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ECONOMIC COMMISSION FOR AFRICA  
Meeting of Experts on Joint Centres  
For Specialized Services in Surveying  
and Mapping  
Addis Ababa, 30 June - 10 July 1965

## REPORT OF TECHNICAL COMMITTEE I

### AERIAL SURVEY

Committee I was requested to study the problems involved in establishing one (or several) Joint Centres for Specialized Services for aerial surveys, namely aerial photography, airborne geophysical surveys, photogrammetry and photo interpretation as well as the testing, calibration and maintenance of instruments, specifications and tests and studies and advice.

As a general principle, the Committee had in mind a centre that would satisfy all the requirements mentioned, though in the initial stages the plan may have to be curtailed for financial reasons.

The following conclusions were reached:

#### 1. Aerial Photography and Airborne Geophysical Surveys

##### A. Requirements

Africa needs photographic coverage in a wide variety of scales, from 1:5,000 to 1:80,000.

The Committee considered that the overall annual requirements would correspond, from the point of view of aerial photographic coverage of 1,000,000 km<sup>2</sup> at 1:50,000 or 23,000 prints. Annual needs for geophysical surveys were assessed at 200,000 km<sup>2</sup> of recordings. These figures were used for the subsequent estimates.

B. Equipment needed

a) Aircraft

7 aircraft will be needed, namely:-

4 for high-altitude photography,

1 for low-altitude photography

2 specially equipped for geophysical surveys.

In case of need, one or two photographic aircraft would be equipped for geophysical surveys.

b) Equipment of aircraft

i) Each photographic aircraft will be capable of using 2 cameras, APR apparatus, and of transporting 6 magazines; it will be fitted with normal navigational instruments, equipment and radio.

The centres will be equipped with a total of:-

20 cameras of different focal lengths

40 magazines of different types.

The centres will also be provided with Communication facilities.

ii) Each aircraft for geophysical surveys would be equipped with:-

1 magnetometer

1 electromagnetic equipment

1 radioactivity equipment

1 camera - 35 mm, continuous strip

1 radar altimeter

navigation instruments

radio equipment

iii) In addition the following equipment would be needed for occasional use

2 APR recorders

2 additional statoscopes

2 horizon cameras

and the following as reserves:

2 complete sets of geophysical survey equipment.

c) Photographic laboratories

The centre (or each centre, if the aircraft are allotted to several centres) must have a mobile laboratory and a permanent photographic laboratory with the following equipment:

i) Film development equipment

Processing units  
Dryers  
Microdensitometer  
"X-Y" measurement device

ii) Printing equipment

Electronic dodging  
Contact printer  
Print dryer

iii) Enlarging equipment

Enlarger

iv) Equipment for processing plates

Diapositive printer  
Diapositive printer with electronic dodging  
Automatic equipment for plate developing  
Plate dryer

v) Complete laboratory unit for processing colour films and printing colour prints

vi) Miscellaneous accessories for above instruments

as well as all expendable supplies (films, papers, plates, chemicals etc.) See annex I,<sup>1/</sup> prepared by the Observer of U.S.A. for further details.

<sup>1/</sup> To be issued as E/CN.14/CART/142 /Add.1

C. Personnel requirements

a) Flying personnel

The crew of each aircraft will comprise of five persons, including the photographic and/or AFR technicians and the mechanic. In addition, the Centre should have a reserve equivalent to one or two complete crews, including the necessary technicians.

b) Ground personnel

Permanent laboratory personnel: 10 technicians

D. Aircraft maintenance

a) The aircraft would be bought with the standard set of spare parts and normal maintenance would be conducted by the mechanics attached to each crew.

b) The Centre should be set up in a town with facilities for carrying out the large scale periodic overhauls outside the Centre, for example in the workshops of an airline.

2. Photogrammetry: Acrotriangulation

A. Requirements

In view of the area to be surveyed every year, requiring 23,000 photographs, the average figure of 10,000 models per year to be covered by aerial triangulation, was taken as a basis for calculating the personnel and equipment required, as follows:-

B. Equipment and personnel required

One unit of 4 stereocomparators, with at least 8 operators, is necessary to satisfy these needs.

The choice of additional accessories required for this unit is left to the Director of the Centre, according to the methods used.

Processing of data should be made by electronic computers. Reference is made to the report of Committee No.2, which dealt with this question.

3. Photogrammetry; Plotting

A. Requirements

Some countries which have no service equipped with plotting instruments may request the Centre to undertake this type of work.

B. Requirements in equipment

The initial equipment of the centre, which may be increased or reduced according to demand, is estimated at:

- 12 instruments for large-scale surveys,
- 12 instruments for medium and small-scale surveys.

In addition, the Centre will be provided with a differential rectifier an automatic co-ordinatograph and with rectifiers, image converters and other ancillary equipment, the quantity of which will be left to the discretion of the Director of the Centre.

C. Personnel requirements

The use of plotting apparatus in two shifts will require a total of about sixty operators and draughtsmen.

4. Photo Interpretation

In view of the special nature and the diversity of work involved in the interpretation of aerial photographs as well as the necessity for frequent field work, the Committee recommends broad decentralization of interpretation.

With this end in view, it is not considered advisable to set up an interpretation section at the Joint Centre for Specialized Services, but rather to increase the number of staff with appropriate qualification at the Proposed **Training** Centre. The additional staff specializing in this work could be sent to the countries that request the centre for help in the interpretation of photographs.

These experts will themselves decide what equipment is necessary for their work.

5. Testing, calibration and maintenance of instruments

A. Requirements

Provision must be made for:

- testing, calibrating and maintaining the instruments in use at the Centre;
- meeting requests from countries for on-the-spot inspection of their instruments.

B. Staff requirements

A team of:-

- 2 electronics technologists and 2 electronics technicians
- 2 optics technologists and 1 optics technician
- 2 mechanical & electrical technologists and
- 4 or 5 mechanical and electrical technicians should suffice for the requirements of the Centre itself and make possible the training of mobile teams to be sent to the countries.

C. Equipment required

- 1 photogrameter
- normal equipment for repairs and maintenance, the list of which as prepared by the Observer from U.S.A. is included in annex 2.<sup>1/</sup>

6. Specifications and tests

Provision has been made for these activities since the centre has technicians in all fields (methods & instruments) and in particular, tests of instruments are included under Testing, calibration & maintenance of instruments.

7. Studies and advice

- Cartographic advisers already provide this service
- The structure of the Centre implies the possibility of studying the special problems of a country and of giving advice without its being necessary to provide special staff.

<sup>1/</sup> To be issued as E/CN.14/ CART/142/Add.2