

JOINT MEMORANDUM COVERING THE TOPOGRAPHIC MAPPING
PROJECT OF THE CAGAYAN VALLEY UNDER THE
TECHNICAL COOPERATION BETWEEN BCGS AND JICA

In response to the request of the Government of the Republic of the Philippines, the Government of Japan despatched a preliminary survey team to the Philippines from January to March, 1978.

As a result of the discussions, the Bureau of Coast and Geodetic Survey and the preliminary survey team from Japan International Cooperation Agency hereby mutually agree that the topographic mapping project of the Cagayan Valley shall be carried out based on the Draft of the Scope of Work which is attached hereto.

The following small particulars related to the implementation of the project, which are not mentioned in the Draft of the Scope of Work, are mutually agreed upon by both parties:

I. General

1. The Bureau of Coast and Geodetic Survey, Department of National Defense, hereinafter referred to as BCGS, the central agency responsible for the national mapping program in the Republic of the Philippines, hereinafter referred to as R.P. shall act as counterpart to the Japanese survey teams and also as coordinating body to other concerned governmental & non-governmental organizations of R.P. for the smooth implemen-

tation of the project.

2. The members of the Japanese survey teams who will work in the Philippines on this project possess official passports issued by the government of Japan.

3. To ensure the safety of the survey teams while working in dangerous or critical areas, the BCGS shall arrange with proper authorities for necessary security detail.

4. The cost of establishment of additional geodetic control points using JMR Doppler Survey sets, and the recovery and/or re-establishment of 1st order leveling bench marks, including the salary and incidental expenses of counterparts shall be charged to the account of the BCGS.

5. Aside from the two (2) trainees provided in Item No. II-2 below, JICA shall accept several technical men of the BCGS as trainees on special subjects like aerial triangulation, stereo plotting and map compilation.

6. All maps produced under this project shall bear at the lower margin the following:

THIS MAP WAS PRODUCED UNDER A JOINT UNDERTAKING
BETWEEN THE GOVERNMENT OF THE REPUBLIC OF THE PHILIPPINES
AND THE GOVERNMENT OF JAPAN.

II. Security

1. The Government of Japan shall take all necessary measures to avoid leakage of confidential information obtained in the implementation of this project.

2. To ensure the safety and security of RP aerial photographs and other by-products while under processing in Japan, two security personnel shall be sent to Japan as JICA trainees, with expenses provided by JICA at standard JICA rates.

3. The trainees chosen by the R.P. as security officers as provided in Item 2 above should preferably possess basic knowledge of photogrammetry.

4. During periods when the aerial photographs and other by-products are not being used by the contractor of Japan the safekeeping of materials will be worked out between the two (2) agencies.

5. Aerial photography and photo-processing of the project are subject to the security regulations of the R.P.

6. The Government of Japan shall furnish to R.P. the bio data of Japanese personnel who shall be working in the Philippines for this project before the start of the operations.

7. The R.P. shall issue proper ID cards or credentials to Japanese personnel who shall be working in R.P. for this project.

8. The Government of Japan shall submit to the R.P. the bio-data of key personnel in each stage of work who shall be working in Japan for this project.

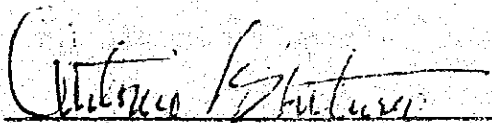
III. Aerial Photography

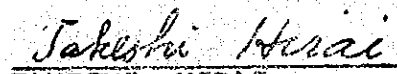
1. The aerial photography of this project in the Philippines shall be performed by a Philippine surveying company under the supervision of Japanese contractor within the budget allocation for the aerial photography.

IV. Technical Details

1. Technical details worked out between BCGS and JICA shall be a part of this Joint Memorandum.

Manila, March 8, 1978


ANTONIO P. VENTURA, Capt., BCGS
Director
Bureau of Coast & Geodetic
Survey
Department of National Defense


TAKESHI HIRAI
Leader
Preliminary Survey Team
of Japan International
Cooperation Agency (JICA)

TECHNICAL DETAILS

I. SPECIFICATIONS

Major specifications of this project are:

- i) Ground control point survey:
Specifications for 2nd order control point survey in the Technical Manual of Overseas Surveying of JICA (hereinafter referred to as TM of JICA),
- ii) Levelling survey for minor height control point:
Specifications for 3rd order levelling survey in TM of JICA.
- iii) Monument: Subject to the specification of BCGS.
- iv) Mapping:
B class mapping specifications for planimetry;
A class mapping specifications for height
- v) Reference Ellipsoid: Clarke Spheroid of 1866
- vi) Vertical Datum: Mean Sea Level (Manila Tidal Station)
Horizontal Datum: Luzon Datum
- vii) Projection: Universal Transverse Mercator for
1:25,000 Topo Map; Philippine Plane
Coordinate System for 1:10,000 Ortho-
Photo Map
- viii) Contour Lines: 10-meter contour intervals (5-meter
supplementary contour and 2.5 meter auxil-
iary contour will be added in case it is
needed.)

- ix) Format: 7-1/2' x 7-1/2' for Topographic Map;
5000 m x 5000 m for Orthophoto Map

II. ACCURACY (Standard deviation)

Accuracy of above-mentioned surveys shall be:

- i) Horizontal control survey

$$\frac{\sqrt{\Delta x^2 + \Delta y^2}}{S} = \frac{1}{75,000}$$

- ii) Vertical Control Survey

$$10^{\text{mm}} \sqrt{S} \quad S: \text{distance in km}$$

- iii) Mapping

Planimetry: $\pm 1^{\text{mm}}$ on the map

height: $\frac{\Delta h}{3}$, Δh : contour interval

contour $\frac{\Delta h}{2}$

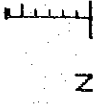
III. WORK TO BE CARRIED OUT BY BCGS:

1. BCGS will establish Doppler Stations in the project area. (See attached drawing). Positioning and signalization of the station will be done prior to the aerial photographic work. Results of this survey will be submitted to the Japanese Survey Team not later than March 31, 1979.
2. BCGS will recover or re-establish 1st order levelling within the project area.

IV. MODIFICATION OF THE TECHNICAL DETAILS

During the execution of the Project, changes may be made in the Technical details by mutual agreement as found necessary by both parties.

DRAWING FOR ITEM III-1 OF MEMORANDUM

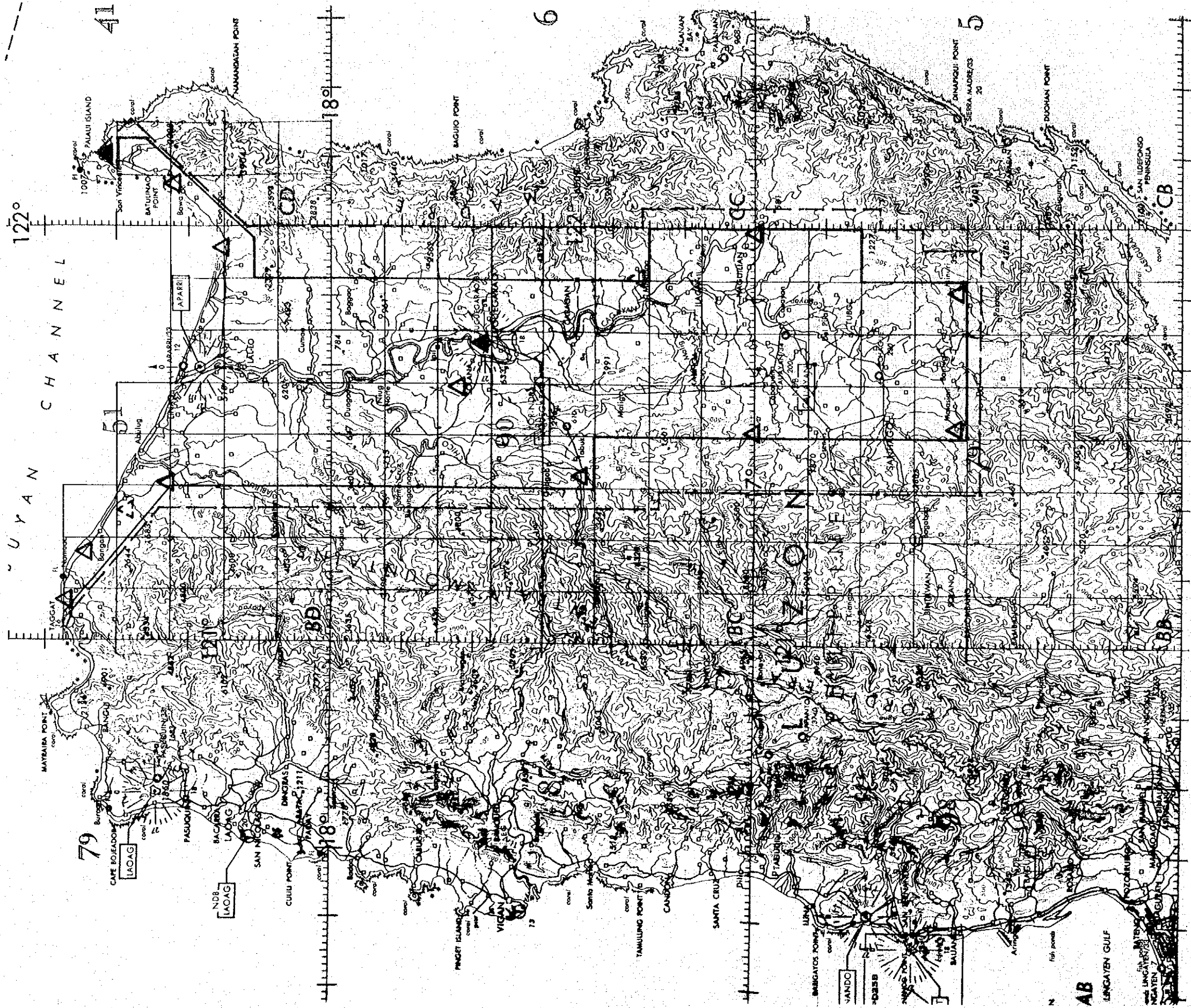


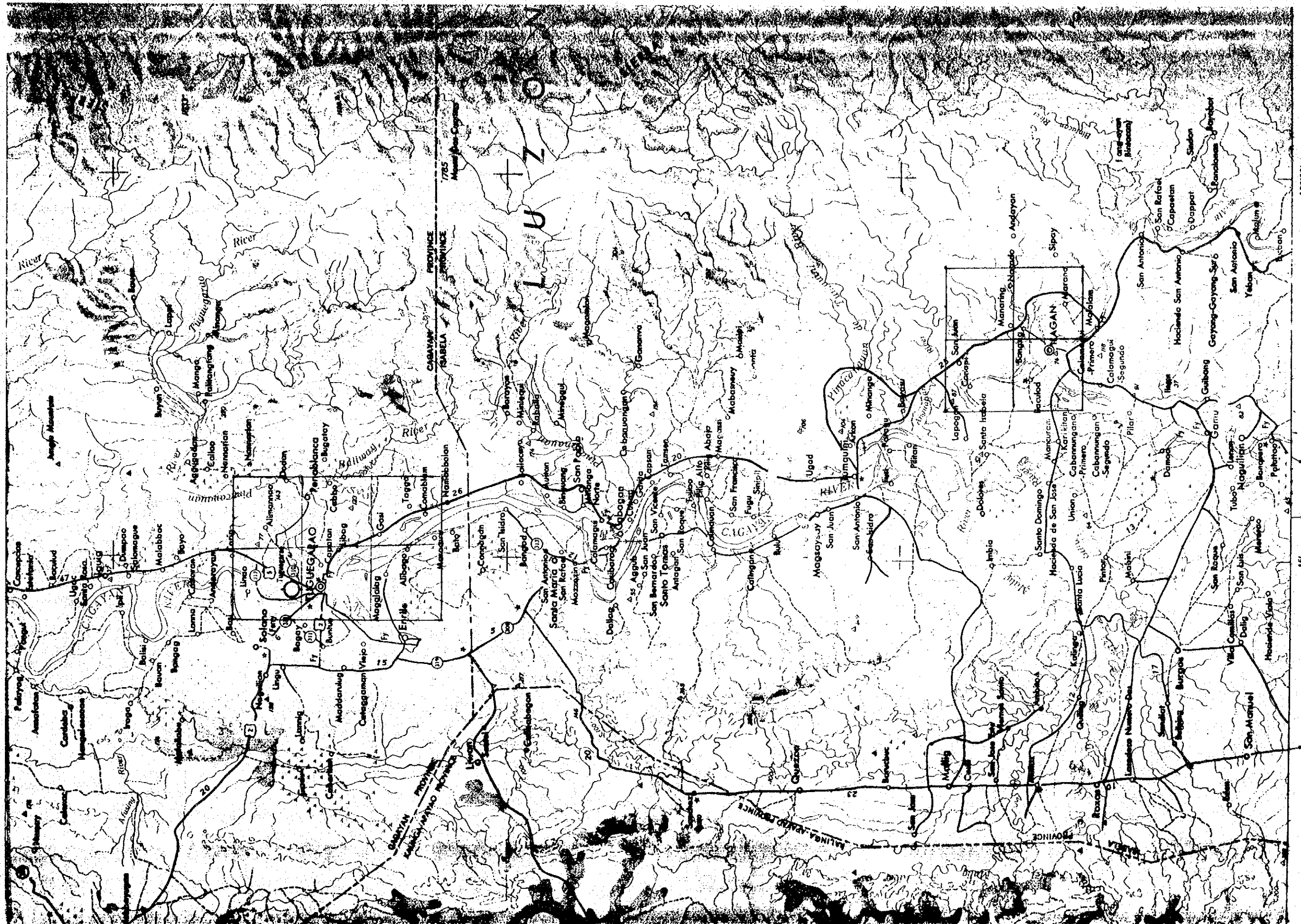
————— 1:25,000 TOPOGRAPHIC MAPPING COVERAGE

----- 1:30,000 PHOTOGRAPHIC COVERAGE

▲ EXISTING DOPPLER STATION

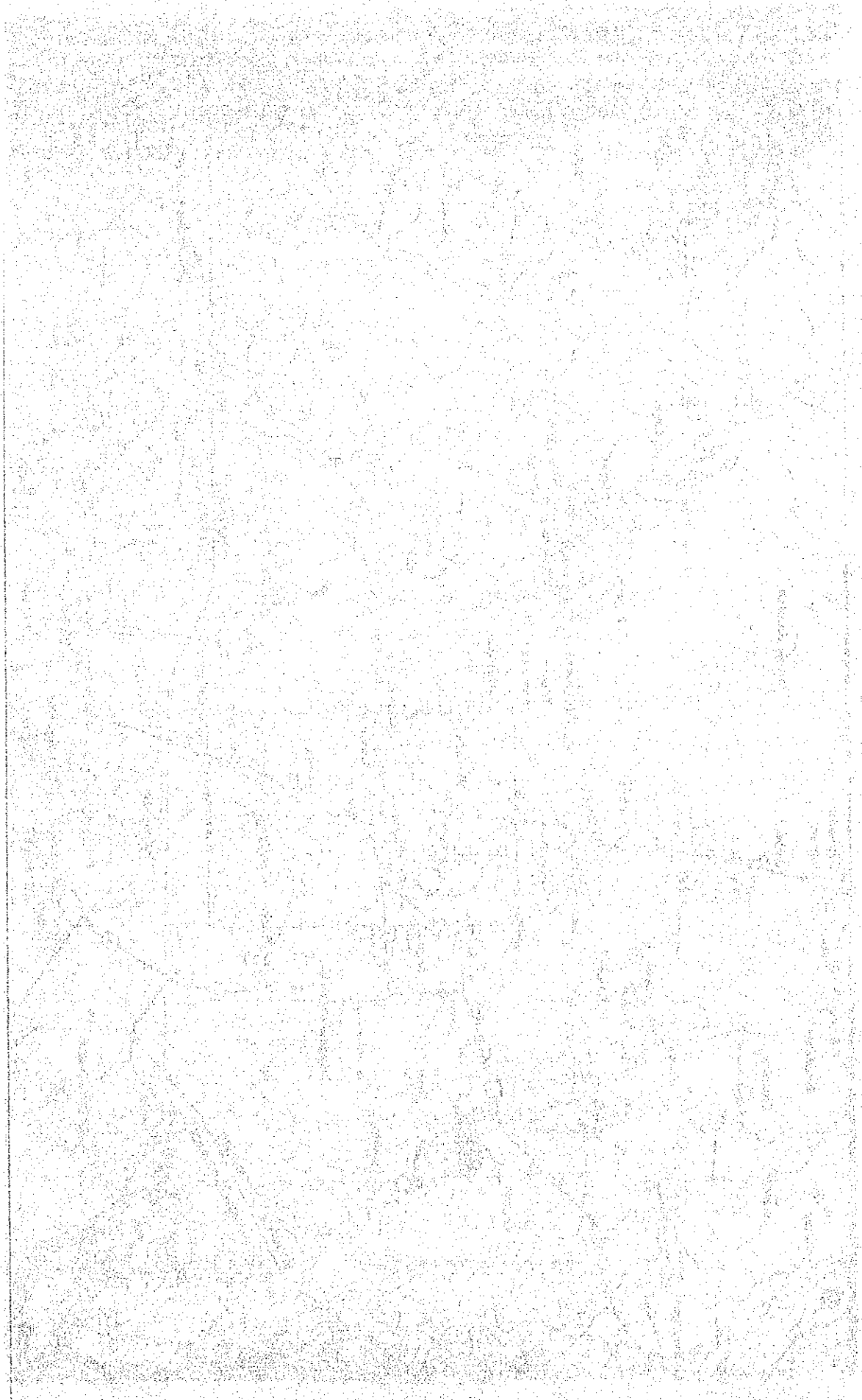
△ DOPPLER STATION TO BE ESTABLISHED





122°00'

45'



SCOPE OF WORK
FOR
TOPOGRAPHIC MAPPING PROJECT OF THE CAGAYAN VALLEY,
THE REPUBLIC OF THE PHILIPPINES

I. Introduction

In response to the request of the Government of the Republic of the Philippines, the Government of Japan despatched a survey team to the Philippines in January, 1978 for the purpose of the preliminary study of a mapping project (hereinafter to be referred to as "The Project") to prepare topographic maps and orthophotomaps of the Cagayan Valley, northern part of Luzon Island of the Philippines, which are prerequisite for the planning of various development projects in this area.

Based on the report of the above survey team, the Government of Japan decided to undertake the Project in accordance with laws and regulations in force in Japan with regard to the technical assistance programs. The Japan International Cooperation Agency (hereinafter to be referred to as "JICA"), the official agency responsible for the implementation of the technical cooperation programs of the Government of Japan, will carry out the works necessary for the Project.

II. Working Plan

The Project will be composed of the following works:

Aerial photography (1/30,000) covering the area approximately 15,000Km²;

Topographic mapping (1/25,000, contoured) covering the area of approximately 11,000Km²; and orthophotomap production (1/10,000) covering the area of approximately 300Km² (See Appendix I).

The entire work shall be carried out under a 4 year program starting from the year of 1978 and shall consist of the following phases:

Phase 1. Aerial Photography.

Phase 2. Ground Control Point Survey (Satellite Geodesy, Triangulation, Traversing, and Leveling) and Field Identification.

Phase 3. Aerial Triangulation, Stereo-plotting and Field Completion.

Phase 4. Orthophotomap Production.

Phase 5. Colour Separation Drafting and Printing.

Phase 1. Aerial Photography

1-1 Aerial photographs shall be taken at the scale of approximately 1/30,000 to cover the Project area with a wide angle precision camera.

Phase 2. Ground Control Point Survey (Satellite Geodesy, Triangulation, Traversing, and Leveling) and Field Identification.

2-1 Satellite Geodesy

Additional primary geodetic controls shall be established by the method of artificial satellite Doppler system.

2-2 Triangulation and Traversing

Minor horizontal control points, necessary for aerial triangulation and mapping work, shall be established by triangulation or traversing.

Accuracy of observations and monumentation of control points shall conform to the specifications established by both parties.

Aerial signals shall be established prior to the aerial photography, whenever possible.

2-3 Levelling

Levelling shall be carried out to obtain vertical controls necessary for aerial triangulation and mapping work. The levelling consists of the 1st order and minor order levellings starting from the existing 1st or 2nd order bench marks. Accuracy of observations and monumentation of bench marks shall conform to the specifications established by both parties.

2-4 Field Identification

The topographic information related to land classification, vegetations, etc. shall be verified in the field using the aerial photographs. Style sheet and symbols shall be those adopted by the Bureau of Coast and Geodetic Survey (hereinafter referred to as BCGS).

Administrative boundaries and geographical names which should be expressed on the maps, shall be identified in the field and shall be shown on the aerial photographs by the staffs of BCGS.

Phase 3. Aerial Triangulation, Stereo-plotting and Field Completion.

3-1 Aerial Triangulation

Aerial Triangulation shall be carried out by an analytical method using stereo-comparators and electronic computer. Adjustment shall be carried out by a block adjustment method.

3-2 Stereo-plotting

The plotting shall be carried out using stereo-plotting instruments at the scale of 1/25,000 with 10-meter contour intervals. The sheet line shall be 7'.5 x 7'.5 .

3-3 Field Completion

Topographic features, vegetation, etc. which cannot be plotted shall be supplemented on the compiled sheet in the field. Administrative boundaries and geographical names shall be verified and supplemented, if necessary, on the paper copy of the compiled sheet by the Government of the Republic of the Philippines.

Phase 4. Orthophotomap Production

4-1 Orthophotomaps shall be produced using orthoprojectors at the scale of 1:10,000. The sheet line shall be 5Km x 5Km in the terrain.

Phase 5. Colour Separation Drafting and Printing.

5-1 Colour Separation Drafting.

Based on the compiled sheet, scribing shall be carried out on the stable polyester base for each of the five colour separation plate. Style sheet and symbols shall be those adopted in BCGS.

5-2 Printing

Plate-making shall be carried out using 1/25,000 scribed negatives, and printing shall be carried out by the off-set method.

III. Time Schedule

The whole work will be conducted in accordance with the time schedule. (See Appendix II)

IV. Report and Final Results

The report will be presented to the Government of the Republic of the Philippines by JICA every fiscal year (from April to March). The materials mentioned in Appendix III will be submitted to the Government of the Republic of the Philippines by JICA after having completed the whole work and they shall belong to the Government of the Republic of the Philippines.

It shall be mentioned on the printed maps to the effect that the maps are the result of the cooperation between the Government of the Republic of the Philippines and the Government of Japan.

V. Contribution to the Mapping Project

A. Japanese Contribution

JICA will contribute to the Project by:

- (a) Despatch of a Japanese survey team to carry out the project.
- (b) Preparation of necessary survey equipment and instruments as listed in Appendix IV and any other

necessary equipment and materials for the Project.

- (c) Training of the Philippine counterparts.

B. Philippine Contribution

The Government of the Republic of the Philippines is to contribute to the Project by providing the Japanese survey team with the following conveniences, facilities and services for the smooth and effective implementation of the work:

- (a) To establish additional primary geodetic control points by JMR Doppler Survey Sets.
- (b) To exempt from custom duties, taxes and charges of any kind with respect to the equipment including vehicles, machinery, materials, personal effects and medical supplies necessary for the performance of the duties of the members of the survey team.
- (c) To supply available data and information related to the Project.
- (d) To arrange for smooth transfer of data and materials including aerial photo films to Japan and to the Philippines for the purpose of executing the Project.
- (e) To arrange suitable office spaces with appurtenant facilities, storage facilities and garage in the Project area and one office room in BCGS in Manila.

- (f) To secure flight permission for aerial photography related to the Project.
- (g) To recommend local aerial survey enterprises related to aerial photography.
- (h) To secure permission for the use of communication facilities including tranceiver and electromagnetic wave distance measuring instruments.
- (i) To secure permission of entry into private properties and the restricted areas and felling of trees when necessary.
- (j) To secure the necessary arrangements for the safety of the survey team.
- (k) To arrange for the hiring labourers as needed.
- (l) To arrange for the availability of medical facilities when needed.
- (m) To arrange for no restrictions on funds introduced into the Philippines from external sources by the members of the survey team for the purpose of the Project.

Bank account opened in the Philippines by the survey team members shall remain at their exclusive disposal, and balance on such accounts shall be freely transferable into Japan in any other convertible currency.

- (n) To provide assigned counterparts of the Government of the Republic of the Philippines consisting of a project coordinator and technical men.
- (o) To provide credentials to the members of the survey team for the execution of their activities.

VI. Modification of the Scope of Work

During the execution of the Project, changes can be made in the text of the scope of work by mutual agreement considered useful by both parties facilitating the work to be performed.

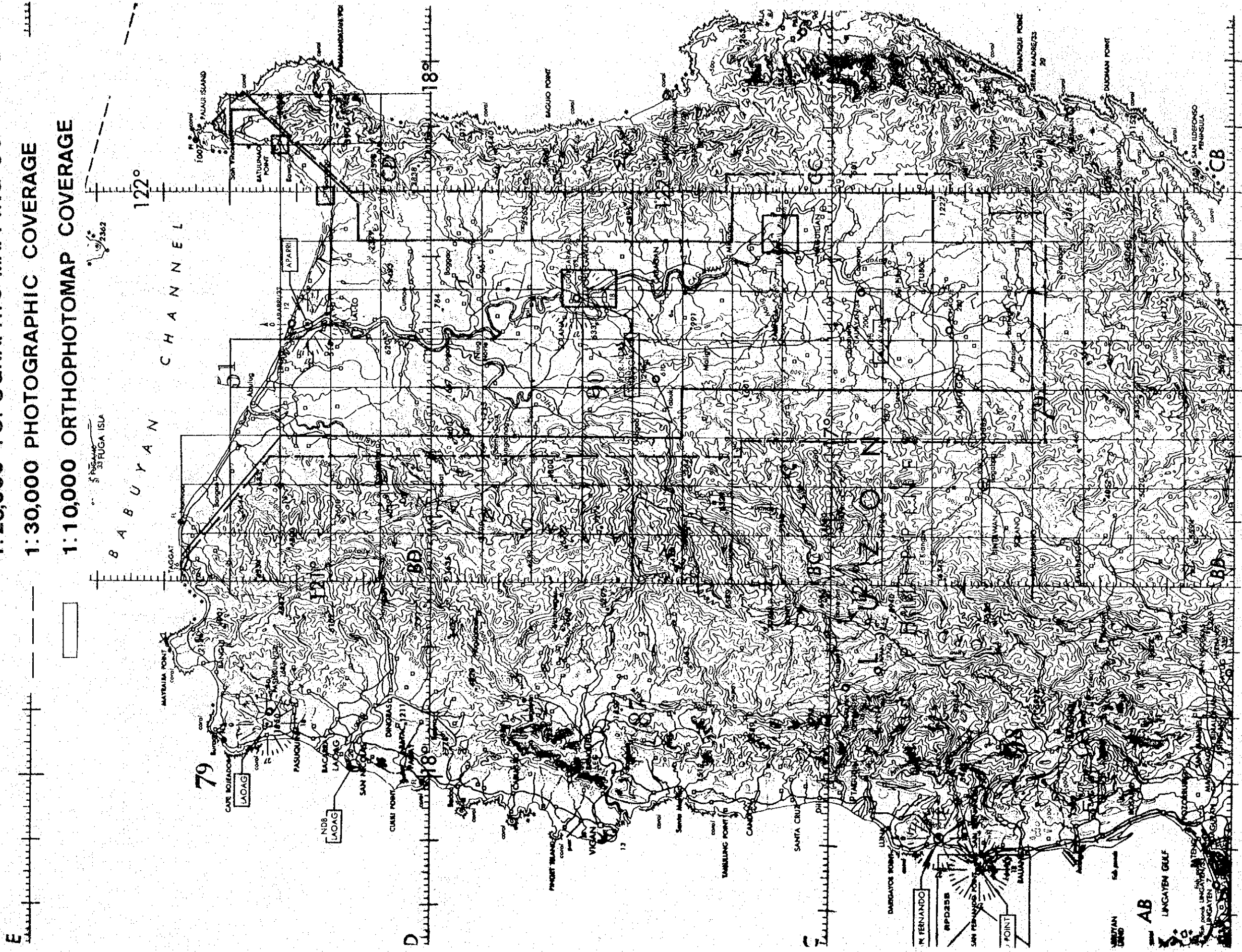
APPENDIX I

P U Y A N

1:25,000 TOPOGRAPHIC MAPPING COVERAGE

1:30,000 PHOTOGRAPHIC COVERAGE

1:10,000 ORTHOPHOTOMAP COVERAGE



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APPENDIX III

Final results

- I. Aerial photography
 1. Original negatives
 2. Contact paper prints (one each)
 3. Photo index sheets

- II. Geodetic Control survey
 1. Horizontal control results
 2. Vertical control results
 3. Computation sheets
 4. Field notes
 5. Description of points

- III. Topographic mapping
 1. Aerial triangulation results
 2. Color separation scribed sheets
 3. 1/25000 Topographic maps (each 1000 copies)
 4. Pricked photos
 5. Original manuscripts
 6. Dia positives

- IV. Orthophoto mapping
 1. Original ortho-photo negatives
 2. Contour overlay
 3. Final ortho-photo positives prints 1/10000 (two sets)
 4. An offset printing plate for each sheet

APPENDIX IV

List of equipment to be used for field survey by the Japanese Survey Team

1. Theodolites
2. Electro magnetic distance measuring equipment
3. Electro optic distance measuring equipment
4. Short wave transmitter receivers
5. Transceivers
6. Heliotropes
7. Signal lamps
8. Precision levels with staves
9. Auto levels with staves
10. Electronic calculators
11. Vehicles including trucks
12. Camping materials including food staff
13. Materials and components of observation towers
14. Generators
15. Small instruments, office equipment and consumables

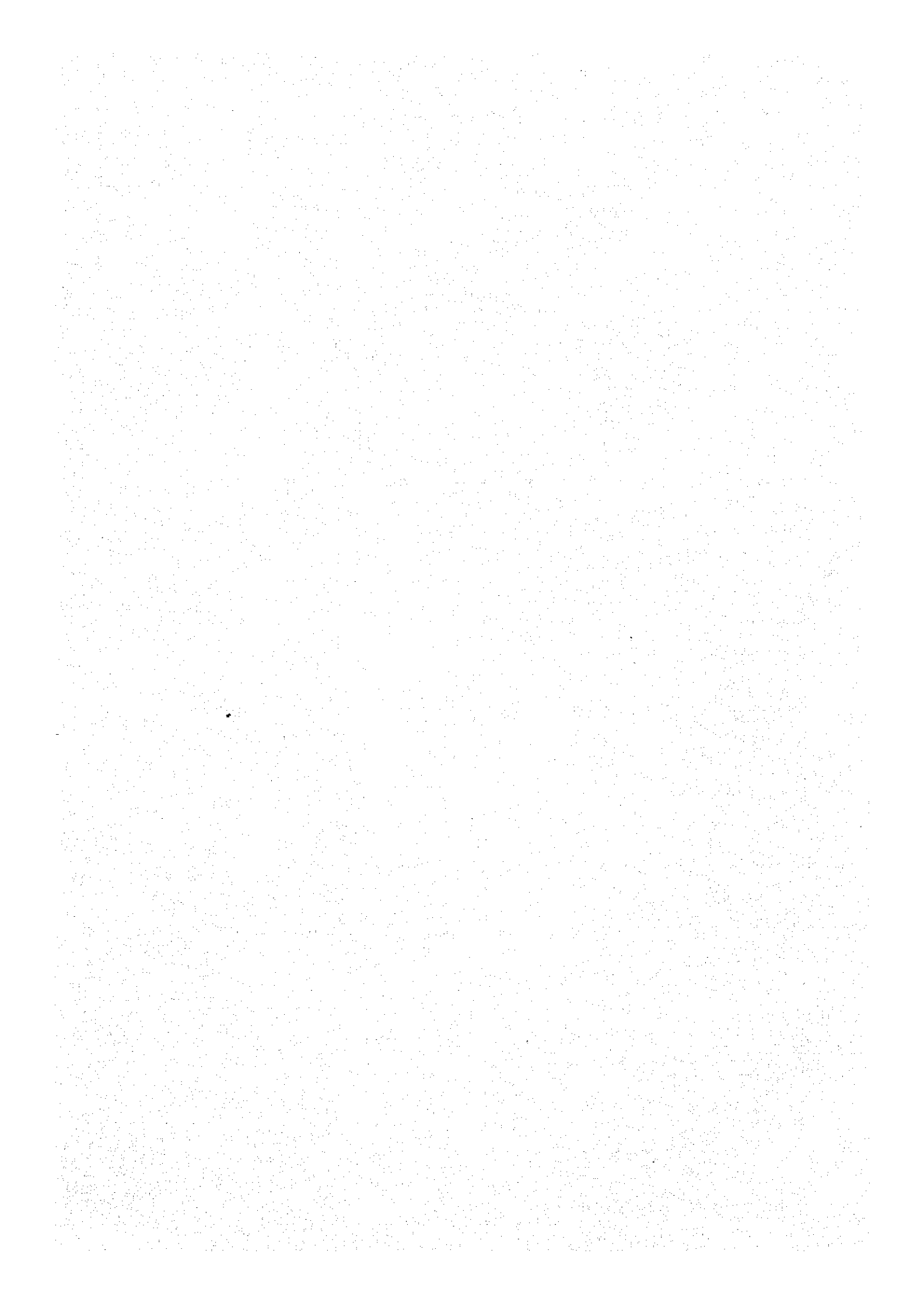
Note: Above mentioned equipment are subject to alteration.

付録（Ⅷ） 入手関連資料リスト

作業実施に関連した資料で、今回入手した主なものは、以下の通りである。

1. 1/50,000 地形図
2. 1/250,000 地形図
3. ナショナル・アトラス
4. 一等水準成果表
5. 基準点網図
6. 三角点成果表
7. 基準点順路説明図
8. D P H 道路図
9. ドプラー・ステーション設置計画図
10. 行政面積表
11. 都市名一覧表
12. 気象統計表
13. 月別台風経路図
14. 注記一覧表
15. 労働法規
16. B C G S 組織図
17. カガヤン・アルマナーク

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JICA