AND WHETHER IT WILL BE BILINGUAL WAS LEFT OPEN FOR TIME BEING, ALTHOUGH TEAM STRONGLY CONCURRED WITH CDO'S RECOMMENDATION FOR CIEH SPONSORSHIP AND MANAGEMENT.

2. THE NEXT STEP IN THE PLANNING OF THE PROJECT WILL BE PERFORMED BY THE TECHNICAL MISSION WHICH IS BEING ORGANIZED BY ECA WITH THE AIM OF STARTING WORK NEXT MONTH (SEE CHAPTER FOUR AND PAGE 37 OF REPORT). AFR HAS ACCEPTED REPORT'S RECOMMENDATION TO FINANCE AN EXPERT FOR ECA TEAM AND HAS RECRUITED DONALD LOWE, THE CONSULTANT ON THE A.I.D. TEAM, TO BE THE U.S. EXPERT ON THE ECA TEAM. WE UNDERSTAND THAT CANADA HAS ALSO AGREED TO PROVIDE AN EXPERT. WILL KEEP MISSION ADVISED ON PROGRESS OF TEAM WHOSE ITINERARY WILL INCLUDE OUAGADOUGOU.

3. ASSUMING ECA TEAM ENDORSES CNES/FAC PROPOSAL AND RELATED TRAINING ACTIVITIES ALONG LINE OF OPTION TWO, AND THAT THEY HAVE ALSO RECEIVED CILSS ENDORSEMENT, THE NEXT STEP WILL BE THE CONVENING BY ECA OF A DONORS CONFERENCE WHICH WILL SEEK TO NAIL DOWN THE SPECIFICS OF A COLLABORATIVE PROGRAM FOR REMOTE SENSING IN AFRICA INCLUDING PLANS FOR THE WEST AFRICAN RECEIVING AND DATA PROCESSING STATION AND FOR THE RELATED TRAINING ACTIVITIES. BASED ON ARRANGEMENTS WORKED OUT WITH FAC AND POSSIBLY OTHER DONORS AS TO THE TERMS AND MODALITIES OF A MULTI-DONOR PROJECT FOR WEST AFRICA, AFR WOULD FIELD A FINAL DESIGN TEAM TO PREPARE A PROJECT PAPER FOR A.I.D. APPROVAL AND FUNDING. IT SEEMS REASONABLE THAT SUCH A TEAM COULD START WORK SOMETIME IN THE SPRING OF 1976.

4. A SUMMARY OF THE ECPR MEETING AND RELATED DOCUMENTS

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PAGE 03 STATE 305012

WILL BE POUCHED TO FIELD SHORTLY.

5. ABOVE IS FOR ADDRESSEES BACKGROUND INFORMATION ONLY. IN VIEW OF THE UNSETTLED ASPECTS OF THE PROJECT, WE BELIEVE IT UNWISE TO DISCUSS THE SPECIFICS OF A.I.D. PROPOSAL AT THIS TIME WITH AFRICAN OR OTHER DONORS. ROBINSON

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Department of State

INCOMING  
TELEGRAM

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ACTION AID-59

INFO OCT-01 AF-10 EUR-12 IGA-02 L-03 EB-08 OES-07  
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R 292057Z JUL 77  
FM AMEMBASSY PARIS  
TO SECSTATE WASHDC 6415  
INFO AMEMBASSY OUAGADOUGOU  
AMEMBASSY OTTAWA  
AMEMBASSY ADDIS ABABA  
AMEMBASSY ABIDJAN

UNCLAS PARIS 22101

AIDAC: OUAGA FOR CDO, OTTAWA FOR LEARY, ADDIS ABABA FOR  
WILSON, ABIDJAN FOR REDSO

E.O. 11652: N/A

TAGS: EAID

SUBJECT: UPPER VOLTA REMOTE SENSING: MEETING OF  
TECHNICAL COMMITTEE

1. HALF DAY INFORMAL DONORS MEETING JULY 25 AND THREE DAY  
MEETING OF TECHNICAL COMMITTEE, JULY 26-28, HAS RESULTED  
IN OVERALL REVIEW, REVISION AND APPROVAL BY ALL PARTIES  
(CANADA, FRANCE, U.S., UPPER VOLTA AND ECONOMIC COMMISSION  
FOR AFRICA -ECA) OF COMMITTEE'S REPORT WHICH DEFINES THE SCOPE  
AND COST OF THE PROJECT AS WELL AS COST SHARING AND  
INSTITUTIONAL ARRANGEMENTS. PARTIES ALSO REACHED  
AGREEMENT ON SPECIFIC FOLLOW UP ACTIONS TO BE TAKEN  
TO PERMIT PROJECT IMPLEMENTATION TO BEGIN IN OCTOBER.  
PROSPECTS NOW LOOK VERY BRIGHT FOR U.S. OBLIGATION IN  
SEPTEMBER THROUGH GRANT AGREEMENT WITH UPPER VOLTA OF  
INITIAL U.S. CONTRIBUTION OF \$750,000 AS SHOWN  
IN FY 1977 C.P.

2. PARTIES AGREED ON ESSENTIALLY A TWO-PHASED PROJECT TO BE  
LOCATED AT THE FORMER FRENCH SATELLITE TRACKING STATION IN  
OUAGADOUGOU. THE FIRST PHASE OF ABOUT TWO YEARS WILL BE  
DEVOTED TO DEMONSTRATING REMOTE SENSING APPLICATIONS TO  
AFRICAN PROBLEMS, TRAINING OF AFRICAN OFFICIALS AND  
THE CENTER'S STAFF, AND ASSISTING AFRICAN GOVERNMENTS IN  
USING REMOTE SENSING DATA IN THEIR DEVELOPMENT  
PROGRAMS. CONCURRENTLY, STUDIES WILL BE UNDER-TAKEN TO  
EXAMINE THE SOCIO/ECONOMIC FEASIBILITY AND COST EFFECTIVENESS  
OF ESTABLISHING A GROUND STATION. IN ADDITION, DURING THIS  
PHASE THE EFFECTIVENESS OF PHASE ONE ACTIVITIES WILL BE EVALUATED  
AS WILL AFRICAN WILLINGNESS TO BEGIN SHOULDERING THE LOCAL  
COSTS OF THE PROGRAM AND TO ESTABLISH A VIABLE REGIONAL  
INSTITUTION FOR IT. A FIRST EVALUATION WILL BE HELD IN JUNE  
OF 1978 WITH THE PROBABLE NEED FOR A SECOND IN EARLY 1979  
PRIOR TO A DECISION TO PROCEED TO PHASE TWO.

3. SUBJECT TO A FAVORABLE DECISION, PHASE TWO OF THE PROGRAM  
(THREE YEARS) WOULD INVOLVE THE CONSTRUCTION OF A GROUND STATION,  
TO BE FINANCED BY CANADA. STATION WOULD HAVE CAPABILITY TO  
RECEIVE RECORD AND PROCESS DATA FROM LANDSAT AND OTHER SATEL-  
LITES AND PROVIDE REPETITIVE COVERAGE OVER ALL OR MOST OF 30  
AFRICAN COUNTRIES EVERY 18 DAYS. MEANWHILE TECHNICAL  
ASSISTANCE AND TRAINING PROGRAMS INITIATED IN PHASE ONE WOULD  
BE CONTINUED AND EXPANDED SO AS TO ACHIEVE TARGET OF AFRICA-  
MIZATION OF CENTER WITHIN FIVE YEAR TIME FRAME.

4. THREE DONORS AGREED AIM AT COMPLETING PROJECT AGREEMENTS  
WITH UPPER VOLTA IN SEPTEMBER; FRANCE AND CANADA EXPECT  
TO FIELD INITIAL EXPERTS IN OCTOBER. ALSO, FRENCH AND  
U.S. EXPERTS REVIEWED EQUIPMENT NEEDS AND FRENCH AGREED PROVIDE  
RAPIDLY ESSENTIAL ITEMS TO REFURNISH  
EX-FRENCH FACILITY AND TO PERMIT DEMONSTRATION AND

TRAINING PROGRAMS TO GET UNDERWAY. GOUV REPS AGREED  
ESTABLISH A NATIONAL REMOTE SENSING AGENCY TO BE INTERIM  
CUSTODIAN OF PROJECT (PENDING ESTABLISHMENT OF REGIONAL  
INSTITUTION), APPOINT INTERIM DIRECTOR, FINANCE COSTS  
OF LOCAL SUPPORT PERSONNEL AND A PORTION OF SALARIES OF  
CENTER'S PROFESSIONAL STAFF.

5. PROJECT WILL FUNCTION WITHIN FRAMEWORK OF ECA-SPONSORED  
AFRICAN REMOTE SENSING PROGRAM. GOUV HAS AGREED HOST  
MEETING OF PLENIPOTENTIARIES IN FEBRUARY TO RATIFY CONSTITUTION  
OF AFRICAN REMOTE SENSING COUNCIL. ESTABLISHMENT OF REGIONAL  
INSTITUTION FOR UPPER VOLTA PROJECT (WHICH IS ONE OF CONDI-  
TIONS FOR STARTING PHASE TWO) IS AIMED FOR JUNE 1978.  
HARTMAN

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ITEMIZED EQUIPMENT LIST1. Equipment and Supplies

The following will be needed for the Browsing Area:

<u>Donor</u>			<u>Cost Type*</u>
	16 mm Microfilm viewers (2)	\$6,000	
	Empty film cartridges (dependent upon type of viewers)	500	
	Microfilm splicer	150	
	Film viewer (portable)	260	
	World Atlas, comprehensive	200	
		<hr/>	
		\$7,110	E
	Storage cabinets or racks (dependent on type of cartridge)	250	
	Working tables (2)	500	
		<hr/>	
		\$ 750	F
	EROS Microfilms	\$2,880 yr 1,600/yr	I
		<hr/>	2-5
U.S.	SUBTOTAL BROWSE FACILITY	\$10,740	

## \*Cost Type

E = Equipment

F = Furnishings

S = Supplies

I = Imagery

The following equipment will be needed for the Reference Library:

<u>Donor</u>	<u>Approximate Price</u>	<u>Quantity</u>	<u>Item</u>
	-- <sup>1</sup> E	1	Paper cutter
	28 E	1 kit	Microfilm repair supplies
	766 <sup>2</sup> F	1	Microfilm cabinet (will handle 900 reels of film, not cartridges)
	397 F	1	Fiche cabinet
	205/each F	3	5-drawer, legal size file cabinets
	370 F	1	Map cabinet
	386 F	1	Card catalog (15 drawers w/1,200 cards/drawer)
	180 F	1	Work table (for staff)
	80 F	36	Plastic magazine holders
	257 F	1	Journal display (browsing)
	1,980 <sup>3</sup> F	9	Shelving units
	300 E	1	Typewriter
	450 F	1	Desk
	1,500 F	2 tables w/8 or so chairs	
	150 F	1	Reference shelf
	5,000 E	1	Fiche/film reader/printer
	2,500 E	1	Fiche reader printer
	600 E	2 <sup>4</sup>	Portable fiche reader
	400 F	3	Tables for microform readers
	<u>40</u> E	1	Globe
	7,531		<u>Furniture</u>
	<u>8,468</u>		<u>Equipment</u>
U.S.	15,999		TOTAL

1. It is assumed these will be located elsewhere in the Facility.

2. Will depend on whether cartridge type viewer is needed.

3. This is totally dependent on the amount of microfilm used.

The 9 shelves is a maximum number

4. One might be loaned out.

The following supplies and materials are anticipated:

<u>Donor</u>	\$	350	Paper, stamps, cards, etc.
		250	General Reference Books
		200	Maps
		300	Monographs
		500	Proceedings
		200	Journals
		200	Abstracting Services
<hr/>			
U.S.	\$	2,000	

IMAGE ANALYSIS LABORATORY

The unit costs for all the equipment recommended for inclusion as part of the image interpretation facility are summarized in this Annex. Where more than 1 piece of a specific type of equipment is needed, total cost for the required number of units is also indicated. The lists are organized by program support function.

<u>Donor</u>		<u>Cost Type*</u>
	IMAGE ANALYSIS	
U.S.	a. Image Viewing Equipment	
	2 Richards Light tables Model MIM231100 *to be used for viewing roll transparencies and single images.	\$11,895
U.S.	Bausch & Lomb Zoom Stereoscope w/rhombus arms mounted on light table. *to be used for Landsat and aerial photo analysis Model 24OR/15AB @	5,150
France	Old Delft Scanning Stereoscope @ (provides a portable mode of magnified image viewing)	4,650

<u>Donor</u>	a. Image Viewing Equipment (Continued)	<u>Cost Type*</u>
France	Air Force pocket stereoscopes 2 each of 2X and 4X lens types *to be used for photointerpretation and stereo measurements @ 75 x 4	300
France	Tube magnifiers 7X @ 30 x 4 *to be used for quick analysis of image detail	120
	TOTAL	<u>\$22,115 E</u>
	b. Image Enhancing Equipment	
U.S.	VP-8 Density slicer @ *turns a black and white image into 8 grayscale tones with density profile, color coding, automatic percent determination	14,300
	TOTAL	<u>\$14,300 E</u>

\*Cost Types:

- F = Furnishings
- E = Capital Equipment
- S = Operating, Supplies
- I = Imagery
- A = Plane Rental

<u>Donor</u>	CARTOGRAPHIC CAPABILITY	<u>Cost Type</u>
France	a. Detail Transfer Equipment Mapograph @ \$3,397 *to be used for projecting an image onto a plain surface and transferring detail	\$ 3,397.00
U.S.	Bausch and Lomb Zoom Transfer Scope *optically superimposes two images and permits detail transfer from one to another; 5 x to 14 x range	\$ 6,000.00
	TOTAL	<u>\$ 9,397.00 E</u>
France	b. Furnishings (drafting) 2 drafting tables @ \$200 x 2 drafting machine @ \$98 drafting pen set @ \$66 x 2	\$ 400.00 98.00 132.00

<u>Donor</u>	Furnishing (drafting) CONTINUED	<u>Cost Type*</u>
	Leroy lettering set	\$ 180.00
	1 ring light on flex arm	80.00
	2 fluorescent lights with flex arm	204.00
France	2 tall drafting chairs @ \$60.00	120.00
	1 pinboard	75.00
	1 set of metal shelves	60.00
	1 storage cabinet	418.00
		<hr/>
	TOTAL	\$ 1,767.00 E
France	c. Supplies	
	T-squares, set squares, templates, 2H and 3H pencils, compasses, triangles, masking tape, etc.	<u>\$ 1,100.00 S</u>
	IMAGERY FILE	
France	a. Furnishings	
	2 legal size file cabinets @ \$200	400.00
	3 file boxes @ \$20	60.00
	1 bulletin board	<u>75.00</u>
	TOTAL	\$ 535.00 F
U.S.	b. Imagery	
	Year 1 800 scenes of 9" x 9" Landsat data 3 bands @ \$30.00	\$24,000.00
	50 scenes of 9" x 9" Landsat color composites @ \$15.00	<u>750.00</u>
	TOTAL	\$24,750.00 I
	Year 2 300 scenes of 9" x 9" Landsat @\$30	9,000.00
	c. Mensuration	
France	Linear	
	Box wood scales .5mm/.001 ft @ \$7 x 4	\$ 28.00
	Area	
U.S.	Dot grids @ \$2 x 20	40.00
	Dot counter @ #33.00	33.00
	Acetate rectangular grids, various sizes @ \$2 x 25	50.00

France	Polar Planimeter @ \$125	125.00
U.S.	Digital electronic planimeter @ \$760	760.00
	Height	
France	Parallax wedges @ \$6 x 4	24.00
France	Abram's height finder @ \$75	75.00
		<hr/>
	TOTAL	\$1,135.00 E

d. Addition Image Viewing Equipment

U.S.	A rear projection viewer (e.g. a Variscan) @ \$75.00	\$75,000.00
	*used for rapid scanning of roll film and enlarged viewing of roll film or single transparencies by several persons	
France	A second old Delft scanning stereoscopic *to be used with the other Delft for simultaneous stereoscopic viewing by 2 persons	4,650.00
U.S.	Stereo countour plotter type 121-GE *to be used with air photos to develop contour lines.	800.00
		<hr/>
	TOTAL	\$80,450.00 E

e. Furnishings

4 legal size file cabinets @\$200 x 4	800.00
2 sets of metal shelves @ 60 x 2	120.00
2 work tables @ 418 x 2	836.00
1 storage cabinet @ \$48.00	418.00
2 tall drafting chairs @ \$60 x 2	120.00
2 pin boards @ \$75 x 2	150.00
1 map cabinet \$300	300.00
4 regular chairs @ \$75 x 4	300.00
1 ring light on a flex arm	80.00
2 programmable pocket calculators @ \$400	800.00
1 map tube rack w/tubes	121.00
	<hr/>
	\$4,045.00 F

f. Supplies

color pencils, mylar for overlays, cotton gloves, masking tape, grease pencils, etc.	\$1,100.00 S
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<u>Donor</u>	<u>TRAINING</u>		
	<u>CLASSROOM</u>		
France	a. Furniture		
	1 lectern @ \$320	\$ 320.00	
	8 long tables: 2 students/table @\$215	1,720.00	
	20 chairs @\$80	1,600.00	
	1 blackboard/Pegboard 4' x 6' @ \$200	200.00	
	2 Easels @ \$40.00	80.00	
	1 cabinet for storing A-V equipment @\$150	150.00	
	1 cabinet for storing A-V programs (carousels, cassettes, etc)	150.00	
	2 projector stands @ \$45	90.00	
		<hr/>	
	TOTAL		\$4,230.00 F
France	b. Expendables		
	Chalk and erasers; flip charts	\$ 150.00 S	
	AUDIO-VISUAL EQUIPMENT		
France	a. 35 mm Slide Program System, consisting of:		
	2 Kodak Ektographic 35 mm slide projectors		
	AF-1 auto focus w/zoom: @\$267.50 (Europe model \$600)	\$ 535.00	
U.S.	1 Audio Visual Lab (AVL)MkII,Dissolve Unit:	365.00	
U.S.	1 Wollensak 25-73 cassette tape recorder:	540.00	
	Extension speaker:	50.00	
France	Extra Carousels (5) @ \$3.78	20.00	
U.S.	16 mm sound movie projector, Kodak Pageant w/extra take up reels, assorted sizes	1,775.00	
France	Overhead Project with roll film adaptor	300.00	
France	1 DaLite 70" x 70" tripod matte white screen	100.00	
France	Electric light-arrow pointer	120.00	
		<hr/>	
	TOTAL		\$ 3,805.00 E
	PHOTO INTERPRETATION KITS (15)		
	Pocket Stereoscope (2X)	15.00	
	Photo Interpreter's slide rule	7.50	
	Protractor	1.00	
	.0001' and .5 mm Boxwood Scale	6.00	
	Straight edge	3.00	
	Right triangle	1.00	
	7x tube magnifier	30.00	
	Parallalax wedge	6.00	
	Grease pencils, colored pencils	2.50	
	Dot grid	2.00	
		<hr/>	
	TOTAL		\$ 74.00
	Portable light table	70.00	
		<hr/>	
	TOTAL		\$ 144.00
France	15 complete kits		<u>\$ 2,150.00 E</u>

FIELD RECONNAISSANCE

U.S.	a. Micrometeorology		
	Integrating anemometer (wind speed & direction)	\$	75.00
	Air temperature (1°C)		15.00
	Psychrometer (relative humidity)		28.00
	Raingauge		<u>32.00</u>
	TOTAL	\$	150.00 E
U.S.	b. Radiance and Irradiance		
	Bendix 4-band (ERTS) field portable spectrometer w/tripod or equivalent	\$	4,000.00
	Standard reflectance panels (Kodak gray cards) 10%, 30%, 60%, and others		5.00
	TOTAL	\$	<u>4,005.00 E</u>
U.S.	c. Vegetation		
	Plant press	\$	20.00
	Diameter tape		25.00
	Relaskop		400.00
	Quadrat templates @ \$5 x 4		20.00
	Increment bores		50.00
	Clippers		13.00
	1 m. sq. plastic mirror		70.00
	Meter stick		2.00
		\$	<u>600.00</u> E
U.S.	d. Soils		
	Auger	\$	13.00
	Color Kit		65.00
	Sterile sample bags 500		28.50
	Sieves: (8)		50.00
	Thermocouple psychrometer		450.00
		\$	<u>606.50</u> E

U.S.	e. Water		
	Kempler bottles (10)	\$	24.95
	Secchi disc		11.95
	Plastic sample bottles (30) @ 1.00		30.00
	pH/conductivity		649.00
	sample preservation kits for phytoplankton and zooplankton @ 1.00		30.00
	flow meter		800.00
	water quality parameter test kits (dissolved O <sub>2</sub> , CO <sub>2</sub> , etc.)		150.00
	thermistor w/sounding probe		188.00
	recording depth meter		600.00
			<hr/>
		TOTAL	\$ 2,483.90 E

U.S.	f. Geology		
	rock hammer/chisels		17.00
	sample bags @\$5 x 5		25.00
	musette bag		34.00
	streak plate		1.00
	bottle of HCl		2.00
	steel file		2.00
	dental probes		15.00
			<hr/>
		TOTAL	\$ 96.00 E

RECORDS, SURVEY & GROUND PHOTOGRAPHIC EQUIPMENT

France	a. Records		
	form holders @\$6.50 x 2	\$	13.00
	rigid plastic photo cases @\$4.50 x 2		9.00
	plastic map cases @\$1.85 x 25		31.25
	grease pencils, colored pencils		10.00
	leather field case		30.00
			<hr/>
		TOTAL	\$ 93.25 S

France	b. Survey Equipment		
	scale	\$	20.00
	binoculars		150.00
	Brunton pocket transit system w/tripod		135.00
	hand magnifiers @\$5 x 2		10.00
	pocket lensotic compasses @\$20 x 2		40.00
	tall step ladder		15.00

Donor

Survey Equipment (Continued)

clinometer	\$ 42.00
"chain" tapes 50 m, 100 m	205.00
surveyors stakes @1.25 x 50	62.50
plane table and tripod \$200 plus \$250	450.00
plastic flagging, 12 rolls	11.10
pedometer	17.50

TOTAL \$1,158.10 E

U.S. c. Ground Photographic

35mm SLR camera bodies 3 x 2	\$ 778.00
lenses - standard 50 mm	79.00
macro 55 mm/f3.5	214.00
telephoto 200 mm	200.00
fish eye 18	437.00
Filters 1A @ \$13 x 2	26.00
Film-100 rolls of color and black & white	225.00

TOTAL \$1,734.00 E  
225.00 S

CAMPING

France a. Special Clothing

Safety hats	5.70
Snake leggings \$20 x 2	40.00
Waders	35.00
Rubber boots \$20 x 2	40.00

TOTAL \$ 120.70 E

France b. Shelter

2 wall tents @163 x 2	\$ 325.00
1 dining fly @40	40.00
1 folding table @25	25.00
4 camp stools @5	20.00
4 sets of mosquito netting and bars @15	60.00
4 sleeping bags @35	140.00
4cots @22	88.00
3 camp lanterns @22	66.00
1 first aid kit	44.00
canteens (4) @3.50	14.00

\$ 823.00

France c. Cooking

Food storage boxes	\$ 30.00
Food and water coolers	78.00
Grill	9.00
2 cook kits @ \$16	32.00

Cooking (Continued)

U.S.	1 cooking utensil kit	12.00
	2 camp stoves @ 24	42.00
	2 vacuum bottles @26.50	<u>53.00</u>

TOTAL \$ 256.00 E

France d. Miscellaneous

4 flashlights @5	\$ 20.00
machete	35.00
chainsaw	250.00
box saw	10.00
axe	7.00
sharpening stone	5.00

TOTAL \$ 327.00 E

France e. Transportation

4 wheel drive pick-up truck or station wagon w/trailer	\$10,500.00
boat w/motor, 4 hp	725.00
winch	427.00
Microbus and car rental	<u>10,130.00</u>

TOTAL \$21,782.00 E

airplane rental 66 hrs a \$75/hr 5,000.00 A

France f. Communication

short wave radio	300.00
walkie-talkies @150	300.00

TOTAL \$ 600.00 E

France & U.S. g. Operations

food, gas, etc. TOTAL \$10,000.00 S

PHOTOGRAPHIC EQUIPMENT LIST

DONOR

Cost Type\*

Film Processing

US

Calumet 3-1/2 gal tanks (5)	
Calumet 3-1/2 gal washer	\$ 1,000
Basket for roll film	
Reels for roll film	
Kinderman tanks for roll film (color)	7,500
Calumet hangers - plastic	200
Water jacket for tanks or deep sink	500
Frigid-head temperature control unit	800
Six 10x12 trays	60
Wall mount roll film dryer	100
Fisher or other cut film dryer	400
Eastman 4x5 hangers	100
Rotex silver reclaimer	600
Nitrogen burst timer	200
Darkroom doors	2,000

TOTAL	\$ 13,460	E
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Black & White Printing

France

9x9 Enlarger equipped with glass carrier and roll film attachment and 12" lens	\$ 3,000
4x5 Enlarger with condenser and diffusion heads	1,000
180 - 150 - 100 - 50 mm lenses, mounted	800
Tube processor for 36x36 prints	600
4 trays 24x30	
4 trays 16x20	
4 trays 11x14	200
4 trays 8x10	
Safe lights, timers, focussing aids, etc.	1,000
9x9 contact printer, Morse or equivalent	500
Diazo machine	1,000
Negative carriers	100

	\$ 8,000	E
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\*Cost Type  
 E = Equipment  
 S = Supplies

DONOR	Color Printing		<u>Cost Type*</u>
U.S.	Point source contact printer 9x9	1,000	
	Calumet processors	3,000	
	4x5 Beseler with color head	750	
	Color head processor	1,500	
	Filters for point source printer	75	
	Tube processor for 36x36	1,000	
	Ph meter	250	
	Pako dryer for RC prints	4,500	
	Screen rack dryer for Ceba prints	150	
	Copy stand for opaque & transparent materials	1,000	
	8 x 10 view camera with reducing back and assorted lenses	1,500	
	35 mm SLRs 350 each x 3	1,050	
	Tripods 75 each x 3	225	
	Exposure meters 60 each x 4	240	
	Densitometer, reflection and transmission	1,200	
	Color analyzer	600	
	Easels, including large vacuum easel	1,000	
	Pako chemical mixer and storage tanks	300	
	Refrigerator for storing films	500	
	Asisto illuminator	400	
	8 x 10 and 4x5 film holders	300	
		<hr/>	
		\$ 20,540	E
		<hr/>	
		\$ 42,000	
	Supplies		
	Chemicals, paper, film, etc.	\$ 12,000	



**PROJECT DESIGN SUMMARY  
LOGICAL FRAMEWORK**

Life of Project:  
From FY 1977 to FY 1981  
Total U.S. Funding \$4,324,000  
Date Prepared: 8/12/77

Project Title & Number: 625-11-190-913  
REGIONAL REMOTE SENSING/UPPER VOLTA

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
<p><b>Program or Sector Goal:</b> The broader objective to which this project contributes: The goal of this multi-donor project is to accelerate the economic and social development of West Africa by improving the ability of the countries of the region to carry out long and short term development programs, through the utilization of remote sensing, particularly earth resources satellite technology. Attainment of this goal is dependent upon the institutionalization of the technology within the appropriate government agencies of the West African countries.</p>	<p><b>Measures of Goal Achievement:</b> Inclusion of remote sensing technology in the development project plans of the West African development agencies; growing demand for Landsat imagery; and growing West African support of a Center to supply images, training, and assistance in the use of the technology.</p>	<ul style="list-style-type: none"> <li>- Future project reports and records.</li> <li>- Reports of the Regional Remote Sensing Center</li> </ul>	<p><b>Assumptions for achieving goal targets:</b> User agencies will adopt remote sensing when it is demonstrated to be useful and cost effective.</p> <p>The Landsat series of satellites (or satellites with similar capabilities) will continue for at least another decade.</p>
<p><b>Project Purpose:</b> To establish a West African Remote Sensing Center with a capacity to:</p> <ul style="list-style-type: none"> <li>- develop and demonstrate the use of remote sensing technology in various development projects.</li> <li>- provide training in use of the technology to a number of user agency personnel.</li> <li>- establish a satellite data reception station capable of providing repetitive real time coverage of West Africa.</li> </ul>	<p><b>Conditions that will indicate purpose has been achieved:</b> End of project status.</p> <ul style="list-style-type: none"> <li>- An operating Regional Remote Sensing Center staffed by Africans, providing training and assistance in utilization of the technology; and receiving, processing and distributing satellite data.</li> <li>- User agencies having a cadre of personnel trained and pursuing remote sensing utilization in their agency projects.</li> </ul>	<ul style="list-style-type: none"> <li>- Reports and records of the Center</li> <li>- Agency project reports and records.</li> </ul>	<p><b>Assumptions for achieving purpose:</b></p> <ul style="list-style-type: none"> <li>- West African nations are willing to cooperate in the maintenance of a Regional Remote Sensing Center, including personnel and financial support.</li> <li>- Successful applications of existing data will confirm the need for the ground station.</li> <li>- Donor coordination and cooperation functions smoothly.</li> </ul>
<p><b>Outputs:</b></p> <ul style="list-style-type: none"> <li>- Demonstrated successful utilization of remote sensing imagery.</li> <li>- User agency personnel trained and utilizing remote sensing in agency projects.</li> <li>- Satellite data received, processed, and distributed by the Center</li> <li>- African personnel trained to staff the Center.</li> </ul>	<p><b>Magnitude of Outputs:</b></p> <ul style="list-style-type: none"> <li>- Three to four major development programs per year assisted by the Center and using remote sensing as a key tool.</li> <li>- Ongoing basic training courses for 20-30 persons each year; advanced training for 6-10 users per year.</li> <li>- Complete coverage of the West Africa region at least every 18 days (cloud cover permitting)</li> </ul>	<ul style="list-style-type: none"> <li>- Project reports and records</li> <li>- Reports of the Center</li> </ul>	<p><b>Assumptions for achieving outputs:</b></p> <ul style="list-style-type: none"> <li>- Development programs which can be assisted by remote sensing will be willing to utilize the technology.</li> <li>- West African support of the Regional Center develops in a timely manner.</li> <li>- Capable personnel are made available from the user agencies.</li> <li>- Earth resources satellite program is continued by NASA.</li> </ul>
<p><b>Inputs:</b></p> <ol style="list-style-type: none"> <li>1. Short and long-term technical assistance.</li> <li>2. Imagery interpretation, reference, and reproduction equipment.</li> <li>3. Reception station design studies and capital equipment.</li> <li>4. Physical facilities.</li> <li>5. Operating supplies and logistic support</li> <li>6. African staff support.</li> </ol>	<p><b>Implementation Target (Type and Quantity)</b></p> <p>See first budget table, page 23 of Implementation Schedule.</p>	<ul style="list-style-type: none"> <li>- Reports of the Regional Center</li> <li>- On-site visits</li> </ul>	<p><b>Assumptions for providing inputs:</b></p> <ul style="list-style-type: none"> <li>- Qualified technical consultants and advisors can be recruited by the donors</li> <li>- Funds authorized by all donors</li> <li>- Appropriate interim institution and eventual regional organization are instituted to act as the legal body for the purpose of receiving and managing donor commitments.</li> <li>- Agreements successfully executed between the government of Upper Volta and respective donors.</li> </ul>

16A

Annex D-1

6C(2) - PROJECT CHECKLIST

Listed below are, first, statutory criteria applicable generally to projects with FAA funds, and then project criteria applicable to individual fund sources: Development Assistance (with a sub-category for criteria applicable only to loans); and Security Supporting Assistance funds.

CROSS REFERENCES: IS COUNTRY CHECKLIST UP TO DATE? IDENTIFY. HAS STANDARD ITEM CHECKLIST BEEN REVIEWED FOR THIS PROJECT?

GENERAL CRITERIA FOR PROJECT.

1. App. Unnumbered; FAA Sec. 653(b)
  - (a) Describe how Committees on Appropriations of Senate and House have been or will be notified concerning the project;
  - (b) is assistance within (Operational Year Budget) country or international organization allocation reported to Congress (or not more than \$1 million over that figure plus 10%)?
  - (a) Project is included in FY 77 C.P. (pg. 170); Congressional Notification will be required for FY 78 funding.
  - (b) Yes.
  
2. FAA Sec. 611(a)(1). Prior to obligation in excess of \$100,000, will there be (a) engineering, financial, and other plans necessary to carry out the assistance and (b) a reasonably firm estimate of the cost to the U.S. of the assistance?
  - (a) and
  - (b) Yes.
  
3. FAA Sec. 611(a)(2). If further legislative action is required within recipient country, what is basis for reasonable expectation that such action will be completed in time to permit orderly accomplishment of purpose of the assistance?
  - Not Applicable
  
4. FAA Sec. 611(b); App. Sec. 101. If for water or water-related land resource construction, has project met the standards and criteria as per Memorandum of the President dated Sept. 5, 1973 (replaces Memorandum of May 15, 1962; see Fed. Register, Vol 38, No. 174, Part III, Sept. 10, 1973)?
  - Not Applicable
  
5. FAA Sec. 611(e). If project is capital assistance (e.g., construction), and all U.S. assistance for it will exceed \$1 million, has Mission Director certified the country's capability effectively to maintain and utilize the project?
  - Not Applicable

A.

6. FAA Sec. 209, 619. Is project susceptible of execution as part of regional or multi-lateral project? If so why is project not so executed? Information and conclusion whether assistance will encourage regional development programs. If assistance is for newly independent country, is it furnished through multi-lateral organizations or plans to the maximum extent appropriate?

Project in both regional and multi-lateral.

7. FAA Sec. 601(a); (and Sec. 201(f) for development loans). Information and conclusions whether project will encourage efforts of the country to: (a) increase the flow of international trade; (b) foster private initiative and competition; (c) encourage development and use of cooperatives, credit unions, and savings and loan associations; (d) discourage monopolistic practices; (e) improve technical efficiency of industry, agriculture and commerce; and (f) strengthen free labor unions.

Project will increase agricultural efficiency by providing agricultural planners and natural resource managers better data for the selection & planning of agricultural projects and for preventing adverse environmental consequences.

8. FAA Sec. 601(d). Information and conclusion on how project will encourage U.S. private trade and investment abroad and encourage private U.S. participation in foreign assistance programs (including use of private trade channels and the services of U.S. private enterprise).

Will promote use of remote sensing technology in West Africa and use of U.S. consulting firms which have a leadership role in the applications of the technology.

9. FAA Sec. 612(b); Sec. 636(h). Describe steps taken to assure that, to the maximum extent possible, the country is contributing local currencies to meet the cost of contractual and other services, and foreign currencies owned by the U.S. are utilized to meet the cost of contractual and other services.

Upper Volta is making a substantial contribution to local costs and other West African countries that will participate in program are expected to do so as well.

10. FAA Sec. 612(d). Does the U.S. own excess foreign currency and, if so, what arrangements have been made for its release?

No.

B. FUNDING CRITERIA FOR PROJECT

1. Development Assistance Project Criteria

a. FAA Sec. 102(c); Sec. 111; Sec. 281a. Extent to which activity will (a) effectively involve the poor in development, by extending access to economy at local level, increasing labor-intensive production, spreading investment out from cities to small towns and rural areas; and (b) help develop cooperatives, especially by technical assistance, to assist rural and urban poor to help themselves toward better life, and otherwise encourage democratic private and local governmental institutions?

Activity will indirectly assist rural poor by providing data for better agricultural planning and resource management raising rural income levels and facilitating measures to prevent environmental degradation.

AD

AID HANDBOOK 3, App 6C	TRANS. MEMO NO. 3:11	EFFECTIVE DATE November 10, 1976	PAGE NO. 6C(2)-3
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B1

b. FAA Sec. 103, 103A, 104, 105, 106, 107. Is assistance being made available: [include only applicable paragraph -- e.g., a, b, etc. -- which corresponds to source of funds used. If more than one fund source is used for project, include relevant paragraph for each fund source.]

- (1) [103] for agriculture, rural development or nutrition; if so, extent to which activity is specifically designed to increase productivity and income of rural poor; [103A] if for agricultural research, is full account taken of needs of small farmers;
- (2) [104] for population planning or health; if so, extent to which activity extends low-cost, integrated delivery systems to provide health and family planning services, especially to rural areas and poor;
- (3) [105] for education, public administration, or human resources development; if so, extent to which activity strengthens nonformal education, makes formal education more relevant, especially for rural families and urban poor, or strengthens management capability of institutions enabling the poor to participate in development;
- (4) [106] for technical assistance, energy, research, reconstruction, and selected development problems; if so, extent activity is:
  - (a) technical cooperation and development, especially with U.S. private and voluntary, or regional and international development, organizations;
  - (b) to help alleviate energy problem;
  - (c) research into, and evaluation of, economic development processes and techniques;
  - (d) reconstruction after natural or manmade disaster;
  - (e) for special development problem, and to enable proper utilization of earlier U.S. infrastructure, etc., assistance;
  - (f) for programs of urban development, especially small labor-intensive enterprises, marketing systems, and financial or other institutions to help urban poor participate in economic and social development.

Project will facilitate more rapid agricultural productivity and growth and benefit rural poor by providing agricultural planners and resource managers with more recent and comprehensive data for planning and selecting agricultural projects and for taking measures to forestall adverse ecological consequences

5

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(5) [107] by grants for coordinated private effort to develop and disseminate intermediate technologies appropriate for developing countries.

c. FAA Sec. 110(a); Sec. 208(e). Is the recipient country willing to contribute funds to the project, and in what manner has or will it provide assurances that it will provide at least 25% of the costs of the program, project, or activity with respect to which the assistance is to be furnished (or has the latter cost-sharing requirement been waived for a "relatively least-developed" country)?

d. FAA Sec. 110(b). Will grant capital assistance be disbursed for project over more than 3 years? If so, has justification satisfactory to Congress been made, and efforts for other financing?

e. FAA Sec. 207; Sec. 113. Extent to which assistance reflects appropriate emphasis on; (1) encouraging development of democratic, economic, political, and social institutions; (2) self-help in meeting the country's food needs; (3) improving availability of trained worker-power in the country; (4) programs designed to meet the country's health needs; (5) other important areas of economic, political, and social development, including industry; free labor unions, cooperatives, and Voluntary Agencies; transportation and communication; planning and public administration; urban development, and modernization of existing laws; or (6) integrating women into the recipient country's national economy.

f. FAA Sec. 281(b). Describe extent to which program recognizes the particular needs, desires, and capacities of the people of the country; utilizes the country's intellectual resources to encourage institutional development; and supports civic education and training in skills required for effective participation in governmental and political processes essential to self-government.

Section 110(a) is inapplicable to a multi-donor and regional project. Upper Volta is nevertheless making a substantial contribution to the project.

Section 110(b) is inapplicable to a multi-donor regional project.

Project designed to assist all countries to obtain data through which they can more successfully plan their agricultural & rural development programs and to manage their natural resources more effectively. These activities will result in increasing the self-help efforts of the participating countries for meeting their food needs. Training of African planners and managers will be a major output of project. Women will benefit from project by participating in its training activities.

Project will train a cadre of Africans knowledgeable in remote sensing technology and capable of applying that technology to their countries' agricultural and natural resource development programs.

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g. FAA Sec. 201(b)(2)-(4) and -(8); Sec. 201(e); Sec. 211(a)(1)-(3) and -(8). Does the activity give reasonable promise of contributing to the development: of economic resources, or to the increase of productive capacities and self-sustaining economic growth; or of educational or other institutions directed toward social progress? Is it related to and consistent with other development activities, and will it contribute to realizable long-range objectives? And does project paper provide information and conclusion on an activity's economic and technical soundness?

Yes.

See pages 17-30 of Project Paper

h. FAA Sec. 201(b)(6); Sec. 211(a)(5), (6). Information and conclusion on possible effects of the assistance on U.S. economy, with special reference to areas of substantial labor surplus, and extent to which U.S. commodities and assistance are furnished in a manner consistent with improving or safeguarding the U.S. balance-of-payments position.

Most of project funding will be for U.S. goods and services.

2. Development Assistance Project Criteria (Loans only)

a. FAA Sec. 201(b)(1). Information and conclusion on availability of financing from other free-world sources, including private sources within U.S.

b. FAA Sec. 201(b)(2); 201(d). Information and conclusion on (1) capacity of the country to repay the loan, including reasonableness of repayment prospects, and (2) reasonableness and legality (under laws of country and U.S.) of lending and relending terms of the loan.

c. FAA Sec. 201(e). If loan is not made pursuant to a multilateral plan, and the amount of the loan exceeds \$100,000, has country submitted to AID an application for such funds together with assurances to indicate that funds will be used in an economically and technically sound manner?

d. FAA Sec. 201(f). Does project paper describe how project will promote the country's economic development taking into account the country's human and material resources requirements and relationship between ultimate objectives of the project and overall economic development?

PAGE NO. 6C(2)-6	EFFECTIVE DATE November 10, 1976	TRANS. MEMO NO. 3:11	AID HANDBOOK 3, App. 6C
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B2

e. FAA Sec. 202(a). Total amount of money under loan which is going directly to private enterprise, is going to intermediate credit institutions or other borrowers for use by private enterprise, is being used to finance imports from private sources, or is otherwise being used to finance procurements from private sources?

f. FAA Sec. 620(d). If assistance is for any productive enterprise which will compete in the U.S. with U.S. enterprise, is there an agreement by the recipient country to prevent export to the U.S. of more than 20% of the enterprise's annual production during the life of the loan?

3. Project Criteria Solely for Security Supporting Assistance

FAA Sec. 531. How will this assistance support promote economic or political stability?

4. Additional Criteria for Alliance for Progress

[Note: Alliance for Progress projects should add the following two items to a project checklist.]

a. FAA Sec. 251(b)(1), -(8). Does assistance take into account principles of the Act of Bogota and the Charter of Punta del Este; and to what extent will the activity contribute to the economic or political integration of Latin America?

b. FAA Sec. 251(b)(8); 251(h). For loans, has there been taken into account the effort made by recipient nation to repatriate capital invested in other countries by their own citizens? Is loan consistent with the findings and recommendations of the Inter-American Committee for the Alliance for Progress (now "CEPCIES," the Permanent Executive Committee of the OAS) in its annual review of national development activities?

8/10

Annex D-2

6C(3) - STANDARD ITEM CHECKLIST

Listed below are statutory items which normally will be covered routinely in those provisions of an assistance agreement dealing with its implementation, or covered in the agreement by exclusion (as where certain uses of funds are permitted, but other uses not):

These items are arranged under the general headings of (A) Procurement, (B) Construction, and (C) Other Restrictions.

A. Procurement

- |   |   |
|---|---|
| 1. <u>FAA Sec. 602.</u> Are there arrangements to permit U.S. small business to participate equitably in the furnishing of goods and services financed?   | Standard A.I.D. procedures will be followed.          |
| 2. <u>FAA Sec. 604(a).</u> Will all commodity procurement financed be from the U.S. except as otherwise determined by the President or under delegation from him?   | See source/origin waiver in authorization memorandum. |
| 3. <u>FAA Sec. 604(d).</u> If the cooperating country discriminates against U.S. marine insurance companies, will agreement require that marine insurance be placed in the U.S. on commodities financed?  | Yes.  |
| 4. <u>FAA Sec. 604(e).</u> If offshore procurement of agricultural commodity or product is to be financed, is there provision against such procurement when the domestic price of such commodity is less than parity?   | Not Applicable  |
| 5. <u>FAA Sec. 608(a).</u> Will U.S. Government excess personal property be utilized wherever practicable in lieu of the procurement of new items?  | Yes.  |
| 6. <u>MMA Sec. 901(b).</u> (a) Compliance with requirement that at least 50 per centum of the gross tonnage of commodities (computed separately for dry bulk carriers, dry cargo liners, and tankers) financed shall be transported on privately owned U.S.-flag commercial vessels to the extent that such vessels are available at fair and reasonable rates. | Yes.  |
| 7. <u>FAA Sec. 621.</u> If technical assistance is financed, will such assistance be furnished to the fullest extent practicable as goods and professional and other services from private enterprise on a contract basis? If the facilities of other Federal agencies will be utilized,  | Yes.  |

17

A7

are they particularly suitable, not competitive with private enterprise, and made available without undue interference with domestic programs?

8. International Air Transport. Fair Competitive Practices Act, 1974

If air transportation of persons or property is financed on grant basis, will provision be made that U.S.-flag carriers will be utilized to the extent such service is available?

Yes.

B. Construction

FAA Sec. 601(d). If a capital (e.g., construction) project, are engineering and professional services of U.S. firms and their affiliates to be used to the maximum extent consistent with the national interest?

Not Applicable

2. FAA Sec. 611(c). If contracts for construction are to be financed, will they be let on a competitive basis to maximum extent practicable?

Yes.

3. FAA Sec. 620(k). If for construction of productive enterprise, will aggregate value of assistance to be furnished by the U.S. not exceed \$100 million?

Not Applicable

C. Other Restrictions

1. FAA Sec. 201(d). If development loan, is interest rate at least 2% per annum during grace period and at least 3% per annum thereafter?

Not Applicable

2. FAA Sec. 301(d). If fund is established solely by U.S. contributions and administered by an international organization, does Comptroller General have audit rights?

Not Applicable

3. FAA Sec. 620(h). Do arrangements preclude promoting or assisting the foreign aid projects or activities of Communist-Bloc countries, contrary to the best interests of the U.S.?

Yes.

4. FAA Sec. 636(i). Is financing not permitted to be used, without waiver, for purchase, long-term lease, or exchange of motor vehicle manufactured outside the U.S. or guaranty of such transaction?

Yes.

78

5. Will arrangements preclude use of financing:

- a. FAA Sec. 114. to pay for performance of abortions or to motivate or coerce persons to practice abortions? Yes.
- b. FAA Sec. 620(g). to compensate owners for expropriated nationalized property? Yes.
- c. FAA Sec. 660. to finance police training or other law enforcement assistance, except for narcotics programs? Yes.
- d. FAA Sec. 662. for CIA activities? Yes.
- e. App. Sec. 103. to pay pensions, etc. for military personnel? Yes.
- f. App. Sec. 106. to pay U.N. assessments? Yes.
- g. App. Sec. 107. to carry out provisions of FAA Sections 209(d) and 251(h)? (transfer to multilateral organization for lending). Yes.
- h. App. Sec. 501. to be used for publicity or propaganda purposes within U.S. not authorized by Congress? Yes.

WEST AFRICA REMOTE SENSING CENTER  
JOB DESCRIPTIONS

USER ASSISTANCE APPLICATIONS EXPERT

The User Assistance Applications Expert will be responsible for developing and performing a program of assistance in the application of remote sensing to African development projects. As part of the Regional Remote Sensing Center, his/her goal will be to foster interest and understanding of remote sensing technology, and to implement its adoption by potential user agencies through cooperative demonstration and assistance efforts. He/she will need to become familiar with resource development priorities and capabilities throughout the West Africa region, will develop contacts with the appropriate agencies and define assistance projects in his/her scientific field(s). He/she will then have full responsibility for technical performance and management of these projects for the Center, including the necessary research, field and laboratory studies.

In addition, the applications expert will be called upon to prepare course material and present lectures and/or workshops in his/her field, in support of the Center's training program. He/she will also act as advisor to a limited number of advanced students each year.

During the course of his/her assignment, the applications expert will also be responsible for the selection and training of an African counterpart who will fill the position at the Center upon the expatriate's departure.

The user assistance applications expert must have a sound technical background in his/her scientific field(s) and a minimum of 3 years of experience in the application of remote sensing to this field, including the use of Landsat data. The individual should be dynamic and enthusiastic in contacts with the African user community, as well as imaginative in envisioning possible applications of remote sensing capabilities and inventive in devising and performing the interpretive procedures for using the imagery under existing conditions. He/she must also have a demonstrated capability in transferring knowledge and ideas to others.

63

## User Assistance Applications Expert

A working knowledge of the French language is essential, but not a prerequisite.

At the present time, positions for three individuals are anticipated to provide expertise in some combination of the following fields:

- Cartography
- Forestry
- Land Use/Geography
- Agriculture
- Geology
- Soils/Hydrology
- Rangeland

The individuals selected must be willing to locate in Ouagadougou, Upper Volta, for a period of 2 - 3 years. Extensive travel throughout West Africa will be required.

1

WEST AFRICA REMOTE SENSING CENTER  
JOB DESCRIPTION

PHOTOGRAPHIC ENGINEER

The Photographic Engineer will have responsibility for establishment, operation and management of the photographic laboratory at the Regional Remote Sensing Center. This will include ordering of equipment and supplies, oversight of the new facilities to be constructed, and in the interim period, operation of the best possible photographic services within the limited facilities available. He/she will have one to two African assistants and will be expected to train an African to take over responsibility for the photo facility within three years. In addition, he/she may be called upon to instruct students at the Center in basic photographic practices as they relate to remote sensing applications (formation of false color images, ozalid production, processing to enhance special features or contrast, etc.).

The Photographic Engineer must be an individual with a sound practical background in photographic technology and several years experience in operating a photo laboratory. He/she must be competent in both black-and-white and color manual processing, and preferably be familiar with European films and processes. A knowledge of the French language is essential but not required. The individual selected must be willing to locate in Ouagadougou, Upper Volta, for a period of up to three years.

WEST AFRICA REMOTE SENSING CENTER  
JOB DESCRIPTION

IMAGE PHYSICIST

The Image Physicist will be responsible for operation and maintenance of the image interpretation and field equipment. He/she will be expected to perform routine maintenance, make repairs, keep the necessary inventory of parts and supplies, and arrange for expert repair services when required. He/she will work with and train an African counterpart to perform these functions. In addition, the Image Physicist will lecture students at the Center on the basic physical principles of Remote Sensing, including feature-energy interactions, image formation and geometry, etc. He/she will also be expected to participate in the user applications programs, providing assistance in program design and image interpretation.

The Image Physicist must have a solid background in the physical principles of Remote Sensing, and experience in maintenance and operation of image interpretation equipment, including electronic equipment. He/she should also have a demonstrated teaching ability. Preference will be given to individuals who can directly complement or develop one of the proposed applications program areas. The person selected must be willing to locate in Ouagadougou, Upper Volta, for a period of two to four years. A working knowledge of French is essential.

He/She will have one or two African assistants and will be expected to train an African to take over responsibility for the facility within three years.

## ANNEX F

### Draft of Project Description

The project involves the establishment of a Remote Sensing Center with headquarters at Ouagadougou, Upper Volta. External financing for the project is being provided by Canada, the United States and France while Upper Volta is donating the land and facilities of a former French satellite tracking station. The five year project consists of two major phases.

Phase I, of approximately two years in duration, involves the establishment of a regional center which will provide (a) training to African development officials in the applications of data derived from remote sensing, (b) "user assistance" services, that is, helping African governments to use such data in their development planning and resource management programs, (c) a "sensitization program" to familiarize high and upper level African officials and managers with the potential of data derived from satellites and the uses to which it can be put, and (d) an information and reference service to visitors or for responding to written requests. These services will be offered on a bi-lingual basis and will be based on existing Landsat data plus data from Landsat III when it is launched in 1978. Support facilities required to provide these services will include (a) an information and distribution center (including an imagery scanning facility and a reference library), (b) an image interpretation facility for analyzing and manipulating Landsat scenes, and (c) a photographic laboratory to support the center's requirement for visual data products. These services and support facilities will initially be manned primarily by expatriate staff stationed at the Center, but a program to train African staff will be initiated immediately.

The land and buildings for the project will be donated by the Government of Upper Volta (GOUV). Some additions to this facility, notably a building for the photo laboratory, and subsequently, construction of additional office and archive space will be required during Phase I.

The implementation of the program, beginning with Phase I, will involve the coordinated contributions by the U.S., France and Canada based on a report prepared by a Technical Committee made up of representatives and consultants from those three countries plus similar officials from the GOUV and the U.N. Economic Commission for Africa (ECA). Donor contributions will follow the pattern outlined in the report and its budgets and will include experts, equipment, materials and contributions to local costs of operations.

The U.S. contribution to Phase I will include (a) the construction of the additional physical facilities mentioned above, (b) equipment for the information center and a portion of the equipment for the image interpretation facility and the photographic laboratory, (c) up to four experts (including a photo technician for the photographic laboratory, an image physicist for

the image interpretation facility and one or two data applications experts, preferably in the disciplines of range resources and forestry), (d) a portion of the operating expenses of Phase I operations, including a portion of the salaries of African professional personnel, (e) training of African personnel in the U.S.

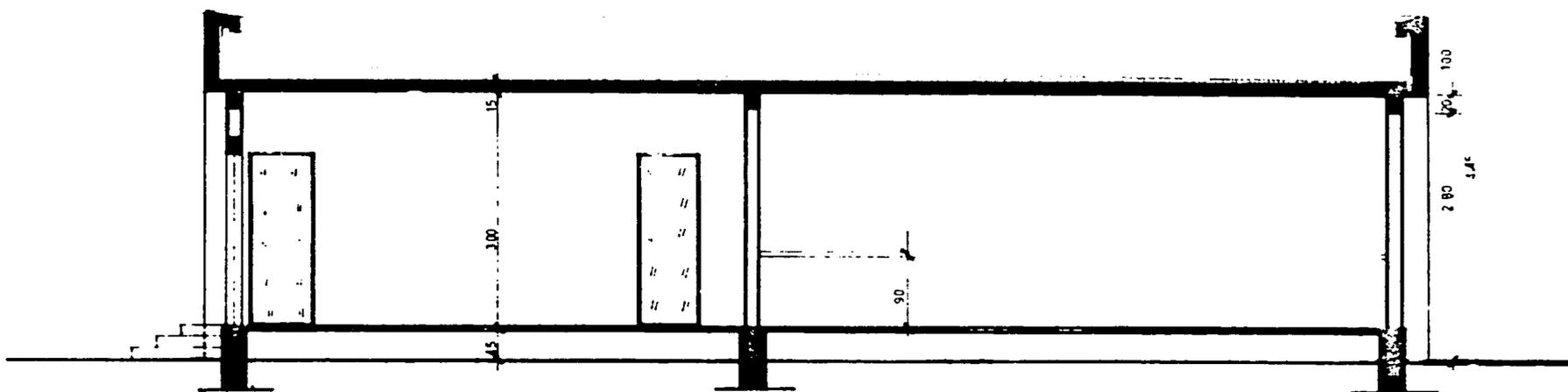
A portion of the Canadian contribution to Phase I will finance studies to determine the socio/economic feasibility and cost effectiveness of construction of a ground station. Other criteria affecting a decision to proceed to Phase II will be the development of an appropriate African regional institution to take responsibility for the project and to seek African sources for its long term financing. One or more in-depth evaluations of the effectiveness of the project will be held during Phase I as a basis for reaching a decision with respect to proceeding to Phase II.

If a favorable decision to proceed to Phase I is reached, the costs and scheduling of the donor and African contributions to the program will require recalculation, since only approximate estimates on Phase II could be made by the Technical Committee.

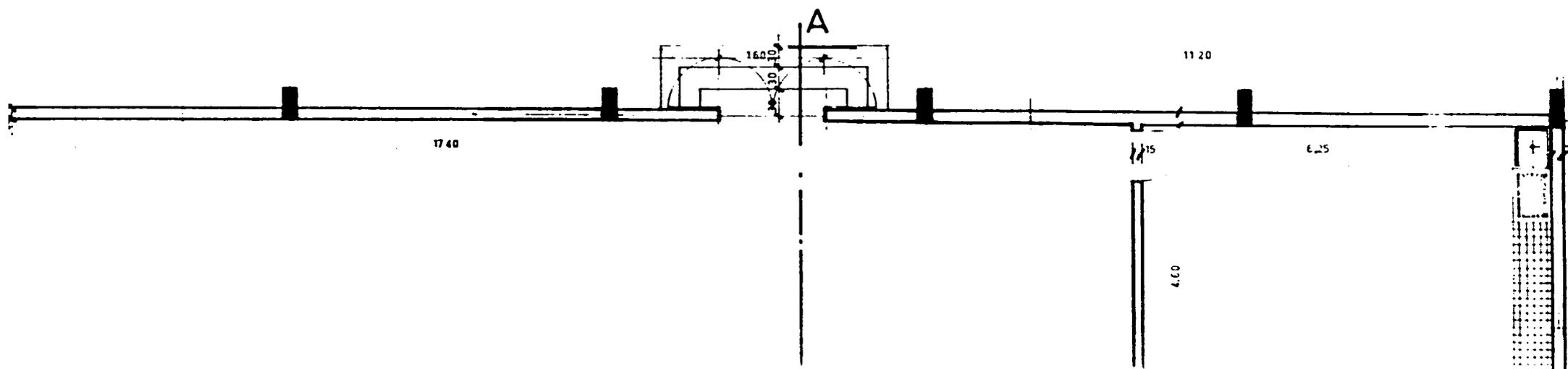
In Phase II a satellite reception station would be added to the program. It is planned that the station would be financed by Canada. It would have the capability to receive and record data from NASA's Landsat series of satellites as well as from other satellites such as METEOSAT. It would further have the capability for processing the data onto magnetic tapes and onto images of the scenes transmitted by the satellites. In other words, 23 countries of West, North and Central Africa (see Appendix IV of Technical Committee Report and Map shown in Annex B-2 of this Project Paper) which would be 100% within the 3,000 kilometer radius of Ouagadougou would have direct access to Landsat satellites via the receiving station, which would furnish repetitive coverage of their countries every eighteen days.

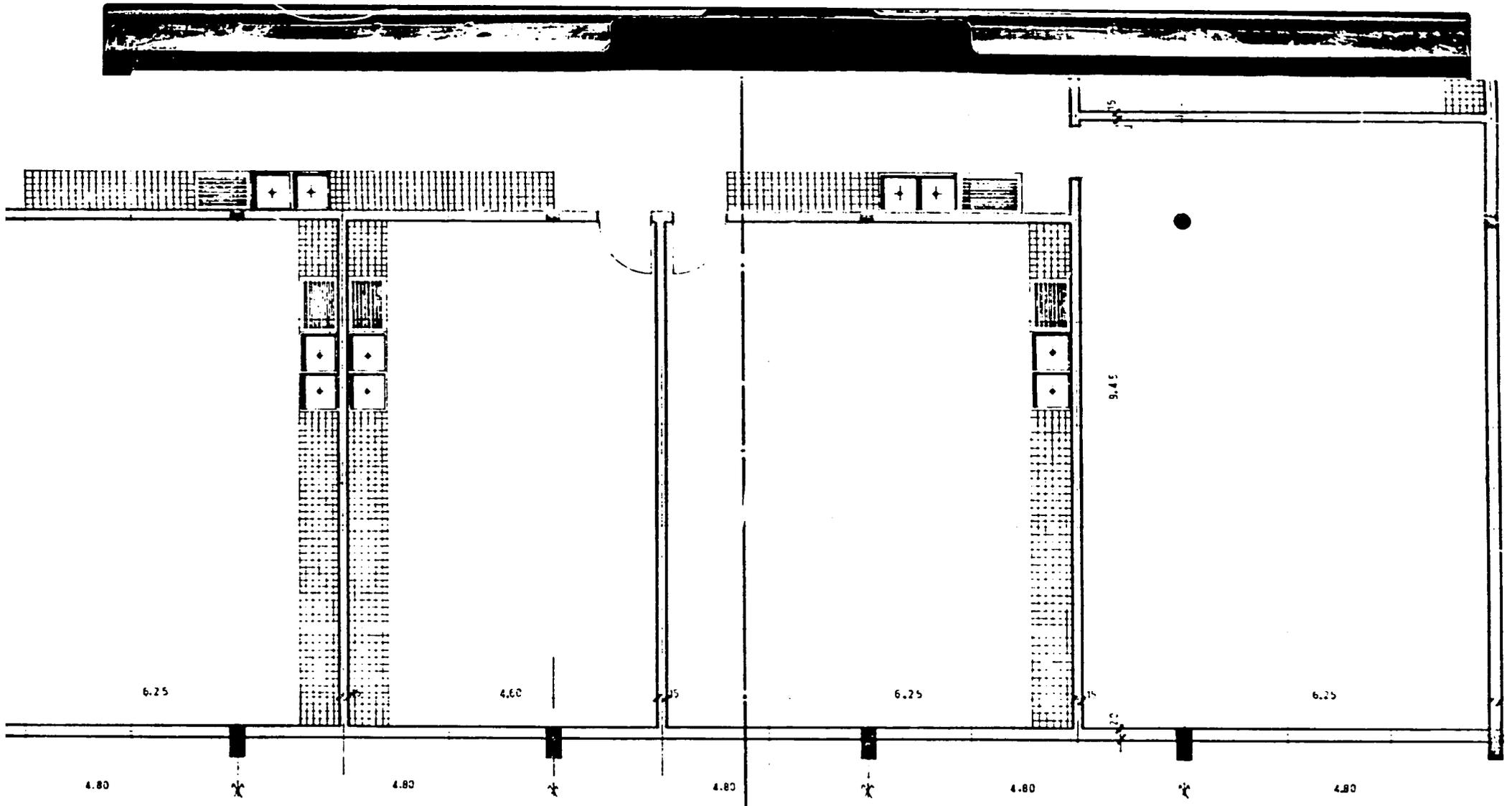
Phase II would comprise the last three years of the five year project. It would include a continuation of the functions initiated in Phase I including training, outreach, information services and the completion of the training of the Center's African staff. It is planned that Canada would provide an expatriate station manager and staff, the U.S. would complete its expert services for the photographic and image interpretation facilities and all three donors would continue to provide technical assistance in user application disciplines. Expatriate staff would phase out as they were replaced by African counterparts. Phase II would also see the growth of local financing for the program through membership fees by nations participating in the regional organization and by payments for the Center's services.

End of project status would see a functioning African Regional Center, staffed by about 20 African professionals and technicians, capable of providing coverage of all or parts of 30 African countries every eighteen days (clouds permitting) and distributing images of such coverage expeditiously to all users, upon request. The Center would have the capability for training 17-32 technical and professional persons per year in the applications of remote sensing to their various technical disciplines, and to assist African development agencies to carry out 3-4 major projects using remote sensing as a key tool. It would serve as a "center of excellence" capable of providing information and guidance to numerous visitors, serving as a resource for research, and generally acting as a catalyst for enhancing the capability of African governments to utilize satellite imagery as a tool for addressing their agricultural development, resource management and physical planning problems.



COUPE AA





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PLAN

STATION DE TELEDETECTION  
DE OUAGADOUGOU

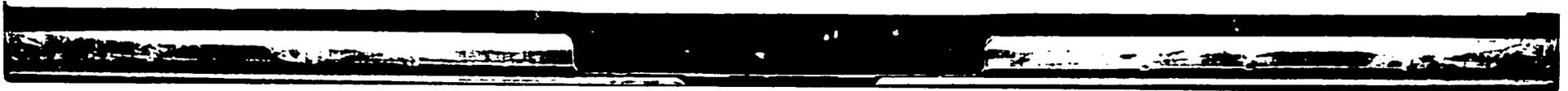
PLAN COUPE FAÇADES

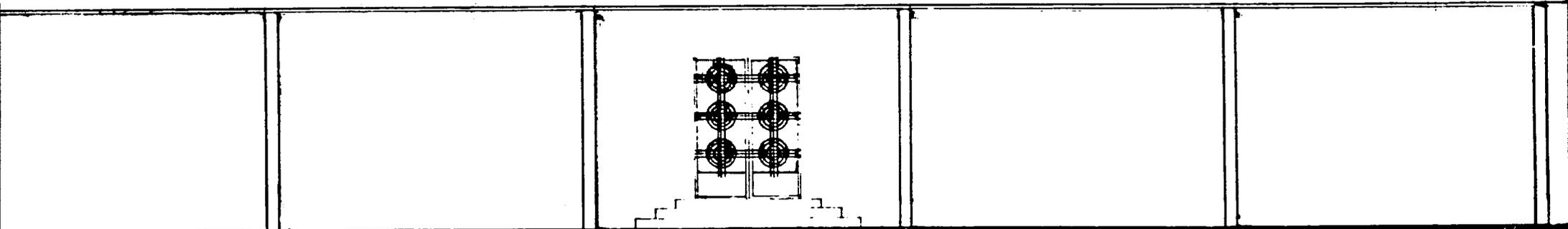
ABEL ISAAC TRAORE  
ARCHITECTE DPLG

PROJET D'EXECUTION

ECHELLE 1/50

DATE JUN 1977



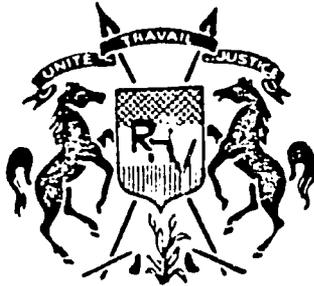


FAÇADE PRINCIPALE

4



*Ministère des Affaires Étrangères*



N° 0 1 9 3 2 E./S.G/CI /DCI.

*AMS*  
*CB*

Ouagadougou, le 12 AOUT 1977

Son Excellence

Monsieur l'Ambassadeur  
des Etats-Unis d'Amérique

- OUAGADOUGOU -

Excellence,

Vous vous rappelez, sans doute, qu'au mois de mars 1975 une mission d'experts de la Commission Economique pour l'Afrique (C.E.A.) avait séjourné en Haute-Volta dans le but de voir si le Centre National d'Etudes Spatiales (C.N.E.S.) pouvait offrir des possibilités de reconversion en station de réception Landsat. Les conclusions de la mission, en ce sens, s'étaient révélées positives et devaient permettre aux représentants des Etats membres de la C.E.A., réunis en septembre 1976 à ADDIS-ABEBA, de confirmer par une décision la vocation de Ouagadougou à recevoir un des centres de télédétection prévus en Afrique.

Vu l'importance du projet et la nécessité d'aller vite, le gouvernement de Haute-Volta décidait aussitôt de créer une "Commission Scientifique Nationale pour le Landsat" en même temps qu'il s'associait aux donateurs potentiels et à la C.E.A. pour former un "Comité technique" ayant

charge de mettre au point toutes les questions afférentes au projet de télédétection du Centre de Ouagadougou. Après plusieurs rencontres successives, le Comité technique est parvenu à dégager les paramètres et les données essentiels dudit projet. La phase exécutoire devrait maintenant démarrer en septembre prochain.

C'est pourquoi, au nom du gouvernement de la République de Haute-Volta,

Je voudrais solliciter officiellement la contribution de votre pays pour la mise en place et le fonctionnement du Centre de télédétection de Ouagadougou. A cette fin le gouvernement voltaïque, pour sa part, mettra à disposition les infrastructures et les facilités existantes de l'ex-CNES de Ouagadougou

Espérant que la présente requête rencontrera la sollicitude voulue,

Je vous prie d'agréer, Excellence, les assurances de ma considération distinguée.



Moussa KARGOUGOU



Ministre des Affaires Etrangères.

PIO/C	AGENCY FOR INTERNATIONAL DEVELOPMENT		<input type="checkbox"/> Worksheet <input checked="" type="checkbox"/> Issuance		PAGE 1 OF <u>1</u> PAGES	
	PROJECT IMPLEMENTATION ORDER/COMMODITIES		1. Cooperating Country UPPER VOLTA		2. PIO/C Number 625-0913-0-80019	
			3. Project Number and Title  Regional Remote Sensing 698-0420			
Distribution USAID/Ouaga		4. Appropriation Symbol 72 - 1181021.3	5. Allotment Symbol and Charge 843-60-686-00-69-13	6. Funds Allotted To <input type="checkbox"/> AID/W <input checked="" type="checkbox"/> Mission		
OPR 2	7. Obligation Status <input type="checkbox"/> Administrative Reservation <input checked="" type="checkbox"/> By Agreement		8. <input type="checkbox"/> Original OR Amendment Number <u>2</u>			
OFM 2	9. Authorized Agent USAID, UPPER VOLTA		10. Method of Financing A. <input checked="" type="checkbox"/> U.S. Government B. <input type="checkbox"/> Direct Letter of Commitment			
Proj Manager 2	11. Contracting Period (Mo., Day, Yr.) From: N/A To:		12. Delivery Period (Mo., Day, Yr.) From: N/A To:		13. Project Assistance Completion Date (Mo., Day, Yr.) 12/28/82	
JAO/Ouaga 2	14. Area of Source U.S. Only Code 000		15. DOLLAR VALUE			
REDSO/WA			A. Previous Total	B. Increase	C. Decrease	D. Total to Date
Supply Advisor 2			6,000.00		1,016.00	4,984.00
AID/W	16. Quantity, Description, Specifications, Instructions and Special Provisions					
OFM/BFD 4	Procurement completed. Excess funds being decreased. All other terms and conditions of the PIO/C remain the same.					
SER/COM/CPS 4						
AFR/DR/SFWAP 1						
AFR/RA 2						
AFR/SFWA (U.V. desk officer) 1						
Mail Room 10						
17. MISSION REFERENCES						
Project Agreement dated Feb 24, 1978 as amended						
18. MISSION CLEARANCES		DATE	MISSION CLEARANCES		DATE	
<i>Sam Donnan</i> Larry J. Dominessy		20 July 81 ORD	<i>Richard C. Meyer</i> R. Carey Coult		OPR 7/21	
<i>Gary L. Byllesby</i> Gary L. Byllesby, OFM		80/7-21/81	<i>Emerson C. Melaven</i> Emerson C. Melaven		A/DIR	
19. Date of Original Issuance June 9, 1978			20. Date of this Issuance 7/28/81			
21. For the Cooperating Country The terms and conditions set forth herein are hereby agreed to:			22. For the Agency for International Development			
Signature <u>N/A</u> Date _____			Signature <u><i>Richard C. Meyer</i></u> Richard C. Meyer			
Title _____			Title <u>Director</u>			
Date _____			Date <u>7-28-81</u>			