September 16, 1974

F142

NMFS Coordinator for PTDF, La Jolla, CA

Richard S. Shomura, Director, Honolulu Laboratory

Marquesas Islands fishing and environment info

Enclosed is a capsule summary of the fishing information covering the Marquesas Islands area published by this Laboratory. The summary was prepared by Howard Yoshida.

The section on oceanographic conditions will be forwarded within the next several days.

Enclosures

RSShomura:cay

attached

Marquesas Islands Fishing Info

In 1956, the Honolulu Laboratory of the National Marine Fisheries Service (NMFS), which was then known as the Pacific Oceanic Fishery Investigations (POFI) of the Fish and Wildlife Service, began an evaluation of the tuna resources of the south central Pacific Ocean centered around the Marquesas Islands. The investigations were structured to obtain answers on the availability of both the surface and deep-swimming tunas, their distribution, and their relationship to the environment.

Initially, the survey cruises were carried out during two periods, the southern hemisphere winter and the southern hemisphere summer, which afforded the greatest contrast in environmental conditions and possibly in the abundance of tuna. The early cruises did indeed show striking differences in the abundance of tuna schools between the two periods. Later cruises were designed to determine the length of the season of greatest abundance of tuna schools around the Marquesas Islands. Also, some effort was expended to expand the survey into the Tuamotu archipelago. The final survey cruises included an expedition made by a chartered West Coast bait boat, the Cape Falcon, out of San Diego, to test the feasibility of fishing commercially in the Marquesas area. The basic data collected on all the cruises were published in the Special Scientific Report series of the Fish and Wildlife Service (Table 1).

An analysis of the results of the first five survey cruises appeared in Wilson and Austin (1957). Wilson and Austin (1959) examined the results of the cruises conducted between October 1957 and June 1958. An analysis of the results of all the survey cruises to the Marquesas Islands, including the cruise made by the Cape Falcon under charter to NMFS, was prepared for presentation to the Government-Industry Tuna Conference held at La Jolla, California, in January 1962 (Austin, T. S. Report on the tuna surveys in the Marquesas Islands. Mimeographed. In the files of NMFS, Honolulu, Hawaii). An assessment of the tuna resources of the Marquesas Islands area was also done by Rothschild and Uchida (1968). In addition, summaries of sightings of bird flocks and tuna schools in the Pacific Ocean, including the Marquesas Islands area have been prepared (Waldron, 1964; Naughton, MS).

These early fishing surveys were conducted by research vessels using the pole-and-line and live bait method of fishing. The paper by Rothschild and Uchida (1968) provides an excellent summary of conditions in the Marquesas Islands area in terms of pole-and-line fishing. Generally, skipjack tuna schools were more numerous that yellowfin tuna schools. The behavior of the skipjack tuna schools were erratic and wild. The schools were fast-traveling. The density of schools was higher during the southern hemisphere summer (January-March). During the periods January 18-25 and February 27-March 5, 174 schools were sighted in 15 days of scouting, which averaged out to a sighting rate of 11.6 schools per vessel per day. This sighting rate was more than twice that experienced in Hawaiian waters. However, the percentage of schools successfully fished appeared to be low compared to that in Hawaii.

The skipjack tuna caught by pole-and-line in the Marquesas ranged from 39 cm (1.1 kilograms or 2.5 pounds) to 83 cm (14.4 kilograms or 31.7 pounds). Most of the fish were between 45 and 55 cm (1.8 and 3.6 kilograms or 4 and 8 pounds).

In 1972, an eastern Pacific purse seiner, M/V Kerri M., with partial support from NMFS, conducted an exploratory 3-week fishing trip to the Marquesas. Briefly, most of the tuna schools sighted by the Kerri M. were composed of skipjack tuna. The estimated school size ranged from a few tons to something in excess of 100 tons. The skipjack tuna caught by the Kerri M. ranged from 8 to 12 pounds and the yellowfin tuna from 8 to 15 pounds. Nine successful sets (i.e., sets in which more than one ton of fish were caught) were made in a total of 37 attempted. A total of 87 tons (85 tons of skipjack tuna and 2 tons of yellowfin tuna) of tuna was caught. Two sets produced 20 and 35 tons, respectively, and the other seven sets produced six tons or less. The Kerri M.'s experience with the behavior of the fish schools was similar to that experienced earlier by our research vessels. The schools were erratic and unpredictable in their movements.

There have been reports of other purse seiners fishing in Marquesas waters but the results of these ventures have not been available to our Laboratory.

Literature Cited

Naughton, J. J.
MS. Bird flock and surface tuna school sightings in the central Pacific Ocean, 1950-1972.

Rothschild, B. J., and R. N. Uchida
1968. The tuna resources of the oceanic regions of the Pacific Ocean. In The future of the fishing industry in the United States. University of Washington Publications in Fisheries, New Series.

Waldron, K. D.
1964. Fish schools and bird flocks in the central Pacific Ocean, 1950-1961. U.S. Fish Wildl. Serv., Spec. Sci. Rept.-Fish. No. 464.

Wilson, R. C., and T. S. Austin
1957. U.S. Fish and Wildlife Service task force in the Marquesas. Pan American Fisherman 11(12).

_____ 1959. Tuna season in the Marquesas. Pacific Fisherman, vol. 57(1).

Table 1.--Survey cruises conducted in the Marquesas Islands area by the National Marine Fisheries Service.

Cruise	Date	Activity	Reported in
Hugh M. Smith 35	August 1 - October 5, 1956	Oceanography	SSR-F 217
Charles H. Gilbert 30	August 6 - September 26, 1956	Longline and live bait fishing	"
Hugh M. Smith 38	January 11 - March 26, 1957	Oceanography	SSR-F 238
Charles H. Gilbert 32	January 11 - March 22, 1957	Live bait fishing	"
John R. Manning 34	January 4 - March 12, 1957	Longline fishing	"
Charles H. Gilbert 35	October 2 - December 14, 1957	Live bait fishing	SSR-F 283
Hugh M. Smith 43	January 3 - February 25, 1957	Live bait fishing	"
Charles H. Gilbert 38	February 7 - May 2, 1957	Live bait and longline fishing	"
Hugh M. Smith 45	March 28 - June 23, 1958	Live bait fishing	"
Charles H. Gilbert 43	January 7 - March 26, 1959	Live bait fishing	SSR-F 348
Cape Falcon	February 15 - March 15, 1959	Live bait fishing	"

x Per HOY - 10/2/74

September 27, 1974

Mr. Wilvan G. Van Campen
NMFS Coordinator for PIDF
Southwest Fisheries Center
P. O. Box 271
La Jolla, California 92037

Dear Wil:

In Richard Shomura's absence I'm sending you directly the Marquesas data you requested in your letter to him dated September 3. These are the environmental data; I understand you already have the biological info.

Enclosed are two copies each of charts I prepared showing (1) the summer mixed layer depth ("thermocline depth"), (2) permanent (winter) thermocline depth, (3) summer sea surface currents, and (4) winter sea surface currents. Also copies of the base chart, which is partially obscured by overlays on the first four charts.

The season selected, October-December, is of course the southern spring, when conditions will be shifting from winter to summer, so that currents, and thermocline topography, should be intermediate between the two extremes shown on the charts. Thermocline or mixed layer depths in particular should be affected; the summer thermocline topography does not develop until late spring. In any case, the summer thermocline is weak and probably does not have too much effect on the tunas' behavior, so the chart showing the permanent thermocline depth is probably the best one to use.

Sea surface currents around the Marquesas and Tuamotus are generally rather weak and variable, and only the climatic mean patterns can be shown on the charts. It will be wise to use these data with a few grains of salt in any case because observations are rather scarce in that part of the world.

Finally, you might want to look up SSR-F 238 and 283, PCFI reports on Marquesas cruises, which have quite a bit of data on weather, sea conditions, and such goodies as catch data and sightings of bird flocks and fish schools. SSR-F 283, in particular, covers the October-December period when the Gilbert was down there on cruise 35.

Mucha suerte, y felicitaciones por la nueva 'chamba.' Su atto. y s.s.

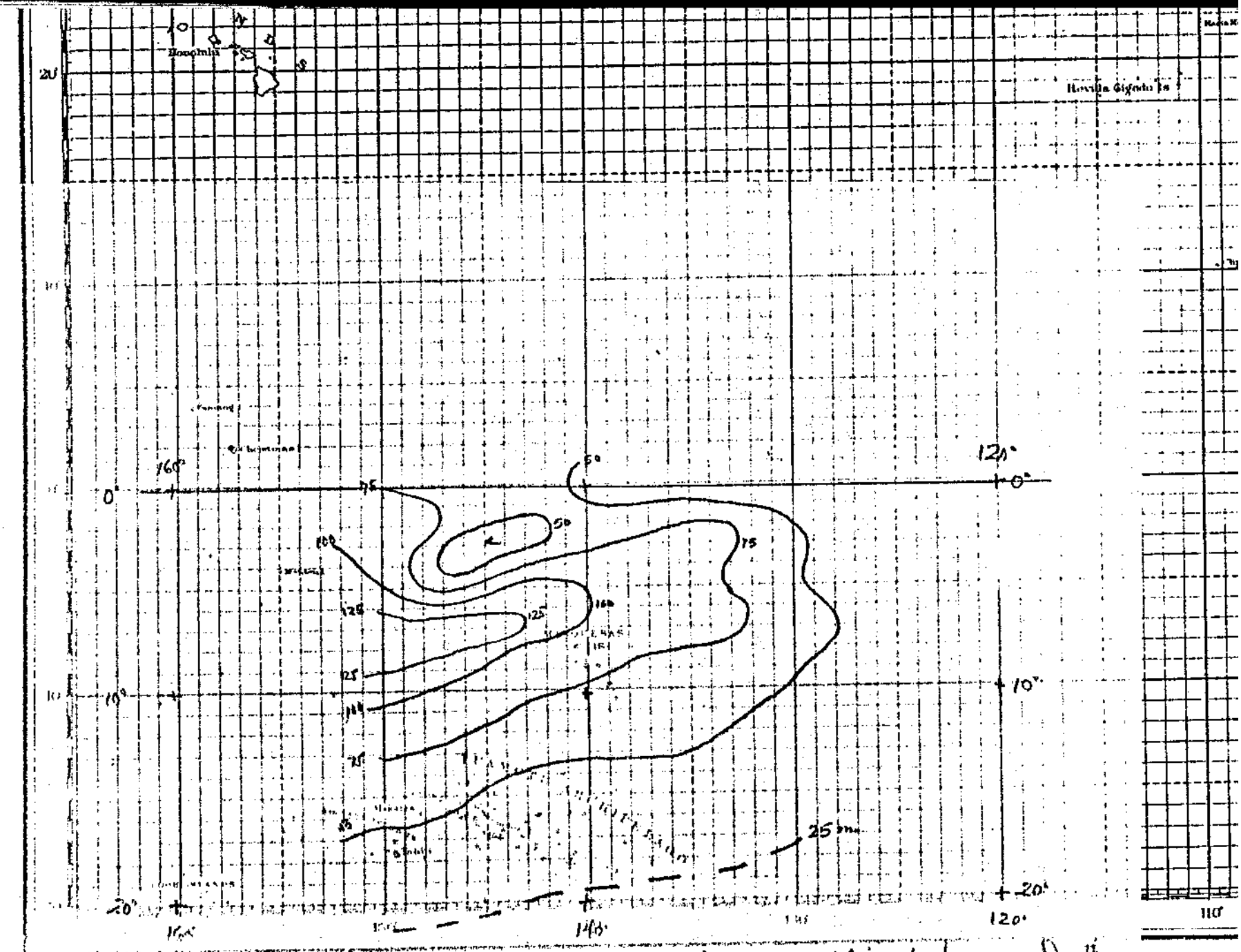
Sincerely,

Richard A. Barkley
Acting Director, Honolulu Laboratory

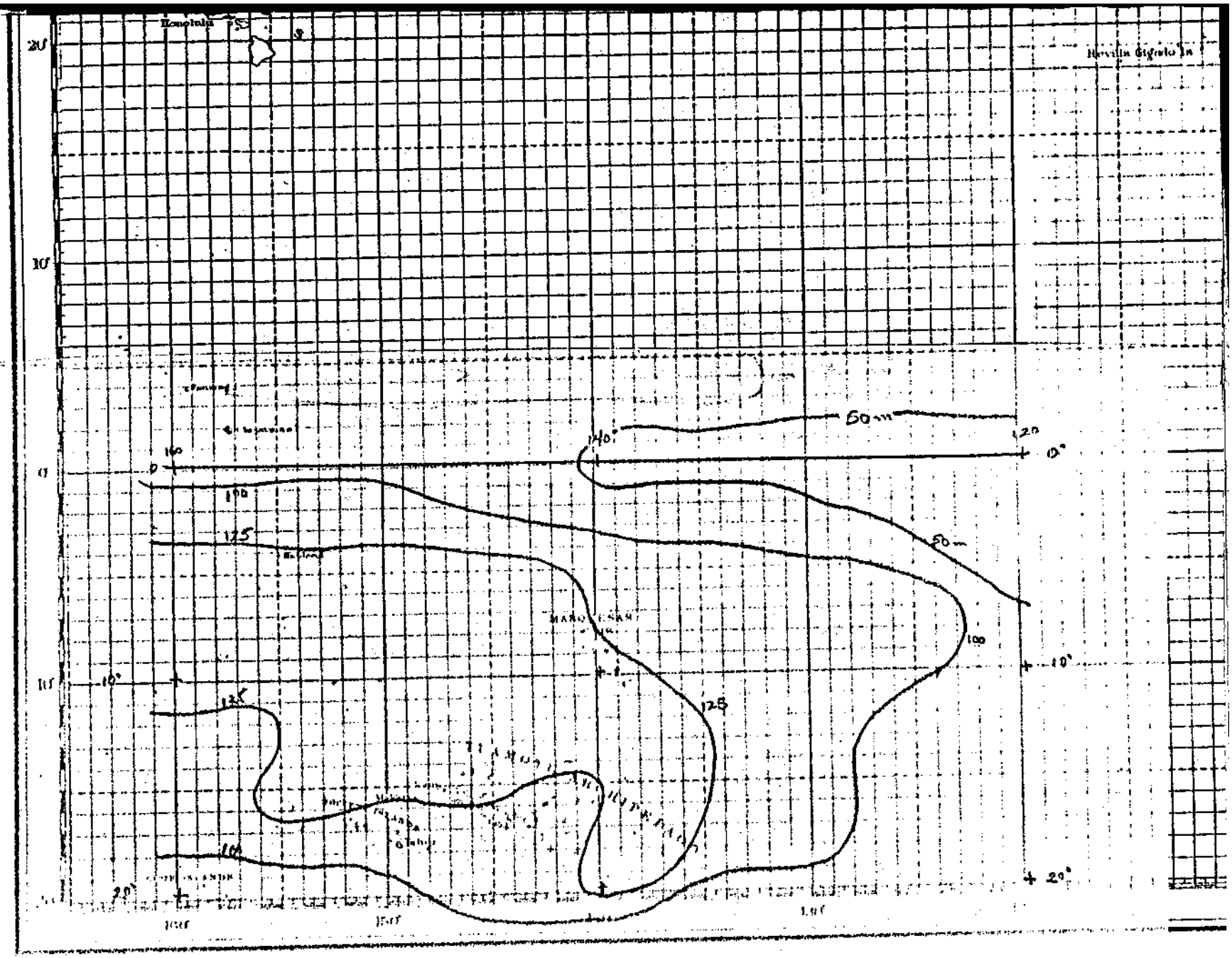
Enclosures

bc: Barkley
DO

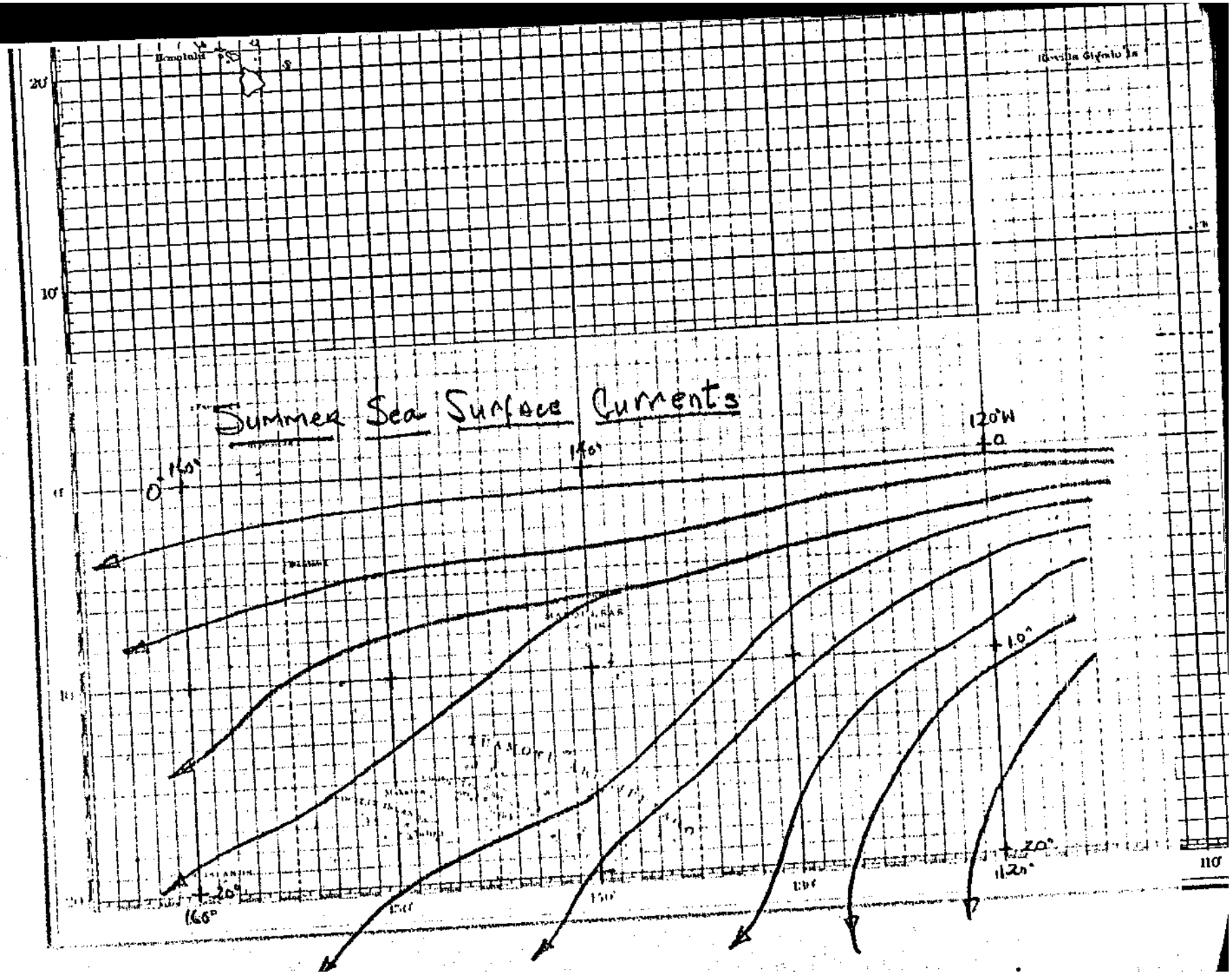
RAB:ihz

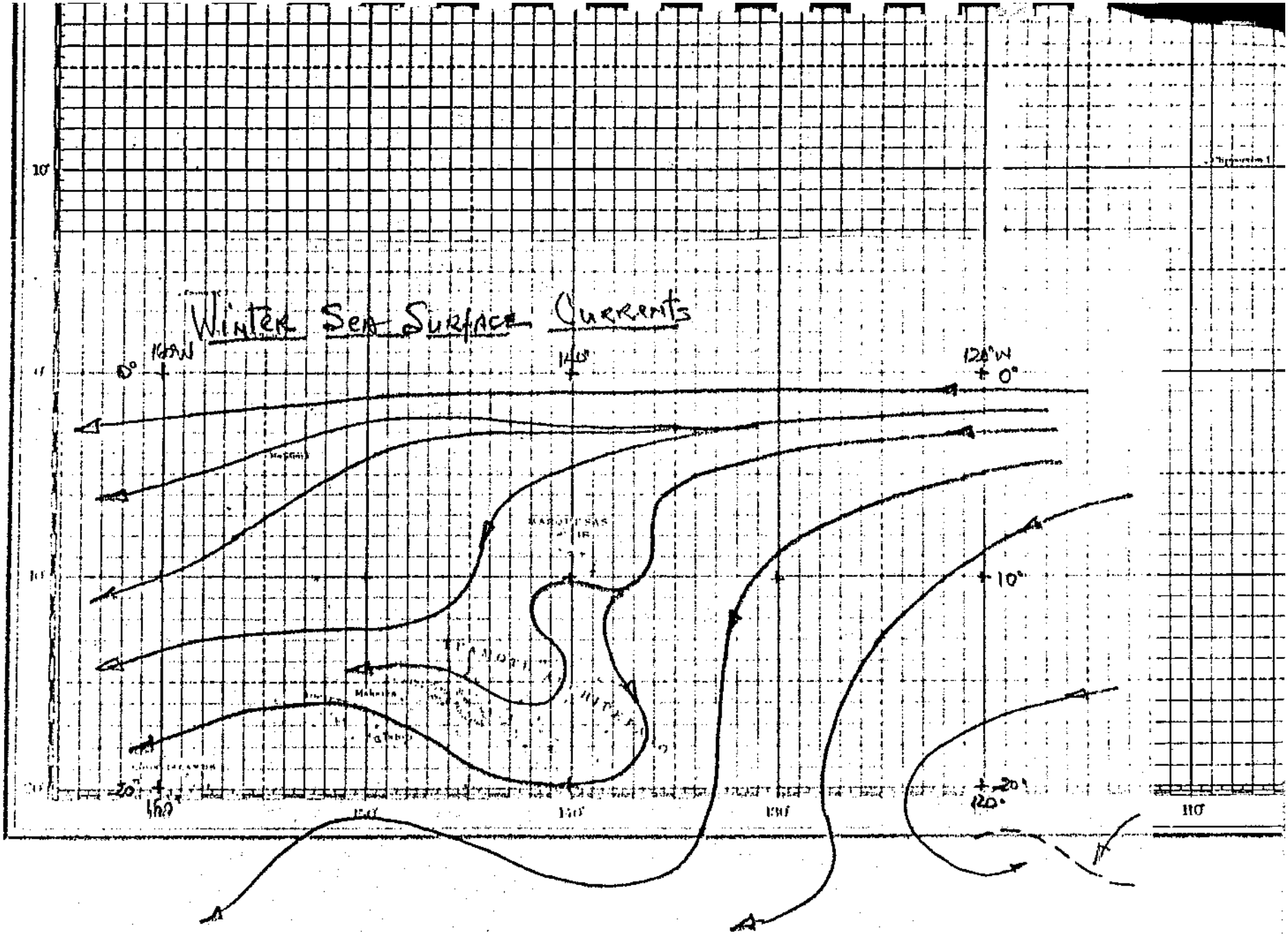


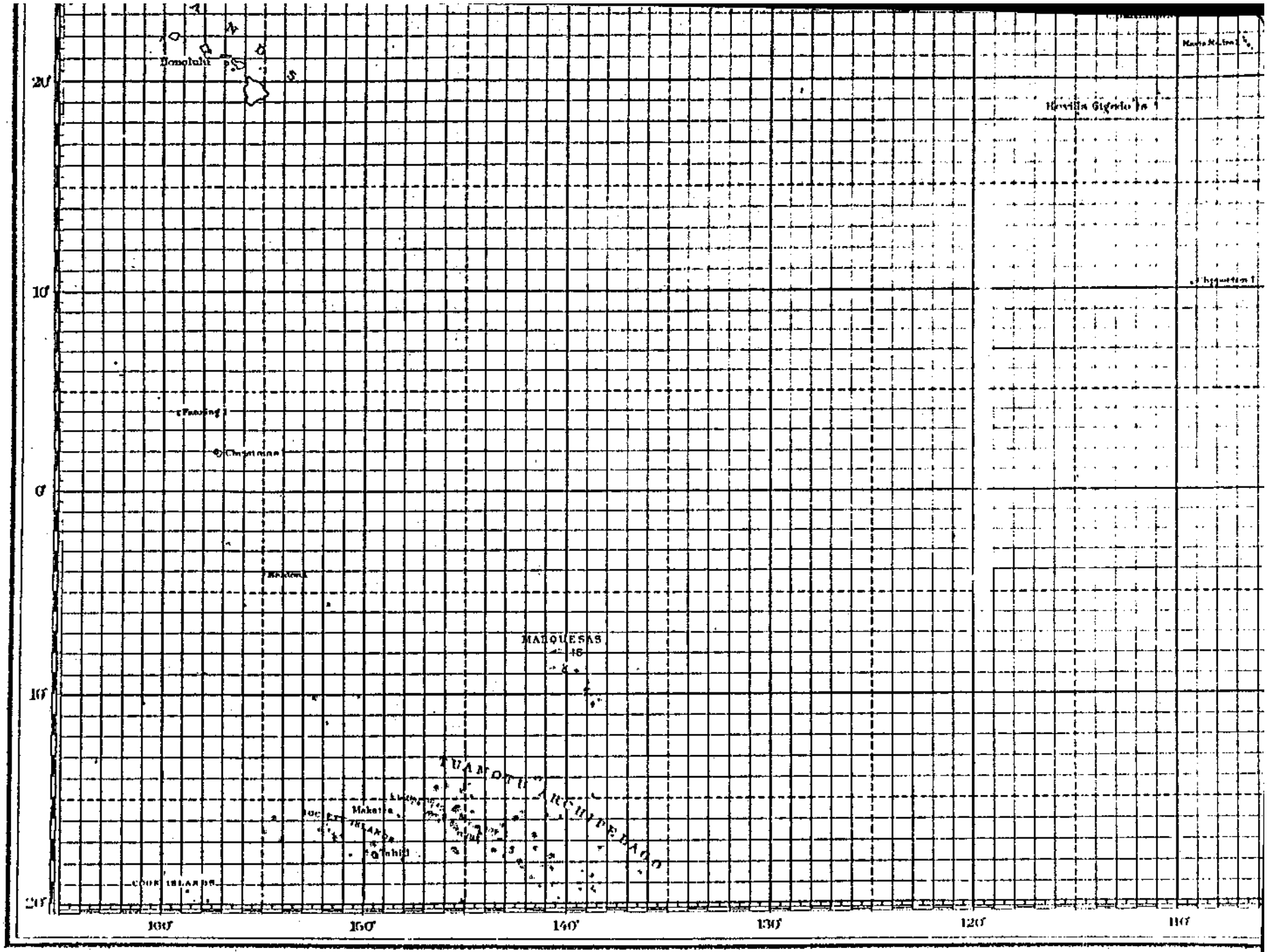
Summer Mixed Layer Depth



PERMANENT THERMOCLINE


Summer Sea Surface Currents
Honolulu
20°
10°
0°
160°
140°
120°W
0
10°
20°
160°
120°
110°


Winter Sea Surface Currents
160°W
140°
120°W
0°
10°
20°
160°
150°
140°
130°
120°
110°



Honolulu
Fanning I
Chapman
MARQUESAS
TUAMOTU ARCHIPELAGO
Makatea
Tahiti
COOK ISLANDS
20°
10°
0°
10°
20°
160°
150°
140°
130°
120°
110°