2. Scope of Work & Minutes of Meetings on Scope of Work

SCOPE OF WORK

FOR

TOPOGRAPHIC MAPPING

OF

KAMPALA AND JINJA BLOCKS, NORTH OF LAKE VICTORIA

AGREED UPON BETWEEN

SURVEYS AND MAPPING DEPARTMENT,

MINISTRY OF LAND, HOUSING AND URBAN DEVELOPMENT

AND

JAPAN INTERNATIONAL COOPERATION AGENCY

KAMPALA, UGANDA

16TH MARCH, 1994

16/3/94

Mr. Paul Bakashabaruhanga
Permanent Secretary
Ministry of Lands, Housing
and Urban Development

Mr. Nagaoka

Mr. Masatoshi Nagaoka
Leader
Preparatory Study Team
Japan International
Cooperation Agency

I. INTRODUCTION

In response to the request of the Government of the Republic of UGANDA (hereinafter referred to as "UGANDA"), the Government of Japan (hereinafter referred to as "JAPAN") has decided to conduct the Topographic Mapping for KAMPALA and JINJA Blocks, North of Lake Victoria (hereinafter referred to as "the Study") in accordance with the relevant laws and regulations in force in Japan.

Accordingly, the Japan International Cooperation Agency (hereinafter referred to as"JICA"), the official agency responsible for the implementation of the technical cooperation programmes of JAPAN, will undertake the Study in close cooperation with the authorities concerned of UGANDA.

Surveys and Mapping Department, Ministry of Land, Housing and Urban Development(hereinafter referred to as "SMD") shall act as a counterpart agency to the Japanese Study team and also as a coordinating body in relation with other governmental and non-governmental organizations concerned for the smooth implementation of the Study.

The present document sets forth the Scope of Work with regard to the Study.

II. OBJECTIVES

The objectives of the Study is to prepare the 1/50,000 Topographic Map covering an area of approximately 30,000 square kilometers shaded on an attached map(APPENDIX-1).

III. SCOPE OF WORK

In order to achieve the above mentioned objective, the Study will cover the following items (The technical details are shown in APPENDIX-2).

1.Aerial Photography

Aerial Photographs shall be taken at a scale of approximately 1/60,000. Setting of air-photo signals shall be done, if necessary, prior to commencement of the aerial photography.

2.Ground Control Point Survey

Although existing control points will be used for the topographic mapping, establishment of temporary control points shall be carried out, if necessary.

(1)Traversing and Satellite Geodesy

Supplementary map control points necessary for aerial trianguration and mapping work shall be established by traversing and/or satellite positioning.

(2)Levelling

Levelling shall be carried out to obtain vertical controls for aerial triangulation and mapping work starting from existing bench marks.

3.Pricking

Pricking of identified control points on the aerial photographs shall be done in the field.

4.Field Verification

The topographic map information related to land use, vegitation, etc. shall be verified in the field.

5.Aerial Triangulation

Aerial Triangulation shall be carried out by analytical block adjustment method.

6.Stereo Plotting

Stereo Plotting shall be carried out using stereo plotting instruments at the scale of 1/50,000.

7.Compilation

Compilation shall be carried out based on restitution manuscripts and field verification data.

8.Field Completion

Topographic features, vegetation, etc., which cannot be properly identified in the course of compilation shall be verified in the field and plotted on the compilation sheet. Administrative boundaries and geographical names shall be verified and indicated on the paper copy of the compilation sheet by SMD.

9.Drafting

Based on the compiled sheet, scribing shall be carried out on stable polyester base for several color separation plates. Map style and symbols shall be those adopted by SMD.

10.Printing

Plate making shall be carried out using 1/50,000 scribed negatives, and printing shall be carried out by offset method.

IV. STUDY SCHEDULE

The whole work shall be conducted in accordance with the attached tentative schedule(APPENDIX-3).

V. REPORTS AND FINAL RESULT

Reports shall be submitted to SMD by JICA every Japanese fiscal year (from April to March). The materials mentioned in APPENDIX-4 shall also be submitted to SMD by JICA as final result.

All maps produced under the Study shall bear at the lower margin the following:

"This map was prepared jointly by Japan International Cooperation Agency (JICA) under the Japanese Government Technical Cooperation Programme and the Government of Uganda."

VI. UNDERTAKING OF UGANDA

1. To facilitate smooth conduct of the Study, UGANDA shall take necessary measures ;
   (1) to secure the safety of the Japanese Study Team,
   (2) to permit the members of the Japanese Study Team to enter, leave and sojourn in Uganda for the duration of theirs assignment therein, and exempt them from foreign registration requirements and consular fees,
   (3) to exempt the members of the Japanese Study Team from taxes, duties and other charges on equipment, machinery and other materials brought into Uganda for the conduct of the Study,.
   (4) to exempt the members of the Japanese Study Team from income tax and charges of any kind imposed on or in connection with any emoluments or allowances paid to the members of the Japanese Study Team for their services in connection with the implementation of the Study,
   (5) to provide necessary facilities to the Japanese Study Team for remittance as well as utilization of the funds introduced into Uganda from Japan in connection with the implementation of the Study,
   (6) to secure permission for entry into private properties or restricted areas for the conduct of the Study,

(7) to secure permission for the Japanese Study Team to take all data and documents (including maps, photographs) related to the Study out of Uganda to Japan, and

(8) to provide medical services as needed. Its expenses will be chargeable on members of the Japanese Study Team.

2. UGANDA shall bear claims, if any arises, against the members of the Japanese Study Team resulting from, occuring in the course of, or otherwise connected with, the discharge of their duties in the implementation of the Study; except when such claims arises from gross negligence or willful misconduct on the part of the members of the Japanese Study Team.

3. To facilitate smooth conduct of the Study, SMD shall take necessary arrangements for the Japanese Study Team as follows, in cooperation with other relevant organizations;

(1) to secure permission to flights for the aerial photography and use of airports for the implementation of the Study,

(2) to secure permission to the use of communication facilities including transceivers which may be used on Japanese language, with allocated frequencies, and

(3) to help in recruting necessary number of labourers and watchmen in the project sites.

4. SMD shall, at its own expense, provide the Japanese Study Team with the following in cooperation with other related organizations ;

(1) available data and information related to the Study,

(2) counterpart personnel (staff of DSM),

(3) suitable office space with necessary equipment in Entebbe,

(4) credentials or identification cards to the members of the Japanese Study Team,
(5) administrative and technical support,
(6) to arrange appropriate number of vehicles with drivers,
(7) existing facilities and space of SMD for processing aerial photographs,
(8) information of necessary administrative boundaries and geographical names on the maps are its full responsibility,, and
(9) annotation materials and annotation sheets in Uganda.

VII. UNDERTAKING OF JICA

For the implementation of the Study, JICA shall take the following measures ;

1. To dispatch, at its own expense, the Study Team to Uganda for Premarking, Aerial Photography, Ground Control Point Survey, Pricking, Field Verification and Field Completion with the use of local expertise as much as applicable with JICA's supervision,
2. To carry out Aerial Triangulation, Stereo Plotting, Compilation, Drafting and Printing in Japan at its own expense, and
3. To pursue technology transfer to Uganda counterpart personnel in the course of the Study.

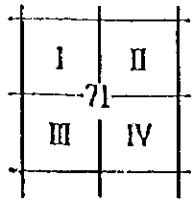
VIII. CONSULTATION

JICA and SMD shall consult with each other in respect of any matter that may arise from or in connection with the Study.

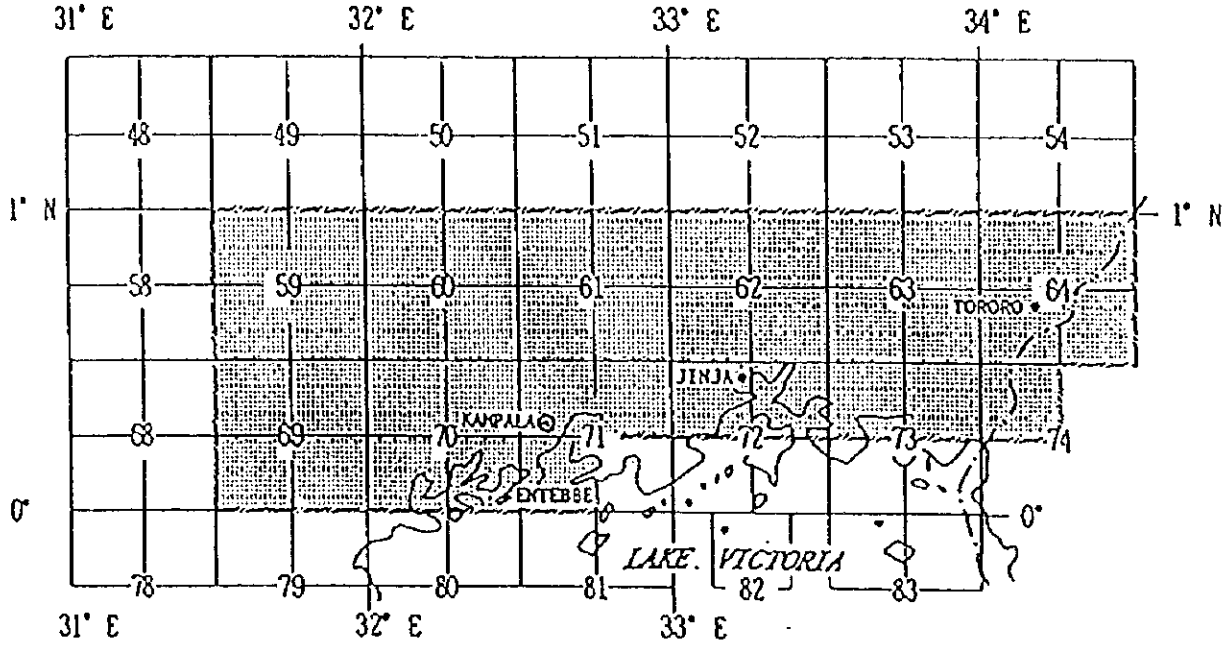
Appendix-1

MAPPING AREA

1:50000 topographic map



Sheet Numbering Exarple



(40 map sheets)

APPENDIX - 2

Principal Technical Specification

1. Aerial Photography : super-wide angle camera

2. Ground Control Point Survey: 10^{-5} (Relative Accuracy)

3. Levelling

   (1) Limit of Difference of Reciprocal Observation for Minor Order Levelling for Photo Control

   $5cm \sqrt{S}$ S:km

4. Mapping

   (1) Projection : UTM Projection

   (2) Sheet Line : 15' × 15' in Latitude and Longitude

   (3) Main Contour Interval : 20m

   (4) Number of Colors : 5 colors

APPENDIX-3

TENTATIVE SCHEDULE

ITEM \ MONTH	1 · 3 · · 6 · · 9 · · 12 · · 15 · · 18 · · 21 · · 24 · · 27 · · 30 · · 33 · · 36 · · 39 · · 42 · · 45 · · 48
Signalization (Premarking)	
Aerial Photography	
Ground Control Point Survey	① ②
Pricking	
Aerial Triangulation	
Field Verification	
Stereo Plotting	
Compilation	
Field Compilation	
Drafting	
Printing	

Note : ——— Work in UGANDA
——— Work in JAPAN
① Traversing and Satellite Geodesy
② Leveling

APPENDIX - 4

FINAL RESULTS

1. Aerial Photography
   (1) original negative-film (1set)
   (2) contact positive prints (1set)
   (3) index map of aerial photographs

2. Ground Control Point Survey
   (1) final result tables
   (2) distribution and route diagram

3. Pricking
   (1) description of Pricking

4. Aerial Triangulation
   (1) final result tables
   (2) diapositive films (1set)

5. Topographic Mapping
   (1) separate scribed sheets
   (2) printed maps (1000 copies for each sheet)

MINUTES OF MEETING

FOR

THE SCOPE OF WORK

FOR

TOPOGRAPHIC MAPPING

OF

KAMPALA AND JINJA BLOCKS, NORTH OF LAKE VICTORIA

AGREED UPON BETWEEN

SURVEYS AND MAPPING DEPARTMENT,

MINISTRY OF LAND, HOUSING AND URBAN DEVELOPMENT

AND

JAPAN INTERNATIONAL COOPERATION AGENCY

KAMPALA, UGANDA

16TH MARCH, 1994

16/3/94.

Mr. Paul Bakashabaruhanga
Permanent Secretary
Ministry of Land, Housing
and Urban Development

M. Nagaoka

Mr. Masatoshi Nagaoka
Leader
Preparatory Study Team
Japan International
Cooperation Agency

The Preparatory Study Team (hereinafter referred to as "the Team"), for Topographic Mapping of Kamapala and Jinja Blocks, North of Lake Victoria (hereinafter referred to as "the Study") organized by the Japan International Cooperation Agency (hereinafter referred to as "JICA") headed by Mr. Masatoshi Nagaoka visited the Republic of Uganda from February 23 to March 20, 1994, and had a series of discussions with the Uganda side, represented by Surveys and Mapping Department, Ministry of Land, Housing and Urban Development (hereinafter referred to as "SMD"). List of participants is shown in Attachment.A.

As a result of the said discussions, both sides came to an agreement on a Scope of Work (hereinafter referred to as "S/W") of the Study, and signed it on March 16, 1994.

This document summarizes major items discussed between both sides and is meant to supplement the S/W for the smooth conduct of the Study.

1.Mapping Area

Both sides agreed that the Mapping area was decreased to approximately 30,000km² (shown in Appendix 1 of S/W).

2.Scale of Aerial Photography

Both sides agreed that the scale of Aerial Photography is 1/60,000 .

3.Airplane for Aerial Photography

SMD agreed that an airplane for Aerial Photography will be brought from a foreign country.

4.Flight Permission

SMD shall obtain flight permission for Aerial Photography from the Government of Uganda. And on the national border of Kenya, SMD shall obtain the permission from the Government of Kenya.

Both shall be obtained at least two (2) months prior to commencement of the Study.

In case the flight permission by Kenya is not available, the area approximately 10km inside along the national border shall be basically excluded for Aerial photography, and the existing 1/50,000 topographic maps shall be utilized for the Study.

5. RADIO FREQUENCY

SMD shall obtain a permission to radio,

6. OFFICE SPACE

SMD shall provide office space in Entebbe for the Japanese Study Team,

7. NECESSARY VEHICLES

SMD requested necessary vehicles for the Study because the Government cannot arrange the necessry vehicles. The Team promised to convey that request to JICA,

8. COUNTERPART TRAINING

SMD strongly requested to send participants to the Counterpart Training in Japan. The Team promised to convey that request to JICA and related organizations.

9. TRAVERSING AND SATELITE GEODESY

Ground control points for Traversing and Satelite Geodesy (item III. 2. of the S/W) shall be marked as a suitable measure and where appropriate.

For instance, measures are as following:

(1) metal tablet,

(2) pile (plastic, concrete, metal, wood, etc.),

etc.,

10. PRINTING COLOURS

Both sides agreed that number of colours for Printing are five (5),

11. THE NUMBER OF PRINTS

Both sides agreed that printed maps will be made one thousand (1000) copies for each sheet,

12. ITEM VI. 3. (3)

In the item VI. 3. (3) . of the originally draft S/W, "to arrange necessary number of labourers and watchmen in the project sites" was amended to as "to help in recruiting local labourers and watchmen in the project sites",

13. ITEM VII. 1.,

The item VII.1. of the originally draft S/W was added as "with the use of local expertise as much as applicable with JICA's supervision",

14. RETAIN OF MAPS

SMD agreed that Japanese side can retain some sets of printed maps which will be produced as a result of the Study.

15. TRIANGULATION POINT

As a result of field survey, it was found that most of trianguration points had been destroyed or stolen, and they can not be utilized for mapping. Therefore JICA requested SMD to identify the location of the trianguration points classified as Tertiary point (Y point) or higher and also requested to provide list of Coordinates which indicates existing trianguration points by the commencement of the Study.

16. BENCH MARK

As a result of field survey, most of bech marks were found out. JICA requested SMD to provide list of bench mark (elevation data) and description cards by the commencement of the Study.

Attachment.A

PARTICIPANTS LIST

THE UGANDA SIDE (SURVEY AND MAPPING DEPARTMENT)

1.	Mr. Paul Bakashabaruhanga	Permanent Secretary
2.	Mr. K. S. B. Mubbala	Commissioner of Surveys and Mapping
3.	Mr. Bwogi Justin	Ag. Assistant Commissioner (Survey)
4.	Mr. Kiwanuka D.K.	Ag. Deputy Commissioner
5.	Mr. Kajumbula M.N.	Senior Staff Surveyor (Mapping)
6.	Mr. Hawondo Joram	Map Production Officer
7.	Mr. Richard Oput	Ag. Principal Staff Computer

THE JAPANESE SIDE (THE PREPARATORY STUDY TEAM OF THE STUDY)

1.	Mr. Masatoshi Nagaoka	Leader
2.	Mr. Masakatu Abe	Deputy Leader/Survey Planning
3.	Mr. Mitsuo Kezuka	Cost Estimate
4.	Mr. Syouji Hashizume	Photogrammetry
5.	Mr. Chiyuki Nishimura	Control Point Survey
6.	Mr. Kenji Isomoto	Project Formation/Planning (1)
7.	Ms. Mikakao Kudo	Project Formation/Planning (2)

3．ウガンダ国測量・地図局との協議議事録

3－1　第1年次現地作業開始時の協議議事録（1994年12月）

MINUTES OF MEETINGS

ON

THE FIRST YEAR'S PLAN OF OPERATION

FOR

TOPOGRAPHIC MAPPING OF KAMPALA AND JINJA BLOCKS

NORTH OF LAKE VICTORIA

IN

THE REPUBLIC OF UGANDA

16TH DECEMBER, 1994

ENTEBBE, UGANDA

Mr. K.S.B.MUBBALA
Commissioner
Surveys and Mapping Department
Ministry of Land, Housing
and Urban Development

Mr. Hiroyuki MATSUDA
Leader
Study Team
Japan International
Cooperation Agency

On the basis of the Scope of Work agreed between Surveys and Mapping Department (hereinafter referred to as SMD) and Japan International Cooperation Agency (hereinafter referred to as JICA) on 16th March 1994, the Japanese Study Team organized by JICA and headed by Mr. H. Matsuda visited the Republic of Uganda from 10th December 1994, to carry out first year's study on Topographic Mapping of Kampala and Jinja Blocks, North of Lake Victoria.

Prior to the commencement of the first year's survey work, meetings were held on 12th and 13th December at SMD in Entebbe to discuss the Plan of Operation, and following items were confirmed and agreed upon by SMD and the JICA Study Team (hereinafter referred to as JST);

1. JST explained the detail and all procedure concerning the Plan of Operation to SMD, and SMD agreed and confirmed in principle.

2. The quantity of printed maps to be provided to SMD as a final product had been decided as 1,000 (one thousand) per each sheet, however, SMD showed an intention to increase the number in future. Against this, JST explained that the quantity had been discussed and agreed in the Scope of Work mission and will be impossible to change at this stage. SMD agreed to it.

3. Some descrepancies in opinion were raised about the accuracy of horizontal position of objects and of the contour on a map, however, after detailed discussion, they were decided and confirmed as follows.

Horizontal; standard deviation of $\pm$0.5mm on a map

considering expansion and contraction
of the printing paper

Contour; 1/2 of contour interval

4. Confirmed that the total number of GPS observation points shall be 60 including existing triangulation points. Out of these 60, 56 points shall be new points.

5. For the new control points, in this phase, only simplified monument shall be installed but not permanent monuments.

6. Numberring of the new control points established by GPS shall be decided by SMD and JST will accept it.

7. SMD confirmed and guaranteed to get the flight permission for aerial photography.

8. SMD pointed out their intention to send staff to Japan for their technology transfer in each step of the work in Japan.
JST promised to convey the request of SMD to JICA.

LIST OF ATTENDANTS IN THE MEETINGS

(UGANDA SIDE)

NAME	POSITION
Mr. K.S.B. Mubbala	Commissioner Surveys and Mapping Department
Mr. Kiwanuka D.K.	Ag. Deputy Commissioner Surveys and Mapping Department
Mr. Bwogi Justin	Ag. Assistant Commissioner (Surveys) Surveys and Mapping Department
Mr. Mbyetsiza E.K.	Ag. Assistant Commissioner (Mapping) Surveys and Mapping Department
Mr. Kajumbula M.N.	Senior Staff Surveyor (Mapping) Surveys and Mapping Department
Mr. R. Oput	Ag. Principal Staff Computer Surveys and Mapping Department

(JAPAN SIDE)

NAME	POSITION
Mr. Hiroyuki Matsuda	Leader JICA Study Team
Mr. Yoshiaki Otoku	Deputy Leader JICA Study Team
Mr. Minoru Ikeda	Mapping Planner JICA Study Team
Mr. Yasuyuki Kuwahata	Chief Surveyor JICA Study Team
Mr. Hiroshi Sanui	Coordinator JICA Study Team

ADVISERS;

Mr. Mitsuo Kezuka	Adviser Geographical Survey Institute, Japan
Mr. Satoru Matsuyama	Study Manager JICA

PLAN OF OPERATION

FOR

TOPOGRAPHIC MAPPING OF KAMPALA AND JINJA BLOCKS

NORTH OF LAKE VICTORIA

IN

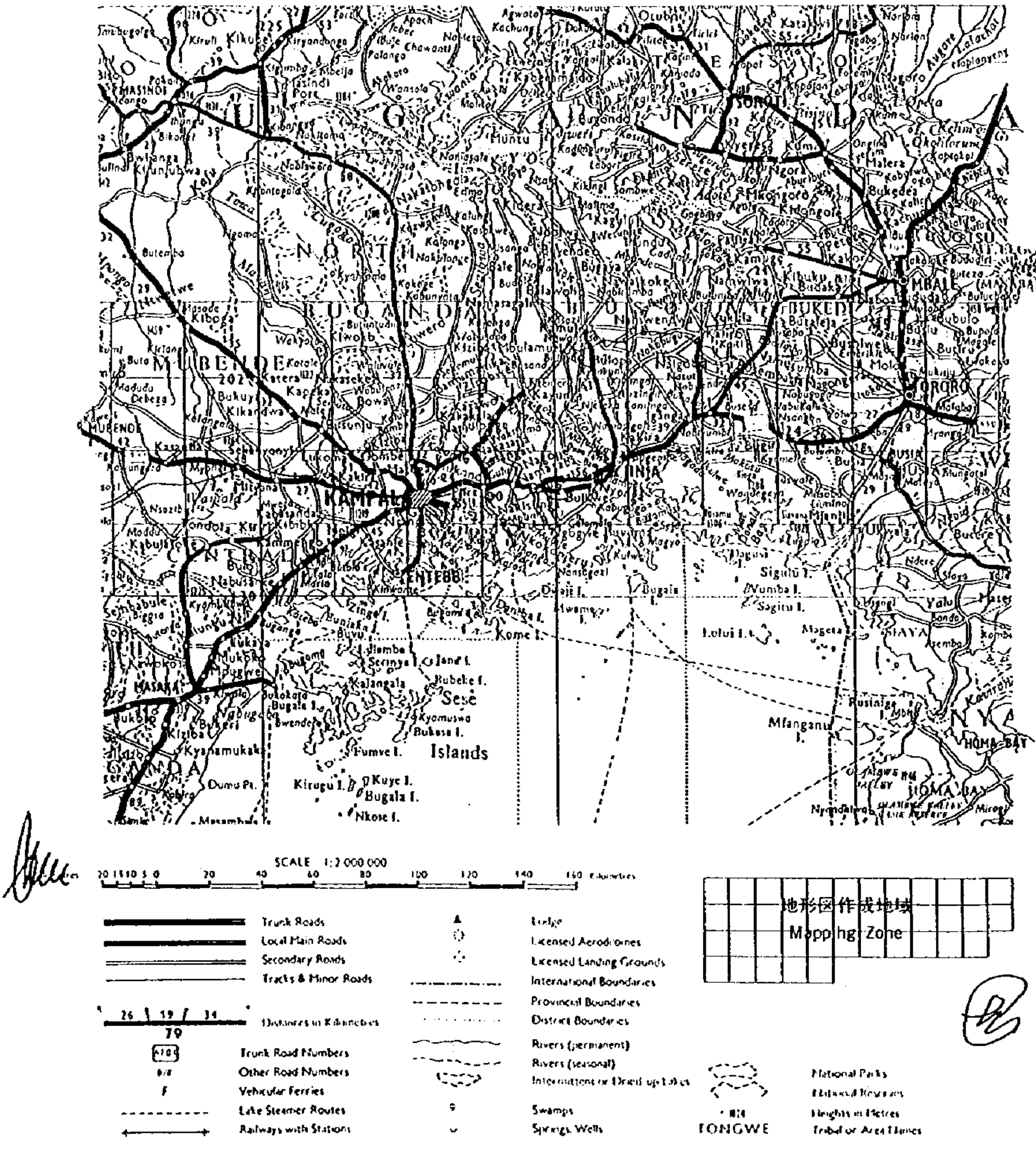
THE REPUBLIC OF UGANDA

DECEMBER, 1994

JAPAN INTERNATIONAL COOPERATION AGENCY

ウガンダ共和国
ヴィクトリア湖北部地形図作成
調査対象地域

THE TOPOGRAPHIC MAPPING OF KAMPALA AND JINJA BLOCKS, NORTH OF LAKE VICTORIA IN THE REPUBLIC OF UGANDA



CONTENTS

INTRODUCTION

The Government of the Republic of Uganda requested the Technical Cooperation Programme on the Topographic Mapping of Kampala and Jinja Blocks North of Lake Victoria (hereinafter referred to as the Study) to the Government of Japan in January, 1992.

In response to the request, Japan International Cooperation Agency (hereinafter referred to as JICA) dispatched the Preparatory Study Team to Uganda from 20th February to 23rd March, 1994.

They had a field investigation and technical discussions with Uganda side, and as a result, Scope of Work (S/W) was signed on 16th March,1994.

This Plan of Operation (P/O) prepared in accordance with S/W describes the outline of the Study to be carried out by JICA. The outline consists of the tentative plan of this four year programme and the implementation plan for the first year (from December 1994 through February 1995).

The Study shall be carried out according to this P/O and also to the results of discussion between the Study Team composed of Infrastructure Development Institute-Japan and Pasco International Inc., and Surveys and Mapping Department,Ministry of Land,Housing and Urban Development (hereinafter referred to as SMD)

CHAPTER 1. PLAN OF OPERATION OF THE WHOLE STUDY

1-1 OBJECTIVES OF THE STUDY

The objectives of the Study are;

(1) To prepare 1/50,000 topographic maps covering an area of approximately 30,000 km² (see the cover map),

(2) To transfer technology to the counterpart personnel of SMD through the implementation of the Study.

1-2 SCOPE OF THE STUDY

This Study shall cover all of the technical fields of survey and mapping including Signalization, Aerial photography, Ground control survey, Levelling, Pricking, Field identification and Field completion, Aerial triangulation, Stereo plotting and Compilation, Drafting, and Map-reproduction. The main technical specifications to achieve the above mentioned technical objectives are as shown in TABLE 1 on page 16.

1-3 OUTLINE OF THE STUDY

(1) Signalization(Premarking)

Prior to the commencement of aerial photography, aerial signals shall be set up the existing control points in order to confirm their position on the aerial photograph to acquire the required accuracy for aerial triangulation.

(2) Aerial photography

Aerial photography shall be taken at a scale of approximately 1/60,000 with a aircraft and a super wide angle camera (9 cm focal length, 23 cm X 23 cm photo size) under contract with a photographic company. There shall be 19 flight courses and approximately 750 photographs (see FIGURE 1).

(3) Ground control point survey

GPS observation (60 points) and the minor order levelling (80 km) shall be carried out.

(4) Pricking

The newly established 56 GPS points shall be pricked. All of the bench marks in the existing levelling route shall be pricked. And the spots on the minor order levelling route shall also be pricked at intervals of approximately 4 km.

(5) Aerial triangulation

Aerial triangulation shall be carried out by analytical block adjustment method. Approximately 680 stereo-models shall be applied for the aerial triangulation.

(6) Field identification (verification)

The topographic features, land use, vegetation and other information necessary for terrain representation shall be identified in the field.

Administrative boundaries and geographical names shall also be collected.

Additionally, map symbols and specifications shall be discussed and agreed between the Study team and SMD.

(7) Plotting

Plotting shall be carried out at a scale of 1/50,000 with stereo plotters. As for the projection, UTM shall be applied. In the case of absolute orientation, height control points within a model shall be used as check points.

(8) Compilation

Map compilation shall be executed in accordance with the symbols and specifications pre-agreed between the Study team and SMD.

Sheet size of the compiled topographic maps shall be 15'X 15',and number of the map sheets shall be 40 (see FIGURE 3).

(9) Field completion

Field completion shall be carried out on the items which are unidentified in the process of plotting and compilation. In this stage, SMD shall be requested to authorize the administrative boundaries and geographical names.

Additionally, subsequent drafting and map-reproduction treatment shall be discussed and agreed between the Study team and SMD.

(10) Drafting

Scribing and masking shall be applied on stable polyester bases for five colour separation plates. Annotation shall be done using the photo-typing method.

(11) Map-reproduction (Printing)

Plates shall be made using the colour separation combined negatives, and Printing shall be done using the off-set method.

Number of colours applied for printing shall be five, and 1,000 final maps shall be printed for each sheet.

1-4 STUDY SCHEDULE

(1) The working period is from December 1994 to January 1998.

(2) The working schedule is as shown in FIGURE 4.

(3) The flowchart for the production of topographic map is as shown in FIGURE 5.

1-5 REPORT AND FINAL PRODUCTS

A report shall be prepared by Japanese Study team at the end of each fiscal year. The report on the final year shall cover all of the activities in this Study.

The final products to be delivered to the SMD are as follows;

(1)	Original negative films	1	set
(2)	Diapositives	1	set
(3)	Contact prints	1	set
(4)	Photo index maps	1	set
(5)	Field books and Results of GPS observation	1	set
(6)	Field books and Results of levelling	1	set
(7)	Pricked and annotated photographs	1	set
(8)	Aerial triangulation results	1	set
(9)	Original manuscripts	1 set each	

(10) Scribe, Mask, and Annotation sheets — 1 set each

(11) Colour separation combined negative (or positive) films — 1 set each

(12) 1/50,000 topographic maps — 1,000 copies each

1-6 UNDERTAKING OF SMD

(1) To facilitate the smooth conduct of the Study, SMD shall take the following arrangements for the Study team in cooperation with other relevant organizations;

1) To secure permission to take aerial-photographs at the Study area ,

2) To secure permission for the use of communication facilities, including transceivers,

3) To help in recruiting necessary number of labourers in the project sites(see TABLE 2),

4) To secure permission for the Study team to take out all necessary data and documents, including the original negatives and other aerial photographs,

5) To establish the monuments for the new ground control points, if necessary.

(2) SMD shall, at its own expense, provide the Study team with the following;

1) Suitable office space with necessary equipment, e.g. furniture,telephone,garages and storages in Entebbe,
2) Counterpart personnel (see TABLE 2),

3) Credential or identification cards (see TABLE 2),

4) Geodetic and levelling data necessary for the ground control survey, pricking and aerial triangulation,

5) Information of administrative boundaries and geographical names, at its full responsibility,

6) Available data and information such as roads, public facilities and others.

7) Existing facilities and space of SMD for processing the aerial photographs.

8) Annotation materials in English .

1-7 UNDERTAKING OF THE STUDY TEAM

Undertaking of the Study team is as follows;

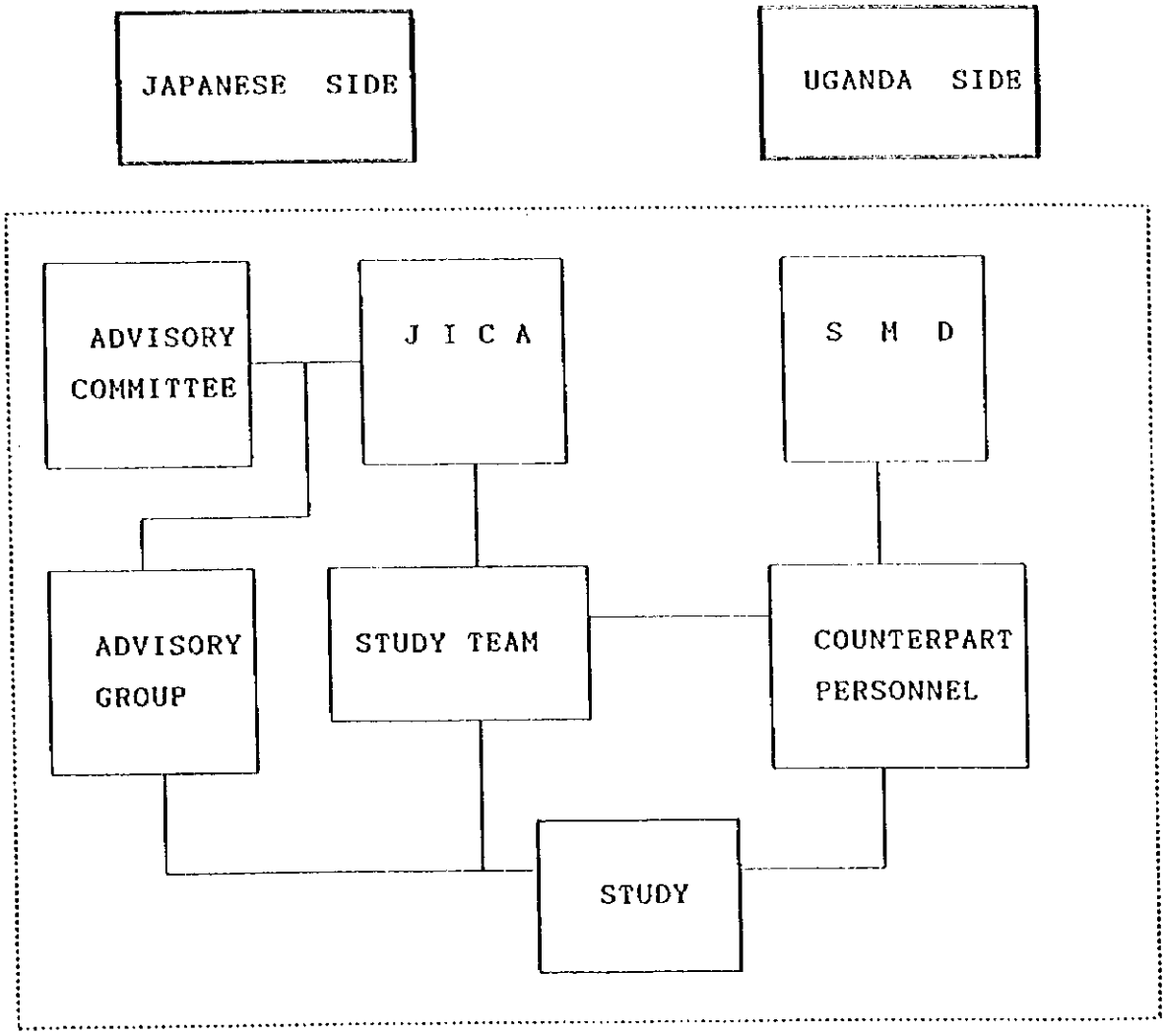
(1) To carry out Signalization, Aerial photography, Photo-processing, Ground control survey, Pricking, Field identification and Field completion in Uganda,

(2) To carry out Aerial triangulation, Plotting and compilation, Drafting, and Map-reproduction in Japan,

(3) To pursue technology transfer to the counterpart personnel through the workshops under field study.

1-8 ORGANIZATION

Parties involved in this Study shall be organized as follows:



CHAPTER 2 WORKS TO BE CARRIED OUT IN THE FIRST YEAR (PHASE 1)

2-1 VOLUME OF THE WORK

Works in the first year (phase 1) are as follows;

☆ Signalization	Ground control points		4
☆ Aerial photography,	Scale	approx.	1:60,000
	Flight course		19
	Flight length	approx.	3,550 km
	Coverage	approx.	29,000 km²
	Number of photos	approx.	750
☆ Photo processing,	Negatives		1 set
	Contact prints		1 set
☆ Ground control survey	GPS observation		60 points

2-2 WORKING SCHEDULE

The working schedule in the first year is as follows;

☆ Signalization , from the middle of December to the end of December, 1944.

☆ Aerial photography , from the beginning of January to the middle of February, 1995,

☆ Ground control survey, from the middle of December to the beginning of February, 1995.

2-3 WORKING GROUP AND THEIR ASSIGNMENT

TABLE 3 shows the members of the Study team and their assignment in the first year.

Legend: ——— Planning run of air-photos(scale:1/60,000
19 courses, approx.3,550 line km)
base height; 1,200 m lense; super-wide

Scale: 1:1.500.000

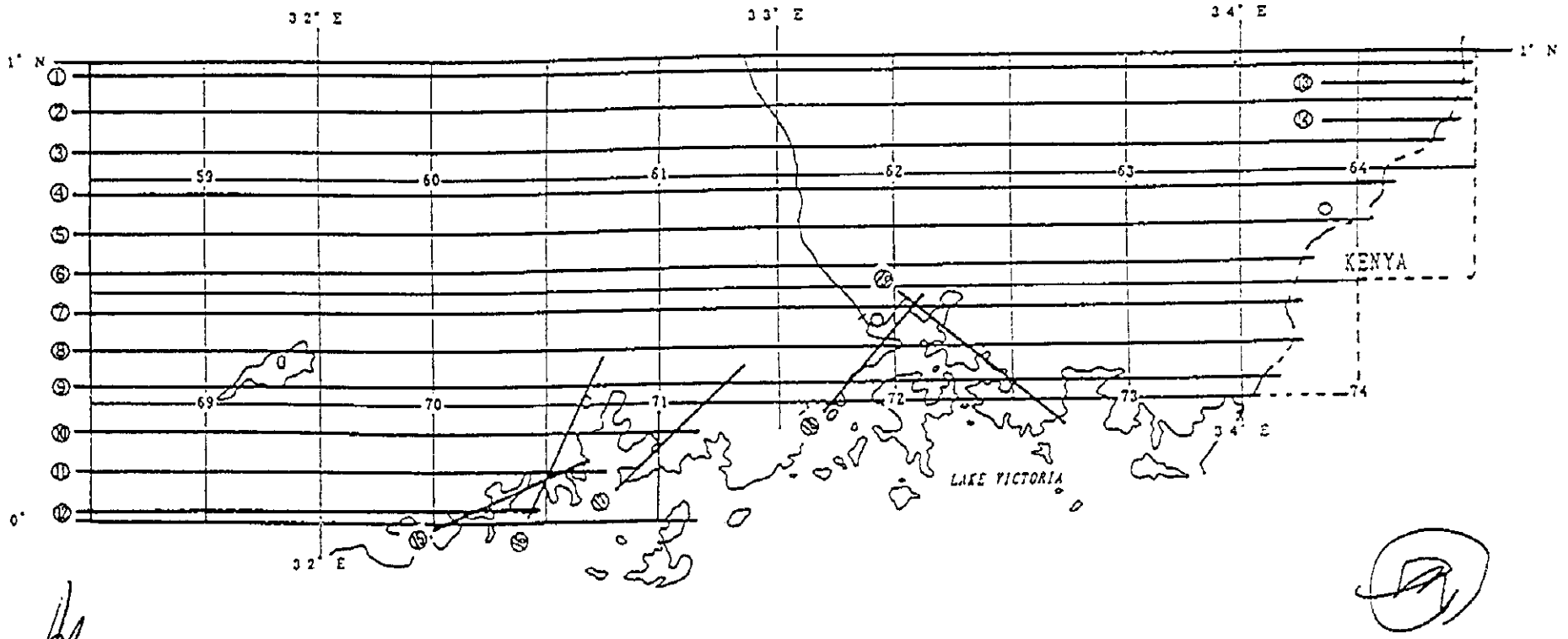


FIGURE 1 INDEX MAP FOR FLIGHT PLANNING

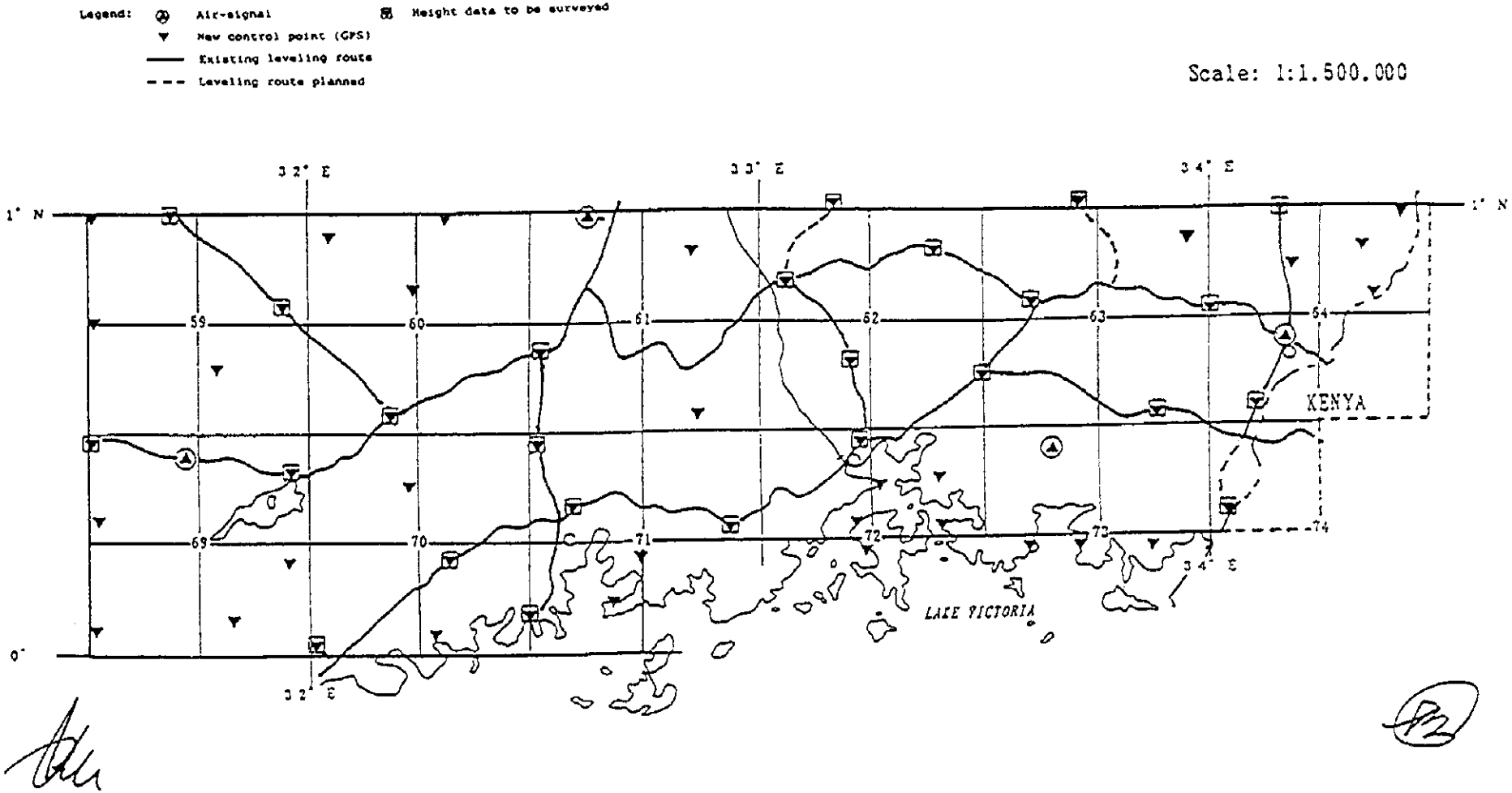


FIGURE 2 INDEX MAP FOR GROUND CONTROL POINTS AND LEVELLING ROUTE

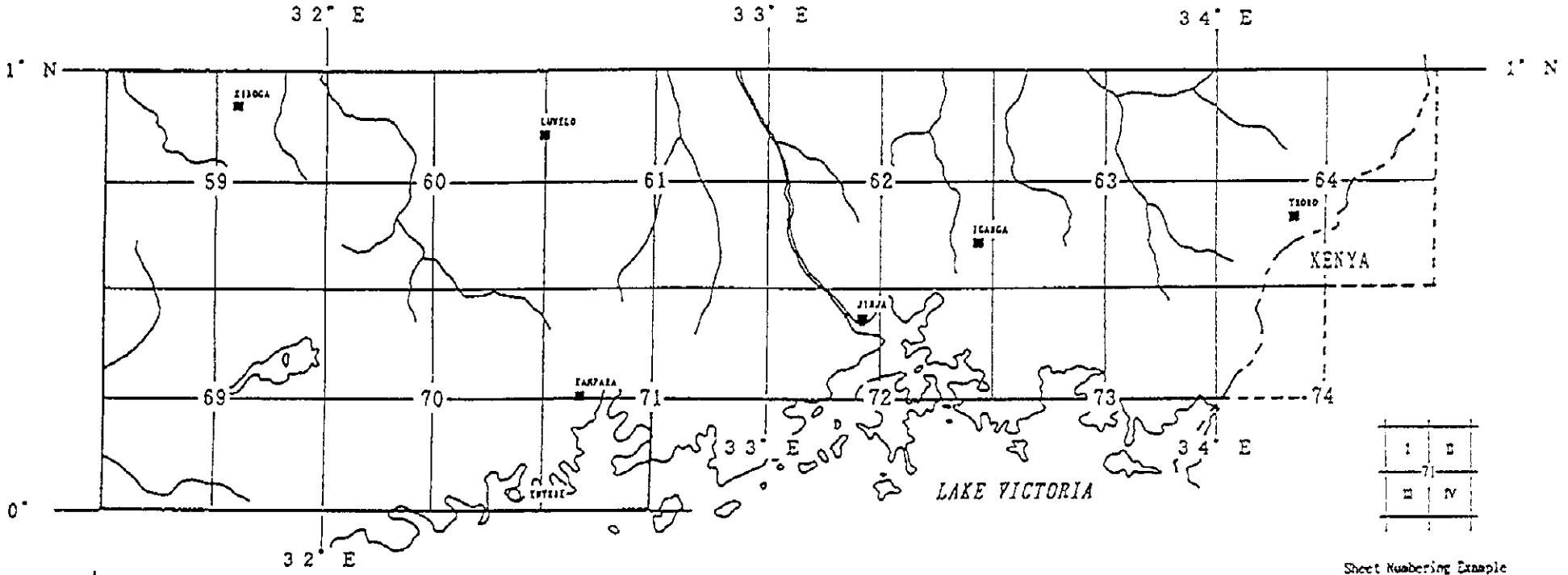


FIGURE 3 INDEX MAP FOR CARTOGRAPHY (15' X 15')

FIGURE 4 TENTATIVE WORKING SCHEDULE

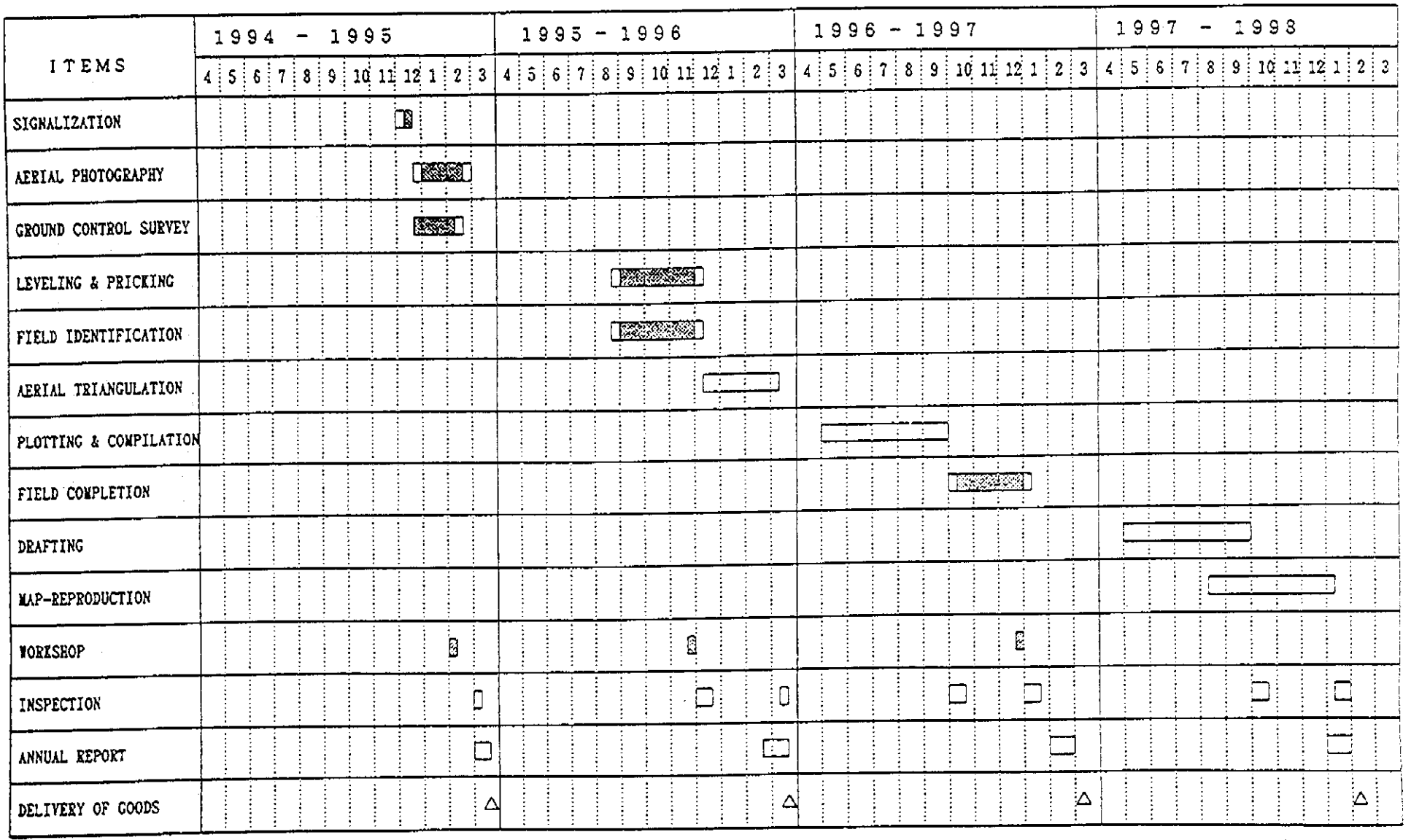
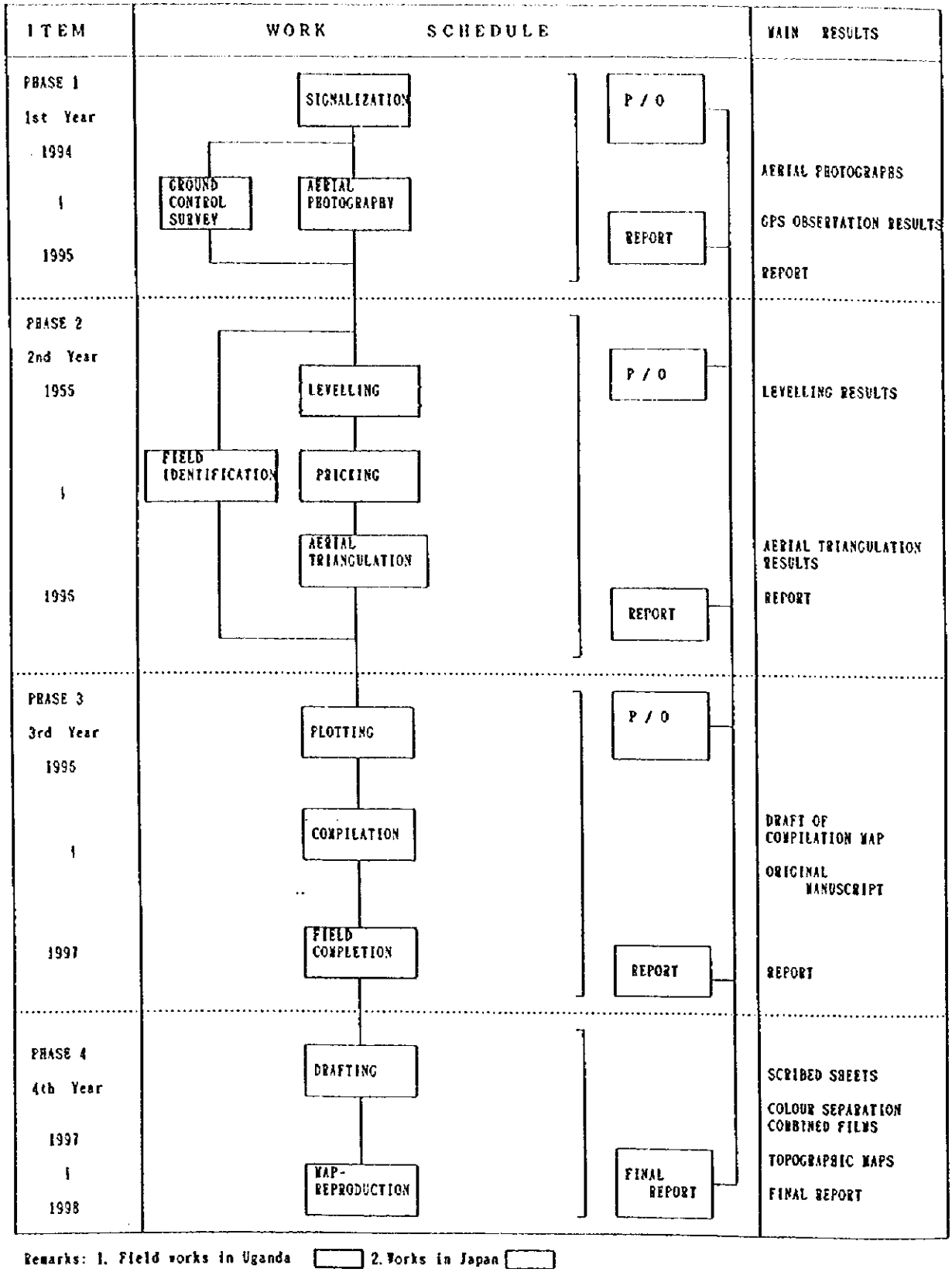


FIGURE 5 FLOWCHART FOR THE PRODUCTION OF TOPOGRAPHIC MAPS



Remarks: 1. Field works in Uganda 2. Works in Japan

TABLE 1 TECHNICAL SPECIFICATIONS

ITEMS	CONTENT	APPLICATIONS
FINAL RESULTS	AERIAL PHOTOGRAPH: SUPER WIDE ANGLE SCALE 1:60,000 APPROX. 29,000 km² OVERLAP 60 % SIDELAP 30 % CRAB 10 ° TIP AND TILT 5 ° TOPOGRAPHIC MAP: SCALE 1:50,000 40 SHEETS APPROX. 28,000 km² (Printed Map in English 5 colours, 1,000s/each)	S/W, INDICATION NOTES TECHNICAL MANUAL OF OVERSEAS SURVEYING BY JICA S/W, INDICATION NOTES
MAP SYMBOLS	1/50,000 MAP SYMBOLS AND ITS APPLICATION RULE BY SMD. (Detailed application shall be discussed between the both sides.)	S/W
SPECIFICATIONS	REFERENCE ELLIPSOID: CLARKE 1880 PROJECTION U T M FORMAT: 15' X 15' CONTOUR INTERVAL: MAIN 20m SUPPLEMENTARY 10m, 5m	S/W , TECHNICAL MANUAL OF OVERSEAS SURVEYING BY JICA
ACCURACY	GROUND CONTROL POINT 10^{-5} MINOR ORDER LEVELLING 5cm/S MAP ACCURACY: A CLASS (Horizontal: 0.5mm) (Spot height:Δh/3) (Contourline:Δh/2)	S/W , TECHNICAL MANUAL OF OVERSEAS SURVEYING BY JICA
APPLICATION RULE	TECHNICAL MANUAL OF OVERSEAS SURVEYING BY JICA	INDICATION NOTES

TABLE 2 UNDERTAKING TO BE REQUESTED TO SWD

ITEMS	PERIOD	CONTENTS
PREPARATION OF I.D. CARD AND SUITABLE OFFICE SPACE	from the middle of Dec. 1994 to the middle of Feb, 1995.	for 13 Japanese
	from the beginning of Sep. 1995 to the end of Nov., 1995.	for 14 Japanese
	from the beginning of Sep. 1996 to the middle of Nov., 1996.	for 10 Japanese
COUNTERPART PERSONNEL	from the middle of Dec. 1994 to the middle of Feb., 1995.	6 counterparts for Aerial photography, GPS observation.
	from the beginning of Sep. 1995 to the end of Nov., 1995.	7 counterparts for Field identification, Levelling and Pricking
	from the beginning of Sep. 1996 to the middle of Nov., 1996.	5 counterparts for Field completion
WORKERS	from the middle of Dec. 1994 to the middle of Feb., 1995.	12 workers
	from the beginning of Sep. 1995 to the end of Nov., 1995.	14 workers
	from the beginning of Sep. 1996 to the middle of Nov., 1996.	8 workers

TABLE 3 MEMBERS OF STUDY TEAM AND THEIR ASSIGNMENT IN THE FIRST YEAR (PHASE 1)

NAME	ASSIGNMENT	DURATION	CONTENTS
Hiroyuki MATSUDA	LEADER	6, Dec. 94~ 23, Dec. 94 3, Feb. 95~ 18, Feb. 95	1. TOTAL MANAGEMENT 2. GENERAL DISCUSSION
Yoshiaki ŌTOKU	SUBLEADER	6, Dec. 94~ 18, Feb. 95	1. SUB MANAGEMENT 2. GENERAL DISCUSSION 3. ASSISTANCE OF LEADER 4. GENERAL SUPERVISION
Minoru IKEDA	MAPPING PLANNER	6, Dec. 94~ 18, Feb. 95	1. FUNDAMENTAL MAP PLANNING 2. GENERAL COORDINATION 3. REPORTING
Yasuyuki KUWAHATA	CHIEF SURVEYOR	6, Dec. 94~ 18, Feb. 95	1. PLANNING OF IMPLEMENTATION 2. SUPERVISION OF WORKS 3. COORDINATION OF WORKS 4. QUALITY CHECKING
Yutaka KYAKUNO	PHOTOGRAPHER	2, Jan. 95~ 18, Feb. 95	1. INSPECTING OF PHOTOGRAPHY AND PHOTO PROCESS
Yoichi KAWANA Nobuhiro SATA Kiyotaka KIMURA Shigeyoshi SAITŌ Koji FURUTA Manabu KAWAGUCHI Yoshihiro MIYAKE Hideki YAMAZAKI	SURVEYOR	11, Dec. 94~ 10, Feb. 95	1. G. P. S OBSERVATION 2. G. P. S ANALYZING
Hiroshi SANUI	COORDINATER	2, Dec. 94 ~ 20, Dec. 94 8, Feb. 95 ~ 18, Feb. 95	1. ARRANGEMENT OF MEETING 2. ACCOUNTING

3－2　第1年次現地作業終了時の協議議事録（1995年2月）

MINUTES OF MEETINGS
AT
THE END OF THE FIRST YEAR'S FIELD WORK
FOR
TOPOGRAPHIC MAPPING OF KAMPALA AND JINJA BLOCKS
NORTH OF LAKE VICTORIA
IN
THE REPUBLIC OF UGANDA

14TH FEBRUARY, 1995

ENTEBBE, UGANDA

Mr. K.S.B.MUBBALA
Commissioner
Surveys and Mapping Department
Ministry of Land, Housing
and Urban Development

Mr. Hiroyuki MATSUDA
Leader of Study Team
Japan International
Cooperation Agency

The Surveys and Mapping Department (hereinafter referred to as "SMD") and JICA Study Team had a series of meetings at the end of the field work of the first year for Topographic Mapping of Kampala and Jinja Blocks, North of Lake Victoria in Uganda from 10th to 14th February, 1995.

1) JICA Study Team submitted the "Progress Report of the Field Work of the First Year for Topographic Mapping of Kampala and Jinja Blocks, North of Lake Victoria in the Republic of Uganda" (See the attachment) and expressed their appreciation to the Study throughout the field operation. The Ugandan side appreciated the work and was satisfied with the results.

2) JICA Study Team explained that some photos - Run No,9D, 10B, 11 & 12 (corressponding to less than 10% of the whole study area)- had been slightly fogged with outer light during film developing and that these Runs could not be rephotographed for the reason of the unfavourable weather, which followed the incident.
SMD understood the unforeseen affairs and confirmed to accept these photos.

3) JICA Study Team requested to be availed the coordinates of all the existing control points appearing on the existing 1/50,000 maps and Gazetteer. The Ugandan side promised to provide the coordinates and a Gazetteer.

4) The Ugandan side expressed that minor order points (minor than third order) are not necessary to be indicated on the new maps.

5) The Ugandan side requested that some Ugandans from SMD should participate in long-term group training course held by GSI in Japan. The above requirement is in addition to counterpart participation in the activities of the study which are to take place in Japan.

6) The Ugandan side requested that when carring out the levelling exercise during the second year of study, some points should be marked with permanent monuments for future use by SMD especially in areas where vertical control points are non-existent.

7) JICA Study Team explained the tentative schedule of the second year's field work and confirmed undertakings to be prepared by SMD.

LIST OF ATTENDANTS IN THE MEETINGS

(UGANDAN SIDE)

NAME	POSITION
Mr. K.S.B. Mubbala	Commissioner Surveys and Mapping Department
Mr. Kiwanuka D.K.	Ag. Deputy Commissioner Surveys and Mapping Department
Mr. Bwogi Justin	Ag. Assistant Commissioner (Surveys) Surveys and Mapping Department
Mr. Kajumbula M.N.	Senior Staff Surveyor (Mapping) Surveys and Mapping Department
Mr. R. Oput	Ag. Principal Staff Computer Surveys and Mapping Department

(JAPANESE SIDE)

NAME	POSITION
Mr. Hiroyuki Matsuda	Leader JICA Study Team
Mr. Yoshiaki Otoku	Deputy Leader JICA Study Team
Mr. Minoru Ikeda	Mapping Planner JICA Study Team
Mr. Yasuyuki Kuwahata	Chief Surveyor JICA Study Team
Mr. Yutaka Kyakuno	Photo Inspector JICA Study Team
Mr. Shuuji Umehara	Coodinator JICA Study Team

3－3　第２年次現地作業開始時の協議議事録（1995年９月）

MINUTES OF MEETING
ON
THE SECOND YEAR PLAN OF OPERATION
FOR
TOPOGRAPHIC MAPPING OF KAMPALA AND JINJA BLOCKS, NORTH OF LAKE VICTORIA
IN
THE REPUBLIC OF UGANDA

13TH SEPTEMBER, 1995
ENTEBBE-UGANDA

Mr. Dathan Kiwanuka
Commissioner
Surveys and Mapping Department
Ministry of Lands, Housing
and Physical Planning

Mr. Hiroyuki Matsuda
Leader
JICA Study Team

On the basis of the Scope of Work agreed between Surveys and Mapping Department (hereinafter referred to as SMD) and Japan International Cooperation Agency (hereinafter referred to as JICA) on 16th March, 1994, the Japanese Study Team headed by Mr. Hiroyuki Matsuda visited Uganda on 6th September, 1995 to carry out the Second Year Study on Topographic Mapping of Kampala and Jinja Blocks, North of Lake Victoria (hereinafter referred to as the Study area).

Prior to the commencement of the second year study, several meetings were held between 7th and 13th September, 1995 to discuss the plan of operation, and both sides agreed and confirmed the following items.

1. The Second Year Plan of Operation presented by the Study Team was agreed upon by both sides in principle.

2. Administrative boundaries, administrative names and other geographical features names shall be provided by SMD to the Study Team by the end of November, 1995.

3. SMD shall provide the necessary number of counterpart personnel to be involved in field survey.

4. A committee consisting of officials from both sides, shall be formed to discuss a set of map symbols presented by the Study Team. The committee will come out with a set of map symbols that will be used on the maps covering the Study area, before the end of November, 1995.

5. SMD shall secure permission for the Study Team to take out of the country the necessary geodetic data, maps and gazetteer.

6. SMD requested the Study Team to kindly contact JICA Headquarters in Tokyo for the purpose of attaining more counterpart staff training opportunities in Japan (individual training courses) during the period of this mapping project.

LIST OF ATTENDANTS IN THE MEETING

(UGANDAN SIDE)

Name	Position
1. Mr. Dathan Kiwanuka	Commissioner Surveys and Mapping Department
2. Mr. Justin Bwogi	Assistant Commissioner Surveys and Mapping Department
3. Mr. Elijah Mbyetsiza	Ag. Assistant Commissioner Surveys and Mapping Department
4. Mr. Richard Oput	Ag. Principal Staff Computer Surveys and Mapping Department

(JAPANESE SIDE)

Name	Position
1. Mr. Hiroyuki Matsuda	Leader JICA Study Team
2. Mr. Yoshiaki Otoku	Deputy Leader JICA Study Team
3. Mr. Minoru Ikeda	Mapping Planner JICA Study Team
4. Mr. Yutaka Kyakuno	Chief Surveyor JICA Study Team
5. Mr. Shuji Umehara	Coordinator JICA Study Team

PLAN OF OPERATION

FOR TOPOGRAPHIC MAPPING OF KAMPALA AND JINJA BLOCKS

NORTH OF LAKE VICTORIA

IN

THE REPUBLIC OF UGANDA

- The Second Year Work -

SEPTEMBER, 1995

JAPAN INTERNATIONAL COOPERATION AGENCY

CONTENTS

INTRODUCTION

The Government of the Republic of Uganda requested the Technical Cooperation Programme on the Topographic Mapping of Kampala and Jinja Blocks, North of Lake Victoria (hereinafter referred to as the Study) to the Government of Japan in January,1992.

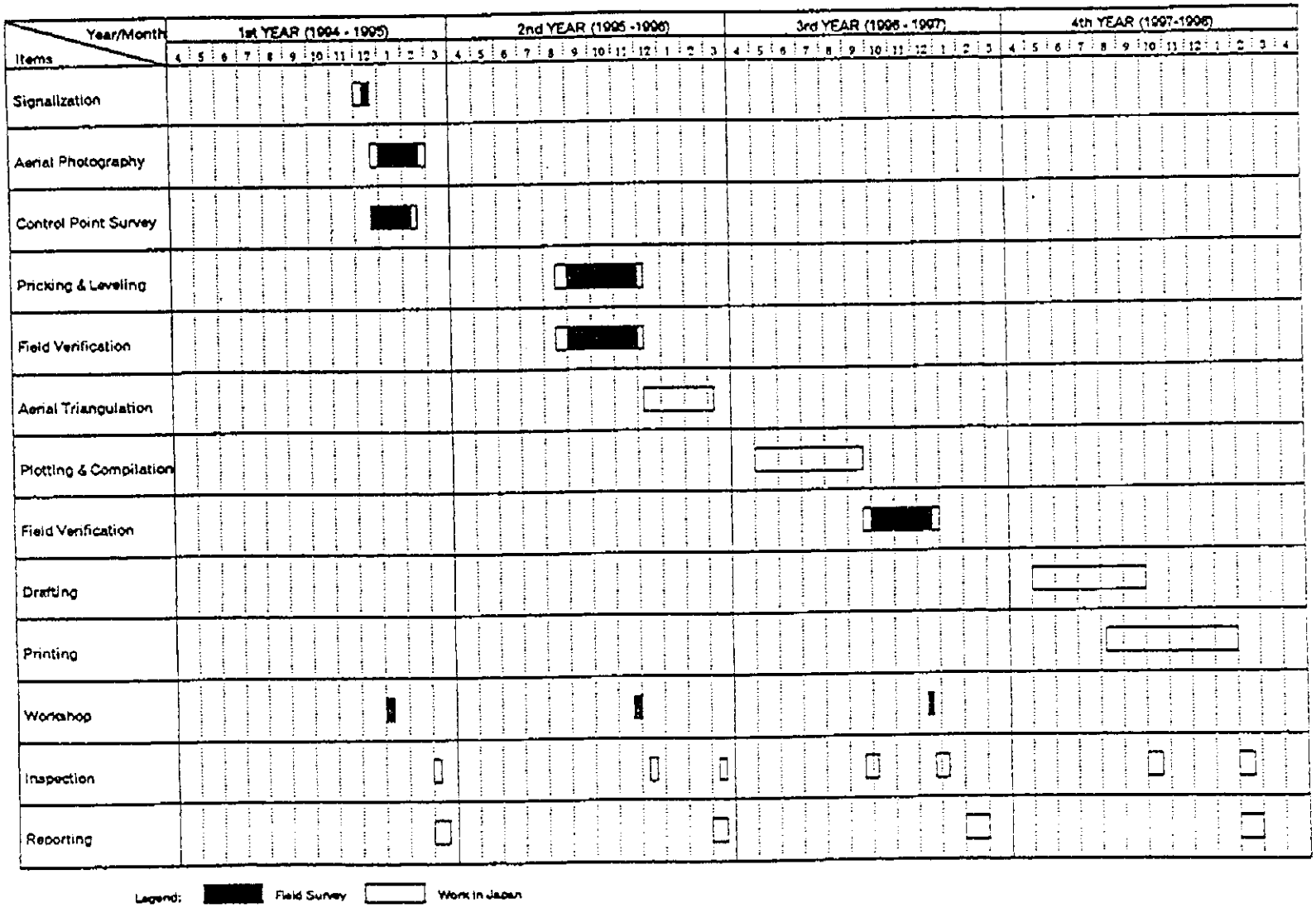
In response to the request, Japan International Cooperation Agency acting as an excuting agency on behalf of the Japanese Government dispatched the Preparatory Study Team to Uganda from 20th February to 23rd March, 1994.
They had a field investigation and technical discussions with Uganda side, and a result, Scope of Work (S/W) was signed on 16th March, 1994.

This Plan of Operation (P/O) prepared in accordance with S/W describes the outline of the Study to be carried out by JICA. The outline consists of the tentative plan of this four year programme and the implementation plan for the second year (from September 1995 through December 1995).

The Study shall be carried out according to this P/O and also to the results of discussion between the the Study Team composed of Infrastructure Development Institute - Japan and Pasco International Inc., and Surveys and Mapping Department, Ministry of Land, Housing and Urban Development (hereinafter referred to as SMD).

Table 1.

TENTATIVE WORKING SCHEDULE



1. WORK PLAN

The overall work plan covering the entire project period from the first to the fourth year is shown in Table 1.

2. OUTLINE OF THE FIRST YEAR WORK

2-1. Impremetation of the First Year Work

The First Year Work was carried out for the period of December 1994 to February 1995 by a team of 14 Japanese surveyors sent out in the field in cooperation with five counterparts from SMD in accordance with the plan as shown in Table 2. It was successfully concluded on schedule.

2-2. Plans and Results

The results of the First Year Work in terms of respective work phases are given below in Table 2.

Table 2

Work Process	Planned	Actual	Remarks
Aerial Signalization	4 points	5 points	
Aerial Photography	19 runs 29,000 km² 750 pcs	21 runs 29,000 km² 866 pcs	photo-scale: 1/60,000
New Control Point	56 points	57 points	GPS

Aerial photography as above was conducted by Kenya-based PHOTOMAP on contract.

3. WORK PLAN FOR THE SECOND YEAR WORK

3-1. Required Works

Work items and work volumes required under the Second Year Work Plan are shown in Table 3 below.

Table 3

Work Process	Contents	Volume	Remarks
1. Pricking	GPS points	57 points	photo: 1/15,000
2. B.M. Pricking	Existing routes	950 km	photo: 1/30,000
3. Levelling	Minor order	272 km	new route
4. Field Verification	40 sheets	28,000 km^2	photo: 1/30,000
5. Aerial Triangulation	Indoor work	720 models	in Japan

3-2. Planning and Preparation

The work flow for the second year work is schematically shown in Figure 1.
In preparation for the entry in the field, the survey team will study data on field verification, levelling, symbols and their application, etc. and prepare detailed work steps the field work. Reconnaissance for field verification will be made on the 2-time enlarged photographs viewed sterescopically along with map data gathered in the first year to determine major items to be represented, examined and clarified.

3-3. Field Survey

At the start of field survey, the work contents, methods and team organization will be explained to SMD and map symbols and their applications will be discussed with SMD based on the attached MAP SYMBOL SPECIFICATIONS to reach agreement in this respect between the two sides.

3-3-1. Pricking of GPS points

The 57 control points surveyed in the frirst year will be identified at their precise locations on site and pricked on the 4-time enlarged photographs within 0.2mm of an

Figure 1. FLOW OF SECOND YEAR'S WORK

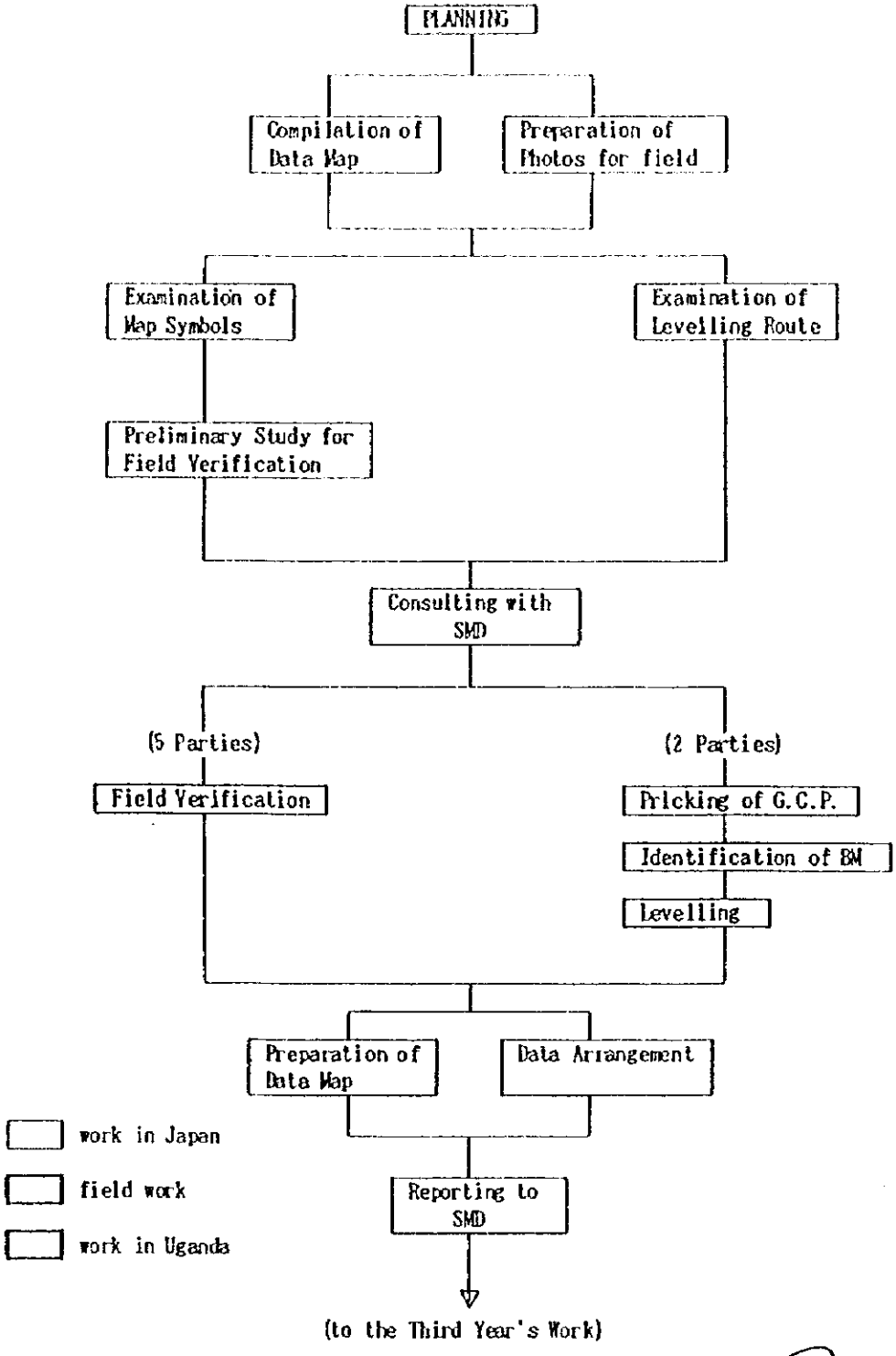
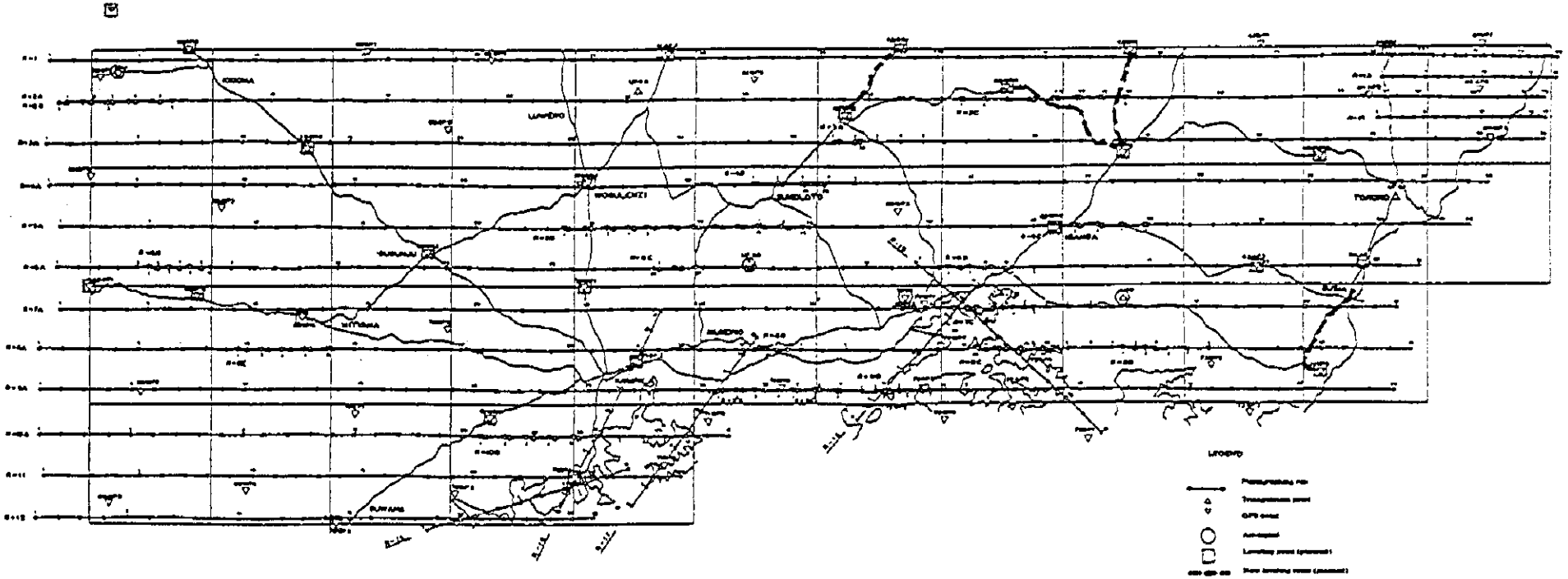


Figure 2. Kampala and Jinja Blocks, North of Lake Victoria
Aerial Photos and Control Points

Photo Scale: 1/60,000

Photographing: Jan. 1995



allowable error, in order to make them serve as control points for aerial triangulation. At the same time, eccentric points for aerial triangulation will be selected within the 30m radius of a control point at locations clearly identifiable on the photo and surveyed for azimuth in relation to the control point by simplified solar obsevation and then pricked for computation of their coodinates.

3-3-2. Pricking of existing bench marks

Existing bench marks are supposed to be located approximately 1 mile apart along the existing levelling routes and some of those existing bench marks will be used for height control in aerial triangulation. Existing bench mark will be identified on site for every 5km if possible and pricked accurately on 2-time enlarged photos. The levelling routes in the survey area amount to about 950km in total.

3-3-3. Minor order levelling

Besides the existing levelling routes, additional routes as shown in Planning Map (Figure 2) will be surveyed by minor order levelling as supplementary height control. Minor order levelling will be conducted starting from an existing bench mark to close at another existing bench mark with two-way observation returning to the starting point. Closure errors should be less thsan $5cm\sqrt{S}$ (Skm: total length of observation route).

Since the shorelines of Lake Victoria are made to serve as reference heights, water levels as recorded at the time photography will be surveyed by direct levelling.

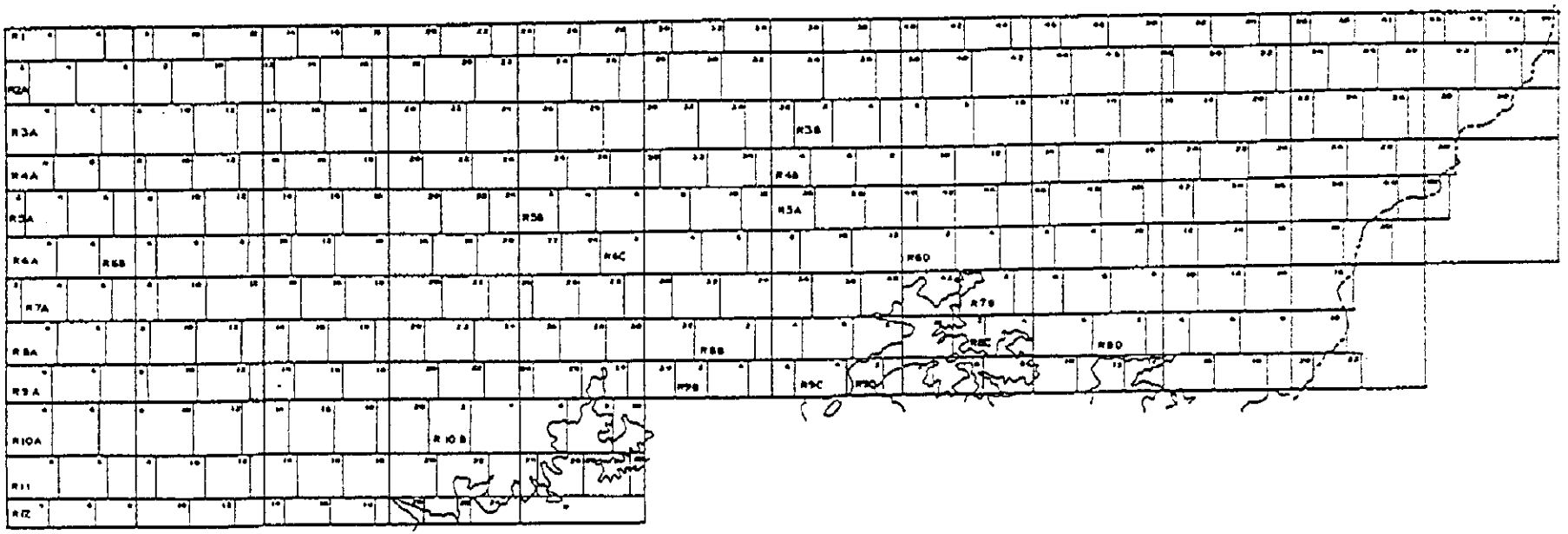
3-3-4. Field verification

Features to be represented on the maps and geographical names, etc. will be surveyed in the field according to the applilication rules of map symbols and findings will be recorded in the aerialphotographs. With respect to vegetation, keys for interpretation will be determined for application in detail plotting of vegetation of inaccessible areas.

The East Africa Map Symbol Specificartions (Riviced) made by the British will be applied basically as the standard symbols but since the original color prints of the Map Symbols are not available even at the Ugandan Surveys and Mapping Department, the survey team has re-edited the symbols (attachment) which then will be applied. The survey will be conducted of the following items based on the map symbols.

1) Confirmation of geographical names and objects as listed out in preliminary survey and field verification of vegetation as photo interpreted.

Figure 3. Kampala and Jinja Blocks, North of Lake Victoria
Field Verification Photo Index



2) Roads, railways, public buildings, rivers, bridges, fords, wells, etc.

3) Existing control points.

4) Vegetation and terrain features.

5) Collection of geographical names and field verification.

Surveys of administrative boudaries, administrative names, village names will be performed by SMD. Surveys of place names and village names will be based on old maps, reference materials at local administration offices and interview with local residents.

The results of the field verification will be entered with red and blue ink into 2-time enlarged even numbered aerial photographs with neat lines and connecting lines with adjoining sheets as shown in Figure 3. File photos covering the field verification results will be used as reference for plotting and compilation and therefore care will be taken to avoid any omissions or errors. Notations will be made also on blue prints of the old maps.

3-4. Aerial Triangulation

Aerial triangulation will be performed in Japan based on the results of aerial signalization, pricked control points, bench marks, water levels at the time of photography.

3-4-1. Methodology

Aerial triangulation will be performed on diapositives of the aerial photographs. By using a stereo comparater, pass points, tie points, ground control points are measured for coordinates, and by block adjustment computations based on independent models, analytical aerial triangulation is excuted to obtain orientation elements as well as ground coodinates of the pass points and tie points. In block adjustment computations, the entire study area is treated as one block except for the small island portion in the south central part.

3-4-2. Contents of work

The work of aerial triangulation involves:

a. Photo-scale : applox. 1/60,000

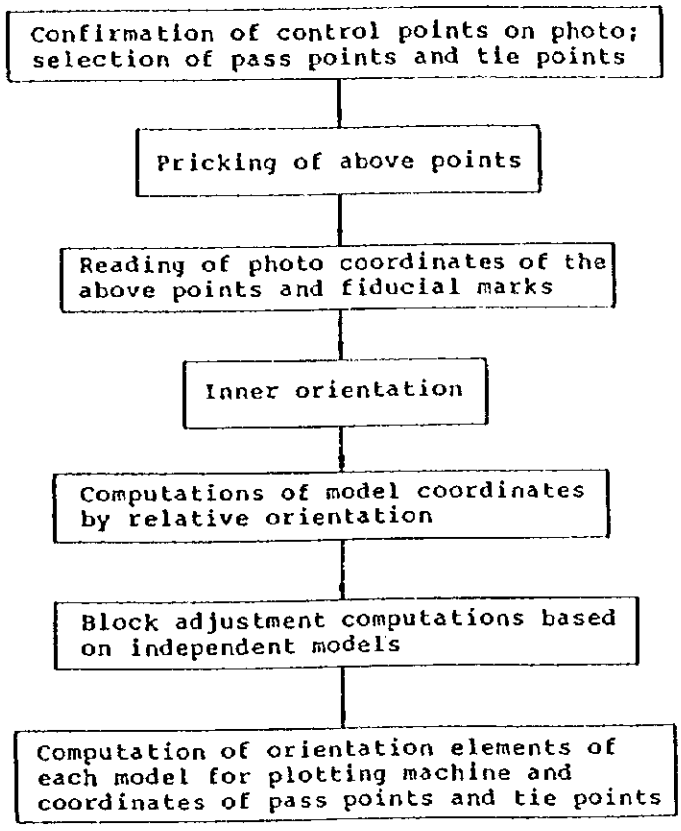
b. Number of runs : 19 runs

c. Number of models : 720 models

d. Controlpoints : Holizontal - 62 / Vertical - 27GPS, 100BM, Water levels

3-4-3. Work procedure

Aerial triangulation shall be performed in the following procedure.



4. UNDERTAKING OF SMD

To facilitate the smooth conduct of the Study, SMD shall take the following arrangements for the Study team in cooperation with other relevant organizations;

1) To help in recruting necessary number of laborers in the project sites,

2) To secure permission for the Study team to take out all necessary data and documents.

And , SMD shall , at its own expense, provide the Study team with the following;

1) Suitable office space with necessary equipment, e.g. furniture, telephone, garages and storages in Entebbe,

2) Required number of counterpart personnel,

3) Credential or identification cards for the Study team members,

4) Geodetic and levelling data necessary for the ground control survey, pricking and aerial triangulation,

5) Information of administrative boundaries and geographical names, at its full r esponsibility,

6) Available data and information such as existing maps, roads, public facilities and others,

7) Annotation materials in English.

5. UNDERTAKING OF THE STUDY TEAM

Undertakings of the Study team are as follows;

1) To carry out Levelling, Pricking, and Field identification in Uganda,

2) To carry out Aerial trianguration in Japan,

3) To pursue technology transfer to the SMD counterpart personnel in the course of the Study.

6. WORKING GROUP AND THEIR ASSIGNMENT

The members of the Study team and their assignments for the second year are as follows;

Name	Assignment	Duration	Contents
1.Hiroyuki MATSUDA	Leader	3, Sep.~ 21, Sep. 13, Nov.~ 1, Dec.	1)Total management 2)General discussion
2.Yoshiaki OHTOKU	Deputy leader	3, Sep.~ 1, Dec.	1)Sub management 2)General discussion 3)Assist. of leader 4)Total coordination
3.Minoru IKEDA	Mapping planner	3, Sep.~ 1, Dec.	1)Map planning 2)Total coordination 3)Reporting
4.Yutaka KYAKUNO	Chief surveyor	3, Sep.~ 1, Dec.	1)Planning 2)Supervision 3)Coodination 4)Quality control
5.Toshiaki KANADA	Surveyor	5, Sep.~ 1, Dec.	1)Field identification
6.Minoru TANIMOTO	Surveyor		2)Levelling
7.Atsushi MOCHIZUKI	Surveyor		3)Pricking
8.Sadao MATSUMOTO	Surveyor		
9.Kiyotaka KIMURA	Surveyor		
10.Hideki YAMAZAKI	Surveyor		
11.Kouji FURUTA	Surveyor		
12.Manabu KAWAGUCHI	Surveyor		
13.Tetsuya HOSHI	Assist. Surveyor		
14.Tamotsu INAMURA	Assist. Surveyor		
15.Hiroyuki ISHIHARA	Assist. Surveyor		
16.Shuji UMEHARA	Coordinater	3, Sep.~ 17, Sep. 17, Nov.~ 1,Dec.	1)Arrangement of meeting and etc.

6-1. Organization of Survey Team

The field survey team is organized in 7 groupes ; 2 for pricking and levelling and 5 for field survey in the line with the flow of work as shown in Figure 1. A total of 9 vehicles are rented for use by these groupes including one for the chief engineer. Two vehicles are assigned exclusively to the group which surveys the Kampala area separately from other groups since they have to cover large volumes of survey items and notations. A total of 8 SMD counterparts, one for each group and the chief engineer, join the groups in their respective activities.

5. FIELD PLAN

A base for all field activities is set up in Entebbe. Individual groups for field verification, pricking, levelling etc. will work out of local hotels in Entebbe, Jinja and the suburbs of Kampala to facilitate access to the work site and exept to move one place (hotel) to next in a cycle of about two or three weeks.

3－4　第２年次現地作業終了時の協議議事録（1995年11月）

MINUTES OF MEETINGS
AT
THE END OF THE SECOND YEAR'S FIELD WORK
FOR
TOPOGRAPHIC MAPPING OF KAMPALA AND JINJA BLOCKS
NORTH OF LAKE VICTORIA
IN
THE REPUBLIC OF UGANDA

27th NOVEMBER, 1995
ENTEBBE, UGANDA

Mr. Dathan Kiwanuka
Commissioner
Surveys and Mapping Department
Ministry of Land, Housing
and Physical Planning

Mr.Hiroyuki MATSUDA
Leader of Study Team
Japan International
Cooperation Agency

The Surveys and Mapping Department (hereinafter referred to as "SMD") and JICA Study Team had a series of meetings at the end of the field work of the Second year for Topographic Mapping of Kampala and Jinja Blocks, North of Lake Victoria in Uganda from 22nd through 24th November 1995.

JICA Study Team submitted the " Progress Report of the Field work of the Second year for Topographic Mapping of Kampala and Jinja Blocks, North of Lake Victoria in the Republic of Uganda" (See the attachment - A)

The following items have been confirmed and agreed upon ;

1) SMD agreed the " Progress Report " of the work explained by JICA Study Team.
2) The JICA Study Team explained that it could not get all the river names in the recent exercise, due to limited time and the large number of rivers in the study area. It was also of the view that some rivers should be omitted on the new maps. SMD however were against the idea and both sides agreed that the matter should be revisited during field completion.
3) Map & Symbol specifications presented by the committee composed of officials from SMD and JICA Study Team were agreed upon as the ones that shall be used on the new maps. (Attachment - B)
4) SMD presented to the JICA Study Team data of the Administrative boundaries plotted on 1/50,000 blue prints. Seven sheets had unresolved problems that needed field verification. It was agreed that this problem shall be solved during the next phase.
5) On the sheets that cover part of Uganda and part of Kenya, the JICA Study Team explained that because of other circumstances it could not map the Kenyan side. SMD understood the problem and it was agreed that the part covering Kenyan territory on these sheets, should be left blank.
6) SMD requested the JICA Study Team to provide more counterpart training for both group and project training in Japan. The JICA Study Team accepted to convey the request to JICA.

LIST OF ATTENDANTS OF THE MEETING

(Uganda side)

1	Mr.D.K. KIWANUKA	Commissioner (S&M)
2	Mr.J.L.BWOGI	Assist.Commissioner
3	Mr.E.K.MBYETSIZA	Ag.A/C
4	Mr.E.K.HAWONDO	Map Production Officer
5	Mr.J.R.OPUT	Ag.Principal Staff Computer
6	Mr.J.M.OGUTTU	Ag.Senior Cartographer
7	Mr.M.N.KAJUMBULA	Principal Staff Surveyor

(Japanese side)

1	Mr.Hiroyuki MATSUDA	Leader
2	Mr.Yoshiaki OHTOKU	Deputy Leader
3	Mr.Minoru IKEDA	Mapping Planner
4	Mr.Yutaka KYAKUNO	Chief Surveyor
5	Mr.Shuji UMEHARA	Coordinator
6	Mr.Mitsuo KEZUKA	Chief Advisor
7	Mr.Yuji IKEDA	Advisor

Attachment B

MINUTES OF CONSULTATION FOR MAP SYMBOL SPECIFICATIONS ON THE TOPOGRAPHIC MAPPING OF KAMPALA AND JINJA BLOCKS, NORTH OF LAKE VICTORIA

October, 1995

On the basis of the Minutes of Meeting on the Second Year Plan of Operation, a committee consisting of both sides, Ugandan and Japanese, discussed 1/50,000 Scale Map Symbol Specifications for the captioned topographic mapping.
Meeting was held on 28th through 29th September 1995 in the Japanese Study Team Office Room of Surveys and Mapping Division. The following persons were present at the meeting as committee members.

- Ugandan side -	
Mr. Hawondo J.	Map Production Officer Surveys and Mapping Division
Mr. Oguttu J. M.	Head of Topo-Mapping Section Surveys and Mapping Division
- Japanese side -	
Mr. Yoshiaki Otoku	Deputy Leader JICA Study Team
Mr. Minoru Ikeda	Map Planner JICA Study Team

Prior to the discussion, the prints of the Map Symbol Specifications (Attachment) based on the East Africa 1/50,000 Map Specifications, compiled by JICA Study Team were submitted to the committee. The following items on each page of these prints were affirmed and agreed uopn by both sides.

- on page 1 -

1. Classification of Item No.2 and No.3 related to the road symbols shall be done by SMD counterparts on site.
   Dry weather road of Item No.3 contains not only double lane width road but also single lane width road.
2. Approximate alignment road of Item No.4 is not applied, then delete this Item.

- on page 2 -

3. Item No.10 shall not be diced line but solid line.
4. As to Item No.14, station name shall be annotated. Space between the railway is not necessary.
5. Tunnel of Item No.15 shall be annotated as "Tunnel" with U/L letters.
6. The symbol of Item No.17 shall be divided two symbols.

1

- on page 3 -

7. Km stone of Item No.22 shall be expressed every 5km on the maps originating from bigger city to another city. The unfound on the site shall not be indicated.
8. Power line of Item No.27 shall be represented only along main route include the lines connecting main cities. Direction of the symbol shall be signed always to north, but as for the lines running at north side of east-west road, these expressions are pending.

- on page 4 -

9. Item No.28 shall be deleted.
10. Built-up areas of Item No.1 shall be changed to 40% black screen so as to be able to express public buildings and symbols inside. The shade is the same as specifications of villages.
11. Villages of Item No.2 shall be the same as built-up areas.
12. The shape of upper portion of mosque symbol (Item No.5) shall be U.
13. The real location of Item No.6 shall be the center of cross. Where church and school are in the same compound, a component symbol for both school and church " " and annotated accordingly by "Sch Ch".
14. Item No.7 shall include high school. Other schools such as technical, collage, university ect. shall be annotated.

- on page 5 -

15. Item No.8 shall be changed to District Head Quarter. The abbreviation shall be "DHQ".
16. Item No.9 shall be replaced with County Head Quarter. The abbreviation shall be "CHQ".
17. Item No.10 shall be changed to Sub-county Head Quarter. The abbreviation shall be "SCHQ".
18. Item No.11 shall be deleted.
19. Item No.15 shall mean a site for storing materials, machines and vehicles for road construction beside the road.

- on page 6 -

20. Telephone of Item No.20 shall be public telephone facilities in the country.
21. Item No.21 shall be deleted.
22. Item No.22 shall be trading centre that contains provisional stores in the village. The abbreviation shall be"TC".
23. Item No.23 shall be annotated as "Cotton Store" instead of "CBP". "Coffee Store" shall be annotated also.
24. Item No.24 shall be deleted.
25. Uganda Electricity Board with its abbreviation of "UEB" shall be annotated as Item No.24.

- on page 7 & 8 -

26. Item No.4 shall be deleted.
27. Item No.5 shall be annotated as Stadium or Racing Track.
28. Antiquity (Item No.8) shall be annotated with Old English type.
29. Item No.9 & 13 shall be deleted.
30. Symbol (Item No.12) shall be used as Leading Light beside lake.
31. Symbol of Mining (Mineral Workshop) shall be added as Item No.13.

- on page 9 -
32. Item No.2 shall be deleted.
33. Division shall be deleted in Item No.4.
34. Location shall be deleted in Item No.5.

- on page 10 & 11 -
35. GPS control points shall be treated as secondary order. The series points number shall be given by SMD.
36. Outcrop rock of Item No.3 is so complicated in original shape that it is difficult to scribe manually. This symbol shall be simplified keeping original shape.
    As for this matter, the discussion shall be pending until next phase meeting to be attended by a Japanese scribe technician.
37. Item No.5 shall be deleted.
38. The symbol of Item No.7 is different from original shape, then adjustment shall be done.

- on page 13 through 15 -
39. Item No.3 & No.4 shall be annotated as "Lake," Item No.5 "Pond".
40. Item No.6 shall be deleted.
41. Instead of annotation of "Dam" as in No.14 & No.15, "Dam" in Item No13 shall be deleted.
42. In Item No.16, "BH" means a well dug by boring machine and "W" means a well dug by man power. "WH" means a pool by running flow.
43. No.17 shall be annotated as "Tank" with symbol.
44. Symbol for Oil Tank shall be added as black circle line with "Oil" annotation.
45. Item No.20 shall be deleted.

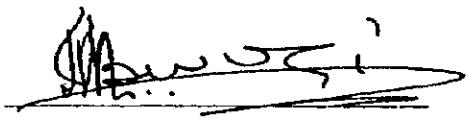
- on page 16 through 18 -
46. As for Item No.1 to 3, the minimum size to be expressed shall be 400m x 400m.
47. Item No.7 shall not be adopted.
48. Annotation specifications for Item No.11 shall be changed to Universal Light letterings.
49. Item No.12 shall be deleted.
50. Symbol of Item No.17 shall be adjusted more realistically to East Africa Map Specifications.

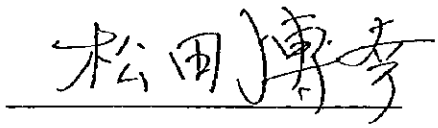
Concerning the lettering specifications to be used on maps, the samples that are applied in Japan shall be proposed at the next phase meeting for approval by SMD.

3－5　第3年次現地作業開始時の協議議事録（1996年10月）

MINUTES OF MEETING
ON
THE THIRD YEAR PLAN OF OPERATION
FOR
TOPOGRAPHIC MAPPING OF KAMPALA AND JINJA BLOCKS
NORTH OF LAKE VICTORIA
IN
THE REPUBLIC OF UGANDA

OCTOBER, 1996
ENTEBBE, UGANDA





Mr. Justin L. BWOGI
Ag. Commissioner
Surveys and Mapping Department
Ministry of Land, Housing
and Physical Planning

Mr. Hiroyuki MATSUDA
Leader of Study Team
Japan International
Cooperation Agency

On the basis of the Scope of Work agreed between SMD and JICA on 16TH March, 1994, the Japanese Study Team organized by JICA and headed by Mr. Hiroyuki Matsuda visited the Republic of UGANDA from 30TH September to 24TH December 1996 to carry out the field stage of the third year study on the topographic mapping of Kampala and Jinja blocks North of Lake Victoria.

At the beginning of the field stage of the third year's work (field completion of 40 map sheets), meetings were held on 2nd October 1996 at Entebbe, to discuss the following :-

(a) Final Report of the Second Year's Work
(b) Plan of Operation of the Third Year's Work

The following items have been confirmed and agreed between SMD and the JICA Study team :-

1. SMD has accepted the results of the field and office work of the second year (Final Report of the Second Year's Work), appreciating the high standard of accuracy achieved in the control point survey and aerial triangulation.

2. Compilation manuscript copies and sheet annotation list were submitted to SMD on which to indicate the Administrative Boundaries and Forest Reserves.
SMD shall check and endorse all field completion sheets and annotation list before the maps are taken to Japan by the JICA Study Team.

3. The JICA Study Team presented four samples of test printing sheets in five colors to be studied by SMD. SMD was requested to give its decision on the color combination, final marginal information and sheet cutting size to JICA Study Team during the next series of meetings.

4. SMD is requesting the JICA Study Team to convey to JICA Headquarters the possibility of making available two positions for counterpart staff training during the final year 1997. It is intended to utilize one position for the Head of Printing Section and the other position for the Map Production Officer.

1

LIST OF ATTENDANTS OF THE MEETIG

(Ugandan side)

1.	Mr. J. L. BWOGI	Ag. Commissioner
2.	Mr. E. K. MBYETSIZA	Ag. Assist. Commissioner
3.	Mr. M. N. KAJUMBULA	Principal Staff Surveyor
4.	Mr. J. R. OPUT	Ag. Principal Staff Computer
5.	Mr. J. HAWONDO	Map Production Officer
6.	Mr. M. KIBIRIGE	Head, Topo Section

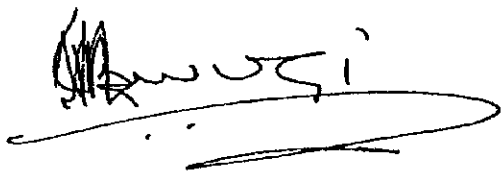
(Japanese side)

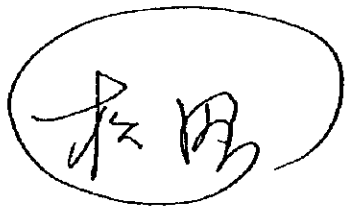
1.	Mr.Hiroyuki MATSUDA	Leader
2.	Mr.Yoshiaki OHTOKU	Deputy Leader
3.	Mr.Minoru IKEDA	Mapping Planner
4.	Mr.Yutaka KYAKUNO	Chief Surveyor
5.	Mr.Shuji UMEHARA	Coordinator

PLAN OF OPERATIONS
FOR TOPOGRAPHIC MAPPING OF KAMPALA AND JINJA BLOCKS
NORTH OF LAKE VICTORIA
IN
THE REPUBLIC OF UGANDA

- The Third Year Work -

OCTORBER 1996

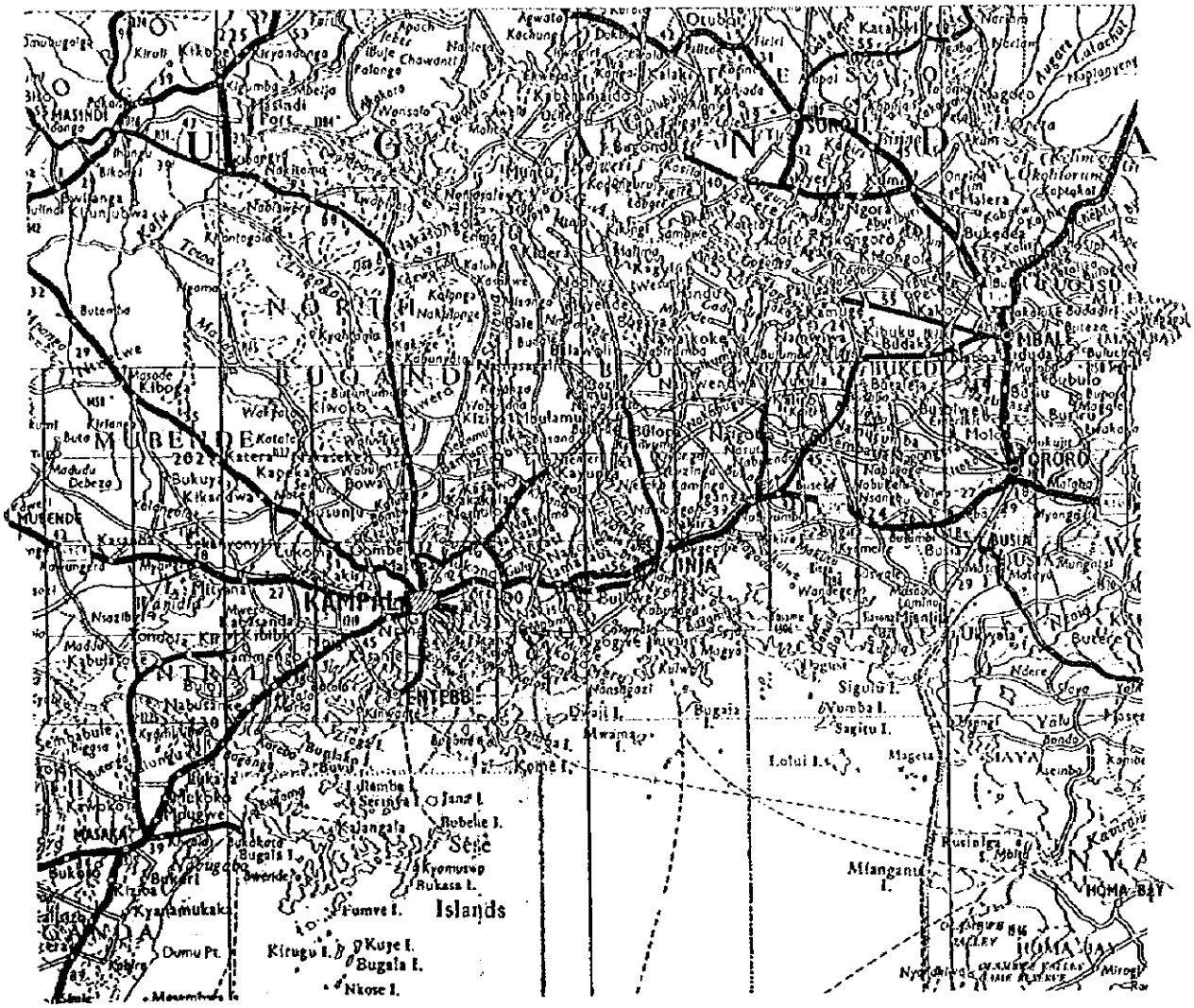




JAPAN INTERNATIONAL COOPERATION AGENCY

ウガンダ共和国
ヴィクトリア湖北部地形図作成
調査対象地域

THE TOPOGRAPHIC MAPPING OF KAMPALA AND JINJA BLOCKS, NORTH OF LAKE VICTORIA IN THE REPUBLIC OF UGANDA



SCALE 1:2 000 000

Kilometres 20 10 5 0 20 40 60 80 100 120 140 160 Kilometres

地形図作成地域
Mapping Zone

- Trunk Roads
- Local Main Roads
- Secondary Roads
- Tracks & Minor Roads
- Distances in Kilometres
- Trunk Road Numbers
- Other Road Numbers
- Vehicular Ferries
- Lake Steamer Routes
- Railways with Stations
- Lodge
- Licensed Aerodromes
- Licensed Landing Grounds
- International Boundaries
- Provincial Boundaries
- District Boundaries
- Rivers (permanent)
- Rivers (seasonal)
- Intermittent or Dried up Lakes
- Swamps
- Springs, Wells
- National Parks
- National Reserves
- Heights in Metres
- TONGWE Tribal or Area Names

CONTENTS

The Government of the Republic of Uganda requested the Technical Cooperation Program on the Topographic Mapping for preparation of social infrastructures related to urban and district developments and for preservation of national lands of Kampala and Jinja Blocks, North of Lake Victoria to the Government of Japan in January 1992. In response to the request, JICA on behalf of the Japanese Government started this Study as a four- year plan from the end of 1994. Then the third year work started in 1996.

1. WORK TO BE CARRIED OUT IN THE THIRD YEAR

1-1. Volume of the Work

The work volume in this phase is as follows;

a.	Stereo Plotting & Map Compilation	Scale 1/50,000 (28,000 km^2)	40 sheets
b.	Field Completion	field work	28,000 km^2
c.	Test Printing	5 colors	1 sheet

1-2. Work Schedule

The work schedule is shown in Table 1 with the field completion to be executed from the first of this October.

2. PLAN OF OPERATIONS FOR THE THIRD YEAR WORK

The Study for the third year consists of stereo plotting, map compilation, field completion and test printing.

2-1. Stereo Plotting

(1) Preparation

1) Plotting sheets shall be polyester with a thickness over 0.12mm and its ratio of differential change in dimension between longitudinal and lateral less than 0.05% in normal temperature and humidity.
2) The plotting scale shall be 1/50,000 with the neat lines of 15' X 15' each in latitude and longitude as the final map scale.
3) Grid lines, neat lines, all control points and each photo's principal points are plotted before plotting based on UTM projection (Clark 1880) by analytical coordinator.

(2) Orientation

1) Relative & absolute orientation is carried out using 6 pass-points from the results of aerial triangulation.
2) Control points including vertical control, if any, are used for checking of absolute orientation.
3) Residual parallax of relative orientation shall not exceed 0.02mm on the dia-positive.
4) Scaling errors of model orientation shall be less than 0.3mm on the map.
5) Leveling errors of model orientation shall be less than 1/4 of the contour intervals.

(3) Stereo Restitution

Digital plotter DSR-14(Kern), BC-1(Wild), SD3000(Leica) and analog plotter A-10(Wild), Metrograph(Zeiss) etc. are used as stereo-plotter.

Restitution shall be executed in accordance with the map symbols and its application rule.

Plotting of geographic details shall be restricted to inside a limit obtained by connecting pass-points, and plotting shall carried out as follows;

1) Plotting errors due to height measurement errors shall not occur.
2) Topographic features for which distorted surface area symbols are not prepared be expressed by contour lines as much as possible.

3) The results of field verification shall be referred to stereo-plotting. For the area not verified in the field, plotting shall be carried out by deduction from photo-interpretation of the surrounding areas.

4) Spot height shall be measured at following points distributed as uniformly as possible on the maps.

   a. Main tops of hills or mountains
   b. Main intersections of roads
   c. Mouth of valley, junction of rivers, river-bed, etc.
   d. Main changes of slopes
   e. Centers of local plains
   f. The lowest parts of depressions

Independent measurements shall be carried out twice and the mean values shall be adopted.

(4) Matching of Existing Maps

1) Continuity shall be established with the sheets adjacent to the surrounding areas when the discrepancy is less than 1.0mm.

2) Vegetation, etc. which have been changed awfully during several decades shall not match with the adjacent existing maps

2-2. Compilation

Editing sheets for map compilation shall be prepared in the same manner as for plotting sheets coordinating control points, grid lines and neat lines.

On the basis of the plotting manuscript, map compilation shall be executed with pencils in accordance with the specifications pre-agreed between the Study Team and SMD, which is attached hereinafter, and also with the field data of annotation, etc.

In this compilation, following overlays and data sheets shall be prepared separately for checking and successive scribing work.

- Control and spot height points
- Road classifications
- Vegetation
- Annotations
- Marginal information data

2-3. Field Completion

Field completion shall be carried out from the first of October through the end of

December 1996 on items unidentified in the stage of restitution and compilation.
In this stage, SMD shall be requested to authenticate the administrative and geographical names as well as the administrative boundaries and other specified boundaries.
Field completion shall be carried out with the compiled manuscript sheet copied on polyester materials and blue copies of the manuscript, and with other data.

1) Annotation and symbols laid down on the manuscripts on the basis of field verification data, shall be confirmed.
2) Doubtful points in plotting and compilation shall be checked.
3) Administrative boundaries and the other boundaries shall be revised on the copied manuscripts using the data collected by SMD.

All final data of field completion shall be checked and certified by SMD. Then, a responsible person of SMD shall be required to sign on every sheet completed by field completion Team.

2-4. Accuracy Control

An accuracy control table shall be substituted by orientation records and other completed Japanese checking form.

2-5. Preparation of Samples of Printed Sheets

As this is the last time for us to meet and discuss the matters concerning the scribing and printing with SMD, sample sheet printed in 5 colors shall be prepared.,
The Study Team shall discuss with SMD on the basis of printed sample maps, and shall have the final results certified by Ugandan side.

3. ORGANIZATION OF STUDY TEAM FOR THE FIELD WORK

The organization of the Team is as follows;

Duty	Number of Personnel
Leader	1
Deputy leader	1
Mapping planner	1
Chief surveyor	1
Surveyor	6
Counterpart (from SMD)	6
Vehicle	6

Individual names of assigned team members are as follows

Responsibility	Name	From	To
Leader	Hiroyuki MATSUDA	Sep.28,'96	Oct.15,'96
		Dec.12,'96	Dec.26,'96
Deputy leader	Yoshiaki OTOKU	Sep.28,'96	Dec.26,'96
Mapping planner	Minoru IKEDA	Sep.28,'96	Dec.26,'96
Chief surveyor	Yutaka KYAKUNO	Sep.28,'96	Dec.26,'96
Surveyor	Minoru TANIMOTO	Oct.01,'96	Dec.24,'96
Surveyor	Toshiaki KANADA	Oct.01,'96	Dec.24,'96
Surveyor	Kiyotaka KIMURA	Oct.01,'96	Dec.24,'96
Surveyor	Sadao MATSUMOTO	Oct.01,'96	Dec.24,'96
Assist. Surveyor	Takashi SHIMONO	Oct.01,'96	Dec.24,'96
Assist. Surveyor	Tetsuya HOSHI	Oct.01,'96	Dec.24,'96
Coordinator	Shuuji UMEHARA	Sep.28,'96	Oct.18,'96
		Dec.12,'96	Dec.26,'96

4. PLAN OF OPERATIONS FOR THE FINAL YEAR, 1997

The Study for the final year involves drafting(scribing) and map printing with five-color separation.

4-1. Drafting (Scribing)

Using the original manuscript, road classification data, annotation sheets, etc., final drafting shall be carried out by the color separation negative scribing method to make printing plate for printing easy.

Negative scribed sheet, negative mask sheets and positive sheets for annotation and marginal information shall be prepared. The procedure for drafting is shown in an annexed figure.

(1) Map Symbols

Map symbols shall be finally applied according to the specifications determined after discussion with SMD at the time of field completion.

(2) Scribing

Kimoto's scribing base and stable synthesized polyester sheets shall be used for all cartographic works.

Scribing shall be carried out as follows;

1) Scribing lines shall not be shifted more than 0.1mm relative to symbols lines drawn on scribing sheets.
2) A map manuscript is a set of color separated sheets including masks and annotation sheets.
3) Scribing sheets are prepared according to the following;
   a. Scribing is carried out on the basis of punching system.
   b. When the length of the sheet line drawn on the scribing sheet is more than 0.2mm compared with the original manuscript, the later shall be printed again on the scribing sheet.
4) Care shall be taken for connection of each sheet with adjacent ones.

4-2. Composite Negative & Positive

Scribing sheets, mask sheets and annotation sheets shall be composed into one negative film so that one color may be included on one sheet for the sake of plate making and printing.

Composite positive shall be prepared composing mainly linear elements to help map

maintenance.

4-3. Printing

Printing shall be carried out by off-set printing machine in 5 color.

Figure-1 **FLOW OF THIRD YEAR'S WORK**

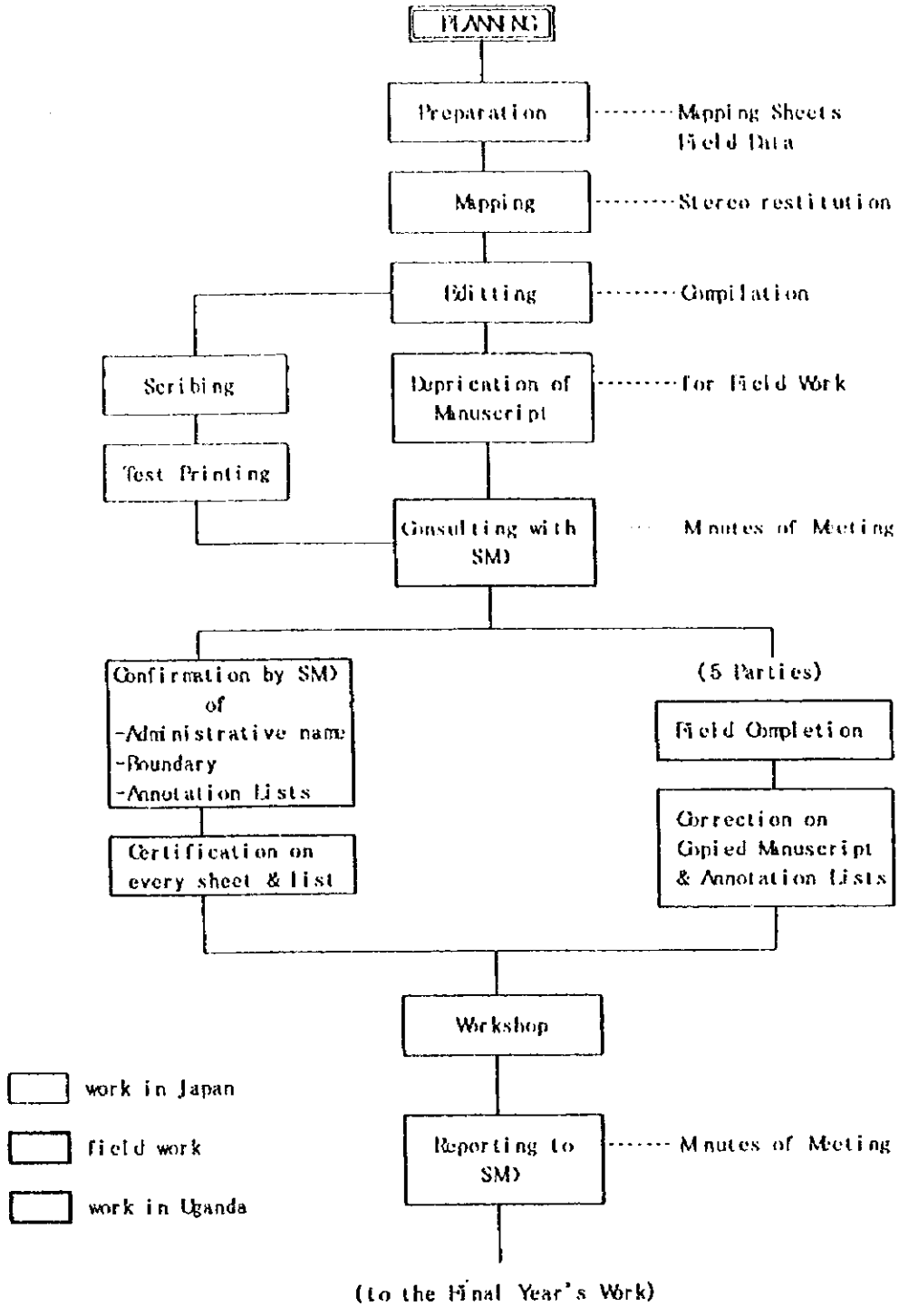


Figure-2 TENTATIVE WHOLE WORK SCHEDULE

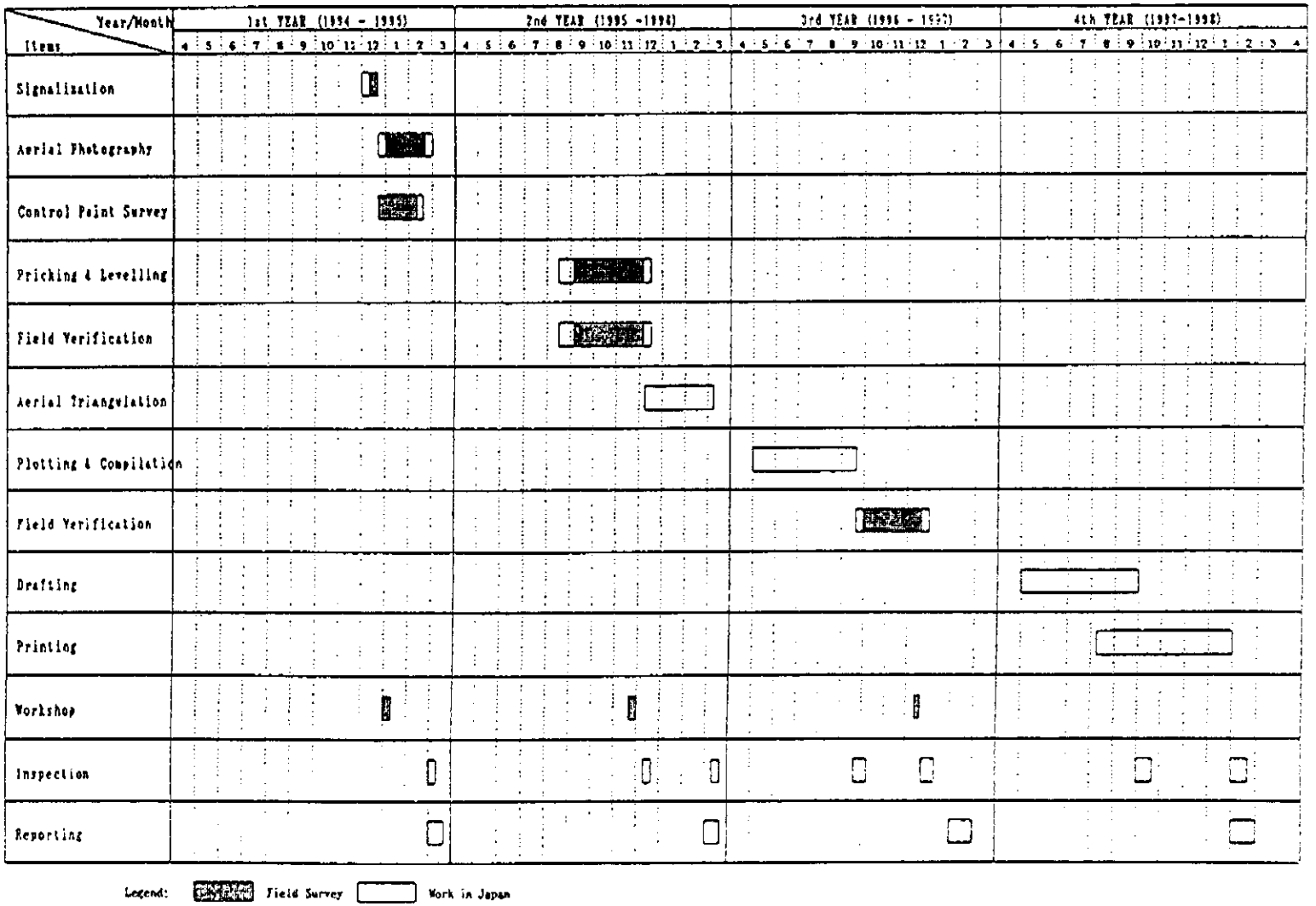


Figure-3 NEW TOPOGRAPHIC MAPPING SHEETS

48-4 NYARWEYO	49-3 BUTEMBA	49-4 KYANKWANZI	50-3 NGOMA	50-4 KAKOGE	51-3 KABUNYATA	51-4 BALE	52-3 BOLAFOLI	52-4 NAYAFKOKE	53-3 PALLISA	53-4 KAMUGE	54-3 MBALE	54-1 BUDADIRI	55-3 ELGON
58-2 KAKUMIRO	59-1 NTWETWE	59-2 KIBOGA	60-1 WAKYATO	60-2 LUWERO	61-1 KIZIBA	61-2 KAYONZA	62-1 KAMULI	62-2 NAMWENDWA	63-1 BUSEMBATIA	63-2 BUSOLWE	64-1 NAGONGERA	64-2 BUBULO	88-1 KIMILILI
58-4 MUBENDE	59-3 DEBEZA	59-4 KASANDA	60-3 KATERA	60-4 BOWA	61-3 BOMBO	61-4 KAYUNGA	62-3 KAGOMA	62-4 IGANGA	63-3 BUSESA	63-4 BUGIRI	64-3 TORORO	64-4	88-3 BUNGOMA
68-2 LUSIBA	69-1 MUSOZI	69-2 WAMALA	70-1 MITYANA	70-2 KAKIRI	71-1 KAMPALA	71-2 LUGAZI	72-1 JINJA	72-2 IKULWE	73-1 KYEMEIRE	73-2 LUMINO	74-1 BUSIA	101/2	102/1
68-4 KYAMUKAMA	69-3 MADDU	69-4 KANONI	70-3 MITALAMARIA	70-4 ENTEBBE	71-3 KAJANSI	71-4 KIBANGA	72-3 BWEMA	72-4 MAGYO	73-3 DAGUSI	73-4 SIGULU	74-3		
	79-1 KAYOKO	79-2 LUKAYA	80-1 BUNJAKO	80-2 LULAMBA	81-1 KOME								

Adjoining Sheets

3－6　第3年次現地作業終了時の協議議事録（1996年12月）

MINUTES OF MEETING
ON
PROGRESS REPORT OF THE THIRD YEAR'S FIELD WORK
FOR
TOPOGRAPHIC MAPPING OF KAMPALA AND JINJA BLOCKS
NORTH OF LAKE VICTORIA
IN
THE REPUBLIC OF UGANDA

December, 1996
Entebbe, UGANDA

Mr. D. K. KIWANUKA
Commissioner
Surveys and Mapping Department
Ministry of Land, Housing
and Physical Planning

Mr. Hiroyuki MATSUDA
Leader of Study Team
Japan International
Cooperation Agency

On the basis of the Scope of Work agreed between SMD and JICA on 16TH March, 1994, the Japanese Study Team organized by JICA and headed by Mr. Hiroyuki Matsuda visited the Republic of UGANDA from 30TH September to 24TH December 1996 to carry out field work of the third year study on the topographic mapping of Kampala and Jinja blocks North of Lake Victoria.

At the end of third year's field work (field completion of 40 map sheets), a meeting was held on 17th December 1996 at Entebbe, to submit and discuss the progress report. The following items were discussed and agreed upon between SMD and JICA Study Team:-

1. The JICA Study Team submitted the Progress Report and explained the outcome of this year's work.
   SMD accepted the Progress Report noting that field work for the study has now been completed. The remaining work includes fair-drawing and printing of the Maps which will be executed in Japan.
2. The field completion results had been endorsed by SMD. Administrative boundaries and additional annotation had been indicated on separate manuscript copies by SMD.
3. SMD agreed the results of Minutes of Consultation Meetings for Drafting and Printing attached to the Progress Report.
4. SMD requested the JICA Study Team to convey to JICA Headquarters to make two personnel for counterpart staff training during the final year 1997.
   The JICA Study Team suggested the suitable period for training would be around September 1997.
5. In consideration of the recent computerization in the Department, SMD requested the JICA Study Team to convey to JICA Headquarters to provide the final maps in digital form (CD-ROM) in addition to the paper maps agreed upon earlier. Related hardware and software requested are shown on Attachment.
6. In consideration of the poor state of SMD's Geodetic Control (Vertical and Horizontal) in the Project area and the general lack of surveying and cartographic instruments in the Department, SMD requested the JICA Study Team to convey to JICA Headquarters a request for assistance in providing surveying and cartographic instruments to enable SMD staff trained in this Project maintain/ densify geodetic control and map at larger scales crucial areas in the Project area for detailed planning.
7. The JICA Study Team agreed to convey the SMD's request to JICA Headquarters.

LIST OF ATTENDANTS OF THE MEETIG

(SMD)

1.	Mr. D. K. KIWANUKA	Commissioner
2.	Mr. J. L. BWOGI	Assist. Commissioner
3.	Mr. E. K. MBYETSIZA	Ag. Assist. Commissioner
4.	Mr. M. N. KAJUMBULA	Principal Staff Surveyor
5.	Mr. J. R. OPUT	Ag. Principal Staff Computer
6.	Mr. J. OGUTTU	Drawing Office Supervisor
7.	Mr. M. KIBIRIGE	Head, Topo Section

(JICA Study Team)

1.	Mr.Hiroyuki MATSUDA	Leader
2.	Mr.Yoshiaki OHTOKU	Deputy Leader
3.	Mr.Minoru IKEDA	Mapping Planner
4.	Mr.Yutaka KYAKUNO	Chief Surveyor
5.	Mr.Shuji UMEHARA	Coordinator

Attachment

TELEGRAMS:

TELEPHONE: 20301-4

IN ANY CORRESPONDENCE ON THIS SUBJECT PLEASE QUOTE NO

C(C)138

THE REPUBLIC OF UGANDA

SURVEYS AND MAPPING DEPARTMENT
P. O. BOX 1,
ENTEBBE, UGANDA.

4th November, 1996.

Japan International Cooperation Agency

Re: Request for Equipment to Manage Topographical Data

BACKGROUND

Under the Topographical Mapping of Kampala and Jinja Blocks, North of Lake Victoria Project, Japanese Consortium in conjuction with PASCO International and IDI, was contracted by JICA to map an area of 28,000km² covering 40 standard map sheets at a scale of 1:50000. Japanese Consortuim will deliver 1000 copies of each of the maps on paper.

The Surveys and Mapping Department, which is the organisation mandated with carrying out all the surveying and mapping activities in Uganda, has realised that in order to continue with the mapping activities concerning the 40 maps, will require to work with the topographical data in digital form. In order for the Department to enhance its capacity building and in particular in the areas of map revision, data manipulation and dissemination, it is hereby proposed that the following computer hardware, software and other peripherals be provided to the Topographic Section of the Department, so that work in the above mentioned areas can be realised.

The equipment and software requested are as follows:-

1) Equipment

a) PC work station.
- Intel Pentium
- 200 MHz
- RAM 64MB expandable to 128MB
- 256 KB of Cache.
- 4 GB Fast SCSI Hard disk
- 6 speed SCSI CD-ROM.
- 4/8 GB DAT Tape backup unit.
- 1.44MB. 3.5 " diskette drive
- Screen 22" SVGA NI Colour display, 2MB of video.
- Expansion slots (3 PCI, 2 ISA, 1 ISA/PCI)minimum.
- Enhanced keyboard
- 3 button mouse
- Two serial ports
- Two parallel ports.
- A network card, 10 Base T.
- 300 watt power supply

b) CD-ROM Writer

c) External Magneto-Optical drive

d) Smart UPS 1000 VA (with in-built voltage regulator)

2. Software

a) Software for vectorising (Raster data to vector)
b) Standard office software - Microsoft Office, running under Windows 95

3. Peripherals

a) Plotter A0 - HP750C with a network card, 10 Base T.

The Department would prefer to have the data in both vector and raster formats. However, if the data is provided in raster format only, then the software to vectorise as specified in No 2 above will absolutely be necessary to ensure that the activities initiated by the Project are continued harmoniously.

D.K. Kiwanuka.
Commissioner (Surveys and Mapping)

Figure-1 MAPPING SHEET INDEX

59/1 NTWETWE	59/2 KIBOGA	60/1 WAKYATO	60/2 LUWERO	61/1 KIKYUSA	61/2 KAYONZA	62/1 KAMULI	62/2 NAMWENDWA	63/1 BUSEMBATIA	63/2 BUSOLWE	64/1 NAGONGERA	64/2 BUBULO
59/3 DEBEZA	59/4 KASSANDA	60/3 KATEERA	60/4 BOWA	61/3 BOMBO	61/4 KAYUNGA	62/3 KAGOMA	62/4 IGANGA	63/3 BUSESA	63/4 BUGIRI	64/3 TORORO	64/4 MALABA
69/1 MUSOZI	69/2 WAMALA	70/1 MITYANA	70/2 KAKIRI	71/1 KAMPALA	71/2 LUGAZI	72/1 JINJA	72/2 MAYUGE	73/1 NANKOMA	73/2 LUMINO	74/1 BUSIA	
69/3 MADDU	69/4 KANONI	70/3 MUTARAMARIA	70/4 ENTEBBE	71/3 KAJANSI							

(110)

3．製図・印刷打合せ議事録

ATTACHMENT

Minutes of Consultation Meeting for Drafting and Printing
on
The Topographic Mapping of Kampala and Jinja Blocks
North of Lake Victoria

18th November 1996

The Ugandan side and Japanese side discussed the drafting and printing for the captioned topographic mapping.
Meetings were held between 11th October and 11th November 1996 at the JICA Study Team's room in SMD. In attendance were:-

SMD :-	Mr. J. Hawondo	Mr. M. Kibirige	
	Mr. J. Oguttu	Mr. M. Kajumbula	
Study Team :-	Mr. Y. Otoku	Mr. M. Ikeda	Mr. Y. Kyakuno
	Mr. M. Tanimoto	Mr. S. Matsumoto	Mr. T. Shimono

Prior to the discussion, the test printing sheet (70/1 ENTEBBE) with four types of color combination and the list of lettering style with each size based on East African 1/50,000 Map Specifications adaptable in Japan, were submitted by the JICA Study Team.
The test printing sheets were reviewed, then SMD selected the best color combination and put their signatures on the Map selected.

1. Lettering style and sizes
   1) Types to be used on final printing maps were agreed upon by SMD side as in the sample printing map and the list. Generally, it was acceptable to SMD that the specifications of text in JICA Kenyan and Tanzanian mapping project be used.
   2) Town annotation code number 111 on the manuscript maps, shall be Town Council and Small Town code number 112, shall be Town Board as per attached list herein.

2. Marginal information
   1) The cutting lines of final maps shall be 20mm from the most outer expression

of the right, left, top and bottom as indicated on the sample map.

2) "Printed by JICA, Japan 1998" and "1000-month-98" with parallel shall be at the right side corner of below the border line.
   And also, the red color sentence at the bottom of the Map shall be changed to "Map users are invited to inform the Commissioner of Surveys and Mapping, P.O.Box 1 Entebbe, of any errors or addition".
3) The UTM grid lines for every 10km shall be stopped at the neat line.
4) Sheet history on the test print map shall be maintained. However, this sentence might be changed at the final meeting of this phase.
5) The symbols of quarry, crater and steep slope shall be in the legend. Therefore, these symbols shall be added in the legend frame.
6) The color combination of final maps shall be the same as that of the sample map selected by SMD.

3. Others (map symbols, and others)
   1) The power lines shall be shown only the main route with tower. In this occasion, any direction of its symbol shall be acceptable.
   2) The guide lamps along the tarmac at Entebbe airport shall be described with slight black solid lines.
   3) Coffee store and cotton store shall be abbreviated to "Cof. S" and "Cot. S" respectively.
   4) The annotation of "Pond" and "Lake" for the small water surfaces shall not be applied.
   5) Large plantation houses shall be shown with black dotted lines.
   6) The diameter of index points for control points and elevations shall be 0.3mm.
   7) The boundaries of forest reserve areas shall not be shown until there are properly surveyed.
   8) The vegetation around the settlement is almost a mixture of scattered cultivation, scattered trees and shrub. Therefore, the vegetation symbols for these areas shall be arranged in a well-balanced density. In this case, small areas surrounded by roads and path may not require labeling use of symbols.

TYPE RULE FOR ANNOTATION

Classification	Lettering (SHAKEN)	Size mm	Style	Application	Code No. on manuscripts
Sub-County Name	E102-34	4.5	Caps		100
Topographical Area	E 30-25	3.2-2.3	Caps	Peninsula, Mountain Range	101
City	E 08-24	3.9	Caps	Main City	110
Town	E 08-24	3.2	Caps	Town Council	111
Small Town	E 08-24	2.6	Caps	Town Board	112
Trading Centre Name	E 08-24	2.3	Caps	Indication by SMD	114
Village	E 08-24	2.4	U/L	RC1&Local Area Name	113
Island	E 08-24	4.7	Caps	More than 70sq km	120
Island	E 08-24	3.9	Caps	10sq km to 70sq km	121
Island	E 08-24	3.2	U/L	10sq km to 2sq km	122
Island	E 08-24	2.6	U/L	Less than 2sq km	123
Reserve Area	E 08-24	4.7	Caps	Not applied	130
Reserve Area	E 08-24	3.9	Caps	400sq km to 200sq km	131
Reserve Area	E 08-24	3.2	Caps	200sq km to 100sq km	132
Reserve Area	E 08-24	2.6	Caps	100sq km to 25sq km	133
Reserve Area	E 08-24	2.0	Caps	Less than 25sq km	134
Cape	E 08-24	4.7	U/L	Not applied	140
Cape	E 08-24	2.6	U/L	Usual	141
Cape	E 08-24	2.0	U/L	Where the space is limited	142
				by a lot of annotation	
Hill	E 08-24	2.0	U/L		150
Mountain/Tableland	E 08-24	4.7	Caps	Not applied	160
Mountain/Tableland	E 08-24	3.9	Caps	400sq km to 200sq km	161
Mountain/Tableland	E 08-24	3.2	Caps	200sq km to 100sq km	162
Mountain/Tableland	E 08-24	2.6	Caps	100sq km to 25sq km	163
Mountain/Tableland	E 08-24	2.0	Caps	Less than 25sq km	164
Landmarks Name	E 16-24	1.5	U/L	Buildings, structures, and others	170
Antiquity	E 36-24	2.0	U/L	Antiquity, ruin	180
Road Destination	E102-22	1.5	U/L		200
Sub-Title/Scale		4.5	Caps		201
Main Tytle	E 30-24	9.5	Caps		202
Supplementary Tytle		2.4	Caps		203
Sheet No.	E102-24	9.5			
UTM Grid No.	E 16-04	2.0/1.0			
Ladder No.	E102-24	3.2			
Geographical Grid	E102-24	1.8			
Spot Elevation	E102-24	1.8			
Triangulation Point	E 16-04	1.8			
Air-photo Point	E 16-04	1.5			
Contour Number	E100-14	1.5			

Classification	Lettering (SHAKEN)	Size mm	Style	Application	Code No. on manuscript
Double Line Stream 1	E 30-25	4.0	Caps		300
Double Line Stream 2	E 30-25	3.4	Caps		301
Double Line Stream 3	E 30-25	2.6	Caps		302
Single Line Stream 1	E 08-25	3.2	U/L		303
Single Line Stream 2	E 08-25	2.6	U/L		304
Single Line Stream 3	E 08-25	2.0	U/L		305
Double Line (Short)	E 08-25	2.0	Caps		306
Harber/Small Bay	E 08-25	4.7-2.9	Caps		310
Sea/Canal/Large Bay	E 08-25	4.7	Caps	More than 70sq km	320
Sea/Canal/Large Bay	E 08-25	3.4	Caps	70sq km to 4sq km	321
Lake	E 08-25	4.7	Caps		330
Lake	E 08-25	3.4	Caps		331
Lake	E 08-25	2.6	Caps		332
Swamp	E 08-25	4.7	Caps	Not applied	340
Swamp	E 08-25	3.4	Caps		341
Swamp	E 08-25	2.6	Caps		342
Swamp	E 08-25	2.0	Caps		343

THE 1991 POPULATION AND HOUSING CENSUS

UGANDA

Table 1.2: Population by Urban Centre by Sex

District	Urban Centre	Male	Female	Total
Apac	Apac TC	2,781	3,002	5,783
Arua	Arua Municipality	10,682	11,535	22,217
	Koboko TB	2,308	2,187	4,495
Bundibugyo	Bundibugyo TC	3,275	3,570	6,845
	Ntoroko TR	1,383	987	2,370
Bushenyi	Bushenyi TC	6,981	7,214	14,195
Gulu	Gulu Municipality	18,404	19,893	38,297
Hoima	Hoima TC	2,078	2,538	4,616
Iganga	Iganga TC	9,052	10,688	19,740
	Busembatia TR	4,353	5,153	9,506
	Bugiri TB	1,520	1,801	3,321
	Nagamaga TR	1,151	1,204	2,355
	Busesa TR	974	1,026	2,000
	Idudi TR	823	1,041	1,864
	Nayuge TR	797	897	1,694
	Namnyemba TR	573	678	1,251
	Kuluba TR	530	667	1,197
	Bukatube TR	506	568	1,074
Jinja	Jinja Municipality	32,578	32,591	65,169
	Bugembe TR	3,263	3,676	6,939
	Buwenge TR	2,221	2,725	4,946
	Kakira TR	1,967	1,872	3,839
Kabale	Kabale Municipality	13,994	15,252	29,246
Kabarole	Fort Portal Municipality	15,844	16,945	32,789
	Kyenjojo TR	697	730	1,427
	Rwimi TR	653	736	1,389
	Kamwenge TR	692	657	1,349
Kalangala	Kalangala TC	752	624	1,376
Kampala	Kampala City	377,225	397,016	774,241
Kamuli	Kamuli TC	2,948	3,547	6,495
	Kaliro TB	832	935	1,767
Kapchorwa	Kapchorwa TC	2,235	2,369	4,604
Kasese	Kasese TC	9,376	9,374	18,750
	Katwe-Kabatooro TR	3,188	3,109	6,297
	Kilembe Estates TR	2,550	2,650	5,200
	Hima TB	1,966	1,888	3,854
	Bwera TB	996	1,161	2,157
	Katunguru TR	781	719	1,500
	Kinyamaseke TR	498	585	1,083
	Mpondwe TR	446	605	1,051
Kibaale	Kagadi TR	643	735	1,378
	Mohorro TR	453	577	1,030
Kiboga	Kiboga TC	2,479	2,798	5,277
Kisoro	Kisoro TC	3,615	3,870	7,485
Kitgum	Kitgum TC	6,203	6,775	12,978
	Kalongo TB	1,149	1,200	2,349
Kotido	Kaabong TB	2,458	2,700	5,158
	Kotido TC	2,282	2,262	4,544
Kumi	Kumi TC	5,659	6,090	11,749

Table 1.2: Population by Urban Centre by Sex
- continued

District	Urban Centre	Male	Female	Total
Lira	Lira Municipality	14,857	12,711	27,568
Luwero	Luwero TC	5,201	5,911	11,112
	Bombo TC	5,337	5,229	10,566
	Wobulenzi TC	2,411	2,980	5,391
	Nakasongola TB	2,851	2,491	5,342
	Zengebe TR	1,033	907	1,940
	Nakaseke TR	454	694	1,148
	Luampanga TR	570	462	1,032
Masaka	Masaka Municipality	23,660	25,925	49,585
	Lukaya TR	2,991	3,377	6,368
	Kitooro TR (Kyazanga)	1,962	2,221	4,183
	Kinoni TR	1,742	2,099	3,841
	Mbirizi TR	1,131	1,398	2,529
	Mateete TR	1,160	1,267	2,427
	Mpugwe TR	800	948	1,748
	Bugomola TR	764	808	1,572
	Kalungu TR	607	774	1,381
	Kabaale TR	610	696	1,306
	Kiriya TR	524	708	1,232
	Ntusi TR	519	505	1,024
Masindi	Masindi TC	6,291	4,548	10,839
	Kigumba TB	1,059	1,191	2,250
	Kijura TB	567	696	1,263
Mbale	Mbale Municipality	25,358	28,629	53,987
	Sironko TR	1,493	1,687	3,180
	Nakaloke TR	1,376	1,755	3,131
Mbarara	Mbarara Municipality	21,493	19,538	41,031
	Ibanda TB	1,423	1,551	2,974
	Ntungamo TB	1,342	1,269	2,611
Moroto	Moroto Municipality	5,386	5,131	10,517
	Nakapiripirit TC	658	821	1,479
	Amudat TB	498	487	985
Moyo	Moyo TC	3,213	3,466	6,679
	Ajumani TB	979	1,129	2,108
Mpigi	Entebbe Municipality	21,218	21,545	42,763
	Namasuba TR	6,856	8,339	15,195
	Kireka TR	5,683	6,434	12,117
	Bweyogerere TR	3,593	4,153	7,746
	Jinja-Kawempe TR	3,484	3,994	7,478
	Mpigi TC	3,486	3,797	7,283
	Kajansi TR	2,361	2,723	5,084
	Seguku TR	1,895	1,968	3,863
	Nansana TR	1,750	1,902	3,652
	Massaja TR	1,511	1,618	3,129
	Abaita-Ababiri TR	1,313	1,675	2,988
	Matuga TR	1,330	1,569	2,899
	Buwama TR	1,142	1,148	2,290
	Wakiso TR	856	921	1,777
	Kibibi TR	750	914	1,664
	Bujuko TR	755	784	1,539
	Kyaliwajala TR	696	819	1,515
	Zana TR	689	800	1,489
	Kakiri TR	726	744	1,470
	Maddu TR	680	735	1,415
	Kyengera TR	615	750	1,365
	Kiboga TR	662	682	1,344
	Gayaza TR	549	723	1,272
	Gombe TR	572	689	1,261
	Kawuku TR	542	629	1,171
	Kiriri TR	565	598	1,163
	Nakawuka TR	509	602	1,111
	Kiwenda TR	533	550	1,083

Table 1.2: Population by Urban Centre by Sex
• Continued

District	Urban Centre	Male	Female	Total
Kabende	Kityana TC	10,411	12,168	22,579
	Kabende TC	4,577	4,724	9,301
	Busunju TR	704	784	1,488
	Kasanda TR	525	648	1,173
Kakono	Njeru TC	18,109	18,622	36,731
	Lugazi TC	9,333	9,495	18,828
	Kayunga TC	6,538	7,631	14,169
	Kakono TC	3,429	3,977	7,406
	Seeta TR	2,168	2,476	4,644
	Kangulumira TR	1,446	1,633	3,079
	Nakifuma TR	1,075	1,281	2,356
	Kyerima TR	937	1,098	2,035
	Kasawo TR	892	1,060	1,952
	Nagalama TR	782	908	1,690
	Buikwe TR	594	796	1,390
	Busaana TR	609	635	1,244
	Bukeeka TR	490	613	1,103
	Nakanyonyi TR	525	558	1,083
	Ntenjeru TR	515	510	1,025
Nebbi	Paidha TB	5,543	6,264	11,807
	Nebbi TC	3,291	3,678	6,969
	Pakwach TB	2,503	2,664	5,167
Pallisa	Pallisa TC	1,405	1,522	2,927
Rakai	Lyantonde TB	2,644	2,876	5,520
	Kyotera TC	2,318	2,793	5,111
	Kalisizo TR	1,089	1,314	2,403
	Mutukula TR	702	584	1,286
	Rakai TB	294	255	549
Rukungiri	Rukungiri TC	4,105	4,473	8,578
	Kihihi TR	850	850	1,700
	Butogota TR	736	696	1,432
	Rweshema TR	845	430	1,275
Soroti	Soroti Municipality	19,336	21,634	40,970
	Katakwi TB	1,620	1,873	3,493
	Kaberamaido TB	941	870	1,811
Tororo	Busia TC	13,303	14,664	27,967
	Tororo Municipality	12,987	13,796	26,783
	Malaba TB	3,209	3,948	7,157
	Busolwe TR	811	939	1,750
Uganda	Total	916,646	972,976	1,889,622

NOTE: TC = Town Council
TB = Town Board
TR = Trading Centre

THE TOPOGRAPHIC MAPPING OF

KAMPALA AND JINJA BLOCKS, NORTH OF LAKE VICTORIA

IN THE REPUBLIC OF UGANDA

1/50,000 SCALE MAP SYMBOL'S SPECIFICATIONS

UGANDA 1/50,000 MAP SYMBOLS

ITEMS 分類	NO.	NAME 名称	FINAL PRODUCT 地図記号	SPECIFICATIONS 仕様	COLOR 色	INTERPRETATION 判読記号	PLOTTING 清化記号	COMPILATION 編集記号	APPLICATION RULES 図式適用規定
Communications and Associated Features 交通及びその関連施設	1	ALL WEATHER ROAD:- Bound Surface 全天候道路：- 舗装路面	[symbol]	Line Weight: 0.13mm Black 0.6mm Red(Solid)	BLACK RED Solid 道路外黒線 中央線	(On the photographs) RED (1) 赤色	(Actual shape) BLACK (1) 黒色	(Same as final product) BLACK (1) 黒色	Paved road with two lanes and over. 二車線以上の舗装道路（舗装の剥離あっても50%以上残るもの）。
	2	ALL WEATHER ROAD:- Loose Surface 全天候道路：- 砂利路面	[symbol]	Line Weight: 0.13mm Black 0.6mm Red(40%Screen)	BLACK RED Screen (40%) 道路外黒線	(Ditto) RED (2) 赤色	(Ditto) RED (2) 赤色	(Ditto) BLACK (2) 黒色	Road width: same as above. Surfaced with gravel and murram and compacted. 二車線以上の道路で、路面を砂利・赤土等で転圧舗装をしているもの。
	3	DRY WEATHER ROAD 乾期道路	[symbol]	Line Weight: 0.13mm 0.6mm	BLACK 黒色 中白抜	(Ditto) RED (3) 赤色	(Ditto) RED (3) 赤色	(Ditto) BLACK (3) 黒色	Road width: same as above. Surface shall be scraped and maintained. 一車線以上の道路で、路面が常にならしている程度か手入れされているもの。 主要な村落を結ぶ道路。
	4	ROAD:- Under Construction 建設中道路	Under Construction [symbol]	Line Weight: 0.13mm Under Construction 0.4mm 1.0mm 7pt F. B. Roman(U/L)	BLACK 黒色	(Ditto) RED U C 赤色	(Ditto) RED U C 赤色	(Ditto) BLACK Under Construction 黒色	Road width: same as above. Shall be annotated. 二車線以上で、長さ100m以上を採用する。 注記する。
	5	ROAD:- Town 市街地道路	[symbol]	Line Weight: 0.13mm 0.4mm	BLACK 黒色	(Ditto) RED [symbol] 赤色	(Ditto) RED [symbol] 赤色	(Ditto) BLACK [symbol] 黒色	Road width: 0.6mm 街路を構成する道路。 市街道路は0.6mmで表示する。
	6	MAIN TRACK:- Motorable 主要軽車道	[symbol]	Line Weight: 0.3 mm	RED 赤色	(Ditto) RED (4) 赤色	(Ditto) RED (4) 赤色	(Ditto) RED [symbol] 赤色	Wide enough for jeep passage 四輪駆動車の通行が可能で、集落或いはプランテーションを結ぶ道路。
	7	OTHER TRACK and FOOTPATH その他の軽車道及び徒歩道	[symbol]	Line Weight: 0.15mm	RED 赤色	(Ditto) RED [dashed line] 赤色	(Ditto) RED [dashed line] 赤色	(Ditto) RED [dashed line] 赤色	Main tracks and foot-paths shall be shown with a single line. その他の軽車道及び徒歩道は一条線で表示する。
	8	CUT LINE 伐開線	CUT LINE	Line Weight: 0.15mm CUT LINE 7pt F.B. Roman(Caps)	BLACK 黒色	(Ditto) GREEN Cut Line 緑色	(Ditto) GREEN Cut Line 緑色	(Ditto) BLACK [symbol] 黒色	If vehicle passable, shall be used the symbol of main track. Annotated 注記を付す。伐開線を軽車道として使用している場合は、軽車道とする。
	9	RAILWAY (Solid Line) 鉄道	[symbol]	Line Weight: 0.13mm 0.6mm	BLACK 黒色	(Ditto) RED RAILWAY 赤色	(Ditto) BLACK [symbol] 黒色	(Ditto) BLACK 0.6mm 黒色	

UGANDA 1/50,000 MAP SYMBOLS

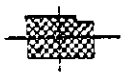
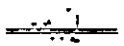
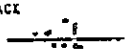
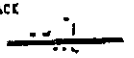
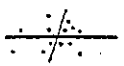
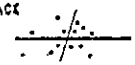
ITEMS 分類	NO.	NAME 名称	FINAL PRODUCT 地図記号	SPECIFICATIONS 仕様	COLOR 色	INTERPRETATION 判読記号	PLOTTING 図化記号	COMPILATION 編集記号	APPLICATION RULES 図式適用規定
Communications and Associated Features 交通及びその関連物	10	RAILWAY:- Light 軽便鉄道		Line Weight: 0.13mm 1.8mm 0.75mm	BLACK 黒色	(On the photographs) RED LIGHT RY 赤色	(Actual shape) RED 赤色	(Same as final product) BLACK 0.75 黒色	
	11	Railway:- Under Construction 建設中の鉄道	Under Construction	As Above but Annotated 0.75mm 7pt F. B. Roman(U/L)	BLACK 黒色	(Ditto) RED UC 赤色	(Ditto) BLACK UC 黒色	(Ditto) BLACK Under Construction 黒色	Shall be annotated. 注記する。
	12	SIDING 鉄道側線		Line Weight: 0.13mm 0.4mm 1.5mm 0.75mm	BLACK 黒色	(Ditto) RED 赤色	(Ditto) BLACK 黒色	(Ditto) BLACK 黒色	
	13	STATION, HALT 駅・停車場	Sta	0.8mm 0.4mm 7pt F. B. Roman(U/L)	BLACK 黒色	(Ditto) RED Sta 赤色	(Ditto) BLACK Sta 黒色	(Ditto) BLACK Sta 黒色	Shall be annotated above railway symbol. (No spacing with railway symbol) 駅名は注記する。 （鉄道との余白部分は不要とする。）
	14	TUNNEL トンネル	TUNNEL	Line Weight: 0.13mm 1.0mm 0.5mm	BLACK 黒色	(Ditto) RED Tunnel 赤色	(Ditto) BLACK 黒色	(Ditto) BLACK Tunnel 黒色	Shall be annotated. 注記する。
	15	LEVEL CROSSING 平面交差点（踏切）	LC	Annotated LC 7pt.Book Roman(Caps)	BLACK 黒色	(Ditto) RED LC 赤色	(Ditto) RED 赤色	(Ditto) BLACK LC 黒色	Doble representation with annotation "LC". LC"と注記する。
	16	CUTTING, EMBANKMENT 切り土、盛り土		0.4mm 0.4mm	BLACK 黒色	(Ditto) RED 赤色	(Ditto) BLACK & GREEN 黒色及び緑色	(Ditto) BLACK & GREEN 黒色及び緑色	This symbol shall be also used for roads. （長さ150m、高さ 5m以上を表示する）
	17	BRIDGES:- Overpass, Underpass 橋、立体交差		Line Weight: 0.15mm 45° 0.3mm 0.5mm	BLACK 黒色	(Ditto) RED 赤色	(Ditto) BLACK 黒色	(Ditto) BLACK 黒色	All bridges shall be shown and the minimum size of symbol shall be 2.0mm length. （橋はすべて表示する、最小長は 2mmとする）
	18	VIADUCT 高架橋		Line Weight: 0.15mm 45° 0.8mm 0.5mm	BLACK 黒色	(Ditto) RED 赤色	(Ditto) BLACK 黒色	(Ditto) BLACK 黒色	

UGANDA 1/50,000 MAP SYMBOLS

NO. 3

ITEMS 分類	NO.	NAME 名称	FINAL PRODUCT 地図記号	SPECIFICATIONS 仕様	COLOR 色	INTERPRETATION 判読記号	PLOTTING 図化記号	COMPILATION 編集記号	APPLICATION RULES 図式適用規定
Communications and Associated Features 交通及びその関連物	19	FOOTBRIDGE 徒歩橋		Line Weight: 0.15mm 45° 0.5mm 0.6mm	BLACK 黒色	(On the photographs) RED 赤色	(Actual shape) RED 赤色	(Same as final product) RED 赤色	
	20	CULVERT カルバート		Line Weight: 0.15mm 60° 1.2mm	BLACK 黒色	(Ditto) RED 赤色	(Ditto) BLACK 黒色	(Ditto) BLACK 黒色	
	21	KM STONE キロ杭	25 KM STONE	Line Weight: 0.30mm 25 0.5mm KM STONE 7pt.Book Roman(Caps)	BLACK 黒色	(Ditto) RED 25 赤色	(Ditto) RED 25 赤色	(Ditto) BLACK 25 KM STONE 黒色	KM stone shall be indicated every 5km toward the next town from main town. キロ杭は主要都市から次の都市に向かって5km毎のみを表記する。ただし起点は表記しない。
	22	FERRY:- Vehicular フェリー（車）	Ferry	Line Weight: 0.13mm Annotated 0.8mm 1.2mm 7pt.Book Roman(U/L)	BLACK 黒色	(Ditto) RED Ferry 赤色	(Ditto) RED Ferry 赤色	(Ditto) BLACK Ferry 黒色	Shall be annotated. 注記する。
	23	FERRY:- Pedestrian フェリー（歩行者）	Ferry	Line Weight 0.13mm Annotated 7pt.Book Roman(U/L)	RED 赤色	(Ditto) RED Ferry P 赤色	(Ditto) RED Ferry P 赤色	(Ditto) RED Ferry 赤色	Shall be annotated. 注記する。
	24	FORD 徒渉場	Ford	Line Weight: 0.20mm Ford 7pt F. B. Roman(U/L)	RED 赤色	(Ditto) RED Ford 赤色	(Ditto) RED Ford 赤色	(Ditto) RED Ford 赤色	Shall be annotated. 注記する。（二重線にあるものは全て表示する）
	25	TELEGRAPH or TELEPHONE LINE 電信、電話線		Line Weight: 0.15mm with dia.0.35mm dots 2.5mm	BLACK 黒色	(Ditto) RED TEL LINE 赤色	(Ditto) BLACK TEL LINE 黒色	(Ditto) BLACK 黒色	
	26	POWER LINE 電力線		Line Weight: 0.15mm 4.7mm 60° 0.8mm	BLACK 黒色	(Ditto) RED POWER L. 赤色	(Ditto) BLACK POWER L. 黒色	(Ditto) BLACK 黒色	More high tension than 33.1KV shall be shown. 33.1KV以上を表示する。
	27	WALL 囲い	WALL	Line Weight: 0.15mm WALL 7pt.Book Roman(caps)	BLACK 黒色	(Ditto) RED WALL 赤色	(Ditto) RED WALL 赤色	(Ditto) BLACK WALL 黒色	

UGANDA 1/50,000 MAP SYMBOLS

ITEMS 分類	NO.	NAME 名称	FINAL PRODUCT 地図記号	SPECIFICATIONS 仕様	COLOR 色	INTERPRETATION 判読記号	PLOTTING 図化記号	COMPILATION 編集記号	APPLICATION RULES 図式適用規定
Buildings and Abbreviation Signs 建物及び略記号	1	BUILT-UP AREA 市街地		Solid generalised shapes Line weight: outline 0.13mm shade'S'and 'E'line 0.30mm Fill in stipple 40% dot screen	BLACK Screen 黒色 197-7		(Actual shape) BLACK 黒色 	(Same as final product) BLACK 黒色 	Dence housing area surrounded by town road whose actual coverage of building is more than 70% of the surface area shall be shown(Covered)by 40% dot screen.Area is not surrounded by roads shall be shown with acutual outline.If there is a public building in this area shall be symbolised in black and annotated. 道路等で区画された地域において、建物が70%以上の場合は被覆地物として40%のスクリーンで表示する。市街地内に存在する公共施設・注記施等を黒色で表示してシンボル等を記入する。
	2	VILLAGE 村落		Line weight: outline 0.13mm shade'S'and 'E'line 0.30mm Fill in stipple 40% dot screen	BLACK Screen 黒色 197-7		(Ditto) BLACK 黒色 	(Ditto) BLACK 黒色 	Dense settlement with earthen wall. The surface area shall be shown (Covered)by 40% dot screen. 土塁の集落密集地 黒色40%のスクリーンで表示する。
	3	PERMANENT BUILDINGS 永久施物		0.8mm square	BLACK 黒色		(Ditto) BLACK 黒色 	(Ditto) BLACK 黒色 	Concrete buildings and buildings with symbol and annotation are shown as permanent regardless of it's construction. 堅ろう建物、注記或いは記号施物もその構造に拘泥なく堅ろう表示する。
	4	HUTS 小屋		0.6mm diameter	BLACK 黒色		(Ditto) BLACK 黒色 	(Ditto) BLACK 黒色 	Buildings with earthen wall and grass roof are shown as ordinarly buildings 'Huts'. Interval of the building shall be minimum of 0.6mm. 二芝、草葺の施物・施物の間隔に 0.6mm以上とする。
	5	MOSQUE モスク		2.0mm	BLACK 黒色	(Ditto) RED · M 赤色	(Ditto) RED · M 赤色	(Ditto) RED M 赤色	Prominent one shall be shown. 著名なものを表示する。
	6	CHURCH 教会	· Ch	1.2mm square 7pt Futura Book Roman(U/L)	BLACK 黒色	(Ditto) RED · Ch 赤色	(Ditto) RED · Ch 赤色	(Ditto) RED + Ch 赤色	The location shall be the center of cross. 教会の表位置は十字の中心とする。
	7	SCHOOL 学校	· Sch	Actual shape with symbol 7pt Futura Book Roman(U/L)	BLACK 黒色	(Ditto) RED · Sch 赤色	(Ditto) RED · Sch 赤色	(Ditto) RED · Sch 赤色	Higher graduation than technical school shall be annotated. 技術訓練学校以上は注記する。
	8	CHURCH and SCHOOL 教会及び学校	· Sch · Ch	2.0mm	BLACK 黒色	(Ditto) RED · Sch · Ch 赤色	(Ditto) RED · Sch · Ch 赤色	(Ditto) RED · Sch · Ch 赤色	If there is church and school in the same site,sysable shall be shown. 同一敷地内に教会と学校がある場合に表示する。 ただし十字の中心は真位置ではない。

U G A N D A 1 / 5 0 , 0 0 0 M A P S Y M B O L S

ITEMS 分類	NO.	NAME 名称	FINAL PRODUCT 地図記号	SPECIFICATIONS 仕様	COLOR 色	INTERPRETATION 判読記号	PLOTTING 図化記号	COMPILATION 編集記号	APPLICATION RULES 図式適用規定
Buildings and Abbreviation Signs 建物及び省略記号	9	DISTRICT HEADQUATER 郡行政事務所	· DHQ	with permanent building · DHQ 7 pt Futura Book Roman(Caps)	BLACK 黒色	(On the photographs) RED · DHQ 赤色	(Actual shape) RED · DHQ 赤色	(Same as final product) RED · DHQ 赤色	Symbol shall be shown at either actual location or under the administrative name in case of imposible to shown at right place. 建物に略記号を付ける。但し、真位置に表現できない場合は行政名注記の下に並べる。
	10	COUNTY HEADQUATER 州町行政事務所	· CHQ	DITTO 同上	BLACK 黒色	(Ditto) RED · CHQ 赤色	(Ditto) RED · CHQ 赤色	(Ditto) RED · CHQ 赤色	DITTO 同上
	11	SUB-COUNTY HEADQUARTERS 区郡行政事務所	· SCHQ	with permanent building · SCHQ 7 pt Futura Book Roman(Caps)	BLACK 黒色	(Ditto) RED · SCHQ 赤色	(Ditto) RED · SCHQ 赤色	(Ditto) RED · SCHQ 赤色	DITTO 同上
	12	COURT HOUSE 裁判所	· CtHo	7 pt Futura Book Roman(U/L)	BLACK 黒色	(Ditto) RED · CtHo 赤色	(Ditto) RED · CtHo 赤色	(Ditto) RED · CtHo 赤色	DITTO 同上
	13	HOSPITAL, DISPENSARY 病院、診療所	· Hosp · Disp	DITTO 同上	BLACK 黒色	(Ditto) RED · Hosp · Disp 赤色	(Ditto) RED · Hosp · Disp 赤色	(Ditto) RED · Hosp · Disp 赤色	(Prominent one shall be annotated) (Shall be annotated above Health Center.) re DITTO (著名なものは注記する) (ヘルスセンターはHEALTH CENTER と注記する。) RE
	14	MARKET 公設マーケット	· Mkt	DITTO 同上	BLACK 黒色	(Ditto) RED · Mkt 赤色	(Ditto) RED · Mkt 赤色	(Ditto) RED · Mkt 赤色	(Official one shall be shown) DITTO (公設のマーケットのみ表示する) 同上
	15	MINISTRY OF WORKS 土木建設局	· MOW	7 pt Futura Book Roman(Caps)	BLACK 黒色	(Ditto) RED · MOW 赤色	(Ditto) RED · MOW 赤色	(Ditto) RED · MOW 赤色	DITTO 同上
	16	POST OFFICE 郵便局	· PO	DITTO 同上	BLACK 黒色	(Ditto) RED · PO 赤色	(Ditto) RED · PO 赤色	(Ditto) RED · PO 赤色	DITTO 同上
	17	POLICE STATION 警察署	· PS	with permanent building · PS 7 pt Futura Book Roman(Caps)	BLACK 黒色	(Ditto) RED · PS 赤色	(Ditto) RED · PS 赤色	(Ditto) RED · PS 赤色	DITTO 同上

UGANDA 1/50,000 MAP SYMBOLS

No. 6

ITEMS 分類	NO.	NAME 名称	FINAL PRODUCT 地図記号	SPECIFICATIONS 仕様	COLOR 色	INTERPRETATION 判読記号	PLOTTING 図化記号	COMPILATION 編集記号	APPLICATION RULES 図式適用規定
Buildings and Abbreviation Signs 建物及び略記号	20	POLICE POST 交番	· PP	with permanent building · PP 7 pt Futura Book Roman(Caps)	BLACK 黒色	(On the photographs) RED · PP 赤色	(Actual shape) RED · PP 赤色	(Same as final product) RED · PP 赤色	DITTO 同上
	21	REST HOUSE 公設休憩所	· RH	DITTO 同上	BLACK 黒色	(Ditto) RED · RH 赤色	(Ditto) RED · RH 赤色	(Ditto) RED · RH 赤色	DITTO 同上
	20	TELEPHONE 電話局舎	· T	DITTO 同上	BLACK 黒色	(Ditto) RED · T 赤色	(Ditto) RED · T 赤色	(Ditto) RED · T 赤色	DITTO 同上
	21	TRADING CENTER 商業センター	· TC	7 pt Futura Book Roman(Caps)	BLACK 黒色	(Ditto) RED · TC 赤色	(Ditto) RED · TC 赤色	(Ditto) RED · TC 赤色	DITTO 同上 (仮設商店を含む物資の交易場所を表示する。)
	22	COTTON STORE 綿花貯蔵場	· COTTON STORE	DITTO 同上	BLACK 黒色	(Ditto) RED · COTTON STORE 赤色	(Ditto) RED · COTTON STORE 赤色	(Ditto) RED · COTTON STORE 赤色	DITTO 同上
	23	COFFEE STORE コーヒー貯蔵場	· COFFEE STORE	DITTO 同上	BLACK 黒色	(Ditto) RED · COFFEE STORE 赤色	(Ditto) RED · COFFEE STORE 赤色	(Ditto) RED · COFFEE STORE 赤色	DITTO 同上
	24	UGANDA ELECTRIC BOAD ウガンダ電力公社	· UEB	DITTO 同上	BLACK 黒色	(Ditto) RED · UEB 赤色	(Ditto) RED · UEB 赤色	(Ditto) RED · UEB 赤色	DITTO 同上

UGANDA 1/50,000 MAP SYMBOLS

NO. 7

ITEMS 分類	NO.	NAME 名称	FINAL PRODUCT 地図記号	SPECIFICATIONS 仕様	COLOR 色	INTERPRETATION 判読記号	PLOTTING 図化記号	COMPILATION 編集記号	APPLICATION RULES 図式適用規定
Other Facilities and Conventional Signs その他の施設及び記号	1	AIRFIELD RUNWAY:- Bound 滑走路：- 舗装		Line Weight: 0.15mm black line red solid	BLACK RED-Solid 黒色 赤色 塗潰し	(On the photographs) RED RWY.BD 赤色	(Actual shape) GREEN B 緑色	BLACK B 黒色	
	2	AIRFIELD RUNWAY:- Murrum 滑走路：- 赤土		Line Weight: 0.15mm black line red screen 150dot 40%	BLACK RED-screen 黒色 赤色 スクリーン	(Ditto) RED MURRAM 赤色	(Ditto) GREEN M 緑色	(Ditto) BLACK M 黒色	
	3	AIRFIELD RUNWAY:- Grass 滑走路：- 草		Line Weight: 0.15mm flame-line only	BLACK 黒色	(Ditto) RED GRASS 赤色	(Ditto) GREEN G 緑色	(Ditto) BLACK G 黒色	
	4	STADIUM 競技場	STADIUM	Line Weight: 0.13mm 1.2mm STADIUM 0.6mm	BLACK 黒色	(Ditto) RED STADIUM 赤色	(Ditto) BLACK STADIUM 黒色	(Ditto) BLACK STADIUM 黒色	Annotated, 7pt Futura Book Roman(U/L)
	5	CEMETERY 墓地	C	Line Weight: 0.13mm 1.2mm C 0.6mm	BLACK 黒色	(Ditto) RED Cem 赤色	(Ditto) GREEN & RED Cem green red 緑、赤色	(Ditto) BLACK C 黒色	Minimum size to be shown shall be 200m x 200m or equivalent. (7pt Futura Book Roman) 図上 4mm x 4mm以上を表示
	6	RUIN 廃墟	∴	∴ 1.2mm	BLACK 黒色	(Ditto) RED Ruin 赤色	(Ditto) GREEN & RED R green red 緑、赤色	(Ditto) RED ∴ 赤色	
	7	ANTIQUITY 遺跡	Ant	3.0mm square 8pt Old English	BLACK 黒色	(Ditto) RED · Ant 赤色	(Ditto) RED · Ant 赤色	(Ditto) RED Ant 赤色	Shall be annotated. 注記する。
	8	LIGHTHOUSE 燈台		2.5mm 1.5mm	BLACK 黒色	(Ditto) RED · LH 赤色	(Ditto) RED · LH 赤色	(Ditto) RED 赤色	
	9	BEACON 標識塔		2.0mm 1.5mm	BLACK 黒色	(Ditto) RED · Beacon 赤色	(Ditto) RED · Beacon 赤色	(Ditto) RED 赤色	

UGANDA 1/50.000 MAP SYMBOLS

No. 4

ITEMS 分類	NO.	NAME 名称	FINAL PRODUCT 地図記号	SPECIFICATIONS 仕様	COLOR 色	INTERPRETATION 判読記号	PLOTTING 図化記号	COMPILATION 編集記号	APPLICATION RULES 図式適用規定
Other Facilities and Conventional Signs その他の施設及び記号	10	WIRELESS MAST 無線塔	△ VK	△ 3.0mm 1.5mm 7pt F. Book L.(Caps)	BLACK 黒色	(On the photographs) RED · VK 赤色	(Actual shape) RED · VK 赤色	(Same as final product) RED △ VK 赤色	
	11	MINERAL WORKSHOP 採鉱所	⚒	⚒ 3.0mm	BLACK 黒色	(Ditto) RED · XY 赤色	(Ditto) RED · XY 赤色	(Ditto) RED ⚒ 赤色	

UGANDA 1/50,000 MAP SYMBOLS

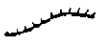
NO. 9

ITEMS 分類	NO.	NAME 名称	FINAL PRODUCT 成図記号	SPECIFICATIONS 仕様	COLOR 色	INTERPRETATION 判読記号	PLOTTING 図化記号	COMPILATION 編集記号	APPLICATION RULES 図式適用細則
Boundaries 境界	1	BOUNDARY:- International or Territorial 国境界		Line Weight: 0.23mm 1.2mm 1.2 60 dot red screen (75/25 diagonal)	BLACK RED- Screen 黒色 赤色 1994-7			RED 赤色	
	2	BOUNDARY:- District 県境界		Line Weight: 0.23mm 0.23mm 1.2 60 dot red screen (75/25 diagonal)	BLACK RED- Screen 黒色 赤色 1994-7			DITTO 同上	
	3	BOUNDARY:- County, Municipality or Town ship 市町界		Line Weight: 0.23mm 1.2mm 1.2mm 60 dot red screen (75/25 diagonal)	BLACK RED- Screen 黒色 赤色 1994-7			DITTO 同上	
	4	BOUNDARY:- Sub-county, Yard or Gambolola 区界、地域界		60 dot red screen (75/25 diagonal)	RED- Screen 赤色 1994-7				
	5	BOUNDARY:- National park, Game or Nature reserve 国立公園、鳥獣区界		Line Weight: 0.23mm 3.8mm 1.4mm 60 dot red screen (75/25 diagonal)	BLACK RED- Screen 黒色 赤色 1994-7			RED 赤色	
	6	TERRITORIAL SRY. IN INDEX TO ADJ SHEETS 凡例表図中の境界		Line Weight: 0.46mm	RED 赤色			DITTO 同上	

ITEMS 分類	NO.	NAME 名称	FINAL PRODUCT 地図記号	SPECIFICATIONS 仕様	COLOR 色	INTERPRETATION 判読記号	PLOTTING 図化記号	COMPILATION 編集記号	APPLICATION RULES 図式適用規定
Control Points 基準点他	1	TRIGONOMETRICAL STATION:- Primary 一等三角点	UP50 △ 1319 UP65 △ 1184	Line Weight: 0.15mm △ △ 0.18mm Pillar G.S. 7pt F. R.Roman(Caps)	BLACK 黒色			(Same as final product) BLACK 黒色	Shall be annotated point number and elevation in meter, and point name shall be annotated for numberless point. Decimals of control points and BM points height shall be rounded to the nearest whole number. However, in case of 0.5 decimal shall be rounded to the nearest even whole number.
	2	TRIGONOMETRICAL STATION:- Secondary 二等三角点	64X7 ▽ 1333 72X6 ▽ 1281	The same as above but inverted	BLACK 黒色			DITTO 同上	
	3	TRIGONOMETRICAL STATION:- Others その他、三・四等点	24Y3 ⊙ 1365 23Y4 ⊙ 1284	Line Weight: 0.15mm 0.38mm ⊙ ⊙ 1.6mm Pillar G.S. 7pt F. R.Roman(Caps)	BLACK 黒色			DITTO 同上	点番号と標高を付記する。点番号のない場合には、その点名を注記する。標高値は、その小数一位を四捨五入した値を記入する。（標柱、標石の区分は地形で判断し、山頂にある点を標柱とし、そのほかをG.S.点とする。）
	4	G.P.S.POINT GPS基準点	(GPS) ▽ 1278	The same as above but annotated (GPS) ▽ 0.38mm	BLACK 黒色			DITTO 同上	GPS points shall be second order. GPS基準点は2等点扱いとする。
	5	BENCH MARK 水準点（固定点）	· 1240 BM	0.18mm dia.	BLACK 黒色			DITTO 同上	Sprit level point (Permanent Station) 直接水準測量による固定点のみを表示し、附点はBMとしない。
	6	SPOT HEIGHT 標高点	· 1154	The same as above	BLACK 黒色			DITTO 同上	
	7	PHOTO CENTER WITH SORTIE NO. 写真主点	JICA/95 ┼ R33-3	Line Weight: 0.13 mm ┼ 5.0mm sq. 7pt F. R.Roman(Caps)	RED 赤色			DITTO 同上	Shall be arranged in flight direction and annotated completely for the points at both ends nearest to neatline, and only photo number for the intermediate points. 飛行方向に並べる。図葉両端以外の主点は写真番号のみ注記する。
	8	BOUNDARY PILLAR 境界石	▲	Side length: 1.2mm Inside: black-solid	RED 赤色			DITTO 同上	

UGANDA 1/50,000 MAP SYMBOLS

NO.11

ITEMS 分類	NO.	NAME 名称	FINAL PRODUCT 地図記号	SPECIFICATIONS 仕様	COLOR 色	INTERPRETATION 原図記号	PLOTTING 図化記号	COMPILATION 編集記号	APPLICATION RULES 図式適用規定
Natural Topographic Features and Contour Lines 自然地形及び等高線	1	FLAT ROCK 平岩		Symbol No.21	BLACK 黒色	(On the photographs) RED  赤色	(Actual shape) BRAWN  茶色	(Same as final BLACK product) 黒色	Minimum size to be shown shall be 400m x 400m or equivalent. 400m x 400m 以上を表現する
	2	BOULDER ROCK 取岩		Symbol No.22	BLACK 黒色	(Ditto) RED  赤色	(Ditto) BRAWN  茶色	DITTO 同上	DITTO 同上
	3	OUTCROP ROCK 露岩		Symbol No.23	BLACK 黒色	(Ditto) RED  赤色	(Ditto) BRAWN  茶色	DITTO 同上	DITTO 同上
	4	CLIFF 絶崖		Symbol No.24	BLACK 黒色	(Ditto) RED 赤色	(Ditto) BRAWN 茶色	DITTO 同上	DITTO 同上
	5	LAVA 熔岩		Symbol No.19	BLACK 黒色	(Ditto) RED  赤色	(Ditto) BRAWN  茶色	(Ditto) BLACK & GREEN 黒色及び緑色	DITTO 同上
	6	CRATER 噴火口		Symbol No.20	BLACK 黒色	(Ditto) RED  赤色	(Ditto) BRAWN  茶色	DITTO 同上	DITTO 同上
	7	QUARRY 石切場、採石場		Symbol No.25	BLACK 黒色	(Ditto) RED  赤色	(Ditto) BRAWN  茶色	(Ditto) BLACK 黒色	DITTO 同上
	8	STEEP SLOPE 崩土		Symbol No.20	BLACK 黒色	(Ditto) RED  赤色	(Ditto) BRAWN  茶色	DITTO 同上	
	9	SAND or MAR:- land 砂原（内陸）		14 diatone reduced 3/5	BROWN 茶色	(Ditto) RED  赤色	(Ditto) BLACK  黒色	BRAWN &GREEN 茶色及び緑色	Minimum size to be shown shall be 400m x 400m or equivalent. 400m x 400m ，又は同等以上のものを表現する。

UGANDA 1/50,000 MAP SYMBOLS

NO.12

ITEMS 分類	NO.	NAME 名称	FINAL PRODUCT 地図記号	SPECIFICATIONS 仕様	COLOR 色	INTERPRETATION 判読記号	PLOTTING 図化記号	COMPILATION 編集記号	APPLICATION RULES 図式運用規定
Natural Topographic Features and Contour Lines 自然地形表現及び等高線	10	SAND or HAB:- Coastal 砂浜（海岸）		0.15mm 0.33mm 0.25 0.43	BROWN 茶色	(On the photographs) RED SAND 赤色	(Actual shape) BLACK SAND 黒色	BRAWN & GREEN SAND 茶色及び緑色	Minimum size to be shown shall be 400m x 400m or equivalent. 400m x 400m，又は同等以上のものを表示する。
	11	SAND DUNE 砂丘		The same as Above	BROWN 茶色	(Ditto) RED SD 赤色	(Ditto) RED SD 赤色	BRAWN & GREEN SD 茶、緑色	DITTO 同上
	12	CONTOUR 等高線	250	Line weight: 0.13mm 250	BROWN 茶色		(Ditto) ORANGE 橙色	ORANGE 橙色	
	13	INDEX CONTOUR (every fifth) 計曲線（五本毎）	250	Line weight: 0.23mm 250	BROWN 茶色		(Ditto) BLACK 黒色	BLACK 黒色	
	14	INTERMIDIATE CONTOUR 補助曲線	250	Line weight: 0.13mm 4.0mm 0.3mm	BROWN 茶色		(Ditto) ORANGE 橙色	ORANGE 橙色	Shall be drawn at the space of contour line of more than 2cm on maps. 等高線間隔が、図上 2cm 以上空く所に表示する。
	15	APROXIMATE CONTOUR 不確定等高線		5.0mm 1.0mm	BROWN 茶色		(Ditto) BLACK 黒色	(Same as final product) BLACK 黒色	
	16	DEPRESSION CONTOURS 凹地	500 480	1.2mm 0.8mm	BROWN 茶色		(Ditto) BLACK 黒色	BLACK 黒色	Ticks shall be shown only on the heighest and lowest of each depression. テック記号は、各凹地のいちばん高い等高線といちばん低い等高線のみに入れる。
	17	CONTOUR NUMBER 等高線数値	600	7pt Gill S.N.(Figs)	BRAWN 茶色		BLACK 600 黒色	BLACK 600 黒色	Contour number should read uphill and from the bottom of sheet in scattered formation. 等高線数値は、山の高い方向に向かい、しかも正方向に見えるように散在させる（逆字はさける。等高線数値に底とする。）

UGANDA 1/50,000 MAP SYMBOLS

NO.12

ITEMS 分類	NO.	NAME 名称	FINAL PRODUCT 地図記号	SPECIFICATIONS 仕様	COLOR 色	INTERPRETATION 判読記号	PLOTTING 製化記号	COMPILATION 成果記号	APPLICATION RULES 図式適用規定
Hydrography and Others 自然水系及びその他	1	COAST LINE 海岸線		Line weight: 0.18mm Sea side 80 dot blue diagonal screen	BLUE 青色		(Actual shape) BLUE 青色	PURPLE 紫色	Shore shall be shown high tide level 海岸線は満潮線を表示する。
	2	COAST LINE:- Indifinite 不定海岸線		Line weight: 0.18mm 2.4mm / 0.6mm	BLUE 青色		(Ditto) BLUE 青色	PURPLE 紫色	
	3	LAKE:- Large 湖（大）	Lake	Line weight: 0.18mm 80 dot blue diagonal screen	BLUE 青色	(On the potographs) RED Lake 紫色	(Ditto) BLUE Lake 青色	PURPLE Lake 紫色	The lake name shall be annotated,if any. 湖の名称があれば注記する。
	4	LAKE:- Small 湖（小）	Lake	The same as above	BLUE 青色	(Ditto) RED Lake 紫色	(Ditto) BLUE Lake 青色	PURPLE Lake 紫色	Maximum size to be shown shall be 400m x 400m or equivalant. 図上、8mm x 8mm 以下の湖
	5	POND 池	Pond	Blue solid	BLUE 青色	(Ditto) RED Pond 紫色	(Ditto) BLUE Pond 青色	PURPLE Pond 紫色	Under 100m x 100m or equivalant 図上、2mm x 2mm 以下の池
	6	RIVER: Double line (over 0.6mm wide) 二条河川		Line weight: 0.18mm 80 dot blue diagonal screen	BLUE 青色		(Ditto) BLUE 青色	PURPLE 紫色	River which is more than 30m in width shall be shown as double line, and annotated the name within double line if room. 二条河川は、図上 0.6mm 以上として、その名称はスペースがある限り河幅に注記する。
	7	RIVER or WATER COURSE:- Single line 一条河川、流水線		0.15mm / 0.12mm	BLUE 青色		(Ditto) BLUE a b 青色	PURPLE a b 紫色	Clear water courses shall be shown as river, in spite of no running water. 明瞭な谷の流水線は、水流上に水が無くても、川として画測する。
	8	RIVER or WATER COURSE:- Indifinite 不定流水線		Line weight: same as above 0.6mm / 2.4mm	BLUE 青色		(Ditto) BLUE 青色	PURPLE 紫色	River which is infinitive running course 流水経路の不明瞭な河川
	9	SPLIT STREAM 分岐流水		Line Weight: - Main course 0.25mm Split 0.18mm	BLUE 青色	(Ditto) Blue 青色	(Ditto) Blue 青色	PURPLE 紫色	

UGANDA 1/50,000 MAP SYMBOLS

NO.14

ITEMS 分類	NO.	NAME 名称	FINAL PRODUCT 成図記号	SPECIFICATIONS 仕様	COLOR 色	INTERPRETATION 調測記号	PLOTTING 図化記号	COMPILATION 編集記号	APPLICATION AND RULES 図式適用規定
Hydrography and Others 自然水系及びその他	10	WATERFALLS:- Single Double 滝		Line Weight: 0.13mm 0.4mm 0.75mm Stick-up symbol	BLUE 青色	(On the photographs) RED & Blue 赤色及青色	(Actual shape) RED & BLUE 赤色及青色	RED & PURPLE 赤色及び紫色	
	11	RAPIDS:- Single Double 急流、早瀬		Stick-up symbol	BLUE 青色	(Ditto) RED & Blue 赤色及青色	(Ditto) RED & BLUE 赤色及青色	RED &PURPLE 赤色及び紫色	
	12	DAM:- Large water area ダム（大）		Line Weight: 0.25mm 0.3mm 7pt F.H.Roman (Caps)	BLACK BLUE 黒色 青色	(Ditto) RED & Blue 赤色及青色	(Ditto) RED & BLUE 赤色及青色	RED & PURPLE 赤色及び紫色	Shall be annotated if any. あればその旨記する。
	13	DAM:- Small water area ダム（小）	DAM	Line Weight: 0.18mm 1.2mm 1.8mm blue solid	BLACK BLUE 黒色 青色	(Ditto) RED & Blue DAM 赤色及青色	(Ditto) RED & BLUE DAM 赤色及青色	(Ditto) RED & PURPLE DAM 赤色及び紫色	Maximum size to be shown shall be 100m x 100m or equivalent. 100m'以下のものを表示する。
	14	DAM:- Sub-surface 地下ダム	DAM	Line Weight: 0.18mm 1.2mm 1.8mm 7pt F.H.Roman(Caps)	BLACK 黒色	(Ditto) RED & Blue DAM 赤色及青色	(Ditto) RED & BLUE DAM 赤色及青色	RED & PURPLE DAM 赤色及び紫色	
	15	BORE HOLE,WELL, WATER HOLE 掘抜井、井戸、水溜		Line Weight: 0.15mm 1.2mm	BLUE 青色	(Ditto) BLUE BH W WH VH 青色	(Ditto) BLUE BH W WH 青色	RED & PURPLE BH W WH 赤色及び紫色	
	16	WATER TANK 水タンク	■ TANK	1.2mm blue solid	BLUE 青色	(Ditto) BLUE WT 青色	(Ditto) BLUE WT 青色	PURPLE WT 紫色	
	17	OIL TANK オイルタンク	○ OIL TANK	Line Weight: 0.15mm 1.2mm	BLUE 青色	(Ditto) BLUE OT 青色	(Ditto) BLUE OT 青色	PURPLE OT 紫色	
	18	DITCH,WATER FURROW Etc. 水路、溝等	Ditch	Line Weight: 0.15mm 7pt Futura S.E.(B/L)	BLUE 青色	(Ditto) BLUE Ditch 青色	(Ditto) BLUE Ditch 青色	PURPLE Ditch 紫色	

UGANDA 1/50,000 MAP SYMBOLS

NO.15

ITEMS 分類	NO.	NAME 名称	FINAL PRODUCT 成図記号	SPECIFICATIONS 仕様	COLOR 色	INTERPRETATION 判読記号	PLOTTING 図化記号	COMPILATION 編集記号	APPLICATION RULES 図式適用規定
Hydrography and Others 水系及その他	1	DRAIN.PIPE LINE Etc. 排水、パイプライン等	Underground Pipeline Pipeline	Line Weight: 0.13mm 2.5mm 0.8mm 7pt Futura M.E.(8/L)	BLACK 黒色	(On the photographs) RED UP ? 赤色	(Actual shape) BLUE UP ? 青色	PURPLE UP ? 紫色	

UGANDA 1/50,000 MAP SYMBOLS

NO.16

ITEMS 分類	NO.	NAME 名称	FINAL PRODUCT 地図記号	SPECIFICATIONS 仕様	COLOR 色	INTERPRETATION 原図記号	PLOTTING 図化記号	COMPILATION 編集記号	APPLICATION RULES 図式適用規定
Vegetation 植生	1	FOREST 森林		Symbol No.1 black green solid	BLACK GREEN 黒色 緑色	(On the photographs) RED 赤色	(Actual area) BLACK & GREEN same shape as interpretation 黒色及び緑色	(Same as final product) BLACK & GREEN 黒色及び緑色	Dence forest with tall trees Minimum size to be shown 400m x 400m or equivalent. 樹木の密度が濃く、樹高が高く茂っている森。 （縦横 8mm x 8mm 以上を表示する。）
	2	THICKET ヤブ、茂み		Symbol No.2 black green solid	BLACK GREEN 黒色 緑色	(Ditto) RED 赤色	DITTO 同上	DITTO 同上	Mixuture of tall and low trees Minimum size to be shown as above. 高いヤブと低木の茂っているもの。 （縦横 8mm x 8mm 以上を表示する。）
	3	BAMBOO 竹林		Symbol No.10 black green solid	BLACK GREEN 黒色 緑色	(Ditto) RED 赤色	DITTO 同上	DITTO 同上	Minimum size to be shown as above. （縦横 8mm x 8mm 以上を表示する。）
	4	PLANTATION:- Coffee, Sisal, Sugar Palm, Wattle, Cashew nut ﾌﾟﾗﾝﾃｰｼｮﾝ:-ｺｰﾋｰ、ｻｲｻﾞﾙ、ｻﾄｳﾔｼ、ｱｶｼｱ、ｶｼｭｰﾅｯﾂ、ｿﾉﾎｶ	C ｺ	Symbol No.7 black green,30 line ruling 30/70 at 45 (NE,SW)	BLACK GREEN 黒色 緑色	(Ditto) RED C, S, Su P, W, Ca 赤色	DITTO 同上	DITTO 同上	Minimum size to be shown as above. Annotated by symbol No.7 for Palm, and by letter other known crops. 7pt. Futura Book Lower (U/L)
	5	WOODLAND 疎木		Symbol No.1 (3/4 spacing)	BLACK 黒色	(Ditto) RED 赤色	DITTO 同上	DITTO 同上	Tall trees scattered in grassland Minimum size to be shown as above. 比較的に地上が開けていて、樹木が散在する場所ーアカシア疎等。
	6	SCRUB 灌木		Symbol No.3	BLACK 黒色	(Ditto) RED 赤色	DITTO 同上	DITTO 同上	Dence but not tall, dence with smaller than 5m trees(shrubs). Minimum size to be shown as above. 樹木5m以内の灌木の多く茂っている場所。
	7	SCATTERED TREES 散在樹木		Symbol No.2	BLACK 黒色	(Ditto) RED 赤色	DITTO 同上	DITTO 同上	Tall trees scattered in grassland Minimum size to be shown as above.
	8	SCRUB WITH SCATTERED TREES 灌木、疎木の混合		Symbol No.2,3 (mixture) replacing scrub symbol (more scub than tree)	BLACK 黒色	(Ditto) RED 赤色	DITTO 同上	DITTO 同上	Tall trees scattered in the area of shrub Minimum size to be shown as above.
	9	PALMS ヤシ林		Symbol No.7	BLACK 黒色	(Ditto) RED 赤色	DITTO 同上	DITTO 同上	

UGANDA 1/50,000 MAP SYMBOLS

NO.17

ITEMS 分類	NO.	NAME 名称	FINAL PRODUCT 原稿記号	SPECIFICATIONS 仕様	COLOR 色	INTERPRETATION 原版記号	PLOTTING 製化記号	COMPILATION 原版記号	APPLICATION AREAS 図式適用地域
Vegetation 植生	10	CULTIVATION 耕地	CULTIVATION	Annotated 6pt.Universal Light	BLACK 黒色	(On the photographs) RED Cu 赤色	(Actual area) BLACK & GREEN Cu 黒色及び緑色	(Same as final product) BLACK & GREEN Cu 黒色及び緑色	
	11	TREE LINE 樹林線（並木）		Stick-up symbol (symbol No.2)	BLACK 黒色	(Ditto) RED 赤色	(Actual shape) BLACK 黒色	(Ditto) BLACK 黒色	
	12	RIVERINE TREES 川沿樹木		Green solid band Centerized over river not less than 1.5mm wide	GREEN 緑色	(Ditto) RED RT 赤色	(Actual area) GREEN & BLUE 緑色及び青色	(Ditto) GREEN & BLUE 緑色及び青色	
	13	MANGROVE SWAMP マングローブ湿地		Symbol No.50 green 133 dot 20% screen at 45	BLUE GREEN Screen 青色 緑色 スクリーン	(Ditto) BLUE 青色	(Ditto) BLUE & GREEN 青色及び緑色	(Ditto) PURPLE & GREEN 紫色及び緑色	
	14	TREE SWAMP 木の生えた湿地		Symbol No.13 green 133 dot 20% screen at 45	BLUE GREEN Screen 青色 緑色 スクリーン	(Ditto) BLUE 青色	(Ditto) BLUE & GREEN 青色及び緑色	DITTO 同 上	
	15	PAPYRUS SWAMP, MARSH or BOG パピルス湿地、沼地、湿地		Symbol No.14	BLUE 青色	(Ditto) BLUE 青色	(Ditto) BLUE & GREEN 青色及び緑色	DITTO 同 上	
	16	SEASONAL SWAMP 季節的湿地		Symbol NO.49	BLUE 青色	(Ditto) BLUE 青色	(Ditto) BLUE & GREEN 青色及び緑色	DITTO 同 上