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ECONOMIC COMMISSION FOR AFRICA  
Meeting of Experts on Regional Centres  
For Training in Photogrammetry and Airborne  
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## TRAINING CENTRE FOR TECHNIQUES OF CARTOGRAPHY AND PHOTOGRAMMETRY

Paper submitted by the Government of Rwanda

### 1. PRESENT STATE OF CARTOGRAPHIC DOCUMENTATION IN RWANDA

Rwanda has a very close triangulation network covering almost 80 per cent of its area. The geographical grid was prepared by the Survey Office, with the collaboration of the Institut géographique du Congo, which made the calculations.

In addition, the triangulation points were provisionally calculated in rectangular co-ordinates on Clarke's ellipsoid of 1880 and Gauss orthomorphic projection. The final calculations have not yet been made, as the triangulation network has not yet been definitively readjusted to the arc of the 30th meridian.

Aerial coverage has also been carried out by the Institut géographique du Congo with Wild RC.5/L.4 C.3 aerial survey cameras equipped with Aviogon lenses of 114 mm. focal length at an absolute altitude of 3,400 m. and an average flying height above ground of 1,500 - 1,700 m. The average scale of the photographs is of the order of 1:22,500. At present there is one set of photographs covering the whole country. The films are still kept at Leopoldville, for Rwanda has not yet an air-conditioned storage room.

\* For participants only.

Available cartographic documentation may be summed up as follows:

- a) The 1:100,000 map prepared by the Institut géographique du Congo (Léopoldville) on a Gauss projection on the basis of aerial photographs taken in 1953 and 1954 and existing maps. The sheets, ten in number, are prepared according to administrative divisions.
- b) The 1:50,000 map: In the framework of geological surveys, the Musée Royal de l'Afrique, Tervueren (Brussels), has since 1961-1962 been providing 1:50,000 sheets, solely planimetric, prepared by simplified plotting on the basis of the 1/16 degree square grid. Only thirty five of the fifty sheets necessary to cover the whole country have been prepared.

Photo-geological map: A 1:50,000 map covering the volcanic region, prepared by simple plotting.

Tourist map of Ruanda-Urundi. A 1:500,000 map in colour with rectified contour lines at 250 m. intervals.

New 1:250,000 map A 1:250,000 tourist map in colour (planimetric), which the Bureau d'Etudes et réalisations cartographiques, "ERCA", Brussels, was recently commissioned to prepare.

## 2. PRESENT PROGRAMME

Owing to the inadequacy of existing cartographic documentation, the Government has decided to set up a cartographic office within the Ministry of Agriculture. This office will, initially, have three photogrammetric sections:

- (a) an air-conditioned storeroom to protect films from premature deterioration,
- (b) a photographic laboratory to meet the growing demands of public and private bodies for aerial photographs;

(c) a photogrammetric plotting office to prepare:

- (i) the 1:50,000 map, with contours at 50 m. distance;
- (ii) the 1:100,000 map;
- (iii) the 1:20,000, 1:10,000 and 1:5,000 maps.

3. TECHNICAL FIELDS IN WHICH TRAINING AT THE ECA CENTRES IS NEEDED BY RWANDA

To carry out its task, Rwanda needs technicians with knowledge of the following fields: photogrammetry, photo-interpretation and cartography. It is desirable for our future technicians to receive supplementary training in mathematics and physics related to photogrammetric techniques.

4. TECHNICAL SUBJECTS IN WHICH TRAINING HAS BEEN CARRIED ON

So far, two technicians have already been given training in general photogrammetry, lower course, at the Institut géographique, Brussels, for one year; a third is at present attending the higher course in general photogrammetry at the same institute.

In addition to the training mentioned above, these technicians have had the opportunity of doing practical work on certain plotting instruments.

5. SUBJECTS AND METHODS OF TRAINING TO BE EMPHASIZED IN ECA TRAINING CENTRES

Seeing that the training and experience of technicians are often very varied, it is desirable to organize courses related to previous studies and to group trainees according to educational level:

1. Preparatory course. General subjects related to mathematics and physics and an introduction to photogrammetry.
2. Specialized courses: Trainees with a good grounding in mathematics and physics will immediately be able to begin with the

special subjects, namely: geodesy, topography, photogrammetry (general photogrammetry, the production of aerial photographs, plotting instruments and map production).

The training centre should have a certain number of instruments to allow the students to perfect their theoretical knowledge by practical work.

Trainees who have completed their courses should be awarded diplomas as photogrammetric technicians or engineers, as the case may be, and according to previous study.

#### 6. NUMBER OF TRAINEES THAT RWANDA WOULD WISH TO SEND ANNUALLY

Rwanda can immediately send three technicians to attend courses in geodesy, topography and photogrammetry.

These technicians have already been given initial instruction in topography and photogrammetry.

In addition, Rwanda could send annually about five trainees to the various courses in geodesy, photogrammetry, cartography and photo-interpretation for training as technicians. The general educational level of these trainees would correspond to the first part of the secondary school course.

Later Rwanda will need some engineer-geographers. The educational level of these trainees will correspond to the mathematics and science section of the secondary school leaving certificate.

#### 7. VIEWS REGARDING THE ECA TRAINING CENTRES

Two centres should be established: one French-language and one English-language.

For reasons of economy (buildings, instruments, teaching material) a training centre might be established at a place where there is already a well and suitably equipped geographical service.