shallower water is likely to exist, interlines will be sounded.

(9) Supplementary sounding or resounding will be conducted as follows:

- In case where sounding line intervals have become more than 20% wider than the planned interval, interline sounding will be conducted.
- In case where a depth of less than 30m is likely to exist in between the sounding lines which is considered to be dangerous to navigation, supplementary sounding will be conducted to confirm the least depth.
- Resounding will be conducted in such waters where the echogram shows an extraordinary record, illegible record, or lack of record.
- In case where the difference between soundings at the crossing point of a principal sounding line and a cross-check sounding line exceeds twice the value of the accuracy of sounding, resounding will be carried out when the previous sounding data are considered to have exceeded an allowable error.

2-2-3. Post-work in Japan (Common to Phase II through Phase IV)

2-2-3-1. Data processing

Data processing will be carried out as follows:

(1) Control point survey

Computation of control points will be performed by a computer.

(2) Coastline survey

Data for drawing coastlines will be processed.

(3) Tidal observation

Tidal data will be processed to obtain the zero of the tide gauge, MSL and DL with reference to BM on land.

(4) Sounding

- Soundings will be read out to 0.1m order for those shallower than 31m, and to 1m order for deeper ones, disregarding the fractions.
- Soundings of shallower than 200m will be corrected for tidal heights.
- Soundings for which bar-check was carried out, the reading-scale prepared from the results of bar-check will be used for underwater sound velocity correction, while for deeper soundings the correction tables will be used.

2-2-3-2. Preparation of manuscript sheets

(1) Control point sheet

(2) Coastline sheet

(3) Sounding sheet

(4) Bathymetric plotting sheet

2-2-3-3. Preparation of smooth sheet of survey

(1) The smooth sheet will be produced on the scale of 1/150,000.

(2) As for the projection of the smooth sheet, Transverse Mercator Projection will be adopted.

(3) Depth contours to be drawn will be those of 2m, 5m, 10m, 20m, 200m and every 1000m.

(4) Drawing of various data will be made in accordance with the Specifications adopted by JHD, and IHO Chart Specifications where there is no Japanese specification.

2-2-3-4. Inspection of smooth sheet of survey

The smooth sheet of survey thus prepared will undergo inspection by the Japan Hydrographic Association in due course.

2-2-3-5. Preparation of Progress Report (Common to Phase II through Phase IV)

Progress Report incorporating the progress of work up to the current phase as well as problems encountered and solved and tasks for future work will be prepared and submitted to the Fiji Government.

2-3. THE STUDY IN PHASE III (F.Y.1996)

2-3-1. Work in Fiji

2-3-1-1. Tidal observation

(1) Establishment of tide station

- A self-recording tide gauge will be set at the pier of Vanua Balavu.
- Levelling will be conducted between the tide gauge and the Bench Mark (BM) established in Phase II to find the relationship with the value obtained in Phase II.

(2) Determination of Mean Sea Level (MSL) and Datum Level for soundings (DL)

The MSL and DL for the area F6 will be determined by the data from the Vanua Balavu tide station, based on the data processing in the same manner as in Phase II and compared to the previous values.

2-3-1-2. Co-operation in technology transfer in Vanua Balavu lagoon survey

(1) Co-operation by experts

Two Japanese experts will join FHS survey team for their hydrographic survey in the lagoon of Vanua Balavu (Exploring Isles) to render technology transfer to Fiji counterpart personnel. The survey area is as shown in Fig.5.

(2) Provision of equipment

The Study Team will provide the FHS survey team with survey equipment as follows:

- Survey launch : About 5 tons (locally chartered)
- Positioning system : Available for real time data processing
- Four-beam echo sounder for shallow water use : Equivalent to the one to be equipped aboard SMB BABALE.
- Side-scan Sonar : Equivalent to the one to be used in Phase II.

2-3-2. Post-work in Japan

2-3-2-1. Production of nautical charts (Common to Phase III through Phase V)

The production of nautical charts Nos.F2, F6 and F7 will be undertaken by JHD upon receipt of the results of the hydrographic surveys and other relevant materials and data from JICA.

2-3-2-1-1. Chart specifications common to the three charts to be produced

i. Projection: Mercator Projection

ii. Geodetic system: Fiji Geodetic Datum (FGD), which is equivalent to WGS 72

iii. Chart scale: 1:150,000

iv. Chart paper: The same paper as currently used by JHD; size 1,085 × 765mm, weight 140g/m^2

v. Unit of measure for depths: In metres and reduced to Chart Datum, which is approximately the level of Lowest Astronomical Tide (LAT)

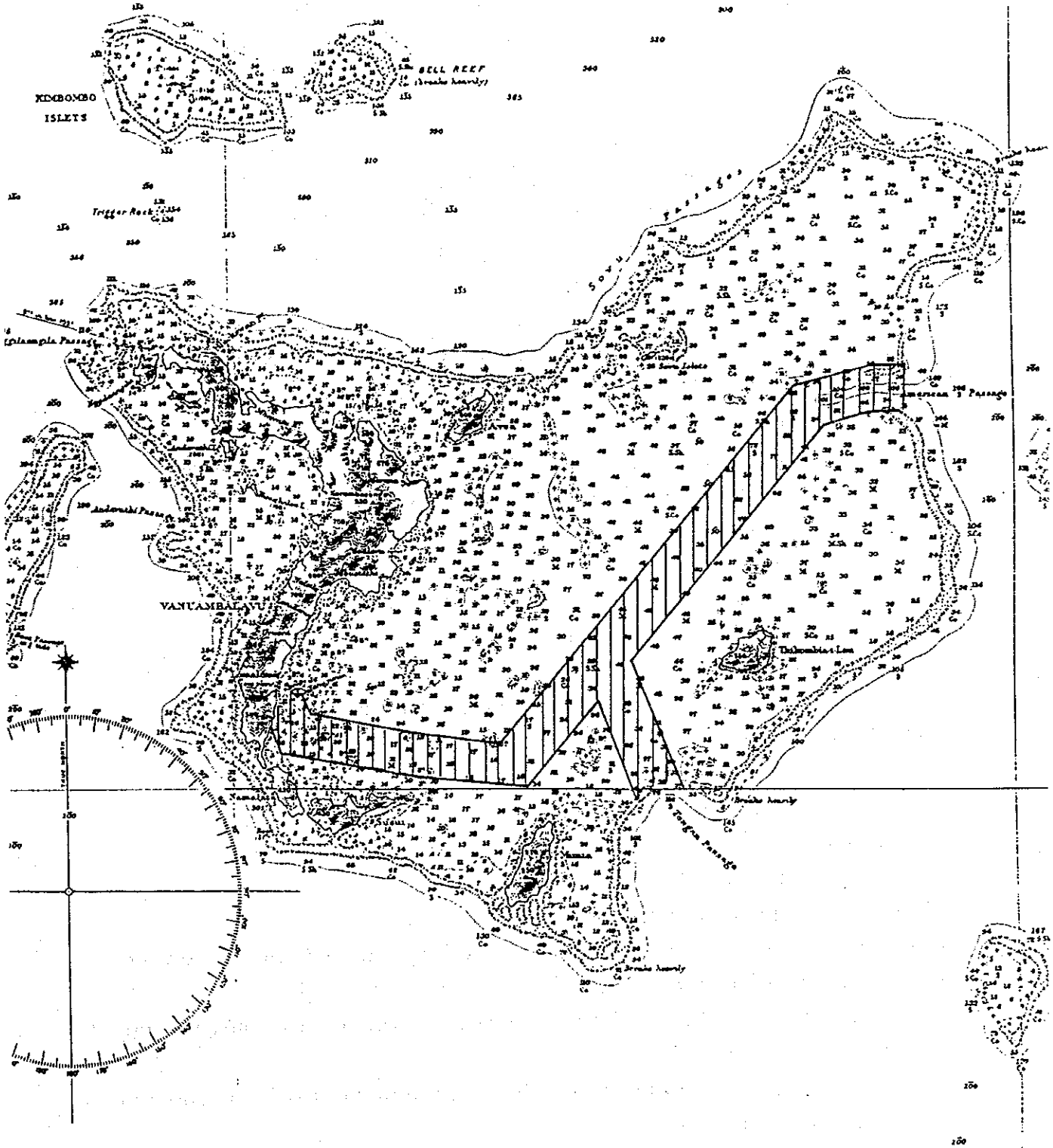
vi. Unit of measure for heights: In metres and above Mean High Water Springs

vii. Title block including:

- Title of the chart
- FHS seal
- General geographical area and specific geographical reference

Fig. 5

HYDROGRAPHIC SURVEY IN VANUA BALAVU LAGOON



Legend

Study area

0 5 10 20km

- Chart scale
- Unit of measure for depths and heights
- Name and date of the horizontal datum used
- Name of the projection used

viii. Graticules: Every 15 minutes of latitude and longitude
ix. Graduation in the borders: Every 0.2 minute
x. Source diagram : Showing source material data
xi. Conversion table: For metres/fathoms/feet
xii. Compass roses: Three compass roses on each chart

2-3-2-1-2. Compilation planning

Based on the results of hydrographic surveys as well as the existing data and information collected, the planning sheet and the planning note will be prepared for each chart.

(1) Preparation of planning sheet

The following items will be indicated on the planning sheet:

i. Borders and neatlines of the chart
ii. Graticules
iii. Graduation
iv. Information on and the coverage of the existing data to be adopted on the chart
v. Chart title
vi. Notes to be given in the title block
vii. Chart number
viii. Tidal notes
ix. Cautionary notes
x. Submarine cables
xi. Source diagram
xii. Geographical names
xiii. Other data and information to be adopted on the chart

(2) Preparation of planning note

The planning note will be prepared, listing or indicating the following items:

i. Type of the chart (new chart or new edition of the chart) to be produced
ii. Ellipsoid of reference
iii. Chart scale and projection
iv. Coverage and neatline dimensions, as well as the corner coordinates
v. Units of measures
vi. List of source materials to be adopted

vii. Use of colours

viii. Positions of compass roses, as well as magnetic variations and their annual change

ix. Other data and information as well as directions and instructions necessary for compilation of the chart

2-3-2-1-3. Preparation of Drawing Guide

Based on the planning sheet and the planning note prepared, the Drawing Guide will be prepared on the plasting film exactly on the same scale as that of the chart to be produced.

2-3-2-1-4. Preparation of Chart Original

(1) Chart drawing

The original drawing (Chart Original) of the chart which is a manuscript for platemaking will be prepared based on the Drawing Guide prepared, in conformity with the IHO Chart Specifications. The chart original will be prepared on the plastic sheets by the scribing method, and sounding figures, chart symbols, compass roses, and geographical names and various type faces which are to be given on the chart will be prepared by phototypesetting and stuck up on the plastic sheets.

(2) Two sheets of the chart original will be prepared, one for black colour and the other for magenta colour.

2-3-2-1-5. Verification and insepction of Chart Original completed

The Chart Original (original drawing) will be checked for consistency, accurcy and adequacy according to the contents of the drawing guide. The chart representation will also be examined. Items to be checked and inspected include the following:

(1) The format as a nautical chart.

(2) The original drawing is examined to ensure that it does not exceed maximum possible printing size.

(3) Whether the original drawing is drafted in accordance with the Chart Specifications of the IHO.

(4) Whether the contents are adequately checked to suit the purpose of the chart.

(5) Whether the representation of the chart is comprehensive to users.

(6) Ensure that it is checked up to the latest Notice to Mariners affecting the chart to be printed.

The charted information has to be updated according to additional data and Notices to Mariners. Such additions or amendments will be incorporated or made on the original drawing up to the time of the platemaking process.

2-3-2-1-6. Platemaking

(1) Preparation of original plates

By using the Chart Original completed, the following original plates (negative films) will be prepared:

i. Original plate for black colour (for chart borders and neatlines, coastlines, geographical names, etc.)

ii. Original plate for magenta (for distinguishing information superimposed)

iii. Original plate for buff (for land tint)

iv. Original plate for blue (for shallow water)

(2) Preparation of machine plates

By using each of four original plates (negative films) prepared, the machine plates will be prepared by printing negative images on the PS plates, for which the final checking and inspection will be made.

2-3-2-1-7. Chart printing

(1) Using the printing plates made from the chart original prepared by JHD, 200 copies of the nauticai charts will be printed.

(2) Printing specifications

- Type of printing : Offset printing
- Colour : In four colours

(3) Inspection

The contents of the printed charts will undergo inspection by the Japan Hydrographic Association.

2-3-3. Production of Nautical Chart No.F2

Basic factors and principles will be as follows:

(1) Corner coordinates: 16°46′58″S, 15°55′00″S
179°32′57″E, 179°04′30″W

(2) Scale: 1:150,000 (at Lat.16°20′S)

(3) Graticules: Every 15 minutes of latitude and longitude

(4) Graduation of latitude and longitude on the chart borders:
Every 0.2 minute

(5) Graticules graduated: One parallel of 16°20′S
Two meridians of 180° and 179°30′W

(6) Existing source materials to be adopted:

For compilation of Chart No.F2, the existing copies of the smooth sheets covering the area concerned, the Charts Nos.F50 and F51 as well as BA Chart No.495 will be adopted for the areas other than those where the hydrographic survey will be carried out under the Study.

2-4. THE STUDY IN PHASE IV (F.Y.1997)

2-4-1. Work in Fiji

2-4-1-1. Tidal observation

(1) Establishment of tide station

A tide station will be established at Vanua Balavu and tidal observation will be conducted in the same manner as in the previous Phase.

(2) Erection of tide pole and observation

A tide pole will be erected at Lakeba.

(3) Determination of MSL and DL

The MSL and DL for the area F7 will be determined by comparison between the data from Lakeba tide pole observation and those from the Suva and Vanua Balavu tide stations.

2-4-2 Post-work in Japan

2-4-2-1. Production of Nautical Chart No.F6

Basic factors and principles will be as follows:

(1) Corner coordinates: 17°59′33″S, 16°40′00″S
179°25′00″W, 178°30′55″W

(2) Scale: 1:150,000 (at Lat.17°20′S)

(3) Graticules: Every 15 minutes of latitude and longitude

(4) Graduation of latitude and longitude on the chart borders:
Every 0.2 minute

(5) Graticules graduated: Two parallels of 17°S and 17°30′S
One meridian of 179°W

(6) Existing source materials to be adopted:

For compilation of Chart No.F6, depths in lagoon areas will be adopted from the existing BA Charts Nos.440, 441 and 416. For the area in Vanua Balavu, the results of the hydrographic survey to be carried out during the Study will be adopted.

2-5. THE STUDY IN PHASE V (F.Y.1998)

2-5-1. Work in Fiji

2-5-1-1. Survey of the existing status of the operation and management system for hydrographic surveying and nautical charting in Fiji

(1) Survey will be made to the existing status of the organization, human resources (number of personnel, expertise, capacity), facilities and equipment (survey vessels, instruments for control point survey, hydrographic survey, oceanographic observation, nautical charting), recent work results, financial status, maintenance, arrangements and storage of nautical charts and relevant data and information, chart publication plan, etc. of FHS which is responsible for the planning, maintenance, production and management of nautical charts in Fiji.

(2) Analytical study of the results and findings of the survey will be made by JHO.

(3) Discussions will be held afterwards between FHS and Study Team to finalize the draft Final Report on the recommendation prepared by JHD.

2-5-2. Post-work in Japan

2-5-2-1. Drafting of recommendation

Based on the relevant data and information obtained by the survey and analytical study thereof on the current conditions and problems in operation and management system of hydrographic surveying and nautical charting in FHS, drafting of recommendation will be performed by JHD for discussion with FHS afterwards.

2-5-3. Production of Nautical Chart No.F7

Basic factors and principles will be as follows:

(1) Corner coordinates: 19° 04′ 40″ S, 17° 45′ 00″ S
179° 06′ 30″ W, 178° 11′ 16″ W

(2) Scale: 1:150,000 (at Lat.18° 20′ S)

(3) Graticules: Every 15 minutes of latitude and longitude

(4) Graduation of latitude and longitude on the chart borders:
Every 0.2 minute

(5) Graticules graduated: Two parallels of 18° 15′ S and 18° 45′ S
One meridian of 178° 45′ W

(6) Existing source materials to be adopted:
For compilation of Chart No.F7, depths in lagoon areas will be adopted from the existing BA Charts Nos.416 and 441.

2-5-4. Preparation of Final Report

(1) Recommendation for improvement of the operation and management system of hydrographic surveying and nautical charting in Fiji

Comments on the Draft Final Report will be received from the Fiji side within one month after the submission, and the Final Report will be prepared by incorporating any corrections and additions as necessary.

(2) Report on the Whole Work of the Study

Based on the Progress Reports prepared in Phases I to V, the Report on the Whole Work of the Study will be compiled.

2-5-5. Submission of Final Report

The Final Report composed of the Report on the Whole Work of the Study and the Recommendation for Improvement of the Operation and Management System of Hydrographic Surveying and Nautical Charting in Fiji will be submitted to the Government of Fiji together with the Final Products of the Study as undermentioned.

2-6. Final Products of the Study

2-6-1. Re : Smooth Sheets of Survey and Nautical Charts

Work	Product	Ph.I	Ph.II	Ph.III	Ph.IV	Ph.V
Coastline drawing	Coastline sheets	■F2, 6,7				
Control point survey	Final reslults		■F2	■F6	■F7	
	Control point sheet		■F2	■F6	■F7	
Coastlining	Coastlining data		■F2	■F6	■F7	
	Coastline sheet		■F2	■F6	■F7	
Tidal observation	Marigram		■F2	■F6	■F7	
	Results of levelling		■F2	■F6	■F7	
	DL determination book		■F2	■F6	■F7	
Sounding	Sounding record		■F2	■F6	■F7	
	Position fixing record		■F2	■F6	■F7	
	Sounding sheet		■F2	■F6	■F7	
	Bathymetric plotting sheet		■F2	■F6	■F7	
Smooth sheet of survey	Smooth sheet of survey		■F2	■F6	■F7	
	Inspection certificate		■F2	■F6	■F7	
Nautical chart	Nautical chart			■F2	■F6	■F7
	Inspection certificate			■F2	■F6	■F7

Note : F2, F6 and F7 indicate the chart number or the area thereof.

2-6-2. Re : Reports (Number of copies to be produced)

Product	Ph.I	Ph.II	Ph.III	Ph.IV	Ph.V
Plan of Operation (English)	27	27	27	27	27
Progress Report (English)	27	27	27	27	
Draft Final Report (DF/R) (English)					27
Summary of DF/R (English) (Survey and analysis of hydrographic surveying and nautical charting in Fiji)					27
do. (Japanese)					7
Final Report (F/R) (English) (Recommendation for improvement)					60
Summary of F/R (English)					60
do. (Japanese)					20
Report on the Whole Work of Study (English)					60

IV. ORGANIZATION

1. Study Team

The organization of the Team and the task of each member in the field will be as shown in Appendices 3 and 4, respectively.

2. Equipment and instruments

Survey equipment and instruments to be used in the Study will be as shown in Appendix 5.

3. Work schedule

Daily, weekly and monthly work schedule will, in principle, be as follows:

3-1. Daily schedule

The work aboard the survey vessel will be for 12 hours by two shifts.

3-2. Weekly schedule

Working days will be Monday through Saturday. There will be no work on Sunday.

3-3. Monthly schedule

The survey vessel will return to Port of Suva once every 30 days in the field for rest and replenishment for four days.

4. Safety measures

(1) The safety measures including an emergency communication network (Appendix 6) will be prepared and distributed among Study Team members.

(2) The weather forecast from Suva Radio and Radio Fiji will be watched continually to grapse daily weather and sea conditions so that safe operation of the survey vessel may be secured.

(3) In case of emergency or avoiding any danger to navigation, all the Study Team members will be under the command of the master of the survey vessel.

(4) Every effort shall be exerted for safe custody of the survey instruments and materials.

V. IMPLEMENTATION PLAN OF THE STUDY IN PHASE I (F.Y.1994)

1. Pre-work in Japan

1-1. Collection and study of relevant information and data available

In order to frame an execution plan of the hydrographic survey and nautical charting of the Study area, collection and study will be made as to existing nautical charts, topographical maps, aerial photographs, lists/maps showing geographical names, list of lights and other aids to navigation, index maps of control points, information on the availability of nautical charts and smooth sheets of survey, Notices to Mariners concerned and meteorological and oceanographic data relevant to the Study area.

1-2. Preparation of Plan of Operation (P/O)

The P/O will be prepared to describe the plan of operation for the whole period of the Study including the purpose, work process, details of each item of survey work together with the amount and accuracy, cooperation requested from the Fiji side (provision of counterpart personnel, survey vessels, equipment, materials, etc.), survey results according to the items of work both in Japan and in Fiji for each year and the whole period of Study. Also included will be the implementation plan of the study in Phase I, and undertakings of both the Government of Fiji and JICA.

2. Work in Fiji

2-1. Explanation of P/O to the Fiji side and consultations

The P/O thus prepared will be submitted to the Fiji side and explanation will be given as to the whole Study and the Study in the first year, and consultations will be held to reach agreements on the P/O.

2-2. Acquisition of source materials

Aerial photographs and other materials necessary for drawing coastlines of islands and atolls for the whole Study area will be acquired.

2-3. Confirmation of survey implementation and support systems

The capability, facility and maintenance condition of the survey vessels to be used for the survey from the second year onward, as well as the performance of survey equipment and

instruments aboard will be checked and confirmed. The method for retrieving tidal data from Suva tide station will also be examined and confirmed.

2-4. Reconnaissance of survey sites

To facilitate the work in Phase II onward, reconnaissance of the sites for establishing survey bases and tide stations at Rabi and Vanua Balavu will be made as to e.g. communications conditions, commercial electricity, lodging facilities, availability of materials and expendables for survey operations as well as to various procedural matters necessary for execution of field work.

2-5. Study team

2-5-1. The Study Team will comprise the following personnel:

Mr. Yasuhiro OYAMADA (Aero Asahi Corporation): Leader
Mr. Masao KUGA (Asia Aerial Survey Company): Hydrographic survey
Mr. Masashi SAITO (Aero Asahi Corporation): Control point survey
Mr. Hiromi HAMASAKI (JHD): Nautical charting
Mr. Hideo TANAKA (JHD): Survey instrumentation
Mr. Mitsuyoshi KAWASAKI (JICA): Study management

3. Post-work in Japan

3-1. Drawing of coastlines

Prior to coastlining in the survey site, coastlines of islands and atolls in Charts Nos.F2, F6 and F7 will be drawn by using the aerial photographs (on the scale of 1/50,000) on a transparent plastic sheets, which will then be reduced to the scale of 1/150,000.

As for the northeastern part of Vanua Levu on Chart F2, the drawing will not be made as the coastlines on the existing nautical charts are to be adopted.

3-2. Preparation of Progress Report

A Progress Report of Phase I will be prepared to describe the progress of work, problems encountered and solved, tasks to the future work, etc., and submitted to the Fiji side.

VI. UNDERTAKING OF THE GOVERNMENT OF FIJI

1. To facilitate smooth conduct of the Study, the Government of Fiji shall take necessary measures:

(1) to secure the safety of the Japanese Study Team (hereinafter referred to as "the Team");

(2) to permit the members of the Team to enter, leave and stay in Fiji for the duration of their assignment therein, and exempt them from foreign registration requirements and consular fees;

(3) to exempt the members of the Team from taxes, duties, fees and other charges on equipment, machinery and other materials brought into and out Fiji for the conduct of the Study;

(4) to exempt the members of the 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 Team for their services in connection with the implementation of the Study;

(5) to provide necessary facilities to the Team for unrestricted re-export of equipment and machinery brought into Fiji for the conduct of the Study;

(6) to provide necessary facilities to the Team for remittance as well as utilization of the funds introduced into Fiji from Japan in connection with the implementation of the Study;

(7) to secure permission for entry into private properties or restricted area for the implementation of the Study;

(8) to secure permission for the Team to take all data and documents (including maps and aerial photographs) related to the Study out of Fiji to Japan;

(9) to provide medical services as needed. Its expences will be chargeable on the members of the Team; and

(10) to secure permission to use telecommunication facilities for the execution of the Study.

2. The Government of Fiji shall bear claims, if any arises, against the members of the 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 arise from gross negligence or willful misconduct on the part of the members of the Team.

3. FHS shall act as a counterpart agency to the Team and also as a coordinating body in relation with other governmental and non-governmental organizations concerned for the smooth implementation of the Study.

4. FHS shall, at its own expense, provide the Team with the followings, in co-operation with other organizations concerned:

(1) Available data (including maps and aerial photographs) and information related to the Study;
(2) Counterpart personnel;
(3) Suitable office space with necessary equipment in Suva if necessary;
(4) Credentials or identification cards if necessary;
(5) Surveying vessels with crew; and
(6) Appropriate number of vehicles and drivers when required.

VII. UNDERTAKING OF JICA

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

1. To dispatch, at its own expense, the Team to Fiji; and
2. To pursue technology transfer to the Fiji counterpert personnel in the course of the Study.

VIII. TASK OF FHS

In addition to the items described in VI.4. above, the task of FHS shall be as follows:

(1) To maintain public relations for local authorities and people on the Study.

(2) To facilitate acquisition by the Team of necessary materials, data and informaiton such as maps and aerial photographs.

(3) To make negotiations and arrangements for hiring local manpower to assist the work of the Team.

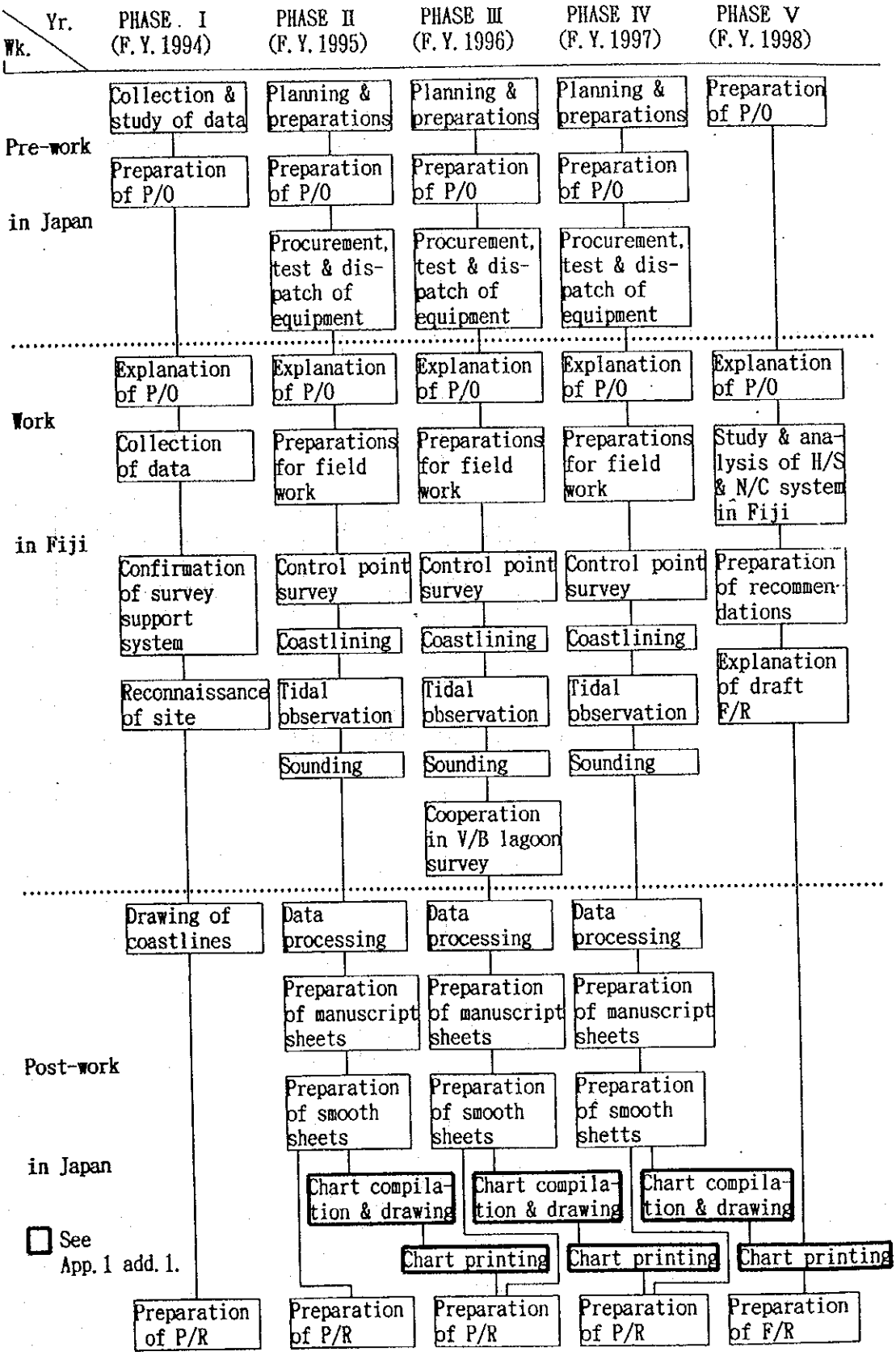
IX. OTHERS

The Team will inform FHS of their working schedule prior to commencement of the field work. Any changes in the schedule will be communicated to FHS without delay.

Appendix 1

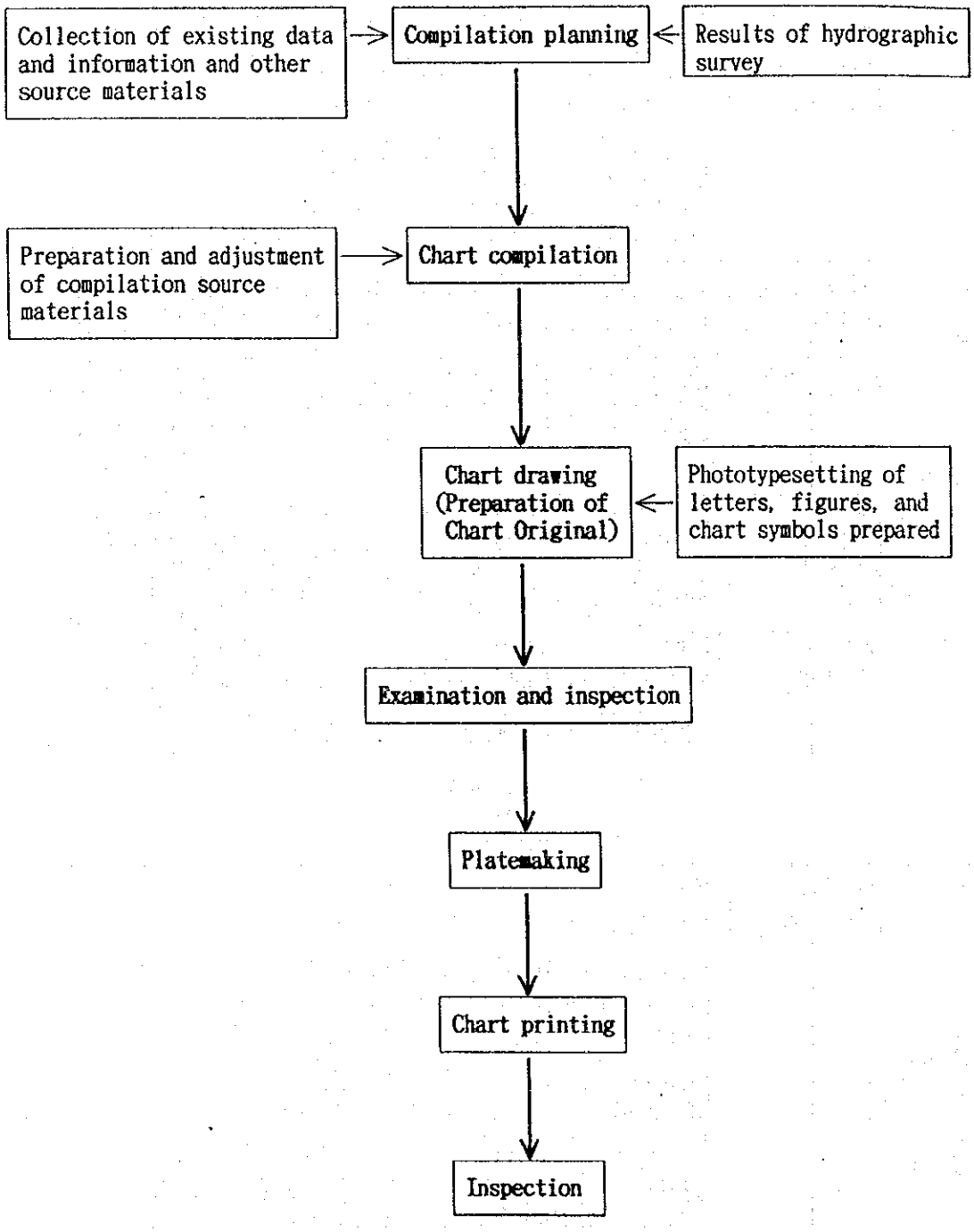
FLOW OF WORK OF THE STUDY

(N. B. P/O:Plan of operation H/S:hydrographic survey N/C:nautical charting
V/B:Vanua Balavu P/R:Progress Report F/R:Final Report)



Appendix 1 add.1

Process of Chart Production under the Study



Appendix 2

TENTATIVE 5-YEAR SCHEDULE OF THE STUDY

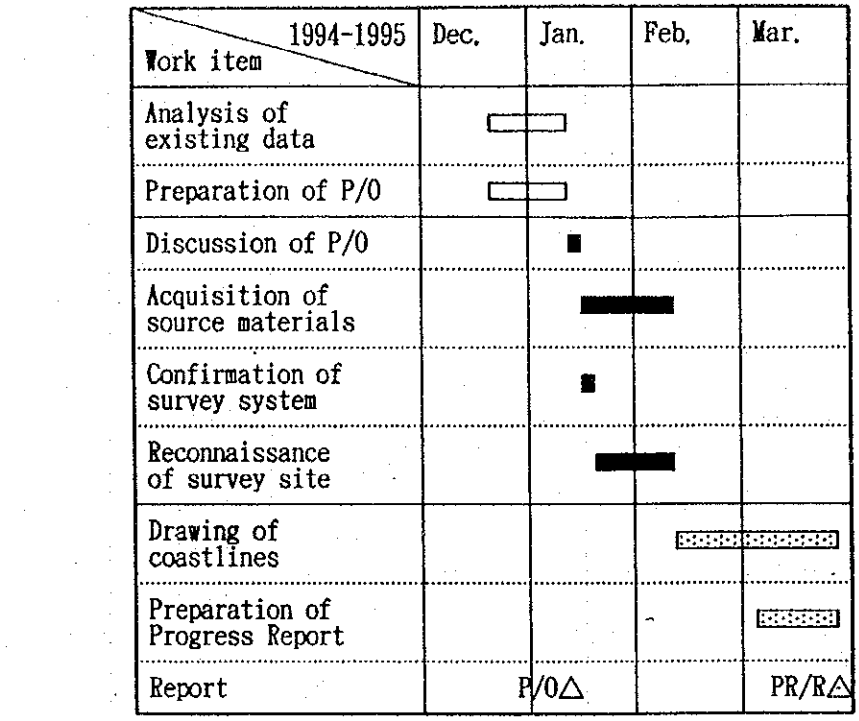
Item \ Year	F.Y.1994 (Phase I)	F.Y.1995 (Phase II)	F.Y.1996 (Phase III)	F.Y.1997 (Phase IV)	F.Y.1998 (Phase V)
	1 7 10 1	1 7 10 1	1 7 10 1	1 7 10 1	1 7 10 1
Analysis of existing data	□				
Preparation of P/0	□	□	□	□	□
P/0 discussion	▮	▮	▮	▮	▮
Coastline drawing	□				
Control point survey		■	■	■	
Coastlining		■	■	■	
Tidal observation		■	■	■	
Sounding		■	■	■	
Preparation of smooth sheet		⊡	⊡	⊡	
Preparation of PR/R		▣	▣	▣	
Chart compilation			⊡	⊡	⊡
Chart drawing			⊡	⊡	⊡
Platemaking			⊡	⊡	⊡
Chart printing			▣	▣	▣
Analysis of operation & management system					▮
Preparation of recommendation(DF/R)					▮
Discussion of DF/R					▮
Preparation of F/R -Survey report -Recommendation					▣ ▣

□ : Pre-work in Japan ■ : Work in Fiji ⊡ : Post-work in Japan

P/0 : Inception Report PR/R : Progress Report DF/R : Draft Final Report

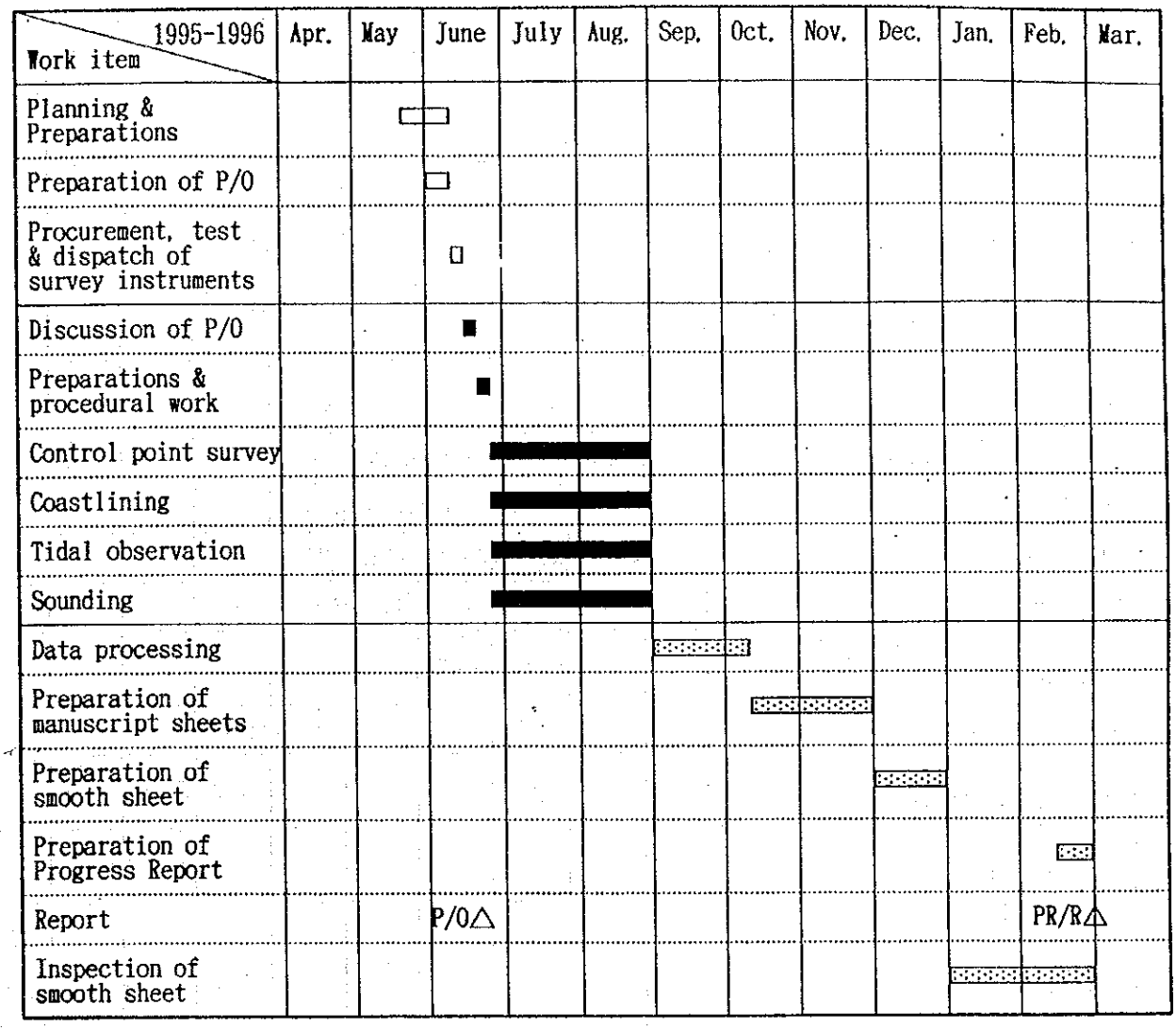
F/R : Final Report

WORK SCHEDULE (PHASE I)

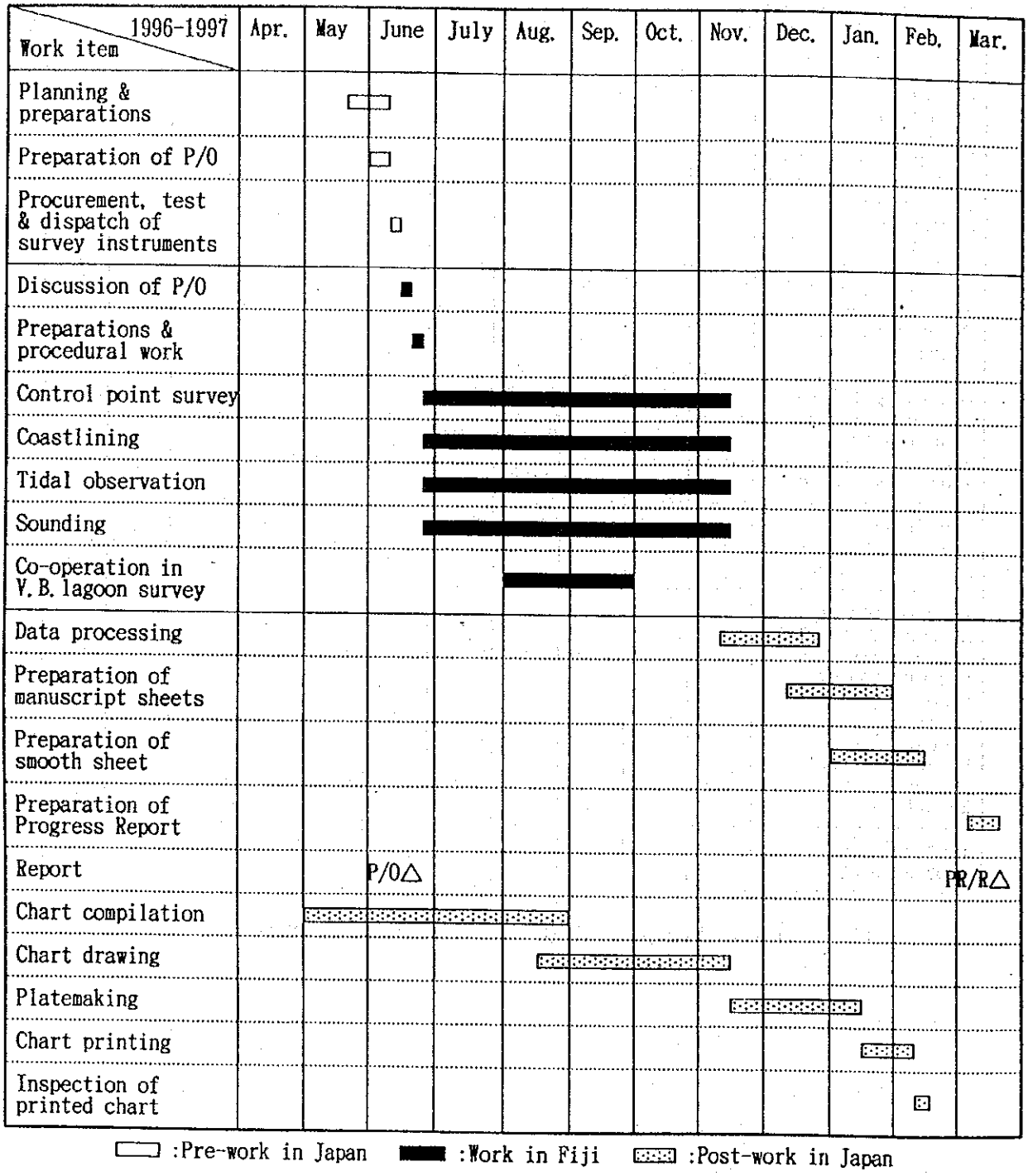


:Pre-work in Japan :Work in Fiji :Post-work in Japan

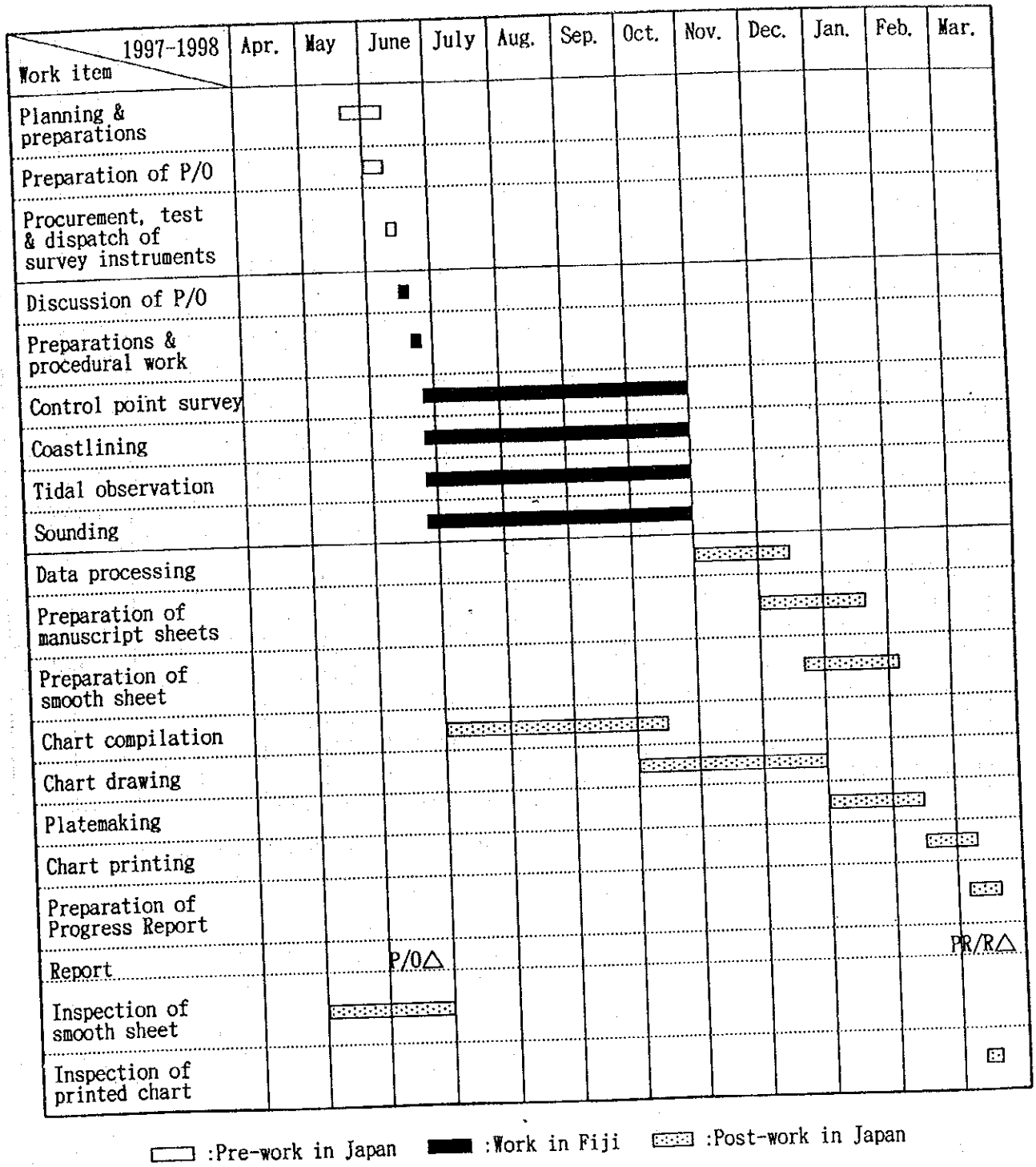
WORK SCHEDULE (PHASE II)



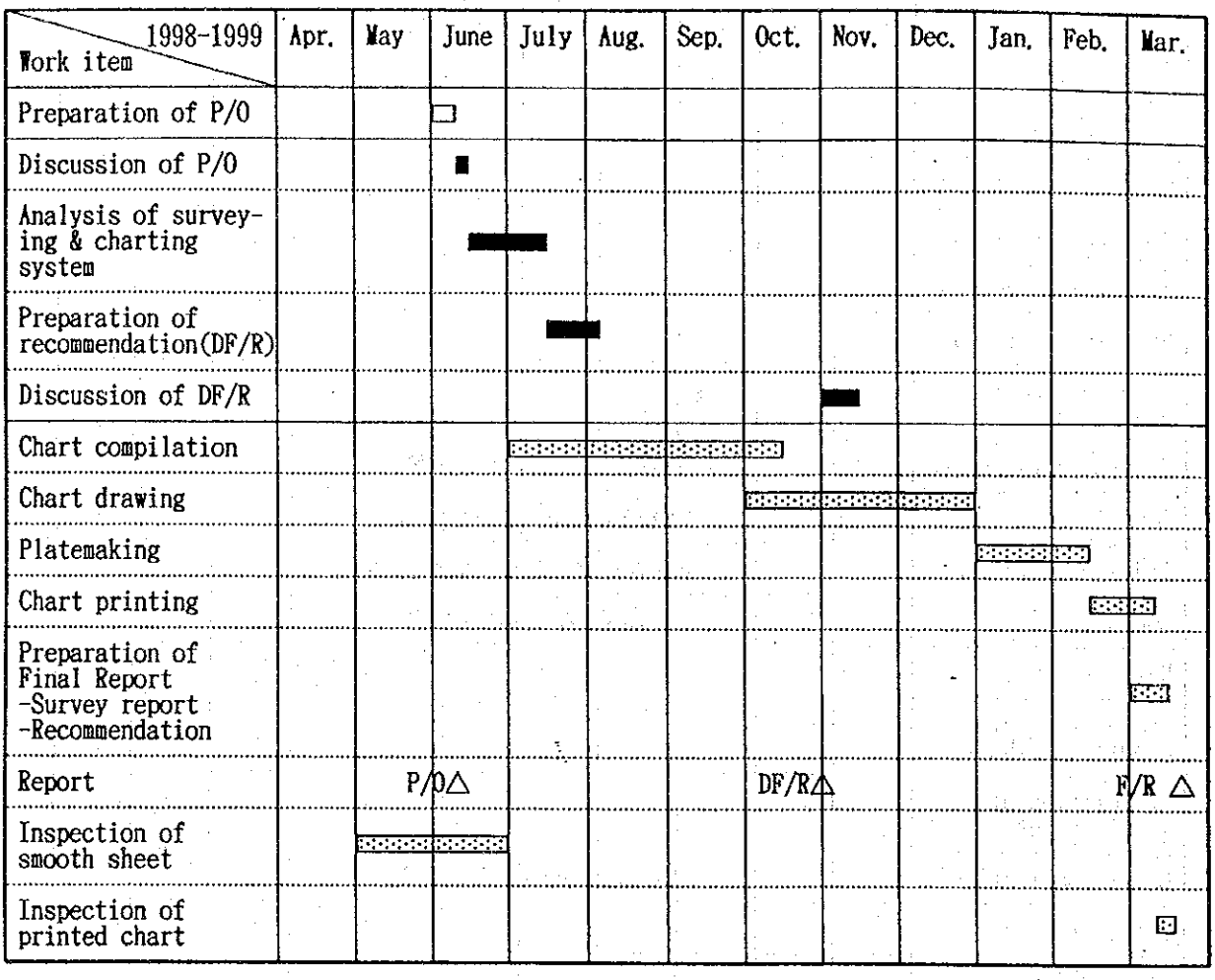
WORK SCHEDULE (PHASE Ⅲ)



WORK SCHEDULE (PHASE IV)



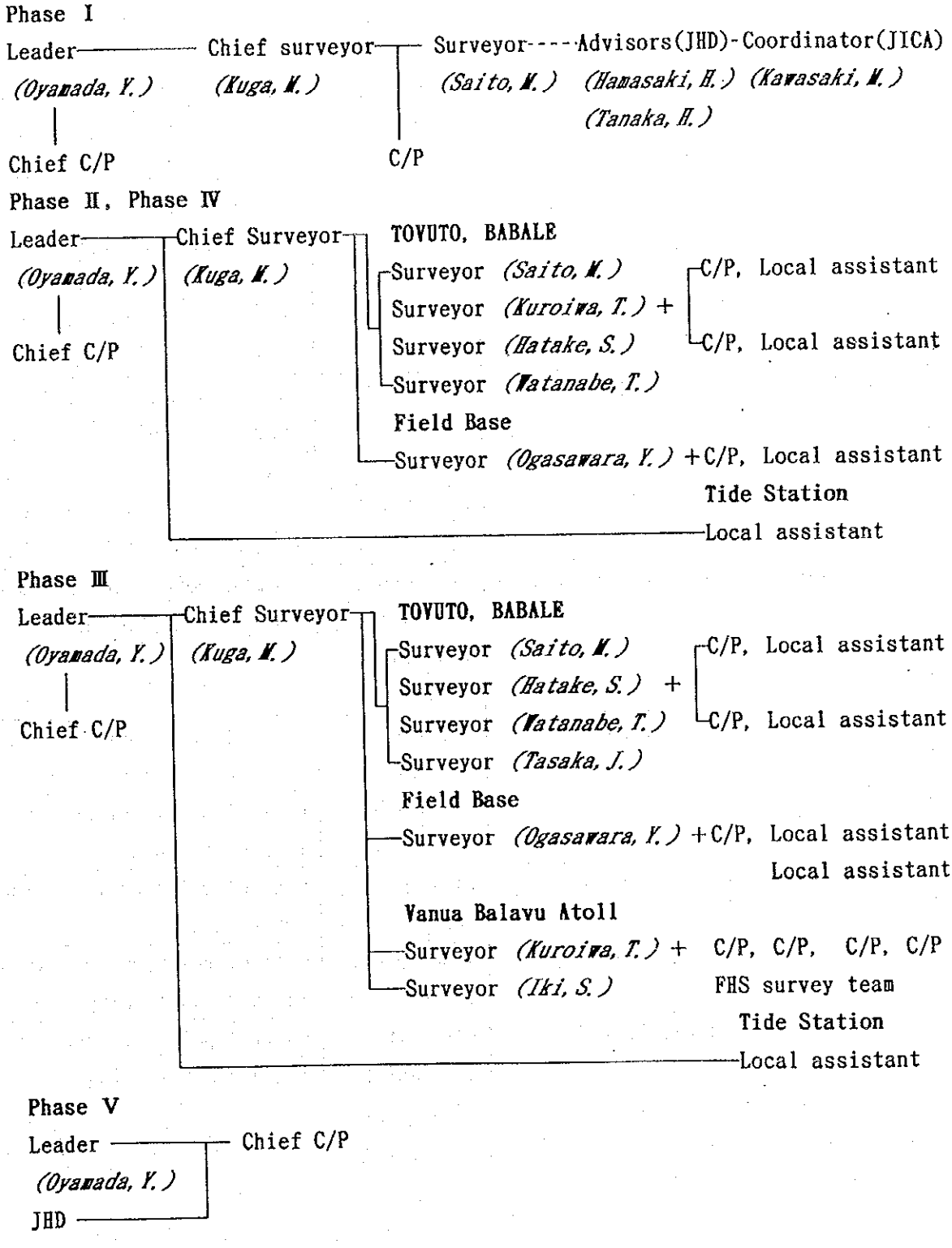
WORK SCHEDULE (PHASE V)



Appendix 3

ORGANIZATION OF FIELD STUDY TEAM

(with Japanese members' names)



Appendix 4

FIELD TASKS OF STUDY TEAM MEMBERS

Position	Name	Post of duty	Task
1. Team leader	Yasuhiro OYAMADA	Survey base in Suva	General managing of overall work of the Study; consultation with Fiji side; supervision of the V.B. tide station; study and analysis of hydrographic surveying and nautical charting system in Fiji
2. Chief surveyor	Masao KUGA	R/V TOYUTO	Supervision of control point survey, sounding and coastlining
3. Surveyor	Masashi SAITO	R/V TOYUTO, SMB BABALE	Control point survey, sounding and coastlining
4. Surveyor	Toshiki KUROIWA	R/V TOYUTO, SMB BABALE; V.B. lagoon (Phase Ⅲ)	Control point survey, sounding and coastlining
5. Surveyor	Shuhei HATAKE	R/V TOYUTO, SMB BABALE	Control point survey, sounding, coastlining
6. Surveyor	Toshiaki WATANABE	R/V TOYUTO, SMB BABALE	Control point survey, sounding, coastlining
7. Surveyor	Yoshikazu OGASAWARA	Field survey base	Control point survey, tidal observation
8. Surveyor	Shinji IKI	V.B. lagoon (Phase Ⅲ)	Control point survey, sounding and coastlining
9. Surveyor	Junji TASAKA	R/V TOYUTO, SMB BABALE (Phase Ⅲ)	Control point survey, sounding and coastlining

Appendix 5

LIST OF SURVEY EQUIPMENT AND INSTRUMENTS (PHASE II - PHASE IV)

1. Survey vessel
   R/V TOYUTO
   SMB BABALE
   Chartered launch (for V.B. lagoon survey in Phase III)

2 Survey instruments (to be provided by the Study Team)

2-1. Control survey

- GPS receiver (Trimble 4000SSE)	3 sets
- Total Station (Nikon Model TTM-1)	2 sets
- Distance meter (Atlas Model LARA 90/205) (one for V.B. lagoon survey)	2 sets

2-2. Coastlining

- GPS receiver (as mentioned in 2-1 above)	

2-3. Tidal observation

- TidAL gauge (YEO-KAL 610)	1 set
- Level (Model B2)	1 set

2-4. Sounding

- GPS receiver (Sercel NDS 200/NRS 103)	2 sets
- GPS receiver (Del Norte Model 1009GPS) (one for V.B. lagoon survey)	3 sets
- Echo sounder (Ocean Data BATHY 1000)	1 set
- Echo sounder (4-beam)(Senbon Denki Model PDR 501) (one for V.B. lagoon survey)	3 sets
- Side-scan Sonar (EG&G Model 260) (one for V.B. lagoon survey)	3 sets
- GPS receiver (navigation)	1 set
- Plotter (EF 3100) (one for V.B. lagoon survey)	2 sets

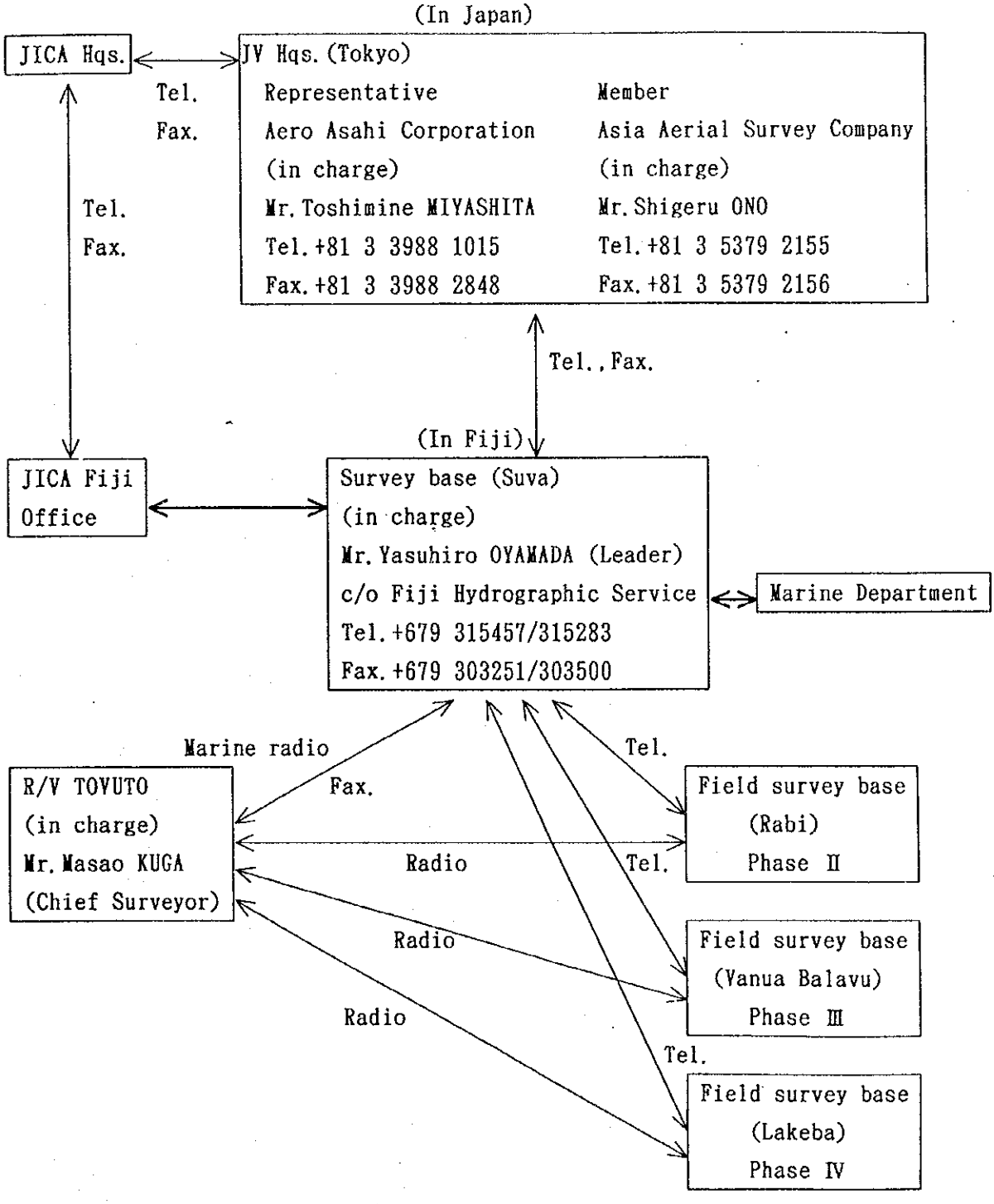
2-5. Others

- Personal computer	1 set
- Laser printer	1 set
- Radio set	3 sets
- Battery charger	3 sets

- Power generator	3 sets
- Copying machine	1 set
- Outboard motor	1 set
- Voltage stabilizer	2 sets
- Fax. machine	1 set
- Autopilot	1 set
- Gyrocompass	1 set
- Outboard engine	1 set

Appendix 6.

EMERGENCY COMMUNICATION NETWORK



MINUTES OF MEETING

ON

THE FIRST YEAR'S PLAN OF OPERATION

FOR

THE PREPARATION OF NAUTICAL CHARTING

IN

THE NORTHERN LAU ISLANDS REGION

IN

THE REPUBLIC OF FIJI

BETWEEN

MINISTRY OF INFRASTRUCTURE, PUBLIC WORKS AND TRANSPORT

AND

JAPAN INTERNATIONAL COOPERATION AGENCY

SUVA, 27 JANUARY 1995

MR. A. VOCEA
PERMANENT SECRETARY FOR
INFRASTRUCTURE, PUBLIC WORKS
AND TRANSPORT

MR. YASUHIRO OYAMADA
LEADER
STUDY TEAM
JAPAN INTERNATIONAL
COOPERATION AGENCY

MR. F. R. MAHARAJ
CHIEF HYDROGRAPHER
FIJI HYDROGRAPHIC SERVICE
MARINE DEPARTMENT
MINISTRY OF INFRASTRUCTURE,
PUBLIC WORKS AND TRANSPORT

MR. HIROMI HAMASAKI
ADVISOR (SENIOR
CARTOGRAPHY OFFICER)
STUDY TEAM
JAPAN INTERNATIONAL
COOPERATION AGENCY

The Study Team of Japan International Cooperation Agency (JICA) headed by Mr. Yasuhiro OYAMADA visited the Republic of Fiji on 24 January 1995, to conduct the first year (Phase I) work for the Study on Preparation of Nautical Charts in the Northern Lau Islands Region of the Republic of Fiji.

A series of meetings were held on 25 and 26 January 1995, at the Fiji Hydrographic Service (FHS), Marine Department, Ministry of Infrastructure, Public Works and Transport.

As the result, the following items have been confirmed and agreed by FHS and JICA Study Team.

1. The Plan of Operation (P/O) proposed by JICA Study Team was discussed and in principle agreed by both sides, with the following amendments:

(1) As the numbering of the three Fiji nautical charts to be produced will cause duplication of the numbers of the existing Fiji nautical charts, the chart numbers, and accordingly the Study area numbers, described in the P/O shall be amended to read as follows:

F2 to read F52,
F6 to read F53, and
F7 to read F54.

(2) As to the proposed site for establishment of a tide gauge at Vanua Balavu on pages 8 and 15, the wording "at the pier of Vanua Balavu." shall be amended to read "at an appropriate place in Vanua Balavu."

(3) On page 22, in para.2-5-1-1.(2), "JHO" shall be amended to read "JHD".

(4) On page 27, in para.3-1., bottom line, "and land maps" shall be inserted after "charts".

(5) Appendix 5 "LIST OF SURVEY EQUIPMENT AND INSTRUMENTS (PHASE II - PHASE IV)" shall be substituted by "Appendix 5 Revised" annexed hereto.

2. Through good offices of FHS, the Study Team shall receive latest land maps and aerial photographs necessary for drawing coastlines of islands and atolls in the Study area from the Lands and Survey Department before the Study Team leaves Fiji for Japan.

3. In addition to the above, technical matters including procurement and types of equipment were discussed and basic agreements were reached.

LIST OF ATTENDANTS

FIJI SIDE

(Fiji Hydrographic Service)

1. Mr.F.R.MAHARAJ	Chief Hydrographer
2. Mr.Aca SILATOLU	Senior Hydrographer
3. Mr.Seci LAGIVOLA	Hydrographer
4. Mr.Yauka SORO	Technical Officer 1 (Cartography)

JAPANESE SIDE

(JICA Study Team)

1. Mr.Yasuhiro OYAMADA	Leader
2. Mr.Masao KUGA	Chief Surveyor
3. Mr.Masashi SAITO	Surveyor
4. Mr.Hiromi HAMASAKI	Advisor (Senior Cartography Officer)
5. Mr.Hideo TANAKA	Advisor (Senior Coastal Survey Officer)
6. Mr.Mitsuyoshi KAWASAKI	Study Management

(JICA Fiji Office)

7. Mr.Hajime WATANABE	Assistant Resident Representative

Annex

Appendix 5 Revised

LIST OF SURVEY EQUIPMENT AND INSTRUMENTS (PHASE II – PHASE IV)

1. Survey vessel
   R/V TOYUTO
   SNB BABALE
   Chartered launch (for V.B. lagoon survey in Phase III)

2. Survey instruments (to be provided by JICA and the Study Team)

2-1. Control survey

- GPS receiver (Trimble 4000SSE)	3 sets
- Total Station (Nikon Model TTM-1)	2 sets
- Distance meter (Atlas Model LARA 90/205) (one for V.B. lagoon survey)	2 sets

2-2. Coastlining

- GPS receiver (as mentioned in 2-1 above)	

2-3. Tidal observation

- Tide gauge (YEO-KAL 610 or equivalent)	1 set
- Level (Model B2)	1 set

2-4. Sounding

- GPS receiver (Sercel NDS 200/NRS 103 or equivalent)	2 sets
- GPS receiver (Del Norte Model 1009GPS) (one for V.B. lagoon survey)	3 sets
- Echo sounder (Ocean Data BATHY 2000 or equivalent)	1 set
- Echo sounder (4-beam)(Senbon Denki Model PDR 501) (one for V.B. lagoon survey)	3 sets
- Side-scan Sonar (EG&G Model 260 or equivalent) (one for V.B. lagoon survey)	3 sets
- GPS receiver (navigation)	1 set
- Plotter (EF 3100) (one for V.B. lagoon survey)	2 sets

2-5. Others

- Personal computer	1 set
- Laser printer	1 set
- Radio set	3 sets
- Battery charger	2 sets

- Power generator	3 sets
- Copying machine	1 set
- AC power conditioner	2 sets
- Voltage stabilizer	2 sets
- Fax. machine	1 set
- Autopilot	1 set
- Gyrocompass	1 set
- Outboard engine	1 set

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)
MINISTRY OF COMMUNICATION, WORKS AND ENERGY, FIJI

PLAN OF OPERATION
FOR
THE STUDY ON THE PREPARATION OF NAUTICAL CHARTS
IN
THE NORTHERN LAU ISLANDS REGION
IN
THE REPUBLIC OF FIJI

PHASE V

(THE FIFTH YEAR – F.Y. 1998)

MAY 1998

AERO ASAHI CORPORATION
ASIA AIR SURVEY CO., LTD.

CONTENTS

STUDY AREA AND CHART COVERAGE

1. INTRODUCTION

The Government of the Republic of Fiji requested the Government of Japan for technical cooperation in the Study on the Preparation of Nautical Charts in the Northern Lau Islands Region in the Republic of Fiji.

In response to the request, the Japan International Cooperation Agency (JICA), the official agency responsible for implementation of the technical cooperation programmes of the Government of Japan, dispatched a Preparatory Study Team to Fiji from 15 February to 15 March 1994, and the Scope of Work (S/W) was agreed between JICA and the Ministry of Infrastructure, Public Works and Transport (now Ministry of Communication, Works and Energy) on 15 March 1994.

According to the S/W, the objectives of the Study are:

(1) To prepare three Fiji nautical charts, Nos.F52, F53 and F54, each on the scale of 1/150,000, covering the Northern Lau Islands region;

(2) To report the recommendation for improvement of operation and management system of hydrographic surveying and nautical charting in Fiji; and

(3) To promote technology transfer through the implementation of the Study with a view to enabling the Fiji counterpart personnel to improve their technique in hydrographic surveying and nautical charting.

Pursuant to the S/W, the Study has been implemented as follows:

First Year (Phase I)(From 13 January to 30 March 1995)

- Work in Fiji : Consultation of the Plan of Operation for Phase I (P/O-I) with the Fiji Hydrographic Service (FHS), Marine Department, Ministry of Infrastructure, Public Works and Transport, and agreement thereof (27 January 1995).

Preparations for hydrographic surveys in the forthcoming phases:

(1) Selection of survey equipment to be used;

(2) Acquisition of aerial photographs and other source materials;

(3) Reconnaissance of survey sites for Phase II work; and

(4) Confirmation of survey implementation and support systems

- Work in Japan: (1) Tentative drawing of coastlines of islands and atolls of the whole Study area.

(2) Preparation of the Progress Report of Phase I(PR/R-I), which was then submitted to the Government of Fiji from JICA.

Second Year (Phase II)(From 13 June 1995 to 29 March 1996)

- Work in Fiji : (1) Consultation and agreement on the Plan of Operation for Phase II (P/O-II);

(2) Hydrographic survey in the Study Area F52; and

(3) Technology transfer to FHS counterpart personnel.

- Work in Japan: (1) Processing of survey data and preparation of the smooth sheet of survey for Area F52.

(2) Preparation of the Progress Report of Phase II (PR/R-II), which was then submitted to the Government of Fiji from JICA.

Third Year (Phase III)(From 23 April 1996 to 21 March 1997)

- Work in Fiji : (1) Consultation and agreement on the Plan of Operation for Phase III (P/O-III);

(2) Hydrographic survey in the Study Area F53; and

(3) Technology transfer to FHS counterpart personnel during the survey, in

particular, the large-scale survey in Vanua Balavu lagoon to be conducted by FHS.

- Work in Japan: (1) Processing of survey data and preparation of the smooth sheet of survey for Study Area F53.
  (2) Preparation of the Nautical Chart No. F52 by the Japan Hydrographic Department (JHD) with participation of a Fiji counterpart personnel as on-job training.
  (3) Preparation of the Progress Report of Phase III (PR/R-III), which was then submitted to the Government of Fiji from JICA, together with the printed copies of Chart No.F52.

Fourth Year (Phase IV)(From 15 April 1997 to 31 March 1998)

- Work in Fiji : (1) Consultation and agreement on the Plan of Operation for Phase IV (P/O-IV);
  (2) Hydrographic survey in the Study Area F54; and
  (3) Technology transfer to FHS counterpart personnel.
- Work in Japan: (1) Processing of survey data and preparation of the smooth sheet of survey for Study Area F54.
  (2) Preparation of the Nautical Chart No. F53 by JHD with participation of a Fiji counterpart personnel as on-job training.
  (3) Preparation of the Progress Report of Phase IV (PR/R-IV), which was then submitted to the Government of Fiji from JICA, together with the printed copies of Chart No.F53.

Based on P/O-I and PR/R-IV above, this Plan of Operation for Phase V (P/O-V) is prepared to give a substantial guideline of the work to conclude the whole programme of the Study.

2. GENERAL

2-1. Objectives

The objectives of the Study in Phase V are as follows:

(1) To survey and analyze the existing status of the organization, facilities and activities of FHS.

(2) To make an analytical study of the results and findings of the survey and analysis in (1) above.

(3) Based on the relevant data and information obtained by the survey and analytical study thereof on the current conditions and problems in operation and management system of hydrographic surveying and nautical charting in FHS, to make any recommendation for possible improvement of such system.

(4) To prepare a Draft Final Report (DF/R) including the results of (2) and (3) above, and to discuss and finalize DF/R between the Government of Fiji and JICA.

(5) To prepare Fiji Nautical Chart No.F54, where technology transfer will be made to Fiji counterpart personnel.

(6) To prepare Final Report (F/R) containing the results of (2) and (3) with its Summary and the report covering the whole work and products of the Study, and to submit F/R to the Fiji Government by JICA together with the printed copies of Fiji Nautical Chart No.F54.

2-2. Study period

(1) Pre-work in Japan
From 15 to 24 May 1998.

(2) Work in Fiji
From 25 May to 1 July and from 2 to 8 November 1998.

(3) Post-work in Japan
From 2 July to 1 November 1998 and from 9 November 1998 to 31 March 1999.

(4) Preparation of Nautical Chart No.F54.
From June 1998 to March 1999.

2-3. Flow and schedule of work

The flow and schedule of work are as shown in Appendices 1 and 2, respectively.

3. IMPLEMENTATION PLAN OF THE STUDY IN PHASE V

3-1. Pre-work in Japan

3-1-1. Planning

Based on the materials, data and information collected by the JICA Preparatory Study Team as well as by the Study Team during Phases I and IV, a detailed plan for implementation of the Study in Phase V is worked out.

3-1-2. Preparation of Plan of Operation (P/O-V)

P/O-V for Phase V work for the Study is prepared on the basis of S/W as well as the detailed plan in 3-1-1 above. P/O-V describes a substantial guideline of the work as to methods, types and amount of work, etc., in Japan and in Fiji, as well as the items for which co-operation from the Fiji side is requested and others matters.

3-2. Work in Fiji

3-2-1. General

(1) Composition of Study Team is as follows:

Leader : Mr. Yasuhiro OYAMADA, from 25 May to 1 July and from 2 to 8 November 1998.

Member : Mr. Katsuji Chiba (JHD), from 15 June to 1 July 1998.
Mr. Shinobu Inazumi (JHD), from 15 June to 1 July 1998.
Mr. Kunio Yashima (JHD), from 2 to 8 November 1998.

3-2-2. Explanation of P/O-V and consultation

P/O-V thus prepared will be submitted to FHS for explanation by the Study Team Leader, and consultation will be held to reach agreements on the content.

3-2-3. Survey and analysis of the existing status of the operation and management system for hydrographic surveying and nautical charting in Fiji

(1) A survey will be made to the existing status of the organization, human resources, facilities and equipment, recent work results, financial status, maintenance, arrangements and storage of nautical charts and relevant data and information, chart publication plan, etc. of FHS that is responsible for the planning, maintenance, production and management of nautical charts.

(2) The items of materials, data and information to be collected for the survey will be as follows:

a. Organization of FHS and Marine Department.

b. No., academic and professional background and job descriptions of the staff and employees of FHS.

c. No., type and make of the equipment and instruments:
   - survey vessel
   - control point survey
   - hydrographic survey
   - oceanographic observation
   - cartographic work including printing

d. Results of work of FHS in the recent years:
   - Hydrographic surveys carried out
   - Charts issued and/or sold
   - Publications issued and/or sold, including Notices to Mariners and Navigational Warnings

e. Amount of budgetary allotments and expenditures with breakdowns according to items

f. Maintenance, servicing and storage of charts and relevant materials and data

g. Chart publication planning (domestic and international)

h. Other relevant information.

(3) Those materials, data and information thus collected will be analyzed to clarify the existing status of the all aspects of FHS.

3-2-4. Appraisal of survey results and preparation of suggestion

The results of the survey and analysis thereof will be appraised by the Study Team which will make a pertinent suggestion for publication of nautical charts to be required for the Fijian waters, and in particular, those for short-term requirements.

3-2-5. Analysis of vital points

Any vital point for possible publication of charts according to the suggestion in 3-2-5 above will be brought out and analyzed by the Study Team.

3-2-6. Preparation of Draft Final Report

For improving the current situation thus analyzed, a recommendation that is practicable and adaptable in Fiji will be prepared by the Study Team, and a Draft Final Report (DF/R) including the results of (2), (3) and (4) above.

3-2-7. Discussion for finalization of DF/R

After editing work of DF/R is completed, discussion will be held between the FHS and the Study Team for comments, which will be furnished to the Study Team within one month after the discussion.

3-3. Post-work in Japan

3-3-1. Preparation of Final Report

Upon receipt of the comments on the DF/R from the Fiji side, the Final Report (F/R) will be prepared with incorporating any amendments as necessary.

The F/R will consist of:

(a) Results of analysis of the existing status of management system of hydrographic surveying and nautical charting in Fiji.

(b) Appraisal of the results in (a) and a recommendation for improvement of the system.

(c) Summary of (a) and (b) above.
(d) Report on the whole work and products of the Study from Phase I to Phase V.

3-3-2. Submission of F/R

The F/R thus finalized will be submitted to the Government of Fiji from JICA by the end of fiscal 1998.

3-4. Preparation of Nautical Chart No.F54

The preparation of Chart No.F54 will be undertaken by JHD upon receipt of the results of the hydrographic surveys and other relevant materials and data from JICA.

3-4-1. Chart specifications, basic factors and principles

(1) Projection: Mercator Projection
(2) Geodetic system: Fiji Geodetic Datum (FGD), which is equivalent to WGS 72
(3) Corner coordinates: 19° 04' 40" S, 17° 47' 00" S
179° 06' 00" W, 178° 12' 00" W

(4) Title: FIJI ISLANDS
LAU GROUP-SOUTHERN PORTION
LAKEBA PASSAGE TO KABARA
(5) Scale: 1:150,000 (at Lat.18° 25' S)

(6) Graticules: Every 15 minutes of latitude and longitude
(7) Graticules graduated: Two parallels of 18 15'S and 18° 45' S
One meridian of 178° 45'W

(8) Graduation on the borders: Every 0.2 minute of latitude and longitude

(9) Chart paper: Size 1,052 × 730mm, weight 140g/m^2
(10) Unit of measure for depths: In metres and reduced to Chart Datum, which is approximately the level of Lowest Astronomical Tide (LAT)

(11) Unit of measure for heights: In metres and above Mean High Water Springs

(12) Title block including:

- Title of the chart
- FHS seal
- General geographical area and specific geographical reference
- Chart scale
- Unit of measure for depths and heights
- Name and date of the horizontal datum used
- Name of the projection used

(13) Source diagram : Showing source material data

(14) Conversion table: For metres/fathoms/feet

(15) Compass roses: Three compass roses on the chart

(16) Existing source materials to be adopted: Depths in lagoon areas will be adopted from the existing BA Charts Nos. 416 and 441.

3-4-2. Compilation planning

Based on the results of hydrographic surveys as well as the existing data and information collected, the planning sheet and the planning note will be prepared for the chart.

(1) Preparation of planning sheet

The following items will be indicated on the planning sheet:

1) Borders and neatlines of the chart
2) Graticules
3) Graduation
4) Information on and the coverage of the existing data to be adopted on the chart
5) Chart title
6) Notes to be given in the title block
7) Chart number
8) Tidal notes
9) Cautionary notes
10) Submarine cables
11) Source diagram

12) Geographical names
13) Other data and information to be adopted on the chart

(2) Preparation of planning note

The planning note will be prepared, listing or indicating the following items:

1) Type of the chart (new chart) to be produced
2) Ellipsoid of reference
3) Chart scale and projection
4) Coverage and neatline dimensions, as well as the corner coordinates
5) Units of measures
6) List of source materials to be adopted
7) Use of colours
8) Positions of compass roses, as well as magnetic variations and their annual change
9) Other data and information as well as directions and instructions necessary for compilation of the chart

3-4-3. Preparation of drawing guide

Based on the planning sheet and the planning note prepared, a drawing guide will be prepared on the plastic film exactly on the same scale as that of the chart to be produced.

3-4-4. Preparation of chart original

(1) Chart drawing

The chart original (original drawing) of the chart which is a manuscript for platemaking will be prepared based on the drawing guide prepared, in conformity with the IHO Chart Specifications. The chart original will be prepared on the plastic sheets by the scribing method, and sounding figures, chart symbols, compass roses, and geographical names and various type faces to be given on the chart will be prepared by phototypesetting and stuck up on the plastic sheets.

(2) Two sheets of the chart original will be prepared, one for black colour and the other for magenta colour.

3-4-5. Verification and examination of chart original

The chart original will be checked for consistency, accuracy and adequacy according to the contents of the drawing guide. The chart representation will also be examined. Items to be checked and examined will include the following:

(1) The format as a nautical chart.

(2) The original drawing is examined to ensure that it does not exceed the maximum possible printing size.

(3) Whether the original drawing is drafted in accordance with the Chart Specifications of the IHO.

(4) Whether the contents are adequately checked to suit the purpose of the chart

(5) Whether the representation of the chart is comprehensive to users.

(6) To ensure that it is checked up to the latest Notices to Mariners affecting the chart to be printed. The charted information has to be updated according to additional data and/or Notices to Mariners. Such additions or corrections will be made on the original drawing up to the time of the platemaking process.

3-4-6. Platemaking

(1) Preparation of original plates

By using the chart original completed, the following original plates (negative films) will be prepared:

1) Original plate for black colour (for chart borders and neatlines, coastlines, geographical names, etc.)
2) Original plate for magenta colour (for distinguishing information superimposed)
3) Original plate for buff colour (for land tint)
4) Original plate for blue colour (for shallow water areas)

(2) Preparation of machine plates

By using each of the four original plates (negative films) prepared, the machine plates will be prepared by printing negative images on the PS plates, for which the final checking and inspection will be made.

3-4-7. Chart printing

(1) Using the printing plates made from the chart original prepared by JHD, 200 copies of the nautical chart F54 will be printed.

(2) Printing specifications

1) Type of printing : Offset printing

2) Colour : Black, magenta, blue and buff

3-4-8. Inspection of printed chart

The printed chart No.F54 shall undergo due inspection by JHA.

4. OTHERS

4-1. Technology transfer

Technology transfer to Fiji counterpart personnel will be performed in Japan as follows:

(a) Study and observation basis for management and operation of hydrographic activities.

(b) On-job training basis for preparation of Fiji Nautical Chart No.F54.

4-2. Cooperation by FHS

The FHS will render good offices in all respects for facilitating the Study Team to obtain necessary materials, data and information as described in 3-2-3 above.

The FHS will also provide appropriate personnel for counterpart training as described in 4-1 above.

4-3. Working schedule

The working schedule will be discussed and agreed by the Study Team and FHS, and then informed to JICA Fiji Office in due course. Any changes necessitated in the schedule will be communicated to JICA Fiji Office without delay.

4-4. Concluding meeting

A concluding meeting will be held between the FHS and the Study Team at the end of preparation of DF/R.

4-5. Finalization meeting

A finalization meeting will be held between the FHS and the Study Team at the end of discussions for finalization of DF/R.

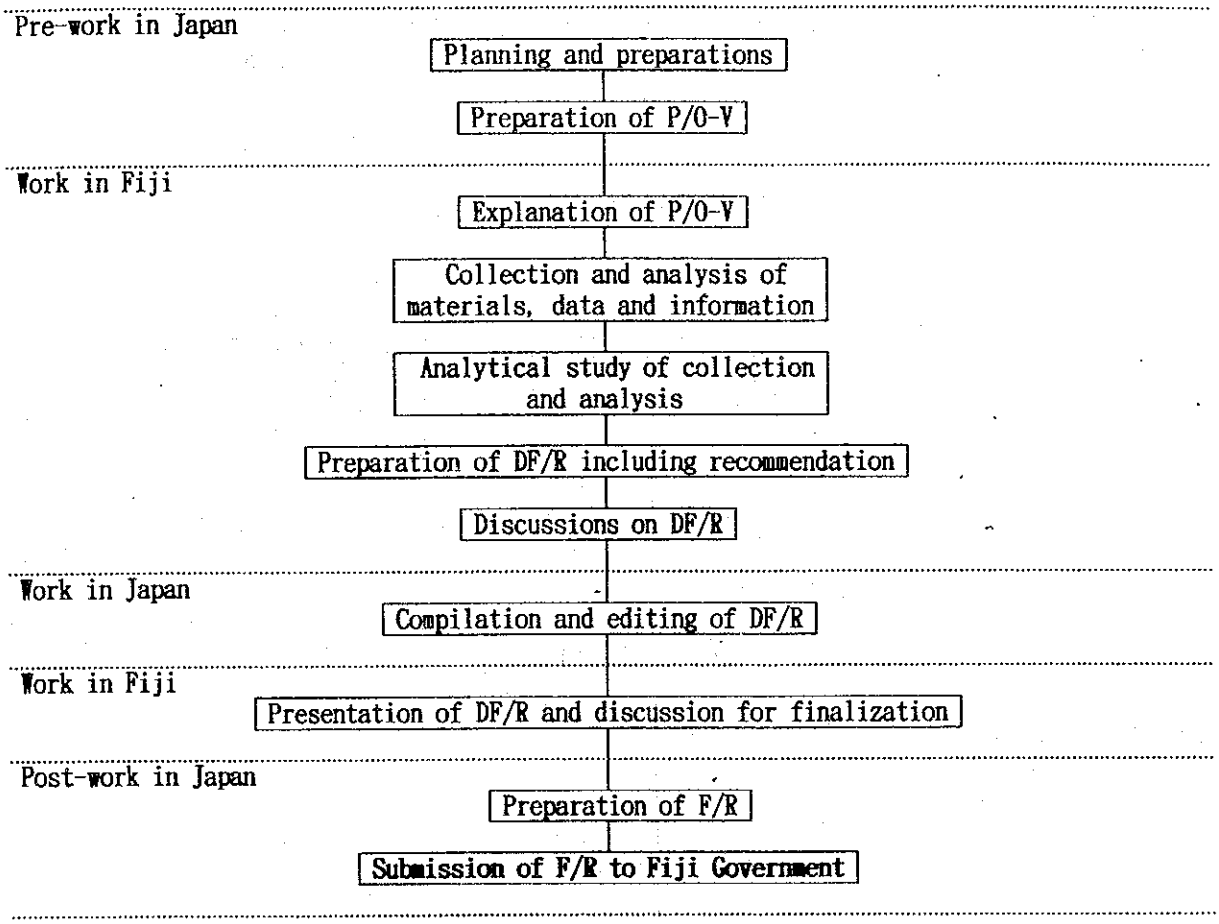
4-6. Emergency communication network

An emergency communication network is shown as in Appendix 3.

Appendix 1

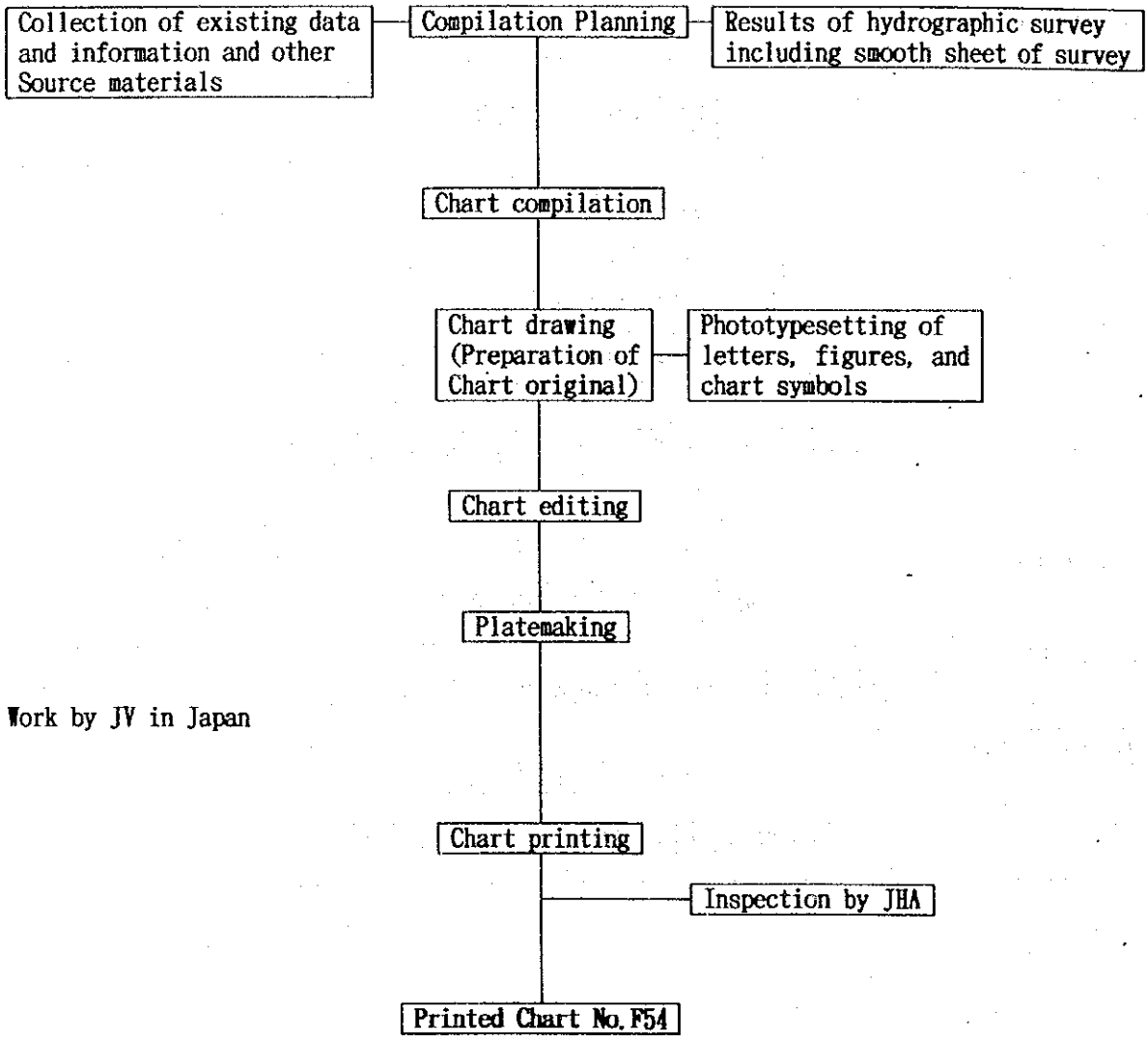
FLOW OF WORK FOR PHASE V (FISCAL 1998)

Part I - Preparation of Final Report



Part II - Preparation of Nautical Chart No. F54

Work by JHD in Japan (with participation of Fiji counterpart personnel)



Appendix 2

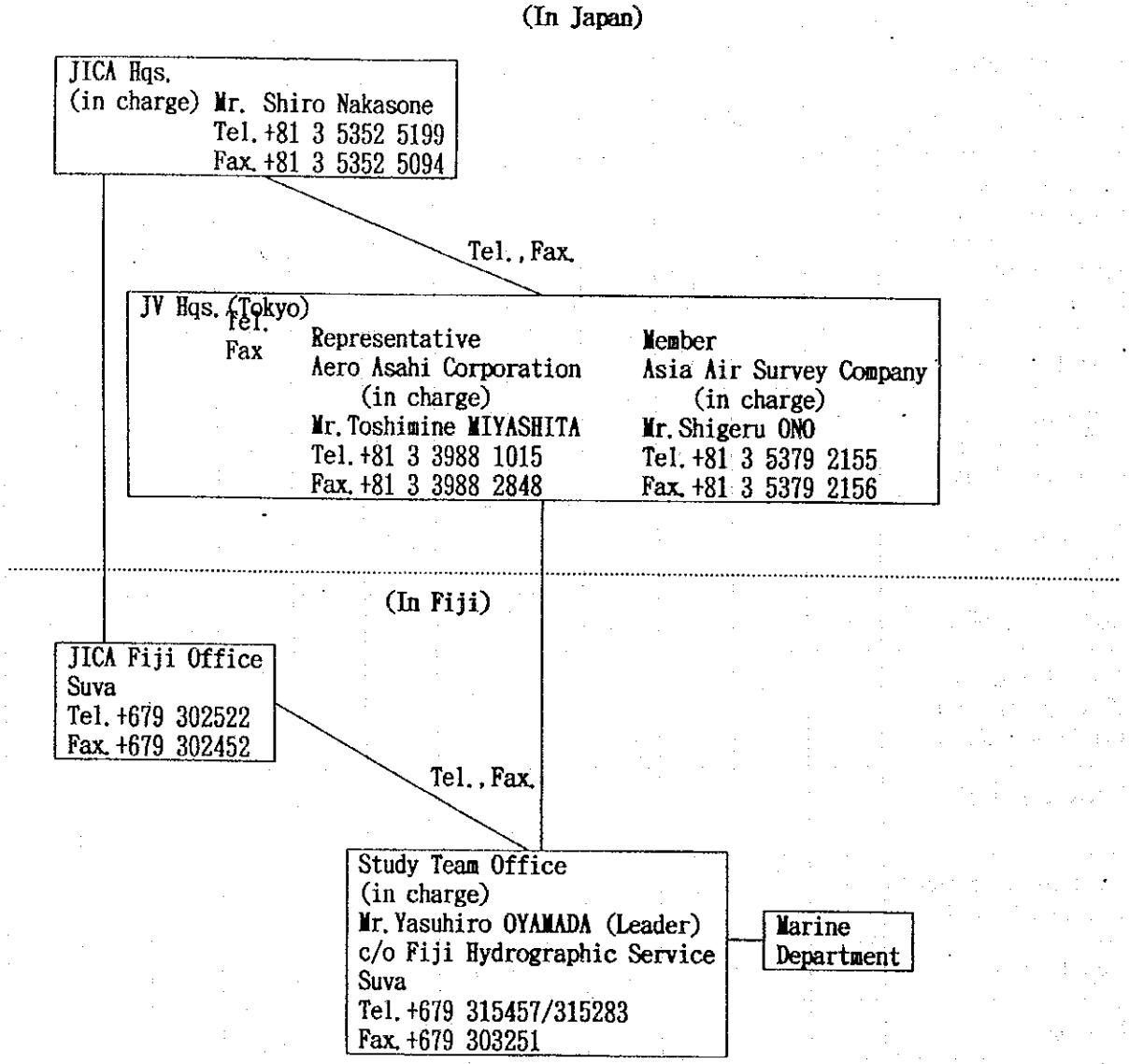
WORK SCHEDULE FOR STUDY IN PHASE V

Work item \ 1998-1999	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.
Planning & Preparations												
Preparation of P/0												
Explanation of P/0												
Collection of materials, etc.												
Analysis of Materials, etc.												
Analytical study												
Preparation of DF/R including recommendation												
Discussion on DF/R												
Editing of DF/R												
Presentation of DF/R, discussion and finalization												
Preparation of F/R												
Compilation planning of Chart No. F54												
Compilation												
Drawing												
Chart editing												
Platemaking												
Printing of chart												
Inspection												

: Work in Japan : Work in Fiji

Appendix 3

EMERGENCY COMMUNICATION NETWORK



MINUTES OF MEETING

ON

THE PLAN OF OPERATION

FOR

THE STUDY OF PREPARATION OF NAUTICAL CHARTS

IN

THE NORTHERN LAU ISLANDS REGION

IN

THE REPUBLIC OF FIJI

PHASE V

(THE FIFTH YEAR - F.Y. 1998)

SUVA, 27 MAY 1998

MR YASUHIRO OYAMADA
LEADER
STUDY TEAM
JAPAN INTERNATIONAL
CO-OPERATION AGENCY

MR F. R. MAHARAJ
CHIEF HYDROGRAPHER
FIJI HYDROGRAPHIC SERVICE
MARINE DEPARTMENT
MINISTRY OF COMMUNICATION,
WORKS & ENERGY

The Study Team Leader of Japan International Co-operation Agency (JICA) Mr Yasuhiro Oyamada visited the Republic of Fiji on 26th May 1998 to conduct the fifth year (Phase V) work for the Study on the Preparation of Nautical Charts in the Northern Lau Islands Region of the Republic of Fiji.

A Meeting was held at the Fiji Hydrographic Service, Marine Department, Ministry of Communication, Works and Energy on 27th May 1998 to discuss the Fifth Year's Plan of Operation and various arrangements prior to commencement of the work.

The Fifth Year's Plan of Operation (P/O) proposed by JICA Study Team was discussed and agreed in the principle by both sides.

It was noted that the Fiji Hydrographic Service received from JICA Study Team the following materials:

(1) 200 copies of Nautical Chart No. F53 together with one sheet of F53 Chart original (negative film) of black-line, magenta-line, water tint and land tint plates and one sheet each of their positive films.

(2) 20 copies each of Progress Report on the Study in Phase IV and Plan of Operation of the Study in Phase V.

(3) Copies of survey documents and data for Charts Nos. F52, F53 and F54.

LIST OF ATTENDANTS

FIJI SIDES
(Fiji Hydrographic Service)

1.	Mr Felix Ranchor MAHARAJ	Chief Hydrographer
2.	Mr Aca SILATOLU	Senior Hydrographer
3.	Mr Philip HILL	Hydrographer
4.	Mr Yauka Daveta SORO	Cartographer

JAPANESE SIDE
(JICA Study Team)

1.	Mr Yasuhiro OYAMADA	Leader

MINUTES OF MEETING

ON

CONCLUDING THE WORK

FOR

PREPARATION OF DRAFT FINAL REPORT

OF

THE STUDY ON THE PREPARATION OF NAUTICAL CHARTS

OF

THE NORTHERN LAU ISLANDS REGION

IN

THE REPUBLIC OF FIJI

PHASE V

(THE FIFTH YEAR - F.Y. 1998)

SUVA, 25 JUNE 1998

MR YASUHIRO OYAMADA
LEADER
STUDY TEAM
JAPAN INTERNATIONAL
CO-OPERATION AGENCY

MR F. R. MAHARAJ
CHIEF HYDROGRAPHER
FIJI HYDROGRAPHIC SERVICE
MARINE DEPARTMENT
MINISTRY OF
COMMUNICATIONS, WORKS
& ENERGY

The Study Team of Japan International Co-operation Agency (JICA) headed by Mr Yasuhiro Oyamada visited the Republic of Fiji on 26th May 1998, to conduct the fifth year (Phase V) work for the Study on the Preparation of Nautical Charts in the Northern Lau Islands Region of the Republic of Fiji.

The meeting was held at the Fiji Hydrographic Service, Marine Department, Ministry of Communications, Works and Energy on 25th June 1998 to discuss the Draft Final Report including the Recommendations for the Improvement of Operation and Management System of Hydrographic Surveying and Nautical Charting in Fiji.

The meeting resulted in the following points being agreed and confirmed between the JICA Study Team and Fiji Hydrographic Service.

1. The Draft Final Report including the Recommendations for the Improvement of Operation and Management System of Hydrographic Surveying and Nautical Charting in Fiji was discussed and agreed in principle by both sides.

2. The meeting agreed the following proposal by FHS to amend the Fifth Years' Plan of Operation (P/O) regarding the Chart F54 limits:

   Page 8, section 3-4-1 (3); for 19° 04' 40" S and 179° 06' 00" W, to read 19° 05' 00" S and 179° 08' 00" W, respectively.

LIST OF ATTENDANTS

FIJI SIDE
(Fiji Hydrographic Service)

1.	Mr Felix Ranchor MAHARAJ	Chief Hydrographer
2.	Mr Philip HILL	Hydrographer
3.	Mr Yauka Daveta SORO	Cartographer

JAPANESE SIDE
(JICA Study Team)

1.	Mr Yasuhiro OYAMADA	Leader
2.	Mr Katsuji CHIBA	Member (Hydrographic Department, Maritime Safety Agency)
3.	Mr Shinobu INAZUMI	Member (Hydrographic Department, Maritime Safety Agency)

MINUTES OF MEETING

ON

FINALIZATION OF DRAFT MAIN REPORT

VOLUME I AND ITS SUMMARY

FOR

THE STUDY ON THE PREPARATION OF NAUTICAL CHARTS

IN

THE NORTHERN LAU ISLANDS REGION

IN

THE REPUBLIC OF FIJI

SUVA, 05 NOVEMBER 1998

MR YASUHIRO OYAMADA
LEADER
STUDY TEAM
JAPAN INTERNATIONAL
CO-OPERATION AGENCY

MR F. R. MAHARAJ
CHIEF HYDROGRAPHER
FIJI HYDROGRAPHIC SERVICE
MARINE DEPARTMENT
MINISTRY OF
COMMUNICATION, WORKS
AND ENERGY

WITNESSED BY:

DR KUNIO YASHIMA
LEADER
ADVISORY TEAM
JAPAN INTERNATIONAL COOPERATION AGENCY

The Leader of the Study Team, Mr Yasuhiro OYAMADA, and the Leader of the Advisory Team, Dr Kunio YASHIMA, of the Japan International Cooperation Agency (JICA), visited the Republic of the Fiji Islands on 03 November 1998, to present and discuss the draft Main Report Volume I and its Summary on the Study on the Preparation of Nautical Charts in the Northern Lau Islands Region of the Republic of the Fiji Islands.

Meetings were held at the Fiji Hydrographic Service, Marine Department, Ministry of Communication, Works and Energy on 04 and 05 November 1998, to discuss the Main Report Volume I and its Summary.

The meeting resulted in the following points being agreed and confirmed between the JICA Study Team and Fiji Hydrographic Service.

1. The Main Report Volume I and its Summary were reviewed and discussed, resulting in the final draft being agreed upon. Corrections are noted in the attachment to these minutes.
2. It was also agreed that the Main Report Vol. I and its Summary will be utilised by the Republic of the Fiji Islands Government and not distributed to the general public until such a time that the Republic of the Fiji Islands Government sees it as fit to do so.

LIST OF ATTENDANTS

FIJI SIDE
(Fiji Hydrographic Service)

1.	Mr .F.R. MAHARAJ	Chief Hydrographer
2.	Mr. A. SILATOLU	Senior Hydrographer

JAPANESE SIDE

1.	Mr Yasuhiro OYAMADA	Leader of the Study Team, JICA
2.	Dr Kunio YASHIMA	Leader of the Advisory Team, JICA Director, Coastal Surveys and Cartography Division, Hydrographic Department, Japan Maritime Safety Agency

K. Y

CORRIGENDA TO MAIN REPORT VOLUME I

1. Page 1; line 10 from the bottom; for " Transport" to read: " Transport (renamed as the Ministry of Communication, Works and Energy as of August 1997)" .

2. Page 2; line 3: for " the Sovereign ... Fiji" to read " the Republic of the Fiji Islands"

3. Page 8; to replace by the separate sheet.

4. Page 10; line 5–6: for " Hydrographic matters, formulation" to read: " hydrographic matters. Formulation"

5. Page 10; line 11: for " International Hydrogrphic Bureau" to read " International Hydrographic Bureau (IHB)" .

6. Page 15; after line 8, insert : " FIG : Federation International de Geometres" .

7. Page 20; after line 3 from the bottom: insert the following line:
" The income from the sale of charts and others in 1997 amounted to about F$15,880" .

8. Page 24; after line 1: insert the following sentence:
" Major marine industries, i.e. maritime traffic, fisheries and tourism, which include movement of vessels at sea, were studied from the viewpoint of needs for nautical charts and other hydrographic services."

9. Page 30; lines 5–8 : to replace by the following lines:
" A survey has been made on the operation and management system of FHS which is responsible for planning, producing and maintaining nautical charts in Fiji. It focused on FHS's organisation, human resources (number of personnel, speciality, capability), facilities (survey ship, instruments for control point survey, hydrographic survey, oceanographic observation and cartographic work),"

10. Page 30; lines 12–16: to replace by the following lines:
" It is considered most probable that the maritime traffic, fisheries and tourism in Fiji will be more intensive in the future. This will create a greater need for modern nautical charts covering critical areas in passages, coastal waters, lagoons, ports and harbours for safer and more economical navigation. From this point of view, an analysis has been made on the existing status thus studied, and, in particular, on certain vital points in FHS's charting capabilities for such demands."

11. Page 30, lines 18–22; to replace by the following lines:
" In the analysis of the existing status of requirements for hydrographic products in Fiji, the following points have been taken into accout; demands from domestic and international shipping and other maritime activities, budgetary constraints, and limited availability of qualified personnel. It is noted that qualified personnel and suitable facilities are most important for FHS's more effective service.

12. Page 30, line 14 from the bottom: for " no staff doing his task" to read " no alternate"

13. Page 30, line 7 from the bottom: to replace by the following:
" It is also considered advisable that the number of Senior Technical/Technical Assistants will be" .

14. Page 31, line 4: to replace by the following:
" It is considered desirable that a survey vessel of medium type built for the specific purpose be provided."

K.Y.

15. Page 31, line 19: for " desirable" to read " also desirable" .

16. Page 31, lines 5–8 from the bottom: to replace the whole sentence by the following:
" It is considered essential that all the technical staff of FHS will be trained at appropriate training facilities abroad, or experts will be invited to carry out training programmes on the following subjects to maintain their technique and knowledge up–to–date:
(a) Basic hydrographic survey and nautical charting.
(b) Tide and tidal current observation and prediction.
(c) Swath survey technique and data processing.
(d) Position fixing by DGPS.
(e) Computer–aided programming of hydrogrphic survey operation and data processing.
(f) Computer–aided marine cartography.
(g) Basic knowledge on electronic navigation charts.

17. Page 31, bottom line: for " be" to read " will be" .

18. Page 32, top line: for " prediction be published" to read " prediction published" .

19. Page 32, line 11: for " noticed" to read " noted" .

20. Page 32, line 13: for " should" to read " will" .

21. Page 32, line 15: for " noticed that,the Senior Technical Assistant should ..." to read " advisable that the post of Senior Technical Assistant ..." .

22. Page 32, line 22: for " are better ...for this work." to read " will be better ... for these tasks." .

23. Page 32, line 13 from the bottom: for " If basic plan" to read " If a basic plan" .

24. Page 32, line 8 from the bottom: for " it is necessary" to read " it is considered necessary" .

25. Page 32, line 6 from the bottom: for " considered" to read " observed" .

26. Page 33, lines 8–9 from the botom: to replace by the following lines:
" It is advised that, as a follow–up scheme of the present JICA Study, the Fiji Government request the Government of Japan for the following technical cooperation matters:

K. Y.

Separate sheet

4--1-2. Functions of the Marine Department

To operate safely and efficiently, the maritime community required a uniform set of minimum standards that apply equally to all participants.

The role of the Marine Department is to provide those standards, monitor and promote compliance within them and, where necessary, take action against those that fail to meet the standards.

The Department is also responsible for ensuring that the maritime community has access to marine safety support services in the form of navigational aids, distress and safety radio system and maritime search and rescue, and is provided with an effective oil spill response capability.

In summary, the Marine Department's functions are as follows:

(1) to establish safety standards relating to entry into the maritime transport system, which promote safe shipping.

(2) to monitor adherence to the safety standards within the maritime transport system.

(3) ensure regular reviews of the maritime transport system to promote the improvement and development of its safety;

(4) to promote compliance with safety and marine pollution prevention standards in the maritime transport system;

(5) to ensure the provision of appropriate distress and safety radio communication systems, marine navigational aids and hydrographic services;

(6) to ensure Fiji's preparedness for, and ability to respond to marine oil pollution spills;

(7) to license vessels, their operation, and their crews;

(8) to ensure the occupational health and safety of seafarers;

(9) to promote safety in the maritime transport system by providing marine safety information and advice;

(10) to investigate and review maritime accidents and incidents;

(11) to maintain the Fiji Register of ships;

(12) to maintain and preserve records and documents relating to the department's functions;

(13) to advise the Minister on technical maritime safety policy;

(14) to perform such other functions as are conferred on it by the Marine Act or any other Act;

(15) providing technical advice and expertise.

The total number of officers and employees working in the Marine Department in 1997 was 557. The annual budget for 1997 was about F$8,064,000.

CORRIGENDA TO MAIN REPORT VOLUME I - SUMMARY

EXECUTIVE SUMMARY

Column : Existing status

I. 2.; for " and Technical" to read " and 5 Technical" .

III. 1.; to replace by the following line : " A limited number of modern instruments are available."

IV.; for " staff" to read " officers" .

V.; for " not exclusive use for" to read " is not exclusively used for" .

Column : Analysis and Assessment

I. 1.; for " should be assigned." to read " is desirable."

I. 2.; for " should be reduced to one or nil." to read " can be reduced to one."

I. 3.; for " should be equivalent to Senior Hydrographer. Also, the posts of cartographers of lower posts should be upgraded to harmony with the Hydrographic Survey Section." to read " can be justifiably upgraded to NS02 level. Also, the posts of cartographers of lower posts can be upgraded in harmony with the other posts within the Hydrographic Section."

I. 4.; for " should be handled exclusively by a staff" to read " can be handled exclusively by an officer" .

I. 5.; for " technical/technical assistants in the Hydrographic Survey Section should be" to read " senior technical/technical assistants in the Hydrographic Section can be"

II. 1.; for " should be worked out." to read " is desirable."

II. 2.; for " should be published for timely providing up-to-date" to read " be published for timely provision of up-to-date" .

II. 3.; for " should be" to read " will ideally be" .

II. 4.; for " should be" to read " will be" .

III.; for " SWATH survey in shallow water and a co-ordinategraph should be provided at" to read " swath survey in shallow water and a co-ordinategraph be provided to" .

IV.; for " staff" to read " officers" .

V.; for " should be replaced by a second-handed 200-500 ton survey vessel capable of carrying asurvey" to read " will preferably be replaced by a more affordable 200-500-ton survey vessel capable of carrying a survey" .

Column : DRAFT RECOMMENDATIONS

I. 1.; for " senior hydrographer" to read " senior hydrographer's post" .

II. 3.; for " Reference charts of the areas where surveys" to read " Publication of reference charts of the areas where survey" .

IV.; for " staff" to read " officers" .

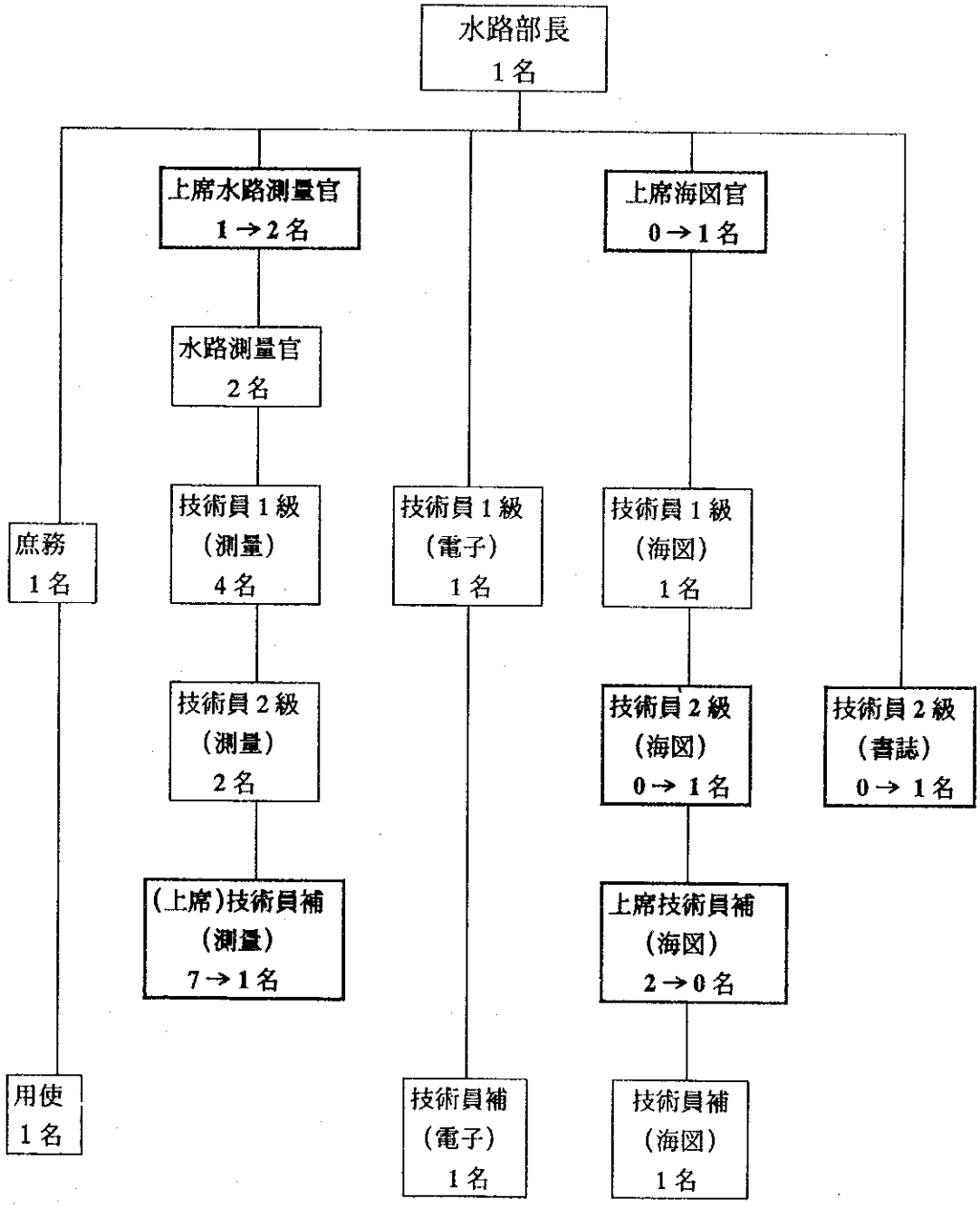
K. Y.

V.; for " used hydrographic" to read " hydrographic" , and for " serviceable to support hydrographic survey activities by" to read " capable of supporting hydrographic survey activities of" .

K.Y.

付録 III

水路部組織図（改善提言）



注： 太字は改善案を示す

JICA