

# **Specification for Aerial Photography**

# **SPECIFICATIONS FOR AERIAL PHOTOGRAPHY**

## **Chapter 1 General**

### ***Section 1 Background***

In compliance with the Scope of Work for the Study for Establishment of Geographic Database in the Republic of The Gambia (hereinafter referred to as “the Study “), it was agreed upon between Department of Lands and Surveys and the International Cooperation Agency (JICA) on December 18, 2000.

JICA has decided to carry out aerial photography during the Study, and assigned the work to the JICA Study Team. The Contractor under the supervision of the JICA Study Team shall carry out aerial photography in the Republic of The Gambia.

### ***Section 2 Specification***

Aerial photography shall be conducted using the photogrammetric mapping method, in accordance with the Detailed Specification attached hereto.

### ***Section 3 Scope of Work***

Aerial photography covering the Study area of Gambia for the Base Maps shall be carried out approximately 11,295 km<sup>2</sup> at a photo scale of 1:50,000 (see attached Figure 1).

### ***Section 4 Unit of Measurement***

In accordance with the Japanese Law of Measurement, the metric system shall be used.

### ***Section 5 Language and Documentation***

As a rule, the language and documentation to be used for the execution of aerial photography shall be English.

## **Chapter 2 Detailed Specification**

### ***Section 1 Execution of the Work***

All the works shall be executed in accordance with this specification, the instructions and requirements of the Supervisor of the JICA Study Team (hereinafter referred to as “the Supervisor”).

## ***Section 2 Aerial Photography***

The aerial photography works shall be carried out based on the following technical items:

### **Aircraft**

The aircraft shall meet the following requirements:

1. Stable when fully loaded while in flight to required height.
2. Unobstructed vision in all directions.
3. Capable of installing apparatus at a position where exhaust fumes will not affect the aerial photography works.
4. Equipped with a GPS flight navigation system suitable to local conditions.
5. Have an undistorted and calibrated view-finder window glass, if necessary.

### **Camera**

Aerial camera shall have a wide angle lens with 23 cm x 23 cm format, 15 cm focal length, e.g. Leica RC-30 and its shall be met the following specifications:

1. Minimum resolution: 30 lines/mm
2. Maximum tangential distortion: 0.015 mm
3. Maximum radial distortion: 0.01 mm
4. Flatness of film: less than 0.01 mm
5. Rotating inter-lens shutter
6. Calibration report certified within 3 years with following items:
  - a. Camera number and lens number
  - b. Position of principal point relative to fiducial marks (in 0.01 mm)
  - c. Calibrated focal length (in 0.01 mm)
  - d. Radial distortion
  - e. Observer’s name and number of report
7. Use the aerial camera equipped airborne GPS system with the GPS ground control points

The following data shall be submitted the Supervisor.

- a. Raw data of airborne GPS measured every 1.5 seconds and the ground control shall be stored in CD-ROM.
- b. Event record that the recorded time for each exposures shall be stored in CD-ROM.
- c. Computed coordinates list of the projection center for each exposures shall be stored in CD-ROM.

### Films

Aerial negative films shall have following performance capabilities:

1. After processing, ratio of differential change in dimension between longitudinal and lateral shall not exceed 0.01 mm.
2. Ratio of differential change shall also be less than 0.001 % per 1 % relative humidity.
3. The spectral sensitivity is panchromatic unless otherwise specified.

### Flight plan

The flights shall be carried out in accordance with the following estimated work volume and flight plan attached Figure 1 prepared by the Supervisor.

1. Study area covered at a scale of 1:50,000
  - a. Covering area: Approx. 11,295 km<sup>2</sup>
  - b. Flight lines: Approx. 19 lines
  - c. Photographs: Approx. 473 photos.

The Contractor shall adopt the geographic coordinates (BL) of both ends on the each flight lines to be instructed by the Supervisor for GPS navigation.

### Flight

The flight shall be satisfied the following items:

1. Forward overlap and lateral overlap, crab, tip and tilt shall be secured within following tolerances:
  - a. Forward overlap: 60 % as standard
  - b. Lateral overlap: 30 % as standard
  - c. Crab: Less than 10 degrees
  - d. Tip & tilt: Less than 5 degrees
2. The tone of photograph shall allow for details in the shade to be interpreted.
3. When a flight line is broken, the broken part shall be covered by a forward overlap of more than 2 models.
4. Photo images should be free of cloud or mist. However, it may be permissible up to 5 %, if covered by photographs of adjacent strips.

### Re-flights

Re-flights shall be carried out immediately if the film is rejected, in accordance with the guidance of the Supervisor.

### **Flight record**

The following information shall be written on the flight record.

1. Name of contract
2. Name of photographing organization
3. Film number
4. Beginning and finish times of flight
5. Date of flight
6. Camera number, lens number and magazine number
7. Calibrated focal length
8. Opening aperture, filter number and exposure time
9. Type of film
10. Type of aircraft
11. Flight altitude

### ***Section 3 Photo Processing***

#### **Negative films**

Processing of negative films shall be carried out as follows:

1. Developer specified by manufacturer's recommendations, or an equivalent one shall be used.
2. Developing shall be carried out in such a manner that the negative contains all highlights, shadow details, and camera recording data is legible.
3. Fixer shall be acid-based and fixing shall be carried out well enough to remove unused silver halide.
4. Washing shall be carried out to remove undesirable residues.
5. In drying, distortions shall be avoided.
6. Photo-images shall not be marred by scratches, fingerprints, smudges, shrinkage in the photo processing.
7. The films of every photo that to be used will be annotated as instructed by the Supervisor.

E.g. sample of film annotation is as follows:

**GAMBIA L-20 23/10/2001 1:50,000 DL&S-JICA**

#### **Photo index maps**

Photo index maps shall be prepared by using topographic map at a scale of 1:250,000

## Chapter 3 Work Schedule

All the aerial photography shall be completed by 19<sup>th</sup> December, 2001.

## Chapter 4 Deliverables

The Contractor shall deliver the following final results and products to the JICA Study Team.

### Photographs and the other reports

- |   |   |
|---|---|
| 1. Contact prints:                            | 3 sets                                      |
| 2. Negative films:                            | 1 set                                       |
| 3. Diapositive films:                         | 1 set                                       |
| 4. Photo index map (scale 1:250,000):         | 1 set of original and 3 sets of photocopies |
| 5. Raw data of airborne GPS:                  | 1 set (CD-ROM and printed sheets)           |
| 6. Recorded time data (event record):         | 1 set (CD-ROM and printed sheets)           |
| 7. Coordinates list of the projection center: | 1 set (CD-ROM and printed sheets)           |
| 8. Certified calibration records of camera:   | 1set  |
| 9. Flight records:                            | 1set  |
| 10. Weekly progress reports:                  | 1set for every week                         |

THE STUDY  
FOR  
ESTABLISHMENT OF GEOGRAPHIC DATABASE  
IN  
THE REPUBLIC OF THE GAMBIA

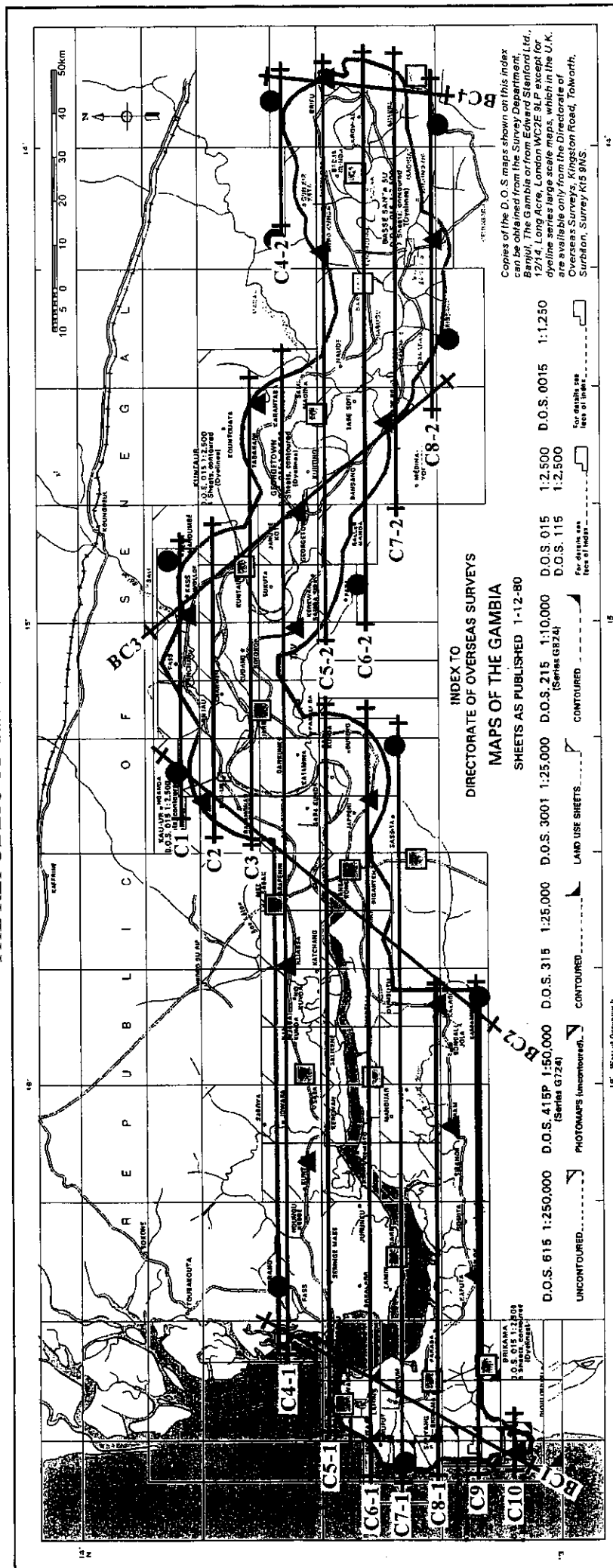


Fig. 1 Flight Map

## **The permission for Aerial Photography**



# The Gambia Civil

Banjul International Airport  
Private Mail Bag 285 Banjul,  
The Gambia  
West Africa

G.C.A.A.



# Aviation Authority

Tel : (220) 472831  
473000  
473001

Fax: (220) 472190  
Telex: 2342 CAA 6JL GV  
CABLE: CIVIL AIR

Our Ref:

FO 57/01/PART 10/(12)

Your Ref:

Date

12 October 2001

Digital Topographical Mapping Services cc  
43/45 Friedland Avenue  
CYRILDENE, 2198  
2235, Bedfordview, 2008  
South Africa

Dear Sir

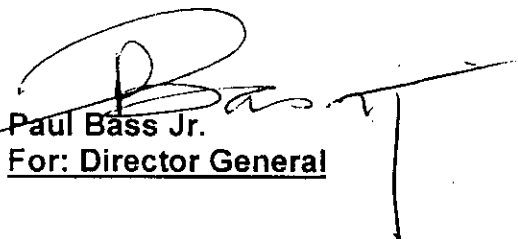
## AERIAL PHOTOGRAPHY – UNDER THE JICA PROJECT

We acknowledge receipt of your letter dated October 8<sup>th</sup> 2001, which was addressed to the Department of State for Local Government and Lands and copied to us.

This office has no objection to such an operation and approval for overflight and landing is hereby granted as per your request.

However, this is subject to approval of the operation by the Department of State for Defense.

Yours faithfully



Paul Bass Jr.  
For: Director General

### GCAA MISSION STATEMENT

"To provide the best Airport and Air navigation facilities in the Sub-region and regulate air transport to International Standards while generating a reasonable return on investments"

The Gambia Civil



Aviation Authority

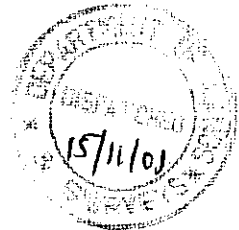
# “Permit – to – Fly” Authorization

*The Civil Aviation Authority of The Gambia in exercise of the Powers vested upon it, in accordance with the Civil Aviation Act of 1991 and the Regulations prescribed thereunder for the issuance of Certificates and Licences, hereby authorizes:*

## DTM SERVICES (Sky Eye Aerial photography)

*to carry out Aerial Photography on behalf of the Department of State for Lands and Surveys.*

Licence Number: PTFA 001/2001

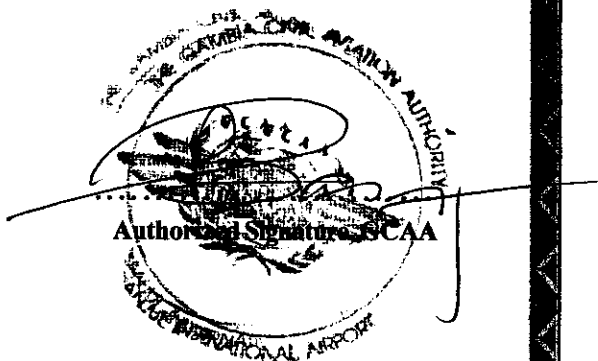


Validity of Licence: From: 06/11/2001 To: 30/11/2001

Aircraft Type: CESSNA 406

Registration: V5 – CAX

Date of Issue: 6<sup>th</sup> November 2001





**VERY URGENT**

Department of State for Defence  
Office of The President  
State House  
BANJUL

FA 196/174/01/Prt.5/(78)

25<sup>th</sup> October 2001

The Director  
Department of Lands and Surveys  
Col. M. Ghadaffi Avenue  
BANJUL

**RE: APPLICATION FOR CLEARANCE FOR AERIAL  
PHOTOGRAPHY FOR THE MAPPING PROJECT FUNDED BY  
JICA UNDER THE TECHNICAL CO-OPERATION AGREEMENT  
PROVIDED BY THE GOVERNMENT OF JAPAN**

Reference is kindly made to your memo: SA 20/132/01/(14) of October 15, 2001 regarding the above.

I write to inform you that approval has been granted for overflight and landing clearance in respect of the following aircraft which is to transport the JICA Study Team to The Gambia, for the concerned project:

- Aircraft : Cessna C 406 Caravan
- Registration : V5 - CAW
- No. of Crew : 5 persons
- Expected Date of arrival : Thursday, 1<sup>st</sup> November 2001

Moreover, permission is issued to fly-over the Gambian Airspace in order to conduct the required photographic and mapping exercise.

Notwithstanding, you are being advised to exclude all military formations/camps/posts from the photographic exercise.

Forwarded for your necessary action please.

Regards.



Habib T.B. Jarra  
For: Permanent Secretary

CC: Director General, GCAA

Armed Forces Chief of Staff

Director General, NIA

Permanent Secretary, DOS for Foreign Affairs

Permanent Secretary, DOS for Local Govt. & Lands

**HAUT COMMISSARIAT DU SENEGAL  
EN GAMBIE**

59, Katraba Avenue Derrière Mosquée Pipe Line  
BP 985, Banjul  
Tel. : 37 37 52. Fax. 37 37 50

Banjul, le 4 NOV. 2001

109  
SAS (T)  
f. y. a.  
L. 9/11

Le Haut Commissariat de la République du Sénégal en Gambie présente ses compliments au Département d'Etat aux Affaires étrangères de la République de Gambie et, se référant à Sa note verbale n° PR9/20/01/PART IX (51 - KCN) du 16 octobre 2001, a l'honneur de porter à Sa connaissance ce qui suit :

Les autorités sénégalaises compétentes saisies ont bien voulu réserver une suite favorable à la demande de survol du territoire sénégalais formulée par le Gouvernement gambien, dans le cadre de la campagne de photographies aériennes parrainée par l'Agence japonaise de coopération internationale (JICA).

Les références de l'autorisation de survol sont les suivantes :  
- 1182/2001/DAC/BTA du 7 novembre 2001.

Le Haut Commissariat de la République du Sénégal en Gambie saisit cette occasion pour renouveler au Département d'Etat aux Affaires étrangères de Gambie les assurances de sa très haute considération.

**DEPARTEMENT D'ETAT  
AUX AFFAIRES ETRANGERES  
DE LA REPUBLIQUE DE GAMBIE**

0756 Ennis @ Jan 09/11/01

ZGZC DYADDZ  
FAJSZTZX GOOYZTZY GOOYZPZX GOOZIZX GOOYKEX  
1011 GOOYVAYX  
NR 1102/2001/DAC/ETA DU UP NOV 01 STOP ATTN FIM SERVICES JOHANNESBURG  
SOUTH AFRICA STOP OVERFLIGHT GOOG FIR GRANTED FOR CESSNA CARAVAN A/C  
606 REG/V5-CAN ROUTING: IYGA/FOOL/DIAP/GEYD PERIOD 01 NOV - 31 DEC 01  
SER/DIGITAL TOPOGRAPHICAL SERVICE CREW-CAPT ETIENNE J D2 ( ALL SOUTH  
AFRICAN ) FROM/CEITA-AVIATION SERVICES STOP/LND

A l'attention de Mr Assane Ndiaje

## **The results of Aerial Triangulation**

THE STUDY  
FOR  
ESTABLISHMENT OF GEOGRAPHIC  
DATABASE  
IN  
THE REPUBLIC OF THE GAMBIA

RESULTS  
OF  
AERIAL TRIANGULATION

MARCH 2002

JAPAN INTERNATIONAL COOPERATION AGENCY



**AERIAL TRIANGULATION  
ACCURACY CONTROL TABLE**

1/2

Project name or area		Work quantity		Adjustment method		Period		Executing agency		Project leader		Signature						
THE REPUBLIC OF THE SAUDI ARABIA		No. of courses: 21		Bundle method		10 Jan 2002		JICA (KOKUSAI KOGYO)		Inspector		A. AL-SHARAH (Signature) K. YAMADA (Signature)						
		No. of models: 456				~ 5 Feb 2002												
Flight course No.	Photo No.	No. of models	No. of control points for orientation		Control point residual errors				Polynomial method				Model or bundle method					
			Hor.	Ver.	Hor. position	Standard	Max.	Elevation	Standard	Max.	Horizontal position	Standard	Max.	Elevation	Standard	Max.		
				Eliminated points after calculation														
				Hor.	Ver.	Hor.	Ver.	Standard	Max.	Standard	Max.	Standard	Max.	Standard	Max.	Standard	Max.	
19	7500	15	43	43	0	0	0	0.874	2.094	0.700	-2.469							
18	"	36~19	17															
17	"	39~65	26															
16	"	33~81	52															
15	"	77~88	9															
14	"	35~73	58															
13	"	75~96	31															
12	"	81~75	6															
12-1	"	74~41	33															
11	"	40~89	31															
10	"	84~24	40															
9	"	26~44	23															
		~ 84~60																
Equipment		Permissible limits		Operate		Inspection		Period		Re-survey rate		Remarks:						
		1.50 3.00		1.50 3.00		1.50 3.00		15 DM		30 DM								

Notes: Permissible limits for control point residual errors and pass/tie points discrepancies

Accuracy control table 9

## AERIAL TRIANGULATION ACCURACY CONTROL TABLE

2/2

Project name or area		Work quantity		Adjustment method		Period		Executing agency		Project leader		(Signature)					
														No. of courses:		Inspector	
		No. of models:															
Flight course No.	Flight altitude	Photo Nos.	No. of models	No. of control points for orientation		Control point residual errors				Polynomial method				Model or bundle method			
				Hor.	Ver.	Horizontal position	Elevation	Horizontal position	Elevation	Horizontal position	Elevation	Horizontal position	Elevation	Horizontal position	Elevation		
				Hor.	Ver.	Standard	Max.	Standard	Max.	Standard	Max.	Standard	Max.	Standard	Max.	Standard	Max.
8	7.500	80-54	26														
7	"	53-63	16														
		37-42															
6	"	27-52	25														
5	"	23-30	3														
4	"	83-94	11														
4-1	"	94-98	4														
3	"	16-98	22														
		94-91															
2	"	86-67	19														
1	"	47-56	9														
Permissible limits																	
Equipment						Inspection:		Period		Re-survey		Remarks:					
						No. of persons/day				rate							

Notes: Permissible limits for control point residual errors and pass/tie points discrepancies

RESIDUAL AT CONTROL POINTS

THE REPUBLIC OF THE GAMBIA

NO.	NAME	DX	RESIDUAL		DH	NO.	NAME	GIVEN / RESULT COORD.		IN METER
			DY	DL				X (N)	Y (E)	
28	290-G	-1.166	-.422	1.240	.367	28	290-G	1482325.174	620008.084	35.037
29	300-G	.668	.217	.703	.508	29	300-G	1482324.008	620007.662	35.404
30	310-G	.245	-.142	.283	.206	30	310-G	1472061.137	306547.815	10.650
31	320-G	.054	.078	.095	.058	31	320-G	1469346.574	324701.271	11.158
32	330-G	-.460	-.240	.519	.298	32	330-G	1469346.819	324701.129	16.044
33	340-G	.120	.211	.243	-.153	33	340-G	1474409.202	350051.664	3.596
34	350-G	1.310	-1.634	2.094	-1.065	34	350-G	1474409.256	350051.742	3.654
35	360-G	-.270	1.314	1.341	-1.451	35	360-G	1476261.667	395255.825	28.244
36	370-G	-.134	1.156	1.164	-.236	36	370-G	1476261.207	395255.585	28.542
37	380-G	-.039	.510	.511	.395	37	380-G	1472164.244	551063.985	27.383
38	390-G	-.060	.659	.662	-.425	38	390-G	1472164.364	551063.196	27.230
39	400-G	-1.577	1.136	1.943	-2.469	39	400-G	1474452.402	614470.386	14.627
40	410-G	-.318	.548	.634	-.737	40	410-G	1474453.712	614468.752	13.562
41	420-G	-.254	.476	.540	-.708	41	420-G	1473530.128	624623.727	54.876
42	430-G	-.139	-.377	.402	.775	42	430-G	1473529.858	624625.041	53.425
43	440-G	.036	.146	.150	-.145	43	440-G	1462659.470	381169.728	15.129
			MAX.	2.094	-2.469			1462659.336	381170.884	14.893
			S.D.	.874	.700			1464648.148	409521.854	11.371
								1463667.654	566381.948	11.766
								1461540.536	566382.607	31.968
								1461538.959	588029.867	57.109
								1457583.142	588031.003	54.640
								329251.811	17.437	17.437
								329252.359	16.700	16.700
								346472.130	27.229	27.229
								346472.606	26.521	26.521
								412339.469	13.370	13.370
								412339.092	14.145	14.145
								308799.219	7.115	7.115
								308799.365	6.970	6.970

RESIDUAL AT CONTROL POINTS

THE REPUBLIC OF THE GAMBIA

NO.	NAME	DX	RESIDUAL			DIU	NO.	NAME	GIVEN / RESULT COORD. IN METER		
			DY	DL	DL				X (N)	Y (E)	H
28	290-G	-1.166	-0.422	1.240	.367	28	290-G	1482325.174	620008.084	35.037	
29	300-G	.668	.217	.703	.508	29	300-G	1482324.008	620007.662	35.404	
30	310-G	.245	-0.142	.283	.206	30	310-G	1472061.137	306547.815	10.650	
31	320-G	.054	.078	.095	.058	31	320-G	1472061.805	306548.032	11.158	
32	330-G	-0.460	-0.240	.519	.298	32	330-G	1469346.574	324701.271	16.044	
33	340-G	.120	.211	.243	-0.153	33	340-G	1469346.819	324701.129	16.250	
34	350-G	1.310	-1.634	2.094	-1.065	34	350-G	1474409.202	350051.664	3.596	
35	360-G	-0.270	1.314	1.341	-1.451	35	360-G	1474409.256	350051.742	3.654	
36	370-G	-0.134	1.156	1.164	-0.236	36	370-G	1476261.667	395255.825	28.244	
37	380-G	-0.039	.510	.511	.395	37	380-G	1476261.207	395255.585	28.542	
38	390-G	-0.060	.659	.662	-0.425	38	390-G	1472164.244	551063.985	27.383	
39	400-G	-1.577	1.136	1.943	-2.469	39	400-G	1472164.364	551064.196	27.230	
40	410-G	-0.318	.548	.634	-0.737	40	410-G	1474453.712	614468.752	13.562	
41	420-G	-0.254	.476	.540	-0.708	41	420-G	1473530.128	624623.727	54.876	
42	430-G	-0.139	-0.377	.402	.775	42	430-G	1473529.858	624625.041	53.425	
43	440-G	.036	.146	.150	-0.145	43	440-G	1462659.336	381170.884	14.893	
			MAX.	2.094	-2.469			1464648.148	409521.854	11.371	
			S.D.	.874	.700			1463667.654	566381.948	11.766	
								1463667.594	566382.607	31.968	
								1461540.536	588029.867	31.543	
								1461538.959	588031.003	54.640	
								1457582.824	329251.811	17.437	
								1456138.196	346472.130	16.700	
								1456137.942	346472.606	27.229	
								1457057.969	412339.469	26.521	
								1457057.830	412339.092	13.370	
								1448725.639	308799.219	14.145	
								1448725.675	308799.365	6.970	

ORIENTATION ELEMENTS WITH PROJECTOR

THE REPUBLIC OF THE GAMBIA

TYPE (A7)		MACHINE SCALE 1 / 25000.0		MAPPING SCALE 1 / 50000.0		GEAR RATE 1 / .5		TYPE (A8)		MACHINE SCALE 1 / 25000.0		MAPPING SCALE 1 / 50000.0		GEAR RATE 1 / .5	
COURSE NAME		19		15 MODELS (PHOTO		1 - 16)		COURSE NAME		19		15 MODELS (PHOTO		1 - 16)	
MODEL	PHOTO	KAPPA	PHI	OMEGA	BZ	EX	FOCUS	MODEL	PHOTO	KAPPA	PHI	OMEGA	L-PHI	BX	FOCUS
1	1	95.21	99.77	99.07	100.03	182.80	153.81	1	1	95.21	99.76	99.07	100.01	182.80	153.81
	2	96.96	100.08	98.60	100.03		153.81		2	96.96	100.07	98.60			153.81
2	2	97.11	100.08	98.60	99.93	181.75	153.78	2	2	97.11	100.10	98.60	99.97	181.75	153.78
	3	97.51	100.18	100.20	99.93		153.78		3	97.51	100.21	100.20			153.78
3	3	97.72	100.18	100.20	99.97	183.43	153.77	3	3	97.72	100.20	100.20	99.99	183.43	153.77
	4	98.59	100.42	99.60	99.97		153.77		4	98.59	100.43	99.60			153.77
4	4	98.38	100.42	99.60	100.55	181.34	153.76	4	4	98.38	100.23	99.60	100.19	181.34	153.76
	5	98.41	101.24	99.67	100.55		153.76		5	98.40	101.05	99.67			153.76
5	5	99.02	101.24	99.66	99.52	182.14	153.75	5	5	99.02	101.41	99.66	99.83	182.14	153.75
	6	100.96	99.66	98.68	99.52		153.75		6	100.97	99.83	98.68			153.75
6	6	99.92	99.68	98.67	100.06	182.95	153.75	6	6	99.92	99.66	98.67	100.02	182.95	153.75
	7	99.37	100.44	99.78	100.06		153.75		7	99.37	100.42	99.78			153.75
7	7	99.78	100.44	99.77	99.79	182.09	153.75	7	7	99.78	100.51	99.77	99.93	182.09	153.75
	8	100.05	100.54	99.62	99.79		153.75		8	100.05	100.61	99.62			153.75
8	8	100.03	100.54	99.62	99.87	182.46	153.74	8	8	100.03	100.58	99.62	99.95	182.46	153.74
	9	99.75	100.09	100.01	99.87		153.74		9	99.75	100.13	100.01			153.74
9	9	99.76	100.09	100.01	100.07	182.40	153.74	9	9	99.76	100.06	100.01	100.02	182.40	153.74
	10	100.50	100.16	99.38	100.07		153.74		10	100.50	100.14	99.38			153.74
10	10	100.69	100.16	99.38	99.68	182.34	153.74	10	10	100.69	100.27	99.38	99.89	182.34	153.74
	11	99.43	100.33	99.91	99.68		153.74		11	99.43	100.44	99.91			153.74
11	11	99.57	100.33	99.91	99.77	181.51	153.75	11	11	99.57	100.41	99.91	99.92	181.51	153.75
	12	99.58	100.43	100.67	99.77		153.75		12	99.58	100.51	100.67			153.75
12	12	99.30	100.43	100.67	100.16	183.28	153.75	12	12	99.30	100.37	100.67	100.06	183.28	153.75
	13	100.11	100.59	100.89	100.16		153.75		13	100.11	100.54	100.89			153.75
13	13	99.84	100.59	100.89	99.97	182.16	153.75	13	13	99.84	100.60	100.89	99.99	182.16	153.75
	14	99.46	100.64	99.99	99.97		153.75		14	99.46	100.65	99.99			153.75
14	14	99.64	100.64	99.99	100.20	182.26	153.74	14	14	99.64	100.57	99.99	100.07	182.26	153.74
	15	100.02	100.47	99.55	100.20		153.74		15	100.02	100.40	99.55			153.74
15	15	100.39	100.47	99.54	100.51	181.86	153.74	15	15	100.39	100.29	99.54	100.18	181.86	153.74
	16	98.87	99.93	100.55	100.51		153.74		16	98.87	99.75	100.55			153.74

OBSERVATIONAL COORDINATES

THE REPUBLIC OF THE GAMBIA

COURSE NAME 19 15 MODELS (PHOTO 1 - 16)

MODEL NO. 1 (PHOTO 1 - 2)

NO.	NAME	X1	Y2	PX2	PY1
1	1-F	609.455	607.720	504.968	499.426
2	2-F	609.489	395.624	505.080	499.398
3	3-F	397.306	395.713	505.024	499.288
4	4-F	397.275	607.848	504.924	499.338
5	19-01-A	501.448	593.331	594.201	502.156
6	19-01-B	506.485	502.684	595.649	502.595
7	19-01-C	504.130	410.868	597.026	501.949
8	19-01-D	506.144	554.210	594.801	502.534
9	19-01-E	507.097	454.435	595.364	502.403
10	19-02-A	595.834	592.179	593.603	504.554
11	19-02-B	598.145	499.228	595.509	505.144
12	19-02-C	592.565	410.247	597.097	504.703
13	19-02-D	597.668	543.079	594.637	504.958
14	19-02-E	596.458	456.061	596.369	505.078
15	19010-T	509.865	418.533	596.945	502.215
16	19020-T	520.014	398.242	597.294	502.301
17	19030-T	596.137	428.730	596.914	504.929
18	1-F	609.457	607.720	504.968	499.428
19	2-F	609.491	395.626	505.084	499.398
20	3-F	397.310	395.715	505.026	499.290
21	4-F	397.279	607.850	504.924	499.338
22	19-01-A	501.450	593.333	594.203	502.158
23	19-01-B	506.489	502.688	595.649	502.595
24	19-01-C	504.134	410.872	597.030	501.951
25	19-01-D	506.148	554.214	594.803	502.538
26	19-01-E	507.099	454.437	596.366	502.407
27	19-02-A	595.838	592.181	593.607	504.556
28	19-02-B	598.145	499.230	595.513	505.146
29	19-02-C	592.567	410.249	597.099	504.705
30	19-02-D	597.670	543.079	594.639	504.962
31	19-02-E	596.462	456.063	596.373	505.080
32	19010-T	509.869	418.537	596.947	502.215
33	19020-T	520.016	398.244	597.298	502.303
34	19030-T	596.141	428.732	596.914	504.931

## Minutes of Meeting

**MINUTES OF MEETING  
FOR  
THE STUDY  
FOR  
ESTABLISHMENT OF GEOGRAPHIC DATABASE  
IN  
THE REPUBLIC OF THE GAMBIA**

**AGREED UPON BETWEEN**

**DEPARTMENT OF LANDS AND SURVEYS**

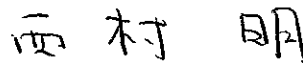
**AND**

**JICA STUDY TEAM  
(JAPAN INTERNATIONAL COOPERATION AGENCY)**

**BANJUL  
22 June, 2001**



**RUTHERFORD A.F. THOMAS**  
Director  
Department of Lands and Surveys,  
Department of State  
for Local Government and Lands



**AKIRA NISHIMURA**  
Leader  
JICA Study Team  
Japan International Cooperation Agency



Japan International Cooperation Agency Study Team for "The Study for Establishment of Geographic Database in The Republic of The Gambia " (hereinafter referred to as "JICA Study Team"), and Department of Lands and Surveys (hereinafter referred to as " DL&S.") held a meeting concerning the Inception Report of "The Study for Establishment of Geographic Database in The Republic of The Gambia " on the 20<sup>th</sup> day of June 2001, from 9:00 to 11:20. The meeting took place at " DL&S" office in a friendly atmosphere.

The conclusions of the discussions were as follows:

1. "DL&S" agreed on the Inception Report prepared by "JICA Study Team".
2. "DL&S" requested the followings to JICA Study Team:
  - (1) The Counterpart personnel shall take the opportunity of training that contains numerical plotting and aerial triangulation in Japan to help them to create topographic map by themselves independently in near future.
  - (2) The Equipments for technical transfer, for example GPS receivers and Digital compilation device, shall be given to Gambia side after this study.

"JICA Study Team" promised to convey these requests to the JICA Headquarter.

The members who attended the meeting are listed in Appendix-1.

Two handwritten signatures in black ink, one on the left and one on the right, located at the bottom right corner of the page.

**LIST OF ATTENDANTS****Gambian Side:**

Mr. Rutherford A. F. Thomas	Director Department of Lands and Surveys Department of State for Local Government and Lands
Mr. Ousuman Semega Janneh	Principal Cartographer Department of Lands and Surveys
Mr. Ousuman S. Jarjusey	Principal Surveyor Department of Lands and Surveys
Mr. Alieu S. Jobe	Senior Cartographer Department of Lands and Surveys
Mr. Y. S. K. Barry	Principal Lands and Valuation Officer Department of Lands and Surveys

**Japanese Side:**

Mr. Akira Nishimura	Leader of JICA Study Team
Mr. Morten Strand	Surveyor
Mr. Atsushi Masano	Surveyor
Mr. Keiji Yamada	Surveyor
Mr. Yoshimitsu Yoshimura	Technical Adviser, JICA

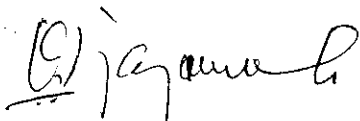


MINUTES OF MEETING  
FOR  
THE STUDY  
FOR  
ESTABLISHMENT OF GEOGRAPHIC DATABASE  
IN  
THE REPUBLIC OF THE GAMBIA

AGREED UPON BETWEEN

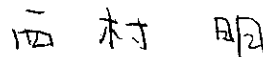
DEPARTMENT OF LANDS AND SURVEYS  
AND  
JICA STUDY TEAM  
(JAPAN INTERNATIONAL COOPERATION AGENCY)

BANJUL  
23 July, 2002



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OUSMAN SEMEGA JANNEH  
Principal Cartographer  
For Director of Lands and Surveys  
Department of Lands and Surveys,  
Department of State  
for Local Government and Lands



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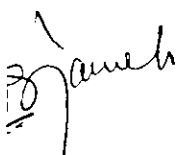
AKIRA NISHIMURA  
Leader  
JICA Study Team  
Japan International Cooperation Agency

Japan International Cooperation Agency Study Team for "The Study for Establishment of Geographic Database in The Republic of The Gambia " (hereinafter referred to as "JICA Study Team"), and Department of Lands and Surveys (hereinafter referred to as " DL&S.") held a meeting concerning the Progress Report of "The Study for Establishment of Geographic Database in The Republic of The Gambia " on the 17<sup>th</sup> day of June 2002, from 10:00 to 12:05. The meeting took place at " DL&S" office in a friendly atmosphere.

The conclusions of the discussions were as follows:

1. There were several questions.
  - a) What kind of software does JICA Study Team use for technology transfer of the map revision ?  
JICA Study Team will use "TNT Mips" mainly
  - b) How does DL&S transform the coordinates of existing national control points in The Gambia based on Clarke 1880 reference ellipsoid to based on WGS-84 reference ellipsoid ?  
JICA Study Team calculated the parameters of transformation in the computation of national control point survey in order to transform the coordinates of existing national control points.
  - c) What are the structures of three GIS database( Topographic database, Road network database, DTM database) ?  
JICA Study Team explained the structures of these database briefly and promised to explain them for further detail later when Mr. Masuda is in the Gambia.
  - d) What kind of equipment does JICA Study Team plan to use in the technology transfer of the map revision ?  
JICA Study Team promised to give DL&S the list of the equipment for the technology transfer of the map revision.
2. "DL&S" agreed on the Progress Report prepared by "JICA Study Team".
3. "DL&S" requested the following to JICA Study Team:
  - a) The Equipment for technology transfer shall be given to Gambian side after this study.  
"JICA Study Team" promised to convey this request to the JICA Headquarter.

The members who attended the meeting are listed in Appendix-1.



LIST OF ATTENDANTSGambian Side ( Department of Lands and Surveys) :

Mr. Ousuman Semega Janneh	Principal Cartographer/overseeing Director of Lands and Surveys
Mr. Yankuba. S. K. Barry	Principal Lands and Valuation Officer
Mr. Alieu S. Jobe	Senior Cartographer
Mr. Momodou Secka	Surveyor
Miss. Mayeh Sabally	Senior Cartographer
Mr. Momodou Joof	Senior Surveyor
Mrs. Rakie Mahmoud	Lands and Valuation Officer
Mr. Momodu Jang Jallow	Survey Technician
Mr. Mohammed Trawally	Survey Technician
Mr. Baba Cham	Survey Technician
Mr. Musa Taban	Cartographer Technician
Mr. Mansour Tamba	Chainman

Japanese Side:

Mr. Akira Nishimura	Leader of JICA Study Team
Mr. Tomoharu Yokota	Surveyor
Mr. Katuyuki Kondou	Surveyor
Mr. Keiji Yamada	Surveyor
Mr. Masahiko Takahashi	Coordinator
Mr. Takanori Zenimoto	JICA
Mr. Hisashi Mori	Technical Adviser, JICA

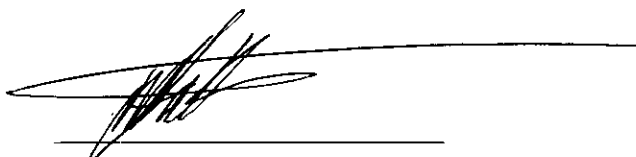
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MINUTES OF THE MEETING  
FOR  
THE STUDY  
OF  
THE ESTABLISHMENT OF GEOGRAPHIC DATABASE  
IN  
THE REPUBLIC OF THE GAMBIA

AGREED UPON BETWEEN

THE DEPARTMENT OF LANDS AND SURVEYS  
AND  
JICA STUDY TEAM  
(JAPAN INTERNATIONAL COOPERATION AGENCY)

BANJUL  
8 October, 2002



MALAMIN JATTA  
Ag. Director of Lands and Survey  
Department of Lands and Surveys  
Department of State for  
Local Government and Lands



AKIRA NISHIMURA  
Leader  
JICA Study Team

Japan International Cooperation Agency Study Team for "The Study for Establishment of Geographic Database in The Republic of The Gambia " (hereinafter referred to as "JICA Study Team"), and Department of Lands and Surveys (hereinafter referred to as " DL&S.") held a meeting concerning the Draft Final Report of "The Study for Establishment of Geographic Database in The Republic of The Gambia " on the 3<sup>th</sup> day of October 2002, from 10:10 to 11:50. The meeting took place at " DL&S" office in a friendly atmosphere.

The conclusions of the discussions were as follows:

1. "DL&S" agreed on the Draft Final Report prepared by "JICA Study Team".
2. "DL&S" requested the following to JICA Study Team:
  - a) "DL&S" shall request additional sessions of technology transfer trainings regarding to map revision in order to maintain and improve their technical skills.

"JICA Study Team" promised to convey this request to the JICA Headquarter.

The members who attended the meeting are listed in Appendix-1.

**LIST OF ATTENDANTS****Gambian Side ( Department of Lands and Surveys) :**

Mr. Alieu S. Jobe	Senior Cartographer
Mr. Momodou Secka	Surveyor
Miss. Mayeh Sabally	Senior Cartographer
Mr. Momodou Joof	Senior Surveyor
Mr. Momodu Jang Jallow	Survey Technician
Mr. Baba Cham	Survey Technician
Mr. Yankuba Cham	Draughtsman
Mr. Dwada Fatty	Cartographic Technician

**Japanese Side:**

Mr. Akira Nishimura	Leader of JICA Study Team
Mr. Morter Strand	Surveyor
Miss. Chiyo Kigasawa	Coordinator
Mr. Hisashi Mori	Technical Adviser, JICA



# Memorandum

# Memorandum

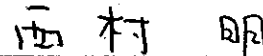
2 - July - 2001

The following items agreed upon between Department of Lands and Surveys and JICA Study Team

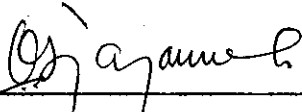
1. Reference Ellipsoid is WGS 84
2. Projection System is UTM (Universal Travers Mercator) in Zone 28
3. Origin Point is 15° west of Greenwich in Longitude and Equator in Latitude
4. Scale Factor at origin is 0.9996
5. False coordinate of origin is 500,000m Easting
6. Unit of measurement is Metre



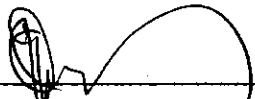
RUTHERFORD A. F. THOMAS  
Director  
Department of Lands and Surveys  
Department of State for  
Local Government and Lands



AKIRA NISHIMURA  
Leader  
JICA Study Team



OSUMAN SEMEGA JANNEH  
Principal Cartography  
Department of Lands and Surveys



OSUMAN S. JARJUSEY  
Principal Surveyor  
Department of Lands and Surveys

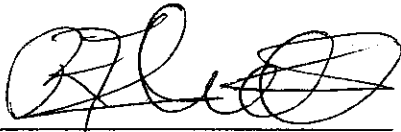
# Memorandum

6<sup>th</sup> - November - 2001

The following items agreed upon between Department of Lands and Surveys and JICA Study Team:

1. The annotation of Aerial film is as follows

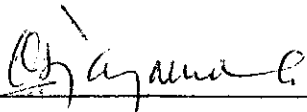
**GAMBIA L-20 23/10/2001 1:50,000 DL&S-JICA**



RUTHERFORD A. F. THOMAS  
Director  
Department of Lands and Surveys  
Department of State for  
Local Government and Lands



AKIRA NISHIMURA  
Leader  
JICA Study Team



OSUMAN SEMEGA JANNEH  
Principal Cartography  
Department of Lands and Surveys



OSUMAN S. JARJUSEY  
Principal Surveyor  
Department of Lands and Surveys

# Memorandum

20<sup>th</sup>-December-2001

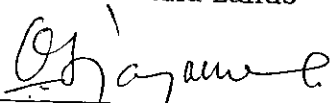
The following items agreed upon between Department of Lands and Surveys and JICA Study Team:

1. The number of topographic map (scale 1/50,000)  
The number of topographic map is 27 sheets and the coordinate of each sheet is referred to an attached one.
2. The name of topographic map  
Department of Lands and Surveys has promised to decide the name of each topographic map by June 2002.
3. The magnetic variation  
Department of Lands and Surveys has promised to provide the magnetic variation for each topographic map by June 2002.

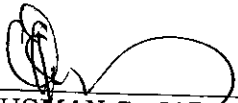


RUTHERFORD A. F. THOMAS  
Director  
Department of Lands and Surveys  
Department of State for  
Local Government and Lands

西村 明  
AKIRA NISHIMURA  
Leader  
JICA Study Team



OUSMAN SEMEGA JANNEH  
Principal Cartography  
Department of Lands and Surveys



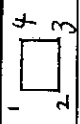
OUSMAN S. JARJUSEY  
Principal Surveyor  
Department of Lands and Surveys

①

No.

THE GAMBIA 1:5000

Sheet No	Name of Sheet	Coordinates at the Shee corner			
		1	2	3	4
1		B= 13° 30' , L= -17° 0' , E= , N=	B= 13° 15' , L= -17° 0' , E= , N=	B= 13° 15' , L= -16° 45' , E= , N=	B= 13° 30' , L= -16° 45' , E= , N=
2		B= 13° 15' , L= -17° 0' , E= , N=	B= 13° 0' , L= -17° 0' , E= , N=	B= 13° 0' , L= -16° 45' , E= , N=	B= 13° 15' , L= -16° 45' , E= , N=
3		B= 13° 45' , L= -16° 45' , E= , N=	B= 13° 30' , L= -16° 45' , E= , N=	B= 13° 30' , L= -16° 30' , E= , N=	B= 13° 45' , L= -16° 30' , E= , N=
4		B= 13° 30' , L= -16° 45' , E= , N=	B= 13° 15' , L= -16° 45' , E= , N=	B= 13° 15' , L= -16° 30' , E= , N=	B= 13° 30' , L= -16° 30' , E= , N=
5		B= 13° 15' , L= -16° 45' , E= , N=	B= 13° 0' , L= -16° 45' , E= , N=	B= 13° 0' , L= -16° 30' , E= , N=	B= 13° 15' , L= -16° 30' , E= , N=
6		B= 13° 38' , L= -16° 30' , E= , L=	B= 13° 23' , L= -16° 30' , E= , L=	B= 13° 23' , L= -16° 15' , E= , L=	B= 13° 38' , L= -16° 15' , E= , L=
7		B= 13° 23' , L= -16° 30' , E= , N=	B= 13° 8' , L= -16° 30' , E= , N=	B= 13° 8' , L= -16° 15' , E= , N=	B= 13° 23' , L= -16° 15' , E= , N=
8		B= 13° 38' , L= -16° 15' , E= , N=	B= 13° 23' , L= -16° 15' , E= , N=	B= 13° 23' , L= -16° 0' , E= , N=	B= 13° 38' , L= -16° 0' , E= , N=



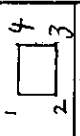
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2

No.

THE GAMBIA 1:5000

Sheet No	Name of Sheet	Coordinates at The Shee corner			
		1	2	3	4
9		B= 13° 23' / L= -16° 15' / E= / N= /	B= 13° 8' / L= -16° 15' / E= / N= /	B= 13° 8' / L= -16° 0' / E= / N= /	B= 13° 23' / L= -16° 0' / E= / N= /
10		B= 13° 38' / L= -16° 0' / E= / N= /	B= 13° 23' / L= -16° 0' / E= / N= /	B= 13° 23' / L= -15° 45' / E= / N= /	B= 13° 38' / L= -15° 45' / E= / N= /
11		B= 13° 23' / L= -16° 0' / E= / N= /	B= 13° 8' / L= -16° 0' / E= / N= /	B= 13° 8' / L= -15° 45' / E= / N= /	B= 13° 23' / L= -15° 45' / E= / N= /
12		B= 13° 45' / L= -15° 45' / E= / N= /	B= 13° 30' / L= -15° 45' / E= / N= /	B= 13° 30' / L= -15° 30' / E= / N= /	B= 13° 45' / L= -15° 30' / E= / N= /
13		B= 13° 30' / L= -15° 45' / E= / N= /	B= 13° 15' / L= -15° 45' / E= / N= /	B= 13° 15' / L= -15° 30' / E= / N= /	B= 13° 30' / L= -15° 30' / E= / N= /
14		B= 13° 49' / L= -15° 30' / E= / L= /	B= 13° 34' / L= -15° 30' / E= / L= /	B= 13° 34' / L= -15° 15' / E= / L= /	B= 13° 49' / L= -15° 15' / E= / L= /
15		B= 13° 34' / L= -15° 30' / E= / N= /	B= 13° 19' / L= -15° 30' / E= / N= /	B= 13° 19' / L= -15° 15' / E= / N= /	B= 13° 34' / L= -15° 15' / E= / N= /
16		B= 13° 51' / L= -15° 15' / E= / N= /	B= 13° 36' / L= -15° 15' / E= / N= /	B= 13° 36' / L= -15° 0' / E= / N= /	B= 13° 51' / L= -15° 0' / E= / N= /



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3

No.

THE GAMBIA 1:5000

Sheet No	Name of Sheet	Coordinates at The Shee corner			
		1	2	3	4
17		B= 13° 36' / L=-15° 15' / E= N=	B= 13° 21' / L=-15° 15' / E= N=	B= 13° 21' / L=-15° 0' / E= N=	B= 13° 36' / L=-15° 0' / E= N=
18		B= 13° 51' / L=-15° 0' / E= N=	B= 13° 36' / L=-15° 0' / E= N=	B= 13° 36' / L=-14° 45' / E= N=	B= 13° 51' / L=-14° 45' / E= N=
19		B= 13° 36' / L=-15° 0' / E= N=	B= 13° 21' / L=-15° 0' / E= N=	B= 13° 21' / L=-14° 45' / E= N=	B= 13° 36' / L=-14° 45' / E= N=
20		B= 13° 45' / L=-14° 45' / E= N=	B= 13° 30' / L=-14° 45' / E= N=	B= 13° 30' / L=-14° 30' / E= N=	B= 13° 45' / L=-14° 30' / E= N=
21		B= 13° 30' / L=-14° 45' / E= N=	B= 13° 15' / L=-14° 45' / E= N=	B= 13° 15' / L=-14° 30' / E= N=	B= 13° 30' / L=-14° 30' / E= N=
22		B= 13° 41' / L=-14° 30' / E= L=	B= 13° 26' / L=-14° 30' / E= L=	B= 13° 26' / L=-14° 15' / E= L=	B= 13° 41' / L=-14° 15' / E= L=
23		B= 13° 26' / L=-14° 30' / E= N=	B= 13° 11' / L=-14° 30' / E= N=	B= 13° 11' / L=-14° 15' / E= N=	B= 13° 26' / L=-14° 15' / E= N=
24		B= 13° 38' / L=-14° 15' / E= N=	B= 13° 23' / L=-14° 15' / E= N=	B= 13° 23' / L=-14° 0' / E= N=	B= 13° 38' / L=-14° 0' / E= N=

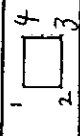


8

No.

THE GAMBIA 1:5000

Sheet No	Name of Sheet	Coordinates at the Shee corner			
		1	2	3	4
25		B = 13° 23'	B = 13° 8'	B = 13° 8'	B = 13° 23'
		L = -14° 15'	L = -14° 15'	L = -14° 0'	L = -14° 0'
		E =	E =	E =	E =
		N =	N =	N =	N =
26		B = 13° 45'	B = 13° 30'	B = 13° 30'	B = 13° 45'
		L = -14° 0'	L = -14° 0'	L = -13° 45'	L = -13° 45'
		E =	E =	E =	E =
		N =	N =	N =	N =
27		B = 13° 30'	B = 13° 15'	B = 13° 15'	B = 13° 30'
		L = -14° 0'	L = -14° 0'	L = -13° 45'	L = -13° 45'
		E =	E =	E =	E =
		N =	N =	N =	N =
		B =	B =	B =	B =
		L =	L =	L =	L =
		E =	E =	E =	E =
		N =	N =	N =	N =
		B =	B =	B =	B =
		L =	L =	L =	L =
		E =	E =	E =	E =
		N =	N =	N =	N =
		B =	B =	B =	B =
		L =	L =	L =	L =
		E =	E =	E =	E =
		N =	N =	N =	N =
		B =	B =	B =	B =
		L =	L =	L =	L =
		E =	E =	E =	E =
		N =	N =	N =	N =



9



# Memorandum

20<sup>th</sup>-December-2001

The following items agreed upon between Department of Lands and Surveys and JICA Study Team:

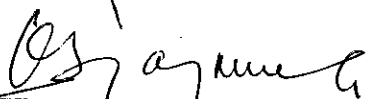
1. The contact prints of aerial photography  
Department of Lands and Surveys has received the set of contact prints of aerial photography on December 20, 2001.
2. The keeping of survey instruments  
Department of Lands and Surveys has promised to keep the survey instruments (see an attached one) by the end of this project.



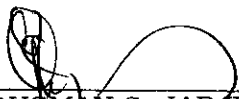
RUTHERFORD A. F. THOMAS  
Director  
Department of Lands and Surveys  
Department of State for  
Local Government and Lands



AKIRA NISHIMURA  
Leader  
JICA Study Team



OUSMAN SEMEGA JANNEH  
Principal Cartography  
Department of Lands and Surveys



OUSMAN S. JARJUSEY  
Principal Surveyor  
Department of Lands and Surveys

## The list of survey instruments

### 1. GPS Z-Xtreme Surveyor System

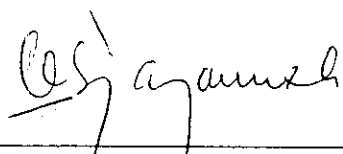
- |   |        |
|---|--------|
| * GPS Receiver Z-Xtreme                       | 3 sets |
| (S/No. ZE120013415, ZE120013417, ZE120013418) |        |
| *GPS Antenna                                  | 3 sets |
| (S/No. 5934, 5943, 5950)                      |        |
| *GPS Antenna Cable                            | 3 sets |
| *Compaq Aero 1550 Handy Controller            | 3 sets |
| *GPS Accessory                                | 3 sets |
| *Tripod                                       | 3 sets |

# Memorandum

17<sup>th</sup> - July - 2002

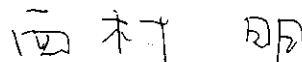
The following items agreed upon between Department of Lands and Surveys and JICA Study Team:

1. The counterpart training in Japan  
The counterpart training in Japan will be started at the middle of October in 2002.
2. The technical transfer of GPS survey  
The JICA Study Team will execute the technical transfer of the analysis of GPS observation data using new analysis software for 7 days in September 2002.



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OSUMAN SEMEGA JANNEH  
Principal Cartographer  
For Director of Lands and Surveys  
Department of Lands and Surveys  
Department of State for  
Local Government and Lands



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AKIRA NISHIMURA  
Leader  
JICA Study Team

# Memorandum

23<sup>th</sup> - July - 2002

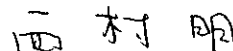
The following items agreed upon between Department of Lands and Surveys and JICA Study Team:

1. The customs clearance of the equipment for the technology transfer  
**Mr. Yamada will be witness when the DL&S will withdraw the equipment from the custom office.**  
JICA Study Team will prepare a truck for transportation of the equipment from the airport to DL&S office at our own expense.  
JICA Study Team will send the invoice, the packing list, the other document related to the customs clearance to the DL&S by FAX or E-mail.
2. The room for the technology transfer  
**The DL&S will provide the room where JICA Study Team use as a office in DL&S's building for the technology transfer.**
3. The persons for the technology transfer  
**The DL&S will recommend the persons who has basic skills and knowledge of computer for the technology transfer. Also the DL&S nominates Mr. Alieu S. Jobe to Network manager.**



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OSUMAN SEMEGA JANNEH  
Principal Cartographer  
For Director of Lands and Surveys  
Department of Lands and Surveys  
Department of State for  
Local Government and Lands



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AKIRA NISHIMURA  
Leader  
JICA Study Team

# Memorandum

29<sup>th</sup> - July - 2002

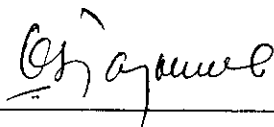
The following items agreed upon between Department of Lands and Surveys and JICA Study Team:

1. The digital data of international boundary based on Clarke1880 is to be converted into digital data based on WGS84. However the position for the international boundary shown lower left of sheet No.5 shall be expressed along the present river(on the opposite bank) and for the sheet No.26 and 27, position of international boundary is to be shown based on present digital data.
2. "Superintendent of Surveys" written by orange colour at the lower right of maps shall be corrected to "Director of Lands and Surveys" and "Survey Department" also shall be corrected to "Department of Lands and Surveys".
3. Lower left of maps, part of Sheet History, "Survey Department " shall be corrected to "Department of Lands and Surveys".
4. Lower right of maps, part of Height Datum, "Survey Department" shall be corrected to "Department of Lands and Surveys".
5. Spelling of "Scale" shall be corrected.
6. Lower right corner of maps, "Survey Department " shall be corrected to "Department of Lands and Surveys".
7. District boundaries shall be shown by bold and Divisional boundaries shall be shown darker.
8. Forest patterns colour to be darker.
9. Sheet index shall be highlighted in reference to sheet number.
10. Settlement name shall be shown closer to the settlements.
11. Text size of settlement name shall be bold for readers or to be of the same size as previous photomaps.
12. Yellow for the secondary roads shall be darker.
13. For colouring/out put sheet No.4 is recommended.
14. Elevation value of all contour lines shall be shown on the maps.
15. Intermediate contour lines (10m) shall be shown by long break line, on the other hand, intermediate contour lines (5m) shall be expressed by short break line.

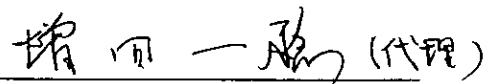
*68/June*

*68/7*

16. The DOT size (.) indicating spot height shall be clearly marked.
17. If JICA Study Team will obtain the coordinates of international boundary pillars from DL&S by 10<sup>th</sup> of August 2002, they shall be shown on the maps.
18. As well as international boundary pillars, other boundary pillars shall be shown if JICA Study Team will obtain the information of position of other boundary pillars from DL&S by 10<sup>th</sup> August 2002.
19. Telephone lines are not shown on the maps and symbol mark of telephone line shall be deleted from the legend, however, it shall be remained in the specification of 1:50,000 topographic map symbols.
20. The symbol of EP shall be changed to PS.
21. The principal point of aerial photography shall be shown every one photos on the maps and the method of numbering must be decided by the study team.
22. Boundary of vegetation shall be taken away from the legend of map.
23. The annotations shown on the old map shall be included on the new map. However, names of villages and buildings that are no longer applicable due to secular change shall be omitted. Moreover, if the spelling used in an annotation is different from the local one, the local spelling shall be given precedence.
24. The annotation of road destinations on the old map shall be used. However, only currently existing names of villages and residential areas shall be indicated.
25. Mosques existing in villages where the size is more than 5mm × 5mm on the topographic map shall be indicated. However, currently existing mosques that are represented on old maps shall also be indicated even if they do not meet the above criteria.
26. A symbol to represent forest park boundaries will be established, as there is no existing one



OSUMAN SEMEGA JANNEH  
Principal Cartographer  
For Director of Lands and Surveys  
Department of Lands and Surveys  
Department of State for  
Local Government and Lands



AKIRA NISHIMURA  
Leader  
JICA Study Team

# Memorandum

9<sup>th</sup> - August - 2002

The following items agreed upon between Department of Lands and Surveys and JICA Study Team:

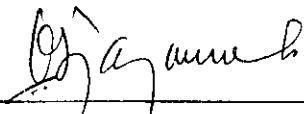
1. The name of topographic map sheet

**The DL&S has decided the name of each topographic map sheet and gave the list to JICA Study Team.( See attached the list. )**

**JICA Study Team shall apply these name for each topographic map sheet.**

2. The magnetic variation

**The DL&S provided the magnetic variation at the center of each topographic map sheet. JICA Study Team shall express these value of the magnetic variation on printed topographic map sheet.( See attached the list. )**



OSUMAN SEMEGA JANNEH

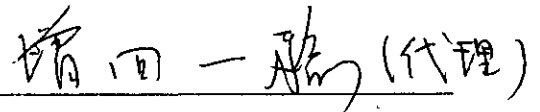
Principal Cartographer

For Director of Lands and Surveys

Department of Lands and Surveys

Department of State for

Local Government and Lands



AKIRA NISHIMURA

Leader

JICA Study Team

**List of name of each topographic map sheet and magnetic variation**

Sheet No.	Name of Sheet	Magnetic Variation (as at January 2002)	Origin Year	Annual Change
1	TANJI	9° 59'	Jan. 1975	6' East
2	GUNJUR	10° 03'	Jan. 1975	6' East
3	GINAK	9° 53'	Jan. 1975	6' East
4	BANJUL	9° 59'	Jan. 1975	6' East
5	SIFOE	10° 03'	Jan. 1975	6' East
6	NDUNGU KEBBEH	9° 53'	Jan. 1975	6' East
7	ALBREDA	9° 57'	Jan. 1975	6' East
8	KEREWAN	9° 54'	Jan. 1975	6' East
9	BWIAM	9° 54'	Jan. 1975	6' East
10	SALIKENE	11° 12'	Jan. 1975	6' East
11	KALAGI	11° 12'	Jan. 1975	6' East
12	FARAFENNI	10° 27'	Jan. 1975	6' East
13	MANSA KONKO	9° 48'	Jan. 1975	6' East
14	KAU-UR	9° 41'	Jan. 1975	6' East
15	JAPPENI	9° 45'	Jan. 1975	6' East
16	KUDANG	9° 38'	Jan. 1975	6' East
17	PAKALIBA	9° 38'	Jan. 1975	6' East
18	KUNTAUR	9° 34'	Jan. 1975	6' East
19	JANJANGBURE	9° 39'	Jan. 1975	6' East
20	SAMI KARANTABA	9° 27'	Jan. 1975	6' East
21	BANSANG	9° 32'	Jan. 1975	6' East
22	NAUDE	9° 27'	Jan. 1975	6' East
23	DIABUGU	9° 27'	Jan. 1975	6' East
24	SUTUKOBA	9° 19'	Jan. 1975	6' East
25	BASSE	9° 19'	Jan. 1975	6' East
26	BRIFU	9° 13'	Jan. 1975	6' East
27	FATOTO	9° 13'	Jan. 1975	6' East

Magnetic variation of FARAFENNI (Sheet No.12) was calculated as an average value using magnetic variation of SALIKENE (Sheet No.10) and KAU-UR (Sheet No.14).

*Signature*  
9.8.2002

*Signature*



# Memorandum

8<sup>th</sup> - October - 2002

The following items agreed upon between Department of Lands and Surveys and JICA Study Team:

1. The final products

Department of Lands and Surveys has received the following final products on October 8, 2002.

**The final products**

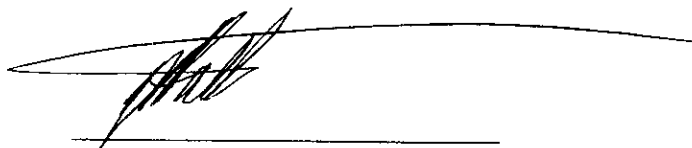
**\* Aerial photographs**

Negative films	1set
Contact prints	1set

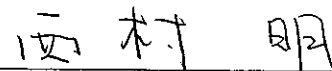
**\* Results of ground control point survey**

Results of control points survey	1set
Description of national control points	1set
Results of GPS survey	1set
Adjustment computation sheets	1set

**\* Results of aerial triangulation** 1set



MALAMIN JATTA  
Ag. Director of Lands and Survey  
Department of Lands and Surveys  
Department of State for  
Local Government and Lands



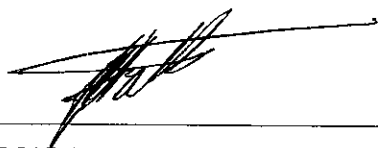
AKIRA NISHIMURA  
Leader  
JICA Study Team

# Memorandum

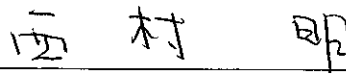
8<sup>th</sup> - October - 2002

The following items agreed upon between Department of Lands and Surveys and JICA Study Team:

1. The proofreading of printed topographic map sheet  
JICA Study Team shall send the proofs of Topographic map(27sheets) to DL&S by DHL.  
The DL&S shall check these proofs of Topographic map(27sheets) and send back its to JICA Study Team.



MALAMIN JATTA  
Ag. Director of Lands and Survey  
Department of Lands and Surveys  
Department of State for  
Local Government and Lands



AKIRA NISHIMURA  
Leader  
JICA Study Team