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REPORT OF A MARINE MAMMAL SURVEY OF THE EASTERN TROPICAL PACIFIC ABOARD THE RESEARCH VESSEL *McARTHUR* JULY 29-DECEMBER 7, 1989

P. Scott Hill
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NOAA-TM-NMFS-SWFC-143

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Southwest Fisheries Center

NOAA Technical Memorandum NMFS

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U.S. DEPARTMENT OF COMMERCE
Robert A. Mosbacher, Secretary
National Oceanic and Atmospheric Administration
John A. Knauss, Under Secretary for Oceans and Atmospheric
National Marine Fisheries Service
William W. Fox, Jr., Assistant Administrator for Fisheries

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P. Scott Hill
Alan Jackson
and
Tim Gerrodette

In 1984, as a result of an amendment to the Marine Mammal Protection Act of 1972, the National Marine Fisheries Service (NMFS) was mandated to conduct a research program to monitor trends in the abundance of stocks of dolphins in the eastern tropical Pacific (ETP). These dolphins are killed incidentally during fishing operations by the U. S. purse seine fishery for yellowfin tuna (*Thunnus albacares*). In 1986, the Southwest Fisheries Center (SWFC) of the NMFS initiated a six-year program to monitor these stocks of dolphins. In the first three years of the program (1986 through 1988), two surveys of marine mammal populations in the ETP were conducted concurrently each year aboard the National Oceanic and Atmospheric Administration vessels *David Starr Jordan* and *McArthur*. The surveys lasted 120 days each. In 1989, the fourth pair of surveys was conducted during the same time period and using the same vessels.

In this report, we describe the experimental procedures used during the 1989 surveys and we present summaries of the distance searched and marine mammals encountered from aboard the *McArthur* (Cruise AR-89-03; SWFC Observer Cruise 1268). A separate report of the *David Starr Jordan* cruise has been published by Hill et al. (1990). A report of environmental data collected during the survey is reported by Lierheimer et al. (1990).

SURVEY OBJECTIVES

The primary objective of the cruise was to collect information to calculate relative abundance of dolphin species in the ETP that are taken incidentally by the purse seine fishery for yellowfin tuna. Specific objectives were to collect information to:

1. estimate school density, school size, and species composition of each species taken by the fishery;

2. investigate the physical and biological environment of the affected species; and

3. contribute to on-going U.S. and international programs investigating oceanography and ocean-atmosphere interactions in the ETP.

MATERIALS AND METHODS

Study Area and Itinerary

The *McArthur* traversed predetermined tracklines in the ETP from July 29 through December 7, 1989 (Figure 1), with port calls in Hilo, Hawaii; La Libertad, Ecuador; and Puerto Caldera, Costa Rica. The itinerary of the vessel included four segments or effort legs:

Leg 1.			
	Departed	San Diego	July 29
	Arrived	Hilo	August 26
Leg 2.			
	Departed	Hilo	August 31
	Arrived	La Libertad	September 30
Leg 3.			
	Departed	La Libertad	October 5
	Arrived	Puerto Caldera	November 3
Leg 4.			
	Departed	Puerto Caldera	November 8
	Arrived	San Diego	December 7

The *McArthur* also conducted bird censuses on the Archipelago de Colon (Ecuador) and on Isla del Coco (Costa Rica).

Scientific Personnel

Cruise Leaders	Legs
Elizabeth Edwards, SWFC	1,4
Scott Hill, NOAA Corps, SWFC	2-3
Identification Specialists	
Scott Benson, SWFC	1-2
Richard LeDuc, SWFC	1-2
Gary Friedrichsen, SWFC	3-4
Scott Sinclair, SWFC	3-4
Observers	
James Carretta, SWFC	1-2
James Cotton, SWFC	1-2
Carrie Fried, SWFC	1-2
Richard Rowlett, SWFC	1-2

Sallie Beavers, SWFC	3-4
William Irwin, SWFC	3-4
Susan Kruse, SWFC	3-4
Brian Smith, SWFC	3-4
Monica Echegaray, Peru	3

<u>Bird Census Specialists</u>

Donald Roberson, Contractor	1-4
Robin Roberson, Contractor	1-4

Oceanographic data were collected by the <u>McArthur</u> survey department personnel.

Marine Mammal Species Surveyed

During the survey, the observers recorded information on all species of whales and dolphins sighted throughout the cruise. However, encounter rates are presented only for dolphin species.

Equipment

The <u>McArthur</u>, commissioned in 1966, is 53.3 m in length, has a beam of 11.6 m, and has a 3.7 m draft. During the surveys, the vessel maintained a cruising speed of approximately 18.5 km/hr.

Several pieces of equipment were used to gather data. The geographic position of the vessel was recorded periodically and at the time of a marine mammal sighting using the vessel's Satellite Navigation System (SAT NAV). Marine mammals were detected with port and starboard pedestal mounted 25X Fuginon[1] binoculars and a variety of hand-held 7-50X binoculars. The glasses were mounted on the upper deck approximately 10.7 m above the sea surface. Surface temperature and salinity, fluorescence (chlorophyll), and temperature-depth profiles were obtained using a thermosalinograph, fluorometer, and expendable bathythermographs (XBTs), respectively. Discrete conductivity and temperature-depth profiles were also obtained using conductivity-temperature-depth (CTD) probes.

The bearing and radial distances of marine mammals from the vessel were calculated using two methods. The first method was the use of estimates of the bearing and radial distance of a school from the vessel, which were recorded by the observers using a 360° graduated washer attached to the base of the 25X binoculars and graduated reticles enclosed in the right eyepiece of the binoculars.

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[1]Reference to trade name does not imply endorsement by the NMFS.

The second method utilized the Computer Assisted Sighting Technology (CAST) system which used information from several sensors to measure sighting angles and then to calculate radial distances. A CAMAC[1] computer collected data from various sources: the vessel's course from the gyroscope; the electronically encoded train angles of the 25X binoculars; a measurement of the relative motion of the vessel from a pitch-roll sensor; speed from the speed log; and information concerning survey status, such as identification of observers occupying survey positions from data pads located on the flying bridge. An IBM-compatible computer, which was interfaced with the CAMAC, was then used to process information to determine the sighting angle to the cue. Successive sighting angles, recorded as the vessel traveled along the trackline, were used to calculate radial distances. Analyses of CAST data will be presented in a separate report.

A 35 mm F-1 Canon[1] camera with motor drive was used to photograph animals to aid in stock and species identification. The system included 400 mm, 70-210 mm zoom, 50 mm, and 28 mm lenses. Some observers also used personal camera equipment to photograph sightings. Animals were also recorded on 1.27 cm video tape using a Panasonic[1] VHS recorder and a Panasonic[1] camera equipped with telephoto lens.

Duty Stations

Three duty stations were used during the survey, with observers rotating through each station.

1. Left Binocular - The port-side observer used a 25X binocular, mounted on the port side of the vessel, to scan the ocean for marine mammal sighting cues. The major area of responsibility for this observer was from the midpoint of the trackline to abeam the port side of the vessel and outward to the horizon or to the extent possible with prevailing environmental conditions.

2. Right Binocular - The starboard observer used a 25X binocular, mounted on the starboard side of the vessel, to search from the midpoint of the trackline to abeam the starboard side of the vessel, and outward to the horizon or to the extent possible with prevailing environmental conditions. Observers in the left and right positions frequently searched up to 10° on the opposite side of the trackline.

3. Recorder - The recorder's duties were to transcribe effort data at regular intervals, to make notes of information pertaining to each sighting, and to search the trackline adjacent to the vessel with hand held binoculars for schools not detected by the observers on the 25X glasses.

Observer Teams and Rotation

Two teams of three observers each alternately occupied the three duty stations. Each team was on duty for a two-hour shift. During each shift, observers spent approximately equal time occupying each duty station. Teams alternated standing the first watch of the day.

Two of the six observers, one on each team, were experts in identifying marine mammals. Team composition remained constant during the entire survey. Team members rotated between the duty stations and teams rotated on and off duty without interrupting searching effort. Observers aboard the Jordan and McArthur switched vessels after the second leg, allowing school size estimates for all observers to be calibrated with the ship-based helicopter on the Jordan.

Data Collection Procedures

A typical day's searching activity began at sunrise, approximately 0630 hours local time, and ended at sunset, approximately 1830 hours local time. The searching procedure was initiated when observers were occupying the duty stations and a recorder was in place to record information on the Research Vessel Effort Form (Figure 2). Except for approximately two to three hours per night when oceanographic data were collected, the vessel maintained its speed and course between sunset and sunrise to provide wider spatial distribution of searching effort. On approximately two-thirds of the nights, the McArthur was forced to steam at a slightly reduced speed in order to conserve fuel.

When a sighting cue (marine mammals, birds, splashes, etc.) was detected, it was determined whether marine mammals were present and if the sighting was appropriate for tracking using the CAST system. Schools that were not tracked included whales, dolphins detected close to the vessel or at distances greater than 5.6 km lateral to the vessel, small schools of dolphins (<15 animals), and schools detected during poor sighting conditions. If tracking was appropriate, the searching effort was terminated and the observer initiated tracking by turning on a switch attached to the binocular stand. With the vessel maintaining course and speed, and with the school in the field of view of the binoculars, the CAST system recorded successive bearings from the vessel to the animals. After approximately 8 minutes the vessel was directed towards the school and the tracking sequence continued for another 8 minutes. When the target was not in the field of view, the switch was turned off until the target was again sighted. The tracking procedure was terminated if the target was lost from view and not resighted, or if the cue was found to be inappropriate for tracking. All marine mammal schools, when possible, were approached to obtain estimates of school size and species composition. The searching mode was resumed after the vessel returned to its original course and speed and the observers resumed searching for other sighting cues.

During each marine mammal sighting, the recorder collected data necessary to complete Research Vessel Effort and Research Vessel Sighting forms (Figure 3). Definition of each data element is given by Ralston[2]. Criteria for assigning sun position and sea state conditions are given in Figure 4 and Table 1, respectively. Observers recorded bearing and range to the mammals using the 360° washer and reticles etched into the right eyepieces of the 25 power binoculars. The reticle measurements were converted to km using

$$a = 0.003942 \tan(\arctan(45242.52) - 0.001088\, r),$$

where a equals radial distance in km and r denotes the number of reticles below the topmost reticle. Values in this equation were calculated by Barlow (per. comm.) using an equation presented by Smith (1982) and data collected during previous research vessel cruises.

Each observer who had a good view of the school independently recorded in his or her logbook high, low and best estimates of school size and a determination of species composition. At no time were the observers allowed to discuss their estimates of school size and species composition. This procedure assured independence and consistency of each observer's data, and will allow individual correction factors to be developed from aerial photographs. On a daily basis, the Cruise Leader (chief of the scientific party on the vessel) collected the individual logbooks and transcribed observer estimates of school size and species composition to complete the Research Vessel Sighting Forms.

However, all available observers did discuss species identification and animal behavior, and a consensus was entered on the Research Vessel Sighting and Research Vessel Continuation Forms (Figure 5) shortly after the time of a sighting. Species identifications were validated when possible by photographing the school at close range using 35 mm and video cameras.

Data Analyses

Sea state conditions were grouped into "calm" conditions, without whitecaps (Beaufort numbers 0-2), or "rough" conditions, with whitecaps (Beaufort numbers 3-6). The presence of whitecaps was important in searching for sighting cues. Animal splashes could not effectively be used as a sighting cue during rough seas because whitecaps were easily confused with the animal splashes.

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[2]Ralston, F. Ms. Usage procedures and coding notes for research vessel sighting and effort records. Southwest Fisheries Center. P.O. Box 271, La Jolla, CA. 92038.

Visibility conditions were classified into "good" and "poor" categories. Poor visibility conditions were recorded when horizontal sun position was 12 and vertical position was 1, 2, or 3, or when there were clouds together with fog or rain (Holt 1987). All other conditions were good conditions.

The study area was divided into four strata, with the sum of the four strata comprising the total study area (Figure 1). The sum of the three northern most strata (inshore, middle and west) constitutes the northern stratum and represents the range of the northern offshore stock of spotted dolphins (the species most impacted by the purse-seine fishery). Data were analyzed using information by stratum, summed over strata and pooled over strata.

The rate of encountering marine mammal schools was determined as the simple ratio of sightings detected per 1000 km searched. The variance of the encounter rate was calculated as

$$Var(n/L) = [\Sigma l_i[(n_i/l_i) - (n/L)]^2]/L(R - 1)$$

where n equals the number of dolphin schools detected in the survey, L equals total thousands of km searched, l_i equals thousands of km searched during the ith day, n_i equals schools detected during the ith day, and R equals number of days searched.

Encounter rates were calculated for all dolphin schools that were detected during Beaufort states 0 through 6. Rates were calculated for these schools detected in the entire study area and for schools stratified by area, species, individual Beaufort numbers, calm and rough sea conditions, good and poor sun conditions, individual observers, and observer teams.

RESULTS

Data describing each leg of searching effort during the entire survey are summarized in Table 2. Information summarized for each marine mammal sighting encountered during the survey is presented in Table 3. The geographic positions of all schools detected during the survey are presented for each species category (code) in Figures 6 through 19. Observer estimates of school size are presented by species and subspecies in Table 4.

During the entire survey, observers searched 14,753 km and made 500 marine mammal sightings (Table 5). Dolphins were detected in 276 schools and whales were detected in 202 schools (22 schools contained both dolphins and whales). These included 13 species of dolphins and 17 species of whales.

Searching effort was conducted during Beauforts 0 through 6 conditions. Generally, effort was terminated shortly after the seas and wind attained a force of Beaufort 6, though at times Beaufort 6 conditions were workable. Effort was terminated at the discretion of the team leader and the cruise leader. While operating in the searching mode in the study area (Figure 1), 14,302 km were searched and 254 dolphin schools were detected. The overall rate of detecting schools in the study area was 17.76 schools/1000 km searched (Table 6).

Searching effort of the McArthur was distributed among all four strata, with the highest percentage of effort (34%) occurring in the southern area (Table 6). The detection rates in the southern and middle strata were similar. The detection rate was lowest in the western area (Table 6).

Sea conditions in the study area were extremely rough. Only 5% of the searching effort was completed in calm seas (Table 6). However, 9% of all schools were detected during calm seas and the rate of detecting schools during calm seas was nearly two times the detection rate during rough seas.

Poor visibility conditions occurred only during 11% of the surveying effort, during which time 11% of the schools were detected (Table 6). It seems that visibility conditions had little effect on sighting dolphin schools as the rates of detecting schools during good conditions and poor conditions were very similar.

The percent of schools detected by individual mammal observers ranged from 4 to 12% (Table 6). Observer #72, a cruise leader who stood watches for sick observers, had a detection rate of zero (due to rounding). However, his detection rate cannot be justly compared to the other observers due to the limited time spent on the binoculars. The rates of detecting dolphin schools also varied considerably among observers (range of 2.82 to 8.16 schools/1000 km).

The percent of schools detected by teams ranged from 20 to 28% (Table 6). The rate of detecting schools by teams ranged from 15.72 to 20.98 schools/1000 km searched.

SUMMARY

In this report, we have presented data on dolphin encounter rates, school size, and species composition which meet the primary objectives of the cruise aboard the McArthur. Data on effort and sightings have been summarized. We found that the rate of encountering dolphin schools was higher during calm seas than during rough seas, and the rate during good visibility conditions

was similar to the rate during poor visibility conditions. Detection rates were highest in the southern area and lowest in the western area. Encounter rates among observers and among teams were variable.

ACKNOWLEDGMENTS

The cruise aboard the NOAA Ship McArthur was successfully executed due to the work of many dedicated professionals. Among those contributing to the success of the cruise were the observers who spent many hours collecting the data, the officers and crew of the McArthur who gave their continuous support, and J. Bortniak (Jordan Port Captain) who provided liaison with ship support personnel and the scientists. Special efforts were provided in procurement by B. Engstrand and B. Watkins. Part of the manuscript was typed by C. Ratcliffe and arranged by R. Allen. R. Rasmussen edited the effort and sightings data. We are grateful to I. Barrett, R. Neal, D. DeMaster, R. Holt, and B. Remington for their support during the entire cruise preparation and execution. Finally, special recognition is given to S. Sexton for critical logistical arrangements, technical support, and invaluable insights given to the authors.

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Table 1. Sea state conditions measured by the Beaufort scale (from Bowditch, 1966).

Wind force (Beaufort)	Knots	Descriptive	Sea Conditions	Probable wave height in feet
0	0- 1	Calm	Sea smooth and mirror-like	-
1	1- 3	Light air	Scale-like ripple without foam crests	1/4
2	4- 6	Light breeze	Small short wavelets; crests have a glassy appearance and do not break	1/2
3	7-10	Gentle breeze	Large wavelets; some crests begin to break; foam of glassy appearance. Occasional white foam crests	2
4	11-16	Moderate breeze	Small waves, becoming longer; fairly frequent white foam crests	4
5	17-21	Fresh breeze	Moderate waves, taking a more pronounced long form; many white foam crests; there may be some spray	6
6	22-27	Strong breeze	Large waves begin to form; white foam crests are more extensive everywhere; there may be some spray	10

Table 2. Daily searching effort recorded in the eastern tropical Pacific aboard the *McArthur* during July 29 through December 7, 1989.

series	leg	date	speed km/hr	observer codes left	observer codes right	observer codes rec.	sun position horz.	sun position vert.	beauf. no.	course (deg.)	position latitude	position longitude	km in leg
01	01	890730	19.45	67	07	56	03	02	3	158	28 03 n	117 30 w	6.16
01	02	890730	19.45	67	07	56			3	158			1.30
01	03	890730	19.45	67	07	56	03	02	3	158			2.27
01	04	890730	19.45	07	56	67	03	02	3	158	27 59 n	117 28 w	9.72
01	05	890730	19.45	56	67	07	03	02	3	158	27 54 n	117 26 w	8.10
01	06	890730	19.45	56	67	07			3	158			1.62
01	07	890730	19.45	71	73	55			3	158	27 49 n	117 24 w	11.34
01	08	890730	19.45	73	55	71			3	158			5.83
01	09	890730	19.45	73	55	71	04	03	3	158			5.51
01	10	890730	19.45	55	71	73	04	03	3	158			11.34
01	11	890730	19.45	71	73	55	04	03	3	158			5.83
01	12	890730	19.45	71	73	55			3	158			1.62
01	13	890730	19.45	71	73	55			3	158	27 30 n	117 14 w	0.32
01	01	890731	19.45	56	67	07			3	150	26 32 n	116 48 w	11.67
01	02	890731	19.45	67	07	56	09	03	3	150	26 25 n	116 44 w	2.92
02	01	890731	19.45	07	56	67	09	03	3	155	26 22 n	116 42 w	3.24
02	02	890731	19.45	07	56	67	09	02	3	155			6.81
02	03	890731	19.45	55	71	73	09	02	4	155	26 16 n	116 40 w	5.19
03	01	890731	19.45	71	73	55	09	02	4	155	26 14 n	116 39 w	12.96
03	02	890731	19.45	73	55	71	10	02	4	155			12.64
03	03	890731	19.45	56	67	07	10	01	4	155	25 59 n	116 32 w	11.99
03	04	890731	19.45	56	67	07	10	01	3	155			0.97
03	05	890731	19.45	67	07	56	10	01	3	155			12.96
03	06	890731	19.45	07	56	67	10	01	3	155			6.81
03	07	890731	19.45	07	56	67	11	01	4	155	25 42 n	116 24 w	6.16
03	08	890731	19.45	55	71	73	11	01	4	155	25 39 n	116 23 w	2.92
04	01	890731	19.45	71	73	55	12	12	4	150	25 38 n	116 23 w	12.64
04	02	890731	19.45	73	55	71	02	12	4	150			11.99
04	03	890731	19.45	56	67	07	02	01	4	155	25 29 n	116 15 w	12.96
04	04	890731	19.45	67	07	56	03	01	4	155			6.48
04	05	890731	19.45	67	07	56	03	01	4	160	25 17 n	116 10 w	6.48
04	06	890731	19.45	07	56	67	04	01	4	160			12.96
04	07	890731	19.45	55	71	73	04	02	4	160	25 07 n	116 05 w	9.40
05	01	890731	19.45	71	73	55	04	02	4	160	25 01 n	116 02 w	9.07
05	02	890731	19.45	73	55	71	04	02	4	160			8.43
05	03	890731	19.45	56	67	07	04	03	4	160	24 51 n	115 59 w	12.96
05	04	890731	19.45	67	07	56	04	03	4	160			12.96
05	05	890731	19.45	07	56	67	04	03	4	160			11.34
05	06	890731	19.45	07	56	67	04	03	4	160	24 32 n	115 51 w	0.32
01	01	890801	19.45	73	55	71			4	183	22 59 n	115 51 w	10.37
01	02	890801	19.45	73	55	71	08	03	4	183			1.30
01	03	890801	19.45	55	71	73	09	03	4	183			1.30
02	01	890801	19.45	55	71	73	08	02	4	183	22 49 n	115 52 w	3.89
02	02	890801	19.45	71	73	55	08	02	4	183			5.83
03	01	890801	19.45	07	56	67	08	02	4	182	22 39 n	115 55 w	12.64
03	02	890801	19.45	56	67	07	09	02	3	182			10.70
03	03	890801	19.45	67	07	56	09	02	3	182			6.48

Table 2. (continued)

series	leg	date	speed km/hr	observer codes left	observer codes right	observer codes rec.	sun position horz.	sun position vert.	beauf. no.	course (deg.)	position latitude	position longitude	km in leg
03	04	890801	19.45	67	07	56	09	01	3	182			4.86
03	05	890801	19.45	73	55	71	09	01	3	182	22 18 n	115 56 w	9.07
03	06	890801	19.45	73	55	71	09	01	4	182			3.89
03	07	890801	19.45	55	71	73	09	01	4	182			12.96
03	08	890801	19.45	71	73	55	09	01	4	182			12.96
03	09	890801	19.45	07	56	67	09	01	4	182	21 54 n	115 56 w	12.96
03	10	890801	19.45	56	67	07	12	12	4	182			12.96
03	11	890801	19.45	67	07	56	03	12	4	182			8.10
03	12	890801	19.45	67	07	56	03	01	4	182			4.86
03	13	890801	19.45	73	55	71	02	01	5	182	21 32 n	115 56 w	7.45
04	01	890801	19.45	55	71	73	03	01	5	180	21 27 n	115 59 w	12.32
04	02	890801	19.45	71	73	55	03	01	5	180			4.54
05	01	890801	19.45	07	56	67	03	01	4	180	21 16 n	115 59 w	7.45
05	02	890801	19.45	07	56	67	03	02	4	180			2.27
05	03	890801	19.45	56	67	07	03	02	4	180	21 10 n	115 59 w	9.72
05	04	890801	19.45	67	07	56	03	02	4	180	21 05 n	115 59 w	9.72
05	05	890801	19.45	73	55	71	03	02	4	180	20 59 n	115 59 w	12.96
05	06	890801	19.45	55	71	73	03	03	4	180			6.48
06	01	890801	19.45	55	71	73	03	03	4	180	20 48 n	115 59 w	1.94
07	01	890801	19.45	71	73	55			4	180	20 43 n	116 00 w	1.94
08	01	890801	19.45	71	73	55			4	180	20 40 n	115 59 w	0.32
01	01	890802	19.45	67	07	56			3	125	19 50 n	115 39 w	4.21
01	02	890802	19.45	67	07	56	10	03	3	125			4.86
01	03	890802	19.45	07	56	67	10	03	3	125	19 47 n	115 35 w	2.27
02	01	890802	19.45	07	56	67	10	03	3	125	19 47 n	115 31 w	1.94
02	02	890802	19.45	56	67	07	10	02	3	125	19 47 n	115 31 w	8.75
02	03	890802	19.45	71	73	55	10	02	4	125	19 44 n	115 26 w	13.94
02	04	890802	19.45	73	55	71	10	02	4	125			3.89
02	05	890802	19.45	73	55	71			4	125	19 37 n	115 16 w	4.86
02	06	890802	19.45	73	55	71	10	02	4	125			3.24
02	07	890802	19.45	55	71	73	10	02	4	125			8.10
02	08	890802	19.45	55	71	73			4	125			4.86
02	09	890802	19.45	67	71	56			4	125	19 31 n	115 06 w	2.27
02	10	890802	19.45	67	07	56	11	01	4	125			10.70
02	11	890802	19.45	07	56	67	11	01	4	125			12.96
02	12	890802	19.45	56	67	07	12	12	4	125			12.96
03	01	890802	19.45	71	73	55	12	12	4	128	19 20 n	114 47 w	4.86
03	02	890802	19.45	71	73	55			4	128			2.27
04	01	890802	19.45	73	55	71			4	130	19 18 n	114 37 w	7.13
04	02	890802	19.45	67	07	56			4	130	19 14 n	114 32 w	4.86
04	03	890802	19.45	67	07	56	05	01	4	130			6.48
04	04	890802	19.45	67	07	56			4	130			1.62
04	05	890802	19.45	07	56	67			4	130			12.96
04	06	890802	19.45	56	67	07			4	130			7.13
05	01	890802	19.45	71	73	55			4	130	18 57 n	114 17 w	8.10
06	01	890802	19.45	73	55	71			4	127	18 54 n	114 12 w	2.59
06	02	890802	19.45	73	55	71			3	127			5.83
07	01	890802	19.45	67	07	56	05	02	3	127	18 51 n	114 06 w	6.81
07	02	890802	19.45	67	07	56			3	127	18 48 n	114 03 w	1.94
07	03	890802	19.45	07	56	67			3	127			8.43
07	04	890802	19.45	56	67	07			3	127	18 45 n	113 59 w	5.83
01	01	890803	19.45	55	71	73			3	126	17 58 n	112 59 w	3.89
01	02	890803	19.45	55	71	73	10	03	3	126	17 56 n	112 56 w	7.45

Table 2. (continued)

series	leg	date	speed km/hr	observer codes left	observer codes right	observer codes rec.	sun position horz.	sun position vert.	beauf. no.	course (deg.)	position latitude	position longitude	km in leg
01	03	890803	19.45	71	73	55	10	03	3	126			11.34
01	04	890803	19.45	73	55	71	10	03	3	126			10.37
01	05	890803	19.45	56	67	07	10	02	3	126	17 47 n	112 43 w	12.96
01	06	890803	19.45	67	07	56			2	126			12.96
01	07	890803	19.45	07	56	67			2	126			10.37
01	08	890803	19.45	07	56	67	10	01	2	126			2.59
01	09	890803	19.45	55	71	73	10	01	2	126	17 34 n	112 25 w	6.16
02	01	890803	19.45	71	73	55	10	01	2	126	17 30 n	112 21 w	4.86
02	02	890803	19.45	71	73	55	10	01	3	126			0.97
02	03	890803	19.45	71	73	55	07	01	3	232			5.19
02	04	890803	19.45	73	55	71	08	01	3	232			4.21
03	01	890803	19.45	56	67	07	12	12	3	232	17 19 n	112 25 w	4.54
03	02	890803	19.45	67	07	56	12	12	3	232			4.21
04	01	890803	19.45	07	56	67	01	01	2	233	17 14 n	112 29 w	4.86
05	01	890803	19.45	55	71	73			3	235	17 10 n	112 32 w	10.05
05	02	890803	19.45	71	73	55	01	01	2	235	17 08 n	112 37 w	10.05
05	03	890803	19.45	73	55	71	01	02	2	235			2.59
05	04	890803	19.45	73	55	71	01	02	2	235			6.81
05	05	890803	19.45	56	67	07	01	02	2	235	17 02 n	112 46 w	10.37
05	06	890803	19.45	56	67	07	02	02	2	235			9.07
05	07	890803	19.45	07	56	67	02	02	2	235	16 56 n	112 55 w	9.72
05	08	890803	19.45	55	71	73	01	02	2	235	16 53 n	112 59 w	7.78
06	01	890803	19.45	71	73	55			2	235	16 49 n	113 06 w	3.24
06	02	890803	19.45	71	73	55	02	03	2	235			2.27
06	03	890803	19.45	71	73	55			2	235			4.21
06	04	890803	19.45	71	73	55			2	235	16 46 n	113 11 w	0.32
01	01	890804	19.45	07	56	67			2	232	15 59 n	114 13 w	4.86
01	02	890804	19.45	07	56	67			2	236	15 57 n	114 14 w	2.27
01	03	890804	19.45	07	56	67	07	03	2	236	15 56 n	114 15 w	1.62
01	04	890804	19.45	56	67	07	07	03	2	236			8.10
01	05	890804	19.45	67	07	56	07	02	3	236			7.78
01	06	890804	19.45	73	55	71	07	02	3	236	15 51 n	114 23 w	12.96
01	07	890804	19.45	55	71	73	07	02	3	236			19.45
01	08	890804	19.45	71	73	55	07	02	3	236			6.48
02	01	890804	19.45	07	56	67	07	01	3	236	15 37 n	114 42 w	2.27
03	01	890804	19.45	56	67	07	07	01	3	236	15 32 n	114 45 w	3.89
04	01	890804	19.45	56	67	07	07	01	2	236	15 30 n	114 48 w	5.83
04	02	890804	19.45	67	07	56	07	01	2	236	15 29 n	114 50 w	4.54
04	03	890804	19.45	67	07	56	07	12	1	236			6.48
04	04	890804	19.45	73	55	71	07	12	1	236	15 26 n	114 56 w	9.07
04	05	890804	19.45	73	55	71	07	12	2	236	15 23 n	115 01 w	3.89
04	06	890804	19.45	55	71	73	01	12	2	236			2.59
05	01	890804	19.45	55	71	73	01	12	2	236	15 21 n	115 04 w	3.89
06	01	890804	19.45	71	73	55	01	12	2	236	15 17 n	115 06 w	5.83
06	02	890804	19.45	71	73	55	01	01	2	236			5.83
06	03	890804	19.45	07	56	67	01	01	2	236	15 14 n	115 12 w	12.96
06	04	890804	19.45	56	67	07	01	01	2	236			11.99
07	01	890804	19.45	67	07	56	01	02	2	236	15 06 n	115 24 w	8.43
08	01	890804	19.45	73	55	71	01	02	2	233	15 03 n	115 27 w	9.40
08	02	890804	19.45	55	71	73	01	02	2	233	14 59 n	115 32 w	1.94
09	01	890804	19.45	71	73	55	01	02	2	233	14 55 n	115 37 w	3.24
09	02	890804	19.45	07	56	67	01	02	3	233	14 54 n	115 38 w	11.02
09	03	890804	19.45	56	67	07	02	03	3	233			8.43

Table 2. (continued)

series	leg	date	speed km/hr	observer codes left	right	rec.	sun position horz.	vert.	beauf. no.	course (deg.)	position latitude	longitude	km in leg
09	04	890804	19.45	67	07	56	02	03	3	233	14 47 n	115 47 w	6.81
09	05	890804	19.45	67	07	56			3	233			3.89
09	06	890804	19.45	67	07	56			3	233	14 44 n	115 52 w	0.32
01	01	890805	19.45	71	73	55			3	225	14 11 n	116 51 w	8.43
01	02	890805	19.45	73	55	71			3	225			9.07
01	03	890805	19.45	55	71	73	07	03	3	225			9.07
01	04	890805	19.45	67	07	56	07	02	3	225	14 01 n	117 01 w	2.92
02	01	890805	19.45	67	07	56	07	02	2	225	13 59 n	117 02 w	5.51
02	02	890805	19.45	07	56	67	07	02	2	225			1.94
02	03	890805	19.45	07	56	67	07	02	3	225			9.40
02	04	890805	19.45	07	56	67	07	02	2	225			1.62
02	05	890805	19.45	56	67	07	07	02	2	225			12.96
02	06	890805	19.45	71	73	55	07	01	2	232	13 46 n	117 16 w	10.05
02	07	890805	19.45	71	73	55			2	232			2.92
02	08	890805	19.45	73	55	71			2	232			0.97
03	01	890805	19.45	73	55	71			2	231	13 41 n	117 22 w	9.07
03	02	890805	19.45	55	71	73			2	231			3.57
04	01	890805	19.45	67	07	56	07	12	2	231	13 35 n	117 29 w	7.45
05	01	890805	19.45	07	56	67	12	12	3	140	13 26 n	117 37 w	6.16
06	01	890805	19.45	71	73	55	05	01	3	135	13 18 n	117 33 w	5.83
06	02	890805	19.45	73	55	71	04	01	3	135			4.54
07	01	890805	19.45	67	07	56	05	02	3	135	13 07 n	117 31 w	7.78
07	02	890805	19.45	07	56	67	05	02	3	135			1.62
08	01	890805	19.45	71	73	55	05	02	3	135	13 03 n	117 26 w	5.19
08	02	890805	19.45	71	73	55	05	02	3	135			4.21
08	03	890805	19.45	73	55	71			3	135	12 59 n	117 22 w	7.13
09	01	890805	19.45	73	55	71			3	135	12 53 n	117 15 w	0.32
01	01	890806	19.26	56	67	07			3	119	11 57 n	116 23 w	6.74
01	02	890806	19.26	56	67	07			3	119			0.96
01	03	890806	19.26	67	07	56	11	03	3	119	11 55 n	116 19 w	2.25
01	04	890806	19.26	67	07	56			3	119			0.96
02	01	890806	18.71	67	07	56			3	119	11 53 n	116 16 w	1.56
03	01	890806	18.71	07	56	67			3	119	11 51 n	116 13 w	2.18
04	01	890806	18.71	55	71	73			4	119	11 49 n	116 10 w	1.87
05	01	890806	18.71	55	71	73			4	119	11 48 n	116 08 w	1.87
05	02	890806	18.71	55	71	73	10	02	4	119			6.24
05	03	890806	18.71	71	73	55	10	02	4	119			2.81
06	01	890806	19.63	56	67	07	11	01	4	117	11 37 n	115 56 w	8.83
06	02	890806	19.63	56	67	07	11	01	3	117	11 35 n	115 51 w	4.25
06	03	890806	19.63	67	07	56	11	01	3	117			13.09
06	04	890806	19.63	07	56	67	11	01	3	117			13.09
06	05	890806	19.63	55	71	73	12	12	3	117	11 27 n	115 36 w	5.89
07	01	890806	19.63	71	73	55			3	117	11 23 n	115 27 w	3.27
07	02	890806	19.63	71	73	55			2	117			3.27
07	03	890806	19.63	71	73	55	06	12	2	117	11 22 n	115 24 w	3.93
07	04	890806	19.63	73	55	71	05	12	2	117	11 21 n	115 22 w	4.58
08	01	890806	19.63	73	55	71	05	12	2	117	11 20 n	115 19 w	2.29
08	02	890806	19.63	56	67	07			2	117	11 20 n	115 18 w	7.20
09	01	890806	19.45	56	67	07			2	117	11 18 n	115 13 w	3.57
09	02	890806	19.45	67	07	56			2	117			7.45
09	03	890806	19.45	67	07	56			2	117	11 16 n	115 08 w	5.51
09	04	890806	19.45	07	56	67			2	117			6.81
10	01	890806	19.45	55	71	73			2	117	11 12 n	114 59 w	4.54

Table 2. (continued)

series	leg	date	speed km/hr	observer codes left	observer codes right	observer codes rec.	sun position horz.	sun position vert.	beauf. no.	course (deg.)	position latitude	position longitude	km in leg
10	02	890806	19.45	55	71	73			1	117	11 11 n	114 56 w	4.21
10	03	890806	19.45	55	71	73			2	117	11 10 n	114 54 w	0.97
10	04	890806	19.45	71	73	55			2	117	11 09 n	114 53 w	5.83
10	05	890806	19.45	71	73	55			2	165	11 08 n	114 51 w	1.94
10	06	890806	19.45	71	73	55			1	165			2.27
10	07	890806	19.45	73	55	71			1	165	11 06 n	114 50 w	3.57
11	01	890806	18.52	73	55	71			1	165	11 04 n	114 49 w	2.47
11	02	890806	18.52	56	67	07			1	165	11 03 n	114 49 w	2.16
12	01	890806	17.96	67	07	56			2	117	10 55 n	114 41 w	2.99
12	02	890806	17.96	67	07	56			2	117	10 55 n	114 40 w	0.30
01	01	890807	18.52	73	55	71			3	115	10 18 n	113 34 w	8.64
01	02	890807	18.52	55	71	73	10	03	3	115			5.56
01	03	890807	18.52	55	71	73	10	03	4	115			3.70
01	04	890807	18.52	71	73	55	10	03	4	115			8.64
01	05	890807	18.52	07	56	67	11	02	4	115	10 11 n	113 20 w	12.35
01	06	890807	18.52	56	67	07	11	02	4	115			12.35
01	07	890807	18.52	67	07	56	11	02	4	115			6.17
01	08	890807	18.52	67	07	56	11	01	4	115			6.17
01	09	890807	18.52	73	55	71	11	01	3	115	10 00 n	113 01 w	4.63
01	10	890807	18.52	73	55	71			3	115			4.63
01	11	890807	18.52	73	55	71			3	113	09 58 n	112 56 w	3.09
01	12	890807	18.52	55	71	73	11	01	4	113			2.16
01	13	890807	18.52	55	71	73			4	113			3.40
01	14	890807	18.52	55	71	73	11	01	4	113	09 55 n	112 51 w	4.94
01	15	890807	18.52	55	71	73			4	113			1.85
01	16	890807	18.52	71	73	55			4	113			1.54
02	01	890807	18.52	73	55	71			4	113	09 53 n	112 44 w	2.16
02	02	890807	18.52	07	56	67			4	113	09 52 n	112 43 w	7.10
03	01	890807	18.52	56	67	07			4	105			4.94
03	02	890807	18.52	73	55	71			4	105	09 40 n	112 28 w	12.04
03	03	890807	18.52	55	71	73			4	105			12.35
03	04	890807	18.52	71	73	55			4	105			4.63
04	01	890807	18.52	71	73	55	06	02	4	105	09 36 n	112 11 w	6.48
04	02	890807	18.52	07	56	67	06	02	4	105	09 34 n	112 07 w	9.26
04	03	890807	18.52	56	67	07	06	02	3	105	09 33 n	112 02 w	1.23
04	04	890807	18.52	56	67	07	06	02	3	105			3.40
05	01	890807	18.52	73	55	71			2	105	09 29 n	111 44 w	2.47
05	02	890807	18.52	73	55	71			2	145			5.56
05	03	890807	18.52	73	55	71			2	145	09 26 n	111 41 w	0.31
01	01	890808	18.52	67	07	56			3	145	08 27 n	110 58 w	7.41
01	02	890808	18.52	67	07	56			4	145	08 24 n	110 55 w	3.09
01	03	890808	18.52	07	56	67			4	145			0.93
01	04	890808	18.52	07	56	67			4	145	08 22 n	110 54 w	4.63
02	01	890808	18.33	56	67	07			3	148	08 16 n	110 49 w	3.97
02	02	890808	18.33	71	73	55			4	148	08 14 n	110 48 w	5.19
02	03	890808	18.33	71	73	55			4	148	08 12 n	110 46 w	0.31
01	01	890809	18.52	55	71	73	09	03	5	156	05 42 n	109 07 w	7.10
01	02	890809	18.52	55	71	73	09	03	4	156			1.85
02	01	890809	18.52	71	73	55	09	02	4	150	05 37 n	109 02 w	8.33
02	02	890809	18.52	73	55	71	09	02	4	150			4.94
02	03	890809	18.52	73	55	71			4	150			2.16
02	04	890809	18.52	56	67	07	09	02	4	150	05 31 n	108 57 w	12.35
02	05	890809	18.52	67	07	56	09	02	4	150			4.63

Table 2. (continued)

series	leg	date	speed km/hr	observer codes left	observer codes right	observer codes rec.	sun position horz.	sun position vert.	beauf. no.	course (deg.)	position latitude	position longitude	km in leg
02	06	890809	18.52	67	07	56			4	150			1.54
02	07	890809	18.52	67	07	56			4	155	05 22 n	108 50 w	6.17
02	08	890809	18.52	07	56	67			4	155			10.49
02	09	890809	18.52	07	56	67			5	155			1.85
02	10	890809	18.52	55	71	73			5	155	05 14 n	108 47 w	9.26
02	11	890809	18.52	55	71	73	09	01	5	155	05 10 n	108 44 w	3.09
02	12	890809	18.52	71	73	55	09	01	5	155			12.35
02	13	890809	18.52	73	55	71	09	01	5	155			5.25
03	01	890809	18.52	73	55	71	08	01	5	155	05 02 n	108 40 w	5.25
03	02	890809	18.52	56	67	07	07	12	4	155	05 00 n	108 34 w	12.35
03	03	890809	18.52	67	07	56	06	12	4	155			6.17
03	04	890809	18.52	67	07	56	05	12	4	155	04 53 n	108 34 w	4.63
03	05	890809	18.52	67	07	56	05	01	4	155			1.54
03	06	890809	18.52	07	56	67	05	01	4	155			3.70
04	01	890809	18.52	07	56	67	04	01	4	155	04 49 n	108 33 w	3.70
04	02	890809	18.52	55	71	73	04	01	4	155	04 47 n	108 33 w	12.35
04	03	890809	18.52	71	73	55	04	01	4	155			7.41
04	04	890809	18.52	71	73	55	04	02	4	150	04 40 n	108 28 w	5.25
04	05	890809	18.52	73	55	71	04	02	4	150			12.04
04	06	890809	18.52	56	67	07	04	02	4	150	04 33 n	108 23 w	9.26
04	07	890809	18.52	67	07	56			4	150			9.26
04	08	890809	18.52	07	56	67	04	02	4	150	04 26 n	108 19 w	8.03
04	09	890809	18.52	07	56	67			4	289			1.23
04	10	890809	18.52	55	71	73			4	289	04 23 n	108 18 w	7.72
04	11	890809	18.52	71	73	55			4	289			6.17
05	01	890809	18.52	71	73	55			4	289	04 31 n	108 28 w	0.31
01	01	890810	18.52	07	56	67			4	305	04 50 n	109 47 w	4.63
02	01	890810	18.52	56	67	07			4	317	04 54 n	109 55 w	9.88
03	01	890810	18.52	07	56	67			4	288	05 01 n	110 04 w	8.64
03	02	890810	18.52	56	67	07			4	288	05 02 n	110 09 w	7.10
03	03	890810	18.52	56	67	07	04	01	4	288			1.85
03	04	890810	18.52	67	07	56	04	01	4	288	05 03 n	110 14 w	4.32
03	05	890810	18.52	67	07	56	04	12	4	288			4.63
03	06	890810	18.52	73	55	71	04	12	5	288	05 05 n	110 19 w	5.25
04	01	890810	18.52	55	71	73	01	01	5	288	05 07 n	110 28 w	9.26
04	02	890810	18.52	71	73	55	01	01	5	288	05 09 n	110 33 w	8.03
04	03	890810	18.52	71	73	55			5	288			1.23
04	04	890810	18.52	07	56	67	12	01	4	288	05 10 n	110 38 w	12.35
04	05	890810	18.52	56	67	07	12	01	4	288	05 13 n	110 44 w	9.88
04	06	890810	18.52	56	67	07			4	288			2.47
04	07	890810	18.52	67	07	56	12	02	4	288			1.23
04	08	890810	18.52	67	07	56	11	02	4	310	05 15 n	110 52 w	11.11
04	09	890810	18.52	73	55	71	11	02	4	310	05 19 n	110 57 w	2.78
05	01	890810	18.52	55	71	73			4	288	05 26 n	110 59 w	5.25
05	02	890810	18.52	55	71	73	12	03	4	288			1.85
05	03	890810	18.52	55	71	73			4	288			2.16
05	04	890810	18.52	07	56	67			4	288	05 28 n	111 04 w	6.17
05	05	890810	18.52	56	67	07			4	288			6.17
05	06	890810	18.52	67	07	56			4	288			1.23
05	07	890810	18.52	67	07	56			4	288	05 30 n	111 12 w	0.31
01	01	890811	18.52	71	73	55			4	289	05 59 n	112 22 w	4.01
01	02	890811	18.52	71	73	55			4	289			6.48
01	03	890811	18.52	73	55	71	05	03	4	289			3.09

Table 2. (continued)

series	leg	date	speed km/hr	observer codes left	observer codes right	observer codes rec.	sun position horz.	sun position vert.	beauf. no.	course (deg.)	position latitude	position longitude	km in leg
01	04	890811	18.52	73	55	71	05	03	4	289			2.47
02	01	890811	18.52	73	55	71	05	03	4	289	05 52 n	112 30 w	2.78
02	02	890811	18.52	67	07	56	05	02	4	289	05 52 n	112 32 w	6.48
02	03	890811	18.52	67	07	56			4	289			5.86
02	04	890811	19.45	07	56	67			4	289			3.57
03	01	890811	19.45	07	56	67			4	289	05 57 n	112 39 w	4.21
03	02	890811	19.45	56	67	07			4	289			12.96
03	03	890811	19.45	71	73	55			4	287	06 00 n	112 52 w	3.24
03	04	890811	19.45	71	73	55			4	287			4.21
03	05	890811	19.45	71	73	55			4	287			6.16
03	06	890811	19.45	73	55	71			5	287			4.54
03	07	890811	19.45	73	55	71	04	01	5	287			0.97
04	01	890811	19.45	73	55	71			5	287	06 03 n	113 03 w	3.57
04	02	890811	19.45	55	71	73			5	287			12.96
04	03	890811	18.52	67	07	56			5	287	06 05 n	113 11 w	6.17
04	04	890811	18.52	67	07	56			5	287			0.93
05	01	890811	18.52	07	56	67			5	287	06 09 n	113 21 w	4.32
05	02	890811	18.52	07	56	67			5	287			4.94
05	03	890811	18.52	56	67	07			5	287	06 10 n	113 26 w	2.78
05	04	890811	18.52	56	67	07	12	12	5	287			6.48
05	05	890811	18.52	71	73	55	12	01	5	287	06 12 n	113 31 w	12.66
05	06	890811	18.52	73	55	71	12	01	5	287			5.86
05	07	890811	18.52	73	55	71	11	01	5	302			6.17
05	08	890811	18.52	55	71	73			5	302			3.09
05	09	890811	18.52	55	71	73			5	285	06 19 n	113 45 w	9.26
05	10	890811	18.52	67	07	56			5	285	06 21 n	113 50 w	3.70
06	01	890811	18.52	07	56	67			5	285	06 19 n	113 53 w	9.26
06	02	890811	18.52	56	67	07			5	285	06 21 n	113 58 w	7.10
06	03	890811	18.52	56	67	07			5	285			2.16
06	04	890811	18.52	71	73	55			5	285	06 22 n	114 03 w	6.17
06	05	890811	18.52	73	55	71			5	285			6.17
06	06	890811	18.52	55	71	73			5	285			6.17
06	07	890811	18.52	55	71	73			5	285	06 24 n	114 11 w	0.31
01	01	890812	14.82	56	67	07			5	287	06 47 n	115 15 w	5.43
01	02	890812	14.82	67	07	56	05	03	5	287			3.70
01	03	890812	14.82	67	07	56			5	287	06 49 n	115 21 w	1.73
01	04	890812	14.82	07	56	67	05	02	5	287			5.68
01	05	890812	14.82	55	71	73	05	02	5	287	06 51 n	115 25 w	4.94
01	06	890812	14.82	71	73	55	05	02	5	287			5.43
01	07	890812	14.82	73	55	71	05	02	5	287			2.22
01	08	890812	14.82	73	55	71			5	287			2.22
01	09	890812	14.82	73	55	71			5	287	06 54 n	115 34 w	0.25
01	01	890814	14.82	07	56	67			5	295	08 46 n	120 26 w	2.72
01	02	890814	14.82	07	56	67	05	03	5	295			2.22
01	03	890814	14.82	56	67	07			5	295			4.94
01	04	890814	14.82	67	07	56			5	295			5.19
01	05	890814	14.82	73	55	71			5	295	08 49 n	120 34 w	5.43
01	06	890814	14.82	73	55	71	05	02	5	295			1.73
01	07	890814	14.82	73	55	71	05	02	5	298	08 51 n	120 38 w	2.47
01	08	890814	14.82	55	71	73	04	02	5	298			9.88
01	09	890814	14.82	71	73	55	05	02	5	298			6.67
01	10	890814	14.82	71	73	55			5	298			3.21
01	11	890814	14.82	07	56	67	05	02	5	300	08 57 n	120 49 w	0.99

Table 2. (continued)

series	leg	date	speed km/hr	observer codes left	observer codes right	observer codes rec.	sun position horz.	sun position vert.	beauf. no.	course (deg.)	position latitude	position longitude	km in leg
01	12	890814	14.82	07	56	67	05	02	5	300	08 57 n	120 50 w	3.95
01	13	890814	14.82	56	67	07	05	02	5	300			4.94
01	14	890814	14.82	67	07	56	05	01	5	300			2.47
01	15	890814	14.82	67	07	56			5	300			0.74
01	16	890814	14.82	67	07	56	05	01	5	300			1.73
02	01	890814	14.82	73	55	71	10	01	5	328	09 25 n	121 34 w	7.41
02	02	890814	14.82	55	71	73	10	02	5	328	09 28 n	121 36 w	4.44
03	01	890814	14.82	07	56	67			5	328	09 36 n	121 40 w	8.15
03	02	890814	14.82	56	67	07			5	328	09 40 n	121 43 w	7.90
03	03	890814	14.82	67	07	56			5	328			7.16
03	04	890814	14.82	67	07	56			5	328	09 47 n	121 48 w	0.25
01	01	890815	18.52	71	73	55	05	03	4	301	10 16 n	122 56 w	1.54
01	02	890815	18.52	71	73	55			4	301			1.54
01	03	890815	18.52	71	73	55	05	03	4	301			0.62
02	01	890815	18.52	71	73	55			4	301	10 18 n	122 58 w	3.09
02	02	890815	18.52	71	73	55	05	03	4	301	10 19 n	123 00 w	0.93
02	03	890815	18.52	73	55	71	05	03	4	301			8.33
02	04	890815	18.52	55	71	73	04	02	4	301	10 22 n	123 04 w	9.26
02	05	890815	18.52	67	07	56			4	301	10 24 n	123 08 w	3.09
02	06	890815	18.52	67	07	56	05	02	4	301			4.63
03	01	890815	18.52	67	07	56			4	301	10 28 n	123 14 w	0.93
03	02	890815	18.52	07	56	67			4	301			4.63
04	01	890815	18.52	07	56	67			4	170	10 28 n	123 16 w	3.40
04	02	890815	18.52	07	56	67	09	02	4	170			2.78
04	03	890815	18.52	56	67	07	09	02	4	170			3.70
05	01	890815	18.52	56	67	07	04	01	5	303	10 21 n	123 15 w	5.56
05	02	890815	18.52	71	73	55	05	01	5	303	10 23 n	123 18 w	12.66
05	03	890815	18.52	73	55	71	05	01	5	303			12.04
05	04	890815	18.52	55	71	73	04	01	5	303			3.09
05	05	890815	18.52	55	71	73	04	12	5	303	10 31 n	123 31 w	9.26
05	06	890815	18.52	67	07	56	12	12	5	303	10 35 n	123 36 w	6.17
05	07	890815	18.52	07	56	67	12	12	5	303			6.17
05	08	890815	18.52	56	67	07	12	12	5	303			6.17
06	01	890815	18.52	71	73	55	11	01	5	303	10 46 n	123 53 w	6.79
06	02	890815	18.52	73	55	71	11	01	5	303			3.09
07	01	890815	18.52	55	71	73	10	01	4	325	10 51 n	124 02 w	6.17
07	02	890815	18.52	71	73	55	10	01	4	325			7.10
07	03	890815	18.52	73	55	71	10	02	4	325			5.25
07	04	890815	18.52	67	07	56	10	02	4	325	11 00 n	124 08 w	9.26
07	05	890815	18.52	07	56	67	10	02	4	325	11 04 n	124 11 w	9.26
07	06	890815	18.52	56	67	07	10	02	4	325	11 09 n	124 15 w	9.26
07	07	890815	18.52	71	73	55	10	03	4	325	11 13 n	124 17 w	9.26
07	08	890815	18.52	73	55	71			4	325	11 16 n	124 20 w	9.26
07	09	890815	18.52	73	55	71			4	325	11 22 n	124 23 w	0.31
01	01	890816	18.52	56	67	07			3	298	11 42 n	125 23 w	6.48
01	02	890816	18.52	56	67	07	05	03	3	298			2.16
01	03	890816	18.52	56	67	07	05	03	4	298			1.23
01	04	890816	18.52	67	07	56			4	298			2.47
01	05	890816	18.52	67	07	56	05	03	4	298	11 45 n	125 30 w	2.16
01	06	890816	18.52	67	07	56	05	03	3	298			4.32
01	07	890816	18.52	67	07	56	05	03	4	298			1.23
01	08	890816	18.52	55	71	73	05	02	4	298	11 47 n	125 34 w	10.19
01	09	890816	18.52	55	71	73	04	02	4	298	11 49 n	125 39 w	9.26

Table 2. (continued)

series	leg	date	speed km/hr	observer codes left	observer codes right	observer codes rec.	sun position horz.	sun position vert.	beauf. no.	course (deg.)	position latitude	position longitude	km in leg
01	10	890816	18.52	55	71	73	04	02	4	305	11 51 n	125 44 w	3.09
01	11	890816	18.52	71	73	55	05	02	4	305	11 52 n	125 45 w	12.96
01	12	890816	18.52	73	55	71	05	02	4	305			8.03
01	13	890816	18.52	73	55	71			4	305			3.70
01	14	890816	18.52	56	67	07	05	01	4	307	11 59 n	125 57 w	12.35
01	15	890816	18.52	67	07	56	05	01	4	307			2.47
01	16	890816	18.52	67	07	56			4	307			1.85
01	17	890816	18.52	67	07	56	05	01	4	307			8.03
01	18	890816	18.52	07	56	67	04	01	4	307	12 06 n	126 09 w	12.35
01	19	890816	18.52	55	71	73	12	12	4	307	12 10 n	126 15 w	12.35
01	20	890816	18.52	71	73	55	12	12	4	307			13.27
01	21	890816	18.52	73	55	71	12	12	4	307			11.42
01	22	890816	18.52	56	67	07	11	01	4	307	12 21 n	126 33 w	12.35
01	23	890816	18.52	67	07	56	11	01	4	307			12.35
01	24	890816	18.52	07	56	67	11	01	4	307			10.80
01	25	890816	18.52	07	56	67	11	02	4	307			1.54
02	01	890816	18.52	55	71	73	11	02	3	307	12 33 n	126 50 w	7.72
03	01	890816	18.52	71	73	55	11	02	3	307	12 34 n	126 57 w	3.09
03	02	890816	18.52	56	67	07	11	03	3	307	12 35 n	126 58 w	3.09
03	03	890816	18.52	56	67	07			3	307			4.63
03	04	890816	18.52	67	07	56			3	307			1.54
03	05	890816	18.52	67	07	56			2	307	12 38 n	127 02 w	1.54
03	06	890816	18.52	67	07	56	11	03	2	307	12 38 n	127 03 w	5.25
03	07	890816	18.52	07	56	67	11	03	2	307			2.47
03	08	890816	18.52	07	56	67	11	03	2	307	12 41 n	127 09 w	3.09
03	09	890816	18.52	07	56	67	11	03	2	307			1.23
03	10	890816	18.52	07	56	67	11	03	2	307	12 42 n	127 11 w	0.31
01	01	890817	18.52	73	55	71			4	310	13 22 n	128 27 w	5.86
02	01	890817	18.52	55	71	73			4	300	13 30 n	128 30 w	3.09
02	02	890817	18.52	07	56	67			3	300	13 31 n	128 32 w	6.48
02	03	890817	18.52	07	56	67			4	300			2.78
03	01	890817	18.52	56	67	07			4	280	13 36 n	128 38 w	4.32
03	02	890817	18.52	56	67	07	05	02	4	280			7.41
03	03	890817	18.52	67	07	56	05	02	4	280			3.09
03	04	890817	18.52	67	07	56			4	280			5.56
03	05	890817	18.52	67	07	56	05	01	4	280			3.09
03	06	890817	18.52	73	55	71	05	01	4	280	13 38 n	128 53 w	5.86
03	07	890817	18.52	73	55	71	05	01	4	280			6.48
03	08	890817	18.52	55	71	73	05	01	4	280			5.25
03	09	890817	18.52	55	71	73	05	01	4	280			2.47
03	10	890817	18.52	55	71	73			4	280			4.63
03	11	890817	18.52	71	73	55			4	280			3.09
03	12	890817	18.52	71	73	55	06	01	4	276	13 41 n	129 11 w	3.09
03	13	890817	18.52	71	73	55	06	01	4	276			3.09
03	14	890817	18.52	71	73	55			4	276			3.09
03	15	890817	18.52	07	56	67			4	276	13 42 n	129 11 w	12.35
03	16	890817	18.52	56	67	07	12	12	4	276			7.72
03	17	890817	18.52	56	67	07	12	12	4	273	13 44 n	129 29 w	3.09
03	18	890817	18.52	56	67	07			4	273			1.54
03	19	890817	18.52	67	07	56	12	12	3	273			4.01
03	20	890817	18.52	67	07	56			3	273			0.93
04	01	890817	18.52	73	55	71			3	273	13 45 n	129 39 w	1.85
05	01	890817	18.52	73	55	71			3	271	13 47 n	129 41 w	0.93

Table 2. (continued)

series	leg	date	speed km/hr	observer codes left	right	rec.	sun position horz.	vert.	beauf. no.	course (deg.)	position latitude	longitude	km in leg
05	02	890817	18.52	55	71	73	12	01	4	271			12.35
05	03	890817	18.52	71	73	55	12	01	4	271			9.26
06	01	890817	18.52	07	56	67	01	01	4	230	13 51 n	129 54 w	0.31
07	01	890817	18.52	56	67	07			4	271	13 48 n	130 02 w	2.16
07	02	890817	18.52	73	55	71	12	02	4	271	13 48 n	130 03 w	7.72
08	01	890817	18.52	55	71	73	01	03	4	240	13 52 n	130 10 w	2.78
08	02	890817	18.52	55	71	73			4	240			6.79
08	03	890817	18.52	55	71	73			4	240	13 49 n	130 15 w	0.31
01	01	890818	18.52	67	07	56	07	03	5	226	13 43 n	131 23 w	7.72
01	02	890818	18.52	07	56	67	07	03	5	226			1.54
01	03	890818	18.52	07	56	67	06	03	5	242	13 39 n	131 27 w	0.93
02	01	890818	18.52	56	67	07	07	03	5	242	13 38 n	131 29 w	5.25
02	02	890818	18.52	71	73	55	07	02	5	242	13 37 n	131 31 w	4.94
02	03	890818	18.52	71	73	55			5	242			2.78
02	04	890818	18.52	71	73	55	07	02	5	242			5.25
02	05	890818	18.52	73	55	71	07	02	5	242			6.48
03	01	890818	19.45	71	73	55	02	02	5	221	12 55 n	132 17 w	8.10
03	02	890818	19.45	71	73	55			5	221			1.94
03	03	890818	19.45	73	55	71			5	221	12 50 n	132 22 w	3.24
03	04	890818	19.45	73	55	71			5	224	12 48 n	132 23 w	3.89
03	05	890818	19.45	73	55	71	02	02	5	224	12 47 n	132 25 w	2.27
03	06	890818	19.45	55	71	73	02	02	5	224	12 46 n	132 25 w	9.72
03	07	890818	19.45	67	07	56	02	02	5	224	12 43 n	132 29 w	3.24
03	08	890818	19.45	67	07	56	02	02	5	234	12 41 n	132 30 w	3.24
03	09	890818	19.45	67	07	56	02	02	5	234			3.24
03	10	890818	19.45	07	56	67	01	03	5	234	12 39 n	132 33 w	9.72
03	11	890818	19.45	56	67	07	01	03	5	234	12 36 n	132 38 w	4.86
03	12	890818	19.45	56	67	07			5	234			6.81
03	13	890818	19.45	56	67	07			5	234	12 32 n	132 42 w	0.32
01	01	890819	20.37	55	71	73	07	03	4	218	11 33 n	133 48 w	7.47
01	02	890819	20.37	71	73	55	07	03	4	218			9.17
01	03	890819	20.37	73	55	71	07	03	4	218	11 26 n	133 54 w	7.13
01	04	890819	20.37	56	67	07	07	02	4	218	11 24 n	133 56 w	13.58
01	05	890819	20.37	67	07	56	07	02	5	218			13.58
01	06	890819	20.37	07	56	67	07	02	5	218			13.58
01	07	890819	20.37	55	71	73	07	01	5	218	11 07 n	134 12 w	13.58
01	08	890819	20.37	71	73	55	07	01	5	218			13.92
01	09	890819	20.37	73	55	71	07	01	4	218	10 56 n	134 22 w	7.81
02	01	890819	20.37	56	67	07	12	12	5	222	10 48 n	134 26 w	10.19
02	02	890819	20.37	67	07	56	12	12	5	222	10 44 n	134 30 w	11.88
02	03	890819	20.37	67	07	56	12	12	5	226			1.70
02	04	890819	20.37	07	56	67	04	12	5	226			13.58
02	05	890819	20.37	55	71	73	02	01	4	226	10 34 n	134 41 w	13.58
02	06	890819	20.37	71	73	55	02	01	4	226			13.92
02	07	890819	20.37	73	55	71	02	01	4	226			2.72
03	01	890819	20.37	56	67	07	02	02	4	224	10 19 n	134 58 w	10.19
03	02	890819	20.37	67	07	56	02	02	4	224	10 15 n	135 01 w	3.06
03	03	890819	20.37	67	07	56	02	02	3	224			7.13
04	01	890819	20.37	55	71	73	02	02	4	224	10 06 n	135 07 w	6.79
04	02	890819	20.37	55	71	73	02	03	4	224			2.38
04	03	890819	20.37	71	73	55	02	03	4	224			1.02
05	01	890819	20.37	71	73	55			4	224	09 56 n	135 19 w	0.34
01	01	890820	18.52	07	56	67			4	302	08 44 n	136 40 w	8.03

Table 2. (continued)

series	leg	date	speed km/hr	observer codes left	right	rec.	sun position horz.	vert.	beauf. no.	course (deg.)	position latitude	longitude	km in leg
01	02	890820	18.52	56	67	07			4	302			4.63
01	03	890820	18.52	56	67	07			5	302	08 48 n	136 45 w	3.40
01	04	890820	18.52	67	07	56			5	302			4.63
02	01	890820	18.52	73	55	71			5	302	08 53 n	136 50 w	3.70
02	02	890820	18.52	73	55	71			5	297	08 53 n	136 51 w	3.70
02	03	890820	18.52	73	55	71			5	297			4.94
02	04	890820	18.52	55	71	73			5	297			1.23
03	01	890820	18.52	07	56	67			2	345	09 21 n	137 37 w	8.33
03	02	890820	18.52	56	67	07			2	345			6.79
03	03	890820	18.52	56	67	07	10	03	2	345			1.54
03	04	890820	18.52	67	07	56			2	345			3.40
03	05	890820	18.52	67	07	56			3	345	09 34 n	137 41 w	6.48
03	06	890820	18.52	67	07	56			3	345	09 38 n	137 42 w	0.31
01	01	890821	20.37	71	73	55			4	290	10 11 n	138 57 w	6.45
01	02	890821	20.37	71	73	55	05	03	4	290	10 13 n	139 01 w	2.72
02	01	890821	20.37	73	55	71	05	03	4	290	10 16 n	139 02 w	11.54
02	02	890821	20.37	55	71	73	05	02	4	290			10.53
03	01	890821	20.37	67	07	56	05	02	4	302	10 21 n	139 19 w	9.51
03	02	890821	20.37	07	56	67	05	02	4	302			7.81
03	03	890821	20.37	56	67	07	05	01	4	302			8.49
03	04	890821	20.37	71	73	55	05	01	4	302	10 29 n	139 30 w	13.58
03	05	890821	20.37	73	55	71	05	01	4	302			11.54
04	01	890821	20.37	55	71	73	05	01	4	302	10 36 n	139 42 w	5.77
04	02	890821	19.45	55	71	73	05	12	4	302			4.54
05	01	890821	19.45	67	07	56	05	12	4	302	10 39 n	139 47 w	3.24
05	02	890821	19.45	67	07	56	12	12	3	302			3.24
05	03	890821	19.45	67	07	56	12	12	4	302			6.48
05	04	890821	19.45	07	56	67	12	12	4	302			6.48
05	05	890821	19.45	07	56	67	12	12	3	302	10 45 n	139 57 w	3.57
05	06	890821	19.45	07	56	67	11	01	4	302			2.92
05	07	890821	19.45	56	67	07	11	01	4	302			12.96
06	01	890821	19.45	71	73	55	11	01	3	302	10 51 n	140 06 w	9.07
06	02	890821	19.45	73	55	71	11	02	3	302	10 53 n	140 07 w	9.07
06	03	890821	19.45	67	07	56	11	02	3	302	10 55 n	140 14 w	9.72
06	04	890821	19.45	07	56	67	11	02	2	302	10 58 n	140 19 w	3.89
07	01	890821	19.45	56	67	07	11	02	2	302	11 04 n	140 21 w	4.86
08	01	890821	19.45	71	73	55	11	03	2	302	11 04 n	140 25 w	8.75
08	02	890821	19.45	71	73	55			2	302			1.62
08	03	890821	19.45	71	73	55			2	302	11 08 n	140 29 w	0.32
01	01	890822	19.45	56	67	07			4	307	11 46 n	141 41 w	4.86
02	01	890822	19.45	67	07	56			4	307	11 47 n	141 45 w	3.57
02	02	890822	19.45	67	07	56			4	307			4.86
02	03	890822	19.45	07	56	67	04	03	4	307	11 50 n	141 49 w	6.48
02	04	890822	19.45	07	56	67			4	307			1.62
02	05	890822	19.45	55	71	73	04	02	4	307	11 52 n	141 53 w	12.96
02	06	890822	19.45	71	73	55	05	02	4	307			6.48
02	07	890822	19.45	71	73	55			4	307	11 58 n	142 02 w	6.48
02	08	890822	19.45	73	55	71	05	02	4	307			9.72
02	09	890822	19.45	73	55	71	05	01	4	307	12 03 n	142 10 w	3.24
02	10	890822	19.45	56	67	07	05	01	4	307	12 04 n	142 12 w	11.34
03	01	890822	19.45	67	07	56	05	01	4	307	12 08 n	142 18 w	12.96
03	02	890822	19.45	07	56	67	05	01	4	307			5.51
03	03	890822	19.45	07	56	67	05	12	4	307			7.45

Table 2. (continued)

series	leg	date	speed km/hr	observer codes left	right	rec.	sun position horz.	vert.	beauf. no.	course (deg.)	position latitude	longitude	km in leg
03	04	890822	18.52	55	71	73	05	12	4	307	12 17 n	142 31 w	4.94
04	01	890822	18.52	71	73	55	12	12	4	301	12 22 n	142 33 w	7.41
04	02	890822	18.52	73	55	71	11	01	4	301			7.10
04	03	890822	18.52	56	67	07	11	01	4	301	12 27 n	142 40 w	12.35
04	04	890822	18.52	67	07	56	11	01	4	301			7.72
04	05	890822	18.52	67	07	56			4	301			1.54
04	06	890822	18.52	67	07	56	11	01	4	301	12 34 n	142 52 w	3.09
04	07	890822	18.52	07	56	67	11	01	5	301			6.17
04	08	890822	18.52	07	56	67	11	02	4	301			6.17
04	09	890822	18.52	55	71	73	11	02	4	301	12 39 n	143 00 w	9.26
04	10	890822	18.52	71	73	55	11	02	4	301	12 42 n	143 05 w	2.78
05	01	890822	18.52	73	55	71	11	02	4	301	12 43 n	143 07 w	5.56
05	02	890822	18.52	56	67	07	11	02	4	301	12 45 n	143 10 w	5.56
05	03	890822	18.52	56	67	07			4	301			2.16
05	04	890822	18.52	67	07	56			4	301			6.17
05	05	890822	18.52	67	07	56	11	03	4	301			1.54
05	06	890822	18.52	07	56	67	11	03	4	301			4.01
05	07	890822	18.52	07	56	67	11	03	4	301	12 51 n	143 20 w	0.31
01	01	890824	14.82	67	07	56			4	305	16 10 n	148 51 w	3.95
01	02	890824	14.82	67	07	56			4	303	16 12 n	148 53 w	4.94
01	03	890824	14.82	07	56	67			4	303			3.70
02	01	890824	14.82	07	56	67			4	303	16 14 n	148 59 w	1.48
02	02	890824	14.82	07	56	67			4	303			1.23
02	03	890824	14.82	56	07	07			4	303			3.70
02	04	890824	14.82	56	67	07			4	303			4.94
02	05	890824	14.82	71	73	55	11	02	4	303	16 18 n	149 05 w	7.41
02	06	890824	14.82	73	55	71	11	02	4	303	16 21 n	149 09 w	7.41
02	07	890824	14.82	55	71	73	11	02	4	303	16 24 n	149 13 w	1.23
03	01	890824	14.82	67	07	56	11	02	4	303	16 25 n	149 16 w	6.67
03	02	890824	14.82	67	07	56	11	03	4	303	16 26 n	149 20 w	1.23
03	03	890824	14.82	07	56	67	11	03	4	303	16 27 n	149 21 w	0.74
03	04	890824	15.74	07	56	67	11	03	4	303	16 27 n	149 21 w	8.40
03	05	890824	15.74	56	67	07	11	03	4	303			7.87
03	06	890824	15.74	56	67	07	11	03	4	303	16 33 n	149 31 w	0.26
01	01	890825	16.11	73	55	71	05	03	4	303	17 28 n	151 04 w	6.18
01	02	890825	16.11	55	71	73	05	03	4	303			6.44
01	03	890825	16.11	71	73	55	05	03	4	303			6.18
01	04	890825	16.11	56	67	07	05	02	4	303	17 33 n	151 13 w	10.74
01	05	890825	16.11	67	07	56	05	02	4	303			10.74
01	06	890825	16.11	07	56	67	05	02	4	303			10.74
01	07	890825	16.11	73	55	71	05	02	4	303	17 43 n	151 30 w	1.07
01	08	890825	16.11	73	55	71	05	02	4	307			9.67
01	09	890825	16.11	55	71	73	05	01	4	307			10.74
01	10	890825	16.11	71	73	55	05	01	4	307			10.74
01	11	890825	16.11	56	67	07	05	01	4	307	17 53 n	151 46 w	8.06
01	01	890901	18.89	73	55	71	10	03	4	139	18 02 n	153 32 w	11.33
01	02	890901	18.89	55	71	73	10	03	4	139			11.02
01	03	890901	18.89	71	73	55	10	02	4	139	17 53 n	153 24 w	6.30
01	04	890901	18.89	71	73	56	10	02	4	139			4.72
01	05	890901	18.89	67	56	07	10	02	4	139	17 48 n	153 20 w	6.30
01	06	890901	18.89	56	07	67	10	02	4	139	17 46 n	153 17 w	6.30
01	07	890901	18.89	07	67	56	11	02	4	139			6.30
02	01	890901	18.89	73	55	71	11	01	5	142	17 25 n	152 58 w	6.30

Table 2. (continued)

series	leg	date	speed km/hr	observer codes left	right	rec.	sun position horz.	vert.	beauf. no.	course (deg.)	position latitude	longitude	km in leg
02	02	890901	18.89	55	71	73	11	12	5	142			3.15
02	03	890901	18.89	55	71	73	12	12	5	142	17 21 n	152 55 w	3.15
02	04	890901	18.89	71	73	55	12	12	5	142			6.30
02	05	890901	18.89	67	56	07	12	12	5	142	17 18 n	152 52 w	6.30
02	06	890901	18.89	56	07	67	12	12	5	142			6.30
02	07	890901	18.89	07	67	56	03	12	5	142			6.30
03	01	890901	18.89	73	55	71			5	142	16 57 n	152 36 w	3.78
03	02	890901	18.89	73	55	71			5	142	16 54 n	152 34 w	0.94
01	01	890904	18.52	07	67	56			1	135	11 03 n	148 00 w	0.93
02	01	890904	18.52	67	56	07			1	142	11 02 n	147 58 w	2.47
02	02	890904	18.52	67	56	07			2	142	10 59 n	147 57 w	3.70
02	03	890904	18.52	56	07	67			2	142			6.17
02	04	890904	18.52	07	73	55			3	142	10 57 n	147 54 w	1.54
02	05	890904	18.52	71	73	55			3	142			7.72
02	06	890904	18.52	71	73	55			4	142	10 52 n	147 50 w	3.09
03	01	890904	18.52	71	73	55			4	137	10 24 n	147 26 w	9.57
03	02	890904	18.52	73	55	71			4	137			1.23
04	01	890904	18.52	55	71	73			4	137	10 13 n	147 15 w	1.85
05	01	890904	18.52	07	67	56			3	142	10 03 n	146 59 w	7.10
05	02	890904	18.52	67	56	07			3	142	10 59 n	146 56 w	6.79
05	03	890904	18.52	56	07	67			3	142			1.85
06	01	890904	18.52	71	73	55			4	142	09 55 n	146 56 w	2.78
06	02	890904	18.52	71	73	55	04	02	4	142	09 53 n	146 55 w	4.32
06	03	890904	18.52	73	55	71	04	02	3	142			5.25
06	04	890904	18.52	73	55	71	04	02	3	142	09 51 n	146 52 w	1.23
07	01	890904	18.52	55	71	73			3	142	09 45 n	146 50 w	5.25
07	02	890904	18.52	07	67	56			3	142	09 46 n	146 48 w	7.72
07	03	890904	18.52	67	56	07			3	142			3.70
08	01	890904	18.52	56	07	67			3	142	09 36 n	146 42 w	2.16
08	02	890904	18.52	56	07	67			3	142	09 35 n	146 41 w	0.31
01	01	890905	18.52	55	71	73			3	150	08 45 n	145 41 w	7.41
01	02	890905	18.52	55	71	73	10	03	3	150	08 41 n	145 39 w	0.62
01	03	890905	18.52	71	73	55	10	03	4	150			7.41
01	04	890905	18.52	73	55	71	10	03	4	150			9.88
01	05	890905	18.52	73	55	71	10	02	4	150			0.62
01	06	890905	18.52	56	07	67	10	02	4	150	08 33 n	145 33 w	12.35
01	07	890905	18.52	07	67	56	10	02	4	150			12.35
01	08	890905	18.52	67	56	07	10	02	4	150			12.35
01	09	890905	18.52	55	71	73	10	01	4	150	08 14 n	145 20 w	12.35
01	10	890905	18.52	71	73	55	10	01	4	150			9.88
01	11	890905	18.52	71	73	55	10	01	4	142	08 04 n	145 13 w	2.47
01	12	890905	18.52	73	55	71	11	01	4	142			8.33
01	13	890905	18.52	73	55	71	11	12	4	142			4.01
01	14	890905	18.52	56	07	67	12	12	4	142	07 57 n	145 08 w	8.03
02	01	890905	18.52	07	67	56	04	12	4	142	07 58 n	145 03 w	5.56
02	02	890905	18.52	07	67	56	04	01	5	142	07 54 n	145 00 w	2.47
02	03	890905	18.52	67	56	07	04	01	5	142			2.47
03	01	890905	18.52	67	56	07	04	01	5	142	07 50 n	144 57 w	3.09
03	02	890905	18.52	55	71	73	04	01	5	142	07 49 n	144 55 w	4.63
04	01	890905	18.52	71	73	55	04	01	5	142	07 42 n	144 55 w	9.88
04	02	890905	18.52	73	55	71	05	02	5	116	07 37 n	144 50 w	9.88
04	03	890905	18.52	56	07	67	05	02	5	116	07 37 n	144 44 w	9.26
04	04	890905	18.52	07	67	56	05	02	5	116	07 33 n	144 38 w	9.26

Table 2. (continued)

series	leg	date	speed km/hr	observer codes left	right	rec.	sun position horz.	vert.	beauf. no.	course (deg.)	position latitude	longitude	km in leg
05	01	890905	18.52	55	71	73	05	03	5	116	07 29 n	144 31 w	4.63
05	02	890905	18.52	71	73	55	05	03	5	116	07 28 n	144 28 w	6.17
05	03	890905	18.52	73	55	71	05	03	5	116			7.72
05	04	890905	18.52	73	55	71	05	03	5	116	07 25 n	144 21 w	0.31
01	01	890906	18.52	67	56	07			3	117	06 51 n	143 06 w	4.63
01	02	890906	18.52	67	56	07	11	03	3	117			6.17
01	03	890906	18.52	67	56	07			3	117			1.54
01	04	890906	18.52	56	07	67	11	03	3	117			7.10
01	05	890906	18.52	56	07	67	11	02	4	117	06 46 n	142 56 w	0.62
01	06	890906	18.52	07	67	56			4	117			1.54
01	07	890906	18.52	07	67	56	11	02	4	117			6.17
01	08	890906	18.52	73	55	71	11	02	4	117	06 44 n	142 51 w	12.35
01	09	890906	18.52	55	71	73	11	02	4	117			1.85
02	01	890906	19.63	55	71	73	11	02	4	117	06 40 n	142 44 w	8.18
02	02	890906	19.63	71	73	55	11	02	4	117	06 38 n	142 40 w	13.09
02	03	890906	19.63	67	56	07	11	01	4	117	06 35 n	142 34 w	13.09
02	04	890906	19.63	56	07	67	11	01	4	117			13.09
02	05	890906	19.63	07	67	56	11	12	4	117			2.94
02	06	890906	19.63	07	67	56			3	117	06 29 n	142 19 w	2.94
02	07	890906	19.63	07	67	56	11	12	3	117			3.93
02	08	890906	19.63	07	67	56			3	117			1.64
02	09	890906	19.63	07	67	56			3	117			1.64
02	10	890906	19.63	73	55	71	11	12	4	117	06 26 n	142 14 w	2.94
02	11	890906	19.63	73	55	71			4	117			10.14
02	12	890906	19.63	55	71	73			4	117			6.54
02	13	890906	19.63	55	71	73	05	12	4	117	06 21 n	142 04 w	6.54
02	14	890906	19.63	71	73	55	05	01	4	117			9.82
02	15	890906	19.63	71	73	55			4	117			1.31
02	16	890906	19.63	71	73	55	05	01	4	117	06 17 n	141 54 w	1.96
02	17	890906	19.63	67	56	07	05	01	4	120	06 16 n	141 53 w	12.11
02	18	890906	19.63	56	07	67	05	01	4	120			14.40
02	19	890906	19.63	07	67	56	05	02	3	120			9.16
02	20	890906	19.63	07	67	56			3	120			1.31
02	21	890906	19.63	07	67	56	05	02	3	120			2.29
02	22	890906	19.63	73	55	71	05	02	3	120	06 07 n	141 36 w	9.82
02	23	890906	19.63	55	71	73	05	02	3	120	06 05 n	141 31 w	6.54
02	24	890906	19.63	55	71	73			3	120			3.27
02	25	890906	19.63	71	73	55			3	120			9.82
02	26	890906	19.63	67	56	07			3	120	05 59 n	141 23 w	6.54
02	27	890906	19.63	56	07	67			3	120			6.54
02	28	890906	19.63	07	67	56			3	120			4.91
02	29	890906	19.63	07	67	56			3	120	05 54 n	141 14 w	0.33
01	01	890907	19.63	71	73	55			4	116	05 18 n	140 03 w	1.96
01	02	890907	19.63	71	73	55	11	03	4	116			9.16
01	03	890907	19.63	73	55	71	11	03	4	116			5.23
01	04	890907	19.63	73	55	71			4	116			1.31
01	05	890907	19.63	73	55	71	11	03	4	116			5.56
01	06	890907	19.63	55	71	73	11	02	4	116	05 14 n	139 52 w	11.45
01	07	890907	19.63	07	67	56	11	02	4	116	05 11 n	139 46 w	13.09
01	08	890907	19.63	67	56	07	11	02	4	116			13.09
01	09	890907	19.63	56	07	67	11	01	4	116	05 06 n	139 34 w	13.09
01	10	890907	19.63	71	73	55	11	01	4	116	05 04 n	139 27 w	13.09
01	11	890907	19.63	73	55	71	11	01	4	116			7.85

Table 2. (continued)

series	leg	date	speed km/hr	observer codes left	right	rec.	sun position horz.	vert.	beauf. no.	course (deg.)	position latitude	longitude	km in leg
02	01	890907	19.63	55	71	73	12	12	4	116	04 59 n	139 16 w	6.54
03	01	890907	19.63	55	71	73	12	12	4	116	04 58 n	139 13 w	3.60
03	02	890907	19.63	07	67	56	12	12	4	116	04 57 n	139 11 w	10.80
03	03	890907	19.63	07	67	56			4	116			1.96
03	04	890907	19.63	67	56	07	12	12	5	086	04 54 n	139 05 w	6.87
03	05	890907	19.63	67	56	07	12	12	5	094	04 55 n	139 01 w	6.54
03	06	890907	19.63	56	07	67	06	01	4	094			13.09
03	07	890907	19.63	71	73	55	06	01	4	094	04 54 n	138 51 w	8.51
03	08	890907	19.63	71	73	55			4	094			2.94
03	09	890907	19.63	71	73	55	06	01	4	094			1.64
03	10	890907	19.63	73	55	71	06	01	4	094			3.27
04	01	890907	19.63	73	55	71	06	02	4	094	04 54 n	138 42 w	3.93
04	02	890907	19.63	55	71	73	06	02	4	094			6.54
05	01	890907	19.63	55	71	73	06	02	4	094	04 54 n	138 35 w	4.91
05	02	890907	19.63	07	67	56	06	02	4	094	04 54 n	138 32 w	2.62
06	01	890907	19.63	72	67	56	06	02	4	094	04 54 n	138 30 w	3.27
06	02	890907	19.63	72	67	56	06	02	4	086	04 53 n	138 28 w	2.29
06	03	890907	19.63	67	56	72			4	086			6.22
07	01	890907	19.63	71	73	55			4	086	04 58 n	138 17 w	2.29
07	02	890907	19.63	71	73	55			4	086	04 58 n	138 16 w	0.33
01	01	890908	18.52	56	72	67			4	086	05 01 n	137 03 w	3.09
02	01	890908	18.52	56	72	67			5	086	05 01 n	136 59 w	3.09
02	02	890908	18.52	72	67	56			5	086			3.70
03	01	890908	17.96	56	07	67			5	093	05 05 n	136 23 w	5.99
03	02	890908	17.96	07	67	56			5	093			5.99
03	03	890908	17.96	67	56	07			5	093			5.99
03	04	890908	17.96	67	56	07			5	093	05 05 n	136 13 w	0.30
01	01	890909	16.67	55	71	73			4	084	05 14 n	133 39 w	1.94
01	02	890909	16.67	55	71	73			4	084			3.61
01	03	890909	16.67	55	71	73	12	03	4	084			2.78
01	04	890909	16.67	71	73	55	12	03	4	084	05 14 n	133 34 w	6.94
01	05	890909	16.67	71	73	55			4	084			1.39
01	06	890909	16.67	67	56	07			4	088	05 15 n	133 29 w	2.78
02	01	890909	17.59	56	07	67			4	090	05 18 n	133 28 w	7.62
02	02	890909	17.59	56	07	67	11	02	4	120	05 18 n	133 24 w	4.11
02	03	890909	17.59	07	67	56	11	02	4	120			6.45
03	01	890909	18.15	07	67	56	11	02	4	120	05 16 n	133 19 w	2.12
03	02	890909	18.15	55	71	73	11	01	4	120	05 15 n	133 18 w	6.05
03	03	890909	18.15	55	71	73			4	120			2.12
03	04	890909	18.15	55	71	73	11	01	4	120			3.93
03	05	890909	18.15	71	73	55	11	01	4	120			6.96
03	06	890909	18.15	71	73	55	12	01	4	084	05 10 n	133 09 w	5.44
03	07	890909	18.15	73	55	71	12	01	4	084			11.80
03	08	890909	18.15	67	56	07			4	084	05 12 n	132 59 w	12.10
03	09	890909	18.15	56	07	67			4	084			7.56
04	01	890909	18.15	07	67	56	06	01	4	084	05 14 n	132 42 w	5.75
04	02	890909	18.15	55	71	73	06	01	4	084	05 14 n	132 39 w	12.10
04	03	890909	18.15	07	73	55	06	01	4	084			12.40
04	04	890909	18.15	73	55	71	06	01	4	084			2.72
04	05	890909	18.15	73	55	71	06	01	4	089			9.07
04	06	890909	18.15	67	56	07	06	02	4	089	05 16 n	132 18 w	4.84
05	01	890909	18.15	56	07	67	06	02	4	089	05 17 n	132 14 w	9.07
05	02	890909	18.15	07	67	56	06	02	4	089	05 17 n	132 09 w	3.63

Table 2. (continued)

series	leg	date	speed km/hr	observer codes left	observer codes right	observer codes rec.	sun position horz.	sun position vert.	beauf. no.	course (deg.)	position latitude	position longitude	km in leg
05	03	890909	18.15	07	67	56			4	089			5.44
05	04	890909	18.15	55	72	73			4	089	05 18 n	132 04 w	6.05
05	05	890909	18.15	72	73	55			4	089			6.05
05	06	890909	18.15	73	55	07			4	089			9.68
05	07	890909	18.15	73	55	07			4	089	05 19 n	131 52 w	0.30
01	01	890910	18.89	07	67	56	01	03	4	044	06 01 n	130 49 w	8.50
01	02	890910	18.89	67	56	07	01	03	4	044			9.13
01	03	890910	19.63	56	07	67	01	03	4	044			8.18
01	04	890910	19.63	73	55	72	01	02	4	044	06 11 n	130 39 w	10.80
02	01	890910	19.63	55	72	73	01	02	5	044	06 15 n	130 31 w	8.83
02	02	890910	19.63	71	73	55	02	02	5	044	06 19 n	130 27 w	8.51
02	03	890910	19.63	07	67	56	02	01	5	044	06 22 n	130 24 w	13.09
02	04	890910	19.63	67	56	07	02	01	5	044			13.09
02	05	890910	19.63	56	07	67	02	01	5	044			11.12
03	01	890910	19.63	73	55	71			5	046	06 42 n	130 09 w	10.47
03	02	890910	19.63	55	71	73			5	046	06 46 n	130 05 w	5.56
03	03	890910	19.63	72	71	73			5	046			4.25
03	04	890910	19.63	71	73	72			5	046	06 50 n	130 01 w	2.29
03	05	890910	19.63	71	73	55			5	046	06 51 n	129 59 w	3.60
04	01	890910	19.63	07	67	56			5	046	06 54 n	129 58 w	12.11
04	02	890910	19.63	07	72	56			5	046			0.98
04	03	890910	19.63	72	56	07			5	046			7.85
04	04	890910	19.63	72	56	07			5	046			5.23
04	05	890910	19.63	56	07	72			5	046	07 05 n	129 48 w	13.09
04	06	890910	19.63	73	55	71			5	046	07 10 n	129 43 w	9.82
04	07	890910	19.63	55	71	73			5	046	07 15 n	129 39 w	5.89
04	08	890910	19.63	55	71	73			5	046			3.93
04	09	890910	19.63	71	73	55			5	046	07 18 n	129 35 w	4.25
04	10	890910	19.63	71	73	55			5	052	07 20 n	129 33 w	1.96
05	01	890910	19.63	07	72	56			5	046	07 22 n	129 31 w	2.29
05	02	890910	19.63	07	72	56			5	046	07 23 n	129 30 w	0.33
01	01	890912	19.63	56	07	67			5	104	05 22 n	125 33 w	6.54
01	02	890912	19.63	07	67	56			5	104			4.91
01	03	890912	19.63	07	67	56			5	120	05 22 n	125 26 w	1.64
01	04	890912	19.63	67	56	07			5	120			1.64
02	01	890912	19.63	71	73	55			5	120	05 20 n	125 26 w	10.14
02	02	890912	19.63	71	73	55	11	02	5	120	05 20 n	125 21 w	2.62
02	03	890912	19.63	73	55	71	11	02	5	120			13.09
03	01	890912	19.63	55	71	73	11	02	5	120	05 18 n	125 12 w	5.23
03	02	890912	19.63	56	07	67			5	120	05 17 n	125 10 w	6.54
03	03	890912	19.63	07	67	56			5	120			2.62
04	01	890912	19.63	67	56	07			5	120	05 16 n	125 04 w	6.54
05	01	890912	19.63	71	73	55	04	12	5	120	05 13 n	124 51 w	6.54
05	02	890912	19.63	73	55	71	04	12	5	120			6.54
05	03	890912	19.63	55	71	73	04	12	5	120			3.60
06	01	890912	19.63	55	71	73			5	120	05 11 n	124 42 w	0.65
07	01	890912	19.63	56	07	67	05	01	5	123	05 08 n	124 33 w	6.54
07	02	890912	19.63	07	67	56	05	01	5	123			6.54
07	03	890912	19.63	67	56	07	05	01	5	123			6.54
08	01	890912	19.63	71	73	55	05	02	4	123	05 01 n	124 15 w	7.85
08	02	890912	19.63	71	73	55	05	02	4	116	04 59 n	124 11 w	1.96
08	03	890912	19.63	73	55	71	05	02	4	116	04 58 n	124 11 w	9.82
08	04	890912	19.63	55	71	73	05	02	4	116	05 00 n	124 06 w	3.27

Table 2. (continued)

series	leg	date	speed km/hr	observer codes left	right	rec.	sun position horz.	vert.	beauf. no.	course (deg.)	position latitude	longitude	km in leg
08	05	890912	19.63	55	71	73	05	03	4	116	04 59 n	124 03 w	6.54
08	06	890912	19.63	56	07	67	05	03	5	116	04 57 n	124 00 w	8.18
08	07	890912	19.63	07	67	56			5	116			5.89
08	08	890912	19.63	07	67	56			5	116	04 54 n	123 53 w	0.33
01	01	890913	19.45	55	71	73			4	100	04 33 n	122 48 w	3.57
01	02	890913	19.45	55	71	73			4	097	04 32 n	122 47 w	7.78
01	03	890913	19.45	55	71	73	12	03	4	097			1.62
01	04	890913	19.45	71	73	55	12	03	4	097			6.48
01	05	890913	19.45	71	73	55			4	097	04 31 n	122 39 w	3.57
01	06	890913	19.45	71	73	55	12	03	4	097			4.21
01	07	890913	19.45	73	55	71	12	03	4	097			11.67
02	01	890913	19.45	67	56	07	12	02	4	097	04 26 n	122 26 w	9.72
02	02	890913	19.45	56	07	67			4	090	04 25 n	122 22 w	2.27
02	03	890913	19.45	56	07	67	12	02	4	090			3.24
02	04	890913	19.45	56	07	67	12	01	5	090			4.21
02	05	890913	19.45	07	67	56	12	01	5	090	04 24 n	122 17 w	9.72
02	06	890913	19.45	55	71	73	12	01	5	090	04 24 n	122 12 w	12.96
02	07	890913	19.45	71	73	55	12	01	5	090			13.29
02	08	890913	19.45	73	55	71	12	01	5	090			2.59
03	01	890913	19.45	73	55	71	12	12	5	090	04 22 n	121 57 w	5.83
03	02	890913	19.45	73	55	71			5	090	04 21 n	121 55 w	1.62
03	03	890913	19.45	67	56	07			5	090	04 21 n	121 54 w	1.94
04	01	890913	19.45	67	56	07	12	12	5	090	04 22 n	121 51 w	6.48
04	02	890913	19.45	56	07	67	12	12	5	090			4.86
04	03	890913	19.45	56	07	67	06	01	5	090			1.62
04	04	890913	19.45	07	67	56	06	01	5	090	04 21 n	121 45 w	6.48
05	01	890913	19.45	55	71	73	06	01	5	090	04 19 n	121 36 w	6.48
05	02	890913	19.45	71	73	55	06	01	5	090			6.81
05	03	890913	19.45	73	55	71	06	01	5	090	04 18 n	121 29 w	6.16
06	01	890913	19.45	67	56	07			5	109	04 16 n	121 17 w	3.89
07	01	890913	19.45	56	07	67	05	02	5	109	04 16 n	121 12 w	6.48
07	02	890913	19.45	56	07	67	05	03	5	109			2.92
07	03	890913	19.45	07	67	56	05	03	5	109	04 13 n	121 09 w	2.59
08	01	890913	19.45	07	67	56	05	03	5	109	04 11 n	121 07 w	4.21
08	02	890913	19.45	55	71	73	05	03	5	109	04 10 n	121 05 w	4.86
08	03	890913	19.45	55	71	73			5	109			2.92
08	04	890913	19.45	55	71	73			5	109	04 09 n	121 01 w	0.32
01	01	890914	19.63	07	67	56	12	03	5	098	03 53 n	119 58 w	6.54
01	02	890914	19.63	67	56	07	12	03	5	098			3.93
01	03	890914	19.63	67	56	07	12	03	5	108	03 52 n	119 52 w	2.62
01	04	890914	19.63	56	07	67	11	03	5	108			6.54
02	01	890914	19.63	73	55	71	01	02	5	070	03 50 n	119 37 w	6.54
02	02	890914	19.63	55	71	73	01	02	5	070			6.54
02	03	890914	19.63	71	73	55	01	02	5	070			6.54
03	01	890914	19.63	07	67	56	12	12	5	110	03 50 n	119 09 w	4.91
04	01	890914	19.63	67	56	07	12	12	5	110	03 48 n	119 04 w	4.58
04	02	890914	19.63	56	07	67	12	12	5	110			6.54
04	03	890914	19.63	73	55	71	12	12	5	110	03 47 n	118 59 w	6.54
04	04	890914	19.63	55	71	73	12	12	5	110			6.54
05	01	890914	19.63	71	73	55	05	01	5	110	03 45 n	118 52 w	2.62
06	01	890914	19.63	07	67	56	05	01	4	115	03 42 n	118 40 w	10.80
07	01	890914	19.63	67	56	07	05	01	4	115	03 40 n	118 33 w	9.82
07	02	890914	19.63	56	07	67	05	02	4	115	03 38 n	118 29 w	6.22

Table 2. (continued)

series	leg	date	speed km/hr	observer codes left	observer codes right	observer codes rec.	sun position horz.	sun position vert.	beauf. no.	course (deg.)	position latitude	position longitude	km in leg
07	03	890914	19.63	56	07	67			4	115			3.60
07	04	890914	19.63	73	55	71	05	02	4	115	03 35 n	118 24 w	3.60
07	05	890914	19.63	73	55	71			4	115			4.58
07	06	890914	19.63	73	55	71	05	02	4	115			1.64
07	07	890914	19.63	55	71	73	05	02	4	115	03 34 n	118 20 w	2.62
07	08	890914	19.63	55	71	73			4	115			7.20
07	09	890914	19.63	71	73	55			4	115	03 32 n	118 16 w	2.29
07	10	890914	19.63	71	73	55	05	03	4	115			7.53
07	11	890914	19.63	71	73	55	05	03	4	115	03 30 n	118 11 w	0.33
01	01	890915	18.52	71	73	55	11	03	4	115	03 13 n	117 04 w	2.47
02	01	890915	18.52	73	55	71	11	03	4	115	03 11 n	117 04 w	7.72
02	02	890915	18.52	55	71	73	11	03	4	115			6.79
02	03	890915	18.52	56	07	67	11	03	4	115	03 08 n	116 57 w	12.35
02	04	890915	18.52	07	67	56	11	02	5	115			12.35
02	05	890915	18.52	67	56	07	11	02	5	115			12.35
02	06	890915	18.52	71	73	55	11	01	5	115	03 00 n	116 41 w	12.66
02	07	890915	18.52	73	55	71	11	01	5	115			12.04
02	08	890915	18.52	55	71	73	11	01	5	115			6.17
02	09	890915	18.52	55	71	73	12	12	5	115			6.17
02	10	890915	18.52	56	07	67	12	12	5	109	02 53 n	116 25 w	12.35
02	11	890915	18.52	07	67	56	12	12	5	109			6.17
02	12	890915	18.52	07	67	56	05	12	5	109	02 50 n	116 17 w	6.17
02	13	890915	18.52	67	56	07	05	12	5	109			12.35
02	14	890915	18.52	71	73	55	05	01	5	109	02 47 n	116 09 w	6.48
02	15	890915	18.52	73	55	71	05	01	5	109			5.86
02	16	890915	18.52	55	71	73	05	01	5	109			6.17
02	17	890915	18.52	55	71	73	05	01	5	109	02 44 n	116 00 w	0.31
01	01	890916	19.45	67	56	07			5	098	02 36 n	114 12 w	8.75
01	02	890916	19.45	56	07	67			5	098			9.07
01	03	890916	19.45	07	67	56			5	098	02 35 n	114 05 w	8.75
01	04	890916	19.45	55	71	73	12	02	5	098	02 35 n	114 01 w	4.54
01	05	890916	19.45	55	71	73			5	098			1.94
01	06	890916	19.45	71	73	55			5	098	02 35 n	113 58 w	3.57
02	01	890916	19.45	67	56	07	12	01	5	095	02 33 n	113 35 w	6.48
02	02	890916	19.45	56	07	67	12	01	5	095			5.19
02	03	890916	19.45	56	07	67	12	12	5	095			1.30
02	04	890916	19.45	07	67	56	12	12	5	095			6.48
02	05	890916	19.45	55	71	73	01	12	5	095	02 35 n	113 27 w	2.92
02	06	890916	19.45	55	71	73	02	12	5	110	02 35 n	113 26 w	3.57
02	07	890916	19.45	55	71	73	03	12	5	110			4.86
02	08	890916	19.45	55	71	73	04	12	5	110			1.62
02	09	890916	19.45	71	73	55	04	12	5	110			6.48
02	10	890916	19.45	71	73	55	05	12	5	110	02 35 n	113 19 w	6.81
02	11	890916	19.45	73	55	71	05	01	5	110	02 34 n	113 16 w	0.32
03	01	890916	19.45	73	55	71	05	01	5	110	02 34 n	113 16 w	10.37
03	02	890916	19.45	67	56	07	05	01	5	110	02 34 n	113 12 w	6.48
03	03	890916	19.45	56	07	67	05	01	5	110			6.48
03	04	890916	19.45	07	67	56	05	01	5	110			1.62
04	01	890916	19.45	67	56	07	05	02	5	110	02 32 n	113 05 w	0.97
05	01	890916	19.45	55	71	73	05	02	5	110	02 30 n	112 50 w	9.72
05	02	890916	19.45	67	56	07	05	03	5	110	02 28 n	112 46 w	6.48
05	03	890916	19.45	56	07	67	05	03	5	110			7.45
05	04	890916	19.45	07	67	56			5	096			3.24

Table 2. (continued)

series	leg	date	speed km/hr	observer codes left	right	rec.	sun position horz.	vert.	beauf. no.	course (deg.)	position latitude	longitude	km in leg
05	05	890916	19.45	07	67	56			5	096	02 26 n	112 39 w	0.32
01	01	890917	18.52	73	55	71			5	110	02 29 n	111 30 w	4.63
01	02	890917	18.52	73	55	71	11	03	5	110			1.54
01	03	890917	18.52	73	55	71			5	110	02 28 n	111 28 w	5.25
01	04	890917	18.52	55	71	73			5	110			2.47
01	05	890917	18.52	55	71	73	11	03	5	110			6.17
02	01	890917	18.52	55	71	73	11	03	5	110	02 26 n	111 22 w	2.16
02	02	890917	18.52	71	73	55	11	03	5	110			11.11
02	03	890917	18.52	07	67	56	12	02	5	102	02 25 n	111 16 w	4.01
02	04	890917	18.52	07	67	56			5	102			2.16
02	05	890917	18.52	67	56	07			5	102			1.54
02	06	890917	18.52	67	56	07	12	02	5	102			4.63
02	07	890917	18.52	56	07	67	12	02	5	102			2.16
02	08	890917	18.52	56	07	67			5	102			1.54
02	09	890917	18.52	56	07	67	12	02	5	102			2.47
02	10	890917	18.52	56	07	67	12	02	5	102	02 23 n	111 08 w	0.31
01	01	890918	19.45	56	07	67			4	090	02 18 n	108 41 w	8.75
02	01	890918	19.45	07	67	56			4	090	02 19 n	108 32 w	9.72
02	02	890918	19.45	07	67	56	12	02	4	090			0.97
02	03	890918	19.45	71	73	55			4	090	02 19 n	108 28 w	10.05
02	04	890918	19.45	71	73	55			5	085	02 19 n	108 23 w	0.97
02	05	890918	19.45	71	73	55			5	092	02 19 n	108 22 w	1.94
02	06	890918	19.45	73	55	71			5	092			3.89
03	01	890918	19.45	73	55	71	12	02	5	092	02 18 n	108 21 w	1.30
03	02	890918	19.45	55	71	73	12	02	5	092			3.24
03	03	890918	19.45	55	71	73			5	092	02 17 n	108 19 w	9.72
03	04	890918	19.45	56	07	67	12	01	5	092	02 17 n	108 14 w	6.48
04	01	890918	19.45	07	67	56			5	092	02 17 n	108 11 w	4.21
04	02	890918	19.45	67	56	07			5	088	02 17 n	108 08 w	6.48
04	03	890918	19.45	56	07	67	12	01	5	088	02 17 n	108 05 w	6.48
05	01	890918	19.45	07	67	56			5	088	02 18 n	108 02 w	5.19
05	02	890918	19.45	67	56	07			5	088			6.48
05	03	890918	19.45	71	73	55			5	088	02 18 n	107 56 w	3.24
05	04	890918	19.45	71	73	55	12	12	5	088			6.48
05	05	890918	19.45	71	73	55			5	088	02 18 n	107 51 w	3.24
05	06	890918	19.45	73	55	71			5	088			7.78
05	07	890918	19.45	73	55	71	05	01	5	088			5.19
05	08	890918	19.45	55	71	73			4	088			3.24
05	09	890918	19.45	55	71	73			4	085	02 19 n	107 42 w	9.72
05	10	890918	19.45	56	07	67			4	085	02 20 n	107 37 w	12.96
05	11	890918	19.45	07	67	56			4	085			6.48
06	01	890918	19.45	07	67	56			5	085	02 21 n	107 27 w	1.62
07	01	890918	19.45	67	56	07			5	085	02 21 n	107 25 w	3.24
08	01	890918	19.45	71	73	55			5	087	02 27 n	107 21 w	1.94
08	02	890918	19.45	71	73	55			5	090	02 27 n	107 20 w	5.19
08	03	890918	19.45	73	55	71			5	090			1.94
09	01	890918	19.45	73	55	71			5	090	02 28 n	107 15 w	2.59
09	02	890918	19.45	55	71	73			5	090			7.13
09	03	890918	19.45	56	07	67			5	090	02 28 n	107 10 w	7.45
09	04	890918	19.45	56	07	67			5	090	02 28 n	107 06 w	0.32
01	01	890919	19.45	55	71	73			4	092	02 28 n	105 33 w	7.45
01	02	890919	19.45	71	73	55			4	092			3.89
01	03	890919	19.45	71	73	55			5	092			4.21

Table 2. (continued)

series	leg	date	speed km/hr	observer codes left	observer codes right	observer codes rec.	sun position horz.	sun position vert.	beauf. no.	course (deg.)	position latitude	position longitude	km in leg
01	04	890919	19.45	73	55	71			5	092			6.81
01	05	890919	19.45	67	56	07			5	092	02 28 n	105 22 w	1.94
01	06	890919	19.45	67	56	07			5	092			2.92
01	07	890919	19.45	67	56	07			5	092			4.86
01	08	890919	19.45	67	56	07			5	087	02 27 n	105 17 w	3.24
01	09	890919	19.45	56	07	67			5	087			7.78
01	10	890919	19.45	56	07	67			5	087			5.19
01	11	890919	19.45	07	67	56			5	087			12.96
01	12	890919	19.45	55	71	73			5	087	02 29 n	105 03 w	14.91
01	13	890919	19.45	71	73	55			5	087	02 29 n	104 55 w	2.27
02	01	890919	19.45	73	55	71			4	090	02 32 n	104 51 w	11.02
02	02	890919	19.45	67	56	07			4	090	02 32 n	104 46 w	2.27
03	01	890919	19.45	56	07	67			4	092	02 38 n	104 40 w	5.83
04	01	890919	19.45	07	67	56			4	092	02 38 n	104 35 w	8.75
04	02	890919	19.45	55	71	73	05	01	4	092	02 38 n	104 31 w	4.86
04	03	890919	19.45	55	71	73			4	092			6.48
04	04	890919	19.45	55	71	73			4	092			1.62
04	05	890919	19.45	71	73	55			4	092			7.45
04	06	890919	19.45	71	73	55	06	01	4	094	02 38 n	104 21 w	1.94
04	07	890919	19.45	71	73	55	06	01	5	094			3.57
04	08	890919	19.45	73	55	71			5	094			6.81
04	09	890919	19.45	73	55	71	06	02	5	094			3.24
04	10	890919	19.45	73	55	71			4	094	02 38 n	104 14 w	2.92
04	11	890919	19.45	67	56	07			4	094	02 38 n	104 12 w	9.72
04	12	890919	19.45	56	07	67			4	094	02 38 n	104 07 w	2.59
04	13	890919	19.45	56	07	67			5	094			2.92
04	14	890919	19.45	56	07	67	06	02	5	094			4.21
04	15	890919	19.45	07	67	56	06	02	5	094	02 38 n	104 03 w	9.72
04	16	890919	19.45	55	71	73	06	02	5	094	02 37 n	103 58 w	6.48
04	17	890919	19.45	71	73	55	06	03	5	094	02 37 n	103 55 w	2.59
04	18	890919	19.45	71	73	55			5	094	02 37 n	103 53 w	3.89
04	19	890919	19.45	73	55	71			4	094			6.48
04	20	890919	19.45	73	55	71			4	094	02 37 n	103 48 w	0.32
01	01	890920	19.45	07	67	56			4	090	02 34 n	102 37 w	1.62
02	01	890920	19.45	67	56	07			4	090	02 36 n	102 33 w	7.13
02	02	890920	19.45	67	56	07			4	080	02 37 n	102 30 w	1.62
02	03	890920	19.45	67	56	07			4	090	02 38 n	102 29 w	0.97
02	04	890920	19.45	73	55	71			4	090	02 38 n	102 29 w	2.27
03	01	890920	19.45	55	71	73			5	090	02 36 n	102 27 w	3.89
04	01	890920	19.45	55	71	73			5	090	02 36 n	102 25 w	6.48
05	01	890920	19.45	71	73	55			4	090	02 38 n	102 18 w	3.24
05	02	890920	19.45	07	67	56			4	090	02 38 n	102 17 w	12.96
05	03	890920	19.45	67	56	07			4	090			12.96
05	04	890920	19.45	56	07	67			4	090			12.96
05	05	890920	19.45	73	55	71			4	080	02 38 n	101 58 w	5.83
05	06	890920	19.45	73	55	71			4	095	02 39 n	101 56 w	7.13
05	07	890920	19.45	55	71	73			4	095			7.78
05	08	890920	19.45	55	71	73	05	12	4	095			5.19
05	09	890920	19.45	71	73	55	05	01	4	095	02 39 n	101 47 w	3.24
05	10	890920	19.45	71	73	55			4	095	02 39 n	101 45 w	9.72
05	11	890920	19.45	07	67	56			4	095	02 37 n	101 41 w	6.48
05	12	890920	19.45	07	67	56			4	090	02 37 n	101 37 w	0.97
05	13	890920	19.45	07	67	56			5	105	02 37 n	101 37 w	4.86

Table 2. (continued)

series	leg	date	speed km/hr	observer codes left	right	rec.	sun position horz.	vert.	beauf. no.	course (deg.)	position latitude	longitude	km in leg
05	14	890920	19.45	07	67	56			5	090	02 36 n	101 35 w	0.65
05	15	890920	19.45	67	56	07			5	090			9.72
05	16	890920	19.45	67	56	07			5	090			3.24
05	17	890920	19.45	56	07	67			5	090			5.51
05	18	890920	19.45	56	07	67			5	105	02 37 n	101 25 w	3.57
06	01	890920	19.45	73	55	71			5	100	02 36 n	101 29 w	3.24
06	02	890920	19.45	73	55	71			5	100			0.97
07	01	890920	19.45	55	71	73			4	100	02 35 n	101 20 w	9.72
07	02	890920	19.45	71	73	55			4	110	02 34 n	101 15 w	1.94
07	03	890920	19.45	71	73	55			4	100	02 34 n	101 14 w	7.78
08	01	890920	19.45	07	67	56			4	100	02 35 n	101 12 w	7.78
08	02	890920	19.45	07	67	56			4	100	02 34 n	101 08 w	0.32
01	01	890921	19.45	71	73	55			4	100	02 22 n	100 00 w	4.86
01	02	890921	19.45	71	73	55			5	100			4.21
01	03	890921	19.45	73	55	71			5	100			9.07
01	04	890921	19.45	55	71	73	12	02	5	100			2.92
01	05	890921	19.45	55	71	73			5	100	02 20 n	099 47 w	1.30
02	01	890921	19.45	56	07	67			5	100	02 26 n	099 44 w	3.24
02	02	890921	19.45	56	07	67	12	02	5	100			1.62
02	03	890921	19.45	56	07	67			5	110	02 25 n	099 43 w	3.24
02	04	890921	19.45	07	67	56			5	100	02 25 n	099 41 w	5.19
02	05	890921	19.45	07	67	56			5	100	02 24 n	099 39 w	0.32
01	01	890922	19.45	67	56	07			5	112	01 27 n	097 01 w	9.07
01	02	890922	19.45	56	07	67			5	112	01 26 n	096 58 w	3.24
01	03	890922	19.45	56	07	67			5	112			6.16
01	04	890922	19.45	07	67	56			5	112	01 24 n	096 53 w	9.07
01	05	890922	19.45	55	71	73			5	112	01 22 n	096 49 w	8.43
01	06	890922	19.45	55	71	73	11	02	5	112			5.51
01	07	890922	19.45	71	73	55	11	02	5	122	01 21 n	096 44 w	8.43
01	08	890922	19.45	71	73	55			5	112	01 18 n	096 41 w	2.92
02	01	890922	19.45	73	55	71	11	01	4	112	01 17 n	096 40 w	6.16
03	01	890922	19.45	67	56	07			4	116	01 20 n	096 33 w	8.75
03	02	890922	19.45	56	07	67			4	116			9.07
03	03	890922	19.45	07	67	56			4	116	01 16 n	096 27 w	8.75
03	04	890922	19.45	55	71	73			4	116	01 14 n	096 23 w	12.96
03	05	890922	19.45	71	73	55			5	116			4.86
03	06	890922	19.45	71	73	55	05	12	5	116			8.10
03	07	890922	19.45	73	55	71	05	01	5	116			1.62
03	08	890922	19.45	73	55	71			5	116	01 09 n	096 12 w	1.30
03	09	890922	19.45	73	55	71	05	01	5	116	01 09 n	096 11 w	3.57
03	10	890922	19.45	73	55	71			5	116			6.48
04	01	890922	19.45	67	56	07			5	116	01 06 n	096 07 w	6.48
04	02	890922	19.45	67	56	07			5	116			6.16
04	03	890922	19.45	56	07	67			5	116			12.64
04	04	890922	19.45	07	67	56			5	116			12.64
04	05	890922	19.45	55	71	73			5	116	00 58 n	095 52 w	6.48
04	06	890922	19.45	55	71	73			4	116			3.24
04	07	890922	19.45	71	73	55			4	116	00 57 n	095 48 w	9.72
04	08	890922	19.45	73	55	71			5	116	00 55 n	095 44 w	9.72
05	01	890922	19.45	67	56	07			5	116	00 52 n	095 40 w	2.27
05	02	890922	19.45	67	56	07			5	116	00 51 n	095 39 w	0.32
01	01	890923	19.45	07	55	71			4	113	00 13 n	094 25 w	0.97
02	01	890923	19.45	07	55	71			4	113	00 11 n	094 22 w	2.59

Table 2. (continued)

series	leg	date	speed km/hr	observer codes left	right	rec.	sun position horz.	vert.	beauf. no.	course (deg.)	position latitude	longitude	km in leg
03	01	890923	19.45	55	71	07			4	115	00 09 n	094 17 w	1.30
04	01	890923	19.45	73	55	71			5	115	00 01 s	093 59 w	6.48
04	02	890923	19.45	55	71	73			5	115			6.48
04	03	890923	19.45	71	73	55			5	115			5.19
05	01	890923	19.45	07	67	56			5	115	00 04 s	093 47 w	9.72
05	02	890923	19.45	67	56	07			5	115	00 06 s	093 44 w	5.51
06	01	890923	19.45	56	07	67			5	116	00 06 s	093 38 w	3.89
06	02	890923	19.45	56	07	67			5	116	00 07 s	093 36 w	0.32
01	01	890924	19.45	56	07	67			5	116	01 04 s	091 35 w	5.19
01	02	890924	19.45	56	07	67			5	120			6.48
01	03	890924	19.45	07	67	56			5	120			11.34
01	04	890924	19.45	67	56	07			5	120			11.34
01	05	890924	19.45	71	73	55			5	120	01 12 s	091 23 w	3.57
01	06	890924	19.45	71	73	55	11	02	4	120			2.92
01	07	890924	19.45	71	73	55			4	120			1.94
01	08	890924	19.45	71	73	55			4	120	01 14 s	091 19 w	0.32
01	01	890926	19.45	07	67	56	11	02	5	122	01 42 s	088 43 w	2.92
01	02	890926	19.45	07	67	56	10	02	5	146	01 43 s	088 42 w	2.92
01	03	890926	19.45	07	67	56			5	146			0.65
01	04	890926	19.45	67	56	07			5	146			2.59
01	05	890926	19.45	67	56	07	10	02	5	146	01 46 s	088 41 w	3.89
01	06	890926	19.45	56	07	67	10	02	5	146			3.57
01	07	890926	19.45	56	07	67			5	146			2.27
01	08	890926	19.45	56	07	67			5	146	01 49 s	088 38 w	0.65
02	01	890926	19.45	07	67	56			5	148	02 13 s	088 23 w	3.89
02	02	890926	19.45	07	67	56			5	148	02 15 s	088 23 w	0.32
01	01	890928	19.45	55	71	73			5	060	05 20 s	085 24 w	3.89
02	01	890928	19.45	55	71	73			5	060	05 17 s	085 21 w	0.97
02	02	890928	19.45	71	73	55			5	060	05 16 s	085 20 w	2.59
03	01	890928	19.45	71	73	55			5	060	05 15 s	085 19 w	4.86
03	02	890928	19.45	73	55	71			5	060			5.19
04	01	890928	19.45	56	07	67			5	060	05 12 s	085 12 w	11.99
04	02	890928	19.45	07	67	56			5	060			12.96
04	03	890928	19.45	67	56	07			5	060			9.07
05	01	890928	19.45	55	71	73			5	060	05 00 s	084 54 w	9.07
06	01	890928	19.45	71	73	55			5	060	04 54 s	084 46 w	5.51
07	01	890928	19.45	73	55	71			5	060	04 52 s	084 42 w	3.89
08	01	890928	19.45	56	07	67			5	060	04 50 s	084 39 w	10.05
08	02	890928	19.45	56	07	67			5	054	04 47 s	084 34 w	2.59
08	03	890928	19.45	07	67	56			5	054			5.19
08	04	890928	19.45	07	67	56			4	054	04 45 s	084 31 w	7.13
08	05	890928	19.45	67	56	07			4	054			3.24
09	01	890928	19.45	67	56	07			4	054	04 42 s	084 26 w	7.13
09	02	890928	19.45	55	71	73			4	054	04 40 s	084 24 w	12.96
09	03	890928	19.45	71	73	55			4	054			6.48
10	01	890928	19.45	55	71	73			4	054	04 15 s	083 51 w	4.86
10	02	890928	19.45	55	71	73			4	054	04 14 s	083 49 w	0.32
01	01	890929	19.45	67	56	07			4	054	03 23 s	082 47 w	8.10
02	01	890929	19.45	56	07	67			4	054	03 20 s	082 39 w	3.57
03	01	890929	19.45	56	07	67			3	054	03 19 s	082 38 w	4.86
03	02	890929	19.45	56	07	67			4	054			1.94
03	03	890929	19.45	73	55	71			4	054	03 16 s	082 36 w	12.96
03	04	890929	19.45	55	71	73			3	054	03 12 s	082 30 w	8.10

Table 2. (continued)

series	leg	date	speed km/hr	observer codes left	right	rec.	sun position horz.	vert.	beauf. no.	course (deg.)	position latitude	longitude	km in leg
03	05	890929	19.45	55	71	73			3	054			3.24
04	01	890929	19.45	67	56	07			4	049			7.13
04	02	890929	19.45	67	56	07			4	049			2.59
04	03	890929	19.45	56	07	67			4	049	03 06 s	082 11 w	6.16
05	01	890929	19.45	56	07	67			3	049	03 04 s	082 10 w	2.27
05	02	890929	19.45	07	67	56			3	049	03 02 s	082 09 w	9.72
05	03	890929	19.45	73	55	71			3	049	02 58 s	082 05 w	12.64
06	01	890929	19.45	55	71	73			4	049	02 52 s	081 59 w	10.05
06	02	890929	19.45	71	73	55			4	049	02 47 s	081 55 w	2.59
06	03	890929	19.45	71	73	55	07	01	4	049			1.30
06	04	890929	19.45	71	73	55	07	01	4	053	02 45 s	081 34 w	6.48
06	05	890929	19.45	67	56	07	07	01	4	053	02 44 s	081 52 w	12.96
06	06	890929	19.45	56	07	67			4	053			2.27
07	01	890929	19.45	56	07	67			4	058	02 37 s	081 43 w	0.32
08	01	890929	19.45	07	67	56			3	053	02 31 s	081 37 w	0.97
08	02	890929	19.45	07	67	56			3	040			2.27
09	01	890929	19.45	73	55	71			3	053	02 28 s	081 34 w	2.59
09	02	890929	19.45	73	55	71			3	000	02 27 s	081 33 w	4.54
09	03	890929	19.45	55	71	73			3	000	02 25 s	081 33 w	7.13
09	04	890929	19.45	71	73	55			3	000			7.45
09	05	890929	19.45	67	56	07			3	000	02 18 s	081 33 w	5.83
09	06	890929	19.45	56	07	67			3	000			4.54
09	07	890929	19.45	56	07	67			3	000	02 12 s	081 33 w	0.32
01	01	891006	19.45	74	01	51			3	243	02 41 s	082 35 w	5.83
02	01	891006	19.45	51	74	01			3	243	02 41 s	082 40 w	8.43
02	02	891006	19.45	22	45	05			3	243	02 43 s	082 43 w	6.16
02	03	891006	19.45	45	05	22			3	243			6.48
02	04	891006	19.45	05	22	45			3	243			7.45
02	05	891006	19.45	22	45	05			3	243	02 47 s	082 52 w	5.83
02	06	891006	19.45	45	05	22			3	243			2.59
03	01	891006	19.45	45	05	22			4	243			1.62
03	02	891006	19.45	51	01	74			4	243	02 53 s	082 57 w	12.96
03	03	891006	19.45	74	51	01			4	243			12.96
03	04	891006	19.45	01	74	51			4	243			12.96
03	05	891006	19.45	05	22	45			3	243	03 00 s	083 18 w	5.83
04	01	891006	19.45	22	45	05			3	243	03 00 s	083 21 w	1.30
05	01	891006	19.45	45	05	22			3	272	03 02 s	083 28 w	5.51
05	02	891006	19.45	05	22	45			3	272			6.48
05	03	891006	19.45	74	01	51			3	272	03 03 s	083 33 w	6.48
06	01	891006	19.45	51	74	01			3	272			13.29
06	02	891006	19.45	01	51	74			3	272			12.64
06	03	891006	19.45	22	45	05			3	272	03 00 s	083 55 w	6.48
06	04	891006	19.45	45	05	22			3	272			6.48
06	05	891006	19.45	05	22	45			3	272			6.48
06	06	891006	19.45	22	45	05			3	272	03 00 s	084 06 w	9.72
06	07	891006	19.45	51	74	01			3	272	03 00 s	084 11 w	1.94
07	01	891006	19.45	01	51	74			3	272	03 01 s	084 14 w	4.21
01	01	891007	18.52	22	45	05			3	271	02 58 s	085 41 w	4.32
01	02	891007	18.52	22	45	05			3	271			1.85
01	03	891007	18.52	45	05	22			3	271	02 58 s	085 45 w	4.94
02	01	891007	18.52	05	22	45			3	271	02 53 s	085 51 w	0.62
03	01	891007	18.52	01	51	74			3	271	02 55 s	085 55 w	8.64
03	02	891007	18.52	01	51	74			3	271			0.93

Table 2. (continued)

series	leg	date	speed km/hr	observer codes left	right	rec.	sun position horz.	vert.	beauf. no.	course (deg.)	position latitude	longitude	km in leg
03	03	891007	18.52	74	01	51			3	271			3.70
03	04	891007	18.52	74	01	51			3	271			8.33
03	05	891007	18.52	51	74	01			3	271			7.41
03	06	891007	18.52	51	74	01	06	01	3	271			2.78
03	07	891007	18.52	51	74	01			3	271			2.16
03	08	891007	18.52	05	22	45			3	271	02 55 s	086 15 w	6.17
03	09	891007	18.52	22	45	05	06	01	3	271			6.17
03	10	891007	18.52	45	05	22	06	01	3	271			6.17
03	11	891007	18.52	05	22	45	06	01	3	271	02 55 s	086 26 w	5.25
03	12	891007	18.52	05	22	45			3	271			0.93
03	13	891007	18.52	22	45	05			3	271			6.17
03	14	891007	18.52	45	05	22	06	01	3	271			6.17
03	15	891007	18.52	74	01	51	05	01	4	271	02 56 s	086 37 w	11.42
03	16	891007	18.52	74	01	51	05	01	4	271			0.93
03	17	891007	18.52	51	74	01	12	12	4	271			5.25
04	01	891007	18.52	51	74	01	12	12	4	271	02 57 s	086 49 w	4.63
04	02	891007	18.52	01	51	74	12	01	4	271			11.11
04	03	891007	18.52	01	51	74	12	01	4	271			1.23
04	04	891007	18.52	05	22	45			4	271	02 58 s	087 00 w	5.25
05	01	891007	18.52	22	45	05	12	01	4	271	02 59 s	087 05 w	6.17
05	02	891007	18.52	45	05	22	12	01	4	271			5.86
06	01	891007	18.52	05	22	45	12	02	4	271	02 59 s	087 10 w	4.63
07	01	891007	18.52	22	45	05			4	271	02 57 s	087 16 w	5.86
07	02	891007	18.52	51	74	01			4	271	02 57 s	087 19 w	11.42
07	03	891007	18.52	01	51	74			4	271			7.72
07	04	891007	18.52	74	01	51			4	271	02 59 s	087 31 w	7.72
07	05	891007	18.52	45	05	22			3	271	02 59 s	087 36 w	6.17
07	06	891007	18.52	05	22	45			3	271			5.86
07	07	891007	18.52	22	45	05			3	271			1.85
01	01	891008	18.52	74	51	01			3	276	02 58 s	089 04 w	8.03
01	02	891008	18.52	01	74	51			3	276			4.32
01	03	891008	18.52	01	74	51			4	276			5.25
01	04	891008	18.52	51	01	74			4	276			7.10
01	05	891008	18.52	22	45	05	06	02	4	276	02 57 s	089 18 w	5.25
01	06	891008	18.52	22	45	05			4	276			1.23
01	07	891008	18.52	45	05	22	06	02	4	276			6.17
01	08	891008	18.52	05	22	45	06	02	4	276			3.09
01	09	891008	18.52	05	22	45			4	276			3.09
01	10	891008	18.52	22	45	05			4	276	02 56 s	089 28 w	2.47
01	11	891008	18.52	22	45	05			4	276			3.70
01	12	891008	18.52	45	05	22			4	276			6.17
01	13	891008	18.52	05	22	45			4	276			5.25
01	14	891008	18.52	01	74	51			4	276	02 55 s	089 39 w	3.09
02	01	891008	18.52	01	74	51			4	276	02 54 s	089 44 w	5.25
02	02	891008	18.52	01	74	51			4	276			2.47
03	01	891008	18.52	51	01	74			4	276	02 54 s	089 49 w	4.94
03	02	891008	18.52	51	01	74			4	276			2.47
03	03	891008	18.52	74	51	01			4	276	02 54 s	089 53 w	9.26
03	04	891008	18.52	22	45	05			4	276	02 54 s	090 00 w	6.17
03	05	891008	18.52	45	05	22			4	276			5.25
03	06	891008	18.52	45	05	22			3	276			0.93
03	07	891008	18.52	05	22	45			3	276			6.48
03	08	891008	18.52	22	45	05			3	276	02 54 s	090 11 w	2.78

Table 2. (continued)

series	leg	date	speed km/hr	observer codes left	observer codes right	observer codes rec.	sun position horz.	sun position vert.	beauf. no.	course (deg.)	position latitude	position longitude	km in leg
04	01	891008	18.52	45	05	22	12	12	3	276	02 54 s	090 14 w	6.17
04	02	891008	18.52	05	22	45			3	276			5.86
04	03	891008	18.52	51	01	74			3	276	02 53 s	090 21 w	12.35
04	04	891008	18.52	74	51	01			3	276			12.35
04	05	891008	18.52	01	74	51			3	276			13.58
04	06	891008	18.52	22	45	51			3	276	02 51 s	090 44 w	4.94
04	07	891008	18.52	45	05	22			3	276			6.17
04	08	891008	18.52	05	22	45			3	276			6.17
05	01	891008	18.52	01	74	51			3	276	02 50 s	091 01 w	9.26
05	02	891008	18.52	51	01	74			3	276	02 50 s	091 08 w	5.25
06	01	891008	18.52	51	01	74			3	276	02 51 s	091 12 w	4.01
01	01	891009	19.45	45	22	05			3	273	02 46 s	092 47 w	7.78
01	02	891009	19.45	22	05	45	06	03	3	273			5.19
01	03	891009	19.45	05	45	22	06	03	3	273			1.62
02	01	891009	19.45	01	74	51			3	273	02 48 s	092 59 w	10.05
02	02	891009	19.45	51	01	74			3	273			12.64
02	03	891009	19.45	74	51	01	06	01	4	273			13.61
02	04	891009	19.45	45	22	05	06	01	4	273	02 47 s	093 19 w	2.92
03	01	891009	19.45	22	05	45	06	01	4	273	02 50 s	093 23 w	0.97
04	01	891009	19.45	22	05	45	06	01	4	273	02 50 s	093 25 w	5.51
04	02	891009	19.45	22	05	45	06	01	4	276	02 49 s	093 27 w	0.65
04	03	891009	19.45	05	45	22	06	01	4	276			6.16
05	01	891009	19.45	45	22	05	06	01	3	276	02 49 s	093 32 w	9.07
05	02	891009	19.45	51	01	74	06	01	3	276	02 49 s	093 37 w	12.96
05	03	891009	19.45	74	51	01	12	12	3	276			12.96
05	04	891009	19.45	01	74	51	02	12	4	276			11.34
06	01	891009	19.45	22	05	45	12	01	3	276	02 48 s	094 02 w	3.89
06	02	891009	19.45	22	05	45			3	276			1.62
06	03	891009	19.45	22	05	45	12	01	3	276			1.30
06	04	891009	19.45	05	45	22			3	276	02 48 s	094 06 w	1.94
07	01	891009	19.45	45	22	05	12	01	3	276	02 46 s	094 13 w	7.13
07	02	891009	19.45	22	05	45	12	01	3	276			2.59
07	03	891009	19.45	22	05	45			3	276			1.62
07	04	891009	19.45	22	05	45			4	276			2.92
07	05	891009	19.45	74	51	01			4	276	02 45 s	094 22 w	3.57
07	06	891009	19.45	74	51	01	12	02	4	276			1.94
07	07	891009	19.45	74	51	01	11	02	4	296			4.21
07	08	891009	19.45	01	74	51	11	02	5	296	02 44 s	094 28 w	9.72
07	09	891009	19.45	51	01	74	11	02	5	296			9.72
07	10	891009	19.45	05	45	22	11	02	5	296	02 38 s	094 39 w	6.48
07	11	891009	19.45	45	22	05	11	02	5	296			7.13
07	12	891009	19.45	22	05	45	11	03	5	296			2.27
07	13	891009	19.45	22	05	45	11	03	4	296			3.89
07	14	891009	19.45	05	45	22	11	03	4	296	02 33 s	094 51 w	6.48
07	15	891009	19.45	45	22	05	11	03	4	296			1.30
08	01	891009	19.45	45	22	05	11	03	4	296	02 31 s	094 56 w	3.24
01	01	891010	19.45	74	01	51			2	276	02 37 s	096 31 w	7.78
02	01	891010	19.45	51	74	01			2	280	02 43 s	096 38 w	1.30
03	01	891010	19.45	22	45	05			2	280	02 45 s	096 45 w	4.86
03	02	891010	19.45	45	05	22			2	280			2.27
03	03	891010	19.82	45	05	22			2	000	02 44 s	096 48 w	0.66
04	01	891010	19.45	05	22	45			2	278	02 39 s	096 49 w	9.07
04	02	891010	19.45	51	74	01			2	278	02 38 s	096 55 w	2.92

Table 2. (continued)

series	leg	date	speed km/hr	observer codes left	observer codes right	observer codes rec.	sun position horz.	sun position vert.	beauf. no.	course (deg.)	position latitude	position longitude	km in leg
05	01	891010	19.45	51	74	01			2	274	02 36 s	096 57 w	1.94
06	01	891010	19.45	01	51	74			2	272	02 33 s	097 01 w	8.10
06	02	891010	19.45	74	01	51			2	272	02 33 s	097 06 w	8.75
06	03	891010	19.45	74	01	51			3	272			2.27
06	04	891010	19.45	22	45	05			3	272	02 33 s	097 12 w	2.92
07	01	891010	19.45	45	05	22	12	12	3	272	02 29 s	097 17 w	7.13
07	02	891010	19.45	05	22	45	12	01	3	272			2.27
07	03	891010	19.45	05	22	45	12	01	4	272			4.21
07	04	891010	19.45	22	45	05	12	01	3	272	02 29 s	097 25 w	10.70
08	01	891010	19.45	01	51	74	12	01	3	272	02 28 s	097 32 w	5.51
08	02	891010	19.45	01	51	74	12	01	4	272			5.51
08	03	891010	19.45	74	01	51	12	01	4	272			7.78
08	04	891010	19.45	74	01	51	12	02	4	272	02 29 s	097 41 w	2.92
08	05	891010	19.45	74	01	51	11	02	4	292			2.27
08	06	891010	19.45	51	74	01			4	272			2.27
08	07	891010	19.45	51	74	01			3	272	02 28 s	097 46 w	7.78
09	01	891010	19.45	45	05	22			3	272	02 29 s	097 52 w	6.48
09	02	891010	19.45	05	22	45			3	272			6.48
09	03	891010	19.45	22	45	05			3	272			6.48
09	04	891010	19.45	45	05	22			3	272	02 29 s	098 03 w	9.72
09	05	891010	19.45	74	01	51			3	272	02 29 s	098 09 w	5.51
10	01	891010	19.45	74	01	51			3	272	02 27 s	098 13 w	4.21
01	01	891011	19.45	45	22	05			3	273	02 31 s	099 39 w	7.45
01	02	891011	19.45	22	05	45			3	273	02 31 s	099 44 w	6.16
01	03	891011	19.45	05	45	22			3	273			5.83
01	04	891011	19.45	05	45	22			3	273			0.97
01	05	891011	19.45	45	22	05			3	273			6.81
01	06	891011	19.45	01	74	51			3	273	02 31 s	099 55 w	13.94
01	07	891011	19.45	51	01	74	06	02	4	273			10.37
02	01	891011	19.45	74	51	01	06	01	3	278	02 32 s	100 15 w	2.27
02	02	891011	19.45	22	05	45	05	01	3	278	02 31 s	100 17 w	7.13
02	03	891011	19.45	05	45	22	06	01	3	278			6.48
02	04	891011	19.45	45	22	05	06	01	3	278			6.48
02	05	891011	19.45	22	05	45	06	01	3	278	02 32 s	100 28 w	6.16
02	06	891011	19.45	05	45	22	06	01	3	278			6.81
02	07	891011	19.45	45	22	05	12	12	3	278			5.83
02	08	891011	19.45	51	01	74	12	12	3	278	02 32 s	100 37 w	12.96
02	09	891011	19.45	74	51	01	12	12	3	278			12.96
02	10	891011	19.45	01	74	51	12	12	3	278			12.96
02	11	891011	19.45	22	05	45	12	12	3	278	02 28 s	101 00 w	6.16
02	12	891011	19.45	05	45	22			3	278			3.89
03	01	891011	19.45	05	45	22			3	278	02 27 s	101 08 w	0.65
03	02	891011	19.45	45	22	05			3	278			6.48
03	03	891011	19.45	22	05	45			3	272	02 26 s	101 12 w	0.32
04	01	891011	19.45	74	51	01	12	02	3	272	02 27 s	101 28 w	3.57
04	02	891011	19.45	74	51	01	11	02	3	292	02 27 s	101 29 w	3.57
04	03	891011	19.45	01	74	51	11	02	3	292			9.40
04	04	891011	19.45	51	01	74			3	292			6.81
05	01	891011	19.45	05	45	22			3	292	02 20 s	101 40 w	7.13
01	01	891012	19.45	74	01	51			4	280	02 25 s	103 05 w	0.97
02	01	891012	19.45	74	01	51			4	280	02 23 s	103 07 w	1.30
02	02	891012	19.45	51	74	01			4	280			9.40
02	03	891012	19.45	01	51	74			4	280			6.81

Table 2. (continued)

series	leg	date	speed km/hr	observer codes left	right	rec.	sun position horz.	vert.	beauf. no.	course (deg.)	position latitude	longitude	km in leg
02	04	891012	19.45	22	45	05			4	280	02 22 s	103 17 w	6.48
02	05	891012	19.45	45	05	22			3	280			8.75
02	06	891012	19.45	05	22	45			3	280			5.83
03	01	891012	19.45	22	45	05	06	02	4	280	02 21 s	103 30 w	6.81
03	02	891012	19.45	45	05	22	06	02	4	280			8.43
03	03	891012	19.45	51	74	01	06	01	4	280	02 19 s	103 38 w	12.96
03	04	891012	19.45	01	51	74	06	01	4	280			12.96
03	05	891012	19.45	74	01	51	06	01	4	280			12.96
03	06	891012	19.45	05	22	45	06	01	4	280	02 17 s	104 00 w	1.62
03	07	891012	19.45	05	22	45	06	01	4	275			4.86
03	08	891012	19.45	22	45	05	12	12	4	275			6.81
03	09	891012	19.45	45	05	22	12	12	4	275			6.48
03	10	891012	19.45	05	22	45	12	12	4	275	02 17 s	104 10 w	6.16
03	11	891012	19.45	22	45	05	12	12	4	275			6.81
03	12	891012	19.45	45	05	22	12	01	4	275			6.16
03	13	891012	19.45	01	51	74	12	01	4	275	02 17 s	104 22 w	13.29
03	14	891012	19.45	74	01	51	12	01	4	275			14.26
03	15	891012	19.45	51	74	01	12	01	4	275	02 17 s	104 37 w	11.34
03	16	891012	19.45	05	22	45	12	02	4	275	02 15 s	104 43 w	6.48
03	17	891012	19.45	22	45	05	12	02	4	275			6.81
03	18	891012	19.45	45	05	22	11	02	4	295			6.48
03	19	891012	19.45	05	22	45	11	02	4	295	02 13 s	104 54 w	4.54
03	20	891012	19.45	22	45	05	11	02	4	295			5.19
03	21	891012	19.45	74	01	51	11	03	4	295	02 11 s	104 58 w	9.40
03	22	891012	19.45	51	74	01	11	03	4	295	02 09 s	105 03 w	8.75
03	23	891012	19.45	01	51	74	11	03	4	295	02 07 s	105 09 w	7.45
01	01	891013	19.45	05	45	22			4	274	02 10 s	106 30 w	6.48
01	02	891013	19.45	45	22	05			4	274	02 10 s	106 34 w	11.67
01	03	891013	19.45	01	51	74	06	02	4	274	02 09 s	106 41 w	11.67
01	04	891013	19.45	74	01	51	06	02	4	274			8.43
01	05	891013	19.45	74	01	51	06	02	5	274	02 08 s	106 53 w	0.97
02	01	891013	19.45	74	01	51	06	02	5	274	02 09 s	106 55 w	0.97
02	02	891013	19.45	51	74	01	06	02	5	274			11.99
02	03	891013	19.45	22	05	45	06	01	6	274	02 08 s	107 02 w	6.48
02	04	891013	19.45	05	45	22	06	01	6	274			8.10
02	05	891013	19.45	45	22	05	06	01	6	274			6.81
02	06	891013	19.45	22	05	45	06	01	6	274	02 08 s	107 12 w	6.48
02	07	891013	19.45	05	45	22	06	01	5	274	02 07 s	107 18 w	6.16
02	08	891013	19.45	45	22	05	06	01	5	274			4.86
02	09	891013	19.45	74	01	51	06	01	5	274	02 07 s	107 23 w	12.96
02	10	891013	19.45	51	74	01	06	12	5	274			1.94
03	01	891013	19.45	01	51	74	12	12	5	274	02 08 s	107 36 w	13.94
03	02	891013	19.45	22	05	45	12	01	5	274	02 08 s	107 44 w	6.48
03	03	891013	19.45	05	45	22	12	01	5	274			2.59
04	01	891013	19.45	45	22	05	12	01	5	274	02 08 s	107 52 w	6.48
04	02	891013	19.45	22	05	45	12	01	5	274	02 08 s	107 55 w	3.24
04	03	891013	19.45	22	05	45	11	01	5	294			3.24
04	04	891013	19.45	05	45	22	11	01	5	294			6.48
04	05	891013	19.45	45	22	05	11	01	5	294			6.48
04	06	891013	19.45	51	74	01	11	02	5	294	02 04 s	108 06 w	9.72
04	07	891013	19.45	01	51	74	11	02	5	294	02 02 s	108 11 w	9.72
04	08	891013	19.45	74	01	51	11	02	5	294	02 00 s	108 10 w	9.72
04	09	891013	19.45	22	05	45	11	02	4	294	01 58 s	108 21 w	6.16

Table 2. (continued)

series	leg	date	speed km/hr	observer codes left	observer codes right	observer codes rec.	sun position horz.	sun position vert.	beauf. no.	course (deg.)	position latitude	position longitude	km in leg
04	10	891013	19.45	05	45	22	11	03	4	294			6.81
04	11	891013	19.45	45	22	05	11	03	4	294			6.48
04	12	891013	19.45	22	05	45	11	03	4	294	01 54 s	108 33 w	2.59
04	13	891013	19.45	22	05	45	12	03	4	272			3.89
04	14	891013	19.45	05	45	22	12	03	4	272			3.89
01	01	891014	18.52	51	74	01			4	267	02 00 s	109 45 w	11.42
01	02	891014	18.52	01	51	74			4	267			3.70
01	03	891014	14.82	01	51	74			4	267	02 01 s	109 54 w	5.19
01	04	891014	14.82	74	01	51			4	267			1.73
01	05	891014	14.82	74	01	51			4	290	02 01 s	109 59 w	1.98
01	06	891014	14.82	74	01	51			4	300			0.25
02	01	891014	19.45	01	51	74			4	268	02 00 s	110 07 w	11.34
02	02	891014	19.45	74	01	51			4	268			2.59
03	01	891014	19.45	51	74	01			4	268	02 00 s	110 18 w	13.61
03	02	891014	19.45	05	22	45	12	12	4	268	02 00 s	110 25 w	6.48
03	03	891014	19.45	22	45	05	12	12	4	268			6.48
03	04	891014	19.45	45	05	22	12	12	4	270			3.24
03	05	891014	19.45	45	05	22	12	12	5	270			3.24
03	06	891014	19.45	05	22	45	12	01	5	270	02 01 s	110 36 w	6.48
03	07	891014	19.45	22	45	05	12	01	5	270			6.48
03	08	891014	19.45	45	05	22	12	01	5	270			6.48
03	09	891014	19.45	74	01	51	12	01	5	270	02 01 s	110 46 w	10.70
03	10	891014	19.45	74	01	51	12	01	5	272	02 01 s	110 52 w	2.27
03	11	891014	19.45	51	74	01	11	01	5	292			12.96
03	12	891014	19.45	01	51	74	11	02	5	292			12.96
03	13	891014	19.45	05	22	45	11	02	4	292	01 57 s	111 09 w	6.48
03	14	891014	19.45	22	45	05	11	02	4	292			7.13
03	15	891014	19.45	45	05	22	11	02	4	292			1.62
04	01	891014	19.45	05	22	45	11	03	4	292	01 53 s	111 19 w	8.10
04	02	891014	19.45	01	74	51	11	03	4	292	01 52 s	111 24 w	15.56
01	01	891015	19.45	22	45	05			3	270	02 02 s	112 50 w	5.83
02	01	891015	19.45	45	05	22			3	270			4.21
02	02	891015	19.45	51	01	74	06	02	3	270	02 03 s	113 00 w	11.34
02	03	891015	19.45	51	01	74			3	330	02 03 s	113 06 w	1.62
02	04	891015	19.45	74	51	01			3	330			1.94
02	05	891015	19.45	74	51	01			3	260			1.94
03	01	891015	19.45	74	51	01			3	269	02 00 s	113 09 w	5.83
03	02	891015	19.45	01	74	51			3	269			12.96
03	03	891015	19.45	05	22	45	06	01	3	269	02 00 s	113 19 w	7.13
03	04	891015	19.45	22	45	05	06	01	3	269			5.83
03	05	891015	19.45	45	05	22	06	01	3	269			3.57
04	01	891015	19.45	05	22	45	06	01	3	269	02 01 s	113 30 w	6.48
04	02	891015	19.45	22	45	05	06	01	3	269			6.81
04	03	891015	19.45	45	05	22	12	12	3	269			6.16
04	04	891015	19.45	74	51	01	12	12	3	269	02 02 s	113 39 w	12.96
04	05	891015	19.45	01	74	51	12	12	4	269	02 02 s	113 47 w	10.05
05	01	891015	19.45	51	01	74			4	269	02 05 s	113 54 w	8.43
05	02	891015	19.45	51	01	74			4	269			1.94
05	03	891015	19.45	05	22	45	12	01	4	269	02 06 s	114 01 w	7.78
05	04	891015	19.45	22	45	05	12	01	4	269			6.48
05	05	891015	19.45	45	05	22	12	01	4	269			2.27
06	01	891015	19.45	45	05	22	12	01	4	269	02 07 s	114 10 w	3.57
06	02	891015	19.45	05	22	45	11	02	4	288	02 07 s	114 12 w	6.48

Table 2. (continued)

series	leg	date	speed km/hr	observer codes left	observer codes right	observer codes rec.	sun position horz.	sun position vert.	beauf. no.	course (deg.)	position latitude	position longitude	km in leg
06	03	891015	19.45	22	45	05	11	02	4	288			2.59
06	04	891015	19.45	22	45	05	11	02	4	300	02 06 s	114 17 w	1.94
06	05	891015	19.45	22	45	05	10	02	4	310			0.65
06	06	891015	19.45	22	45	05	11	02	4	288			0.97
06	07	891015	19.45	45	05	22	11	02	4	288			5.83
06	08	891015	19.45	01	74	51	11	02	3	288	02 04 s	114 21 w	9.40
06	09	891015	19.45	51	01	74	11	02	3	288	02 03 s	114 26 w	9.40
07	01	891015	19.45	05	22	45	11	03	3	288	01 59 s	114 37 w	5.51
07	02	891015	19.45	05	22	45			3	288			1.30
01	01	891016	19.45	74	01	51			3	280	02 05 s	115 59 w	11.67
02	01	891016	19.45	51	74	01	06	02	4	280	02 04 s	116 05 w	12.32
03	01	891016	19.45	45	22	05	06	02	4	280	02 03 s	116 15 w	7.13
03	02	891016	19.45	22	05	45	06	02	4	280	02 03 s	116 18 w	6.16
03	03	891016	19.45	05	45	22	06	02	4	280	02 02 s	116 22 w	6.48
03	04	891016	19.45	45	22	05	06	02	4	280			6.81
03	05	891016	19.45	22	05	45	06	02	4	280	02 02 s	116 29 w	7.78
03	06	891016	19.45	51	74	01	06	01	4	275	02 01 s	116 34 w	12.96
03	07	891016	19.45	01	51	74	06	01	4	275			6.16
04	01	891016	19.45	01	51	74	06	01	4	270	02 01 s	116 34 w	4.54
04	02	891016	19.45	74	01	51	06	01	4	270			12.96
04	03	891016	19.45	05	45	22	12	12	4	250	02 03 s	116 56 w	6.48
04	04	891016	19.45	45	22	05	12	12	4	250			6.16
05	01	891016	19.45	22	05	45	12	01	4	250	02 04 s	117 08 w	0.65
06	01	891016	19.45	22	05	45	12	01	4	250	02 04 s	117 11 w	7.13
06	02	891016	19.45	01	51	74	12	01	4	250	02 06 s	117 15 w	12.64
06	03	891016	19.45	74	01	51			4	250			6.48
06	04	891016	19.45	74	01	51	11	01	4	290	02 11 s	117 25 w	6.48
06	05	891016	19.45	51	74	01	11	02	4	290			12.96
06	06	891016	19.45	05	45	22	11	02	4	290	02 08 s	117 35 w	6.48
06	07	891016	19.45	45	22	05	11	02	4	290			6.48
06	08	891016	19.45	22	05	45	11	02	4	290			6.48
06	09	891016	19.45	05	45	22	11	02	4	290	02 04 s	117 45 w	4.86
06	10	891016	19.45	45	22	05	11	02	4	290			4.86
06	11	891016	19.45	74	01	51	11	03	4	290	02 04 s	117 52 w	11.67
06	12	891016	19.45	51	74	01	11	03	4	290	02 02 s	117 58 w	7.45
06	13	891016	19.45	51	01	74			4	290	02 00 s	118 02 w	6.81
01	01	891017	19.45	45	22	05	06	03	5	275	02 02 s	119 24 w	1.30
02	01	891017	19.45	22	05	45	06	02	5	275	02 08 s	119 30 w	1.94
03	01	891017	19.45	74	51	01	06	02	5	275	02 07 s	119 35 w	3.24
04	01	891017	19.45	74	51	01	06	02	5	275	02 07 s	119 37 w	8.43
04	02	891017	19.45	01	74	51	06	02	5	275			9.72
05	01	891017	19.45	51	01	74	06	01	5	275	02 05 s	119 49 w	5.51
05	02	891017	19.45	22	05	45	06	01	5	275	02 04 s	119 52 w	2.27
06	01	891017	19.45	05	22	45	06	01	5	270			0.65
06	02	891017	19.45	05	45	22	06	01	5	270			6.48
06	03	891017	19.45	45	22	05	06	01	5	270	02 01 s	119 58 w	6.48
06	04	891017	19.45	22	05	45	06	01	5	270			6.48
06	05	891017	19.45	05	45	22	06	01	5	270			6.48
06	06	891017	19.45	01	74	99	06	12	5	270	02 01 s	120 08 w	1.30
06	07	891017	19.45	01	74	51	06	12	5	270			11.99
06	08	891017	19.45	51	01	74	12	12	5	270			12.64
06	09	891017	19.45	74	51	01	11	01	5	270			13.61
06	10	891017	19.45	45	22	05	11	01	5	270	02 00 s	120 31 w	6.48

Table 2. (continued)

series	leg	date	speed km/hr	observer codes left	right	rec.	sun position horz.	vert.	beauf. no.	course (deg.)	position latitude	longitude	km in leg
06	11	891017	19.45	22	05	45	12	01	5	270			5.51
06	12	891017	19.45	05	45	22	12	01	5	270			1.62
07	01	891017	19.45	05	45	22	12	01	5	270	02 01 s	120 39 w	3.24
07	02	891017	19.45	45	22	05	12	01	5	270	02 01 s	120 41 w	2.92
07	03	891017	19.45	45	22	05	12	01	5	250			0.65
07	04	891017	19.45	45	22	05	11	01	5	290			3.24
07	05	891017	19.45	22	05	45	11	01	5	290			6.16
07	06	891017	19.45	05	45	22	11	01	5	290			5.83
07	07	891017	19.45	51	01	74	11	02	5	290	01 58 s	120 53 w	10.70
07	08	891017	19.45	74	51	01	11	02	5	290	01 56 s	120 58 w	8.75
07	09	891017	19.45	01	74	51	11	02	5	290	01 54 s	121 02 w	3.89
07	10	891017	19.45	01	74	51	10	02	5	305			6.48
07	11	891017	19.45	45	22	05	10	03	5	290	01 51 s	121 08 w	6.48
07	12	891017	19.45	22	05	45	11	03	5	290			1.94
08	01	891017	19.45	22	05	45	11	03	5	290	01 50 s	121 13 w	2.27
09	01	891017	19.45	05	45	22	11	03	5	290	01 49 s	121 14 w	6.48
09	02	891017	19.45	45	22	05	11	03	5	290	01 48 s	121 17 w	3.89
09	03	891017	19.45	45	22	05	01	03	4	245			1.62
01	01	891019	18.52	22	45	05			5	109	03 06 s	119 26 w	4.63
01	02	891019	18.52	45	05	22			5	109	03 07 s	119 24 w	0.62
02	01	891019	18.52	01	74	51	12	02	5	101			4.01
02	02	891019	18.52	01	74	51	01	02	5	080			6.17
02	03	891019	18.52	51	01	74	01	02	5	080			11.11
02	04	891019	18.52	74	51	01	01	02	5	080			12.35
02	05	891019	18.52	45	05	22	01	02	5	080	03 07 s	118 59 w	6.17
02	06	891019	18.52	05	22	45	01	02	5	080			6.17
02	07	891019	18.52	22	45	05	01	01	5	080			1.54
02	08	891019	18.52	22	45	05			5	115			4.63
02	09	891019	18.52	45	05	22			5	115	03 06 s	118 50 w	6.79
02	10	891019	18.52	05	22	45	12	01	5	115			5.56
02	11	891019	18.52	22	45	05	12	01	5	115			6.17
02	12	891019	18.52	51	01	74	01	01	5	115	03 10 s	118 43 w	12.35
02	13	891019	18.52	74	51	01	12	12	5	115			7.10
03	01	891019	18.52	01	74	51			5	105	03 15 s	118 36 w	2.78
04	01	891019	18.52	01	74	51			5	105	03 17 s	118 33 w	6.17
04	02	891019	18.52	45	05	22			5	105	03 18 s	118 31 w	6.17
04	03	891019	18.52	05	22	45	05	01	5	105			6.48
04	04	891019	18.52	22	45	05	05	01	5	105			5.86
04	05	891019	18.52	45	05	22	05	01	5	105	03 20 s	118 23 w	6.17
04	06	891019	18.52	05	22	45	05	02	5	105			6.17
04	07	891019	18.52	22	45	05	05	02	5	105			6.17
04	08	891019	18.52	74	51	01	05	02	5	105	03 22 s	118 15 w	9.26
04	09	891019	18.52	01	74	51	05	02	5	105	03 23 s	118 10 w	9.26
04	10	891019	18.52	51	01	74	05	02	5	105	03 25 s	118 06 w	9.26
04	11	891019	18.52	45	05	22	05	03	6	105	03 26 s	118 02 w	6.17
04	12	891019	18.52	05	22	45	05	03	6	105			3.70
01	01	891020	18.52	01	51	74			5	101	03 38 s	117 00 w	2.78
01	02	891020	18.52	01	51	74	12	03	5	101			0.93
01	03	891020	18.52	01	51	74	01	03	5	080			5.86
01	04	891020	18.52	74	01	51	01	03	5	080	03 38 s	116 56 w	7.10
01	05	891020	18.52	74	01	51			5	101			3.70
01	06	891020	18.52	51	74	01			4	101	03 38 s	116 51 w	5.25
01	07	891020	18.52	51	74	01	01	02	4	080			2.16

Table 2. (continued)

series	leg	date	speed km/hr	observer codes left	observer codes right	observer codes rec.	sun position horz.	sun position vert.	beauf. no.	course (deg.)	position latitude	position longitude	km in leg
01	08	891020	18.52	45	22	05	01	02	5	080	03 38 s	116 50 w	6.17
01	09	891020	18.52	22	05	45	01	02	5	080			6.17
01	10	891020	18.52	05	45	22	01	02	5	080			6.17
01	11	891020	18.52	45	22	05	01	02	5	080	03 37 s	116 39 w	6.17
01	12	891020	18.52	22	05	45	01	02	5	080			6.17
01	13	891020	18.52	05	45	22	01	02	5	080			6.17
01	14	891020	18.52	74	01	51	01	01	5	080	03 35 s	116 30 w	12.35
01	15	891020	18.52	51	74	01	01	01	5	080			1.85
02	01	891020	18.52	51	74	01	01	01	5	080	03 33 s	116 23 w	8.95
02	02	891020	18.52	01	51	74	01	01	5	107	03 31 s	116 21 w	7.72
03	01	891020	18.52	01	51	74	01	01	5	107	03 33 s	116 17 w	3.40
03	02	891020	18.52	45	22	05	12	12	5	107	03 33 s	116 16 w	6.17
03	03	891020	18.52	22	05	45	12	12	6	107	03 34 s	116 12 w	4.94
04	01	891020	18.52	05	45	22	05	02	5	110	03 48 s	115 45 w	6.48
04	02	891020	18.52	45	22	05	05	02	5	110	03 50 s	115 42 w	0.93
04	03	891020	18.52	45	22	05	05	02	5	105			6.17
04	04	891020	18.52	22	05	45	05	02	5	105			2.16
04	05	891020	18.52	22	05	45	05	02	6	105	03 51 s	115 38 w	0.93
01	01	891021	19.45	05	45	22	12	03	5	092	04 09 s	114 30 w	7.45
01	02	891021	19.45	45	22	05	12	03	5	092			7.13
01	03	891021	19.45	22	05	45	12	03	6	092			0.32
02	01	891021	19.45	01	74	51	01	02	5	080	04 12 s	114 06 w	8.75
02	02	891021	19.45	51	01	74	01	02	5	080			7.78
02	03	891021	19.45	74	51	01	01	02	5	080	04 10 s	113 56 w	1.62
03	01	891021	19.45	74	51	01	01	02	5	080	04 11 s	113 53 w	4.54
03	02	891021	19.45	22	05	45	01	02	5	080	04 11 s	113 51 w	6.16
03	03	891021	19.45	05	45	22	01	01	5	080			6.81
03	04	891021	19.45	45	22	05	01	01	5	080			6.48
03	05	891021	19.45	22	05	45	01	01	5	080	04 09 s	113 46 w	6.16
03	06	891021	19.45	05	45	22	01	01	5	080			2.59
03	07	891021	19.45	05	45	22	02	01	5	101	04 08 s	113 41 w	0.97
03	08	891021	19.45	05	45	22	02	01	5	108			1.94
03	09	891021	19.45	05	45	22	12	12	5	108			1.62
03	10	891021	19.45	45	22	05	12	12	5	108			4.86
03	11	891021	19.45	51	01	74	12	12	5	108	04 10 s	113 37 w	13.29
03	12	891021	19.45	74	51	01	02	02	5	108			12.64
03	13	891021	19.45	01	74	51	04	01	5	108			12.96
03	14	891021	19.45	22	05	45	05	01	5	108	04 16 s	113 19 w	6.48
03	15	891021	19.45	05	45	22	05	01	5	108			6.81
03	16	891021	19.45	45	22	05	05	01	5	108			6.48
03	17	891021	19.45	22	05	45			5	108	04 19 s	113 10 w	6.16
03	18	891021	19.45	05	45	22			5	108			2.27
03	19	891021	19.45	05	45	22	05	02	5	108	04 21 s	113 06 w	4.54
03	20	891021	19.45	45	22	05	05	02	5	108			6.48
03	21	891021	19.45	74	51	01	05	02	5	108	04 22 s	113 01 w	9.40
03	22	891021	19.45	01	74	51	05	02	5	108	04 23 s	112 57 w	9.72
03	23	891021	19.45	51	01	74	05	02	5	103	04 25 s	112 52 w	10.70
03	24	891021	19.45	22	05	45	05	02	5	103	04 26 s	112 49 w	3.24
03	25	891021	19.45	22	05	45			6	103			3.24
03	26	891021	19.45	05	45	22			6	103			1.62
03	27	891021	19.45	05	45	22			5	103	04 28 s	112 44 w	2.59
01	01	891022	19.45	51	74	01			4	103	04 46 s	111 21 w	12.96
01	02	891022	19.45	01	51	74			4	103			8.43

Table 2. (continued)

series	leg	date	speed km/hr	observer codes left	right	rec.	sun position horz.	vert.	beauf. no.	course (deg.)	position latitude	longitude	km in leg
01	03	891022	19.45	01	51	74			5	103	04 48 s	111 12 w	4.54
01	04	891022	19.45	74	01	51			5	103			12.96
01	05	891022	19.45	45	22	05			5	103	04 50 s	111 04 w	6.48
01	06	891022	19.45	22	05	45			5	103			6.16
01	07	891022	19.45	05	45	22			5	103			6.81
02	01	891022	19.45	45	22	05			5	097	04 52 s	110 54 w	6.48
02	02	891022	19.45	22	05	45			5	097	04 52 s	110 51 w	9.40
02	03	891022	19.45	01	51	74			5	097	04 53 s	110 46 w	12.96
02	04	891022	19.45	74	01	51			5	097			8.10
02	05	891022	19.08	74	01	51			5	103	04 53 s	110 36 w	5.09
01	01	891023	19.45	74	01	51	03	12	5	096	05 15 s	107 30 w	12.32
01	02	891023	19.45	51	74	01	04	01	5	096			12.64
01	03	891023	19.45	01	51	74	05	01	5	096			12.96
01	04	891023	19.45	45	22	05	05	01	5	096	05 16 s	107 11 w	6.48
01	05	891023	19.45	22	05	45	05	01	5	096			6.48
01	06	891023	19.45	05	45	22	05	02	5	096			1.62
02	01	891023	19.45	05	45	22	05	02	5	096	05 17 s	107 03 w	1.94
02	02	891023	19.45	45	22	05			6	096	05 17 s	107 02 w	6.48
02	03	891023	19.45	22	05	45			6	096			6.48
02	04	891023	19.45	05	45	22	05	02	6	096			6.48
02	05	891023	19.45	51	74	01	05	02	5	096	05 18 s	106 53 w	9.72
02	06	891023	19.45	01	51	74	05	02	5	096	05 19 s	106 48 w	9.72
01	01	891024	19.45	74	51	01			5	096	05 25 s	105 32 w	3.89
01	02	891024	19.45	74	51	01	01	03	5	086			4.21
01	03	891024	19.45	01	74	51	01	03	5	086	05 25 s	105 28 w	5.83
01	01	891025	19.45	45	22	05			5	096	05 46 s	102 18 w	7.45
01	02	891025	19.45	22	05	45			6	096			4.86
02	01	891025	19.45	74	01	99			5	096	05 46 s	102 04 w	38.24
02	02	891025	19.45	05	22	45			5	096	05 48 s	101 46 w	4.21
02	03	891025	19.45	05	22	45	12	01	5	096			2.27
02	04	891025	19.45	22	45	05	12	01	5	096			6.48
03	01	891025	19.45	74	01	51	03	12	5	096	05 49 s	101 20 w	7.45
03	02	891025	19.45	74	01	51	04	12	6	101			0.32
01	01	891026	19.45	51	01	74	12	03	6	096	06 10 s	098 54 w	6.16
02	01	891026	18.52	51	01	74			5	063	05 46 s	097 46 w	12.96
02	02	891026	18.52	74	51	01			5	063			11.73
02	03	891026	18.52	01	74	51			5	063			12.35
02	04	891026	18.52	22	45	05			5	063	05 36 s	097 28 w	6.17
02	05	891026	18.52	45	05	22			5	063			6.17
02	06	891026	18.52	05	22	45			5	063			6.17
02	07	891026	18.52	22	45	05			5	063	05 31 s	097 20 w	5.56
03	01	891026	18.52	74	51	01			5	065	05 28 s	097 16 w	2.47
04	01	891026	18.52	74	51	01			5	065	05 27 s	097 13 w	2.47
04	02	891026	18.52	01	74	51			5	065			6.17
04	03	891026	18.52	01	74	51	07	03	5	065			0.31
01	01	891027	19.45	22	45	05			4	065	04 45 s	095 43 w	3.24
01	02	891027	19.45	22	45	05			5	065			3.24
01	03	891027	19.45	45	05	22			4	065	04 44 s	095 38 w	3.57
01	04	891027	19.45	45	05	22	01	03	4	065			3.57
01	05	891027	19.45	05	22	45			4	065			5.83
01	06	891027	19.45	05	22	45	01	03	4	065	04 40 s	095 33 w	0.65
01	07	891027	19.45	22	45	05	01	03	4	065			6.48
01	08	891027	19.45	45	05	22	01	02	4	065	04 39 s	095 29 w	10.37

Table 2. (continued)

series	leg	date	speed km/hr	observer codes left	observer codes right	observer codes rec.	sun position horz.	sun position vert.	beauf. no.	course (deg.)	position latitude	position longitude	km in leg
01	09	891027	19.45	74	51	01	01	02	4	065	04 37 s	095 25 w	4.86
01	10	891027	19.45	74	51	01			3	065			7.45
01	11	891027	19.45	01	74	51	01	02	3	065			4.54
01	12	891027	19.45	01	74	51	01	02	4	065			2.27
01	13	891027	19.45	01	74	51	01	02	4	063	04 32 s	095 16 w	2.59
01	14	891027	19.45	01	74	51	01	02	4	063			2.92
02	01	891027	19.45	51	01	74	01	01	4	063	04 30 s	095 11 w	10.70
02	02	891027	19.45	05	22	45	01	01	4	063	04 27 s	095 07 w	5.83
02	03	891027	19.45	22	45	05	01	01	4	063			6.16
02	04	891027	19.45	45	05	22	02	01	4	063			0.65
03	01	891027	19.45	45	05	22	02	01	4	063	04 22 s	094 59 w	2.27
04	01	891027	19.45	05	22	45			4	065	04 20 s	094 59 w	7.45
04	02	891027	19.45	05	22	45	02	12	4	065			1.62
04	03	891027	19.45	01	74	51	03	01	4	065	04 18 s	094 55 w	7.13
04	04	891027	19.45	01	74	51	03	01	4	065			3.57
05	01	891027	19.45	51	01	74	04	01	4	065	04 15 s	094 49 w	10.05
05	02	891027	19.45	51	01	74	04	01	5	065			1.62
05	03	891027	19.45	74	51	01	05	01	5	065			2.27
05	04	891027	19.45	74	51	01	05	01	5	065	04 12 s	094 42 w	8.43
05	05	891027	19.45	74	51	01	05	01	5	065			2.27
05	06	891027	19.45	22	45	05			5	065	04 11 s	094 39 w	6.16
06	01	891027	19.45	45	05	22			5	065			6.48
06	02	891027	19.45	05	22	45	06	02	5	065			5.83
06	03	891027	19.45	22	45	05	06	02	5	065	04 06 s	094 28 w	6.48
06	04	891027	19.45	45	05	22	06	02	5	065			6.48
06	05	891027	19.45	05	22	45	06	02	5	065			4.54
06	06	891027	19.45	05	22	45			4	065			1.94
06	07	891027	19.45	51	01	74			4	065	04 01 s	094 19 w	7.78
06	08	891027	19.45	51	01	74			4	065			1.94
06	09	891027	19.45	74	51	01			4	065	03 59 s	094 15 w	9.72
07	01	891027	19.45	01	74	51			4	065	03 54 s	094 09 w	1.62
08	01	891027	19.45	22	45	05			4	065	03 51 s	094 05 w	5.19
01	01	891028	19.45	74	01	51	01	03	4	062	03 14 s	092 42 w	11.34
01	02	891028	19.45	51	74	01			4	062			3.24
02	01	891028	19.45	51	74	01			4	064	03 10 s	092 33 w	4.21
02	02	891028	19.45	01	51	74			4	064	03 09 s	092 30 w	3.89
02	03	891028	19.45	01	51	74	01	02	4	064			7.13
02	04	891028	19.45	22	45	05			4	064	03 07 s	092 26 w	6.48
02	05	891028	19.45	45	05	22	01	02	4	064			2.27
02	06	891028	19.45	45	05	22			4	064	03 04 s	092 22 w	4.86
02	07	891028	19.45	05	22	45			4	064			1.94
02	08	891028	19.45	05	22	45	02	02	4	064			3.89
02	09	891028	19.45	22	45	05			4	064	03 02 s	092 17 w	2.27
02	10	891028	19.45	22	45	05			5	064			3.24
02	11	891028	19.45	22	45	05			5	064			0.97
02	12	891028	19.45	45	05	22			5	064			6.48
02	13	891028	19.45	05	22	45	02	01	4	064			6.48
02	14	891028	19.45	51	74	01			4	064	02 57 s	092 08 w	12.96
02	15	891028	19.45	01	51	74			4	064			12.96
02	16	891028	19.45	74	01	51	03	01	4	064			6.48
03	01	891028	19.45	74	01	51			4	064			2.59
03	02	891028	19.45	22	45	05			4	064	02 48 s	091 51 w	6.48
03	03	891028	19.45	45	05	22			4	064			8.10

Table 2. (continued)

series	leg	date	speed km/hr	observer codes left	observer codes right	observer codes rec.	sun position horz.	sun position vert.	beauf. no.	course (deg.)	position latitude	position longitude	km in leg
03	04	891028	19.45	05	22	45			4	064			4.86
03	05	891028	19.45	05	22	45	06	01	4	064	02 42 s	091 42 w	1.62
03	06	891028	19.45	22	45	05			4	064			6.48
03	07	891028	19.45	45	05	22			4	064	02 40 s	091 39 w	6.48
03	08	891028	19.45	05	22	45			4	064			3.24
03	09	891028	19.45	05	22	45			5	064			1.62
03	10	891028	19.45	01	51	74			5	064	02 39 s	091 35 w	6.48
03	11	891028	19.45	74	01	51			4	064			16.20
03	12	891028	19.45	74	01	51	06	02	4	064			1.94
04	01	891028	19.45	51	74	01			4	064	02 31 s	091 23 w	8.75
04	02	891028	19.45	22	45	05			4	064	02 28 s	091 20 w	4.21
05	01	891028	19.45	45	05	22			4	064	02 26 s	091 16 w	5.51
05	02	891028	19.45	45	05	22	06	03	4	064			1.30
05	03	891028	19.45	05	22	45	06	03	4	064			6.16
05	04	891028	19.45	22	45	05	06	03	4	064	02 24 s	091 12 w	7.13
05	05	891028	19.45	74	01	51	06	03	3	064	02 22 s	091 07 w	7.78
01	01	891029	19.45	45	22	05	01	03	4	066	01 48 s	089 58 w	6.48
01	02	891029	19.45	22	05	45			4	066	01 46 s	089 54 w	6.48
01	03	891029	19.45	05	45	22			4	066			0.97
01	04	891029	19.45	05	45	22	01	02	3	066			1.30
01	05	891029	19.45	05	45	22			3	066	01 44 s	089 51 w	4.21
01	06	891029	19.45	45	22	05			3	066			5.19
01	07	891029	19.45	45	22	05	01	02	3	066			1.30
01	08	891029	19.45	01	51	74	01	02	3	066	01 42 s	089 47 w	2.59
01	09	891029	19.45	01	51	74			3	026			7.13
01	10	891029	19.45	01	51	74			3	026	01 38 s	089 44 w	3.24
01	11	891029	19.45	74	01	51			3	026			6.16
02	01	891029	19.45	51	74	01	01	01	3	075	01 31 s	089 47 w	13.61
02	02	891029	19.45	22	05	45	02	01	3	075	01 28 s	089 41 w	1.62
03	01	891029	19.45	22	05	45			3	075	01 28 s	089 39 w	6.16
03	02	891029	19.45	05	45	22			3	075			6.81
03	03	891029	19.45	45	22	05			3	075			4.86
03	04	891029	19.45	45	22	05	02	01	3	075			2.59
03	05	891029	19.45	22	05	45	03	01	3	075	01 25 s	089 31 w	8.75
03	06	891029	19.45	74	01	51	04	01	3	075	01 23 s	089 26 w	2.92
04	01	891029	19.45	51	74	01	05	01	3	075	01 22 s	089 24 w	14.58
05	01	891029	19.45	74	01	22	05	01	3	075			1.30
05	02	891029	19.45	05	45	22	06	01	3	075	01 16 s	089 12 w	6.48
05	03	891029	19.45	45	22	05			3	075			7.13
05	04	891029	19.45	22	05	45			2	075			1.94
05	05	891029	19.45	22	05	45			3	075			1.94
05	06	891029	19.45	22	05	45			2	075			2.59
05	07	891029	19.45	05	45	22			3	075	01 14 s	089 02 w	4.86
06	01	891029	19.45	51	74	01			3	075	01 10 s	088 54 w	10.70
06	02	891029	19.45	01	51	74			3	075	01 09 s	088 49 w	7.78
06	03	891029	19.45	01	51	74			4	075	01 08 s	088 44 w	0.97
01	01	891030	19.45	01	74	51	02	03	3	028	00 09 s	088 02 w	11.34
02	01	891030	19.45	01	74	51	02	03	3	028	00 05 s	088 00 w	4.54
02	02	891030	19.45	72	01	74			3	028			2.92
03	01	891030	19.45	72	01	74	03	02	4	010	00 01 n	087 58 w	7.78
03	02	891030	19.45	74	72	01	03	02	5	010			15.23
03	03	891030	19.45	22	45	05	03	02	5	010	00 12 n	087 57 w	5.83
03	04	891030	19.45	45	05	22	03	02	5	010			6.48

Table 2. (continued)

series	leg	date	speed km/hr	observer codes left	observer codes right	observer codes rec.	sun position horz.	sun position vert.	beauf. no.	course (deg.)	position latitude	position longitude	km in leg
03	05	891030	19.45	05	22	45	03	02	5	010			6.48
03	06	891030	19.45	22	45	05	03	02	5	010	00 23 n	087 56 w	3.57
03	07	891030	19.45	22	45	05	03	01	5	015			3.24
03	08	891030	19.45	45	05	22	03	01	5	015			6.48
03	09	891030	19.45	05	22	45	03	01	5	015			6.16
03	10	891030	19.45	72	01	74	03	01	5	015	00 33 n	087 54 w	12.96
03	11	891030	19.45	74	72	01	04	01	5	015			12.96
03	12	891030	19.45	01	74	72	05	01	5	015			13.61
03	13	891030	19.45	22	45	05	12	12	5	015	00 49 n	087 50 w	5.83
03	14	891030	19.45	45	05	22	12	12	5	015			6.48
03	15	891030	19.45	05	22	45	07	01	5	015			6.16
03	16	891030	19.45	22	45	05	07	01	5	015	01 04 n	087 47 w	6.81
03	17	891030	19.45	45	05	22	07	01	5	015			6.48
03	18	891030	19.45	05	22	45	07	01	5	015			6.48
03	19	891030	19.45	74	72	01			5	015	01 14 n	087 45 w	6.48
04	01	891030	19.45	01	74	51			5	015			14.26
04	02	891030	19.45	51	01	74			5	015			12.32
04	03	891030	19.45	22	45	05			5	015	01 35 n	087 39 w	6.16
04	04	891030	19.45	45	05	22			5	015			6.48
04	05	891030	19.45	05	22	45			5	015			6.16
04	06	891030	19.45	22	45	05			5	015	01 45 n	087 37 w	8.10
01	01	891031	19.45	22	45	05			4	010	03 07 n	087 23 w	6.48
02	01	891031	19.45	45	05	22			4	010	03 14 n	087 22 w	7.45
02	02	891031	19.45	05	22	45			4	010	03 18 n	087 22 w	9.40
02	03	891031	19.45	01	74	51			4	010	03 23 n	087 21 w	6.48
02	04	891031	19.45	01	74	51			4	010			6.48
02	05	891031	19.45	51	01	74			4	010			6.48
02	06	891031	19.45	51	01	74			5	010	03 33 n	087 19 w	3.57
03	01	891031	19.45	74	51	01			5	010	03 39 n	087 19 w	1.94
03	02	891031	19.45	74	51	01			5	340			0.97
04	01	891031	19.45	74	51	01	05	01	5	340	03 41 n	087 20 w	1.62
04	02	891031	19.45	22	45	05	05	01	5	340			2.27
04	03	891031	19.45	22	45	05			5	350			4.21
04	04	891031	19.45	45	05	22			5	350			6.48
04	05	891031	19.45	05	22	45			5	350			6.48
04	06	891031	19.45	22	45	05			5	350	03 53 n	087 23 w	6.81
04	07	891031	19.45	45	05	22			5	350			6.48
04	08	891031	19.45	05	22	45			6	350			6.16
04	09	891031	19.45	51	01	74			6	350	04 02 n	087 24 w	4.86
05	01	891031	19.45	22	45	05			5	020	04 24 n	087 21 w	5.19
05	02	891031	19.45	22	45	05			5	020			1.62
05	03	891031	19.45	45	05	22			5	020	04 27 n	087 20 w	6.16
06	01	891031	19.45	72	51	74			5	020	04 48 n	087 13 w	3.89
06	02	891031	19.45	72	51	74			5	035			3.57
06	03	891031	19.45	74	01	51			5	035	04 51 n	087 11 w	1.62
01	01	891101	19.45	74	01	51	07	02	5	028	05 42 n	086 56 w	11.02
01	02	891101	19.45	51	74	01	07	02	4	028			8.43
01	03	891101	19.45	51	74	01	07	02	4	028	05 50 n	086 51 w	4.54
01	04	891101	19.45	01	51	74			4	028			6.48
01	05	891101	19.45	01	51	74			5	028			4.54
01	06	891101	19.45	01	51	74			5	028			1.94
01	07	891101	19.45	22	45	05			5	028	05 59 n	086 46 w	6.48
01	08	891101	19.45	45	05	22			5	028			6.48

Table 2. (continued)

series	leg	date	speed km/hr	observer codes left	observer codes right	observer codes rec.	sun position horz.	sun position vert.	beauf. no.	course (deg.)	position latitude	position longitude	km in leg
01	09	891101	19.45	05	22	45	08	03	5	028			6.48
01	10	891101	19.45	22	45	05			5	028	06 09 n	086 40 w	0.32
01	01	891102	19.45	22	45	05			5	020	07 11 n	086 07 w	6.48
01	02	891102	19.45	45	05	22			5	020	07 14 n	086 07 w	3.24
01	03	891102	19.45	45	05	22			4	020			4.54
01	04	891102	19.45	05	22	45			4	020	07 18 n	086 05 w	1.62
01	05	891102	19.45	05	22	45			4	028			4.86
01	06	891102	19.45	22	45	05			4	028			5.19
01	07	891102	19.45	45	05	22	03	02	4	028	07 23 n	086 02 w	6.81
01	08	891102	19.45	05	22	45			4	028	07 28 n	086 00 w	4.54
01	09	891102	19.45	05	22	45	03	02	4	028			1.62
01	10	891102	19.45	22	45	05	03	02	4	028			2.59
02	01	891102	19.45	51	01	74			4	028	07 35 n	085 55 w	8.75
03	01	891102	19.45	45	05	22			4	028	07 53 n	085 42 w	0.65
03	02	891102	19.45	45	05	22			3	024			5.51
03	03	891102	19.45	05	22	45			3	015			6.81
03	04	891102	19.45	22	45	05			4	015	07 59 n	085 39 w	9.07
03	05	891102	19.45	74	51	01			4	015	08 04 n	085 37 w	7.13
03	06	891102	19.45	74	51	01	07	02	4	015			4.86
03	07	891102	19.45	74	51	01			4	015			0.97
04	01	891102	19.45	01	74	51			4	015	08 12 n	085 33 w	2.27
05	01	891102	19.45	45	05	22			3	015	08 20 n	085 30 w	6.48
05	02	891102	19.45	05	22	45			3	015			2.59
05	03	891102	19.45	05	22	45	08	02	3	015	08 23 n	085 29 w	3.57
05	04	891102	19.45	22	45	05	08	02	3	015			6.48
05	05	891102	19.45	45	05	22	08	02	3	022	08 30 n	085 27 w	5.83
05	06	891102	19.45	45	05	22	07	02	3	030			0.97
05	07	891102	19.45	05	22	45	07	02	3	030	08 33 n	085 25 w	6.16
05	08	891102	19.45	22	45	05	07	02	3	030			4.86
05	09	891102	19.45	01	74	51	07	02	3	030	08 38 n	085 23 w	2.92
05	10	891102	19.45	01	74	51	07	02	3	028			4.21
06	01	891102	19.45	51	01	74	07	03	3	028	08 43 n	085 21 w	9.72
06	02	891102	19.45	74	51	01			4	028	08 47 n	085 18 w	4.54
01	01	891109	19.45	05	45	22			2	264	09 23 n	086 14 w	6.48
01	02	891109	19.45	45	22	05	07	03	2	264			6.48
01	03	891109	19.45	22	05	45	07	03	2	264	09 22 n	086 21 w	6.81
01	04	891109	19.45	05	45	22	07	02	2	264			6.48
01	05	891109	19.45	45	22	05	07	02	2	264			6.48
01	06	891109	19.45	22	05	45	07	02	2	264	09 21 n	086 32 w	9.40
01	07	891109	19.45	51	74	01	07	02	2	264	09 21 n	086 37 w	12.96
01	08	891109	19.45	01	51	74	07	02	2	264			12.96
01	09	891109	19.45	74	01	51	07	01	2	264			12.96
01	10	891109	19.45	05	45	22	07	01	2	264	09 18 n	086 58 w	6.48
01	11	891109	19.45	45	22	05	07	01	2	264			6.48
01	12	891109	19.45	22	05	45	08	01	2	264			7.13
01	13	891109	19.45	05	45	22	08	01	2	264	09 17 n	087 08 w	5.83
01	14	891109	19.45	45	22	05	08	01	2	264			6.48
01	15	891109	19.45	22	05	45	09	01	2	264			1.62
01	16	891109	13.89	22	05	45	09	01	2	264			0.23
02	01	891109	13.89	22	05	45	09	01	2	264	09 15 n	087 16 w	1.62
02	02	891109	13.89	01	51	74	09	01	2	264	09 15 n	087 17 w	5.09
03	01	891109	13.89	74	01	51	09	01	1	264	09 15 n	087 20 w	9.95
03	02	891109	13.89	51	74	01	10	01	1	264			8.80

Table 2. (continued)

series	leg	date	speed km/hr	observer codes left	right	rec.	sun position horz.	vert.	beauf. no.	course (deg.)	position latitude	longitude	km in leg
03	03	891109	13.89	05	45	22	10	01	1	264	09 13 n	087 29 w	4.17
03	04	891109	13.89	45	22	05	10	01	1	264			4.63
03	05	891109	13.89	22	05	45	11	02	1	264			4.86
03	06	891109	13.89	05	45	22	11	02	1	264	09 12 n	087 37 w	0.23
04	01	891109	13.89	05	45	22	11	02	1	264	09 12 n	087 37 w	2.08
05	01	891109	13.89	45	22	05	11	02	1	264	09 11 n	087 39 w	4.63
05	02	891109	13.89	22	05	45	11	02	1	264			4.17
05	03	891109	13.89	74	01	51	11	02	1	264	09 11 n	087 43 w	1.16
05	04	891109	13.89	74	01	99	11	02	1	264			1.39
06	01	891109	13.89	74	01	51	11	03	1	264	09 09 n	087 44 w	0.93
06	02	891109	13.89	51	74	01	11	03	1	264			2.08
07	01	891109	13.89	01	51	74	11	03	1	264	09 09 n	087 46 w	5.09
01	01	891110	18.52	01	51	74			2	218	08 54 n	089 10 w	8.95
01	02	891110	18.52	74	01	51			2	218			3.70
01	03	891110	18.52	74	01	51			3	218			8.64
01	04	891110	18.52	51	74	01	09	02	3	218			12.35
01	05	891110	18.52	22	45	05			4	218	08 41 n	089 20 w	4.94
01	06	891110	18.52	22	45	05			5	218			1.54
01	07	891110	18.52	45	05	22			5	218			6.17
01	08	891110	18.52	05	22	45			5	218			5.86
01	09	891110	18.52	22	45	05			5	218	08 34 n	089 26 w	2.16
02	01	891110	18.52	01	74	51			5	218	07 43 n	089 58 w	7.41
02	02	891110	18.52	22	45	05			5	218	07 42 n	090 01 w	6.48
02	03	891110	18.52	45	05	22			5	218			0.93
02	04	891110	18.52	45	05	22			5	220			5.56
02	05	891110	18.52	05	22	45			5	220			2.16
02	06	891110	18.52	05	22	45	01	03	5	220			3.40
02	07	891110	18.52	22	45	05	01	03	5	220	07 33 n	090 08 w	1.85
02	08	891110	18.52	22	45	05			5	220			5.56
01	01	891111	19.45	22	05	45			6	223	06 40 n	090 44 w	3.24
02	01	891111	18.52	51	01	74	09	02	5	223	06 16 n	091 02 w	9.26
03	01	891111	14.82	74	51	01	11	01	5	223	05 56 n	091 17 w	7.16
04	01	891111	13.89	05	45	22			5	223	05 45 n	091 26 w	4.63
04	02	891111	13.89	45	22	05			5	223	05 42 n	091 28 w	4.86
04	03	891111	13.89	22	05	45			5	223			5.09
04	04	891111	13.89	05	45	22			5	223			1.39
04	05	891111	13.89	05	45	22			5	218			2.78
04	06	891111	13.89	05	45	22			6	218	05 36 n	091 34 w	0.23
05	01	891111	13.89	01	74	51			5	218	05 32 n	091 39 w	0.23
01	01	891112	18.52	74	51	01			4	210	04 25 n	092 24 w	3.09
01	02	891112	18.52	74	51	01			4	237			5.86
01	03	891112	18.52	01	74	51			4	237			1.23
02	01	891112	18.52	01	74	51			4	237	04 20 n	092 30 w	1.54
02	02	891112	18.52	01	74	51			4	208			6.17
02	03	891112	18.52	51	01	74			5	208			11.42
03	01	891112	18.52	22	45	05	09	02	5	208	04 02 n	092 39 w	4.94
04	01	891112	18.52	45	05	22	09	01	5	218	03 59 n	092 41 w	9.26
04	02	891112	18.52	01	74	51	09	01	5	218	03 56 n	092 43 w	12.66
04	03	891112	18.52	51	01	74	09	01	5	218			12.04
04	04	891112	18.52	74	51	01	10	01	5	218			12.35
04	05	891112	18.52	05	22	45	11	01	5	218	03 40 n	092 55 w	6.17
04	06	891112	18.52	22	45	05	11	01	5	218			6.48
04	07	891112	18.52	45	05	22	12	01	5	218			6.17

Table 2. (continued)

series	leg	date	speed km/hr	observer codes left	observer codes right	observer codes rec.	sun position horz.	sun position vert.	beauf. no.	course (deg.)	position latitude	position longitude	km in leg
04	08	891112	18.52	05	22	45	12	01	5	215	03 32 n	093 01 w	6.17
04	09	891112	18.52	22	45	05	12	01	5	215			6.17
04	10	891112	18.52	45	05	22			5	215			5.86
04	11	891112	18.52	51	01	74			4	215	03 24 n	093 06 w	12.35
04	12	891112	18.52	74	51	01			4	215			3.70
04	13	891112	18.52	74	51	01	01	01	3	215			9.88
04	14	891112	18.52	01	74	51			3	215			6.48
04	15	891112	18.52	01	74	51	01	02	3	215			4.63
04	16	891112	18.52	45	22	51	01	02	3	215	03 08 n	093 18 w	2.16
04	17	891112	18.52	45	22	05	01	02	3	215			4.01
04	18	891112	18.52	22	05	45	01	02	3	215			6.17
04	19	891112	18.52	05	45	22	01	03	3	215			6.17
05	01	891112	18.52	74	51	01			2	215	02 56 n	093 27 w	1.54
01	01	891113	18.52	22	45	05	09	03	3	205	01 44 n	094 10 w	7.10
01	02	891113	18.52	45	05	22	09	03	3	205	01 40 n	094 12 w	6.17
01	03	891113	18.52	05	22	45	09	03	3	205			6.17
01	04	891113	18.52	22	45	05	09	02	3	205			3.40
02	01	891113	18.52	45	05	22	09	02	3	217	01 29 n	094 13 w	4.01
03	01	891113	19.45	01	74	51	08	02	3	217	01 27 n	094 15 w	10.70
04	01	891113	19.45	51	01	74	08	02	3	217	01 21 n	094 19 w	8.10
04	02	891113	19.45	74	51	01	09	01	3	217	01 18 n	094 22 w	5.19
04	03	891113	19.45	74	51	01	09	01	4	217			4.54
04	04	891113	19.45	05	22	45	10	01	4	176	01 13 n	094 25 w	6.48
04	05	891113	19.45	22	45	05	10	01	4	176			6.48
04	06	891113	19.45	45	05	22	11	01	4	176			6.48
04	07	891113	19.45	05	22	45	11	01	4	176	01 01 n	094 26 w	6.48
04	08	891113	19.45	22	45	05	11	01	4	176			6.48
04	09	891113	19.45	45	05	22	11	01	4	176			1.30
04	10	891113	19.45	45	05	22			4	176			5.19
04	11	891113	19.45	51	01	74	12	01	4	176	00 52 n	094 26 w	11.67
04	12	891113	19.45	51	01	74	01	01	4	168	00 46 n	094 26 w	1.30
04	13	891113	19.45	74	51	01	01	01	4	168			12.96
04	14	891113	19.45	01	74	51	01	01	4	168			12.96
04	15	891113	19.45	05	22	45	02	01	4	168	00 31 n	094 25 w	6.48
04	16	891113	19.45	22	45	05			4	168			6.48
04	17	891113	19.45	45	05	22	02	02	4	168			4.86
04	18	891113	19.45	45	05	22	02	02	5	168			1.62
04	19	891113	19.45	05	22	45	02	02	5	168	00 22 n	094 25 w	6.48
04	20	891113	19.45	22	45	05	02	02	5	168			6.81
04	21	891113	19.45	45	05	22	03	02	5	168			5.51
05	01	891113	19.45	74	51	01	03	02	4	165	00 08 n	094 25 w	7.78
05	02	891113	19.45	01	74	51	03	02	4	165			2.92
06	01	891113	19.45	51	01	74	03	03	4	165	00 01 n	094 26 w	5.83
06	02	891113	19.45	05	22	45	03	03	4	165	00 02 s	094 25 w	6.48
06	03	891113	19.45	22	45	05	03	03	4	165			4.54
01	01	891114	19.45	74	01	51	10	03	3	165	01 16 s	094 18 w	0.97
02	01	891114	19.45	51	74	01	10	03	4	170	01 26 s	094 14 w	1.62
03	01	891114	19.45	51	74	01	10	03	4	170	01 27 s	094 13 w	2.59
03	02	891114	19.45	01	51	74	10	02	4	170			5.19
04	01	891114	19.45	22	45	05	10	02	4	170	01 33 s	094 17 w	6.81
04	02	891114	19.45	45	05	22	10	02	4	170			2.92
05	01	891114	19.45	05	22	45	10	02	4	160	01 40 s	094 14 w	6.16
05	02	891114	19.45	22	45	05	10	01	4	160			6.81

Table 2. (continued)

series	leg	date	speed km/hr	observer codes left	right	rec.	sun position horz.	vert.	beauf. no.	course (deg.)	position latitude	longitude	km in leg
05	03	891114	19.45	45	05	22	11	01	4	160			3.24
06	01	891114	19.45	45	05	22	10	01	4	165	01 49 s	094 12 w	0.65
06	02	891114	19.45	51	74	01	10	01	4	165			4.21
07	01	891114	19.45	01	51	74	11	01	4	170	01 56 s	094 13 w	8.10
07	02	891114	19.45	01	51	74			3	170			3.89
07	03	891114	19.45	74	01	51			3	170			4.21
07	04	891114	19.45	74	01	51	11	01	4	170			7.78
08	01	891114	19.45	05	22	45	01	01	4	170	02 09 s	094 12 w	6.48
08	02	891114	19.45	22	45	05	01	01	4	170	02 14 s	094 10 w	7.13
08	03	891114	19.45	45	05	22	01	01	4	170			8.43
08	04	891114	19.45	05	22	45	03	01	4	170			6.16
08	05	891114	19.45	22	45	05	03	01	4	170	02 23 s	094 09 w	8.10
08	06	891114	19.45	01	51	74	03	01	4	170	02 28 s	094 08 w	1.30
09	01	891114	19.45	74	01	51	03	02	4	170	02 34 s	094 11 w	4.54
09	02	891114	19.45	51	74	01	03	02	4	170			13.94
10	01	891114	19.45	45	05	22	03	02	4	170	02 46 s	094 09 w	6.48
10	02	891114	19.45	05	22	45	03	02	4	170			1.94
11	01	891114	19.45	22	45	05	03	03	4	170	02 51 s	094 11 w	6.81
11	02	891114	19.45	45	05	22	03	03	4	170			5.83
11	03	891114	19.45	74	01	51	03	03	4	170	02 58 s	094 10 w	11.99
01	01	891115	19.45	45	22	05			4	188	04 19 s	094 02 w	6.48
01	02	891115	19.45	22	05	45	09	03	4	188	04 23 s	094 03 w	6.48
01	03	891115	19.45	05	45	22	09	03	4	188			0.65
01	04	891115	19.45	05	45	22			4	188			2.27
02	01	891115	19.45	05	45	22	09	03	4	188	04 28 s	094 04 w	2.59
02	02	891115	19.45	45	22	05	09	03	4	188			6.48
02	03	891115	19.45	22	05	45			4	188	04 34 s	094 05 w	6.16
02	04	891115	19.45	05	45	22			4	188			5.19
02	05	891115	19.45	01	51	74	09	02	4	188	04 39 s	094 05 w	12.32
02	06	891115	19.45	74	01	51	09	02	4	188			13.29
02	07	891115	19.45	51	74	01			4	188			12.64
02	08	891115	19.45	45	22	05			4	188	04 59 s	094 07 w	2.59
02	09	891115	19.45	45	22	05			4	180			4.54
02	10	891115	19.45	22	05	45			4	180			6.16
02	11	891115	19.45	05	45	22			4	180			6.16
02	12	891115	19.45	45	22	05			4	180	05 09 s	094 10 w	6.48
02	13	891115	19.45	22	05	45			4	180			6.16
02	14	891115	19.45	05	45	22			4	180			2.92
02	15	891115	19.45	05	45	22			5	180			4.86
02	16	891115	19.45	74	01	51			4	286	05 18 s	094 14 w	10.70
02	17	891115	19.45	74	01	51	09	12	4	286	05 18 s	094 15 w	3.24
02	18	891115	19.45	51	74	01	09	12	4	286			8.75
03	01	891115	19.45	01	51	74	10	01	4	286	05 14 s	094 25 w	9.72
03	02	891115	19.45	45	22	05	11	01	4	286	05 13 s	094 30 w	6.48
03	03	891115	19.45	22	05	45	11	01	4	286			5.83
03	04	891115	19.45	05	45	22			4	286			6.48
03	05	891115	19.45	45	22	05			4	286	05 09 s	094 40 w	6.48
03	06	891115	19.45	22	05	45			4	286			6.16
03	07	891115	19.45	05	45	22			4	286			6.81
03	08	891115	19.45	51	74	01	11	02	4	286	05 06 s	094 52 w	9.72
03	09	891115	19.45	01	51	74			4	286	05 04 s	094 57 w	8.10
04	01	891115	19.45	01	51	74	11	03	4	286	05 01 s	095 04 w	3.24
04	02	891115	19.45	45	22	05			4	286	05 00 s	095 06 w	3.57

Table 2. (continued)

series	leg	date	speed km/hr	observer codes left	right	rec.	sun position horz.	vert.	beauf. no.	course (deg.)	position latitude	longitude	km in leg
04	03	891115	19.45	45	22	05	11	03	4	286			3.57
04	04	891115	19.45	22	05	45	11	03	4	286			5.83
01	01	891116	19.45	74	51	01			4	287	04 38 s	096 27 w	7.13
02	01	891116	19.45	01	74	51			4	284	04 31 s	096 35 w	8.43
02	02	891116	19.45	51	01	74			4	284			6.81
02	03	891116	19.45	22	45	05			4	284	04 29 s	096 43 w	6.48
02	04	891116	19.45	45	05	22			4	284			6.48
02	05	891116	19.45	05	22	45			4	284			6.48
02	06	891116	19.45	22	45	05			4	284	04 27 s	096 54 w	6.48
02	07	891116	19.45	45	05	22			4	284			6.48
02	08	891116	19.45	05	22	45			4	284			6.48
02	09	891116	19.45	01	74	51			4	284	04 25 s	097 05 w	12.96
02	10	891116	19.45	51	01	74			4	284			6.48
02	11	891116	19.45	51	01	74			4	288	04 23 s	097 15 w	6.48
02	12	891116	19.45	74	51	01			4	288			1.94
03	01	891116	19.45	74	51	01			4	288	04 19 s	097 20 w	3.24
03	02	891116	19.45	45	22	05			4	288	04 18 s	097 22 w	6.48
03	03	891116	19.45	45	05	22			4	288			1.62
04	01	891116	19.45	05	22	45			4	288	04 22 s	097 36 w	2.59
04	02	891116	19.45	05	22	45	11	01	4	288			3.57
05	01	891116	19.45	22	45	05	11	01	4	288	04 20 s	097 41 w	2.59
06	01	891116	19.45	51	01	74	11	01	4	290	04 19 s	097 46 w	10.05
06	02	891116	19.45	74	51	01	11	02	4	290	04 17 s	097 51 w	9.72
06	03	891116	19.45	01	74	51	11	02	4	290	04 14 s	097 57 w	9.72
06	04	891116	19.45	45	05	22	11	02	4	290	04 14 s	098 03 w	6.48
06	05	891116	19.45	05	22	45	11	02	4	290			6.48
06	06	891116	19.45	22	45	05	11	02	4	290			6.48
06	07	891116	19.45	45	05	22	11	02	4	290	04 10 s	098 12 w	2.27
06	08	891116	19.45	45	05	22	11	03	4	290			7.45
06	09	891116	19.45	74	51	01	11	03	4	290	04 08 s	098 18 w	9.72
06	10	891116	19.45	01	74	51	11	03	4	290	04 06 s	098 22 w	9.72
01	01	891117	19.45	22	45	05			4	290	03 41 s	099 43 w	6.48
01	02	891117	19.45	45	05	22			4	290	03 39 s	099 48 w	6.48
01	03	891117	19.45	05	22	45			4	290			6.81
01	04	891117	19.45	22	45	05			4	290			6.48
01	05	891117	19.45	45	05	22			4	290	03 37 s	099 58 w	6.81
01	06	891117	19.45	05	22	45			4	290			6.16
01	07	891117	19.45	22	45	05			4	290			7.13
01	08	891117	19.45	01	74	51			4	290	03 36 s	100 09 w	12.96
01	09	891117	19.45	51	01	74			4	290			12.96
01	10	891117	19.45	74	51	01			4	290			11.99
01	11	891117	19.45	74	51	01			4	300			0.97
01	12	891117	19.45	45	05	22			4	300	03 31 s	100 30 w	4.21
01	13	891117	19.45	22	05	01			4	300			5.83
01	14	891117	19.45	05	22	45			4	300	03 30 s	100 35 w	6.48
01	15	891117	19.45	22	45	05			4	300			0.97
02	01	891117	19.45	22	45	05			4	300	03 27 s	100 40 w	0.97
03	01	891117	19.45	45	05	22			4	300			6.48
03	02	891117	19.45	05	22	45	09	12	4	300			6.16
03	03	891117	19.45	51	01	74	09	01	4	300	03 24 s	100 49 w	6.16
04	01	891117	19.45	01	74	51	10	01	5	300	03 15 s	100 52 w	12.96
04	02	891117	19.45	22	45	05	10	01	5	300	03 12 s	100 53 w	6.48
04	03	891117	19.45	45	05	22	10	02	5	300			6.48

Table 2. (continued)

series	leg	date	speed km/hr	observer codes left	right	rec.	sun position horz.	vert.	beauf. no.	course (deg.)	position latitude	longitude	km in leg
04	04	891117	19.45	05	22	45	11	02	5	300			2.27
05	01	891117	19.45	05	22	45	11	02	5	300	03 09 s	101 08 w	0.32
05	02	891117	19.45	22	45	05	11	02	5	300			6.48
05	03	891117	19.45	45	05	22	11	02	5	300			5.51
05	04	891117	19.45	45	05	22	11	02	5	290			1.62
05	05	891117	19.45	05	22	45	11	03	5	290			5.83
05	06	891117	19.45	74	51	01	11	03	5	290	03 06 s	101 17 w	5.19
06	01	891117	19.45	74	51	01	11	03	5	290	03 07 s	101 20 w	2.59
06	02	891117	19.45	01	74	51	11	03	5	290	03 06 s	101 21 w	9.40
06	03	891117	19.45	51	01	74	11	03	5	284	03 05 s	101 28 w	5.51
01	01	891118	19.45	51	74	01			4	290	02 48 s	102 45 w	9.72
02	01	891118	19.45	01	51	74			5	290	02 46 s	102 54 w	1.30
03	01	891118	19.45	01	51	74			5	290	02 46 s	102 55 w	3.24
03	02	891118	19.45	01	51	74			5	300	02 46 s	102 57 w	8.10
03	03	891118	19.45	74	01	51			4	300	02 43 s	103 01 w	11.34
03	04	891118	19.45	22	45	05			4	300	02 41 s	103 07 w	6.48
03	05	891118	19.45	45	05	22			4	300			6.48
03	06	891118	19.45	05	22	45			4	300			6.48
03	07	891118	19.45	22	45	05			4	300	02 36 s	103 16 w	5.19
04	01	891118	19.45	45	05	22			5	285	02 30 s	103 21 w	2.59
04	02	891118	19.45	01	51	74			4	285	02 30 s	103 23 w	1.30
05	01	891118	19.45	01	51	74			4	285	02 30 s	103 28 w	2.59
05	02	891118	19.45	74	01	51			4	285			11.99
06	01	891118	19.45	45	05	22	12	12	4	285			7.13
06	02	891118	19.45	05	22	45	10	01	5	285	02 23 s	103 47 w	6.48
06	03	891118	19.45	22	45	05	10	01	5	285			1.62
07	01	891118	19.45	22	45	05	10	01	5	285	02 22 s	103 52 w	3.89
07	02	891118	19.45	45	05	22	10	01	5	285			6.48
07	03	891118	19.45	05	22	45	11	01	5	285	02 21 s	103 56 w	8.10
07	04	891118	19.45	74	01	51	11	01	5	285	02 14 s	104 02 w	6.48
07	05	891118	19.45	51	74	01	11	02	5	285			8.10
08	01	891118	19.45	51	74	01	11	02	5	285	02 19 s	104 12 w	3.24
09	01	891118	19.45	22	45	05	11	02	5	285	02 17 s	104 17 w	4.54
10	01	891118	19.45	45	05	22	11	02	5	285	02 16 s	104 20 w	6.81
10	02	891118	19.45	05	22	45	11	03	4	285	02 15 s	104 21 w	4.86
10	03	891118	19.45	22	45	05	11	03	4	285			4.86
10	04	891118	19.45	74	51	01	11	03	4	285	02 14 s	104 31 w	4.21
01	01	891119	19.45	45	22	05			5	285	01 49 s	105 54 w	7.13
01	02	891119	19.45	22	05	45			5	285			5.83
01	03	891119	19.45	05	45	22			4	285			7.13
01	04	891119	19.45	45	22	05			4	285	01 46 s	106 04 w	6.48
01	05	891119	19.45	22	05	45			4	285			5.83
01	06	891119	19.45	05	45	22			4	285			6.48
01	07	891119	19.45	01	74	51			4	285	01 43 s	106 15 w	6.16
01	08	891119	19.45	01	74	51			4	285			10.05
01	09	891119	19.45	51	01	74			4	285			4.54
01	10	891119	19.45	51	01	74			4	282	01 40 s	106 26 w	5.19
01	11	891119	19.45	74	51	01			4	282			4.54
02	01	891119	19.45	74	51	01			4	282	01 38 s	106 34 w	3.24
02	02	891119	19.45	45	22	05			4	282	01 38 s	106 36 w	6.81
02	03	891119	19.45	22	05	45			4	282			5.83
02	04	891119	19.45	05	45	22			4	282			3.57
03	01	891119	19.45	45	22	05			3	282	01 34 s	106 51 w	6.48

Table 2. (continued)

series	leg	date	speed km/hr	observer codes left	observer codes right	observer codes rec.	sun position horz.	sun position vert.	beauf. no.	course (deg.)	position latitude	position longitude	km in leg
03	02	891119	19.45	51	01	74			3	282	01 33 s	106 55 w	6.16
04	01	891119	19.45	51	01	74			3	284	01 33 s	107 00 w	1.30
04	02	891119	19.45	74	51	01			3	284			2.59
04	03	891119	19.45	74	51	01			4	284			10.37
04	04	891119	19.45	01	74	51			4	284			7.78
04	05	891119	19.45	01	74	51			3	284			5.19
05	01	891119	19.45	22	05	45			3	284	01 28 s	107 17 w	5.51
05	02	891119	19.45	22	05	45	11	01	3	284			0.65
05	03	891119	19.45	05	45	22	11	01	3	284			3.57
05	04	891119	19.45	05	45	22	11	02	3	284	01 27 s	107 23 w	2.92
05	05	891119	19.45	45	22	05	11	02	3	284			6.48
06	01	891119	19.45	22	05	45			3	284			6.16
06	02	891119	19.45	05	45	22			3	284	01 24 s	107 31 w	10.37
06	03	891119	19.45	74	51	01			3	284	01 23 s	107 36 w	6.48
07	01	891119	19.45	01	74	51			3	284	01 21 s	107 41 w	9.72
08	01	891119	19.45	22	45	05			3	284	01 18 s	107 52 w	1.30
01	01	891120	19.45	51	01	74			2	284	00 53 s	109 11 w	10.05
01	02	891120	19.45	74	51	01			2	284			2.92
02	01	891120	19.45	74	51	01			2	284	00 53 s	109 20 w	2.59
03	01	891120	19.45	01	74	51			3	284	00 53 s	109 28 w	0.32
04	01	891120	19.45	01	74	51			3	284	00 53 s	109 29 w	4.86
05	01	891120	19.45	22	45	05			3	284	00 52 s	109 32 w	6.48
05	02	891120	19.45	45	05	22			3	284			4.21
05	03	891120	19.45	45	05	22			3	292			2.92
05	04	891120	19.45	05	22	45			3	292			6.48
05	05	891120	19.45	22	45	05			3	292	00 49 s	109 42 w	5.19
06	01	891120	19.45	74	51	01			3	292	00 44 s	109 50 w	12.96
06	02	891120	19.45	01	74	51	07	01	3	292			8.75
06	03	891120	19.45	01	74	51			3	292	00 40 s	110 02 w	4.21
06	04	891120	19.45	51	01	74			3	292			12.96
06	05	891120	19.45	45	05	22			3	292	00 26 s	110 08 w	7.13
06	06	891120	19.45	05	22	45			3	292			6.16
06	07	891120	19.45	22	45	05			3	292			6.48
06	08	891120	19.45	45	05	22			3	292	00 33 s	110 24 w	6.48
06	09	891120	19.45	05	22	45			3	292			6.16
06	10	891120	19.45	22	45	05			3	292			6.48
06	11	891120	19.45	01	74	51			3	292	00 29 s	110 36 w	13.61
06	12	891120	19.45	51	74	51			3	292			12.32
06	13	891120	19.45	74	51	01			3	292			4.86
07	01	891120	19.45	74	51	01	11	02	4	292	00 22 s	110 55 w	0.97
07	02	891120	19.45	45	05	22	11	02	4	292			10.05
07	03	891120	19.45	05	22	45	11	02	4	292	00 20 s	111 02 w	9.40
07	04	891120	19.45	22	45	05	11	03	4	292	00 20 s	111 10 w	9.72
07	05	891120	19.45	51	01	74	11	03	4	292			14.58
01	01	891121	19.45	22	05	45			4	286	00 12 n	112 54 w	6.48
01	02	891121	19.45	05	45	22	06	03	4	286			6.16
01	03	891121	19.45	45	22	05			4	286	00 14 n	113 01 w	7.13
01	04	891121	19.45	22	05	45			4	286			6.16
01	05	891121	19.45	05	45	22	06	02	4	286			4.86
01	06	891121	19.45	05	45	22	06	02	5	286			0.97
01	07	891121	19.45	01	74	51	06	02	5	286	00 17 n	113 14 w	13.29
01	08	891121	19.45	51	01	74	06	02	5	286			12.64
01	09	891121	19.45	74	51	01	06	02	5	286			13.61

Table 2. (continued)

series	leg	date	speed km/hr	observer codes left	right	rec.	sun position horz.	vert.	beauf. no.	course (deg.)	position latitude	longitude	km in leg
01	10	891121	19.45	45	22	05	06	01	5	286	00 23 n	113 40 w	7.13
01	11	891121	19.45	22	05	45	06	01	5	286			5.51
02	01	891121	19.45	05	45	22	06	01	5	286	00 28 n	113 48 w	6.16
02	02	891121	19.45	45	22	05	06	01	5	286	00 29 n	113 51 w	6.81
02	03	891121	19.45	22	05	45	07	01	5	286			4.86
02	04	891121	19.45	22	05	45			5	286			1.30
02	05	891121	19.45	05	45	22			5	286			4.54
02	06	891121	19.45	51	01	74			5	286	00 32 n	114 04 w	1.62
03	01	891121	19.45	74	51	01	09	01	5	286	00 36 n	114 10 w	4.86
04	01	891121	19.45	01	74	51	09	01	5	286	00 37 n	114 16 w	13.61
04	02	891121	19.45	45	22	05	10	01	5	286	00 40 n	114 25 w	6.48
04	03	891121	19.45	22	05	45	11	01	5	286			6.16
04	04	891121	19.45	05	45	22	11	01	5	286			6.81
04	05	891121	19.45	45	22	05	11	01	5	286	00 43 n	114 37 w	6.48
04	06	891121	19.45	22	05	45	11	02	5	286			6.16
04	07	891121	19.45	05	45	22	11	02	5	286			7.13
05	01	891121	19.45	74	51	01			4	286	00 50 n	114 52 w	8.10
05	02	891121	19.45	01	74	51			4	286			13.29
05	03	891121	19.45	45	22	05			4	286	00 53 n	115 08 w	6.48
05	04	891121	19.45	22	05	45			4	286			1.62
06	01	891121	19.45	05	45	22			4	286	00 55 n	115 15 w	1.94
01	01	891122	19.45	74	51	01			3	280	01 24 n	116 50 w	7.78
01	02	891122	19.45	01	74	51			3	280	01 25 n	116 54 w	10.05
01	03	891122	19.45	51	01	74			3	280	01 27 n	116 59 w	6.48
01	04	891122	19.45	51	01	74			4	280			2.92
01	05	891122	19.45	22	45	05			4	280	01 28 n	117 05 w	6.48
01	06	891122	19.45	45	05	22			4	280			6.48
01	07	891122	19.45	05	22	45	06	02	4	280			3.89
02	01	891122	19.45	22	45	05			4	286	01 31 n	117 16 w	5.83
02	02	891122	19.45	45	05	22			4	286			6.48
02	03	891122	19.45	05	22	45			4	286			1.94
03	01	891122	19.45	01	74	51			4	286	01 36 n	117 28 w	6.48
03	02	891122	19.45	01	74	51			4	286	01 37 n	117 32 w	4.86
03	03	891122	19.45	51	01	74			4	286			6.48
03	04	891122	19.45	51	01	74			4	273	01 39 n	117 38 w	5.83
03	05	891122	19.45	74	51	01			4	273			12.96
03	06	891122	19.45	22	45	05			4	273	01 41 n	117 49 w	6.48
03	07	891122	19.45	45	05	22	09	01	4	273			6.48
03	08	891122	19.45	05	22	45	10	01	5	273			6.81
03	09	891122	19.45	22	45	05	10	01	5	273	01 42 n	118 01 w	1.30
03	10	891122	19.45	22	45	05	10	01	5	268			4.86
03	11	891122	19.45	45	05	22	10	01	5	268			6.48
03	12	891122	19.45	05	22	45	10	01	5	268			6.81
03	13	891122	19.45	51	01	74	10	01	5	268	01 42 n	118 12 w	0.97
04	01	891122	19.45	51	01	74	10	01	5	268	01 41 n	118 17 w	6.81
04	02	891122	19.45	74	51	01	11	01	5	268			9.07
04	03	891122	19.45	74	51	01	10	02	5	288	01 43 n	118 26 w	3.89
04	04	891122	19.45	01	74	51	10	02	5	288			3.89
04	05	891122	19.45	01	74	51			5	265	01 45 n	118 30 w	7.13
04	06	891122	19.45	01	74	51	11	02	5	265			2.27
04	07	891122	19.45	22	45	05	11	02	5	265	01 45 n	118 36 w	5.83
04	08	891122	19.45	45	05	22	11	02	5	285			7.45
04	09	891122	19.45	05	22	45	11	02	5	285			5.83

Table 2. (continued)

series	leg	date	speed km/hr	observer codes left	right	rec.	sun position horz.	vert.	beauf. no.	course (deg.)	position latitude	longitude	km in leg
04	10	891122	19.45	22	45	05	11	02	5	285	01 47 n	118 48 w	4.86
04	11	891122	19.45	45	05	22	11	02	5	285			4.86
04	12	891122	19.45	74	51	01			4	285	01 49 n	118 54 w	2.59
04	13	891122	19.45	74	51	01			4	265			3.89
04	14	891122	19.45	01	74	51			4	265			4.54
04	15	891122	19.45	01	74	51	11	03	4	285	01 50 n	119 01 w	2.27
04	16	891122	19.45	51	01	74	11	03	4	285			11.34
01	01	891123	19.45	22	45	05			4	270	01 48 n	120 40 w	6.48
01	02	891123	19.45	45	05	22			4	270			6.48
01	03	891123	19.45	05	22	45	07	03	4	270			6.48
01	04	891123	19.45	22	45	05	07	03	4	270	01 48 n	120 51 w	6.48
01	05	891123	19.45	45	05	22			4	270			6.48
01	06	891123	19.45	05	22	45			4	270			7.13
01	07	891123	19.45	51	01	74	07	02	4	270	01 48 n	121 02 w	12.32
01	08	891123	19.45	74	51	01			4	270			12.96
01	09	891123	19.45	01	74	51	07	01	5	270			12.96
01	10	891123	19.45	22	45	05	07	01	5	270	01 49 n	121 24 w	6.48
01	11	891123	19.45	45	05	22	07	01	5	270			6.48
01	12	891123	19.45	05	22	45	08	01	5	270			6.48
01	13	891123	19.45	22	45	05	08	01	5	270	01 50 n	121 35 w	6.81
01	14	891123	19.45	45	05	22	08	01	5	270			0.97
02	01	891123	19.45	74	51	01	09	01	4	270	01 50 n	121 47 w	11.34
02	02	891123	19.45	01	74	51	10	01	4	270			12.32
02	03	891123	19.45	51	01	74	10	01	5	270			7.13
02	04	891123	19.45	51	01	74	10	01	5	265			5.83
02	05	891123	19.45	22	45	05	11	01	5	265	01 50 n	122 11 w	6.48
02	06	891123	19.45	45	05	22	11	02	5	265			6.48
02	07	891123	19.45	05	22	45	11	02	5	265			6.48
02	08	891123	19.45	22	45	05	11	02	5	265	01 50 n	122 20 w	6.48
02	09	891123	19.45	45	05	22	11	02	5	265			3.24
02	10	891123	19.45	45	05	22	10	02	5	295	01 50 n	122 26 w	4.54
02	11	891123	19.45	05	22	45	10	02	5	295			5.19
02	12	891123	19.45	01	74	51	10	02	5	295	01 53 n	122 31 w	4.86
02	13	891123	19.45	01	51	99	10	02	5	295			0.97
02	14	891123	19.45	01	74	51	10	02	5	295			5.83
02	15	891123	19.45	51	01	74	10	03	4	295	01 55 n	122 37 w	3.57
03	01	891123	19.45	74	51	01	10	03	4	295	01 59 n	122 41 w	6.81
01	01	891124	19.45	74	51	01	06	03	4	273	01 55 n	124 15 w	10.37
01	02	891124	19.45	01	74	51	07	03	4	273			6.16
02	01	891124	19.45	01	74	51	07	03	4	276			5.19
02	02	891124	19.45	51	01	74	07	02	4	276			9.72
02	03	891124	19.45	51	01	74	07	02	5	276			2.59
02	04	891124	19.45	22	45	05	07	02	5	276	01 56 n	124 36 w	6.48
02	05	891124	19.45	45	05	22	07	02	5	276			6.48
02	06	891124	19.45	05	22	45	07	02	5	276			6.48
02	07	891124	19.45	22	45	05	07	02	5	276	01 57 n	124 47 w	6.48
02	08	891124	19.45	45	05	22	07	02	5	276			6.48
02	09	891124	19.45	05	22	45	07	01	5	276			7.13
02	10	891124	19.45	01	74	51	07	01	5	276	01 58 n	124 58 w	12.96
02	11	891124	19.45	51	01	74	08	01	5	276			10.70
02	12	891124	19.45	51	01	74	08	01	5	274			2.92
02	13	891124	19.45	74	51	01	08	01	5	274			4.54
03	01	891124	19.45	22	45	05	09	01	4	274	01 59 n	125 21 w	5.83

Table 2. (continued)

series	leg	date	speed km/hr	observer codes left	observer codes right	observer codes rec.	sun position horz.	sun position vert.	beauf. no.	course (deg.)	position latitude	position longitude	km in leg
03	02	891124	19.45	45	05	22	09	01	4	274			6.48
03	03	891124	19.45	05	22	45	10	01	4	274			6.48
03	04	891124	19.45	22	45	05	10	01	4	274	02 00 n	125 33 w	6.48
03	05	891124	19.45	45	05	22	10	01	4	274			6.48
03	06	891124	19.45	05	22	45	10	01	4	274			6.48
03	07	891124	19.45	51	01	74	10	01	4	274	02 01 n	125 44 w	10.05
04	01	891124	19.45	74	51	01	11	02	4	274	02 00 n	125 52 w	5.51
04	02	891124	19.45	74	51	01			4	060	02 01 n	125 55 w	5.83
04	03	891124	19.45	01	74	51	06	02	5	060			12.96
04	04	891124	19.45	22	45	05			5	060	02 06 n	125 46 w	9.72
04	05	891124	19.45	45	05	22	06	02	5	060			9.72
04	06	891124	19.45	05	22	45	06	03	5	060	02 11 n	125 37 w	9.72
04	07	891124	19.45	74	51	01	06	03	5	060			5.51
05	01	891124	19.45	74	51	01			5	060	02 15 n	125 26 w	3.57
01	01	891125	19.45	45	22	05			5	065	02 54 n	124 29 w	6.48
01	02	891125	19.45	22	05	45			5	065	02 55 n	124 26 w	7.13
02	01	891125	19.45	01	74	51	02	02	5	065	03 02 n	124 13 w	3.24
02	02	891125	19.45	01	74	51	02	02	5	065			7.45
03	01	891125	19.45	51	01	74			5	065	03 07 n	124 02 w	4.21
03	02	891125	19.45	51	01	74			5	065			5.51
03	03	891125	19.45	05	45	22	02	01	5	065	03 09 n	123 57 w	2.92
03	04	891125	19.45	05	45	22			6	065			1.94
01	01	891127	19.45	22	45	05			5	310	06 54 n	123 07 w	6.48
01	02	891127	19.45	45	05	22			5	310			6.48
01	03	891127	19.45	05	22	45			5	310	06 59 n	123 12 w	6.48
01	04	891127	19.45	22	45	05			5	310			6.48
01	05	891127	19.45	45	05	22			5	310	07 03 n	123 16 w	7.78
01	06	891127	19.45	51	01	74			5	310	07 06 n	123 20 w	12.96
01	07	891127	19.45	74	51	01			5	310			11.02
02	01	891127	19.45	01	74	51			4	308	07 17 n	123 30 w	11.02
03	01	891127	19.45	05	22	45			4	308	07 23 n	123 36 w	2.92
03	02	891127	19.45	05	22	45			4	305	07 24 n	123 37 w	2.59
03	03	891127	19.45	05	22	45			3	305			1.30
03	04	891127	19.45	22	45	05			3	305			3.89
04	01	891127	19.45	74	51	01			3	305	07 35 n	123 50 w	8.43
05	01	891127	19.45	01	74	51			3	305	07 40 n	123 59 w	3.89
05	02	891127	19.45	01	74	51	09	01	4	305			5.83
05	03	891127	19.45	51	01	74	09	01	4	305	07 43 n	124 01 w	10.37
05	04	891127	19.45	45	05	22	09	01	4	305	07 45 n	124 05 w	5.83
05	05	891127	19.45	05	22	45	10	01	4	305			6.81
05	06	891127	19.45	22	45	05	10	01	4	305			6.16
05	07	891127	19.45	45	05	22	10	02	4	305	07 51 n	124 14 w	4.86
06	01	891127	19.45	05	22	45	10	02	4	305	07 57 n	124 12 w	9.40
06	02	891127	19.45	01	74	51	10	02	4	305	08 00 n	124 16 w	5.19
07	01	891127	19.45	01	74	51	10	02	4	305	08 03 n	124 17 w	2.27
07	02	891127	19.45	51	01	74	10	02	4	305			2.59
07	03	891127	19.45	51	01	74	10	02	4	300			6.48
07	04	891127	19.45	74	51	01	10	03	4	300	08 07 n	124 21 w	9.72
07	05	891127	19.45	22	45	05			4	300	08 10 n	124 24 w	5.83
01	01	891128	19.45	22	45	05			3	055	09 53 n	125 00 w	6.48
01	02	891128	19.45	45	05	22			3	055	09 55 n	124 56 w	5.83
01	03	891128	19.45	05	22	45			3	055			5.51
01	04	891128	19.45	51	01	74			2	055	09 58 n	124 52 w	7.13

Table 2. (continued)

series	leg	date	speed km/hr	observer codes left	right	rec.	sun position horz.	vert.	beauf. no.	course (deg.)	position latitude	longitude	km in leg
01	01	891129	19.45	22	45	05			4	055	10 53 n	123 32 w	6.81
01	02	891129	19.45	45	05	22			4	055			4.54
01	03	891129	19.45	45	05	22	02	03	4	055			1.94
01	04	891129	19.45	05	22	45	02	03	4	055	10 57 n	123 28 w	0.65
01	05	891129	19.45	05	22	45	02	03	4	058			6.48
01	06	891129	19.45	22	45	05	02	03	4	058			6.48
01	07	891129	19.45	45	05	22	02	02	4	058			2.59
01	08	891129	19.45	45	05	22			4	058			3.24
01	09	891129	19.45	51	74	01	02	02	4	058	11 01 n	123 20 w	4.54
01	10	891129	19.45	51	74	01			4	058			1.94
01	11	891129	19.45	51	74	01			4	058			6.48
01	12	891129	19.45	01	51	74			4	058			12.96
01	13	891129	19.45	74	01	51	02	02	5	058			2.59
01	14	891129	19.45	74	01	51			5	058	11 09 n	123 09 w	3.57
01	15	891129	19.45	74	01	51	02	02	5	058			1.62
02	01	891129	19.45	74	01	51	02	02	5	058	11 10 n	123 07 w	0.65
03	01	891129	19.45	05	22	45	03	01	5	058	11 16 n	123 59 w	6.48
03	02	891129	19.45	22	45	05	04	01	5	058			6.81
03	03	891129	19.45	45	05	22	04	01	5	058	11 19 n	122 55 w	8.75
03	04	891129	19.45	01	51	74	04	01	5	058	11 21 n	122 51 w	13.29
03	05	891129	19.45	74	01	51	04	01	5	058			12.64
03	06	891129	19.45	51	74	01	05	01	5	058			11.02
03	07	891129	19.45	51	74	01	05	01	5	058			1.94
03	08	891129	19.45	05	22	45			5	058	11 31 n	122 36 w	6.81
03	09	891129	19.45	22	45	05			5	058			6.48
03	10	891129	19.45	45	05	22			5	058			6.16
03	11	891129	19.45	05	22	45			4	058			4.21
04	01	891129	19.45	22	45	05			5	058	11 39 n	122 26 w	1.94
04	02	891129	19.45	74	01	51			5	058	11 39 n	122 25 w	10.70
04	03	891129	19.45	51	74	01			5	058	11 42 n	122 21 w	8.75
04	04	891129	19.45	01	51	74			5	058	11 44 n	122 17 w	8.75
01	01	891130	19.45	74	01	51			5	330	13 11 n	122 46 w	9.40
01	02	891130	19.45	74	01	51	05	02	5	330			1.94
01	01	891202	19.45	22	45	05	05	02	5	040	19 53 n	120 41 w	6.81
01	02	891202	19.45	45	05	22	06	02	5	040	19 57 n	120 37 w	5.83
01	03	891202	19.45	45	05	22	06	02	5	050			0.32
02	01	891202	19.45	05	22	45	06	02	5	050	19 59 n	120 35 w	3.24
02	02	891202	19.45	01	74	51	06	02	5	050	20 00 n	120 34 w	11.34
02	03	891202	19.45	01	74	51	06	02	5	036	20 01 n	120 32 w	1.62
02	04	891202	19.45	51	01	74	06	02	5	036			12.96
02	05	891202	19.45	74	51	01	07	02	5	036			12.96
02	06	891202	19.45	05	22	45	07	03	5	036	20 15 n	120 23 w	6.48
02	07	891202	19.45	22	45	05	07	03	6	036			6.48
01	01	891203	19.45	74	01	51	03	02	5	032	22 03 n	118 59 w	11.34
01	02	891203	19.45	51	74	01	03	02	5	032			11.34
01	03	891203	19.45	01	51	74	03	02	5	032			3.24
02	01	891203	19.45	01	51	74	03	02	5	032	22 14 n	118 51 w	6.48
02	02	891203	19.45	22	45	05	03	02	5	032	22 17 n	118 49 w	6.48
02	03	891203	19.45	45	05	22	03	02	5	032			6.48
02	04	891203	19.45	05	22	45	04	02	5	032			6.48
02	05	891203	19.45	22	45	05	04	02	5	032	22 25 n	118 45 w	2.27
02	06	891203	19.45	22	45	05	04	02	5	035			4.21
02	07	891203	19.45	45	05	22	05	02	5	035			6.48

Table 2. (continued)

series	leg	date	speed km/hr	observer codes left	right	rec.	sun position horz.	vert.	beauf. no.	course (deg.)	position latitude	longitude	km in leg
02	08	891203	19.45	05	22	45	05	01	5	035			6.48
02	09	891203	19.45	51	74	01	05	01	5	035	22 33 n	118 40 w	8.10
03	01	891203	19.45	01	51	74	06	01	5	035	22 37 n	118 36 w	7.45
03	02	891203	19.45	74	01	51	06	01	5	035			8.10
03	03	891203	19.45	22	45	05	06	01	5	035	22 47 n	118 31 w	4.21
03	04	891203	19.45	22	45	05	06	02	5	040	22 50 n	118 31 w	1.94
03	05	891203	19.45	45	05	22	06	02	5	040			6.48
03	06	891203	19.45	05	22	45	06	02	5	040			6.48
03	07	891203	19.45	22	45	05	06	02	5	040	22 55 n	118 25 w	6.48
03	08	891203	19.45	45	05	22	06	02	5	040			6.48
03	09	891203	19.45	05	22	45	06	02	5	040	23 01 n	118 17 w	6.48
03	10	891203	19.45	01	51	74	07	03	5	040			9.72
03	11	891203	19.45	74	01	51	07	03	5	040			6.16
03	12	891203	19.45	74	01	51	07	03	4	040			3.57
01	01	891204	19.45	51	74	01	03	03	5	030	24 14 n	117 17 w	11.34
01	02	891204	19.45	01	51	74	03	03	5	030			11.34
01	03	891204	19.45	74	01	51	03	03	5	030	24 22 n	117 10 w	11.34
01	04	891204	19.45	22	45	05	03	02	5	030	24 26 n	117 07 w	7.13
01	05	891204	19.45	45	05	22	03	02	5	030			5.83
01	06	891204	19.45	05	22	45	03	02	5	030			6.48
01	07	891204	19.45	22	45	05	03	02	5	030	24 34 n	117 01 w	6.48
01	08	891204	19.45	45	05	22	04	02	5	030			6.48
01	09	891204	19.45	05	22	45	04	02	5	030			6.48
01	10	891204	19.45	01	51	74	04	02	5	030	24 42 n	116 56 w	12.96
01	11	891204	19.45	74	01	51	04	02	5	030			8.43
01	01	891205	19.45	22	45	05	03	03	5	030	26 55 n	115 33 w	6.16
01	02	891205	19.45	45	05	22	03	03	5	030			6.16
01	03	891205	19.45	05	22	45	03	03	5	030	26 59 n	115 30 w	6.48
01	04	891205	19.45	22	45	05	03	03	5	030			6.48
01	05	891205	19.45	45	05	22	03	03	5	030			6.48
01	06	891205	19.45	01	74	51	03	02	5	030	27 07 n	115 25 w	13.29
01	07	891205	19.45	51	01	74	03	02	5	030			9.40
01	08	891205	19.45	51	01	74	03	02	4	030			3.24
01	09	891205	19.45	74	51	01	03	02	4	030			12.96
01	10	891205	19.45	05	22	45	04	02	4	030	27 24 n	115 15 w	6.48
01	11	891205	19.45	22	45	05	04	02	4	030			6.48
01	12	891205	19.45	45	05	22	04	02	4	030			6.48
01	13	891205	19.45	05	22	45	04	02	4	030	27 33 n	115 10 w	6.48
01	14	891205	19.45	22	45	05	05	02	4	030			6.48
01	15	891205	19.45	45	05	22	05	02	4	030			1.94
02	01	891205	19.45	51	01	74	08	02	3	308	27 42 n	115 05 w	9.72
02	02	891205	19.45	74	51	01	08	02	3	311			4.54
02	03	891205	19.45	74	51	01	09	02	2	314	27 46 n	115 12 w	6.48
02	04	891205	19.45	01	74	51	09	02	3	314			6.16
02	05	891205	19.45	01	74	51	09	02	4	314			2.27
03	01	891205	19.45	05	22	45	09	02	4	305	27 55 n	115 20 w	7.13
03	02	891205	19.45	22	45	05	09	02	4	305			6.16
03	03	891205	19.45	45	05	22	09	02	4	305			6.81
03	04	891205	19.45	05	22	45	10	02	3	305	27 57 n	115 25 w	5.83
03	05	891205	19.45	22	45	05	10	03	3	305			6.48
03	06	891205	19.45	45	05	22	10	03	3	305			6.48
03	07	891205	19.45	74	51	01	08	03	3	355	27 58 n	115 30 w	6.48
03	08	891205	19.45	01	74	51	08	03	2	355			7.78

Table 2. (continued)

series	leg	date	speed km/hr	observer codes left	observer codes right	observer codes rec.	sun position horz.	sun position vert.	beauf. no.	course (deg.)	position latitude	position longitude	km in leg
01	01	891206	19.45	45	05	22			1	340	30 08 n	116 35 w	6.48
01	02	891206	19.45	05	22	45	04	02	1	025	30 11 n	116 36 w	4.21
01	03	891206	19.45	05	22	45	05	02	1	346			2.59
01	04	891206	19.45	22	01	05	05	02	1	346			4.21
02	01	891206	19.45	01	74	51	05	02	1	347	30 25 n	116 39 w	8.10
02	02	891206	19.45	01	74	51	03	02	1	060	30 30 n	116 40 w	2.92
02	03	891206	19.45	51	01	74	03	02	1	060			9.72

Table 3. Marine mammal sightings, classified by species code, encountered in the eastern tropical Pacific during July 29 through December 7, 1989.

Sightings by Species

species: OFFSHORE SPOTTED DOLPHIN (STENELLA ATTENUATA)

species code: 2

date yrmody	series	leg	sight number	sun position horz.	sun position vert.	beauf. number	detected by	perp. dist.(km)	latitude deg min	longitude deg min	proportion (% of school)	mean school size est best	mean school size est low
890801	06	01	05	03	03	4	55	1.6	20 46 n	115 59 w	100.0	303.0	255.0
890801	07	01	06			4	71	0.7	20 42 n	116 00 w	100.0	62.0	47.0
890805	08	03	07			3	73	0.2	12 58 n	117 20 w	58.7	1537.0	1237.0
890806	05	02	02	10	02	4	71	2.2	11 47 n	116 06 w	60.0	333.0	245.0
890806	11	02	08			1	56	1.2	11 01 n	114 48 w	45.0	494.0	361.0
890807	02	02	03			4	56	3.0	09 51 n	112 39 w	100.0	260.0	203.0
890810	03	06	03	04	12	5	55	0.3	05 06 n	110 21 w	100.0	138.0	107.0
890810	04	09	04	11	02	4	55	1.1	05 21 n	110 58 w	100.0	97.0	82.0
890810	05	06	05			4	07	0.6	05 30 n	111 12 w	20.0	273.0	247.0
890812			01			6	73	0.3	07 01 n	116 02 w	100.0	45.0	40.0
890813			01			5	73	0.4	07 52 n	118 50 w	100.0	90.0	70.0
890814	02	02	03	10	02	5	55	2.0	09 31 n	121 38 w	100.0	127.0	95.0
890816	02	01	02	11	02	3	55	1.6	12 35 n	126 53 w	54.0	218.0	182.0
890817	06	01	06	01	01	4	07	0.8	13 51 n	129 54 w	5.3	1100.0	1013.0
890817	07	02	07	12	02	4	55	3.2	13 48 n	130 04 w	100.0	112.0	97.0
890821	02	02	02	05	02	4	55	0.6	10 20 n	139 12 w	80.2	214.0	196.0
890822	03	04	02	05	12	4	71	2.7	12 17 n	142 31 w	40.3	322.0	277.0
890904	03	01	02			4	73	1.5	10 22 n	147 23 w	45.0	498.0	443.0
890904	04	01	03			4	55	4.4	10 12 n	147 15 w	55.0	265.0	217.0
890904	05	01	04			3	67	0.7	10 59 n	146 56 w	20.3	908.0	817.0
890909	03	09	03			4	56	0.2	05 14 n	132 49 w	96.0	890.0	760.0
890910	01	04	02	01	02	4	55	0.3	06 13 n	130 38 w	100.0	157.0	139.0
890910	02	05	06	02	01	5	56	1.7	06 37 n	130 10 w	50.3	85.0	73.0
890912	01	04	02			5	56	2.1	05 22 n	125 25 w	100.0	95.0	87.0
890913	01	06	01	12	03	4	71	0.0	04 30 n	122 36 w	100.0	119.0	90.0
890918	01	01	01			4	56	1.3	02 18 n	108 37 w	65.0	160.0	140.0
890918	07	01	06			5	67	4.4	02 21 n	107 24 w	83.3	232.0	178.0
890919	02	02	02			4	67	3.5	02 32 n	104 45 w	15.7	330.0	240.0
890921	01	05	01			5	55	5.3	02 20 n	099 47 w	40.0	203.0	167.0
890922	01	08	03			5	73	0.3	01 18 n	096 40 w	100.0	294.0	231.0
891014	02	02	01			4	01	1.0	01 59 s	110 17 w	65.0	350.0	264.0
891016	04	04	04	12	12	4	22	1.1	02 05 s	117 02 w	21.3	1421.0	959.0
891017	01	01	01	06	03	5	45	4.0	02 02 s	119 25 w	35.0	220.0	182.0
891031			06			5	74	0.8	04 05 n	087 25 w	56.7	277.0	213.0
891101	01	08	02			5	05	5.9	06 05 n	086 43 w	100.0	0.0*	75.0
891112	05	01	01			2	74	3.2	02 55 n	093 28 w	33.3	283.0	238.0
891117	03	03	06	09	01	4	01	4.0	03 23 s	100 51 w	11.0	683.0	517.0
891118	01	01	01			4	74	0.5	02 47 s	102 50 w	100.0	315.0	267.0
891118	05	02	06			4	01	1.6	02 29 s	103 36 w	14.0	230.0	190.0
891119	01	11	01			4	74	0.1	01 39 s	106 32 w	100.0	39.0	28.0
891121	03	01	02	09	01	5	51	0.8	00 38 n	114 14 w	100.0	567.0	443.0

Table 3. (continued)

Sightings by Species

species: OFFSHORE SPOTTED DOLPHIN (STENELLA ATTENUATA) species code: 2

date	series	leg	sight	sun position		beauf.	detected	perp.	latitude	longitude	proportion	mean school size est	
yrmody			number	horz.	vert.	number	by	dist.(km)	deg min	deg min	(% of school)	best	low
891121	04	07	03	11	02	5	45	0.3	00 47 n	114 49 w	100.0	597.0	536.0
891121	05	04	04			4	05	1.0	00 54 n	115 12 w	100.0	85.0	120.0
891122	03	13	04	10	01	5	51	0.2	01 41 n	118 14 w	100.0	45.0	32.0
891122	04	16	05	11	03	4	01	0.7	01 52 n	119 07 w	100.0	45.0	33.0
891124	02	13	03	08	01	5	74	1.4	02 00 n	125 17 w	100.0	18.0	13.0

Table 3. (continued)

Sightings by Species

species: SPINNER DOLPHIN (STENELLA LONGIROSTRIS) species code: 3

date	series	leg	sight	sun position		beauf.	detected	perp.	latitude	longitude	proportion	mean school size est	
yrmody			number	horz.	vert.	number	by	dist.(km)	deg min	deg min	(% of school)	best	low
890806	11	02	08			1	56	1.2	11 01 n	114 48 w	5.0	494.0	361.0
890807	04	04	05	06	02	3	56	0.5	09 32 n	112 00 w	3.0	0.0*	150.0
890918	07	01	06			5	67	4.4	02 21 n	107 24 w	16.7	232.0	178.0

Table 3. (continued)

Sightings by Species

species: COMMON DOLPHIN (DELPHINUS DELPHIS)   species code: 5

date	series	leg	sight	sun position		beauf.	detected	perp.	latitude	longitude	proportion	mean school size est	
yrmody			number	horz.	vert.	number	by	dist.(km)	deg min	deg min	(% of school)	best	low
890731	01	02	01	09	03	3	67	3.0	26 24 n	116 43 w	100.0	175.0	142.0
890731	02	03	02	09	02	4	73	2.1	26 13 n	116 32 w	100.0	242.0	208.0
891206			07			2	99	2.9	31 01 n	116 36 w	100.0	0.0*	0.0*

Table 3. (continued)

Sightings by Species

species: EASTERN SPINNER DOLPHIN (STENELLA LONGIROSTRIS) species code: 10

date	series	leg	sight	sun position		beauf.	detected	perp.	latitude	longitude	proportion	mean school size est	
yrmody			number	horz.	vert.	number	by	dist.(km)	deg min	deg min	(% of school)	best	low
890803	03	02	04	12	12	3	67	1.4	17 17 n	112 29 w	100.0	177.0	148.0
890803	04	01	05	01	01	2	07	0.7	17 12 n	112 31 w	5.7	35.0	26.0
890804	05	01	02	01	12	2	55	0.5	15 20 n	115 05 w	100.0	44.0	37.0
890805	04	01	03	07	12	2	07	0.2	13 33 n	117 31 w	100.0	275.0	238.0
890805	08	03	07			3	73	0.2	12 58 n	117 20 w	41.2	1537.0	1237.0
890806	02	01	01			3	56	0.5	11 53 n	116 15 w	100.0	102.0	91.0
890806	05	02	02	10	02	4	71	2.2	11 47 n	116 06 w	6.7	333.0	245.0
890806	06	05	03	12	12	3	55	0.2	11 26 n	115 33 w	100.0	286.0	256.0
890816	02	01	02	11	02	3	55	1.6	12 35 n	126 53 w	46.0	218.0	182.0
891031			06			5	74	0.8	04 05 n	087 25 w	19.0	277.0	213.0

Table 3. (continued)

Sightings by Species

species: WHITEBELLY SPINNER DOLPHIN (STENELLA LONGIROSTRIS) species code: 11

date	series	leg	sight	sun position		beauf.	detected	perp.	latitude	longitude	proportion	mean school size est	
yrmody			number	horz.	vert.	number	by	dist.(km)	deg min	deg min	(% of school)	best	low
890810	01	01	01			4	07	1.8	04 51 n	109 48 w	100.0	273.0	225.0
890810	05	06	05			4	07	0.6	05 30 n	111 12 w	80.0	273.0	247.0
890817	01	01	01			4	55	5.0	13 23 n	128 27 w	94.3	197.0	167.0
890817	05	02	05	12	01	4	71	6.5	13 48 n	129 49 w	100.0	613.0	517.0
890817	06	01	06	01	01	4	07	0.8	13 51 n	129 54 w	94.7	1100.0	1013.0
890821	02	02	02	05	02	4	55	0.6	10 20 n	139 12 w	19.8	214.0	196.0
890822	03	04	02	05	12	4	71	2.7	12 17 n	142 31 w	59.7	322.0	277.0
890904	01	01	01			1	07	0.6	11 03 n	148 00 w	100.0	98.0	83.0
890904	03	01	02			4	73	1.5	10 22 n	147 23 w	55.0	498.0	443.0
890904	04	01	03			4	55	4.4	10 12 n	147 15 w	45.0	265.0	217.0
890904	05	01	04			3	67	0.7	10 59 n	146 56 w	79.7	908.0	817.0
890904	07	03	06			3	67	0.3	09 41 n	146 44 w	100.0	57.0	51.0
890909	03	09	03			4	56	0.2	05 14 n	132 49 w	4.0	890.0	760.0
890910	02	05	06	02	01	5	56	1.7	06 37 n	130 10 w	49.7	85.0	73.0
890918	01	01	01			4	56	1.3	02 18 n	108 37 w	1.7	160.0	140.0
890919	02	02	02			4	67	3.5	02 32 n	104 45 w	84.3	330.0	240.0
890920	04	01	03			5	71	1.1	02 36 n	102 22 w	100.0	142.0	103.0
890921	01	05	01			5	55	5.3	02 20 n	099 47 w	60.0	203.0	167.0
891014	02	02	01			4	01	1.0	01 59 s	110 17 w	35.0	350.0	264.0
891016	04	04	04	12	12	4	22	1.1	02 05 s	117 02 w	10.7	1421.0	959.0
891017	01	01	01	06	03	5	45	4.0	02 02 s	119 25 w	65.0	220.0	182.0
891031			06			5	74	0.8	04 05 n	087 25 w	6.0	277.0	213.0
891112	05	01	01			2	74	3.2	02 55 n	093 28 w	66.7	283.0	238.0
891116	03	03	03			4	05	0.8	04 19 s	097 27 w	25.0	275.0	243.0
891117	03	03	06	09	01	4	01	4.0	03 23 s	100 51 w	89.0	683.0	517.0

Table 3. (continued)

Sightings by Species

species: STRIPED DOLPHIN (S. COERULEOALBA) species code: 13

date yrmody	series	leg	sight number	sun position horz.	sun position vert.	beauf. number	detected by	perp. dist.(km)	latitude deg min	longitude deg min	proportion (% of school)	mean school size est best	mean school size est low
890731	03	08	03	11	01	4	71	3.5	25 37 n	116 21 w	100.0	188.0	165.0
890801	01	03	01	09	03	4	71	0.0	22 51 n	115 52 w	1.0	100.0	85.0
890801	02	02	02	08	02	4	73	1.5	22 43 n	115 52 w	100.0	81.0	66.0
890801	05	06	04	03	03	4	73	0.1	20 49 n	115 59 w	100.0	2.0	2.0
890802	03	02	04			4	71	4.0	19 18 n	114 43 w	100.0	15.0	11.0
890802	05	01	06			4	73	0.2	18 57 n	114 17 w	100.0	27.0	20.0
890802	07	04	08			3	56	0.1	18 43 n	113 55 w	100.0	20.0	11.0
890803	01	09	02	10	01	2	71	2.3	17 33 n	112 24 w	100.0	78.0	67.0
890803	02	04	03	08	01	3	73	0.4	17 25 n	112 22 w	100.0	44.0	40.0
890803	04	01	05	01	01	2	07	0.7	17 12 n	112 31 w	27.7	35.0	26.0
890804	01	08	01	07	02	3	71	2.7	15 38 n	114 40 w	100.0	52.0	47.0
890805	05	01	04	12	12	3	56	1.2	13 23 n	117 35 w	100.0	49.0	43.0
890805	06	02	05	04	01	3	55	4.4	13 15 n	117 29 w	100.0	40.0	30.0
890805	07	02	06	05	02	3	56	0.2	13 04 n	117 28 w	100.0	35.0	28.0
890809	03	06	03	05	01	4	56	2.9	04 49 n	108 32 w	100.0	131.0	119.0
890811	02	04	01			4	56	1.3	05 55 n	112 39 w	100.0	63.0	50.0
890817	02	02	03			3	56	3.5	13 33 n	128 34 w	100.0	36.0	30.0
890819	02	07	02	02	01	4	55	0.6	10 24 n	134 52 w	100.0	29.0	24.0
890819	03	03	03	02	02	3	67	1.7	10 12 n	135 05 w	100.0	49.0	41.0
890819	04	03	04	02	03	4	73	0.2	10 03 n	135 11 w	65.7	23.0	18.0
890821	06	04	05	11	02	2	56	2.6	11 00 n	140 21 w	100.0	93.0	83.0
890823			01	11	03	5	55	0.0	14 38 n	146 21 w	100.0	17.0	15.0
890824	02	07	01	11	02	4	55	0.4	16 24 n	149 13 w	100.0	26.0	22.0
890905			02	12	12	4	56	0.8	07 53 n	145 04 w	100.0	102.0	88.0
890909	01	06	01			4	67	0.8	05 15 n	133 27 w	100.0	61.0	55.0
890913	03	03	03			5	67	0.4	04 21 n	121 53 w	100.0	28.0	24.0
890913	06	01	05			5	56	0.1	04 16 n	121 17 w	100.0	181.0	156.0
890913	07	03	06	05	03	5	67	0.4	04 12 n	121 08 w	100.0	29.0	25.0
890916	01	05	02			5	71	0.9	02 35 n	113 58 w	100.0	223.0	197.0
890919	01	13	01			5	73	0.2	02 29 n	104 54 w	100.0	8.0	5.0
890920	01	01	01			4	07	3.0	02 34 n	102 36 w	100.0	23.0	19.0
890920	05	15	04			5	56	0.3	02 37 n	101 30 w	100.0	10.0	7.0
890920	06	02	05			5	55	0.5	02 36 n	101 20 w	100.0	72.0	55.0
890920	07	03	06			4	71	0.2	02 33 n	101 13 w	100.0	15.0	11.0
890922	05	01	07			5	67	0.0	00 51 n	095 39 w	100.0	48.0	39.0
890923			09	05	03	5	73	2.0	00 21 s	093 07 w	100.0	110.0	100.0
890929	09	06	07			3	56	1.2	02 12 s	081 33 w	100.0	37.0	31.0
891007	01	03	01			3	05	4.6	02 58 s	085 48 w	100.0	0.0*	37.0
891009	01	03	02	06	03	3	05	1.3	02 46 s	092 56 w	100.0	76.0	64.0
891009	02	01	03			3	01	0.4	02 48 s	092 59 w	100.0	0.0*	8.0
891009	05	04	07	02	12	4	01	0.2	02 46 s	093 59 w	100.0	35.0	29.0
891010			02			2	01	0.0	02 38 s	096 38 w	100.0	160.0	122.0
891010			09			2	99	3.0	02 36 s	096 58 w	100.0	0.0*	40.0
891010	02	01	03			2	51	4.9	02 42 s	096 41 w	100.0	38.0	29.0

Table 3. (continued)

Sightings by Species

species: STRIPED DOLPHIN (S. COERULEOALBA) — species code: 13

date yrmody	series	leg	sight number	sun position horz.	sun position vert.	beauf. number	detected by	perp. dist.(km)	latitude deg min	longitude deg min	proportion (% of school)	mean school size est best	mean school size est low
891010	03	03	06			2	05	5.6	02 44 s	096 50 w	45.0	155.0	112.0
891010	04	02	07			2	74	4.6	02 38 s	096 56 w	100.0	117.0	92.0
891010	05	01	08			2	74	3.7	02 36 s	096 58 w	100.0	80.0	60.0
891010	06	04	12			3	45	5.1	02 33 s	097 13 w	100.0	180.0	142.0
891010	09	04	18			3	45	0.7	02 29 s	098 05 w	100.0	0.0*	15.0
891011			07			3	99	2.4	02 23 s	101 40 w	100.0	20.0	17.0
891013	01	02	01			4	22	0.2	02 09 s	106 40 w	100.0	0.0*	10.0
891013	02	10	03	06	12	5	51	1.7	02 07 s	107 32 w	100.0	31.0	18.0
891013	03	03	04	12	01	5	45	0.1	02 08 s	107 50 w	100.0	20.0	22.0
891015	04	05	04	12	12	4	01	1.5	02 02 s	113 52 w	100.0	33.0	22.0
891016	01	01	01			3	51	1.0	02 05 s	116 05 w	100.0	148.0	105.0
891023			01			5	99	0.1	05 14 s	107 36 w	100.0	140.0	110.0
891026	02	07	03			5	45	0.5	05 30 s	097 18 w	100.0	192.0	121.0
891027	02	04	01	02	01	4	45	0.1	04 24 s	095 01 w	100.0	78.0	60.0
891027	05	06	04			5	22	0.8	04 09 s	094 36 w	100.0	15.0	12.0
891028	02	16	04	03	01	4	74	0.9	02 50 s	091 54 w	100.0	127.0	110.0
891031	02	02	01			4	05	0.5	03 19 n	087 21 w	33.5	62.0	47.0
891031	04	03	04			5	45	0.9	03 44 n	087 20 w	100.0	0.0*	12.0
891031	04	05	05			5	22	0.9	03 50 n	087 22 w	100.0	12.0	5.0
891101	01	09	03	08	03	5	05	1.7	06 06 n	086 42 w	100.0	0.0*	6.0
891109	05	04	10	11	02	1	99	1.9	09 10 n	087 45 w	100.0	39.0	33.0
891113	05	02	08	03	02	4	74	0.2	00 04 n	094 24 w	100.0	120.0	90.0
891114			03	10	03	3	74	0.2	01 21 s	094 15 w	100.0	153.0	130.0
891114			09	11	01	4	51	1.3	01 57 s	094 14 w	100.0	45.0	30.0
891114	01	01	01	10	03	3	01	0.2	01 17 s	094 18 w	100.0	275.0	223.0
891114	06	02	07	10	01	4	74	5.2	01 52 s	094 13 w	100.0	85.0	72.0
891115	03	09	07			4	01	0.0	05 03 s	095 00 w	100.0	0.0*	40.0
891116	01	01	01			4	51	3.0	04 36 s	096 31 w	100.0	362.0	233.0
891116	03	03	03			4	05	0.8	04 19 s	097 27 w	75.0	275.0	243.0
891116	05	01	04	11	01	4	22	0.9	04 20 s	097 42 w	100.0	65.0	50.0
891117	02	01	05			4	22	1.1	03 27 s	100 40 w	100.0	65.0	46.0
891118	03	02	02			5	51	2.2	02 45 s	102 58 w	100.0	65.0	50.0
891118	03	07	03			4	45	4.1	02 35 s	103 19 w	100.0	92.0	70.0
891118	04	02	04			4	51	0.8	02 30 s	103 23 w	100.0	117.0	85.0
891118	05	02	05			4	74	0.2	02 29 s	103 36 w	100.0	215.0	187.0
891118	05	02	06			4	01	1.6	02 29 s	103 36 w	86.0	230.0	190.0
891118	06	03	07	10	01	5	45	2.4	02 22 s	103 51 w	100.0	80.0	70.0
891119	02	04	03			4	45	4.3	01 36 s	106 45 w	100.0	273.0	230.0
891119	04	05	05			3	74	3.4	01 28 s	107 16 w	100.0	0.0*	5.0
891119	08	01	07			3	45	5.2	01 18 s	107 53 w	100.0	0.0*	11.0
891120	02	01	03			2	74	2.2	00 51 s	109 23 w	100.0	50.0	39.0
891120	05	05	06			3	45	0.8	00 48 s	109 44 w	100.0	125.0	148.0
891121	02	06	01			5	01	0.1	00 32 n	114 05 w	100.0	0.0*	31.0
891123	02	15	02	10	03	4	01	1.2	01 56 n	122 39 w	100.0	0.0*	12.0

Table 3. (continued)

Sightings by Species

species: STRIPED DOLPHIN (S. COERULEOALBA)

species code: 13

date	series	leg	sight	sun position		beauf.	detected	perp.	latitude	longitude	proportion	mean school size est	
yrmody			number	horz.	vert.	number	by	dist.(km)	deg min	deg min	(% of school)	best	low
891125			01			5	05	0.0	02 53 n	124 29 w	100.0	100.0	92.0

Table 3. (continued)

Sightings by Species

species: ROUGH-TOOTHED DOLPHIN (STENO BREDANENSIS) species code: 15

date	series	leg	sight	sun position		beauf.	detected	perp.	latitude	longitude	proportion	mean school size est	
yrmody			number	horz.	vert.	number	by	dist.(km)	deg min	deg min	(% of school)	best	low
890807			02			4	73	0.5	09 53 n	112 46 w	100.0	7.0	6.0
890907	06	03	09			4	67	0.1	04 56 n	138 25 w	100.0	20.0	16.0
890909			04	06	01	4	99	0.1	05 14 n	132 43 w	100.0	11.0	9.0
890910			05			4	73	0.2	06 15 n	130 35 w	42.5	24.0	20.0
891011	02	11	05	12	12	3	05	0.7	02 28 s	101 02 w	100.0	1.0	1.0
891017	06	04	04	06	01	5	22	0.6	02 01 s	120 02 w	100.0	3.0	3.0
891117	01	06	01			4	05	0.9	03 36 s	100 08 w	100.0	5.0	4.0

Table 3. (continued)

Sighting by Species

species: "LONG-SNOUTED WHITEBELLY" (DELPHINUS DELPHIS SUBSP. ?)

species code: 16

date yrmody	series	leg	sight number	sun position horz.	sun position vert.	beauf. number	detected by	perp. dist.(km)	latitude deg min	longitude deg min	proportion (% of school)	mean school size est best	mean school size est low
891206			04	08	02	1	45	6.6	30 49 n	116 31 w	100.0	1647.0	1283.0

Table 3. (continued)

Sighting by Species

species: "SHORT-SNOUTED WHITEBELLY" (DELPHINUS DELPHIS SUBSP. ?) species code: 17

date	series	leg	sight	sun position		beauf.	detected	perp.	latitude	longitude	proportion	mean school size est	
yrmody			number	horz.	vert.	number	by	dist.(km)	deg min	deg min	(% of school)	best	low
890801	01	03	01	09	03	4	71	0.0	22 51 n	115 52 w	65.7	100.0	85.0
890804	07	01	04	01	02	2	67	0.4	15 03 n	115 28 w	100.0	84.0	73.0
890923			03			4	99	0.4	00 09 n	094 18 w	100.0	282.0	237.0
890923	01	01	01			4	07	0.8	00 13 n	094 25 w	100.0	135.0	127.0
890923	02	01	02			4	07	0.2	00 10 n	094 21 w	100.0	155.0	137.0
890923	03	01	04			4	71	3.1	00 08 n	094 17 w	100.0	973.0	910.0
890923	04	03	06			5	71	3.2	00 04 s	093 52 w	100.0	616.0	547.0
890923	05	02	07			5	67	1.6	00 07 s	093 41 w	100.0	359.0	297.0
890928	04	03	04			5	56	1.5	05 01 s	084 57 w	100.0	521.0	453.0
890928	05	01	06			5	55	0.3	04 57 s	084 50 w	100.0	310.0	270.0
890928	06	01	07			5	71	0.0	04 53 s	084 44 w	100.0	227.0	185.0
890929	01	01	02			4	56	2.3	03 21 s	082 44 w	100.0	775.0	660.0
890929	03	05	03			3	71	5.5	03 08 s	082 26 w	100.0	325.0	275.0
890929	05	03	04			3	73	0.7	02 54 s	082 00 w	100.0	175.0	145.0
890929	07	01	06			4	56	0.7	02 37 s	081 43 w	100.0	572.0	473.0
891006	01	01	01			3	01	0.8	02 41 s	082 38 w	100.0	45.0	27.0
891006	02	06	04			3	45	4.1	02 29 s	082 56 w	100.0	1017.0	817.0
891007	02	01	02			3	22	0.8	02 53 s	085 51 w	100.0	0.0*	187.0
891007	04	04	04			4	22	0.3	02 58 s	087 02 w	100.0	73.0	58.0
891008	03	05	05			4	45	5.4	02 54 s	090 05 w	100.0	18.0	13.0
891009	02	04	04	06	01	4	45	3.9	02 47 s	093 21 w	100.0	3100.0	2700.0
891009	06	04	09			3	45	4.3	02 48 s	094 07 w	100.0	1495.0	1150.0
891029	01	11	01			3	74	3.2	01 34 s	089 42 w	100.0	210.0	143.0
891029	04	01	05	05	01	3	74	0.1	01 20 s	089 18 w	100.0	570.0	443.0
891029	05	07	06			3	05	1.9	01 13 s	089 00 w	100.0	743.0	643.0
891031	02	02	01			4	05	0.5	03 19 n	087 21 w	16.5	62.0	47.0
891110			03			6	99	0.2	08 00 n	089 48 w	100.0	140.0	110.0
891113	04	21	07	03	02	5	45	0.4	00 12 n	094 25 w	100.0	366.0	311.0
891113	06	03	09	03	03	4	45	1.0	00 07 s	094 24 w	100.0	90.0	75.0
891114	04	02	06	10	02	4	05	0.3	01 37 s	094 17 w	100.0	370.0	335.0
891114	08	06	12	03	01	4	51	1.0	02 30 s	094 08 w	100.0	0.0*	100.0
891114	10	01	14	03	02	4	05	2.6	02 50 s	094 09 w	100.0	165.0	157.0
891129	01	15	01	02	02	5	01	0.1	11 01 n	123 08 w	100.0	0.0*	7.0

Table 3. (continued)

Sightings by Species

species: BOTTLENOSED DOLPHIN (TURSIOPS TRUNCATUS) species code: 18

date yrmody	series	leg	sight number	sun position horz.	sun position vert.	beauf. number	detected by	perp. dist.(km)	latitude deg min	longitude deg min	proportion (% of school)	mean school size est best	mean school size est low
890802	06	02	07			3	55	0.5	18 52 n	114 09 w	100.0	0.0*	3.0
890804	08	02	05	01	02	2	55	0.9	14 59 n	115 32 w	100.0	32.0	28.0
890819	01	09	01	07	01	4	73	2.3	10 52 n	134 25 w	100.0	33.0	27.0
890919	03	01	03			4	07	2.0	02 38 n	104 38 w	28.3	24.0	19.0
890924			04	01	01	4	73	0.5	01 14 s	091 13 w	54.0	65.0	50.0
890924			07			3	71	0.3	01 05 s	090 50 w	100.0	40.0	30.0
890924			08			4	73	1.0	01 03 s	090 48 w	100.0	45.0	35.0
890924			09			4	73	0.6	01 02 s	090 43 w	100.0	20.0	15.0
891006	06	07	08			3	51	5.3	03 00 s	084 12 w	67.3	41.0	37.0
891008	02	02	04			4	01	0.0	02 54 s	089 48 w	100.0	30.0	24.0
891010	01	01	01			2	01	0.3	02 36 s	096 35 w	32.7	80.0	64.0
891010	03	01	04			2	45	1.4	02 45 s	096 47 w	6.0	15.0	12.0
891010	03	03	06			2	05	5.6	02 44 s	096 50 w	23.0	155.0	112.0
891016	04	04	04	12	12	4	22	1.1	02 05 s	117 02 w	0.3	1421.0	959.0
891019	02	13	02	12	12	5	51	1.4	03 14 s	118 35 w	15.0	24.0	18.0
891019	03	01	03			5	74	0.3	03 15 s	118 35 w	10.3	19.0	15.0
891021	03	06	02	01	01	5	45	1.1	04 08 s	113 42 w	34.0	0.0*	21.0
891029	02	01	02	01	01	3	51	1.6	01 30 s	089 45 w	100.0	120.0	0.0*
891115	02	18	05	09	12	4	74	1.9	05 15 s	094 22 w	40.0	28.0	24.0
891117	06	03	09	11	03	5	01	2.1	03 05 s	101 31 w	61.7	40.0	28.0
891118	08	01	10	11	02	5	51	0.3	02 18 s	104 13 w	0.7	35.0	22.0
891118	10	04	13	11	03	4	51	2.8	02 13 s	104 32 w	47.5	18.0	32.0
891205	03	03	04	09	02	4	45	0.5	27 55 n	115 22 w	100.0	0.0*	2.0

Table 3. (continued)

Sightings by Species

species: RISSO'S DOLPHIN (GRAMPUS GRISEUS) species code: 21

date	series	leg	sight	sun position		beauf.	detected	perp.	latitude	longitude	proportion	mean school size est	
yrmody			number	horz.	vert.	number	by	dist.(km)	deg min	deg min	(% of school)	best	low
890803	05	08	06	01	02	2	71	1.7	16 52 n	113 02 w	100.0	27.0	23.0
890910			04			4	73	0.9	06 15 n	130 35 w	100.0	9.0	8.0
890910			05			4	73	0.2	06 15 n	130 35 w	7.5	24.0	20.0
890910	03	05	08			5	71	1.7	06 53 n	129 48 w	100.0	0.0*	1.0
890913	02	08	02	12	01	5	73	0.5	04 22 n	121 59 w	100.0	10.0	7.0
890924			06			4	73	0.3	01 10 s	091 03 w	100.0	30.0	25.0
890928	01	01	01			5	55	2.2	05 19 s	085 23 w	100.0	4.0	3.0
890928	02	02	02			5	71	1.0	05 16 s	085 19 w	100.0	7.0	5.0
890928	03	02	03			5	55	0.5	05 13 s	085 14 w	100.0	15.0	11.0
890928	08	05	09			4	56	0.8	04 42 s	084 27 w	100.0	0.0*	3.0
891008	03	07	08			3	22	0.5	02 54 s	090 10 w	100.0	10.0	7.0
891010	07	04	14	12	01	3	45	0.5	02 29 s	097 31 w	100.0	8.0	6.0
891010	09	02	16			3	05	0.3	02 29 s	097 56 w	100.0	6.0	6.0
891016	03	04	02	06	02	4	45	0.9	02 02 s	116 28 w	100.0	3.0	3.0
891027	06	02	07	06	02	5	05	0.1	04 07 s	094 29 w	100.0	4.0	3.0
891029	03	06	03	04	01	3	74	0.2	01 23 s	089 25 w	100.0	14.0	11.0
891029	06	01	07			3	74	0.1	01 09 s	088 50 w	100.0	2.0	2.0
891031	02	06	02			5	01	1.3	03 35 n	087 19 w	7.5	8.0	8.0
891031	03	02	03			5	74	0.0	03 40 n	087 19 w	40.0	5.0	5.0
891113	04	20	06	02	02	5	45	6.3	00 15 n	094 25 w	100.0	0.0*	2.0
891117	01	15	04			4	22	0.3	03 27 s	100 39 w	100.0	0.0*	4.0

Table 3. (continued)

Sighting by Species

species: PACIFIC WHITE-SIDED DOLPHIN (LAGENORHYNCHUS OBLIQUIDENS)

species code: 22

date	series	leg	sight	sun position		beauf.	detected	perp.	latitude	longitude	proportion	mean school size est	
yrmody			number	horz.	vert.	number	by	dist.(km)	deg min	deg min	(% of school)	best	low
891205	02	04	03	09	02	3	74	2.5	27 50 n	115 16 w	100.0	30.0	13.0
891206			06			1	01	2.7	30 55 n	116 30 w	100.0	192.0	162.0

Table 3. (continued)

Sightings by Species

species: FRASER'S DOLPHIN (LAGENODELPHIS HOSEI)

species code: 26

date	series	leg	sight	sun position		beauf.	detected	perp.	latitude	longitude	proportion	mean school size est	
yrmody			number	horz.	vert.	number	by	dist.(km)	deg min	deg min	(% of school)	best	low
890907			10			4	73	0.9	04 58 n	138 14 w	69.0	160.0	143.0
890920	02	04	02			4	55	1.3	02 38 n	102 28 w	100.0	263.0	232.0
891015			02			3	22	1.7	02 03 s	112 56 w	15.0	507.0	428.0
891017	05	02	03	06	01	5	05	0.8	02 04 s	119 53 w	100.0	87.0	65.0
891123	01	14	01	08	01	5	05	1.9	01 50 n	121 40 w	100.0	570.0	475.0

Table 3. (continued)

Sightings by Species

species: MELON-HEADED WHALE (PEPONOCEPHALA ELECTRA)

species code: 31

date	series	leg	sight	sun position		beauf.	detected	perp.	latitude	longitude	proportion	mean school size est	
yrmody			number	horz.	vert.	number	by	dist.(km)	deg min	deg min	(% of school)	best	low
891015			02			3	22	1.7	02 03 s	112 56 w	85.0	507.0	428.0
891203	02	09	01	05	01	5	51	2.6	22 36 n	118 37 w	100.0	315.0	260.0

Table 3. (continued)

Sighting by Species

species: PYGMY KILLER WHALE (FERESA ATTENUATA) species code: 32

date yrmody	series	leg	sight number	sun position horz.	sun position vert.	beauf. number	detected by	perp. dist.(km)	latitude deg min	longitude deg min	proportion (% of school)	mean school size est best	mean school size est low
891119	03	02	04			3	51	1.0	01 32 s	106 58 w	100.0	11.0	10.0

Table 3. (continued)

Sighting by Species

species: FALSE KILLER WHALE (PSEUDORCA CRASSIDENS) species code: 33

date	series	leg	sight	sun position		beauf.	detected	perp.	latitude	longitude	proportion	mean school size est	
yrmody			number	horz.	vert.	number	by	dist.(km)	deg min	deg min	(% of school)	best	low
890822	01	01	01			4	56	0.4	11 48 n	141 44 w	100.0	3.0	2.0
890822	04	10	03	11	02	4	71	0.7	12 43 n	143 06 w	100.0	22.0	18.0
890910	04	10	09			5	73	0.1	07 21 n	129 32 w	100.0	5.0	4.0
891118	07	05	09	11	02	5	51	1.9	02 18 s	104 11 w	69.7	39.0	26.0
891118	08	01	10	11	02	5	51	0.3	02 18 s	104 13 w	2.7	35.0	22.0
891118	09	01	11	11	02	5	45	0.3	02 16 s	104 18 w	100.0	0.0*	6.0
891205	01	15	02	05	02	4	45	3.2	27 39 n	115 05 w	100.0	26.0	24.0

Table 3. (continued)

Sightings by Species

species: PILOT WHALE (GLOBICEPHALA SP.)   species code: 34

date	series	leg	sight	sun position		beauf.	detected	perp.	latitude	longitude	proportion	mean school size est	
yrmody			number	horz.	vert.	number	by	dist.(km)	deg min	deg min	(% of school)	best	low
890924			04	01	01	4	73	0.5	01 14 s	091 13 w	46.0	65.0	50.0
890924			05			4	73	0.1	01 13 s	091 10 w	100.0	25.0	20.0
890927			01			5	73	2.3	04 14 s	087 03 w	100.0	0.0*	5.0
891006	03	05	06			3	05	0.2	03 01 s	083 21 w	22.7	96.0	97.0
891006	06	07	08			3	51	5.3	03 00 s	084 12 w	32.7	41.0	37.0
891010	01	01	01			2	01	0.3	02 36 s	096 35 w	0.7	80.0	64.0
891010	03	01	04			2	45	1.4	02 45 s	096 47 w	94.0	15.0	12.0
891010	03	03	06			2	05	5.6	02 44 s	096 50 w	32.0	155.0	112.0
891011			01			3	99	0.0	02 31 s	099 40 w	100.0	13.0	12.0
891011	02	12	06			3	45	2.7	02 27 s	101 06 w	100.0	0.0*	15.0
891016	03	05	03	06	02	4	05	1.5	02 02 s	116 33 w	100.0	12.0	10.0
891016	04	04	04	12	12	4	22	1.1	02 05 s	117 02 w	1.0	1421.0	959.0
891017	04	02	02	06	02	5	74	0.2	02 06 s	119 47 w	100.0	28.0	23.0
891017	07	05	06	11	01	5	05	1.0	02 00 s	120 45 w	100.0	9.0	8.0
891019	02	01	01	12	02	5	74	0.8	03 10 s	119 13 w	100.0	5.0	5.0
891019	02	13	02	12	12	5	51	1.4	03 14 s	118 35 w	51.7	24.0	18.0
891019	03	01	03			5	74	0.3	03 15 s	118 35 w	89.7	19.0	15.0
891020	04	02	05	05	02	5	45	0.6	03 50 s	115 42 w	100.0	0.0*	13.0
891021	03	06	02	01	01	5	45	1.1	04 08 s	113 42 w	66.0	0.0*	21.0
891027			11			4	74	0.0	03 57 s	094 11 w	28.5	13.0	11.0
891027	06	01	06			5	45	1.2	04 08 s	094 32 w	100.0	5.0	3.0
891027	06	02	08	06	02	5	45	0.2	04 06 s	094 28 w	100.0	28.0	15.0
891114	03	02	05	10	02	4	51	4.5	01 30 s	094 13 w	100.0	23.0	18.0
891114	06	02	08	10	01	4	74	3.8	01 52 s	094 13 w	100.0	14.0	11.0
891114	09	02	13	03	02	4	74	2.3	02 45 s	094 09 w	100.0	7.0	6.0
891115	01	04	01			4	05	0.4	04 27 s	094 03 w	100.0	8.0	7.0
891115	02	18	05	09	12	4	74	1.9	05 15 s	094 22 w	60.0	28.0	24.0
891117	06	03	09	11	03	5	01	2.1	03 05 s	101 31 w	38.3	40.0	28.0
891118	07	05	09	11	02	5	51	1.9	02 18 s	104 11 w	30.3	39.0	26.0
891118	08	01	10	11	02	5	51	0.3	02 18 s	104 13 w	30.0	35.0	22.0
891118	10	04	13	11	03	4	51	2.8	02 13 s	104 32 w	2.5	18.0	32.0

Table 3. (continued)

Sightings by Species

species: SHORT-FINNED PILOT WHALE (GLOBICEPHALA MACRORHYNCHUS) species code: 36

date	series	leg	sight	sun position		beauf.	detected	perp.	latitude	longitude	proportion	mean school size est	
yrmody			number	horz.	vert.	number	by	dist.(km)	deg min	deg min	(% of school)	best	low
890817	04	01	04			3	55	2.1	13 46 n	129 40 w	8.5	4.0	5.0
890819	04	03	04	02	03	4	73	0.2	10 03 n	135 11 w	34.3	23.0	18.0
890907			10			4	73	0.9	04 58 n	138 14 w	25.0	160.0	143.0
890907	01	11	04	11	01	4	71	0.3	04 59 n	139 17 w	100.0	28.0	24.0
890907	03	06	06	06	01	4	56	3.5	04 55 n	138 54 w	100.0	0.0*	3.0
890910	01	03	01	01	03	4	07	1.8	06 10 n	130 41 w	100.0	18.0	12.0
890910	01	04	03	01	02	4	73	0.8	06 14 n	130 37 w	100.0	30.0	26.0
890916			05	05	02	5	73	0.9	02 30 n	112 53 w	100.0	11.0	11.0
890919	03	01	03			4	07	2.0	02 38 n	104 38 w	38.3	24.0	19.0
891102	02	01	02			4	01	5.1	07 40 n	085 53 w	100.0	17.0	12.0

Table 3. (continued)

Sightings by Species

species: KILLER WHALE (ORCINUS ORCA) species code: 37

date yrmody	series	leg	sight number	sun position horz.	sun position vert.	beauf. number	detected by	perp. dist.(km)	latitude deg min	longitude deg min	proportion (% of school)	mean school size est best	mean school size est low
890809	04	11	04			4	73	3.0	04 27 n	108 26 w	100.0	3.0	3.0
890821	07	01	06	11	02	2	56	0.6	11 04 n	140 22 w	100.0	5.0	5.0
890905	03	02	03	04	01	5	71	2.5	07 46 n	144 53 w	100.0	8.0	7.0
890922	03	02	05			4	56	4.3	01 16 n	096 27 w	100.0	0.0*	2.0
891027	03	01	02	02	01	4	05	0.8	04 22 s	094 59 w	100.0	11.0	10.0
891116	02	12	02			4	51	1.0	04 22 s	097 19 w	100.0	2.0	1.0

Table 3. (continued)

Sightings by Species

species: SPERM WHALE (PHYSETER MACROCEPHALUS) species code: 46

date	series	leg	sight	sun position		beauf.	detected	perp.	latitude	longitude	proportion	mean school size est	
yrmody			number	horz.	vert.	number	by	dist.(km)	deg min	deg min	(% of school)	best	low
890805	01	03	01	07	03	3	73	0.4	14 03 n	116 59 w	100.0	2.0	2.0
890811	06	06	05			5	71	0.0	06 23 n	114 10 w	25.5	38.0	33.0
890909	02	02	02	11	02	4	56	0.4	05 18 n	133 23 w	48.3	11.0	9.0
890909	04	06	05	06	02	4	07	0.5	05 17 n	132 16 w	100.0	1.0	1.0
890916	03	04	04	05	01	5	67	2.2	02 33 n	113 07 w	100.0	4.0	4.0
890928			11			5	56	0.3	04 20 s	083 56 w	100.0	8.0	8.0
890929	01	01	01			4	67	2.8	03 23 s	082 46 w	100.0	6.0	6.0
890929	06	05	05	07	01	4	56	1.6	02 41 s	081 49 w	100.0	8.0	8.0
891006			07			4	01	2.4	03 02 s	083 28 w	100.0	4.0	3.0
891006	02	02	02			3	45	2.3	02 43 s	082 44 w	100.0	1.0	1.0
891006	03	05	06			3	05	0.2	03 01 s	083 21 w	76.3	96.0	97.0
891008	01	05	02	06	02	4	45	0.8	02 56 s	089 21 w	100.0	2.0	2.0
891008	05	02	12			3	01	1.1	02 50 s	091 08 w	100.0	1.0	1.0
891011	01	07	03	06	02	4	51	5.8	02 30 s	100 08 w	100.0	9.0	7.0
891020	01	03	01	01	03	5	01	0.7	03 38 s	116 57 w	100.0	1.0	1.0
891022			07			6	01	0.7	04 56 s	110 19 w	100.0	1.0	1.0
891022	01	02	02			4	01	1.5	04 48 s	111 12 w	100.0	5.0	4.0
891026			01			6	99	0.2	06 10 s	098 49 w	100.0	1.0	1.0
891031	02	06	02			5	01	1.3	03 35 n	087 19 w	42.5	8.0	8.0
891110	01	05	02			4	45	6.3	08 40 n	089 21 w	100.0	5.0	4.0
891114			02	10	03	3	01	0.0	01 17 s	094 18 w	100.0	1.0	1.0
891114	02	01	04	10	03	4	51	5.8	01 27 s	094 14 w	100.0	1.0	4.0
891117	01	12	02			4	45	7.0	03 31 s	100 31 w	100.0	1.0	1.0
891117	04	04	07	11	02	5	05	1.7	03 10 s	101 00 w	100.0	13.0	11.0
891120			08	11	02	4	01	0.2	00 20 s	110 59 w	100.0	0.0*	1.0
891120	02	01	02			2	74	3.3	00 51 s	109 23 w	100.0	3.0	2.0
891120	04	01	05			3	74	1.3	00 52 s	109 31 w	100.0	1.0	1.0

Table 3. (continued)

Sightings by Species

species: DWARF SPERM WHALE (KOGIA SIMUS) species code: 48

date	series	leg	sight	sun position		beauf.	detected	perp.	latitude	longitude	proportion	mean school size est	
yrmody			number	horz.	vert.	number	by	dist.(km)	deg min	deg min	(% of school)	best	low
890810			02			5	73	0.0	05 00 n	110 03 w	100.0	1.0	1.0

Table 3. (continued)

Sightings by Species

species: BEAKED WHALE (ZIPHIID)

species code: 49

date	series	leg	sight	sun position		beauf.	detected	perp.	latitude	longitude	proportion	mean school size est	
yrmody			number	horz.	vert.	number	by	dist.(km)	deg min	deg min	(% of school)	best	low
890821	06	02	04	11	02	3	55	0.3	10 55 n	140 14 w	100.0	1.0	1.0
890916	02	11	03	05	01	5	55	0.1	02 34 n	113 16 w	100.0	5.0	5.0
891027			03			5	99	0.2	04 11 s	094 39 w	100.0	2.0	2.0
891115	02	11	03			4	05	0.3	05 08 s	094 10 w	100.0	2.0	2.0
891118	07	02	08	10	01	5	05	0.3	02 21 s	103 54 w	100.0	1.0	1.0
891205	01	13	01	04	02	4	05	0.1	27 34 n	115 08 w	100.0	2.0	2.0

Table 3. (continued)

Sightings by Species

species: SOUTHERN BOTTLENOSED WHALE (HYPEROODON PLANIFRONS) species code: 50

date	series	leg	sight	sun position		beauf.	detected	perp.	latitude	longitude	proportion	mean school size est	
yrmody			number	horz.	vert.	number	by	dist.(km)	deg min	deg min	(% of school)	best	low
891113	01	04	01	09	02	3	22	3.1	01 33 n	094 16 w	100.0	13.0	11.0

Table 3. (continued)

Sighting by Species

species: UNID. MESOPLODONT (MESOPLODON SP.) species code: 51

date yrmody	series	leg	sight number	sun position horz.	sun position vert.	beauf. number	detected by	perp. dist.(km)	latitude deg min	longitude deg min	proportion (% of school)	mean school size est best	mean school size est low
890804			03	01	01	2	99	0.4	15 06 n	115 24 w	100.0	2.0	1.0
890806	08	02	05			2	07	0.5	11 18 n	115 14 w	100.0	1.0	1.0
890807	03	04	04			4	55	0.1	09 36 n	112 12 w	100.0	3.0	3.0
890811	03	07	02	04	01	5	73	0.1	06 03 n	113 02 w	100.0	1.0	1.0
891114	08	02	11	01	01	4	22	2.2	02 17 s	094 10 w	100.0	0.0*	1.0
891124	02	05	01	07	02	5	05	1.0	01 57 n	124 42 w	100.0	2.0	2.0

Table 3. (continued)

Sightings by Species

species: CUVIER'S BEAKED WHALE (ZIPHIUS CAVIROSTRIS)

species code: 61

date yrmody	series	leg	sight number	sun position horz.	sun position vert.	beauf. number	detected by	perp. dist.(km)	latitude deg min	longitude deg min	proportion (% of school)	mean school size est best	mean school size est low
890806	07	04	04	05	12	2	71	0.4	11 21 n	115 20 w	100.0	3.0	3.0
890809	02	13	02	09	01	5	55	0.9	05 03 n	108 39 w	100.0	3.0	3.0
890821	03	05	03	05	01	4	73	0.6	10 36 n	139 42 w	100.0	2.0	1.0
890914	05	01	02	05	01	5	71	0.2	03 45 n	118 51 w	100.0	3.0	3.0
891007	03	17	03	12	12	4	51	0.1	02 57 s	086 48 w	100.0	1.0	1.0
891008	04	07	11			3	45	0.4	02 51 s	090 49 w	100.0	4.0	4.0
891010			10			2	99	0.3	02 33 s	097 04 w	100.0	1.0	1.0
891011	02	09	04	12	12	3	51	2.0	02 29 s	100 49 w	100.0	1.0	1.0
891012			03			3	99	0.0	02 21 s	103 28 w	100.0	2.0	2.0
891022	02	02	05			5	22	1.0	04 53 s	110 48 w	100.0	1.0	1.0
891109	01	04	03	07	02	2	05	0.1	09 22 n	086 28 w	100.0	3.0	3.0
891109	01	08	04	07	02	2	01	3.8	09 19 n	086 50 w	100.0	3.0	2.0
891109	01	14	06	08	01	2	22	1.0	09 16 n	087 12 w	100.0	2.0	2.0
891109	01	16	07	09	01	2	05	0.5	09 15 n	087 15 w	100.0	2.0	2.0
891113			02	11	02	2	45	0.7	01 30 n	094 14 w	100.0	2.0	2.0
891203	03	05	02	06	02	5	45	0.5	22 52 n	118 30 w	100.0	2.0	2.0
891206			02	04	02	2	45	0.3	30 39 n	116 37 w	100.0	1.0	1.0
891206			05	08	02	1	01	4.6	30 50 n	116 31 w	100.0	1.0	1.0

Table 3. (continued)

Sightings by Species

species: RORQUAL (BALAENOPTERA SP.) — species code: 70

date	series	leg	sight	sun position		beauf.	detected	perp.	latitude	longitude	proportion	mean school size est	
yrmody			number	horz.	vert.	number	by	dist.(km)	deg min	deg min	(% of school)	best	low
890913			04	06	01	5	99	0.1	04 18 n	121 26 w	100.0	1.0	1.0
890914	06	01	03	05	01	4	07	0.3	03 42 n	118 40 w	100.0	2.0	2.0
890915	01	01	01	11	03	4	55	0.9	03 12 n	117 03 w	100.0	4.0	4.0
890918	02	06	02			5	55	1.4	02 19 n	108 20 w	100.0	1.0	1.0
890924			02			4	99	3.9	01 15 s	091 19 w	100.0	2.0	2.0
891009	04	01	05	06	01	4	22	6.5	02 49 s	093 26 w	100.0	1.0	1.0
891009	06	03	08	12	01	3	05	0.5	02 48 s	094 05 w	100.0	1.0	1.0
891011			02			3	05	0.3	02 31 s	099 40 w	100.0	1.0	1.0
891011			08	10	03	3	45	5.2	02 21 s	101 40 w	100.0	1.0	1.0
891015	07	01	05	11	03	3	05	0.9	02 00 s	114 40 w	80.0	5.0	5.0
891018			01	03	12	6	01	0.6	02 36 s	122 02 w	100.0	1.0	1.0
891018			02			6	99	0.0	02 55 s	120 31 w	100.0	1.0	1.0
891021	02	02	01	01	02	5	51	0.0	04 11 s	113 59 w	100.0	1.0	1.0
891022	02	04	06			5	01	0.2	04 53 s	110 39 w	100.0	3.0	3.0
891023	01	05	02	05	01	5	45	0.0	05 17 s	107 07 w	100.0	1.0	1.0
891026	02	01	02			5	01	1.5	05 44 s	097 42 w	100.0	1.0	1.0
891118	10	03	12	11	03	4	45	2.2	02 13 s	104 30 w	100.0	3.0	3.0
891122	01	07	02	06	02	4	05	0.5	01 31 n	117 14 w	100.0	2.0	2.0

Table 3. (continued)

Sighting by Species

species: BRYDE'S WHALE (B. EDENI) — species code: 72

date	series	leg	sight	sun position		beauf.	detected	perp.	latitude	longitude	proportion	mean school size est	
yrmody			number	horz.	vert.	number	by	dist.(km)	deg min	deg min	(% of school)	best	low
890907	03	10	07	06	01	4	71	0.5	04 55 n	138 41 w	100.0	1.0	1.0
890912	02	03	03	11	02	5	71	0.1	05 19 n	125 15 w	100.0	3.0	3.0
890914	07	10	04	05	03	4	73	1.5	03 30 n	118 12 w	100.0	4.0	4.0
890918	06	01	04			5	67	1.0	02 20 n	107 26 w	100.0	1.0	1.0
891009	01	01	01			3	45	0.2	02 46 s	092 47 w	100.0	8.0	7.0
891015	07	01	05	11	03	3	05	0.9	02 00 s	114 40 w	20.0	5.0	5.0
891017	07	12	08	11	03	5	45	0.3	01 50 s	121 12 w	100.0	1.0	2.0
891113	03	01	03	08	02	3	01	1.4	01 23 n	094 18 w	100.0	2.0	2.0
891129	03	11	03			4	05	1.2	11 36 n	122 26 w	12.5	4.0	3.0

Table 3. (continued)

Sightings by Species

species: SEI WHALE (B. BOREALIS) species code: 73

date	series	leg	sight	sun position		beauf.	detected	perp.	latitude	longitude	proportion	mean school size est	
yrmody			number	horz.	vert.	number	by	dist.(km)	deg min	deg min	(% of school)	best	low
891129	03	11	03			4	05	1.2	11 36 n	122 26 w	12.5	4.0	3.0

Table 3. (continued)

Sighting by Species

species: BLUE WHALE (B. MUSCULUS)

species code: 75

date yrmody	series	leg	sight number	sun position horz.	sun position vert.	beauf. number	detected by	perp. dist.(km)	latitude deg min	longitude deg min	proportion (% of school)	mean school size est best	mean school size est low
890924			03			4	99	2.6	01 16 s	091 17 w	100.0	2.0	2.0
890924	01	07	01			4	55	1.6	01 14 s	091 19 w	100.0	2.0	2.0
890928	07	01	08			5	73	0.2	04 51 s	084 41 w	100.0	1.0	1.0
891120	03	01	04			3	01	1.4	00 53 s	109 28 w	100.0	2.0	2.0

Table 3. (continued)

Sighting by Species

species: HUMPBACK WHALE (MEGAPTERA NOVAEANGLIAE) — species code: 76

date yrmody	series	leg	sight number	sun position horz.	sun position vert.	beauf. number	detected by	perp. dist.(km)	latitude deg min	longitude deg min	proportion (% of school)	mean school size est best	mean school size est low
891006	03	05	06			3	05	0.2	03 01 s	083 21 w	1.0	96.0	97.0
891206	02	03	01	03	02	1	51	4.3	30 32 n	116 37 w	50.0	2.0	2.0

Table 3. (continued)

Sightings by Species

species: UNIDENTIFIED DOLPHIN — species code: 77

date yrmody	series	leg	sight number	sun position horz.	sun position vert.	beauf. number	detected by	perp. dist.(km)	latitude deg min	longitude deg min	proportion (% of school)	mean school size est best	mean school size est low
890801	03	13	03	02	01	5	55	7.5	21 29 n	115 56 w	100.0	12.0	0.0*
890802	01	03	01	10	03	3	07	0.8	19 46 n	115 33 w	100.0	15.0	12.0
890802	02	05	02			4	55	0.8	19 37 n	115 16 w	100.0	2.0	2.0
890802	02	12	03	12	12	4	56	4.6	19 17 n	114 48 w	100.0	0.0*	4.0
890802	04	06	05			4	56	0.5	19 02 n	114 17 w	100.0	0.0*	7.0
890803	01	07	01			2	56	7.3	17 37 n	112 29 w	100.0	0.0*	5.0
890806	10	03	06			2	71	7.3	11 10 n	114 54 w	100.0	450.0	178.0
890807	01	16	01			4	71	2.3	09 54 n	112 47 w	100.0	0.0*	1.0
890807	04	04	05	06	02	3	56	0.5	09 32 n	112 00 w	97.0	0.0*	150.0
890808	01	02	01			4	67	7.7	08 23 n	110 55 w	100.0	0.0*	3.0
890811	05	10	03			5	67	3.3	06 21 n	113 53 w	100.0	0.0*	5.0
890813			02			5	73	0.6	08 33 n	119 21 w	100.0	0.0*	1.0
890814			01	12	12	5	71	2.2	09 11 n	121 14 w	100.0	0.0*	5.0
890814			02	11	01	5	73	0.6	09 24 n	121 33 w	100.0	0.0*	10.0
890815	06	02	01	11	01	5	73	2.4	10 49 n	123 57 w	100.0	0.0*	1.0
890816	02	01	01	11	02	3	71	5.5	12 35 n	126 56 w	100.0	0.0*	2.0
890817			02			4	55	0.0	13 26 n	128 31 w	100.0	82.0	62.0
890817	01	01	01			4	55	5.0	13 23 n	128 27 w	5.7	197.0	167.0
890817	04	01	04			3	55	2.1	13 46 n	129 40 w	41.5	4.0	5.0
890904	06	04	05	04	02	3	55	0.8	09 47 n	146 49 w	100.0	6.0	6.0
890907			10			4	73	0.9	04 58 n	138 14 w	6.0	160.0	143.0
890908	01	01	01			4	72	0.3	05 01 n	137 02 w	100.0	0.0*	2.0
890909	02	02	02	11	02	4	56	0.4	05 18 n	133 23 w	18.3	11.0	9.0
890910	03	05	07			5	71	1.6	06 51 n	129 59 w	100.0	0.0*	1.0
890916			06	05	03	5	73	0.2	02 26 n	112 40 w	100.0	0.0*	6.0
890922	01	07	02	11	02	5	71	4.7	01 19 n	096 42 w	100.0	0.0*	4.0
890922	03	01	04			4	56	0.2	01 19 n	096 32 w	100.0	0.0*	1.0
890927			02			5	73	3.3	04 26 s	086 54 w	100.0	0.0*	1.0
890927			03			5	99	0.2	04 26 s	086 54 w	100.0	0.0*	1.0
890927			04			5	73	2.2	05 12 s	086 24 w	100.0	0.0*	1.0
891006	02	02	03			3	45	8.6	02 43 s	082 45 w	100.0	0.0*	0.0*
891008	01	03	01			4	74	0.6	02 57 s	089 12 w	100.0	2.0	2.0
891008	03	05	06			4	45	0.9	02 54 s	090 06 w	100.0	0.0*	1.0
891010	06	01	11			2	51	10.4	02 33 s	097 04 w	100.0	0.0*	1.0
891012	01	01	01			4	01	4.0	02 25 s	103 06 w	100.0	0.0*	7.0
891012	02	05	02			3	05	9.2	02 22 s	103 23 w	100.0	0.0*	1.0
891012	03	02	04	06	02	4	05	3.0	02 20 s	103 34 w	100.0	0.0*	1.0
891013	01	05	02	06	02	5	74	1.6	02 08 s	106 53 w	100.0	0.0*	6.0
891014	03	03	02	12	12	4	45	0.4	02 00 s	110 31 w	100.0	2.0	2.0
891014	03	15	03	11	02	4	05	1.0	01 54 s	111 17 w	100.0	0.0*	2.0
891017	07	01	05	12	01	5	45	3.6	02 01 s	120 40 w	100.0	1.0	1.0
891020	01	15	02	01	01	5	51	1.5	03 34 s	116 24 w	100.0	0.0*	5.0
891020	03	03	04	12	12	6	05	1.5	03 31 s	116 20 w	100.0	0.0*	1.0
891021	03	06	03	01	01	5	05	0.2	04 08 s	113 42 w	100.0	0.0*	4.0

Table 3. (continued)

Sightings by Species

species: UNIDENTIFIED DOLPHIN　　　　species code: 77

date	series	leg	sight	sun position		beauf.	detected	perp.	latitude	longitude	proportion	mean school size est	
yrmody			number	horz.	vert.	number	by	dist.(km)	deg min	deg min	(% of school)	best	low
891022	01	04	03			5	01	0.7	04 49 s	111 08 w	100.0	7.0	5.0
891023	01	05	03	05	01	5	05	1.4	05 17 s	107 07 w	100.0	0.0*	6.0
891027			11			4	74	0.0	03 57 s	094 11 w	21.5	13.0	11.0
891027	06	09	10			4	01	0.6	03 57 s	094 11 w	100.0	10.0	12.0
891028	01	02	02			4	74	3.0	03 11 s	092 35 w	100.0	0.0*	2.0
891101			01	07	02	5	99	0.1	05 39 n	086 57 w	100.0	1.0	1.0
891102	01	02	01			5	45	0.9	07 15 n	086 06 w	100.0	0.0*	2.0
891102	05	09	04	07	02	3	01	5.6	08 39 n	085 23 w	100.0	1.0	1.0
891102	05	10	05	07	02	3	74	6.5	08 40 n	085 21 w	100.0	0.0*	20.0
891102	06	02	06			4	74	4.9	08 49 n	085 17 w	100.0	0.0*	42.0
891109	04	01	08	11	02	1	45	1.1	09 11 n	087 39 w	100.0	0.0*	1.0
891109	06	02	11	11	03	1	74	0.5	09 09 n	087 45 w	100.0	3.0	3.0
891109	07	01	12	11	03	1	01	2.8	09 09 n	087 49 w	100.0	3.0	3.0
891113	04	05	04	10	01	4	45	10.2	01 08 n	094 26 w	100.0	0.0*	3.0
891114	07	04	10	11	01	4	74	3.2	02 09 s	094 13 w	100.0	0.0*	20.0
891115	02	16	04			4	74	8.8	05 18 s	094 15 w	100.0	0.0*	1.0
891117	01	13	03			4	05	9.6	03 30 s	100 34 w	100.0	0.0*	1.0
891123	03	01	03	10	03	4	74	3.2	02 00 n	122 45 w	100.0	0.0*	1.0
891124	03	07	04	10	01	4	51	5.4	02 01 n	125 49 w	100.0	0.0*	20.0
891124	04	07	05	06	03	5	51	1.1	02 16 n	125 29 w	100.0	0.0*	2.0
891127	02	01	01			4	74	0.0	07 20 n	123 33 w	100.0	2.0	2.0

Table 3. (continued)

Sightings by Species

species: UNIDENTIFIED SMALL WHALE species code: 78

date	series	leg	sight	sun position		beauf.	detected	perp.	latitude	longitude	proportion	mean school size est	
yrmody			number	horz.	vert.	number	by	dist.(km)	deg min	deg min	(% of school)	best	low
890806	10	07	07			1	73	0.1	11 05 n	114 50 w	100.0	3.0	3.0
890811	06	06	05			5	71	0.0	06 23 n	114 10 w	74.5	38.0	33.0
890818	02	05	01	07	02	5	55	1.9	13 31 n	131 41 w	100.0	1.0	1.0
890818	03	10	02	01	03	5	56	0.3	12 37 n	132 36 w	100.0	1.0	1.0
890906	01	09	01	11	02	4	73	0.2	06 40 n	142 44 w	100.0	1.0	1.0
890907	02	01	05	12	12	4	73	0.5	04 48 n	139 13 w	100.0	1.0	1.0
890907	04	02	08	06	02	4	73	0.1	04 54 n	138 36 w	100.0	1.0	1.0
890912	05	03	04	04	12	5	55	1.7	05 11 n	124 42 w	100.0	1.0	1.0
890928			05			5	99	0.0	04 59 s	084 52 w	100.0	1.0	1.0
891008	03	07	07			3	05	2.0	02 54 s	090 08 w	100.0	1.0	1.0
891010	03	01	05			2	45	1.6	02 45 s	096 48 w	100.0	3.0	3.0
891010	07	04	13	12	01	3	22	0.1	02 29 s	097 25 w	100.0	1.0	1.0
891010	08	03	15	12	01	4	01	0.9	02 29 s	097 41 w	100.0	1.0	1.0
891010	09	03	17			3	22	0.7	02 29 s	098 00 w	100.0	1.0	1.0
891012	03	09	06	12	12	4	45	3.1	02 16 s	104 08 w	100.0	1.0	1.0
891015	01	01	01			3	22	0.0	02 03 s	112 54 w	100.0	5.0	6.0
891031	03	02	03			5	74	0.0	03 40 n	087 19 w	60.0	5.0	5.0
891102	05	05	03	08	02	3	45	0.1	08 31 n	085 27 w	100.0	1.0	1.0
891109	01	01	01			2	45	0.1	09 23 n	086 14 w	100.0	1.0	1.0
891109	01	02	02	07	03	2	45	2.0	09 22 n	086 19 w	100.0	3.0	2.0
891109	01	11	05	07	01	2	22	0.9	09 17 n	087 02 w	100.0	0.0*	1.0
891109	05	01	09	11	02	1	22	2.7	09 11 n	087 41 w	100.0	0.0*	1.0
891110	01	03	01			3	74	0.3	08 49 n	089 15 w	100.0	1.0	1.0
891119	02	03	02			4	22	4.3	01 37 s	106 42 w	100.0	3.0	3.0
891119	06	03	06			3	51	0.1	01 23 s	107 38 w	100.0	5.0	4.0
891120	06	13	07			3	74	0.3	00 23 s	110 54 w	100.0	1.0	1.0
891206			03	08	02	2	22	0.9	30 46 n	116 23 w	100.0	1.0	1.0

Table 3. (continued)

Sightings by Species

species: UNIDENTIFIED LARGE WHALE   species code: 79

date yrmody	series	leg	sight number	sun position horz.	sun position vert.	beauf. number	detected by	perp. dist.(km)	latitude deg min	longitude deg min	proportion (% of school)	mean school size est best	mean school size est low
890809	01	02	01	09	03	4	55	3.0	05 37 n	109 04 w	100.0	2.0	2.0
890811	06	05	04			5	73	6.8	06 23 n	114 08 w	100.0	3.0	3.0
890824	03	02	02	11	03	4	07	0.3	16 27 n	149 21 w	100.0	1.0	1.0
890907	01	08	03	11	02	4	67	0.5	05 06 n	139 34 w	100.0	2.0	2.0
890914	04	04	01	12	12	5	55	0.9	03 45 n	118 53 w	100.0	1.0	1.0
890916	01	03	01			5	67	2.9	02 35 n	114 03 w	100.0	0.0*	1.0
890922	01	01	01			5	56	5.0	01 27 n	097 00 w	100.0	0.0*	1.0
890922	03	07	06	05	01	5	55	2.4	01 09 n	096 12 w	100.0	0.0*	1.0
890923			05			5	73	2.4	00 00 s	093 59 w	100.0	1.0	1.0
890923			08			5	73	2.6	00 17 s	093 14 w	100.0	2.0	2.0
891006	03	04	05			4	01	1.8	03 00 s	083 17 w	100.0	1.0	1.0
891007	07	01	05			4	45	1.7	02 57 s	087 19 w	100.0	1.0	1.0
891008	02	01	03			4	74	2.2	02 54 s	089 46 w	100.0	1.0	1.0
891008	03	07	09			3	45	1.0	02 54 s	090 10 w	100.0	1.0	1.0
891008	05	02	13			3	51	2.5	02 50 s	091 11 w	100.0	1.0	1.0
891009	05	04	06	02	12	4	74	7.1	02 47 s	093 55 w	100.0	3.0	3.0
891017	07	06	07	11	01	5	05	5.6	01 59 s	120 50 w	100.0	1.0	1.0
891022	01	01	01			4	74	2.7	04 47 s	111 17 w	100.0	1.0	1.0
891028	01	01	01	01	03	4	01	7.2	03 14 s	092 41 w	100.0	2.0	2.0
891113	04	06	05	11	01	4	45	2.9	01 04 n	094 26 w	100.0	1.0	1.0
891117	05	06	08	11	03	5	74	2.2	03 05 s	101 20 w	100.0	1.0	1.0
891120	01	02	01			2	74	5.1	00 52 s	109 19 w	100.0	2.0	2.0
891122	01	01	01			3	51	0.9	01 25 n	116 50 w	100.0	1.0	1.0
891122	03	04	03			4	01	1.9	01 39 n	117 40 w	100.0	1.0	1.0
891124	02	12	02	08	01	5	51	3.6	01 59 n	125 13 w	100.0	1.0	1.0
891129	03	10	02			5	05	0.9	11 35 n	122 29 w	100.0	0.0*	2.0
891129	03	11	03			4	05	1.2	11 36 n	122 26 w	25.0	4.0	3.0
891206	02	03	01	03	02	1	51	4.3	30 32 n	116 37 w	50.0	2.0	2.0

Table 3. (continued)

Sightings by Species

species: UNIDENTIFIED CETACEAN species code: 96

date yrmody	series	leg	sight number	sun position horz.	sun position vert.	beauf. number	detected by	perp. dist.(km)	latitude deg min	longitude deg min	proportion (% of school)	mean school size est best	mean school size est low
890805	03	01	02			2	55	0.1	13 38 n	117 26 w	100.0	4.0	3.0
890905	01	14	01	12	12	4	56	1.0	07 54 n	145 04 w	100.0	3.0	3.0
890918	08	03	08			5	55	0.3	02 28 n	107 16 w	100.0	1.0	1.0
891008	04	05	10			3	01	0.7	02 52 s	090 41 w	100.0	0.0*	3.0
891027	07	01	12			4	74	0.2	03 54 s	094 09 w	100.0	5.0	6.0

Table 3. (continued)

Sightings by Species

species: UNIDENTIFIED WHALE species code: 98

date	series	leg	sight	sun position		beauf.	detected	perp.	latitude	longitude	proportion	mean school size est	
yrmody			number	horz.	vert.	number	by	dist.(km)	deg min	deg min	(% of school)	best	low
890821	01	02	01	05	03	4	55	4.1	10 13 n	139 02 w	100.0	1.0	1.0
890907	01	07	01	11	02	4	67	2.4	05 10 n	139 44 w	100.0	1.0	1.0
890907	01	07	02	11	02	4	07	7.9	05 09 n	139 40 w	100.0	1.0	1.0
890912			01			5	56	0.9	05 25 n	125 37 w	100.0	0.0*	3.0
890918			07			5	07	0.2	02 21 n	107 22 w	100.0	2.0	2.0
890918	03	04	03	12	01	5	07	0.3	02 17 n	108 13 w	100.0	1.0	1.0
890918	07	01	05			5	67	2.0	02 21 n	107 24 w	100.0	1.0	1.0
890928			10			4	99	0.3	04 38 s	084 22 w	100.0	0.0*	2.0
891011	05	01	09			3	45	1.5	02 19 s	101 44 w	100.0	1.0	1.0
891012	03	07	05	06	01	4	22	2.8	02 17 s	104 02 w	100.0	1.0	1.0
891012	03	22	07	11	03	4	74	1.0	02 08 s	105 05 w	100.0	1.0	1.0
891015	02	05	03			3	51	5.4	02 01 s	113 08 w	100.0	2.0	1.0
891016	06	12	05	11	03	4	51	0.6	02 02 s	117 58 w	100.0	5.0	3.0
891020	02	02	03	01	01	5	51	1.5	03 32 s	116 18 w	100.0	2.0	2.0
891022			04			5	99	0.1	04 52 s	110 55 w	100.0	1.0	1.0
891027	05	06	05			5	22	2.5	04 09 s	094 36 w	100.0	1.0	1.0
891027	06	05	09	06	02	5	22	2.5	04 04 s	094 21 w	100.0	0.0*	2.0
891028	02	03	03	01	02	4	51	2.0	03 08 s	092 28 w	100.0	2.0	2.0
891028	03	12	05	06	02	4	74	3.8	02 33 s	091 24 w	100.0	1.0	1.0
891029	04	01	04	05	01	3	51	3.7	01 20 s	089 20 w	100.0	1.0	1.0
891115	02	01	02	09	03	4	45	7.7	04 29 s	094 04 w	100.0	1.0	1.0
891115	03	05	06			4	45	7.5	05 08 s	094 41 w	100.0	1.0	1.0
891116			05			4	22	0.4	04 20 s	097 42 w	100.0	0.0*	1.0

Table 4. Marine mammal school size estimates for each observer, classified by species code, for all sightings encountered in the eastern tropical Pacific during July - September (Part A) and October - December (Part B), 1989.

A: Sightings encountered July through September, 1989.

	date	sight no.	obs 7 best est.	obs 7 pct	obs 55 best est.	obs 55 pct	obs 56 best est.	obs 56 pct	obs 67 best est.	obs 67 pct	obs 71 best est.	obs 71 pct	obs 73 best est.	obs 73 pct
species	2: OFFSHORE SPOTTED DOLPHIN													
	890801	05			375	100					270	100	265	100
	890801	06			60	100					70	100	55	100
	890805	07	1350	40	1800	60					800	65	2200	70
	890806	02									200	90	500	90
	890806	08					800	85					475	95
	890807	03	80	100			300	100	400	100				
	890810	03			300	100					65	100	50	100
	890810	04			150	100					35	100	105	100
	890810	05	125	15			320	5	375	40				
	890814	03			200	100					55	100		
	890816	02			275	60					170	40	210	62
	890817	06	250	10			1700	1	1350	5				
	890817	07			220	100					45	100	70	100
	890821	02	45	80	350	75	220	85	350	80			105	81
	890822	02			375	50					240	35	350	36
	890904	02			550	60					295	35	650	40
	890904	03			400	75					270	50	125	40
	890904	04	225	30	1200	25	1200	12	1700	25	400	15	725	15
	890909	03	220	95			1000	98	1450	95				
	890910	02	65	100	250	100							140	100
	890910	06	50	85	90	40							115	26
	890912	02	40	100			85	100	160	100				
	890913	01	50	100			125	100	250	100			50	100
	890918	01					200	98	225	97				
	890918	06	45	95			250	65	400	90				
	890919	02	65	10			400	30	525	7				
	890921	01			300	40			200	40	110	40		
	890922	03			400	100			225	100	200	100	350	100
species	3: SPINNER DOLPHIN													
	890806	08					800	15					475	5
	890918	06	45	5			250	35	400	10				
species	5: COMMON DOLPHIN													
	890731	01	165	100					185	100				
	890731	02			300	100					200	100	225	100
species	10: EASTERN SPINNER DOLPHIN													
	890803	04	135	100			125	100	225	100	160	100	240	100
	890803	05											60	17
	890804	02	35	100	45	100			70	100	25	100		
	890805	03	180	100	250	100	350	100	350	100	210	100	310	100
	890805	07	1350	60	1800	40					800	35	2200	30
	890806	01	40	100			125	100	200	100			45	100
	890806	02									200	10	500	10
	890806	03	200	100	400	100					225	100	320	100

Table 4A. (continued)

	date	sight no.	obs 7 best est.	obs 7 pct	obs 55 best est.	obs 55 pct	obs 56 best est.	obs 56 pct	obs 67 best est.	obs 67 pct	obs 71 best est.	obs 71 pct	obs 73 best est.	obs 73 pct
species	10: EASTERN SPINNER DOLPHIN													
	890816	02			275	40					170	60	210	38
species	11: WHITEBELLY SPINNER DOLPHIN													
	890810	01	120	100			250	100	450	100				
	890810	05	125	85			320	95	375	60				
	890817	01			350	95					90	98	150	90
	890817	05			650	100					440	100	750	100
	890817	06	250	90			1700	99	1350	95				
	890821	02	45	20	350	25	220	15	350	20			105	19
	890822	02			375	50					240	65	350	64
	890904	01	45	100			135	100	115	100				
	890904	02			550	40					295	65	650	60
	890904	03			400	25					270	50	125	60
	890904	04	225	70	1200	75	1200	88	1700	75	400	85	725	85
	890904	06	25	100	55	100	60	100	110	100			35	100
	890909	03	220	5			1000	2	1450	5				
	890910	06	50	15	90	60							115	74
	890918	01					200	2	225	3				
	890919	02	65	90			400	70	525	93				
	890920	03			160	100					180	100	85	100
	890921	01			300	60			200	60	110	60		
species	13: STRIPED DOLPHIN													
	890731	03			225	100					200	100	140	100
	890801	01									100	1	100	2
	890801	02	35	100	65	100	100	100	125	100	75	100	85	100
	890801	04			2	100					2	100	2	100
	890802	04	8	100	17	100					15	100	20	100
	890802	06	25	100	20	100					25	100	40	100
	890802	08					20	100						
	890803	02			70	100					50	100	115	100
	890803	03	22	100	45	100	40	100	70	100				
	890803	05											60	83
	890804	01	23	100			70	100	70	100			45	100
	890805	04	15	100			55	100	80	100			45	100
	890805	05			40	100	45	100	75	100	13	100	25	100
	890805	06	20	100			30	100	55	100				
	890809	03	65	100			130	100	260	100			70	100
	890811	01	25	100			70	100	150	100	30	100	40	100
	890817	03	20	100			40	100	47	100				
	890819	02			40	100					17	100	30	100
	890819	03	45	100	60	100	60	100					30	100
	890819	04			17	70					23	70	28	57
	890821	05	35	100			115	100	130	100				
	890824	01			40	100					15	100	22	100
	890909	01	22	100			85	100	75	100				
	890913	03	10	100			25	100	50	100				
	890913	05	55	100			150	100	400	100			120	100
	890913	06	12	100			35	100	40	100				
	890916	02			400	100					160	100	110	100

Table 4A. (continued)

	date	sight no.	obs 7 best est.	obs 7 pct	obs 55 best est.	obs 55 pct	obs 56 best est.	obs 56 pct	obs 67 best est.	obs 67 pct	obs 71 best est.	obs 71 pct	obs 73 best est.	obs 73 pct
species	13: STRIPED DOLPHIN													
	890919	01											8	100
	890920	01	10	100			25	100	35	100				
	890920	04	5	100			15	100	10	100				
	890920	05			125	100					60	100	30	100
	890920	06	11	100			20	100	13	100				
	890922	07	23	100			60	100	60	100				
	890929	07	15	100			60	100						
species	15: ROUGH-TOOTHED DOLPHIN													
	890907	09					20	100					14	100
species	17: "SHORT-SNOUTED WHITEBELLY"													
	890801	01									100	99	100	98
	890804	04	65	100			75	100	170	100	55	100	55	100
	890923	01	80	100	190	100								
	890923	02	70	100	235	100					160	100		
	890923	04	320	100	1800	100					800	100		
	890923	06	290	100			950	100	775	100	450	100		
	890923	07	85	100			650	100	350	100			350	100
	890928	04	250	100	700	100	600	100	625	100	400	100	550	100
	890928	06			500	100					250	100	180	100
	890928	07			300	100					160	100	220	100
	890929	02	250	100			1400	100	675	100				
	890929	03			500	100					150	100		
	890929	04			210	100					140	100		
	890929	06	190	100			650	100	875	100				
species	18: BOTTLENOSED DOLPHIN													
	890804	05	30	100	30	100					23	100	45	100
	890819	01			35	100					23	100	40	100
	890919	03					20	25	31	60				
species	21: RISSO'S DOLPHIN													
	890803	06	20	100	30	100					13	100	45	100
	890913	02											10	100
	890928	01											4	100
	890928	02											7	100
	890928	03	8	100									21	100
species	26: FRASER'S DOLPHIN													
	890920	02			400	100					250	100	140	100
species	33: FALSE KILLER WHALE													
	890822	01	3	100										
	890822	03			35	100					12	100	18	100
	890910	09			5	100					6	100	4	100
species	36: SHORT-FINNED PILOT WHALE													
	890819	04			17	30					23	30	28	43
	890907	04			20	100					20	100	45	100

Table 4A. (continued)

	date	sight no.	obs 7 best est.	obs 7 pct	obs 55 best est.	obs 55 pct	obs 56 best est.	obs 56 pct	obs 67 best est.	obs 67 pct	obs 71 best est.	obs 71 pct	obs 73 best est.	obs 73 pct
species	36: SHORT-FINNED PILOT WHALE													
	890910	01	18	100										
	890910	03											30	100
	890919	03					20	75	31	40				
species	37: KILLER WHALE													
	890809	04	3	100	3	100					3	100	3	100
	890821	06			8	100	7	100			2	100	4	100
	890905	03	7	100	7	100					7	100	11	100
species	46: SPERM WHALE													
	890805	01	2	100			2	100	2	100			2	100
	890811	05	37	19	40	25					22	45	52	13
	890909	02					15	75	13	70				
	890909	05	1	100										
	890916	04	4	100									4	100
	890929	01					6	100	6	100				
	890929	05					8	100						
species	49: BEAKED WHALE													
	890821	04			1	100								
	890916	03			5	100								
species	51: UNID. MESOPLODONT													
	890806	05	1	100			1	100	1	100				
	890807	04			3	100							3	100
	890811	02	1	100	1	100					1	100	1	100
species	61: CUVIER'S BEAKED WHALE													
	890806	04			3	100					3	100	3	100
	890809	02	3	100	3	100					3	100	3	100
	890821	03											2	100
	890914	02									3	100	2	100
species	70: RORQUAL													
	890914	03	2	100									1	100
	890915	01			4	100							4	100
	890918	02			1	100								
species	72: BRYDE'S WHALE													
	890907	07			1	100					1	100	1	100
	890912	03	3	100									3	100
	890914	04	4	100									4	100
	890918	04	1	100			1	100	1	100				
species	75: BLUE WHALE													
	890924	01			2	100							2	100
	890928	08											1	100

Table 4A. (continued)

	date	sight no.	obs 7 best est.	obs 7 pct	obs 55 best est.	obs 55 pct	obs 56 best est.	obs 56 pct	obs 67 best est.	obs 67 pct	obs 71 best est.	obs 71 pct	obs 73 best est.	obs 73 pct
species	77: UNIDENTIFIED DOLPHIN													
	890801	03			12	100								
	890802	01	15	100										
	890802	02			2	100								
	890806	06											450	100
	890817	01			350	5					90	2	150	10
	890904	05			6	100							6	100
	890909	02					15	25	13	30				
species	78: UNIDENTIFIED SMALL WHALE													
	890806	07	3	100	3	100					3	100	3	100
	890811	05	37	81	40	75					22	55	52	87
	890818	01			1	100								
	890818	02					1	100						
	890906	01											1	100
	890907	05											1	100
	890907	08											1	100
	890912	04			1	100								
species	79: UNIDENTIFIED LARGE WHALE													
	890809	01			2	100								
	890811	04			3	100							3	100
	890824	02	1	100										
	890907	03	4	100					2	100			1	100
	890914	01			1	100							1	100
species	96: UNIDENTIFIED CETACEAN													
	890805	02			4	100								
	890905	01					3	100						
	890918	08			1	100								
species	98: UNIDENTIFIED WHALE													
	890821	01	1	100	1	100								
	890907	01							1	100				
	890907	02	1	100										
	890918	03	1	100										
	890918	05							1	100				

Table 4B. Sightings encountered October through December, 1989.

date	sight no.	obs 1 best est.	obs 1 pct	obs 5 best est.	obs 5 pct	obs 22 best est.	obs 22 pct	obs 45 best est.	obs 45 pct	obs 51 best est.	obs 51 pct	obs 74 best est.	obs 74 pct
species 2: OFFSHORE SPOTTED DOLPHIN													
891014	01	450	70							320	80	280	45
891016	04							2062	64				
891017	01			250	35	210	30	200	40				
891112	01	330	20							195	30	325	50
891117	06	350	10							600	20	1100	3
891118	01	275	100							310	100	360	100
891118	06	130	20							220	10	340	12
891119	01	35	100							36	100	45	100
891121	02	480	100							750	100	470	100
891121	03	450	100	325	100	780	100	850	100	580	100		
891121	04					85	100						
891122	04									45	100		
891122	05									45	100	45	100
891124	03	18	100										
species 11: WHITEBELLY SPINNER DOLPHIN													
891014	01	450	30							320	20	280	55
891016	04							2062	32				
891017	01			250	65	210	70	200	60				
891112	01	330	80							195	70	325	50
891116	03			200	30	275	25	350	20				
891117	06	350	90							600	80	1100	97
species 13: STRIPED DOLPHIN													
891009	02			85	100	85	100	90	100	45	100		
891009	07	32	100							34	100	38	100
891010	03	28	100							25	100	60	100
891010	06			155	40								
891010	07	110	100							90	100	150	100
891010	08	85	100							75	100		
891010	12			125	100	165	100	250	100				
891013	03	18	100							45	100	30	100
891013	04							20	100				
891015	04	25	100							28	100	45	100
891016	01	135	100							110	100	200	100
891026	03	150	100			60	100			135	100	425	100
891027	01			50	100	65	100	120	100				
891027	04					15	100						
891028	04	85	100									170	100
891031	01					65	67						
891031	05					12	100						
891109	10	32	100							50	100	35	100
891113	08	120	100									120	100
891114	01	350	100							185	100	290	100
891114	07									45	100	125	100
891116	01	175	100									550	100

Table 4B. (continued)

	date	sight no.	obs 1 best est.	obs 1 pct	obs 5 best est.	obs 5 pct	obs 22 best est.	obs 22 pct	obs 45 best est.	obs 45 pct	obs 51 best est.	obs 51 pct	obs 74 best est.	obs 74 pct
species 13: STRIPED DOLPHIN														
	891116	03			200	70	275	75	350	80				
	891116	04					65	100						
	891117	05					110	100	20	100				
	891118	02					65	100						
	891118	03			125	100			60	100				
	891118	04	120	100							80	100	150	100
	891118	05	225	100							200	100	220	100
	891118	06	130	80							220	90	340	88
	891118	07			65	100	95	100	80	100				
	891119	03			255	100	215	100	350	100				
	891120	03	45	100							34	100	70	100
	891120	06					125	100						
species 15: ROUGH-TOOTHED DOLPHIN														
	891011	05			1	100								
	891017	04			3	100								
	891117	01			5	100								
species 17: "SHORT-SNOUTED WHITEBELLY"														
	891006	01	45	100									45	100
	891006	04			650	100	1400	100	1000	100				
	891007	04			80	100	60	100	80	100				
	891008	05			18	100								
	891009	04	2700	100	1900	100	2300	100	5500	100				
	891009	09			900	100	1850	100	2500	100	730	100		
	891029	01	170	100							140	100	320	100
	891029	05	210	100							600	100	900	100
	891029	06			600	100	680	100	950	100				
	891031	01					65	33						
	891113	07	350	100	200	100	435	100	480	100				
	891113	09							90	100				
	891114	06			325	100	385	100	400	100				
	891114	14					165	100						
species 18: BOTTLENOSED DOLPHIN														
	891006	08	48	65							42	70	33	67
	891008	04	35	100							28	100	28	100
	891010	01	165	98										
	891010	04							15	6				
	891010	06			155	40								
	891016	04							2062	1				
	891019	02	25	5									22	40
	891019	03	19	2							20	1	18	28
	891115	05	45	40							18	20	20	60
	891117	09	60	95									20	40
	891118	10	50	2										
species 21: RISSO'S DOLPHIN														
	891008	08			8	100	8	100	15	100				
	891010	14							8	100				

Table 4B. (continued)

	date	sight no.	obs 1		obs 5		obs 22		obs 45		obs 51		obs 74	
			best est.	pct	best est.	pct	best est.	pct	best est.	pct	best est.	pct	best est.	pct
species 21: RISSO'S DOLPHIN														
	891010	16			5	100	6	100	6	100				
	891016	02							3	100				
	891027	07			4	100			4	100				
	891029	03	18	100									10	100
	891029	07									2	100		
	891031	02	9	15										
	891031	03											5	40
species 22: PACIFIC WHITE-SIDED DOLPHIN														
	891205	03	30	100										
species 26: FRASER'S DOLPHIN														
	891017	03			125	100	65	100	70	100				
	891123	01	600	100	450	100	850	100	380	100				
species 31: MELON-HEADED WHALE														
	891203	01	350	100							410	100	185	100
species 32: PYGMY KILLER WHALE														
	891119	04	14	100							12	100	7	100
species 33: FALSE KILLER WHALE														
	891118	09	75	85							30	40	12	84
	891118	10	50	8										
	891205	02			30	100	19	100	30	100				
species 34: PILOT WHALE														
	891006	06			98	24	87	15	104	29				
	891006	08	48	35							42	30	33	33
	891010	01	165	2										
	891010	04							15	94				
	891010	06			155	20								
	891016	03			12	100								
	891016	04							2062	3				
	891017	02	35	100									22	100
	891017	06			12	100	6	100						
	891019	01	5	100									5	100
	891019	02	25	95									22	60
	891019	03	19	98							20	99	18	72
	891027	06							5	100				
	891027	08							28	100				
	891114	05	35	100							19	100	15	100
	891114	08	26	100							7	100	8	100
	891114	13									7	100	7	100
	891115	01			8	100								
	891115	05	45	60							18	80	20	40
	891117	09	60	5									20	60
	891118	09	75	15							30	60	12	16
	891118	10	50	90										

Table 4B. (continued)

	date	sight no.	obs 1 best est.	obs 1 pct	obs 5 best est.	obs 5 pct	obs 22 best est.	obs 22 pct	obs 45 best est.	obs 45 pct	obs 51 best est.	obs 51 pct	obs 74 best est.	obs 74 pct
species 36: SHORT-FINNED PILOT WHALE														
	891102	02	20	100							15	100		
species 37: KILLER WHALE														
	891027	02			11	100	11	100	12	100				
	891116	02									2	100		
species 46: SPERM WHALE														
	891006	02							1	100				
	891006	06			98	75	87	84	104	70				
	891008	02							2	100				
	891008	12	1	100										
	891011	03	7	100							11	100		
	891020	01	1	100										
	891022	02	5	100							5	100		
	891031	02	9	85										
	891110	02									5	100		
	891114	04									1	100		
	891117	02							1	100				
	891117	07			15	100	12	100						
	891120	02									3	100	2	100
	891120	05											1	100
species 49: BEAKED WHALE														
	891115	03			2	100								
	891118	08			1	100								
	891205	01			2	100								
species 50: SOUTHERN BOTTLENOSED WHALE														
	891113	01			13	100	13	100	13	100				
species 51: UNID. MESOPLODONT														
	891124	01			2	100								
species 61: CUVIER'S BEAKED WHALE														
	891007	03	1	100							1	100		
	891008	11			4	100			4	100				
	891011	04									1	100		
	891022	05					1	100						
	891109	03			3	100								
	891109	04	3	100										
	891109	06					2	100						
	891109	07			2	100								
	891203	02							2	100				
species 70: RORQUAL														
	891009	05					1	100						
	891009	08			1	100								
	891015	05			5	80								
	891021	01	1	100							1	100		
	891022	06	2	100									3	100

Table 4B. (continued)

	date	sight no.	obs 1 best est.	obs 1 pct	obs 5 best est.	obs 5 pct	obs 22 best est.	obs 22 pct	obs 45 best est.	obs 45 pct	obs 51 best est.	obs 51 pct	obs 74 best est.	obs 74 pct
species	70: RORQUAL													
	891023	02							1	100				
	891026	02	1	100										
	891118	12					3	100	3	100				
	891122	02			2	100								
species	72: BRYDE'S WHALE													
	891009	01			7	100			8	100				
	891015	05			5	20								
	891017	08							1	100				
	891113	03	2	100							2	100		
	891129	03			4	25								
species	73: SEI WHALE													
	891129	03			4	25								
species	75: BLUE WHALE													
	891120	04	2	100									2	100
species	76: HUMPBACK WHALE													
	891006	06			98	1	87	1	104	1				
	891206	01									2	50		
species	77: UNIDENTIFIED DOLPHIN													
	891008	01											2	100
	891014	02							2	100				
	891017	05							1	100				
	891022	03	7	100										
	891027	10	10	100										
	891102	04	1	100										
	891109	11	4	100									1	100
	891109	12	3	100										
	891127	01											2	100
species	78: UNIDENTIFIED SMALL WHALE													
	891008	07			1	100								
	891010	05			3	100			3	100				
	891010	13					1	100						
	891010	15	1	100										
	891010	17					1	100						
	891012	06							1	100				
	891015	01					5	100						
	891031	03											5	60
	891102	03							1	100				
	891109	01							1	100				
	891109	02									3	100		
	891110	01											1	100
	891119	02					3	100						
	891119	06									5	100		
	891120	07											1	100

Table 4B. (continued)

	date	sight no.	obs 1 best est.	obs 1 pct	obs 5 best est.	obs 5 pct	obs 22 best est.	obs 22 pct	obs 45 best est.	obs 45 pct	obs 51 best est.	obs 51 pct	obs 74 best est.	obs 74 pct
species 79: UNIDENTIFIED LARGE WHALE														
	891006	05	1	100										
	891007	05							1	100				
	891008	03											1	100
	891008	09							1	100				
	891008	13									1	100		
	891009	06											3	100
	891017	07			1	100								
	891022	01									1	100	1	100
	891028	01	2	100										
	891113	05							1	100				
	891117	08	1	100										
	891120	01	2	100							2	100	2	100
	891122	01	1	100										
	891122	03	1	100										
	891124	02									1	100		
	891129	03			4	50								
	891206	01									2	50		
species 96: UNIDENTIFIED CETACEAN														
	891027	12	5	100										
species 98: UNIDENTIFIED WHALE														
	891011	09			1	100			1	100				
	891012	05					1	100						
	891012	07											1	100
	891015	03									2	100		
	891016	05									5	100		
	891020	03									2	100		
	891027	05					1	100						
	891028	03	2	100							2	100		
	891028	05											1	100
	891029	04									1	100		
	891115	02							1	100				
	891115	06							1	100				

Table 5. Summary of marine mammal sightings encountered in the eastern tropical Pacific during July 29 through December 7, 1989.

species name (scientific name)	species code	species sightings total	pure	mixed	means of school size estimates low /(n)	high /(n)	best /(n)
OFFSHORE SPOTTED DOLPHIN (STENELLA ATTENUATA)	2	46	22	24	150.29(46)	237.92(45)	184.75(45)
SPINNER DOLPHIN (STENELLA LONGIROSTRIS)	3	3	0	3	17.43(3)	53.48(2)	31.72(2)
COMMON DOLPHIN (DELPHINUS DELPHIS)	5	3	3	0	175.00(2)	237.50(2)	208.50(2)
EASTERN SPINNER DOLPHIN (STENELLA LONGIROSTRIS)	10	10	5	5	142.17(10)	195.71(10)	169.45(10)
WHITEBELLY SPINNER DOLPHIN (STENELLA LONGIROSTRIS)	11	25	5	20	194.69(25)	280.34(25)	230.42(25)
STRIPED DOLPHIN (S. COERULEOALBA)	13	89	82	7	60.70(89)	104.22(77)	82.73(77)
ROUGH-TOOTHED DOLPHIN (STENO BREDANENSIS)	15	7	6	1	6.79(7)	9.92(7)	8.17(7)
"LONG-SNOUTED WHITEBELLY" (DELPHINUS DELPHIS SUBSP. ?)	16	1	1	0	******(1)	******(1)	******(1)
"SHORT-SNOUTED WHITEBELLY" (DELPHINUS DELPHIS SUBSP. ?)	17	33	31	2	367.53(33)	577.56(30)	466.23(30)
BOTTLENOSED DOLPHIN (TURSIOPS TRUNCATUS)	18	23	9	14	14.78(22)	25.49(19)	25.33(20)
RISSO'S DOLPHIN (GRAMPUS GRISEUS)	21	21	18	3	6.39(21)	11.69(17)	9.02(17)
PACIFIC WHITE-SIDED DOLPHIN (LAGENORHYNCHUS OBLIQUIDENS)	22	2	2	0	87.50(2)	143.50(2)	111.00(2)
FRASER'S DOLPHIN (LAGENODELPHIS HOSEI)	26	5	3	2	186.97(5)	261.34(5)	221.29(5)
UNIDENTIFIED DOLPHIN	77	65	59	6	10.68(63)	42.18(20)	29.82(21)

Table 5. (continued)

species name (scientific name)	species code	species sightings total	pure	mixed	means of school size estimates low /(n)	high /(n)	best /(n)
MELON-HEADED WHALE (PEPONOCEPHALA ELECTRA)	31	2	1	1	311.90(2)	433.62(2)	372.98(2)
PYGMY KILLER WHALE (FERESA ATTENUATA)	32	1	1	0	10.00(1)	16.00(1)	11.00(1)
FALSE KILLER WHALE (PSEUDORCA CRASSIDENS)	33	7	5	2	10.39(7)	20.27(6)	14.02(6)
PILOT WHALE (GLOBICEPHALA SP.)	34	31	15	16	11.79(31)	18.87(27)	15.13(27)
SHORT-FINNED PILOT WHALE (GLOBICEPHALA MACRORHYNCHUS)	36	10	6	4	13.76(10)	22.41(9)	17.94(9)
KILLER WHALE (ORCINUS ORCA)	37	6	6	0	4.67(6)	7.60(5)	5.80(5)
SPERM WHALE (PHYSETER MACROCEPHALUS)	46	27	23	4	6.12(27)	7.16(26)	6.56(26)
DWARF SPERM WHALE (KOGIA SIMUS)	48	1	1	0	1.00(1)	1.00(1)	1.00(1)
BEAKED WHALE (ZIPHIID)	49	6	6	0	2.17(6)	2.33(6)	2.17(6)
SOUTHERN BOTTLENOSED WHALE (HYPEROODON PLANIFRONS)	50	1	1	0	11.00(1)	15.00(1)	13.00(1)
UNID. MESOPLODONT (MESOPLODON SP.)	51	6	6	0	1.50(6)	2.00(5)	1.80(5)
CUVIER'S BEAKED WHALE (ZIPHIUS CAVIROSTRIS)	61	18	18	0	1.94(18)	2.06(18)	2.06(18)
RORQUAL (BALAENOPTERA SP.)	70	18	17	1	1.72(18)	1.83(18)	1.72(18)
BRYDE'S WHALE (B. EDENI)	72	9	7	2	2.37(9)	2.51(9)	2.39(9)
SEI WHALE (B. BOREALIS)	73	1	0	1	0.37(1)	0.62(1)	0.50(1)
BLUE WHALE (B. MUSCULUS)	75	4	4	0	1.75(4)	2.00(4)	1.75(4)
HUMPBACK WHALE (MEGAPTERA NOVAEANGLIAE)	76	2	0	2	0.98(2)	1.03(2)	0.98(2)
UNIDENTIFIED SMALL WHALE	78	27	25	2	2.50(27)	3.36(25)	2.81(25)
UNIDENTIFIED LARGE WHALE	79	28	26	2	1.35(28)	1.51(24)	1.37(24)
UNIDENTIFIED CETACEAN	96	5	5	0	3.20(5)	4.25(4)	3.25(4)
UNIDENTIFIED WHALE	98	23	23	0	1.39(23)	1.84(19)	1.42(19)

Table 6. Summary of distance searched, dolphin schools detected, and rates of encountering dolphins by observers aboard the McArthur in the eastern tropical Pacific during July 29 through December 7, 1989.

	Distance Searched (km)[1]	Percent Distance Searched	Number Schools Detected	Percent Schools Detected	Detection Rate (Schools/ 1000 km)	S.E. Detection Rate	Number[2] Days Searched
All Data	14302	100	254	100	17.76	2.39	97
Inshore	2139	15	33	13	15.43	13.57	17
Middle	3697	26	74	29	20.02	10.86	25
West	3615	25	45	18	12.45	6.16	25
South	4852	34	102	40	21.02	7.50	33
Sea State Conditions							
Calm	697	5	23	9	33.01	126.73	17
Rough	13605	95	231	91	16.98	2.28	96
Visibility Conditions							
Good	12664	89	226	89	17.85	2.78	96
Poor	1638	11	28	11	17.09	9.84	63
Observers							
1	3884	27	22	9	5.66	1.00	51
5	3889	27	24	9	6.17	2.19	49
7	3312	23	10	4	3.02	1.71	46
22	3898	27	11	4	2.82	0.68	49
45	3891	27	30	12	7.71	2.73	49
51	3832	27	18	7	4.70	1.79	51
55	3193	22	26	10	8.14	4.20	44
56	3307	23	27	11	8.16	2.70	46
67	3278	23	16	6	4.88	1.93	46
71	3146	22	25	10	7.95	3.20	44
72	169	1	1	0	5.92	111.52	6
73	3195	22	14	6	4.38	1.00	44
74	3898	27	30	12	7.70	2.69	51

Table 6. (continued)

	Distance Searched (km)	Percent Distance Searched	Number Schools Detected	Percent Schools Detected	Detection Rate (Schools/ 1000 km)	S.E. Detection Rate	Number[2] Days Searched
Teams[3]							
Team 1	3879	27	70	28	18.05	7.75	51
Team 2	3883	27	65	26	16.74	6.36	49
Team 3	3193	22	67	26	20.98	14.04	44
Team 4	3307	23	52	20	15.72	5.20	46

[1]Numbers may not add precisely due to rounding.

[2]Day included in tally of searching effort if variable occurred during any part of the day.

[3]Team 1 members were observers 1,51,74; Team 2 members were observers 5,22,45; Team 3 members were observers 55,71,73; and Team 4 members were observers 7,56,67. 39km of trackline was searched when either both or neither of the team leaders were on duty and is not used for team analysis.

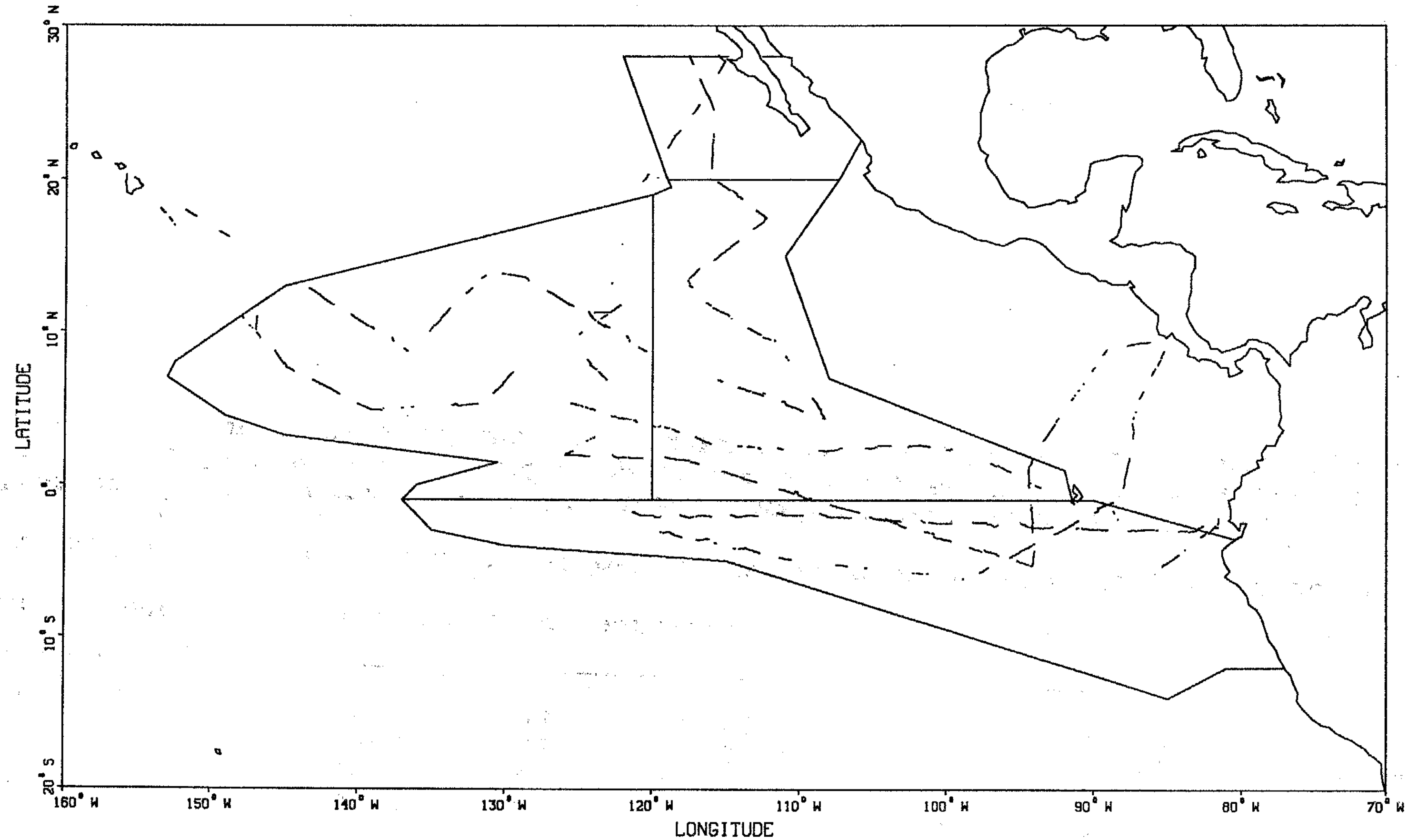

Figure 1. Tracklines surveyed by the NOAA Ship McArthur from July 29 through December 7, 1989, in the eastern tropical Pacific.

CRUISE #	YEAR	MONTH	DAY
1	5	7	9

RESEARCH SHIP
MARINE MAMMAL
DAILY EFFORT RECORD

SERIES #	LEG #	START OF LEG									END OF LEG TIME	COMPASS COURSE °T	VESSEL SPEED KTS & 10ths	POSITION: ONE OR MORE PER SERIES				OBSERVER POSITION			SIGHTING Y/N	END LEG CODE
		TIME	SURFACE TEMP. °F & 10ths	BEAU #	FOG/ RAIN	HORZ. SUN	VERT. SUN	WIND DIR. °T	SWELL DIR. °T	SWELL HEIGHT FT.				LATITUDE	N/S	LONGITUDE	E/W	LEFT BINO.	RIGHT BINO.	REC.		
11	13	15	19	22	23	24	26	28	31	34	36	40	43	46	50	51	56	57	59	61	63	64

ENDING CODES

1 = COURSE CHANGE
2 = SPEED CHANGE
4 = EFFORT TERMINATED
5 = LEG ENDS TO RECORD POSITION IN FOLLOWING LEG
8 = LEG ENDS DUE TO CHANGE IN ENVIRONMENTAL CONDITIONS
9 = LEG ENDS DUE TO CHANGE IN OBSERVER POSITIONS

FOG/RAIN CODES

NO FOG OR RAIN = 1
FOG = 2
RAIN = 3
FOG AND RAIN = 4

NOTES:

Figure 2. Research ship marine mammal daily effort record.

NOAA FORM 88-104

RESEARCH SHIP MARINE MAMMAL SIGHTING RECORD

CRUISE #	DATE			SIGHT #	SERIES #	LEG #	CARD #
	YEAR	MONTH	DAY				
							0 1
1	5	7	9	11	13	15	17

SIGHTING CUE					ENVIR. COND. AT CUE				POSITION AT TIME OF CUE								OBSERVER POSITIONS			
TIME	CUE CODE	SIGHT CODE	BEARING FROM SHIP	DISTANCE nm & 10ths	BEAU	SURF TEMP °F & 10ths	HORZ SUN	VERT SUN	LATITUDE	N/S	LONGITUDE	E/W	SOURCE CODE	TIME M.M. SIGHTED	BIRDS Y/N	LEFT BINO.	RIGHT BINO.	REC	M M DETECTED BY
19	23	24	25	28	31	32	35	37	39	43	44	49	50	51	55	56	58	60	62

OBSERVER 1

	SCHOOL SIZE ESTIMATE				SPECIES PROPORTIONS							
OBS. CODE	BEST	HIGH	LOW	CARD #	SPECIES 1 %	SP 1 CODE	SPECIES 2 %	SP 2 CODE	SPECIES 3 %	SP 3 CODE	SPECIES 4 %	SP 4 CODE
				0 2								
64	66	70	74	77 17	19	22	24	27	29	32	34	37

S P 1 ____ S P 2 ____ S P 3 ____ S P 4 ____

OBSERVER 2

	SCHOOL SIZE ESTIMATE			SPECIES PROPORTIONS							
OBS. CODE	BEST	HIGH	LOW	SPECIES 1 %	SP 1 CODE	SPECIES 2 %	SP 2 CODE	SPECIES 3 %	SP 3 CODE	SPECIES 4 %	SP 4 CODE
39	41	45	49	53	56	58	61	63	66	68	71

S P 1 ____ S P 2 ____ S P 3 ____ S P 4 ____

OBSERVER 3

	SCHOOL SIZE ESTIMATE				SPECIES PROPORTIONS							
OBS. CODE	BEST	CARD #	HIGH	LOW	SPECIES 1 %	SP 1 CODE	SPECIES 2 %	SP 2 CODE	SPECIES 3 %	SP 3 CODE	SPECIES 4 %	SP 4 CODE
		0 3										
73	75	78 17	19	23	27	30	32	35	37	40	42	45

S P 1 ____ S P 2 ____ S P 3 ____ S P 4 ____

OBSERVER 4

	SCHOOL SIZE ESTIMATE			SPECIES PROPORTIONS								
OBS. CODE	BEST	HIGH	LOW	SPECIES 1 %	SP 1 CODE	SPECIES 2 %	SP 2 CODE	SPECIES 3 %	SP 3 CODE	SPECIES 4 %	CARD #	SP 4 CODE
											0 4	
47	49	53	57	61	64	66	69	71	74	76	78 17	19

S P 1 ____ S P 2 ____ S P 3 ____ S P 4 ____

OBSERVER 5

	SCHOOL SIZE ESTIMATE			SPECIES PROPORTIONS							
OBS. CODE	BEST	HIGH	LOW	SPECIES 1 %	SP 1 CODE	SPECIES 2 %	SP 2 CODE	SPECIES 3 %	SP 3 CODE	SPECIES 4 %	SP 4 CODE
	23	27	31	35	38	40	43	45	50	53	

S P 1 ____ S P 2 ____ S P 3 ____ S P 4 ____

OBSERVER 6

	SCHOOL SIZE ESTIMATE			SPECIES PROPORTIONS								
OBS. CODE	BEST	HIGH	LOW	SPECIES 1 %	SP 1 CODE	SPECIES 2 %	SP 2 CODE	CARD #	SPECIES 3 %	SP 3 CODE	SPECIES 4 %	SP 4 CODE
								0 5				
~~56~~	57	61	65	69	72	74	77	78 17	19	22	24	27

RC 1	RC 2	RC 3	RC 4	RC 5	RC 6
29	30	31	32	33	34

S P 1 ____ S P 2 ____ S P 3 ____ S P 4 ____

Figure 3. Research ship marine mammal sighting record.

NOAA FORM 88-105

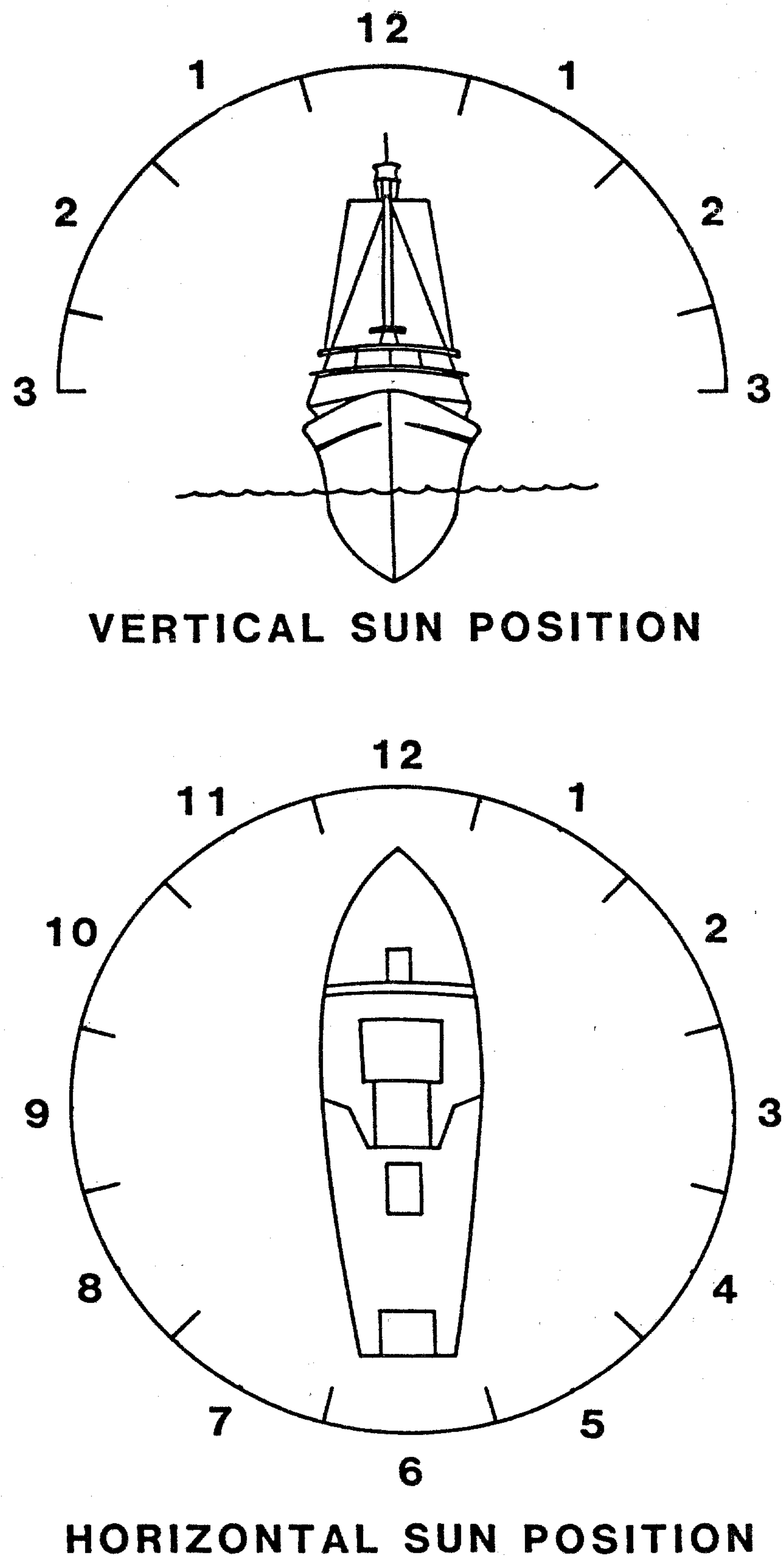

Figure 4. Vertical and horizontal sun position categories.

Figure 5. Research ship sighting continuation record.

CRUISE #	DATE YEAR	MONTH	DAY	SIGHT #	SERIES #	LEG #	OBS. CODE
1	4	6	8	10	12	14	16

SKETCH FEATURES OF ANIMALS SIGHTED

SIGHTING SUMMARY

LIST ALL DIAGNOSTIC FEATURES OBSERVED
(INCLUDING ESTIMATED BODY LENGTH)

BEHAVIOR – (DESCRIBE AGGREGATION, MOVEMENT, BOW AND STERN RIDING, BLOWS, ETC.)

MOVEMENT OF SCHOOL : SPEED (KTS) ___ DIRECTION (RELATIVE TO BOW) ___

ASSOCIATED ANIMALS – (INCLUDE NUMBER AND SPECIES OF BIRDS)

PHOTOS: ROLL # ____

FRAME(S): # ____

TOTAL TIME OF OBSERVATION	____	ENVIR. COND. (RAIN, OVERCAST, FOG, CHOPPY)	____	CLOSEST DISTANCE OF OBSERVATION	____
AMT. OF TIME AT CLOSEST DISTANCE	____	TAGS ASSOCIATED WITH SIGHTING	____	METHOD OF OBSERVATION (EYE, 7x, 10x, 25x)	____

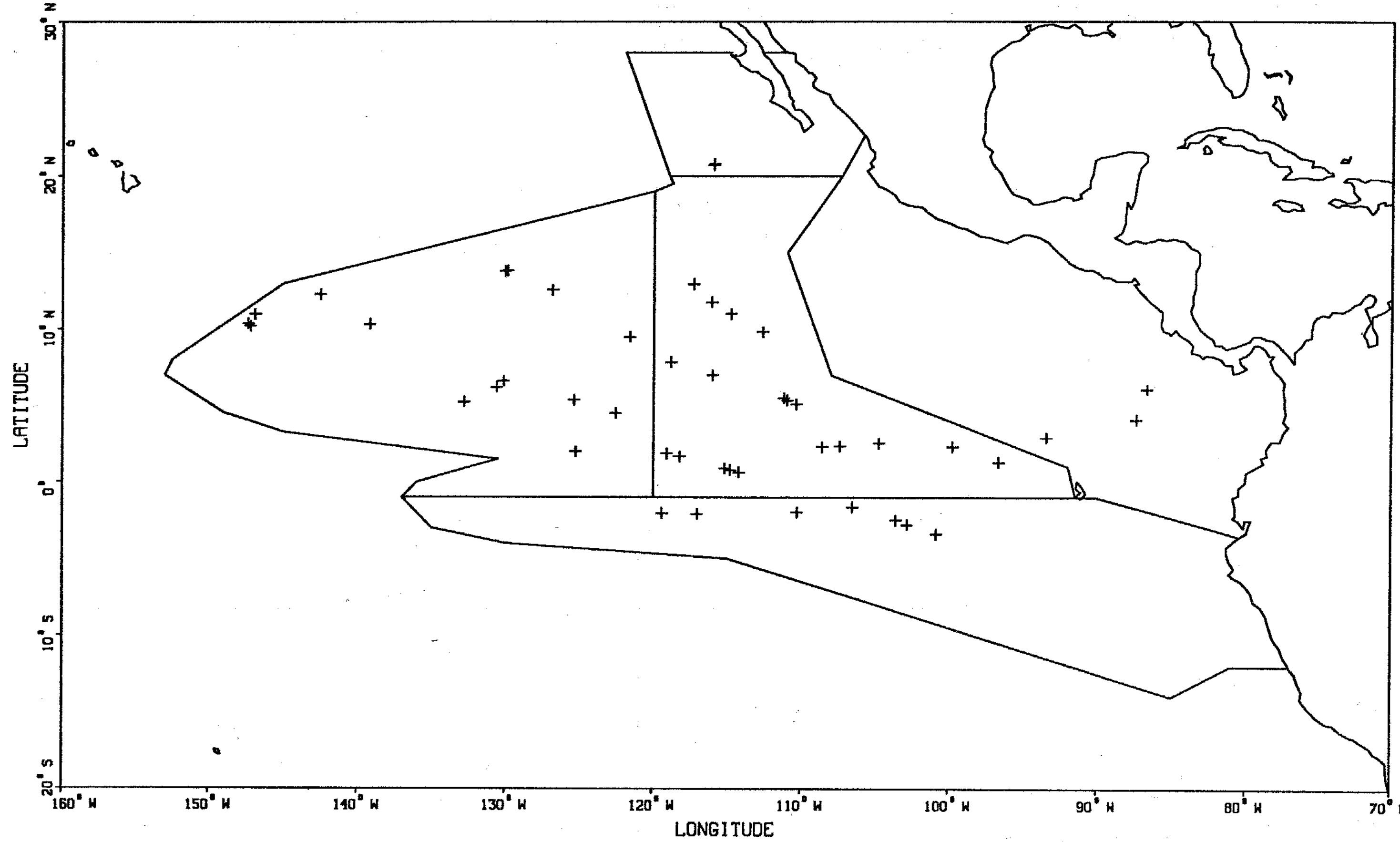

Figure 6. Offshore spotted dolphins (+) detected from board the NOAA Ship McArthur from July 29 through December 7, 1989, in the eastern tropical Pacific.

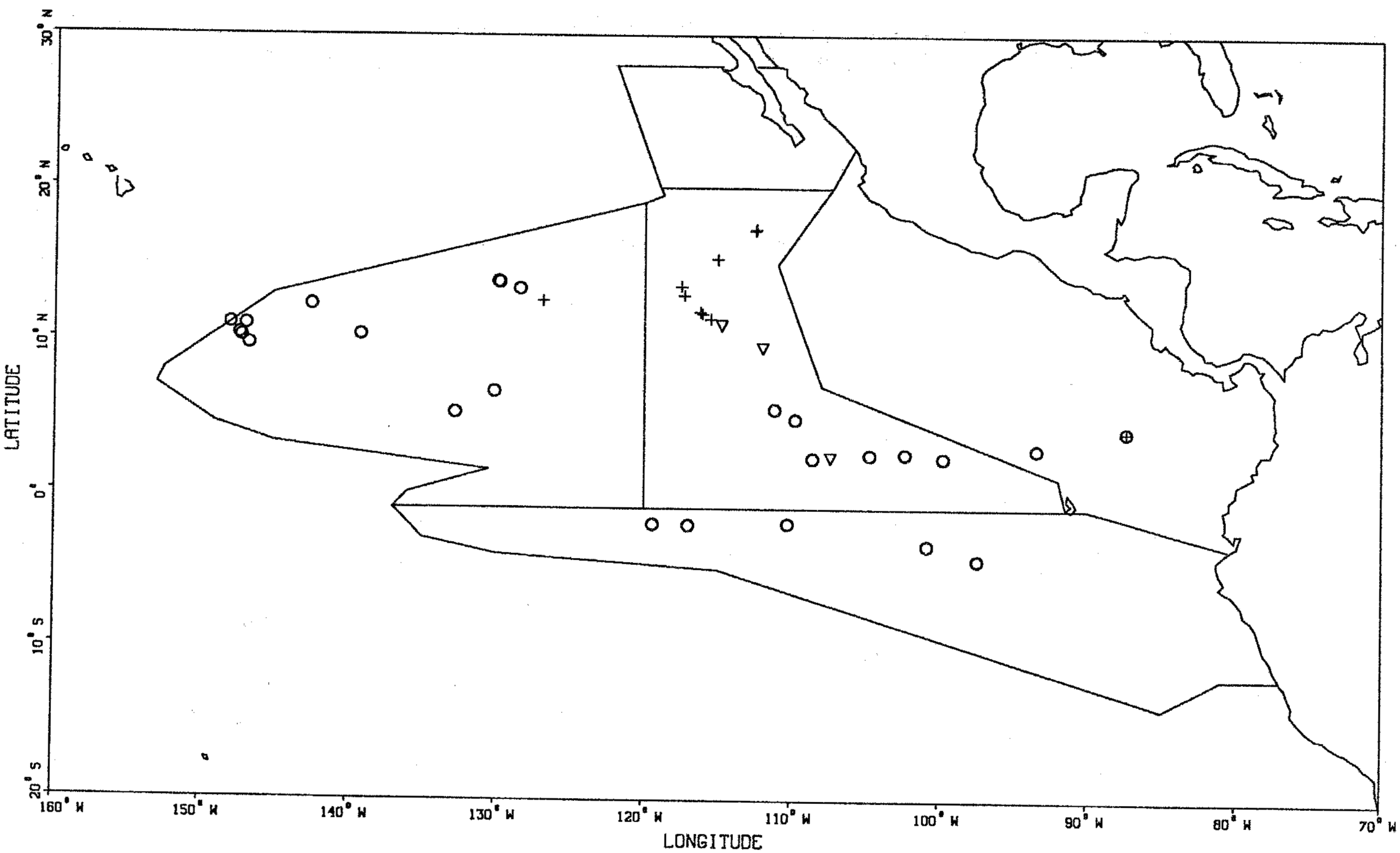

Figure 7. Eastern (+), whitebelly (O) and unidentified (▽) spinner dolphins detected from aboard the NOAA Ship <u>McArthur</u> from July 29 through December 7, 1989, in the eastern tropical Pacific.

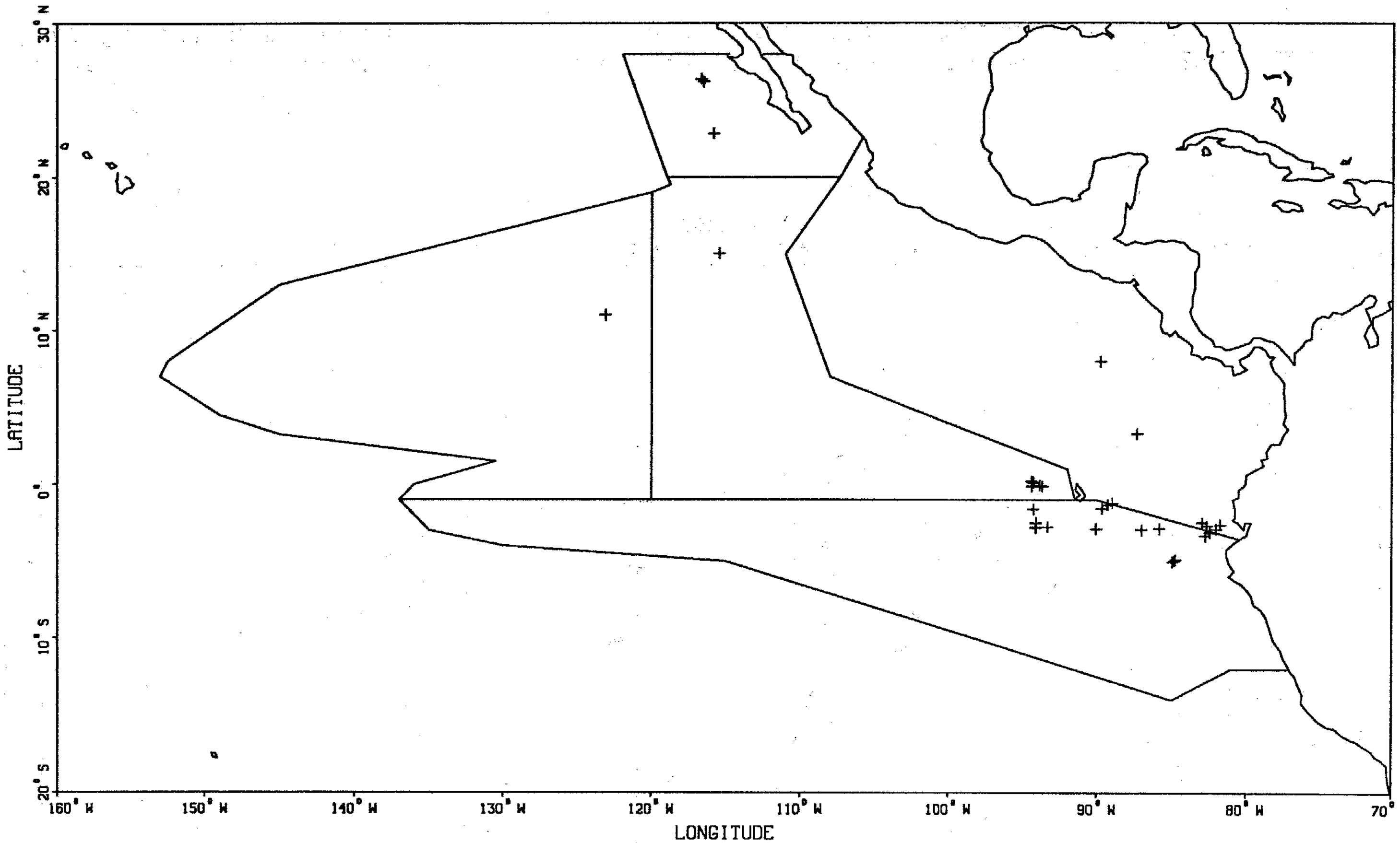

Figure 8. Common dolphins (+) detected from aboard the NOAA Ship McArthur from July 29 through December 7, 1989, in the eastern tropical Pacific.

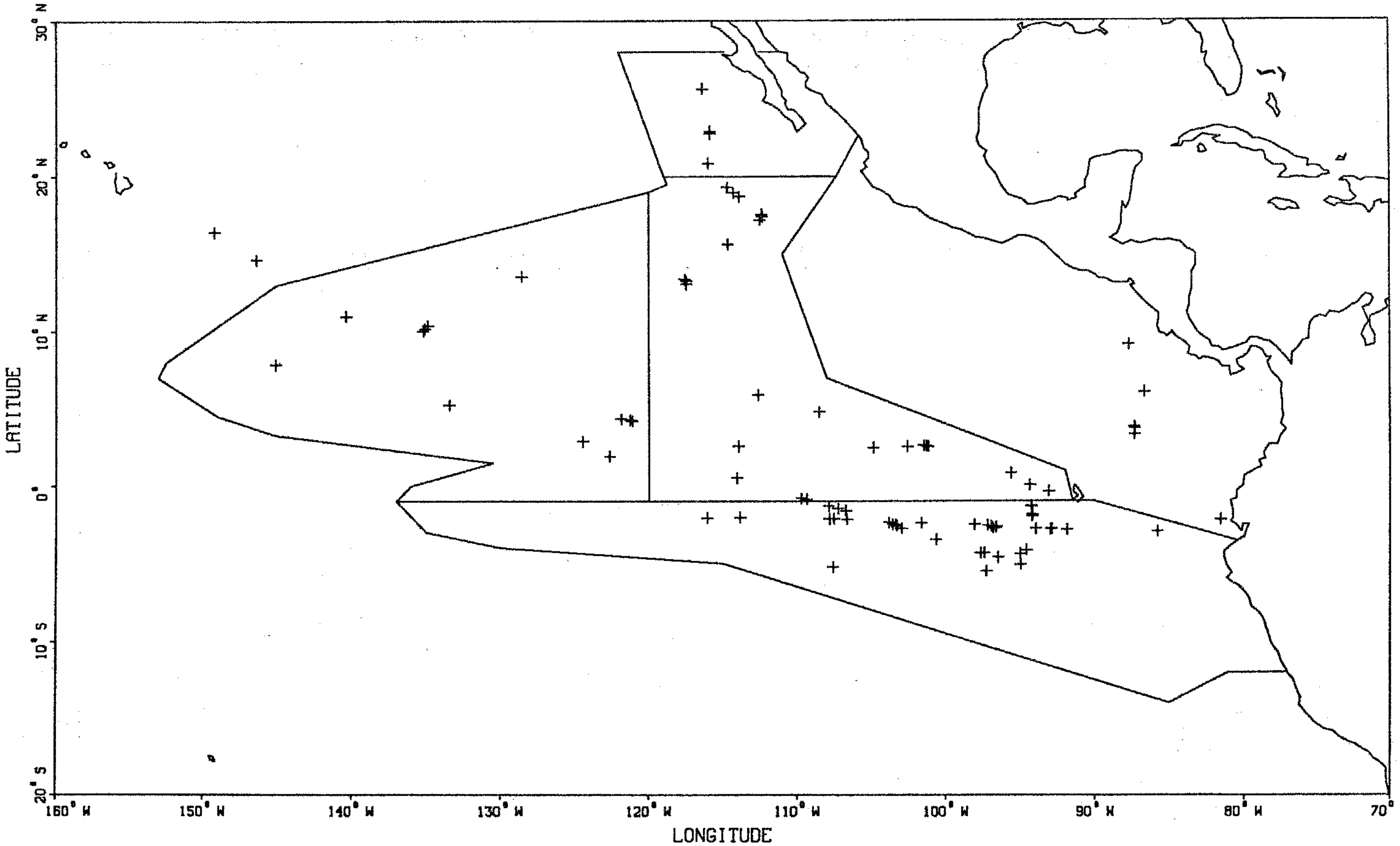

Figure 9. Striped dolphins (+) detected from aboard the NOAA Ship McArthur from July 29 through December 7, 1989, in the eastern tropical Pacific.

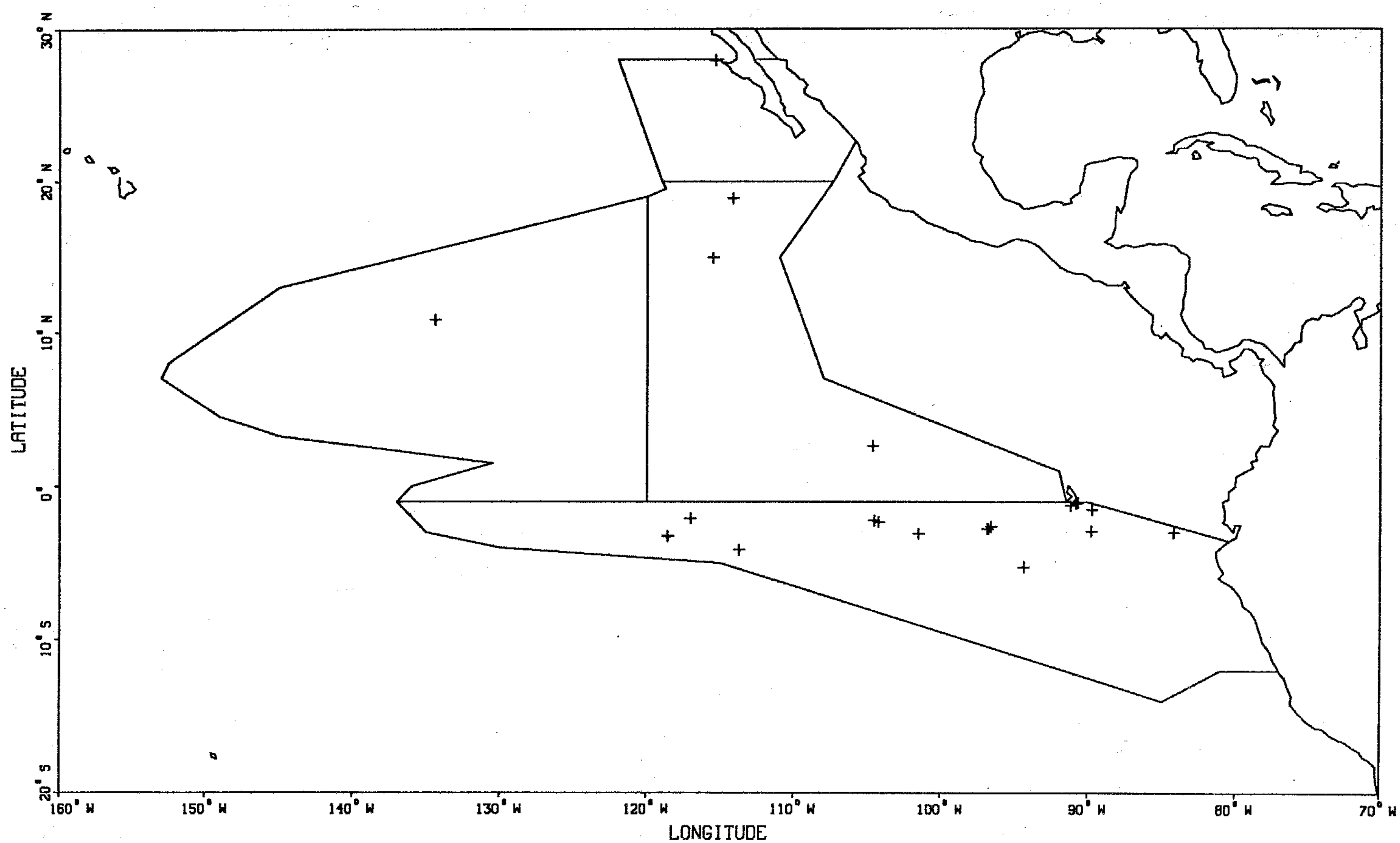

Figure 10. Bottlenose dolphins (+) detected from aboard the NOAA Ship <u>McArthur</u> from July 29 through December 7, 1989, in the eastern tropical Pacific.

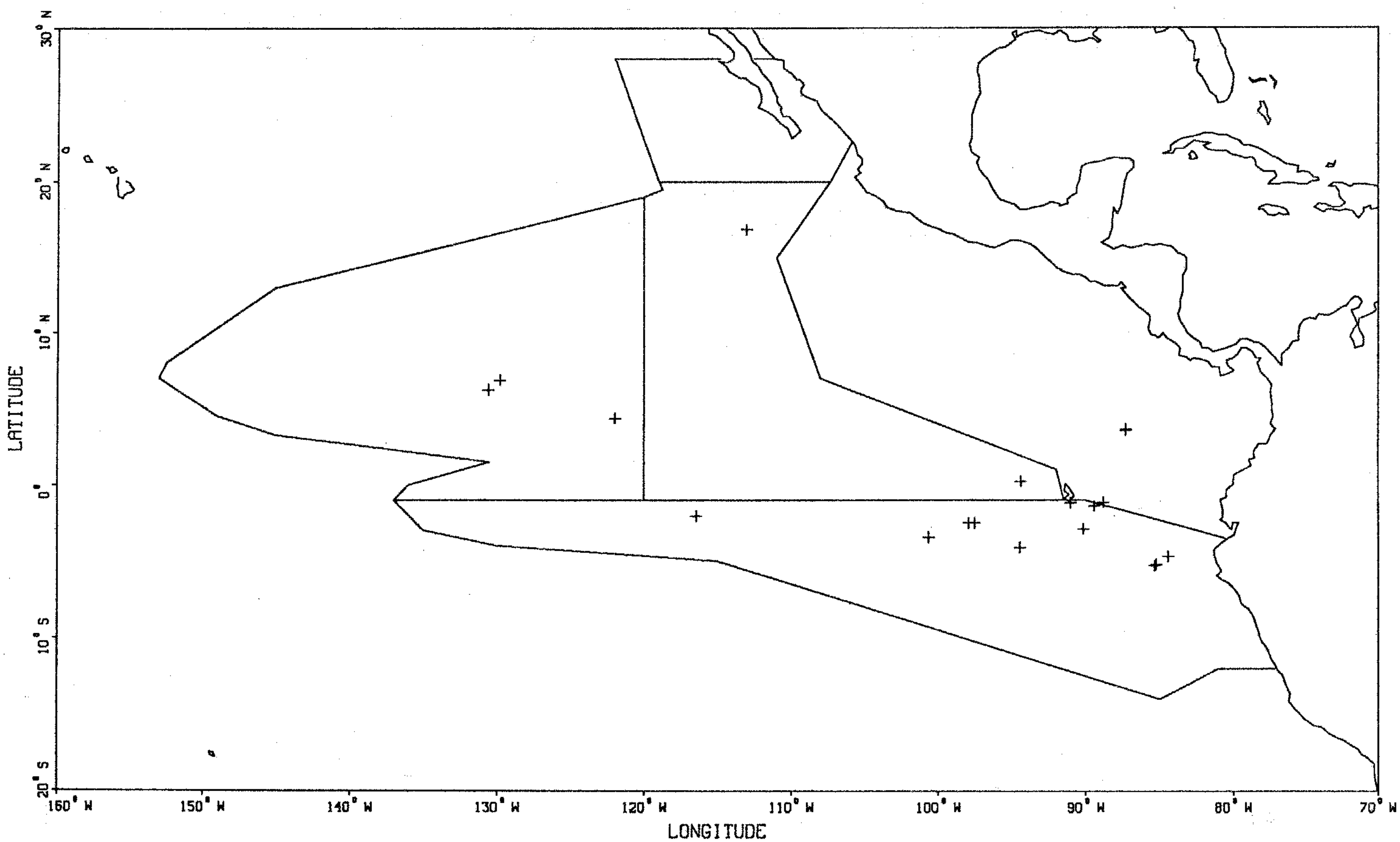

Figure 11. Risso's dolphins (+) detected from aboard the NOAA Ship McArthur from July 29 through December 7, 1989, in the eastern tropical Pacific.

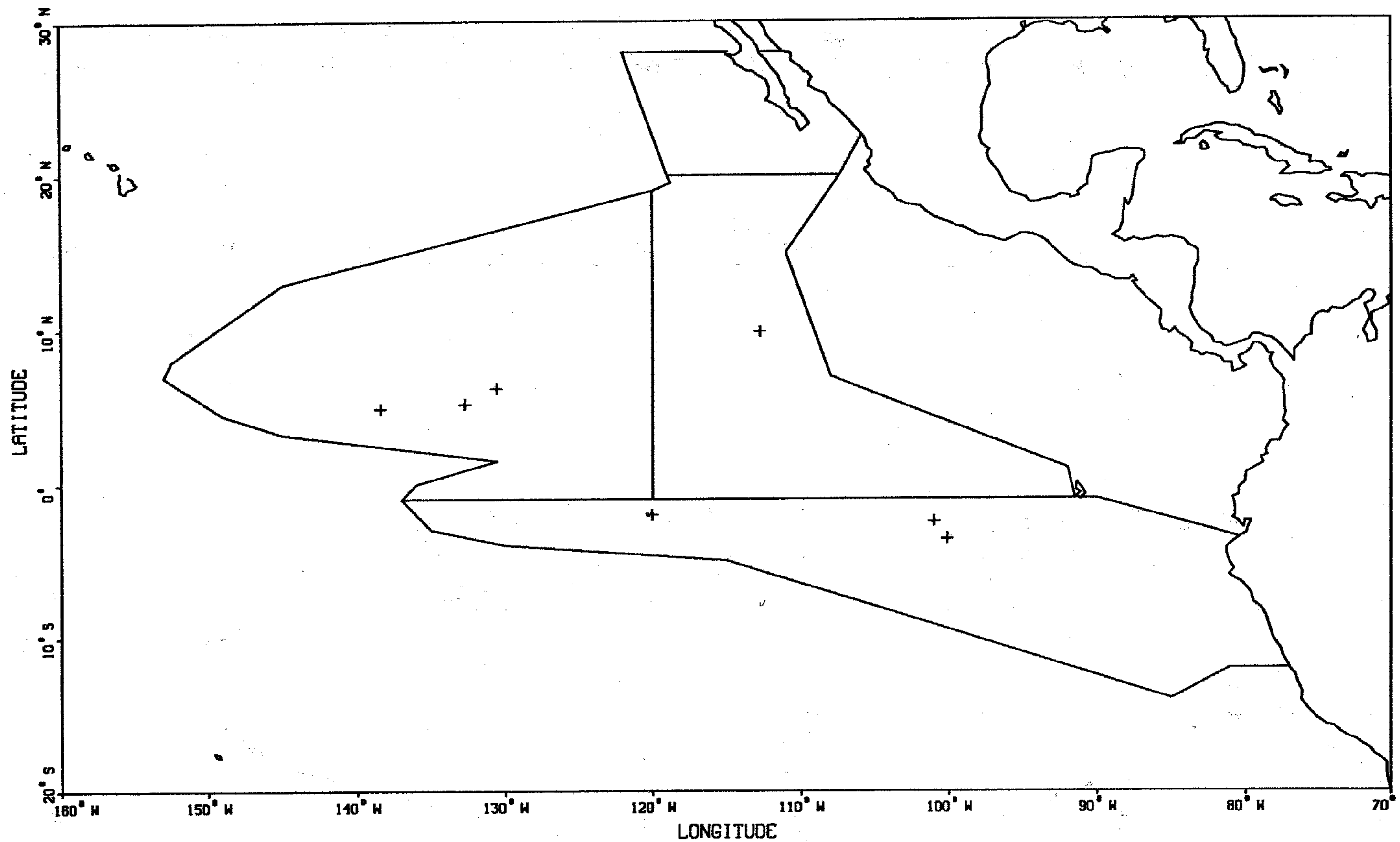

Figure 12. Rough-toothed dolphins (+) detected from aboard the NOAA Ship <u>McArthur</u> from July 29 through December 7, 1989, in the eastern tropical Pacific.

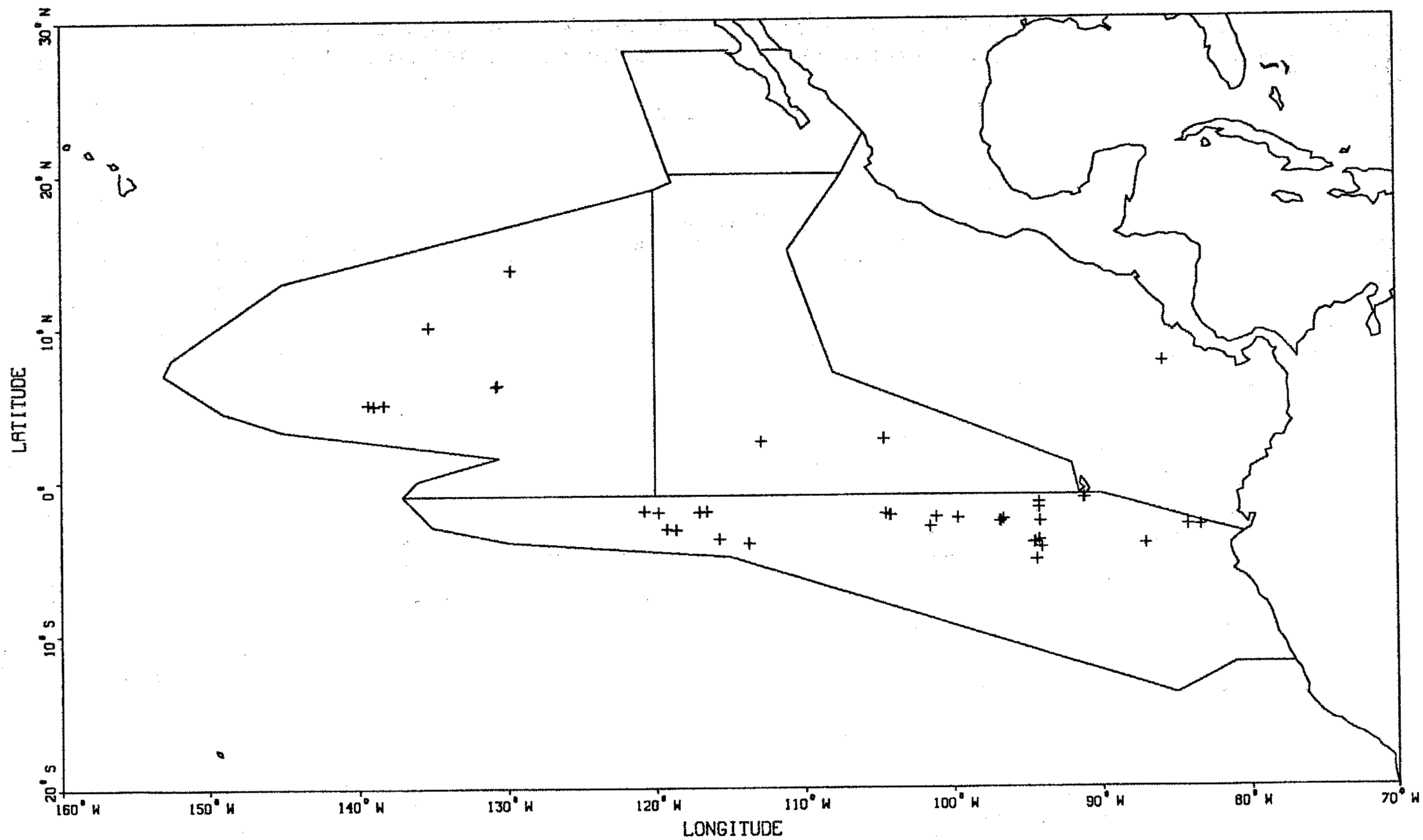

Figure 13. Pilot whales (+) detected from aboard the NOAA Ship <u>McArthur</u> from July 29 through December 7, 1989, in the eastern tropical Pacific.

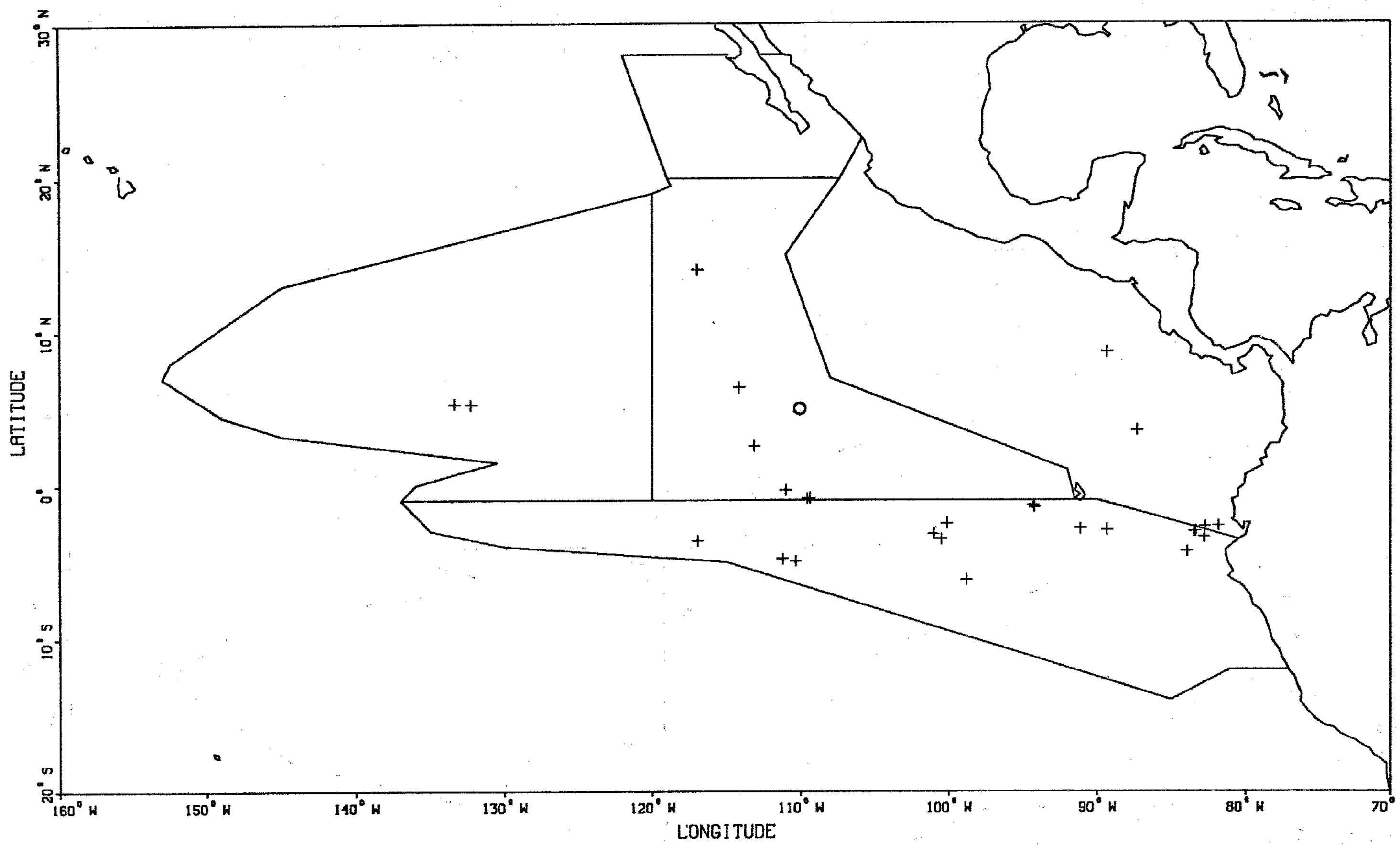

Figure 14. Sperm (+) and dwarf sperm (O) whales detected from aboard the NOAA Ship <u>McArthur</u> from July 29 through December 7, 1989, in the eastern tropical Pacific.

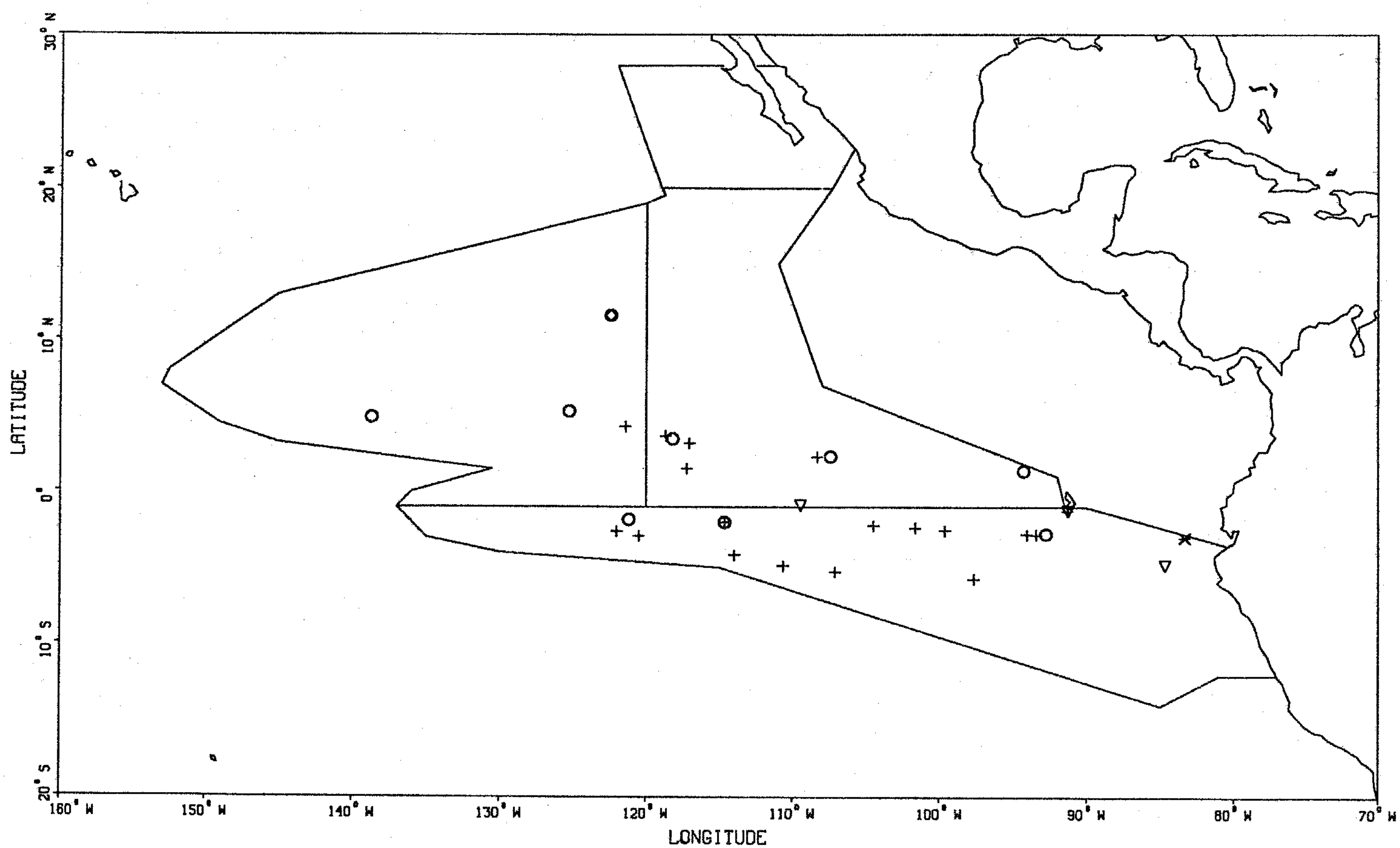

Figure 15. Unidentified rorquals (+), Bryde's (○), blue (▽), humpback (⋇) and sei (◇) whales detected from aboard the NOAA Ship <u>McArthur</u> from July 29 through December 7, 1989, in the eastern tropical Pacific.

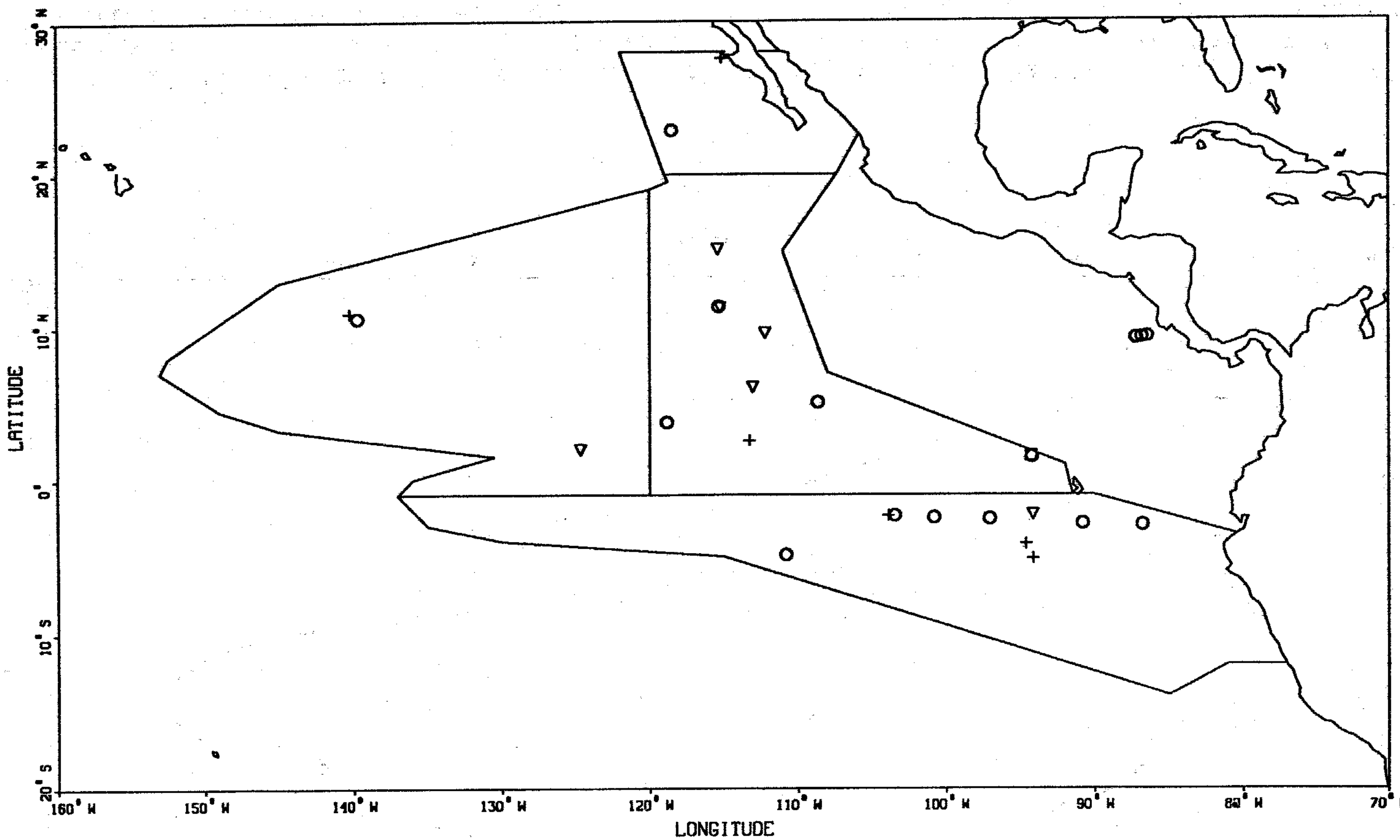

Figure 16. Unidentified beaked (+), Cuvier's beaked (O), mesoplodon (▽), and bottlenose (□) whales detected from aboard the NOAA Ship <u>McArthur</u> from July 29 through December 7, 1989, in the eastern tropical Pacific.

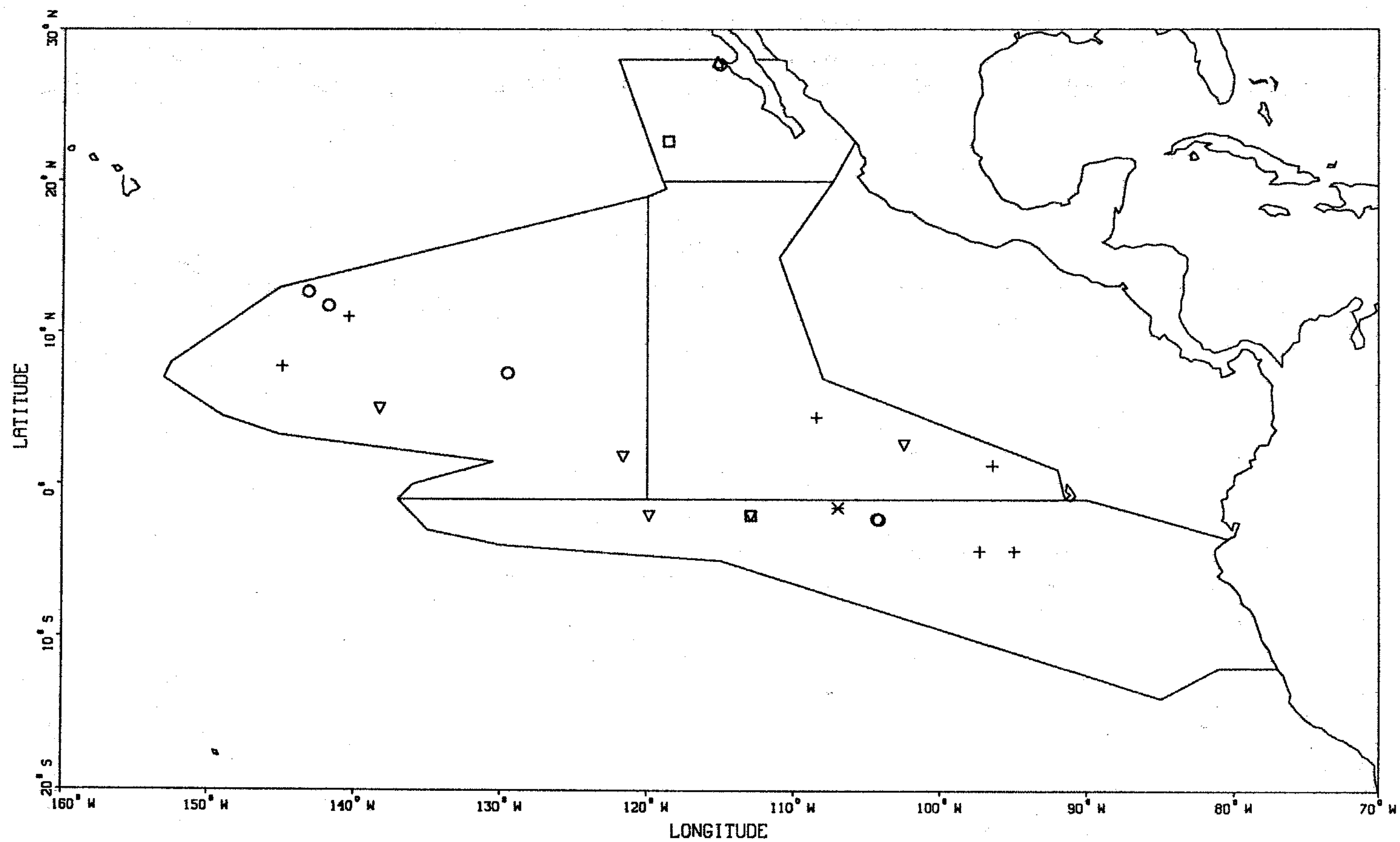

Figure 17. Killer (+) and false killer (O) whales, Fraser's dolphins (▽), melon-headed (□) and pygmy killer (⋇) whales and Pacific white-sided (△) dolphins detected from aboard the NOAA Ship <u>McArthur</u> from July 29 through December 7, 1989, in the eastern tropical Pacific.

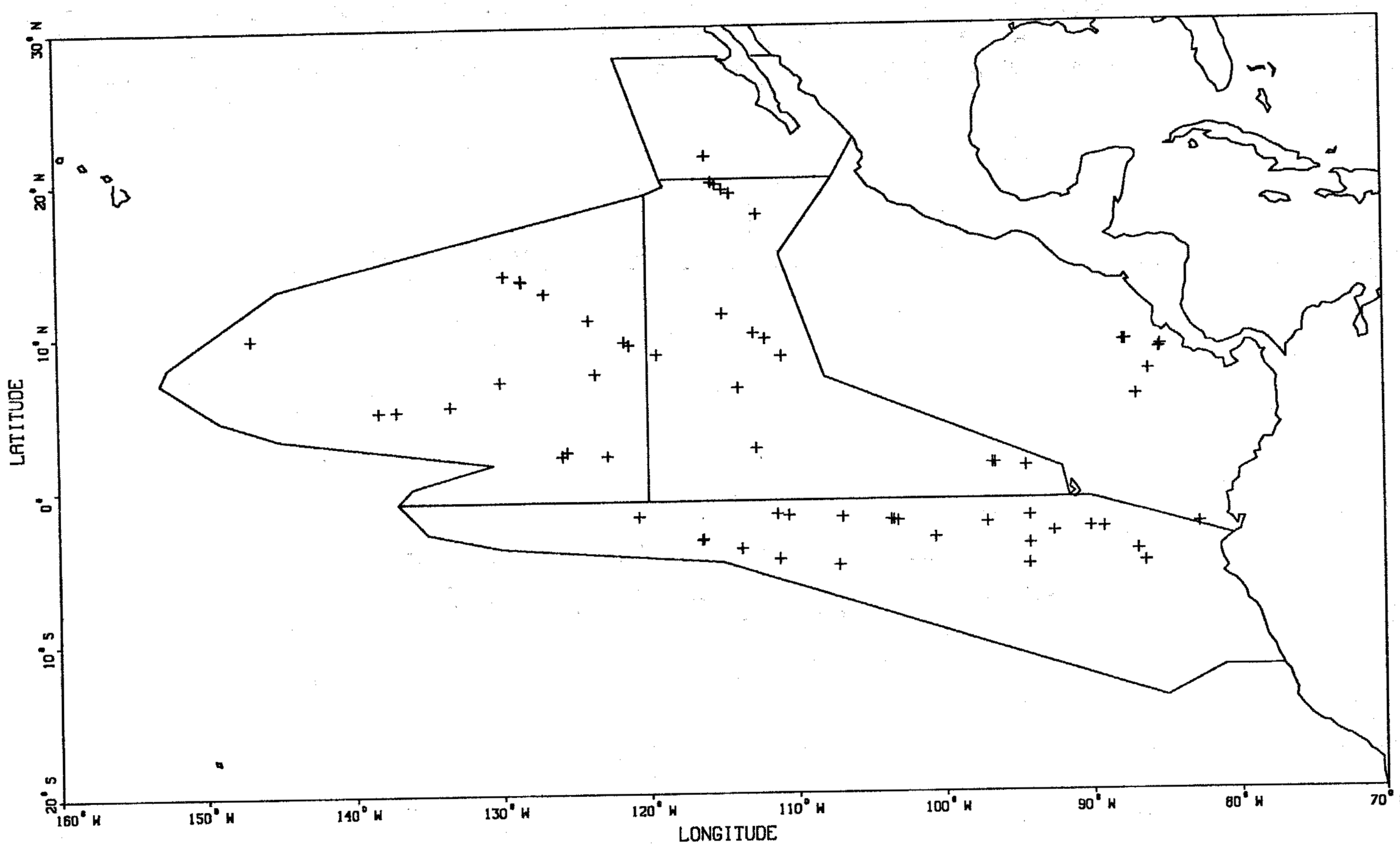

Figure 18. Unidentified dolphins (+) detected from aboard the NOAA Ship McArthur from July 29 through December 7, 1989, in the eastern tropical Pacific.

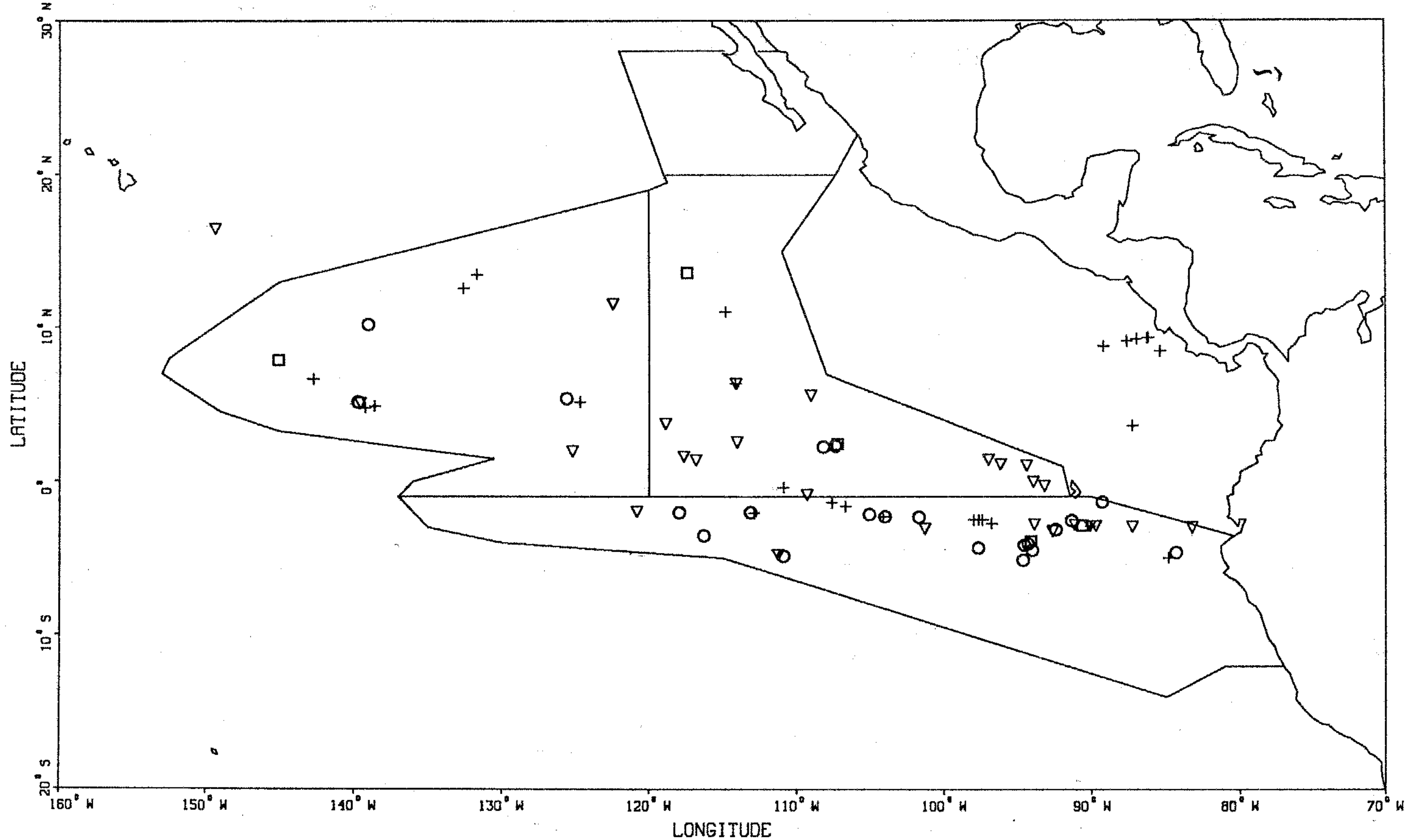

Figure 19. Unidentified small whales (+), unidentified whales (O), unidentified large whales (▽) and unidentified cetaceans (□) detected from aboard the NOAA Ship <u>McArthur</u> from July 29 through December 7, 1989, in the eastern tropical Pacific.

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