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AFRICAN DOPPLER SURVEYS (ADOS)(U) DEFENSE MAPPING
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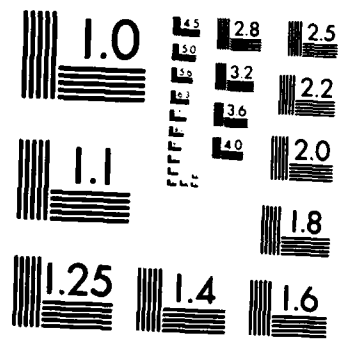
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 This report outlines the work performed between 15 June 1983 and 30 April 1984 by the Defense Mapping Agency (DMA) under the African Doppler Survey (ADOS) project. The observational data and Precise Ephemeris (PE) for 59 ADOS stations in 13 countries were distributed to the ADOS Computing Centers in the United Kingdom, Kenya and Algeria. Results of computations performed at DMA are also included.

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STATUS REPORT
ON
AFRICAN DOPPLER SURVEYS
(ADOS)

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ABSTRACT

This report outlines the work performed between 15 June 1983 and 30 April 1984 by the Defense Mapping Agency (DMA) under the African Doppler Survey (ADOS) project. The observational data and the Precise Ephemerides (PE) for 59 ADOS stations in 13 countries were distributed to the ADOS Computing Centers in United Kingdom, Kenya and Algeria. Results of computations performed at DMA are also included in the report.

1. INTRODUCTION

This report summarizes the work performed by the Defense Mapping Agency (DMA) under the African Doppler Survey (ADOS) project since the last report at the XVIII General Assembly of the International Union of Geodesy and Geophysics (IUGG) at Hamburg, Federal Republic of Germany, August 1983 (Kumar, 1983). The project progress described covers the period between 15 June 1983 and 30 April 1984.

The observational data sets, together with the appropriate Precise Ephemerides (PE) distributed since 15 June 1983, pertained to 13 countries under the ADOS project. The Defense Mapping Agency Hydrographic/Topographic Center (DMAHTC) ADOS Computing Center also computed the station coordinates from the selected data sets.

2. DATA DISTRIBUTION

2.1 OBSERVATIONAL DATA

Table 1 gives the details of the Doppler data exchanged between the DMAHTC Computing Center (ADOS Center No. 3) and the other ADOS Computing Centers, No. 1 - European Consortium, United Kingdom, No. 2 - Regional Computing Center, Kenya and No. 4 - Northwest African Consortium, Algeria. In addition, data tapes containing the observed data and PE (already distributed to Computing Centers No. 1 and 2 prior to 15 June 1983) were sent to Computing Center No. 4.

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The data sets in Table 1 also include additional observations from the West German data for two stations, AIV010 and AIV011, which are identical to stations AIV003 and AIV001 (distributed prior to 15 June 1983), respectively.

2.2 PRECISE EPHEMERIS

Together with the observational data for the ADOS stations (Section 2.1), the DMAHTC Computing Center also provided the PE needed for computations. The PE information for five satellites of the Navy Navigation Satellite System (NNSS) was supplied as per availability.

3. ADOS COMPUTATIONS

Table 2 presents the status of the 59 ADOS stations computed at DMA between 15 June 1983 and 30 April 1984. The ADOS requirement of 40 or more passes could not be met at nine selected stations.

ADOS station coordinates, as computed by the DMAHTC Computing Center are tabulated in Table 3. The table also includes the available information regarding the height of the electrical center of the antenna and the number of Doppler passes input and actually used in each station solution.

4. PRELIMINARY EVALUATION

Table 1 also includes the status report of the observations for the ADOS network as evaluated by the DMAHTC Computing Center.

Out of 149 observed Doppler passes for the ADOS station (ADM301) in Benin, 71 passes were rejected during computations for various reasons. The solution from 78 passes failed to converge within the specified limits and as such the coordinates in Table 3 are provisional pending final acceptance under the ADOS project.

5. ACKNOWLEDGEMENT

This is to acknowledge the valuable contributions of Messrs. Randall Keener, Kenneth Murphy, Joseph Corio and Bernard Staley.

REFERENCES

KUMAR, M., "Status Report on African Doppler Surveys (ADOS)," presented to the XVIII General Assembly of the IUGG, Hamburg, FDR, 15 - 27 August 1983.

TABLE 1

ADOS DATA EXCHANGE
 FROM 15 JUNE 1983 TO 30 APRIL 1984)

COUNTRY	NO. OF ADOS STATIONS DISTRIBUTED BY DMAHTC	STATUS OF ADOS NETWORK
Benin	1	Not yet complete
Cameroon	7	Complete
Canary Island	1	Not yet complete
Equatorial Guinea	3	Not yet complete
Gambia, The	2	Complete
Ivory Coast	5*	Complete
Morocco	14	Complete
Seychelles	5	Complete
South Africa	3	Not yet complete
Sudan	1	Not yet complete
Tanzania	7	Complete
Tunisia	5	Complete
Zambia	5	Complete

*Additional data for two stations already selected prior to 15 June 1983 (Section 2.1).

TABLE 2

DMAHTC COMPUTING CENTER NO. 3

COMPUTATIONAL PROGRESS

(FROM 15 JUNE 1983 TO 30 APRIL 1984)

COUNTRY	NO. OF ADOS STATIONS COMPUTED	40 OR MORE PASSES	25 TO 39 PASSES
BENIN	1	1	--
CAMEROON	7	5	2
CANARY ISLAND	1	1	--
EQUATORIAL GUINEA	3	1	2
GAMBIA, THE	2	1	1
IVORY COAST	5*	5	--
MOROCCO	14	11	3
SEYCHELLES	5	4	1
SOUTH AFRICA	3	3	--
SUDAN	1	1	--
TANZANIA	7	7	--
TUNISIA	5	5	--
ZAMBIA	5	5	--
TOTAL	59	50	9

*Additional data for two stations already selected prior to 15 June 1983 (Section 2.1).

TABLE 3
ADOS STATION COORDINATES

(NSWC 92-1 SYSTEM)

COUNTRY	COMPUTED COORDINATES OF STATION MARK (SOFTWARE DOPPLR 79)			HEIGHT OF ANTENNA E.C. ABOVE STATION MARK (m)	NO. OF PASSES FOR SOLUTION INPUT/USED
	X (m)	Y (m)	Z (m)		
	LATITUDE (ϕ)	LONGITUDE (λ)	ELLIPSOID HT. (m)		
1. <u>BENIN</u>					
ADM301	6 333 473.28 N 06° 21' 46"373	268 522.29 E 2° 25' 39"841	702 160.62 47.56	--	149/78
2. <u>CAMEROON</u>					
ACM001	6 236 367.76 N 03° 50' 28"453	1 271 551.61 E 11° 31' 27"277	424 482.15 767.57	1.608	83/59
ACM002	6 177 935.28 N 04° 35' 30"672	1 504 634.33 E 13° 41' 16"383	507 266.21 715.55	1.335	73/51
ACM003	6 273 190.52 N 04° 37' 14"227	1 036 078.59 E 9° 22' 41"863	510 429.72 622.32	1.673	36/32
ACM004	6 228 224.35 N 06° 31' 01"340	1 182 197.96 E 10° 44' 51"453	719 350.11 2 240.69	1.945	49/40
ACM005	6 150 819.34 N 07° 18' 11"181	1 486 511.88 E 13° 35' 11"592	805 543.01 1 162.82	1.862	41/35
ACM006	6 123 024.35 N 09° 21' 48.231	1 457 007.57 E 13° 23' 05"722	1 030 885.04 270.50	1.523	43/42
ACM007	6 029 726.33 N 12° 05' 37"316	1 597 702.08 E 14° 50' 26"411	1 327 605.53 308.28	1.623	45/41
3. <u>CANARY IS.</u>					
ASPO02	5 390 988.57 N 28° 06' 34"359	-1 623 441.24 E 343° 14' 27"099	2 987 279.81 122.97	--	123/79
4. <u>EQUATORIAL GUINEA</u>					
AEK301	6 281 849.53 N 01° 53' 26"629	1 084 106.23 E 9° 47' 29"468	209 029.64 13.64	--	75/44
AEK317	6 249 867.82 N 02° 09' 20"126	1 253 145.21 E 11° 20' 16"395	238 320.65 600.97	--	61/30
AEK344	6 261 171.04 N 01° 17' 45"955	1 211 075.98 E 10° 56' 50"378	143 319.14 698.67	--	42/36

ADOS STATION COORDINATES

(NSWC 92-2 SYSTEM)

COUNTRY	COMPUTED COORDINATES OF STATION MARK (SOFTWARE DOPPLR '9)			HEIGHT OF ANTENNA E.C. ABOVE STATION MARK (m)	NO. OF PASSES FOR SOLUTION INPUT/USED
	(ELLIPSOID USED: a=6378145m, f=1/298.25)				
	X (m)	Y (m)	Z (m)		
LATITUDE (ϕ)	LONGITUDE (λ)	ELLIPSOID HT. (m)			
5. GAMBIA, THE					
AGA002	5 966 626.37 N 13° 34' 15"033	-1 689 702.09 E 344° 11' 17"849	1 486 883.52 55.84	0.56	57/50
AGA003	6 001 236.86 N 13° 28' 08"948	-1 572 660.45 E 345° 18' 55"783	1 475 939.90 35.38	0.56	36/33
6. IVORY COAST					
AIV010	6 297 287.52 N 07° 42' 04"830	-551 191.84 E 354° 59' 51"855	849 110.30 372.84	1.8	389/336
AIV011	6 306 985.96 N 04° 25' 13"980	-814 426.51 E 352° 38' 31"430	488 328.81 54.95	1.4	198/157
AIV012	6 224 392.84 N 10° 13' 35"967	-818 117.06 E 352° 30' 43"643	1 125 011.61 456.91	0.9	90/82
AIV013	6 268 488.84 N 06° 35' 17"682	-926 897.08 E 351° 35' 19"838	726 958.42 343.90	1.9	135/121
AIV014	6 304 023.43 N 05° 47' 29"104	-728 760.04 E 353° 24' 20"675	639 334.75 201.68	1.8	127/118
7. MOROCCO					
AMO001	5 156 641.65 N 35° 45' 29"297	-513 568.17 E 354° 18' 44"877	3 706 753.42 516.44	0.48	122/102
AMO002	5 216 787.57 N 35° 08' 29"952	-221 228.69 E 357° 34' 18"151	3 650 784.14 88.76	2.194	42/36
AMO003	5 258 006.44 N 33° 59' 12"986	-618 468.61 E 353° 17' 29"245	3 545 370.80 216.99	3.57	116/101
AMO004	5 343 508.15 N 33° 09' 18"400	-171 623.35 E 358° 09' 37"442	3 469 142.03 1 398.39	3.02	117/110
AMO005	5 353 362.42 N 32° 43' 12"160	-455 857.09 E 355° 07' 58"117	3 428 787.48 1 674.19	1.635	44/42
AMO006	5 379 700.47 N 31° 38' 16"216	-777 590.93 E 351° 46' 31"201	3 326 539.85 433.78	1.824	60/55
AMO007	5 430 382.49 N 31° 06' 17"219	-633 760.84 E 353° 20' 35"967	3 276 594.09 1 440.93	4.01	102/89
AMO008	5 436 696.45 N 30° 15' 34"309	-919 644.10 E 350° 23' 56"469	3 195 322.61 123.68	1.658	52/51
AMO009	5 509 918.36 N 28° 22' 13"050	-1 089 332.36 E 348° 48' 59"832	3 012 800.42 254.37	1.630	49/36

ADCS STATION COORDINATES

(NSWC 9Z-2 SYSTEM)

COUNTRY	COMPUTED COORDINATES OF STATION MARK (SOFTWARE DOPPLR 79) (ELLIPSOID USED: a=6378145m, f=1/298.25)			HEIGHT OF ANTENNA E.C. ABOVE STATION MARK (m)	NO. OF PASSES FOR SOLUTION INPUT/USED
	X (m)	Y (m)	Z (m)		
	LATITUDE (ϕ)	LONGITUDE (λ)	ELLIPSOID HT. (m)		
<u>7. MOROCCO</u>					
AM0010	5 238 066.20 N 34° 27' 58"396	-525 190.70 E 354° 16' 27"903	3 589 315.48 191.31	1.873	59/51
AM0011	5 269 802.02 N 34° 13' 41"829	-319 967.06 E 356° 31' 31"557	3 567 717.39 536.60	2.97	127/119
AM0012	5 275 417.74 N 33° 37' 53"600	-657 951.23 E 352° 53' 26"765	3 512 683.11 336.85	2.089	48/45
AM0013	5 484 067.90 N 29° 21' 11"108	-943 984.84 E 350° 13' 59"737	3 108 610.80 1 093.70	1.156	45/43
AM0014	5 303 920.24 N 32° 53' 03"676	-784 546.36 E 351° 35' 09"324	3 443 311.97 207.90	2.135	52/31
<u>8. SEYCHELLES</u>					
ASE001	3 599 452.14 S 04° 40' 12"040	5 239 878.11 E 55° 30' 48"568	-515 820.40 -38.52	--	51/47
ASE002	3 597 924.21 S 04° 46' 40"213	5 239 735.84 E 55° 31' 26"824	-527 703.37 -38.86	1.830	63/58
ASE003	3 761 867.20 S 05° 42' 09"526	5 111 710.45 E 53° 38' 58"159	-629 542.93 -39.96	1.950	42/39
ASE004	3 513 180.16 S 07° 07' 03"595	5 264 738.74 E 56° 17' 04"802	-785 045.52 -29.37	1.970	48/42
ASE005	3 580 686.40 S 04° 18' 33"595	5 256 600.66 E 55° 44' 17"260	-476 065.17 46.84	1.600	54/51
<u>SOUTH AFRICA</u>					
ASF002	5 360 994.28 S 28° 45' 28"985	1 605 019.55 E 16° 40' 01"526	-3 050 590.53 347.50	0.510	45/43
ASF004	4 786 108.14 S 27° 41' 43"277	3 006 381.65 E 32° 08' 05"566	-2 946 925.04 573.78	0.510	44/45
ASF005	5 022 040.91 S 33° 22' 54"789	1 795 031.15 E 19° 40' 06"401	-3 490 661.97 2 281.64	0.710	45/42
<u>10. SUDAN</u>					
ASU004	5 729 264.52 N 09° 46' 29"718	2 588 052.47 E 24° 18' 35"595	1 075 816.57 543.62	0.595	78/71

ADOS STATION COORDINATES

(NSWC 9Z-2 SYSTEM)

COUNTRY	COMPUTED COORDINATES OF STATION MARK (SOFTWARE DOPPLR '9)			HEIGHT OF ANTENNA E.C. ABOVE STATION MARK (m)	NO. OF PASSES FOR SOLUTION INPUT/USED
	(ELLIPSOID USED: a=6378145m, f=1/298.25)				
	X (m)	Y (m)	Z (m)		
LATITUDE (φ)	LONGITUDE (λ)	ELLIPSOID HT. (m)			
11. TANZANIA					
ATZ200	5 137 322.68 S 06° 03' 41"050	3 721 881.00 E 35° 55' 21"109	-669 131.47 1 136.81	1.920	75/73
ATZ201	5 092 391.26 S 03° 16' 32"896	3 826 183.33 E 36° 55' 10"121	-362 131.64 1 835.45	1.300	75/53
ATZ203	5 345 090.27 S 05° 06' 32"112	3 436 056.26 E 32° 44' 04"816	-564 296.30 1 278.85	1.590	75/60
ATZ204	5 445 082.07 S 01° 08' 01"850	3 321 558.29 E 31° 23' 01"095	-125 392.44 1 314.02	1.450	75/63
ATZ205	5 524 703.94 S 04° 51' 58"810	3 143 098.42 E 29° 38' 10"633	-537 535.42 907.66	1.650	75/60
ATZ206	5 403 629.92 S 07° 56' 56"331	3 275 697.50 E 31° 13' 27"753	-876 431.22 1 723.15	1.450	75/67
ATZ207	5 077 799.23 S 10° 32' 55"217	3 681 651.75 E 35° 56' 38"187	-1 160 149.72 1 010.26	1.470	67/65
12. TUNISIA					
ATS301	5 022 224.52 N 36° 49' 26"390	955 277.19 E 10° 46' 10"481	3 802 183.58 672.75	--	75/45
ATS302	5 081 417.83 N 36° 24' 39"650	771 778.81 E 8° 38' 10"414	3 765 459.31 779.77	--	73/42
ATS303	5 147 810.76 N 35° 20' 01"689	803 893.45 E 8° 52' 32"694	3 668 923.00 1 345.54	--	53/42
ATS304	5 220 571.57 N 34° 15' 29"015	772 110.44 E 8° 24' 46"534	3 570 251.17 187.13	--	74/52
ATS305	5 233 998.08 N 33° 42' 15"719	904 982.93 E 9° 48' 34"993	3 519 303.27 153.96	--	73/48
13. ZAMBIA					
AZA401	5 612 258.72 S 14° 47' 46"891	2 561 366.53 E 24° 31' 52"963	-1 618 625.49 1 169.17	0.690	75/71
AZA402	5 504 577.30 S 16° 52' 22"079	2 643 345.43 E 25° 39' 02"590	-1 339 691.60 1 111.33	1.300	75/72
AZA403	5 594 487.10 S 13° 07' 12"515	2 705 134.38 E 25° 48' 19"533	-1 438 694.22 1 496.30	0.760	75/71
AZA404	5 307 324.79 S 14° 27' 53"088	3 161 736.65 E 30° 46' 52"265	-1 583 056.04 925.03	0.790	75/60
AZA405	5 245 642.15 S 10° 07' 25"110	3 455 103.43 E 33° 22' 16"913	-1 114 034.38 1 613.71	0.420	75/50

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