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CSK NEWSLETTER

JAPAN OCEANOGRAPHIC DATA CENTER
Hydrographic Department, Maritime Safety Agency
Tokyo, Japan

C O N T E N T S

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V: Cruise Reports (ROSCOP)

Japan	Takuyo	(18 Oct. - 16 Nov. 1975)
	Ryofu Maru	(14 Jan. - 17 Feb. 1976)
	Kofu Maru	(10 Feb. - 20 Mar. 1976)
	Shumpu Maru	(2 - 27 Feb. 1976)
	Chofu Maru	(9 - 21 Feb. 1976)
	Seifu Maru	(3 Feb. - 15 Mar. 1976)
	Shoyo	(10 - 24 Mar. 1976)

VI: Publications

CSK Atlas, Vol. 7, April 1969 - March 1970
Data Report of CSK, Nos. 318, 334, 337, 345, 346, 349, 357, 368, 372, 383, 385, 386, 387, 388, 389, 390, 391, 394

VII: Data Received

Japan (Ryofu Maru-2 crs., Chofu Maru-2 crs., Seifu Maru, Shumpu Maru, Kofu Maru, Shoyo)
U.S.S.R. (Pelamida)

I. SUMMARY REPORT OF THE ELEVENTH SESSION OF THE INTERNATIONAL CO-ORDINATION GROUP FOR THE CO-OPERATIVE STUDY OF THE KUROSHIO AND ADJACENT REGIONS (CSK), NOUMÉA, NEW CALEDONIA
30 June - 4 July 1977

Summary Report

I) Opening of the Session

The meeting was opened by Professor Kiyoo Wadati, the International Coordinator for CSK. Professor Wadati introduced Mr. Constantin, representative of the High Commissioner of the French Republic in the Pacific. Mr. Constantin welcomed the participants on behalf of the Government of France. He noted that there is a clear requirement for comprehensive oceanographic research programmes in the Western Pacific. He pointed out that such research would establish a basis for the rational use of the resources of the region in the future. Mr. Constantin emphasized that the general public should be kept aware of the importance of this type of research.

Mr. Legand, Director of the O.R.S.T.O.M. Center in Nouméa welcomed the Delegates on behalf of the Director General of O.R.S.T.O.M.. He stressed the need to develop effective international cooperation in the region in order to implement useful research activities.

Professor Wadati introduced the provisional agenda. This agenda was adopted (see Annex I), with the understanding that (1) there would be no report from the Assistant International Coordinator and (2) that the agenda items 5 (Report of the ad hoc Task Team for WESTPAC) and 6 (Proposed Scientific Programme for WESTPAC) would be discussed together. The group elected Mr. Louis Brown and Mr. Pierre Rual as rapporteurs. The list of participants in the meeting is attached in Annex II.

II) Reports of the CSK Officers

Report of the International Coordinator for CSK

Professor Wadati summarized three recent activities which had been held under the aegis of CSK. The first of these had been the Second Regional Group Training Course on the Marine Environment (with special reference to benthos studies). These courses had been sponsored by the Government of Japan with the support of UNESCO. The second course had been held at Hokkaido University in late 1975 and the third at Tokai University in mid 1976.

The International Workshop on Marine Pollution in East

Asian waters had been held in April 1976 in Penang, Malaysia. This workshop had outlined a series of scientific problems related to pollution of the marine environment in the Indo-Pacific region. It had also identified a series of priority studies which should be conducted in the region, including some baseline studies.

Report of the Direction of the Kuroshio Data Center

Professor Nasu presented the report of the Director of the Kuroshio Data Center. He briefly listed the amount and types of data received by the Center since 1975 and summarized the various publications which the Center had issued during this period. He strongly encouraged participating Member States to speed up their submission of both ROSCOP forms and the CSK data itself to the Center. Dr. Nasu indicated that the Data Center might be able to continue its activities in support of CSK for about two or three years after the termination of the CSK programme. The Data Center also expected, he reported, to be able to respond to the IOC's request for the publication of a guide to the CSK data. The Group concluded that the report of the Director of the Kuroshio Data Center is very important and requested the Director to arrange for the publication of the report in an upcoming issue of the CSK Newsletter.

III) Reports of National Coordinators

Report of the National Coordinator for France

Mr. Rual presented a summary of recent French projects in the Western Pacific. He reported that these studies, which had focused on the equatorial and sub-tropical regions, were new coming to an end. He indicated that new programmes are now being planned and that these programmes are likely to focus on the sub-tropical convergence between New Caledonia and New Zealand and on studies of lagoons and coral reefs.

Report of the National Coordinator for Indonesia

Mr. Ilahude reported that the National Institute of Oceanology in Jakarta had conducted two series of cruises during 1976. One series had been in the Flores Sea and the Gulf of Bone, the other in the Bay of Jakarta. He noted that these cruises had made hydrological observations, as well as stduying nutrients, chlorophyll and both phyto and zooplankton. Mr. Ilahude indicated that future oceanographic cruises are being planned for the Molucca Sea and that the Government of Indonesia is exploring with the Government of the Netherlands the possibility of conducting a second Snellius Expedition in 1979 in the Eastern Indonesian Seas.

Report of the National Coordinator for Japan

Dr. Nasu stated that various agencies and universities in Japan had conducted or are planning forty-four research cruises which would contribute to the CSK during the period April 1975 ~ March 1978. He pointed out that these cruises would involve not only standard sections, but also special studies of Kuroshio meander off Enshu-nada and of oceanic pollution by oil and heavy metals. He reported that observations had also been made in the Kuroshio region of drifting and dispersed hydro-carbons as a part of the IGOSS Marine Pollution (Petroleum) Monitoring Pilot Project.

Report of the National Coordinator for Korea

Mr. Kim reported that Korean scientists had conducted twelve oceanographic cruises during 1975~1976. These had included studies of water movement in the Yellow Sea and of the pollution of coastal waters. He indicated that six oceanographic cruises are currently planned for 1977. Mr. Kim reported that additional research on marine pollution is also planned, including studies of the effects of heavy metals and agricultural pesticides on the environment and on the biota.

Report of the National Coordinator for the USSR

Dr. Fedorey indicated that research vessels from the USSR had conducted a series of research programmes in the Kuroshio region, during 1976 and 1977. These programmes extend from the waters of Kamchatka in the north to the waters of the southern tip of Kyushu and to the east as far as 165° East. He reported that this research is especially focused on studies of the meandering of the Kuroshio current to the south of Japan, and the development of large cold-water patches which apparently result from this meandering.

IV) Report of the Ad Hoc Task Team on WESTPAC

The report of the Ad Hoc Task Team was discussed briefly, since most of the delegates had participated in the work of the Task Team. It was recognized that the work conducted under the CSK Programme had indicated a need for (1) comprehensive studies of certain features of the Kuroshio Current system (2) additional research in adjacent oceanic regions which had received limited attention during CSK and (3) extended research into other areas of the Western Pacific defined by the Task Team. It was agreed that the scientific programme recommended by the Task Team reflects an appropriate balance among these interests.

The International Coordination Group therefore adopted Recommendation 1.

V) The Fourth CSK Symposium

The Group agreed that the Fourth CSK Symposium should be held in late 1978 in early 1979. Many Delegates emphasized the need to allow sufficient time for scientists to adequately prepare scientific papers for the Symposium. It was agreed that the Symposium should be held in the CSK region and the Group decided to ask the Government of Japan to host this final important event of the CSK Programme. It was agreed that the Symposium should not only cover the research accomplished during the period since the last Symposium, but should also review the entire CSK Programme. The Group emphasized the importance of inviting a comprehensive series of major papers which would provide focal points for the Symposium's discussions.

It was felt that it would be useful to the future development of WESTPAC to encourage authors to discuss, not only the scientific results of their CSK activities, but also the implications of these results for future WESTPAC research. Similarly, it was agreed that it would be useful for the IOC to hold some WESTPAC planning activities in conjunction with the Symposium. The ICG agreed that both the Convener and the Steering Committee for the Symposium should be selected from among scientists of the host country. Each participating country should also designate a national correspondant for the Symposium who would work with the Steering Committee. The ICG concluded that it would be appropriate for the Symposium to include a few papers in areas of research which will be covered by WESTPAC, but were not covered by CSK. The Group proceeded to adopt Recommendation 2.

VI) The Termination of the CSK Programme

It had become apparent during earlier discussions that it would be very useful for the ICG to outline a procedure which would assure that the CSK Programme is ended gradually. Basically it was decided that the field projects of CSK should be ended first, followed by the later termination of the CSK Data and Marine Biological Sorting Centers. However, it was recognized that the programme which had been endorsed by the ICG for future research in the Western Pacific would require a broad range of supporting services such as those provided to the CSK Programme by the Kuroshio Data Center and by the Biological Sorting Center in Singapore. The Groups considered it essential that the present competence and sample collection of the Biological Sorting Center be maintained, not only as a service to CSK, but to ongoing marine biological research in

general in the region. The ICG also requested all Member States who will participate in cooperative research in the Western Pacific to consider ways and means by which data services and similar scientific support can be provided to WESTPAC. The Group proceeded to adopt Recommendation 3.

VII) Other Matters

The Group noted that many scientists had made outstanding contributions to the advancement of scientific research in the Western Pacific through the contributions to the CSK Programme. The Group decided that it would be especially fitting for the IOC to formally recognize these contributions in conjunction with the CSK Symposium. The Group requested the IOC Secretariat to look into this further.

VIII) Adoption of the Report and Closure of the Session

The Delegates expressed their appreciation to Professor Wadati first for his chairmanship of the meeting, but more importantly his excellent service as the Chairman of the ICG for many years. The Chairman thanked the IOC Secretariat, the Rapporteurs and the Interpreters for their assistance.

The Chairman on behalf of all the participants expressed appreciation to the Government of France and particularly to O.R.S.T.O.M. and the staff of its Center of Nouméa for their hosting of the conference, the excellent support which they had provided for the conference, and the hospitality which they had extended to all participants.

The Chairman then closed the meeting.

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International Coordination Group for the Cooperative Study of the Kuroshio and Adjacent Regions (CSK)

(11th Session - Nouméa - 30 June/4 July 1977)

AGENDA

1. Opening of the Session
2. Election of Rapporteur
3. Reports of CSK Officers
   - 3.1 International Coordinator
   - 3.2 Assistant International Coordinator
   - 3.3 Director of the CSK Data Center
4. Reports of National Coordinators on ongoing and planned activities
5. Report on the work of the Ad Hoc Task Team for the Western Pacific (WESTPAC)
6. Proposed future International Scientific Programme for the Western Pacific
7. The fourth CSK Symposium
8. Any other matters
9. Adoption of the report and closure of the Session

ANNEX II
(ICG/CSK)

LIST OF PARTICIPANTS

FRANCE

Mr. Pierre Rual - National Coordinator for CSK, Section Océanographie, O.R.S.T.O.M., BP A5, Nouméa, New Caledonia.

Mr. Jean-René Donguy - Section Océanographie, O.R.S.T.O.M., BP A5, Nouméa, New Caledonia.

Mr. Jean-Claude Leguen - Section Océanographie, O.R.S.T.O.M., BP A5, Nouméa, New Caledonia.

Mr. l'Ingénieur Hydrographe Joël Metéyé - Mission Océanographique du Pacifique, BP 38, Nouméa, New Caledonia.

Mr. Jacques Daniel - Section Géologie-Géophysique, O.R.S.T.O.M., BP A5, Nouméa, New Caledonia.

Mr. Jacques Recy - Section Géologie-Géophysique, O.R.S.T.O.M., BP A5, Nouméa, New Caledonia.

Mr. Christian Hénin - Section Océanographie, O.R.S.T.O.M., BP A5, Nouméa, New Caledonia.

INDONESIA

Mr. Abdul Gani Ilahude - Chief Oceanography Section, National Institute of Oceanology, Komplex Bina Samudera Ancol, Jakarta Utara 580 DAK.

JAPAN

Dr. Kiyoo Wadati - International Coordinator for CSK, National Coordinator for CSK, Japanese National Commission for UNESCO, c/o Ministry of Education, 2-2 Kasumigaseki, 3-chome, Chiyodaku, Tokyo 100.

Professor Noriyuki Nasu - Ocean Research Institute, University of Tokyo, Minamidai, Nakano-ku, Tokyo.

REPUBLIC OF KOREA

Mr. Ki-Young Kim - National Coordinator for CSK, Director, Fisheries Research and Development Agency, Youngdo-gu, Busan 606.

UNION OF SOVIET SOCIALIST REPUBLICS

Dr. Valentin Fedorey - National Coordinator for CSK, Far East Scientific, Meteorological and Hydrological Institute.

Dr. Georgy Baranov - Hydrographical Service, Leninskaya St. 80 Vladivostok.

UNITED STATES OF AMERICA

Mr. Louis B. Brown - Division of Ocean Sciences, National Science Foundation, 1800 G Street, N.W., Washington D.C. 20550.

SOUTH PACIFIC COMMISSION - (Observers)

Mr. René Grandperrin - Fisheries Advisor
BP D5, Nouméa, New Caledonia.

Dr. Robert Kearney - Skipjack Programme Coordinator, BP D5, Nouméa, New Caledonia.

IOC SECRETARIAT

Dr. Oleg Mamayev - Assistant Secretary, Intergovernmental Oceanographic Commission, UNESCO, Place de Fontenoy, 75700-Paris.

RECOMMENDATION 1

The Ad Hoc Task Team on WESTPAC

The International Coordination Group,

Having discussed the report and the recommendations of the ad hoc Task Team on WESTPAC, which met on 27 to 29 June 1977 in Nouméa,

Endorses the above report and its recommendations.

RECOMMENDATION 2

The Fourth CSK Symposium

The International Coordination Group,

(A)

Recognizing the need to summarize the overall CSK programme, to critically evaluate its results, and to provide guidance for future research in the Western Pacific Region, and

Recalling its agreement in principle to convene a Fourth Symposium at the end of the CSK Programme,

Decides that the Fourth CSK Symposium should be held in late 1978 or early 1979,

Further requests the International Coordinator, in consultation with the IOC Secretariat, to establish a Steering Committee as soon as possible to be responsible for all preparations and arrangements for the Symposium, including:

(a) the designation of a convener, who should be an eminent scientist from the country which hosts the Symposium and who should have substantial time and resources available for this task,

(b) the selection of all scientific papers, including a series of major invited papers, which should deal with not only research conducted since the last Symposium, but more importantly the overall research conducted under the CSK Programme,

(c) the issurance of necessary invitations,

(d) the preparation and distribution of preprints well in advance of the Symposium, and

(e) Working closely with the Commission's scientific advisory bodies in making these preparations.

Agrees that this Steering Committee should be composed of scientists from the host country in all disciplines included in the CSK Programme,

Request each Member State which has participated in the CSK to designate a scientist to be the National Correspondant for the fourth CSK Symposium and to serve as the focal point within that country to work with the Steering Committee,

Further requests the National Delegates to CSK-XI to serve as interim National Correspondants until their Governments designate their permanent Correspondants,

Invites Member States and interested intergovernmental and other organizations to assure that sufficient support is made available to permit the publication of the proceedings of the Symposium as soon as possible after the Symposium,

Invites the Commission's scientific advisory bodies to actively participate in the planning of the Symposium, as well as in the Symposium itself,

Encourages scientists to present papers not only on the Kuroshio Current region, but on the adjacent regions which are expected to be included in future WESTPAC programmes.

(B)

Recognizing that the Government and scientist of Japan have made outstanding and valuable scientific contributions to the CSK Programme,

Requests the Government of Japan to give favorable consideration to hosting the Fourth CSK Symposium.

RECOMMENDATION 3

The Termination of the CSK Programme

The International Coordination Group

(A)

Recalling the IOC's decision expressed in IOC Resolution EC-VIII.5 to terminate the CSK as a co-operative investigation of the Commission by the time of the Fourth CSK Symposium,

Desiring to assure a smooth phase-out of the CSK Programme in accordance with this deadline, and

Recognizing that some States may wish to continue some projects presently underway beyond this deadline,

Recommends that the field projects conducted under the name of the CSK be terminated by the end of 1977,

Requests all participating Member States to submit their data to the CSK Data Center as soon as possible in order to facilitate the preparation of papers for the CSK Symposium,

Recommends that Member States wishing to continue current CSK field projects beyond the deadline do so as part of their national programmes,

(B)

Noting the need to assure a very thorough analysis of the data collected during the CSK,

Requests the CSK Data Center to:

(a) continue its basic operations for approximately two or three years after the termination of the CSK Programme;

and

(b) investigate whether it would be feasible for them to subject the basic CSK data set to additional processing considered important,

(C)

Having received the report of the Regional Marine Biological Centre, Singapore, covering the period 1 April 1976 ~ 25 April 1977,

Being aware of the utmost importance of the R.M.B.C. activities to future research in the Western Pacific region,

Expresses its thanks to the Director and staff of the R.M.B.C. for the excellent work carried out on sorting and archieving the samples,

Reiterates its recommendation CSK-X.2,

Requests UNESCO to once again approach the Government of Singapore to provide sufficient support to assure the continuation of the full programme of the R.M.B.C.

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II. REPORT OF THE DIRECTOR OF THE KUROSHIO DATA CENTER - 11TH SESSION OF THE INTERNATIONAL CO-ORDINATION GROUP FOR THE CO-OPERATIVE STUDY OF THE KUROSHIO AND ADJACENT REGIONS (CSK), NOUMÉA, NEW CALEDONIA, 30 June ~ 4 July 1977

(This is the continuation of the report of the Director of the Kuroshio Data Center submitted to the Tenth Session of the International Coordination Group for CSK at Tokyo, 13~17 March, 1975)

1. Receipt of cruise inventory (ROSCOP) and data for CSK

(1) Cruise Report (ROSCOP) for CSK

ROSCOP (Report of Observations/Samples Collected Oceanographic Programmes) which the Kuroshio Data Center has received from the respective organizations of the member states participating in CSK is published as Cruise Report in the CSK Newsletter.

The ROSCOP forms received by the KDC in the period from January 1975 to March 1977 amounted to 37 cruises (Japan; 36, Korea; 1), and the total number of ROSCOP received is 99 (Japan; 77, Korea; 9, Singapore; 12, USSR; 1).

(2) Data Received

1844 oceanographic station data from 42 cruises were received by the KDC in the period from January 1975 to the end of March 1977, and the total numbers since the start of CSK are respectively 464 for the cruise and 18,053 for the oceanographic station. All of these data are shown as Annex I "Summary of Data Received and Publication", and the data receipt situation classified by countries are shown as Annex II "Number of Serial Oceanographic Station of CSK".

2. Publication

(1) CSK Newsletter

CSK Newsletters from No. 47 to No. 50 were published in the period from January 1975 to March 1977.

(2) Data Report of CSK

The data received by the KDC are computed and processed, and published as the Data Report of CSK. 62 volumes were published in the period from January 1975 to March 1977. 3,331 oceanographic station data from 62 cruises were included in these volumes, and widely distributed all over the world.

Since the commencement of CSK we could publish 375 volumes in total. All of these data reports are listed in Annex I.

(3) CSK Atlas

"CSK Atlas Vol. 7 for Apr. 1969 ~ Mar. 1970" was compiled by the KDC and it will be published in this year.

(4) Abstracts of the literatures

Abstracts of the literatures which had been written by using the CSK data were printed in CSK Newsletter, and the number of these amounted to 94 by the time of its edition of No. 50. It is requested that such abstracts not yet submitted would be sent to the KDC.

(5) Marine Environmental Atlas

In March 1976, "Marine Environmental Atlas - Northwestern Pacific Ocean -" which was composed of the horizontal distributions of T, S, O_2, σ_t and ΔD referred to 1000 db from surface to depth of 5000 meters using all data held at JODC, including CSK data, were compiled by us and published by the Japan Hydrographic Association. This publication was distributed to all National Co-ordinators for CSK as well as to the institutions concerned in the world for their reference on the basic study of sea conditions in the Northwestern Pacific including the Kuroshio region.

3. Acceleration of the Forwarding of Data and Information

Although the Director of the Kuroshio Data Center asked the National Co-ordinators of CSK for forwarding to the KDC of the ROSCOP form (inventory) and copies of the data resulted from CSK at the previous meeting of this group and by his letter of June 29, 1976 (JODC24/76), those submitted to the KDC during the intersessional period were very small in number except a few countries as seen from this report.

According to the IOC Resolution VIII-6, the member states were invited to pay their attention to their obligations to forward inventories (ROSCOP) and data collected during international cooperative investigation coordinated by IOC, in timely manner, to the appropriate regional data centers or to the World Data Centers. Also, IOC Resolution IX-28,C again strongly urged member states participating in co-operative investigations to tape all possible steps, through their National Co-ordinators, for the submission of ROSCOP form and data collected during the investigations to the appropriate regional data centers and World Data Centers. It is also noted that the obligation for

the forwarding of the CSK data to KDC in time less than three months after the end of each cruise was already agreed by all CSK member countries at the 1st meeting of this group (Manila, 8 ~ 11 Feb. 1965).

I again ask to the National Co-ordinators for their early forwarding of all ROSCOP forms and data resulted from CSK to the KDC in order to make possible to process and publish them for KDC and subsequent forwarding them to WDC and participating countries, as well as users interested in.

4. Future activity of the Kuroshio Data Center

After the envisaged termination of the CSK, the Kuroshio Data Center will continue its present activities, except publishing of the CSK Newsletter, about two or three years in order to accomplish the necessary works as the regional data center for CSK.

In this period, all the remained "Data report of CSK" will be published. "Guide to CSK data", the publication of which was requested by the IOC secretariat, will also be issued in this period by the KDC. This guide will contain the list of participating vessels, cruise track charts and/or summary of station distribution, data catalogue for each cruise and list of related papers of which abstracts are printed in the CSK Newsletter.

For our processing and compilation of these publications it is highly requested that the above-mentioned all ROSCOP form and CSK data be sent to the KDC within the period of, the latest, one year after the termination of the CSK project. Those which will be sent to KDC after this time may not be included in these publications.

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Kuroshio Data Center

SUMMARY OF DATA RECEIVED AND PUBLICATIONS as of 31 March 1977

Annex I (ICG-CSK)

Date Received	KDC Ref. No.	Ship Code	Agency	Period	Area	No. of Stas.	Serial Data	BTs	Currents	Bottom Topography	Sediments	Biological	Data Report of CSK Pub.No.	Data Report of CSK Mo./Yr.
11•28/65	49K301	SH	KMOJMA	05.16-05•17,1965	S•E•YAKU	7	T S O PH	13	13				26	11/66
12•10/65	49K001	TA	HDMSA	06.25-09•07,1965	E•PHILIP•	103	T S O P N2 N3 SI PH	279	245	D		P	2	05/66
02•14/66	49K003	RY	KDJMA	06.25-08•09,1965	E•JAPAN	53	T S O P N2 N3 SI PH	221	222	D		P	10	10/66
03•18/66	49K302	CH	KMOJMA	07.01-07•02,1965	S•E•YAKU	7	T S O P	9	13	D		P	26	11/66
12•05/65	49K009	SN	TUF	07.09-07•21,1965	S•JAPAN	13	T S O PH	25	13	DTP			5	06/66
10•09/65	49K013	KY	SUF	07.13-07•22,1965	E•CHIN•SEA	16	T S	28		D			1	05/66
04•09/66	49K012	NA	KU	07.15-07•19,1965	S•JAPAN	12	T S O	12	5	DTP		V	6	06/66
02•14/66	49K004	KO	KMOJMA	07.22-07•28,1965	E•JAPAN	16	T S O P	29	29	D		P	14	10/66
11•28/65	49K005	SH	KMOJMA	07.27-07•29,1965	S•JAPAN	8	T S O P N2 PH	15	15			P	11	08/66
02•14/66	49K006	CH	KMOJMA	07.27-08•07,1965	E•CHIN•SEA	29	T S O P N2	54	53	D		P	12	06/66
06•18/66	49K010	KG	KU	07.28-08•10,1965	E•CHIN•SEA	16	T S	39	2			P	7	07/66
12•05/65	49K008	UM	TUF	08.07-08•17,1965	S•JAPAN	13	T S O P TP N2 N3 SI PH	25	13	D			4	06/66
12•10/65	49K002	KA	HDMSA	08.10-08•30,1965	S•6E•JAPAN	38	T S O P N2 PH	94	149	D			3	06/66
02•14/66	49K007	SI	KMOJMA	08.12-09•01,1965	JAPAN SEA	23	T S O P SI PH	44	43	D		P	13	08/66
03•18/66	49K303	CH	KMOJMA	08.12-08•14,1965	S•E•YAKU	7	T S O P	9	13	D		P	26	11/66
10•09/65	49K014	KY	SUF	08.23-08•31,1965	E•CHIN•SEA	19	T S	29		D			1	05/66
06•18/66	49K011	KE	KU	08.29-09•04,1965	E•CHIN•SEA	15	T S O P	25		D		P	8	07/66
03•18/66	49K304	CH	KMOJMA	09.25-09•27,1965	S•E•YAKU	7	T S O P	9	17	D		P	26	11/66
02•09/66	49K015	SU	NRFRL	10.05-10•07,1965	S•JAPAN	11	T S	11	27	D			9	06/66
12•10/65	49K401	KA	HDMSA	10.09-10•18,1965	S•JAPAN	47	T S	90	65				19	08/66
12•10/65	49K403	ME	HDMSA	10.09-10•18,1965	S•JAPAN			70	124					
12•10/65	49K402	TA	HDMSA	10.10-10•18,1965	S•JAPAN	8	T S	76	117	D			18	08/66
03•18/66	49K305	CH	KMOJMA	11.01-11•02,1965	S•E•YAKU	7	T S O P	9	13	D		P	26	11/66
03•18/66	49K306	SH	KMOJMA	11.11-11•12,1965	S•E•YAKU	7	T S O P	14	14	D		P	26	11/66
						482*/	23	1229*	1205*					
05•04/66	21K001	YM		08.10-10•13,1965	ADJ•TAIWAN	38*/	T S O P TP N2 N3 SI PH 1			D	C	P	22	11/66
12•25/65	24K002	KE	FRDA	08.09-08•27,1965	YELLOW SEA	69	T S O P	PH		D			16	06/66
12•25/65	24K001	BU	FRDA	08.14-09•06,1965	JAPAN SEA	84	T S O P	PH		D			17	06/66
12•25/65	24K003	SU	HO	08.14-08•27,1965	S•KOREA	32	T S O P	PH		D			15	08/66
04•30/66	24K004	BU	FRDA	12.02-12•12,1965	JAPAN SEA	41	T S O P	PH		D			37	12/66
04•30/66	24K005	KE	FRDA	12.04-01•03,1965	YELLOW SEA	40	T S O P	PH		D			38	12/66
						266*/	5							
09•28/66	31K001	AT	WHOI	08.04-09•23,1965	S•JAPAN	106	T S O			D			20	10/66
						106*/	1							
02•17/66	74K001	CM	FRS	10.02-10•10,1965	S•CHIN•SEA	27	T S O P N3			D			21	12/66
						27*/	1							
07•06/66	90K001	SH		07.16-08•18,1965	E•6S•JAPAN	71	T S O P N2 SI PH						23	12/66
09•29/66	90K003	GR		07.20-09•03,1965	E•6S•JAPAN	62	T S O	PH					25	12/66
09•29/66	90K002	ZH		07.28-10•09,1965	E•6S•JAPAN	199*/	T S O P SI PH 3					P	24	12/66
						1118*/	34	1229*	1205*					
08.08/66	49K022	OS	HU	11.30-01•25,1966	S•JAPAN	17	T S O P TP N2 N3 PH					P	33	11/66
07•20/66	49K307	CH	KMOJMA	01.18-01•20;1966	S•E•YAKU	7	T S O P	9	13	D		P	60	02/67
07•20/66	49K020	CH	KMOJMA	01.26-02•28;1966	E•CHIN•SEA	29	T S O P	54	24	D		P	31	11/66

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10.12/66	49K017	RY	MDJMA	02.04-03.09,1966	E.JAPAN	28	T S O P NH N2 N3 SI	74	73	D		P	28	11/66
07.12/66	49K019	SH	KMOJMA	02.10-03.14,1966	S.JAPAN	7	T S O P N2 PH	15	15			P	30	10/66
12.27/66	49K018	KO	HMOJMA	02.12-03.14,1966	E.JAPAN	13	T S O P	30		D		P	29	02/67
07.12/66	49K021	SI	MMOJMA	02.12-03.10,1966	JAPAN SEA	23	T S O P SI PH	37	37	D		P	32	11/66
05.13/66	49K016	TA	HDMSA	02.23-03.15,1966	S.E.JAPAN	31	T S O P N2 SI PH	63	86	D			27	10/66
11.18/66	49K525	SU	NRFRL	02.23-03.13,1966	S.W.KYUSHU	41	T S	19	41	D			48	03/67
12.02/66	49K526	YO	SRFRL	02.24-03.10,1966	E.CHIN.SEA	14	T S			D			49	03/67
07.20/66	49K308	CH	NMOJMA	03.15-03.25,1966	S.E.YAKU	7	T S O P	9	14	D		P	60	02/67
07.20/66	49K309	CH	NMOJMA	04.19-04.28,1966	S.E.YAKU	7	T S O P	9	13	D		P	60	02/67
05.08/67	49K023	KE	KU	04.22-05.01,1966	E.CHIN.SEA	21	T S			D		P	47	10/67
10.12/66	49K310	SH	KMOJMA	05.23-06.09,1966	S.E.YAKU	7	T S O P PH	14	14	D		P	60	02/67
02.21/67	49K417	TN	ORIUT	05.24-06.17,1966	S&SW.JAPAN							P		
12.15/66	49K032	NA	NU	06.15-06.24,1966	S.JAPAN	12	T S O P N2 N3 SI	28	6	DTP		P V	58	02/67
03.17/67	49K422	KY	SUF	06.21-06.23,1966	W.NORPAC					TP		P		
02.23/67	49K026	KO	HMOJMA	06.30-07.10,1966	E.JAPAN	22	T S O P NH N2 N3 SI PH		45	D		P	52	09/67
01.17/67	49K024	TA	HDMSA	07.01-09.13,1966	E.PHILIP.	103	T S O P N2 N3 SI PH	256	353	D			50	02/67
12.27/66	49K311	CH	NMOJMA	07.02-07.03,1966	S.E.YAKU	7	T S O P SI PH		19	D		P	61	09/67
11.07/67	49K036	TE	SUF	07.06-07.17,1966	E.TAIWAN	14	T S O P SI PH		14	DT		P	64	02/68
12.27/66	49K028	CH	NMOJMA	07.08-08.10,1966	E.CHIN.SEA	30	T S O P SI PH		32	D		P	54	02/67
03.17/67	49K034	KY	SUF	07.13-07.23,1966	E.CHIN.SEA	16	T S O PH	33	14	DTP		P	62	10/67
12.09/68	49K421	SY	TRFRL	07.18-08.14,1966	S.JAPAN			131	55					
11.28/66	49K030	SN	TUF	07.19-08.11,1966	S.JAPAN	17	T S O P N3 SI PH	27	18	D			56	02/67
12.09/68	49K420	SU	NRFRL	07.19-08.14,1966	S.JAPAN			133	110					
12.27/66	49K027	SH	KMOJMA	07.25-08.02,1966	S.JAPAN	8	T S O P N2 PH		17			P	53	02/67
03.13/67	49K419	TN	ORIUT	07.30-08.06,1966	IZU IS.	13	T S O	18					79	09/67
05.08/67	49K031	KG	KU	08.05-08.14,1966	E.CHIN.SEA	17	T S O P			D		P	57	11/67
01.23/67	49K025	KA	HDMSA	08.10-08.30,1966	S.&E.JAPAN	27	T S O P SI PH	81	102	D			51	03/67
11.07/67	49K037	TE	SUF	08.10-08.18,1966	E.CHIN.SEA	7	T S O PH		6	DT		P	65	02/68
03.17/67	49K035	KY	SUF	08.18-08.31,1966	E.CHIN.SEA	17	T S O SI	33	17	DTP		P	63	10/67
02.23/67	49K029	SI	MMOJMA	08.21-09.19,1966	JAPAN SEA	24	T S O P SI		35	D		P	55	09/67
12.27/66	49K312	CH	NMOJMA	08.27-08.29,1966	S.E.YAKU	7	T S O P PH		16	D		P	61	09/67
12.27/66	49K033	RY	MDJMA	09.11-09.23,1966	E.JAPAN	17	T S O P NH N2 N3 SI	34	33			P	59	02/67
02.10/67	49K413	TA	HDMSA	10.14-10.24,1966	S.JAPAN	8	T S	113	166	D			76	05/67
12.23/66	49K414	ME	HDMSA	10.14-10.17,1966	S.JAPAN			36	76					
03.17/67	49K038	KY	SUF	10.26-10.29,1966	S.JAPAN	10	T S O P N3 SI		10	DTP		P	66	12/67
02.23/67	49K313	SH	KMOJMA	10.27-10.31,1966	S.E.YAKU	7	T S O P		18	D		P	61	09/67
05.08/67	49K314	CH	NMOJMA	12.07-12.08,1966	S.E.YAKU	7	T S O P		49	D		P	61	09/67
						642*/	35	1256*	1541*					
10.24/66	21K002	YM		03.12-04.25,1966	ADJ.TAIWAN	40	T S O P N2 N3 SI PH			D		P	39	01/67
08.2 /67	21K003	YM		09.10-10.14,1966	ADJ.TAIWAN	36	T S O P N2 N3 SI PH	62			C	P	67	11/67
						76*/	2	62*						
08.01/66	24K007	BU	FRDA	03.08-04.03,1966	YELLOW SEA	64	T S O P SI PH			D			45	01/67
08.01/66	24K006	BA	FRDA	03.21-04.10,1966	JAPAN SEA	57	T S O P SI PH			D			44	01/67
08.01/66	24K008	SU	HO	03.23-04.12,1966	S.KOREA	29	T S O P PH			D			46	01/67
01.23/67	24K009	BA	FRDA	07.14-07.28,1966	JAPAN SEA	61	T S O P N2 SI PH			D			68	05/67
01.23/67	24K010	BU	FRDA	07.16-08.09,1966	YELLOW SEA	66	T S O P N2 SI PH			D			69	05/67
01.30/67	24K011	SU	HO	10.12-11.02,1966	S.KOREA	38	T S O P SI PH			D			70	05/67
						315*/	6							
09.07/66	31K002	CH	CG	01.22-01.27,1966	E.JAPAN	15	T S O			D			35	01/67

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01.31/67	31K003	AR	SIO	01.27-04.01,1966	N.NORPAC	222	T S O P N2 N3 SI			D			36	02/67
09.06/66	31K004	KE	BCF	02.01-04.06,1966	N.NORPAC	56	T S O			D			34	01/67
09.07/66	31K005	BS	CG	07.08-07.14,1966	E.JAPAN	17	T S O			D			71	05/67
						310*/	4							
05.20/67	74K002	CM	FRS	01.09-01.16,1966	S.CHIN.SEA	27	T S O			D			72	10/67
06.05/67	74K003	CM	FRS	06.01-06.08,1966	S.CHIN.SEA	27	T S O			D			77	11/67
06.20/67	74K004	CM	FRS	08.27-09.07,1966	S.CHIN.SEA	53	T S			D			78	11/67
06.09/67	74K005	CM	FRS	11.24-12.07,1966	S.CHIN.SEA	35	T S O			D			80	11/67
						142*/	4							
02.27/67	90K004	SH		12.12-03.31,1966	N.W.NORPAC	242	T S O			D			40	10/67
02.27/67	90K007	VI		12.17-04.15,1966	W.NORPAC	122	T S			DRP			43	09/67
02.27/67	90K005	NE		01.27-04.29,1966	N.W.NORPAC	252	T S O			D			41	10/67
02.27/67	90K006	OR		02.12-04.21,1966	W.NORPAC	156	T S O			D		P	42	10/67
08.07/67	90K009	OR		07.09-09.12,1966	N.W.NORPAC	66	T S O PH			D			74	11/67
05.17/67	90K008	NE		07.13-09.17,1966	N.W.NORPAC	58	T S O PH			D			73	11/68
11.01/67	90K010	SH		07.20-08.23,1966	N.W.NORPAC	71	T S O P AL N2 SI PH			D			75	11/68
						967*/	7							
						2452*/	58	1318*	1541*					
09.18/67	49K040	RY	MDJMA	01.11-02.25,1967	W.NORPAC	88	T S O AL N2 SI PH	133	57	D		P	82	01/68
05.08/67	49K043	CH	NMOJMA	01.13-02.24,1967	E.CHIN.SEA	25	T S O P	147	102	D		P	85	11/67
05.08/67	49K315	CH	NMOJMA	01.13-01.14,1967	S.E.YAKU	7	T S O P		13	D		P	104	12/67
06.08/67	49K045	OS	HU	01.15-02.01,1967	S.JAPAN	12	T S O P TP PH			D		P	87	11/67
06.10/67	49K046	NA	NU	01.19-01.22,1967	E.CHIN.SEA	12	T S O P	12	4	D		P V	88	11/67
07.11/67	49K041	KO	HMOJMA	02.04-03.07,1967	E.JAPAN	27	T S O P	112	109	D		P	83	12/67
05.08/67	49K042	SH	KMOJMA	02.08-03.21,1967	S.JAPAN	8	T S O P	106	86	D		P	84	11/67
07.11/67	49K044	SI	MMOJMA	02.10-03.02,1967	JAPAN SEA	24	T S O P	85	84	D		P	86	01/68
03.31/67	49K039	TA	HDMSA	02.23-03.16,1967	S.&E.JAPAN	30	T S O P SI PH	67	93	D			81	09/67
05.08/67	49K316	CH	NMOJMA	03.16-03.21,1967	S.E.YAKU	7	T S O P	23	37	D		P	104	12/67
07.11/67	49K317	CH	NMOJMA	04.14-04.17,1967	S.E.YAKU	7	T S O P	23	27	D		P	104	12/67
05.14/68	49K052	KE	KU	04.20-05.12,1967	E.CNIN.SEA	24	T S O			D		P	101	02/69
07.11/67	49K050	SH	KMOJMA	04.29-05.18,1967	S.JAPAN	6	T S O P	138	119	D			99	11/67
11.08/67	49K047	KA	HDMSA	05.10-05.29,1967	S.JAPAN	28	T S O P SI PH		106	D			96	01/68
03.01/68	49K049	KO	HMOJMA	05.11-05.30,1967	E.JAPAN	7	T S O P SI	98	101	D			98	10/68
07.11/67	49K318	CH	NMOJMA	05.11-05.29,1967	S.E.YAKU	7	T S O P	44	35	D		P	104	12/67
07.11/67	49K051	CH	NMOJMA	05.17-05.18,1967	E.CHIN.SEA	11	T S O P		8	D		P	100	11/67
11.07/67	49K048	RY	MDJMA	06.02-06.23,1967	E.JAPAN	20	T S O P AL N3 SI PH	98	92	D			97	02/68
09.26/67	49K061	NA	NU	05.13-06.17,1967	S.JAPAN	7	T S O	7	5	D		P V	113	12/67
11.07/67	49K319	CH	NMOJMA	07.03-07.04,1967	S.E.YAKU	7	T S O P		13	D		P	134	10/68
10.11/67	49K053	TA	HDMSA	07.12-08.30,1967	CEN.NORPAC	37	T S O P N2 SI PH	288	307	D			105	01/68
11.07/67	49K062	KY	SUF	07.14-07.21,1967	E.CHIN.SEA	24	T S O PH						114	02/68
01.09/70	49K433	TN	ORIUT	07.24-07.28,1967	E.JAPAN	5	T S						146	06/71
09.17/68	49K055	KO	HMOJMA	07.17-08.18,1967	E.JAPAN	18	T S O P N2 SI PH		40	D		P	107	02/69
10.27/67	49K439	SN	TUF	07.18-07.30,1967	IZU IS.	14	T S O	91	74				145	02/68
11.07/67	49K056	SH	KMOJMA	07.19-07.21,1967	S.JAPAN	8	T S O P N2 N3		16	D		P	108	02/68
03.18/69	49K441	SY	TRFRL	07.27-08.18,1967	S.JAPAN			158	77					
01.09/70	49K434	TN	ORIUT	07.29-08.09,1967	E.JAPAN	1	T S	133		D			146	06/71
11.07/67	49K057	CH	NMOJMA	07.31-08.01,1967	E.CHIN.SEA	9	T S O P		8	D		P	109	02/68
03.18/69	49K440	SU	NRFRL	08.01-08.07,1967	S.JAPAN			75	74					

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03.18/69	49K442	YO	SRFRL	08.01-08.04.1967	S.JAPAN	12	T S O P	50	32				110	10/68
12.11/67	49K058	SI	MMOJMA	08.02-08.24.1967	JAPAN SEA	35	T S O P SI PH	88	23	D		P	106	02/68
12.27/67	49K054	KA	HDMSA	08.08-08.28.1967	E.&S.JAPAN	23	T S O P PH		118	D			112	02/69
05.14/68	49K060	KG	KU	08.08-09.03.1967	E.CNIN.SEA	39	T S			D		P	143	03/69
11.05/68	49K430	KY	SUF	08.19-08.26.1967	S.KYUSHU	15	T S O		19			P	144	03/69
11.05/68	49K431	TE	SUF	08.23-08.26.1967	S.KYUSHU	7	T S O P					P	134	10/68
11.07/67	49K320	CH	NMOJMA	08.28-08.29.1967	S.E.YAKU	11	T S O SI PH		13	D		P	111	10/68
12.22/67	49K059	HK	ORIUT	09.06-09.20.1967	S.JAPAN	21	T S	130	11	D			142	10/68
03.01/68	49K428	TA	HDMSA	09.25-10.17.1967	IZU IS.	7	T S O P		97	D			130	10/68
12.22/67	49K065	CH	NMOJMA	10.05-10.06.1967	E.CHIN.SEA	7	T S O P		7	D		P	134	10/68
12.22/67	49K321	CH	NMOJMA	10.06-10.07.1967	S.E.YAKU	30	T S O P N2		13	D		P	141	05/69
05.04/68	49K423	RY	MDJMA	10.09-11.04.1967	S.JAPAN	1	T S O P N2		71	D			141	05/69
01.14/69	49K424	KO	HMOJMA	10.09-11.04.1967	S.JAPAN	13	T S O P N2		93				141	05/69
09.17/68	49K425	SH	KMOJMA	10.09-11.04.1967	S.JAPAN	6	T S O P N2		53				141	05/69
09.17/68	49K426	CH	NMOJMA	10.09-11.04.1967	S.JAPAN	7	T S O P N2		88	D			141	05/69
09.17/68	49K427	SI	MMOJMA	10.09-11.04.1967	S.JAPAN				89	D				
01.09/70	49K437	HK	ORIUT	10.13-10.14.1967	S.JAPAN	9	T S O	16	16				132	03/69
11.05/68	49K067	KY	SUF	10.29-10.31.1967	E.CHIN.SEA	7	T S O P N2 SI	7	7			P V	133	10/68
01.29/68	49K076	NA	NU	11.07-11.29.1967	E.CHIN.SEA	7	T S O P		4	D		P	134	10/68
12.22/67	49K322	CH	NMOJMA	11.09-11.10.1967	S.E.YAKU	23	T S O P SI PH	53	13	D			128	10/68
02.12/68	49K063	KA	HDMSA	11.13-12.01.1967	S.JAPAN	19	T S O SI	67	76	D		P	131	03/69
10.03/68	49K066	UM	TUF	11.01-02.23.1967	W.NORPAC	15	T S O PH	21	6	D			150	02/69
09.09/68	49K438	HK	ORIUT	12.12-01.25.1967	W.NORPAC	794*/	49	2270*	2536*					
03.20/68	21K004	YM		04.01-05.14.1967	ADJ.TAIWAN	34	T S O P N2 N3 SI PH	42		D	C	P	102	11/68
08.26/69	21K005	YM		09.03-10.29.1967	ADJ.TAIWAN	31	T S O P N2 PH			D			135	01/70
						65*/	2	42*						
07.31/67	24K012	BK	FRDA	02.16-03.25.1967	JAPAN SEA	114	T S O P N2 SI PH			D			89	02/68
07.31/67	24K013	BU	FRDA	02.16-03.09.1967	YELLOW SEA	57	T S O P N2 SI PH			D			90	02/68
07.31/67	24K014	SU	HO	05.04-05.10.1967	S.KOREA	21	T S O P N2 SI PH			D			103	02/68
07.31/67	24K015	SU	HO	05.23-05.27.1967	S.KOREA	21	T S O P SI PH			D			103	02/6
02.20/68	24K016	BA	FRDA	08.12-08.25.1967	JAPAN SEA	70	T S O P N2 SI PH			D			115	11/68
02.20/68	24K018	HA	FRDA	08.12-09.04.1967	E.CHIN.SEA	39	T S O P N2 SI PH			D			117	11/68
02.20/68	24K017	CH	FRDA	08.13-08.21.1967	YELLOW SEA	66	T S O P N2 SI PH			D			116	11/68
02.20/68	24K019	SU	HO	09.23-10.21.1967	S.KOREA	43	T S O P N2 SI PH			D			136	10/68
						431*/	8							
05.14/68	31K007	BS	CG	01.14-01.18.1967	E.JAPAN	8	T S O			D			91	11/68
						8*/	1							
02.05/68	42K001	BU	HO	08.25-09.05.1967	S.CHIN.SEA	32	T S O			D			119	11/68
02.05/68	42K002	JA	HO	10.04-10.19.1967	S.CHIN.SEA	40	T S O P			D			137	11/68
01.17/69	42K003	BU	HO	11.26-12.11.1967	CELEBE.SEA	22	T S O			D			168	09/69
						94*/	3							
06.12/67	74K006	CM	FRS	03.08-03.16.1967	S.CHIN.SEA	49	T S O			D			92	02/68
02.10/68	74K008	CM	FRS	09.19-10.11.1967	S.CHIN.SEA	53	T S O P SI			D			138	11/68
						102*/	2							
05.15/68	86K001	01	HD.RTN	01.18-01.24.1967	GULF THAI.	38	T S O			D			124	12/68

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05.15/68	86K002	01	HD.RTN	03.18-03.23.1967	GULF THAI.	38	T S O			D			125	12/68
05.15/68	86K003	01	HD.RTN	06.07-06.12.1967	GULF THAI.	38	T S O			D			126	12/68
05.15/68	86K004	01	HD.RTN	08.02-08.11.1967	GULF THAI.	38	T S O			D			127	12/68
05.15/68	86K005	F2	DF	11.01-12.10.1967	GULF THAI.	121	T S O			D			139	12/68
01.09/70	86K011	01	HD.RTN	12.14-01.18.1967	GULF THAI.	95	T S O			D			148	05/70
						368*/	6							
03.01/68	90K011	GR		02.05-02.25.1967	N.W.NORPAC	66	T S			D			93	05/69
01.08/68	90K012	OR		02.05-03.11.1967	N.W.NORPAC	59	T S O P N2 SI PH			D			94	11/68
08.06/68	90K013	SH		02.08-03.04.1967	N.W.NORPAC	69	T S O P AL N2 SI PH			D			95	05/69
07.18/68	90K014	SH		04.28-06.03.1967	N.W.NORPAC	70	T S O P AL N2 SI PH			D			121	03/69
05.01/68	90K015	OR		07.29-09.03.1967	N.W.NORPAC	61	T S O P SI PH			D			122	03/69
09.26/68	90K016	NE		08.21-11.26.1967	N.W.NORPAC	62	T S O PH			D			123	05/69
07.18/68	90K017	OR		10.16-11.23.1967	N.W.NORPAC	61	T S O P N2 SI PH			D			140	05/69
						448*/	7							
						2310*/	78	2312*	2536*					
07.24/68	49K075	OS	HU	01.05-02.02.1968	W.NORPAC	21	T S O P TP N2 N3 PH			D		P	160	02/69
06.05/68	49K069	RY	MDJMA	01.13-03.22.1968	W.NORPAC	129	T S O P N2 N3 SI NH			D			155	11/68
04.26/68	49K072	CH	NMOJMA	02.02-02.04.1968	E.CHIN.SEA	10	T S O P N2			D		P	158	10/68
04.26/68	49K323	SH	KMOJMA	02.05-02.06.1968	S.E.YAKU	6	T S O P N2			D		P	169	02/69
08.12/68	49K070	KO	HMOJMA	02.07-02.26.1968	E.JAPAN	16	T S O P			D			156	01/69
04.26/68	49K071	SH	KMOJMA	02.17-02.28.1968	S.JAPAN	7	T S O P N2			D			157	10/68
05.04/68	49K073	SI	MMOJMA	02.17-02.24.1968	JAPAN SEA	10	T S O P			D			159	01/69
06.06/68	49K068	TA	HDMSA	02.19-03.10.1968	S.&E.JAPAN	24	T S O P SI PH	54	78	D			154	10/68
04.26/68	49K324	CH	NMOJMA	02.24-02.28.1968	S.E.YAKU	7	T S O P			D		P	169	02/69
04.30/69	49K079	KE	KU	04.23-05.12.1968	E.CHIN.SEA	16	T S O			D		P	173	11/69
08.26/68	49K325	CH	NMOJMA	04.27-04.28.1968	S.E.YAKU	7	T S O P			D		P	169	02/69
06.02/69	49K080	TO	TOKA.U	05.02-05.19.1968	S.E.JAPAN	16	T		19				174	11/69
07.19/68	49K077	TA	HDMSA	05.14-05.25.1968	S.JAPAN	28	T S O P SI PH	67	86	D			171	01/69
04.25/69	49K078	HK	ORIUT	05.15-06.08.1968	E.CHIN.SEA	10	T S O P N2 SI PH	11	6	D		P	172	12/69
09.01/70	49K074	RY	MDJMA	05.22-06.11.1968	S.E.JAPAN	1	T S O	104	348	D				
06.02/69	49K081	TO	TOKA.U	05.25-06.06.1968	S.E.JAPAN	10	T S		12				174	11/69
06.02/69	49K093	TO	TOKA.U	06.12-06.24.1968	S.E.JAPAN	14	T	15	10				174	11/69
06.25/69	49K084	KO	HMOJMA	06.27-08.09.1968	E.JAPAN	64	T S O P N3	157	145			P	178	06/71
10.07/68	49K085	SH	KMOJMA	06.27-07.31.1968	S.JAPAN	13	T S O P N2 N3			D		P	179	01/69
04.08/69	49K088	SN	TUF	07.13-08.01.1968	S.JAPAN	13	T S O	82	57	D			182	09/69
11.05/68	49K090	KY	SUF	07.16-07.21.1968	E.CHIN.SEA	24	T S		7	D		P	184	03/69
02.02/69	49K082	TA	HDMSA	07.19-09.06.1968	CEN.NORPAC	39	T S O P N2 N3 SI PH	244	256	D			176	03/69
07.16/69	49K448	YO	SRFRL	07.22-08.10.1968	S.JAPAN	8	T C	11		D			195	01/70
07.16/69	49K446	SY	TRFRL	07.23-08.30.1968	S.JAPAN	37	T C	111	97	D			193	01/70
07.16/69	49K447	SU	NRFRL	07.23-08.25.1968	S.JAPAN	44	T C	101	86	D			194	01/70
12.13/68	49K086	CH	NMOJMA	08.04-08.05.1968	E.CHIN.SEA	9	T S O P			D		P	180	03/69
01.09/69	49K087	SI	MMOJMA	08.06-08.10.1968	JAPAN SEA	13	T S O P SI						181	03/69
12.06/68	49K083	KA	HDMSA	08.08-08.28.1968	S.&E.JAPAN	31	T S O P SI PH	78	116	D			177	02/69
04.30/69	49K089	KG	KU	08.15-08.26.1968	E.CHIN.SEA	11	T S			D		P	183	11/69
11.05/68	49K091	KY	SUF	08.17-08.24.1968	S.KYUSHU	45	T S		17	D		P	185	03/69
11.05/68	49K092	TE	SUF	08.31-09.02.1968	E.CHIN.SEA	6	T S O		6			P	186	03/69
01.14/69	49K449	RY	MDJMA	10.07-11.09.1968	E.CHIN.SEA	83	T S O P N2 SI			D			217	11/69
09.29/69	49K450	KO	HMOJMA	10.07-11.08.1968	E.CHIN.SEA	65	T S O P SI			D			218	03/70
09.29/69	49K451	SH	KMOJMA	10.07-11.08.1968	E.CHIN.SEA	51	T S O P SI			D			219	03/70

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09.29/69	49K453	SI	MMOJMA	10.07-11.08,1968	E.CHIN.SEA	64	T S O P SI			D			221	03/70
09.29/69	49K452	CH	MMOJMA	10.11-11.08,1968	E.CHIN.SEA	53	T S O P SI			D			220	03/70
03.18/69	49K454	TA	HDMSA	10.14-11.05,1968	S.KYUSHU	33	T S	125	165	D			206	11/69
07.14/69	49K096	UM	TUF	10.16-11.06,1968	S.CHIN.SEA	22	T S O P N2 SI PH	36					190	01/70
07.14/69	49K455	SA	MSA	10.18-10.30,1968	S.KYUSHU	7	T S O P N2 N3 SI	78	126	D			189	09/69
03.18/69	49K095	NA	NU	11.11-12.02,1968	E.CHIN.SEA	27	T S O P SI PH	93	110				188	05/69
01.09/69	49K094	ME	HDMSA	11.12-12.02,1968	S.JAPAN	6	T		43				174	11/69
06.02/69	49K097	TO	TOKA.U	11.14-11.28,1968	S.E.JAPAN	24	T S O P TP SI			D			216	05/70
12.04/69	49K104	OS	HU	11.05-01.20,1968	W.NORPAC	1124*/	42	1367*	1790*					
08.26/69	21K006	YM		05.14-06.18,1968	ADJ.TAIWAN	40	T S O P N2 N3 SI PH			D			196	01/70
04.04/70	21K007	YM		09.10-10.29,1968	ADJ.TAIWAN	33	T S O P N2 N3 SI PH						164	03/71
						73*/	2							
08.29/68	24K021	HA	FRDA	02.15-03.12,1968	YELLOW SEA	73	T S O P N2 SI PH			D			162	12/68
08.29/68	24K022	TA	FRDA	02.16-03.12,1968	S.KOREA	39	T S O P N2 SI PH			D			163	12/68
08.29/68	24K020	BA	FRDA	02.17-03.12,1968	JAPAN SEA	64	T S O P N2 SI PH			D			161	12/68
11.25/69	24K023	SR	HO	07.22-08.07,1968	S.KOREA	59	T S O P PH			D			197	05/70
01.13/69	24K026	JI	FRDA	07.29-08.15,1968	S.KOREA	52	T S O P SI PH			D			200	05/69
01.13/69	24K024	BA	FRDA	08.01-08.22,1968	JAPAN SEA	53	T S O P SI PH			D			198	07/69
01.13/69	24K025	HA	FRDA	08.01-08.13,1968	YELLOW SEA	72	T S O P N2 SI PH			D			199	05/69
03.03/69	24K027	SR	HO	10.12-11.08,1968	S.KOREA	54	T S O PH			D			201	05/70
						466*/	8							
01.14/69	66K001	RE	PFC	04.20-07.19,1968	N.&E.PHIL.	95	T S O PH			D			202	11/69
						95*/	1							
10.03/68	74K009	CM	FRS	01.06-01.14,1968	S.CHIN.SEA	48	T S O P PH			D			165	03/69
10.03/68	74K010	CM	FRS	05.16-05.23,1968	S.CHIN.SEA	49	T S O P N2 N3 SI PH			D			203	03/69
02.02/69	74K011	CM	FRS	09.18-09.26,1968	S.CHIN.SEA	49	T S O P TP N2 N3 SI PH			D			205	09/69
						146*/	3							
01.14/69	86K006	F2	DF	02.01-02.28,1968	S.CHIN.SEA	91	T S O PH			D			166	07/69
01.14/69	86K007	F2	DF	03.05-03.27,1968	S.CHIN.SEA	88	T S O PH			D			167	07/69
01.14/69	86K008	F2	DF	04.05-04.21,1968	S.CHIN.SEA	17	T S O PH			D			204	07/69
01.14/69	86K009	F2	DF	05.05-05.17,1968	S.CHIN.SEA	12	T S O PH			D			204	07/69
01.14/69	86K010	F2	DF	05.25-05.30,1968	S.CHIN.SEA	2	T S O PH			D			204	07/69
						210*/	5							
05.21/69	90K019	IS		01.26-03.11,1968	N.W.NORPAC	63	T S O P N2 SI PH			D			187	12/69
04.30/69	90K018	OR		04.17-05.22,1968	N.W.NORPAC	62	T S O P N2 SI PH			D			175	03/70
04.30/69	90K020	OR		07.21-08.20,1968	N.W.NORPAC	63	T S O P N2 SI PH			D			191	12/69
08.26/69	90K021	SH		09.17-10.08,1968	N.W.NORPAC	71	T S O P N2 PH	71					192	09/70
11.24/69	90K022	OR		10.31-12.08,1968	N.W.NORPAC	63	T S O P N2 SI PH						208	09/70
05.07/70	90K024	NE		10.28-01.14,1968	N.W.NORPAC	102	T S O PH						209	12/70
						424*/	6	71*						
						2538*/	67	1438*	1790*					
10.08/69	49K099	RY	MDJMA	01.14-03.24,1969	W.NORPAC	139	T S O P N2 N3 SI			D			211	03/70
04.10/69	49K326	CH	NMOJMA	01.15-01.16,1969	S.E.YAKU	7	T S O P			D			212	09/70

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01.23/70	49K100	KO	HMOJMA	02.03-02.22,1969	E.JAPAN	16	T S O P			D			224	09/70
04.10/69	49K101	SH	KMOJMA	02.06-02.08,1969	S.JAPAN	8	T S O P	117	100	D			213	09/69
04.10/69	49K102	CH	NMOJMA	02.06-02.07,1969	E.CHIN.SEA	7	T S O P			D			214	09/69
06.30/69	49K103	SI	MMOJMA	02.08-02.26,1969	JAPAN SEA	10	T S O P			D			215	12/69
05.21/69	49K098	TA	HDMSA	02.18-03.13,1969	S.&E.JAPAN	28	T S O P SI PH	66	87	D			210	09/69
10.19/70	49K109	KE	KU	04.23-05.12,1969	E.CHIN.SEA	15	T S			D			247	06/71
10.08/69	49K106	RY	MDJMA	04.26-05.30,1969	N.W.NORPAC	45	T S O P NH N2 N3 SI			D			223	05/70
12.10/70	49K107	SI	MMOJMA	05.07-06.14,1969	SW.JAPAN	7	T S O			D			242	06/71
08.01/69	49K105	TA	HDMSA	05.09-05.30,1969	S.JAPAN	29	T S O P SI PH	58	96	D			222	01/70
11.26/70	49K108	TE	SUF	06.13-06.30,1969	JAPAN SEA	42	T S	30	15	D			243	06/71
01.23/70	49K110	KO	HMOJMA	07.12-08.20,1969	E.JAPAN	18	T S O P N3 SI			D			246	09/70
11.27/69	49K111	SH	NMOJMA	07.18-08.14,1969	S.JAPAN	9	T S O P	17	16	D			228	05/70
09.08/69	49K114	CH	NMOJMA	07.24-07.31,1969	W.JAPAN	24	T S O			D			231	01/70
10.27/69	49K115	SI	MMOJMA	08.07-08.10,1969	JAPAN SEA	12	T S O P			D			232	01/70
11.10/69	49K112	TA	HDMSA	08.11-09.02,1969	S.&E.JAPAN	37	T S O P SI PH	71	123	D			229	05/70
06.29/70	49K461	TN	ORIUT	09.16-09.24,1969	E.JAPAN			59						
03.02/70	49K462	TA	HDMSA	10.02-10.19,1969	S.JAPAN	27	T S O PH			D			255	09/70
03.11/70	49K116	KA	HDMSA	11.07-11.29,1969	S.JAPAN	16	T S O P SI PH	83	90	D			257	12/70
08.21/73	49K169	UM	TUF	11.16-11.20,1969	S.CHIN.SEA	6	T S	10				F	253	03/74
04.15/71	49K117	KY	SUF	10.25-01.24,1969	S.E.PACIF.	40	T S PH						261	02/72
03.23/70	49K119	OS	HU	11.01-01.15,1969	S.CHIN.SEA	21	T S			D			262	09/70
						563*/	22	511*	527*					
04.04/70	21K008	YM		04.12-05.12,1969	ADJ.TAIWAN	38	T S O P N2 N3 SI PH						244	03/71
						38*/	1							
07.22/69	24K029	HA	FRDA	02.03-02.14,1969	YELLOW SEA	61	T S O P N2 SI PH			D			234	01/70
07.22/69	24K028	BA	FRDA	02.08-03.13,1969	JAPAN SEA	63	T S O P SI PH			D			233	01/70
07.22/69	24K030	JI	FRDA	02.08-02.28,1969	S.KOREA	52	T S O P N2 SI PH			D			235	01/70
07.22/69	24K031	SU	HO	04.11-05.02,1969	S.KOREA	64	T S O PH			D			236	01/70
12.25/69	24K035	SR	HO	07.23-08.19,1969	S.KOREA	68	T S O PH			D			240	05/70
11.25/69	24K034	JI	FRDA	08.07-08.29,1969	S.KOREA	53	T S O P SI			D			239	05/70
11.25/69	24K032	BA	FRDA	08.09-09.06,1969	JAPAN SEA	53	T S O P SI			D			250	09/70
11.25/69	24K033	HA	FRDA	08.09-08.21,1969	YELLOW SEA	68	T S O P N2 SI			D			238	05/70
						482*/	8							
06.03/70	31K008	HU	NAVOCO	06.15-08.22,1969	S.CHIN.SEA	49	T S			D			248	03/71
						49*/	1							
12.09/69	66K002	RE	PFC	01.25-04.01,1969	N.&E.PHIL.	101	T S O PH			D			237	09/70
						101*/	1							
04.07/70	74K012	CM	FRS	01.14-01.23,1969	S.CHIN.SEA	41	T S O PH			D			225	09/70
04.07/70	74K013	CM	FRS	03.28-03.31,1969	S.CHIN.SEA	20	T S P			D			226	09/70
04.07/70	74K014	CM	FRS	09.22-09.25,1969	S.CHIN.SEA	20	T S			D			260	09/70
						81*/	3							
02.23/70	86K012	F2	DF	06.28- . ,1969	S.CHIN.SEA	1	T S O P PH			D			249	03/71
02.23/70	86K013	F2	DF	07.26- . ,1969	S.CHIN.SEA	1	T S O P PH			D			249	03/71
02.23/70	86K014	F2	DF	08.13- . ,1969	S.CHIN.SEA	1	T S O P PH			D			249	03/71
						3*/	3							

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													241	09/71
02.18/71	90K027	KO		01.23-04.01,1969	W.NORPAC	59	T S O P AL N2 SI PH						227	12/70
11.24/69	90K023	OR		01.27-03.06,1969	N.W.NORPAC	62	T S O P N2 SI PH						230	03/71
05.07/70	90K025	SI		01.30-03.31,1969	CEN.NORPAC	146	T S O P AL N2 SI PH						245	03/71
05.07/70	90K026	IS		05.02-06.19,1969	N.W.NORPAC	63	T S O N2 SI PH						254	09/71
02.18/71	90K028	IS		07.24-09.03,1969	N.W.NORPAC	62	T S O P N2 SI PH						256	02/72
02.18/71	90K029	KO		09.06-09.20,1969	N.W.NORPAC	44	T S O P AL N2 SI PH						258	02/72
02.18/71	90K030	IS		10.19-12.05,1969	N.W.NORPAC	61	T S O P N2 SI PH							
						497*/	7							
						1814*/	46	511*	527*					
													263	02/72
03.12/71	49K118	RY	MDJMA	01.16-03.02,1970	S.W.NORPAC	83	T S O P N3 SI			D			267	12/70
03.17/70	49K123	CH	NMOJMA	01.19-01.21,1970	E.CHIN.SEA	9	T S O			D			274	09/71
02.26/71	49K121	KO	HMOJMA	02.03-03.13,1970	E.JAPAN	40	T S O P N3			D			268	12/70
07.11/70	49K124	SI	MMOJMA	02.06-03.16,1970	JAPAN SEA	11	T S O P			D			264	12/70
05.26/70	49K120	TA	HDMSA	02.12-03.07,1970	S.E.JAPAN	21	T S O P SI PH	71	108	D			266	12/70
05.27/70	49K122	SH	KMOJMA	02.21-03.11,1970	S.JAPAN	3	T S O P N2 SI	44	43	D			273	08/72
02.08/71	49K129	KE	KU	04.25-05.09,1970	S.E.TAIWAN	16	T S			D			269	03/71
09.01/70	49K125	TA	HDMSA	05.08-05.25,1970	S.JAPAN	27	T S O P SI PH	99	131	D			285	08/72
06.15/71	49K132	KO	HMOJMA	07.03-08.11,1970	E.JAPAN	42	T S O P N2 N3 SI	107	107	D			278	06/71
11.06/70	49K126	TA	HDMSA	07.10-07.30,1970	S.&E.JAPAN	34	T S O P SI PH	128	91	D			279	06/71
12.11/70	49K127	SH	KMOJMA	07.16-08.08,1970	S.JAPAN	10	T S O P N2 SI	18	18	D			284	08/72
06.22/71	49K133	RY	MDJMA	07.16-07.30,1970	E.JAPAN	29	T S O P N2 N3 SI			D			286	08/72
06.22/71	49K134	CH	NMOJMA	07.24-08.20,1970	E.CHIN.SEA	43	T S O	183	159	D			287	08/72
06.22/71	49K135	SI	MMOJMA	07.27-08.29,1970	JAPAN SEA	70	T S O	28	75	D			277	07/73
01.21/71	49K128	TA	HDMSA	08.12-09.03,1970	S.&E.JAPAN	34	T			D			291	03/73
11.12/71	49K137	IY	FSFRL	10.12-11.03,1970	S.CHIN.SEA	24	T S O P SI PH	28					259	03/76
10.15/73	49K160	OS	HU	11.02-12.25,1970	S.CHIN.SEA	25	T S O						289	09/71
05.17/71	49K130	TA	HDMSA	11.12-12.02,1970	S.JAPAN	25	T S O P SI PH	82	87	D				
						546*/	18	788*	819*					
													270	12/70
06.05/70	24K036	BA	FRDA	02.04-02.20,1970	S.KOREA	50	T S O P SI PH			D			271	12/70
06.05/70	24K037	HA	FRDA	02.11-02.24,1970	YELLOW SEA	56	T S O P SI PH			D			272	12/70
06.05/70	24K038	JI	FRDA	02.18-02.26,1970	JAPAN SEA	40	T S O P SI PH			D			280	09/71
11.18/70	24K039	TA	FRDA	08.13-08.26,1970	JAPAN SEA	54	T S O P SI PH			D			281	09/71
11.18/70	24K040	CH	FRDA	08.13-08.26,1970	S.KOREA	43	T S O P SI PH			D			282	09/71
11.18/70	24K041	HA	FRDA	08.16-08.25,1970	YELLOW SEA	53	T S O P SI PH			D			290	09/71
02.16/71	24K042	SR	HO	11.21-12.05,1970	S.KOREA	22	T S O							
						318*/	7							
										D			275	06/71
11.30/70	74K015	CM	FRS	03.03-03.06,1970	S.CHIN.SEA	24	T S			D			283	09/71
11.30/70	74K016	CM	FRS	08.13-08.17,1970	S.CHIN.SEA	26	T S							
						50*/	2							
													265	02/72
02.18/71	90K031	OR		01.16-03.29,1970	N.W.NORPAC	61	T S O P N2 SI PH						276	08/72
02.18/71	90K032	OR		04.26-06.25,1970	N.W.NORPAC	60	T S O P N2 SI PH						292	03/73
09.29/71	90K033	UC	TINRO	10.15-12.24,1970	N.W.NORPAC	62	T S O P N2 SI PH							
						183*/	3							
										D			288	03/73
01.11/72	MSK001	PE	DF	08.11-10.05,1970	S.CHIN.SEA	130	T S O							
						130*/	1							

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						1227*/	31	788*	819*					
01.12/72	49K139	RY	MDJMA	01.13-03.03,1971	W.NORPAC	85	T S O P N2 N3 SI			D			293	07/73
01.12/72	49K140	CH	NMOJMA	01.28-02.11,1971	E.CHIN.SEA	38	T S O P			D			298	03/73
05.25/71	49K131	KO	HMOJMA	02.03-03.15,1971	E.JAPAN	33	T S O P SI	87	87	D			295	03/73
01.12/72	49K141	SI	MMOJMA	02.04-03.12,1971	JAPAN SEA	43	T S O			D			299	03/73
02.16/72	49K143	KE	KU	05.01-05.08,1971	S.E.TAIWAN	5	T S						303	07/73
08.23/71	49K136	KA	HDMSA	05.11-05.31,1971	S.JAPAN	29	T S O P SI PH	101	109				300	07/73
12.20/71	49K138	IY	FSFRL	05.16-06.04,1971	S.CHIN SEA	29	T S O P	127		D			302	07/73
05.25/72	49K144	KO	HMOJMA	07.01-08.11,1971	E.JAPAN	77	T S O P SI			D			304	03/74
05.25/72	49K145	SH	KMOJMA	07.19-08.17,1971	S.JAPAN	51	T S O P N2 N3 SI			D			305	03/74
05.25/72	49K146	CH	NMOJMA	07.19-08.13,1971	E.CHIN.SEA	30	T S O N2 N3			D			306	03/74
05.25/72	49K147	SI	MMOJMA	07.22-08.28,1971	JAPAN SEA	69	T S O P			D			307	03/74
02.15/72	49K142	TA	HDMSA	08.18-09.21,1971	E.JAPAN	12	T S O	127	200	D			310	03/74
06.02/72	49K148	KA	HDMSA	08.21-09.21,1971	S.JAPAN	21	T S O P SI PH	156	164	D			311	03/74
07.24/73	49K167	ME	HDMSA	11.11-11.23,1971	S.JAPAN	13	T S O P SI PH			D			313	03/74
08.05/75	49K198	OS	HU	11.02-01.11,1971	S.CHIN.SEA	24	T S			D		F	318	03/77
						559*/	15	598*	560*					
01.10/72	24K043	SR	HO	09.23-10.23,1971	S.KOREA	33	T S O PH			D			314	07/73
						33*/	1							
06.09/71	42K004	SA	IMR	02.12-03.05,1971	S.CHIN.SEA	57	T S O P N3			D		P	296	03/73
03.10/72	42K005	JA	HO	12.07-12.28,1971	S.CHIN.SEA	87	T S O N3 SI PH			D		P	317	02/75
						144*/	2							
02.01/72	74K017	CM	FRS	02.09-02.12,1971	S.CHIN.SEA	23	T S			D			294	03/73
02.01/72	74K018	CM	FRS	08.24-08.28,1971	S.CHIN.SEA	26	T S			D			308	07/73
						49*/	2							
02.02/73	86K015	CH	HDRTN	07.20-08.17,1971	GULF THAI.	40	T S O			D			312	03/74
						40*/	1							
02.01/72	90K034	S8	TINRO	04.13-06.13,1971	N.W.NORPAC	112	T S O P N2 SI PH						297	07/73
04.15/74	90K043	PI		06.09-09.10,1971	W.NORPAC	74	T S O P AL N2 SI PH						315	10/76
04.03/72	90K035	OR	TINRO	07.30-09.04,1971	N.W.NORPAC	42	T S O P N2 SI PH						309	02/75
04.15/74	90K044	PR		09.17-10.18,1971	W.NORPAC	91	T S O P AL N2 SI PH						316	10/76
						319*/	4							
01.11/72	MSK002	PE	DF	03.24-05.02,1971	S.CHIN.SEA	20	T S O			D			301	03/73
						20*/	1							
01.10/72	SIK001	CH	MFRD	10.12-10.25,1971	S.CHIN.SEA	13	T	142		D		F		
01.11/72	SIK002	CH	MFRD	11.27-12.06,1971	S.CHIN.SEA	7	T			D		F		
01.11/72	SIK003	CH	MFRD	12.11-12.22,1971	STR.MALAC.	10	T			D		F		
						30*/	3	142*						
						1194*/	29	740*	560*					
10.19/72	49K149	CH	NMOJMA	01.27-02.16,1972	E.CHIN.SEA	36	T S O P			D			323	02/75
02.02/73	49K154	RY	MDJMA	01.13-03.02,1972	W.NORPAC	78	T S O P TP			D		C H	322	03/74
02.02/73	49K157	SI	MMOJMA	02.01-03.14,1972	JAPAN SEA	50	T S O P TP N2 N3			D			327	02/75

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02.02/73	49K155	KO	HMOJMA	02.05-03.15,1972	E.JAPAN	30	T S O P N3 SI			D			324	02/75
02.02/73	49K156	SH	KMOJMA	02.22-03.12,1972	S.JAPAN	17	T S O P N2			D			325	02/75
11.07/72	49K150	TA	HDMSA	03.08-03.25,1972	S.E.JAPAN	23	T S O P SI PH			D			326	03/74
08.06/76	49K214	HK	ORIUT	05.11-08.03,1972	S.E.ASIA	22	T S O P N2 N3 SI PH	45		D			337	03/77
11.07/72	49K151	TA	HDMSA	05.13-05.30,1972	S.JAPAN	30	T S O P SI PH			D			328	03/74
02.02/73	49K158	RY	MDJMA	06.01-06.30,1972	W.NORPAC	86	T S O P TP N3			D		C H	331	03/74
05.07/73	49K164	KO	HMOJMA	07.10-09.13,1972	E.JAPAN	98	T S O P TP N2 N3 PH	233	232	D		C H	338	02/75
03.27/73	49K162	SH	KMOJMA	07.17-08.13,1972	S.JAPAN	66	T S O P N2 N3	130	80	D			339	02/75
02.02/73	49K159	SI	MMOJMA	07.19-08.18,1972	JAPAN SEA	73	T S O P TP N2 N3			D			340	03/74
11.07/74	49K166	CH	NMOJMA	07.27-08.14,1972	E.CHIN.SEA	43	T S O P TP N2 N3 NH			D			343	03/76
11.07/72	49K152	TA	HDMSA	08.14-08.30,1972	S.&E.JAPAN	34	T S O P SI PH			D			336	03/74
01.19/73	49K153	TA	HDMSA	10.25-11.13,1972	S.JAPAN	29	T S O P SI PH			D			344	03/74
01.10/74	49K175	OS	HU	11.14-12.06,1972	S.CHIN.SEA	26	T S			D			350	03/76
						741*/	16	408*	312*					
04.09/73	24K044	SR	HO	05.03-05.05,1972	S.KOREA	20	T S O PH			D			332	03/74
04.09/73	24K045	SR	HO	05.28-05.30,1972	S.KOREA	20	T S O PH			D			333	03/74
04.09/73	24K046	SR	HO	08.15-08.16,1972	S.KOREA	20	T S O PH			D			341	03/74
04.09/73	24K047	SR	HO	09.09-09.11,1972	S.KOREA	18	T S O PH			D			342	03/74
						78*/	4							
08.20/73	86K016	KL	HDRTN	01.22-05.05,1972	ANDAMA.SEA	137	T S O			D			329	03/76
						137*/	1							
05.30/73	90K041	PI		12.07-02.01,1972	W.NORPAC	160	T S O P AL N2 SI PH						319	10/76
03.01/73	90K038	VO		01.16-02.12,1972	N.W.NORPAC	43	T S O P AL N2 SI PH						321	10/76
04.15/74	90K045	SH		01.31-04.23,1972	PACIFIC	161	T S O P AL N2 SI PH						330	10/76
08.08/72	90K036	PR		02.20-02.27,1972	E.JAPAN	40	T S O P AL N2						320	02/75
03.01/73	90K037	OR	TINRO	04.11-06.24,1972	W.NORPAC	99	T S O P SI PH						334	03/77
03.01/73	90K039	VO		05.15-06.09,1972	N.W.NORPAC	121	T S O P AL N2 SI PH						345	03/77
03.01/73	90K040	SH		07.13-07.21,1972	E.JAPAN	52	T S O P AL N2 SI PH						346	03/77
07.26/73	90K042	OR		07.20-09.21,1972	W.NORPAC	108	T S O P N2 SI PH						348	10/76
07.05/74	90K048	PR		09.04-10.15,1972	N.W.NORPAC	53	T S O PH						357	03/77
05.23/74	90K046	VO		09.22-09.30,1972	E.JAPAN	22	T S O P AL N2 SI PH						349	03/77
						859*/	10							
07.05/74	42K006	SA	IMR	07.22-08.02,1972	S.CHIN.SEA	46	T S O P N3 SI					P	347	03/76
						46*/	1							
02.16/72	SIK004	CH	MFRD	01.19-01.23,1972	S.CHIN.SEA	6	T S					F		
03.10/72	SIK005	CH	MFRD	02.04-02.10,1972	S.CHIN.SEA	7	T			D		F		
06.26/72	SIK006	CH	MFRD	04.20-05.12,1972	S.CHIN.SEA	56	T 0					F		
07.19/72	SIK007	CH	MFRD	06.17-06.25,1972	S.CHIN.SEA	26	T					F		
11.09/72	SIK008	CH	MFRD	09.16-09.27,1972	S.CHIN.SEA	25	T					F		
11.09/72	SIK009	CH	MFRD	10.07-10.12,1972	S.CHIN.SEA	3	T					F		
11.14/72	SIK010	CH	MFRD	10.24-10.29,1972	S.CHIN.SEA	3	T					F		
02.20/73	SIK011	CH	MFRD	11.15-11.25,1972	S.CHIN.SEA	10	T			D		F		
02.22/73	SIK012	CH	MFRD	11.29-12.15,1972	S.CHIN.SEA	9	T			D		F		
						145*/	9							
						2006*/	41	408*	312*					

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04.13/73	49K163	RY	MDJMA	01.14-02.28,1973	W.NORPAC	78	T S O P TP N2 N3 NH PH			D			351	02/75
03.20/73	49K161	CH	NMOJMA	01.26-02.11,1973	E.CHIN.SEA	29	T S O P TP N2 N3	51	24	D			354	02/75
08.21/73	49K170	SH	KMOJMA	02.03-02.13,1973	S.JAPAN	44	T S O P N2			D			353	02/75
10.15/73	49K174	KO	HMOJMA	02.05-02.17,1973	E.JAPAN	21	T S O P TP N2 N3	51	45	D		C H	352	03/76
06.04/73	49K165	SI	MMOJMA	02.07-03.23,1973	JAPAN SEA	52	T S O P TP N2 N3 NH	128	136	D			355	03/76
07.24/73	49K168	YY	HDMSA	03.06-03.18,1973	S.&E.JAPAN	32	T S O P SI PH			D			356	02/75
09.05/73	49K171	TA	HDMSA	05.17-05.31,1973	S.JAPAN	28	T S O P SI PH	98	139	D			359	02/75
09.17/73	49K172	RY	MDJMA	06.05-08.03,1973	W.NORPAC	83	T S O P TP N2 N3 NH PH			D			361	03/76
10.03/73	49K173	CH	NMOJMA	07.11-08.10,1973	E.CHIN.SEA	65	T S O P TP N2 N3	127	72	D		C H	364	03/76
05.13/74	49K178	SH	KMOJMA	07.12-08.07,1973	S.JAPAN	65	T S O P TP N2 N3 NH PH	120	88	D		C H	363	03/76
04.15/74	49K177	KO	HMOJMA	07.18-08.17,1973	E.JAPAN	51	T S O P	131	135	D		C H	362	03/76
01.10/74	49K176	SI	MMOJMA	07.21-08.14,1973	JAPAN SEA	61	T S O P N2 N3	122	100	D		C H	365	03/76
08.09/74	49K182	NA	NU	07.30-10.24,1973	S.CHIN.SEA	7	T S							
04.28/75	49K193	KA	HDMSA	08.12-08.27,1973	S.JAPAN	23	T S O P SI PH			D			366	03/76
08.05/75	49K199	OS	HU	10.22-12.25,1973	S.CHIN.SEA	29	T S			D		F	372	03/77
10.14/74	49K185	TA	HDMSA	10.30-11.28,1973	E.CHIN.SEA	40	T S O P SI PH			D			369	03/76
						708*/	16	828*	739*					
08.21/73	24K048	SR	HO	04.23-05.06,1973	S.CHIN.SEA	35	T S O			D			358	02/75
01.10/74	24K049	SR	HO	08.23-09.09,1973	S.KOREA	35	T S O PH			D			367	03/76
						70*/	2							
07.05/74	42K007	SA	IMR	06.29-07.17,1973	S.CHIN.SEA	67	T S O P N3 SI						360	03/76
						67*/	1							
05.23/74	90K047	OK		02.08-03.28,1973	W.NORPAC	60	T S O P AL N2 SI PH						368	03/77
05.27/75	90K051	TA	TINRO	07.17-09.05,1973	S.&E.JAPAN	100	T S O P N2 PH							
07.05/74	90K049	VL		12.07-12.12,1973	PACIFIC	39	T S O PH							
						199*/	3							
03.01/73	SIK013	CH	MFRD	01.16-01.31,1973	ANDAMA.SEA	13	T			D				
04.09/73	SIK014	CH	MFRD	02.20-03.04,1973	GULF THAI.	9	T					F		
04.09/73	SIK015	CH	MFRD	03.16-06.28,1973	S.CHIN.SEA	3	T			D		F		
08.06/73	SIK016	CH	MFRD	04.10-04.30,1973	S.CHIN.SEA	16	T			D		F		
08.06/73	SIK017	CH	MFRD	05.14-05.26,1973	S.CHIN.SEA	13	T					F		
01.10/74	SIK019	CH	MFRD	06.06-07.25,1973	S.CHIN.SEA	41	T S							
09.17/73	SIK018	CH	MFRD	08.15-09.01,1973	S.CHIN.SEA	10	T					F		
01.10/74	SIK020	CH	MFRD	09.28-10.11,1973	S.CHIN.SEA	16	T					F		
01.10/74	SIK021	CH	MFRD	11.16-12.11,1973	S.CHIN.SEA	40	T					F		
						161*/	9							
						1205*/	31	828*	739*					
06.07/74	49K180	RY	MDJMA	01.14-03.03,1974	W.PACIFIC	51	T S O P TP N3 PH	51		D			374	03/76
11.10/74	49K187	KF	MDJMA	01.21-02.27,1974	S.JAPAN	37	T S O P TP N2 N3 NH PH			D		C H	376	03/76
05.13/74	49K179	CH	NMOJMA	01.28-02.28,1974	E.CHIN.SEA	52	T S O P TP N2 N3 NH PH	90	68	D		C H	373	03/76
06.12/74	49K181	SI	MMOJMA	02.02-03.09,1974	JAPAN SEA	36	T S O P TP N2 N3 NH	131	131	D		C H	375	03/76
11.10/74	49K186	KO	HMOJMA	02.05-03.02,1974	E.JAPAN	26	T S O P TP N2 N3 NH PH			D		C H	377	03/76
03.23/76	49K206	TA	HDMSA	03.05-03.22,1974	S.JAPAN	22	T S O P SI			D			383	03/77
12.20/74	49K188	TA	HDMSA	05.10-05.28,1974	S.JAPAN	29	T S O P SI PH			D			378	03/76
09.11/74	49K183	RY	MDJMA	06.07-07.27,1974	W.PACIFIC	76	T S O P TP N2 N3 NH PH	166		D			385	03/77
04.04/75	49K192	KO	HMOJMA	07.05-07.18,1974	E.HOKKAIDO	33	T S O P TP N2 N3	82	79			C H		

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04.30/75	49K194	SH	KMOJMA	07.12-08.03,1974	S.JAPAN	49	T S O P TP N2 N3			D		C H	387	03/77
01.07/75	49K190	SI	MMOJMA	07.16-08.14,1974	JAPAN SEA	70	T S O TP N2 N3	140	140	D		C H	389	03/77
09.18/74	49K184	CH	NMOJMA	07.21-08.14,1974	E.CHIN.SEA	43	T S O P TP N2 N3 NH PH			D		C H	388	03/77
12.20/74	49K189	KA	HDMSA	08.09-08.30,1974	S.JAPAN	22	T S O P SI PH						390	03/77
03.14/75	49K191	YS	FSFRL	10.02-01.07,1974	W.EQU.REG.	72	T S O P SI	184	20				386	03/77
10.01/75	49K202	YS	FSFRL	10.02-11.30,1974	W.EQU.REG.	57	T S O P SI	119	18				394	03/77
07.08/76	49K213	TA	HDMSA	10.28-11.26,1974	E.CHIN.SEA	44	T S O P N3 SI PH			D				
						719*/	16	963*	456*					
12.20/74	24K050	SR	HO	05.15-06.27,1974	S.KOREA	20	T S O PH			D			379	03/76
12.20/74	24K051	SR	HO	08.15-09.28,1974	S.KOREA	19	T S O PH			D			391	03/77
						39*/	2							
03.14/75	90K050	PL	TINRO	05.23-06.08,1974	S.&E.JAPAN	45	T S O P N2 N3 PH					F		
						45*/	1							
02.07/74	SIK022	CH	MFRD	01.05-01.15,1974	ANDAMA.SEA	23	T					F		
11.01/75	SIK023	CH	SEAFDC	02.16-03.07,1974	ANDAMA.SEA	35	T							
						58*/	2							
						861*/	21	963*	456*					
06.05/75	49K195	RY	MDJMA	01.14-02.10,1975	W.PACIFIC	51	T S O P TP N2 N3 NH			D				
11.19/75	49K203	SH	KMOJMA	02.01-02.17,1975	S.JAPAN	65	T S O P TP N2 N3	75	54	D		C H		
06.20/75	49K196	SI	MMOJMA	02.03-03.02,1975	JAPAN SEA	51	T S O P TP N2 NH PH			D		C H		
10.01/75	49K201	KO	HMOJMA	02.04-03.14,1975	E.JAPAN	26	T S O P TP N2 N3	106	95					
07.29/75	49K197	TA	HDMSA	03.07-03.24,1975	S.JAPAN	31	T S O P SI PH			D				
03.23/76	49K207	TA	HDMSA	05.08-05.25,1975	S.JAPAN	24	T S O P SI PH			D				
02.02/76	49K205	RY	MDJMA	06.10-08.08,1975	W.PACIFIC	107	T S O P TP N2 N3			D				
05.20/76	49K211	SH	KMOJMA	07.03-08.04,1975	S.JAPAN	65	T S O P TP N2 N3			D		C H		
11.19/75	49K204	SI	MMOJMA	07.05-08.12,1975	JAPAN SEA	86	T S O P TP N2 N3 NH PH	200	127	D		C H		
09.12/75	49K200	CH	NMOJMA	07.12-08.12,1975	E.CHIN.SEA	43	T S O P TP N2 N3 NH PH			D		C H		
03.23/76	49K208	KA	HDMSA	08.11-09.03,1975	S.JAPAN	31	T S O P SI PH			D				
11.29/76	49K217	TA	HDMSA	10.18-11.16,1975	E.CHIN.SEA	56	T S O P SI PH			D				
						636*/	12	381*	276*					
03.23/76	24K052	SR	HO	06.02-06.20,1975	S.KOREA	20	T S O PH			D				
						20*/	1							
06.07/76	90K053	SE	TINRO	04.11-05.30,1975	N.W.NORPAC	123	T S O P N2 SI PH			D				
04.07/76	90K052	PI		06.22-06.29,1975	W.PACIFIC	36	T S O PH							
08.09/76	90K055	PR	DVNIGM	06.30-06.07,1975	N.W.NORPAC	23	T S O P							
06.07/76	90K054	SE	TINRO	07.10-08.29,1975	N.W.NORPAC	103	T S O P N2							
						285*/	4					F		
11.01/75	SIK024	HO	SEAFDC	06.19-07.22,1975	S.CHIN.SEA	33	T					F		
11.01/75	SIK025	HO	SEAFDC	07.26-08.30,1975	S.CHIN.SEA							F		
11.01/75	SIK026	HO	SEAFDC	09.03-09.21,1975	S.CHIN.SEA	33*/	1							
						974*/	18	381*	276*					

Date Received Mo.Day/Yr.	KDC Ref. No.	Ship Code	Agency	Period	Area	No. of Stas.	Serial Data	BTs	Currents	Bottom Topography	Sediments	Biological	Data Report of CSK Pub.No.	Mo./Yr.
03.24/76	49K209	RY	MDJMA	01.14-02.17,1976	W.PACIFIC	65	T S O P TP N2 N3 NH PH			D				
08.30/76	49K215	SH	KMOJAM	02.02-02.27,1976	S.JAPAN	13	T S O P N2 N3 PH			D		C H		
06.15/76	49K212	SI	MMOJMA	02.03-03.15,1976	JAPAN SEA	48	T S O TP N2 N3 NH PH	102	89	D		C H		
04.12/76	49K210	CH	NMOJMA	02.09-02.21,1976	E.CHIN.SEA	23	T S O	45	29	D				
11.29/76	49K218	YY	HDMSA	03.10-03.24,1976	S.JAPAN	18	T S O P SI PH			D				
11.29/76	49K219	TA	HDMSA	05.12-06.04,1976	S.JAPAN	41	T S O P SI PH			D				
01.10/77	49K221	SI	MMOJMA	07.08-08.14,1976	JAPAN SEA	50	T S O P TP N2 N3 PH	33	119	D		C H		
09.08/76	49K216	CH	NMOJMA	07.10-08.07,1976	E.CHIN.SEA	46	T S O TP N2 N3	95	58	D		C H		
11.29/76	49K220	KA	HDMSA	08.09-08.25,1976	S.JAPAN	23	T S O P SI PH			D				
03.03/77	49K222	YY	HDMSA	11.10-11.26,1976	S.JAPAN	27	T S O P SI PH			D				
						354*/	10	275*	295*					
						354*/	10	275*	295*					

Total No. of Serial Stas./Cruises ----- 18053# / 464# BTs & Cur. --- 11191# 11056#

The symbols of the types of data available used on the table are as follows:

Serial Data:
- T - Temperature of the water sample
- S - Salinity
- O - Dissolved oxygen content
- P - Inorganic phophate-phosphorus
- TP - Total phosphorus
- AL - Alkalinity
- N2 - Nitrite-nitrogen
- N3 - Nitrate-nitrogen
- SI - Inorganic silicate-silicon
- PH - Hydrogen ion consentration
- NH - Ammonia-nitrogen

Bottom Topography:
- D - Soundings at oceanographic stations
- P - Profiles of bottom relief
- T - Table of depths
- R - Plotting sheets with depths recorded

Sediments:
- C - Core sampling data

Biological:
- P - Plankton
- F - Fishery observations
- C - Chlorophyll a
- H - Phaeopigments
- V - Visual observations

CC	COUNTRY	SC	SHIP	ABBREVIATION	AGENCY
49	JAPAN	CH	Chofu Maru	NMOJMA	Nagasaki Marine Observatory, JMA
		HK	Hakuho Maru	ORIUT	Ocean Research Institute, Univ. Tokyo
		IY	Kaiyo Maru	FSFRL	Far Sea Fisheries Research Laboratory
		KA	Kaiyo	HDMSA	Hydrographic Department, MSA
		KE	Keiten Maru	KU	Kagoshima University
		KF	Keifu Maru	MDJMA	Marine Department, JMA
		KG	Kagoshima Maru	KU	Kagoshima University
		KO	Kofu Maru	HMOJMA	Hakodate Marine Observatory, JMA
		KY	Koyo Maru	SUF	Shimonoseki University of Fisheries
		ME	Meiyo	HDMSA	Hydrographic Department, MSA
		NA	Nagasaki Maru	NU	Nagasaki University
		OS	Oshoro Maru	HU	Hokkaido University
		RY	Ryofu Maru	MDJMA	Marine Department, Japan Meteorological Ag.
		SA	Satsuma	MSA	Maritime Safety Agency
		SH	Shumpu Maru	KMOJMA	Kobe Marine Observatory, JMA
		SI	Seifu Maru	MMOJMA	Maizuru Marine Observatory, JMA
		SN	Shinyo Maru	TUF	Tokyo University of Fisheries
		SU	Shunyo Maru	NRFRL	Nansei Regional Fisheries Research Lab.
		SY	Soyo Maru	TRFRL	Tokai Regional Fisheries Research Lab.
		TA	Takuyo	HDMSA	Hydrographic Department, MSA
		TE	Tenyo Maru	SUF	Shimonoseki University of Fisheries
		TN	Tansei Maru	ORIUT	Ocean Research Institute, Univ. of Tokyo
		TO	Tokai University II	TOKA.U.	Tokai University
		UM	Umitaka Maru	TUF	Tokyo University of Fisheries
		YO	Yoko Maru	SRFRL	Seikai Regional Fisheries Research Lab.
		YY	Shoyo	HDMSA	Hydrographic Department, MSA
21	CHINA	YM	Yang Ming		
24	KOREA Rep. of	BA	Baek Du San	FRDA	Fisheries Research & Development Agency
		BK	Buk Ak San	FRDA	"
		BU	Buk Han San	FRDA	"
		CH	Chun Ma San	FRDA	"
		HA	Han Ra San	FRDA	"
		JI	Ji Ri San	FRDA	"
		KE	Kerim	HO	
		SR	Suro No. 3	HO	Hydrographic Office
		SU	Suro No. 1	HO	"
		TA	Tae Baek San	FRDA	Fisheries Research & Development Agncy
31	U.S.A.	AR	Argo	SIO	Scripps Inst. of Oceanography, Univ. Cal.
		AT	Atlantis	WHOI	Woods Hole Oceanographic Institution
		BS	Bering Strait	CG	U.S. Coast Guard
		CH	Chautauqua	CG	"
		HU	Hunt	NAVOCO	U.S. Naval Oceanographic Office
		KE	George B. Kelez	BCF	Bureau of Commercial Fisheries
42	INDONESIA	BU	Burudjulasa	NHO	Navy Hydrographic Office
		JA	Jalanidhi	NHO	"
		SA	Samudera	IMR	Institute of Marine Research
66	PHILIPPINES	RE	Researcher I	PFC	Philippine Fisheries Commission
74	U.K. (Hong Kong)	CM	Cape St. Mary	FRS	Fisheries Research Station
86	THAILAND	CH	Chanthara	HDRTN	Hydrographic Department, Royal Thai Navy
		F2	Fishry Research No. 2	DF	Department of Fisheries
		KL	Kledkeo	HDRTN	Hydrographic Department, Royal Thai Navy
		01	Oceanographic Vessel No. 1	HDRTN	"
90	U.S.S.R.	GR	Uliana Gromova	NHS	Naval Hydrographic Service
		IS	Iskatel	TINRO	Pacific Ocean Inst. Scientific Invest.
		KO	A. Korolev	DVNIGMI	Marine Fisheries & Oceanography Far Eastern Hydrometeorological Scientific Research Institute
		NE	G. Nevelskoy	NHS	
		OK	Okean	DVNIGMI	
		OR	Orlick	TINRO	
		PL	Pelamida	TINRO	
		PI	Priboy	DVNIGMI	
		PR	Priliv	DVNIGMI	
		S8	SRTM 8-459	TINRO	
		SE	Seskar	TINRO	
		SH	U.M. Schokalsky	DVNIGMI	
		SI	A. Shirshov	DVNIGMI	
		TA	Tamango	TINRO	
		UC	Ucheny	TINRO	
		VI	Vitjaz	IOAN	Academic of Sciences of U.S.S.R., Inst. Oceanology
		VL	Volna	DVNIGMI	
		VO	A.I. Voeikov	DVNIGMI	
		ZH	Zhyemchig	PINRO	Polar Institute of Scientific Investigat. for Marine Fisheries & Oceanography
MS	MALAYSIA	PE	Penyelidek I	DF	Department of Fisheries
SI	SINGAPORE	CH	Changi	MFRD	Marine Fisheries Research Department, SEAFDEC

Annex II (ICG-CSK)

NUMBER OF SERIAL OCEANOGRAPHIC STATIONS OF CSK

Line 1. -- No. of Stations/Cruises on hand as of 31 March 1976;
Line 2. -- No. of Stations/Cruises received from 30 April 1976 to 31 March 1977;
Line 3. -- No. of Stations/Cruises on hand as of 31 March 1977

NATION		Years data were observed												TOTALS
		1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	
21. China	1.	38/ 1	76/ 2	65/ 2	73/ 2	38/ 1								290/ 8
	2.													
	3.	38/ 1	76/ 2	65/ 2	73/ 2	38/ 1								290/ 8
42. Indonesia	1.			94/ 3				144/ 2	46/ 1	67/ 1				351/ 7
	2.													
	3.			94/ 3				144/ 2	46/ 1	67/ 1				351/ 7
49. Japan	1.	482/23	642/35	794/49	1124/42	563/22	546/18	559/15	719/15	708/16	675/15	515/10	65/ 1	7,392/261
	2.								22/ 1		44/ 1	121/ 2	289/ 9	476/ 13
	3.	482/23	642/35	794/49	1124/42	563/22	546/18	559/15	741/16	708/16	719/16	636/12	354/10	7,868/274
24. Korea Rep. of	1.	266/ 5	315/ 6	431/ 8	466/ 8	482/ 8	318/ 7	33/ 1	78/ 4	70/ 2	39/ 2	20/ 1		2,518/ 52
	2.													
	3.	266/ 5	315/ 6	431/ 8	466/ 8	482/ 8	318/ 7	33/ 1	78/ 4	70/ 2	39/ 2	20/ 1		2,518/ 52
MS. Malaysia**	1.						130/ 1	20/ 1						150/ 2
	2.													
	3.						130/ 1	20/ 1						150/ 2
66. Philippines	1.				95/ 1	101/ 1								196/ 2
	2.													
	3.				95/ 1	101/ 1								196/ 2
SI. Singapore	1.				* Prompt Report									
	2.													
	3.													
86. Thailand	1.			368/ 6	210/ 5	3/ 3								427/ 24
	2.													
	3.			368/ 6	210/ 5	3/ 3								427/ 24
90. U.S.S.R.	1.	199/ 3	967/ 7	448/ 7	424/ 6	497/ 7		40/ 1	137/ 1					758/ 16
	2.													
	3.	199/ 3	967/ 7	448/ 7	424/ 6	497/ 7		40/ 1	137/ 1					758/ 16
74. U.K. (Hong Kong)	1.	27/ 1	142/ 4	102/ 2	146/ 3	81/ 3	50/ 2	49/ 2						597/ 17
	2.													
	3.	27/ 1	142/ 4	102/ 2	146/ 3	81/ 3	50/ 2	49/ 2						597/ 17
31. U.S.A.***	1.	106/ 1	310/ 4	8/ 1		49/ 1								473/ 7
	2.													
	3.	106/ 1	310/ 4	8/ 1		49/ 1								473/ 7
		1,118/34	2,452/58	2,310/78	2,538/67	1,814/46	1,227/31	1,194/29	2,006/41	1,205/31	861/21	974/18	354/10	18,053/464

** not participated for CSK *** withdrew from CSK in Nov., 1972

III. SUMMARY REPORT OF THE FIRST SESSION OF THE AD HOC TASK TEAM FOR THE WESTERN PACIFIC (WESTPAC), NOUMÉA, NEW CALEDONIA, 27 - 29 June 1977

I) Opening of the Session

The meeting of the Task Team was opened by Professor Kiyoo Wadati, the International Coordinator for CSK. Professor Wadati proposed a provisional agenda which was adopted (see Annex I). The Task Team elected Professor Wadati to serve as the Chairman for its session. The Task Team also asked Mr. Louis Brown and Mr. Pierre Rual to serve as rapporteurs. Dr. Oleg Mamayev, Assistant Secretary of IOC, noted the importance of long-term studies of the Kuroshio Current system. He suggested that within the Western Pacific region there exist various scientific problems which are of interest to different groups of countries. The list of participants is attached as Annex II.

II) Possible Programmes in the Frame of WESTPAC

The Task Team decided that it should first discuss possible future scientific programmes in the Western Pacific and then consider the ways and means by which such programmes might be coordinated under IOC. The Task Team used as the basis of its discussion the list of possible programmes in the frame of WESTPAC which had been offered as a draft discussion paper by Japan. The participants agreed that future IOC scientific programmes in the Western Pacific should be limited to fundamental research. It was recognized, however, that some such research must be related to the specific needs of the developing countries of the region.

It was agreed that future programmes could be established in any discipline, but that any such programme must be of interest to a number of countries in the region, if it is to be conducted under the aegis of the IOC. Various additions were proposed to the list of programmes. It was also suggested that several programmes could be combined into groups of programmes.

The Task Team noted with appreciation the proposal which had been submitted by the USSR regarding the widening of future Western Pacific research. The Delegation of the USSR indicated that this proposal was not yet a final document, they welcomed comments from other countries on this proposal, and they hoped that other countries would work with the Soviet Union to carry out some of the research outlined in this proposal.

The Task Team prepared a statement (see Annex III) of

the objectives of future scientific research in the Western Pacific and the programmes which should be implemented as a matter of priority to achieve these objectives.

The Task Team did not have sufficient time to thoroughly review the USSR proposal, since the Task Team had received this proposal very late in the meeting. It was agreed, however, that the information combined in this proposal would very likely be useful to scientists in many countries in their planning of future WESTPAC activities. For this reason the Task Team decided to include the Soviet proposal as an annex to its report (see Annex VI).

The Task Team decided, that for the purposes of the WESTPAC programme of research, the Western Pacific region should be defined as follows:-

(A) On the East, the coast of Alaska from the Bering Strait to the Aleutian Island Arc; Aleutian Island Arc from the coast of Alaska to the meridian 170°W; the meridian 170°W to the line of latitude 40°S.

(B) On the South, the line of latitude 40°S from the meridian 170°W to the east coast of New Zealand; the southern edge of the Tasman Sea from between the west coast of New Zealand and the east coast of Australia.

(C) On the West, a line from Cape Talbot, Australia, to the south-west tip of Timor; the southern edge of the Indonesian island arc along Java, Sumatra and the Nicobar Islands into the coast of Burma (thus enclosing the Andaman Sea); thence the east-coast of Asia to the Bering Strait.

(D) On the North the Bering Strait.

It was agreed, however, that these boundaries should be considered approximate in nature, since some programmes might require that research extend across these boundaries into adjacent regions. It was recognized that research which is to be conducted in areas under the jurisdiction of coastal states has to be carried out in close cooperation with these states.

III) General Discussions on the Organization of WESTPAC

The Task Team discussed at length various alternatives for the international coordination of WESTPAC. It was concluded that the Commission should establish a subsidiary body to coordinate the programme of research for WESTPAC. The Task Team

felt that this body should be constituted generally as indicated in the statement on "Organization of WESTPAC" (see Annex IV). It was agreed that the subsidiary body for WESTPAC should be assigned specific responsibilities, as outlined in "Proposed Terms of Reference for WESTPAC" (see Annex V).

Various possible titles for the new subsidiary body were discussed. However, the Task Team decided that the Tenth Assembly is better qualified to resolve this question. It was agreed that, to assist the Tenth Assembly on its consideration of WESTPAC, the IOC Secretariat should be asked to prepare draft terms of reference based on those listed in Annex V to this report, and Member States should be invited to include on their Delegations to the Assembly scientists with interest and experience in the Western Pacific region.

IV) Recommendations of the Task Team

The Task Team, in accordance with IOC resolutions EC-VII.16 and EC-VIII.5, recommends that:-

(I) The IOC Tenth Assembly recognize the attached "Outline of Scientific Programmes for WESTPAC" as the basis for future cooperation under this activity,

and

(II) The IOC Tenth Assembly establish a subsidiary body at a relatively high level to coordinate these scientific programmes, based on "Organization of WESTPAC".

The Task Team, in order to facilitate the Tenth Assembly's consideration of WESTPAC, recommends that:-

(III) The IOC Secretariat prepare draft terms of reference for WESTPAC, using as the basis for these the "Proposed Terms of Reference for WESTPAC" adopted by the Task Team, and

(IV) Member States include in their delegations to the Tenth Assembly, scientists with interest and experience in the Western Pacific region.

V) Adoption of the Summary Report and Closure of the Session

The Task Team adopted its report on 30 June. Immediately thereafter Professor Wadati closed the session, thanking the participants for their work. On behalf of the Task Team, Professor Wadati thanked the Government of France and, in particular, the staff of O.R.S.T.O.M. for their hosting of the meeting and their very gracious hospitality.

Ad-hoc Task Team for WESTPAC / IOC

(1st Session, Nouméa, 27~29 June, 1977)

AGENDA

1. Opening of the Session
2. Election of the Chairman
3. Election of the Rapporteur
4. Remarks by IOC Officer
5. Possible programmes in the frame of WESTPAC
6. General Discussions
7. Adoption of the summary report
8. Closure of the Session

Annex II
(WESTPAC)

LIST OF PARTICIPANTS

FRANCE

Mr. Pierre Rual - National Coordinator for CSK, Section Océanographie, O.R.S.T.O.M., BP A5, Nouméa, New Caledonia.

Mr. Jean-René Donguy - Section Océanographie, O.R.S.T.O.M., BP A5, Nouméa, New Caledonia.

Mr. Jean-Claude Leguen - Section Océanographie, O.R.S.T.O.M., BP A5, Nouméa, New Caledonia.

Mr. l'Ingénieur Hydrographe Joël Metéyé - Mission Océanographique du Pacifique, BP 38, Nouméa, New Caledonia.

Mr. Jacques Daniel - Section Géologie-Géophysique, O.R.S.T.O.M., BP A5, Nouméa, New Caledonia.

Mr. Jacques Recy - Section Géologie-Géophysique, O.R.S.T.O.M., BP A5, Nouméa, New Caledonia.

Mr. Christian Hénin - Section Océanographie, O.R.S.T.O.M., BP A5, Nouméa, New Caledonia.

INDONESIA

Mr. Abdul Gani Ilahude - Chief Oceanography Section, National Institute of Oceanology, Komplex Bina Samudera Ancol, Jakarta Utara 580 DAK.

JAPAN

Dr. Kiyoo Wadati - International Coordinator for CSK, National Coordinator for CSK, Japanese National Commission for UNESCO, c/o Ministry of Education, 2-2 Kasumigaseki, 3-chome, Chiyodaku, Tokyo 100.

Professor Noriyuki Nasu - Ocean Research Institute, University of Tokyo, Minamidai, Nakano-ku, Tokyo.

REPUBLIC OF KOREA

Mr. Ki-Young Kim - National Coordinator for CSK, Director, Fisheries Research and Development Agency, Youngdo-gu, Busan 606.

UNION OF SOVIET SOCIALIST REPUBLICS

Dr. Balentin Fedorey - National Coordinator for CSK, Far East Scientific, Meteorological and Hydrological Institute.

Dr. Georgy Baranov - Hydrographical Service, Leninskaya St. 80, Vladivostok.

UNITED STATES OF AMERICA

Mr. Louis P. Brown - Division of Ocean Sciences, National Science Foundation, 1800 G Street, N.W., Washington D.C. 20550.

Dr. Warren White - Scripps Institution of Oceanography, La Jolla, California, 92037.

IOC SECRETARIAT

Dr. Oleg Mamayev - Assistant Secretary, Intergovernmental Oceanographic Commission, UNESCO, Place de Fontenoy, 75700-Paris.

Annex III
(WESTPAC)

OUTLINE OF SCIENTIFIC PROGRAMMES FOR WESTPAC

1. Statement of the Objectives

The ultimate objectives with which WESTPAC is concerned are the predictions or forecast of ocean climate variability and of ocean food resources variability and the improved understanding of geological processes which have economic impact upon the countries comprising the Western Pacific community.

The attainment of the above objectives requires strong emphasis on basic research into (1) the dynamics of ocean circulation; (2) its relation to the distribution of productivity and of ocean food resources; and (3) the geology of the region. This research will have to involve both new projects and the continuation of some projects which are already underway.

Concerning ocean climate variability, emphasis is placed upon the study of the seasonal and secular changes within the general circulation in the upper 1000 m-layer of ocean and its interaction with the overlying atmospheric climate variability. Of importance is as investigation into the way heat and momentum within the ocean are redistributed and how the atmosphere drives the upper layers of the ocean.

Concerning ocean food resource variability, emphasis is placed upon the study of seasonal and secular changes of the productivity of the sea and ocean resources in the upper 1000 m of ocean and their relationship to the ocean climate variability. Of importance is an investigation into the way productivity and ocean food resources are altered in association with changes in the distribution of heat and momentum within the upper ocean.

2. Basic WESTPAC Programmes

A. Physico-chemical structure of the ocean and its dynamics

Studies will be on the time/space climatic variability of the large-scale general circulation in the Western Pacific, with space scales of 100's ~ 1000's of kilometers and time scales greater than 1 month using a number of field programmes that regularly monitor the sea surface temperature and salinity,

the sub-surface temperature field and the surface currents over the entire region.

The Programme will be as follows:

(1) Structure of the upper layer of the ocean with special emphasis on its heat contents and its variability, in connection with atmospheric processes.

(2) The equatorial current system, specifically the Equatorial Undercurrents, and its fluctuation in space and time.

(3) The oceanic circulation in the tropical and sub-tropical regions of the Western Pacific, with specific emphasis on the biologically productive convergence zones.

(4) The Kuroshio System meandering and eddy formation with emphasis on the energy exchange across the Sub-Artic Front of the North-West Pacific.

(5) Deep and Bottom Water formation in the North-West Pacific.

(6) Heat and mass balance and circulation in the basin seas and marginal seas (Sea of Japan, East China Sea, Indonesian Seas, etc.)

B. Marine Ecosystems and Productivity of the Sea

There are two productive zones of interest that have great economic impact upon the countries of the Western Pacific. The first is the open-ocean productive zones where a relationship between marine ecosystems and productivity has been linked to changes in the ocean circulation. The second area is the continental shelves and coastal areas where well known effects between productivity and wind-driven upwelling events exist.

The Programmes will be as follows:

(1) Marine ecosystems and their dynamics in the open-ocean tropical and sub-tropical areas, with special emphasis on the zones of open-ocean upwelling and convergences.

(2) Marine ecosystems and their dynamics on continental shelves.

(3) Marine ecosystems and their dynamics in coral reefs, lagoons, and mangrove areas.

(4) Marine seagrass and seaweeds ecosystems.

(5) Productivity of the sea, with emphasis on the tropical and sub-tropical areas.

C. Evolution of the Western Margin of the Pacific Ocean

The mid-oceanic ridges have been studied extensively during the past several years in the light of the plate tectonics. On the other hand, the plate convergence areas are largely confined to the Western Pacific margins, and their investigations have not been thoroughly carried out because of their complexity. The aim of the proposed studies is to promote the basis researchs on those problems related with the evolution of the marginal areas of the Western Pacific.

The Programmes will be as follows:

(1) Geophysical and geological studies on marginal zones of the oceanic plate.

(2) Studies on evolution in space and time of island arcs and their associated seas.

(3) Drillings on islands.

(4) Pleistocene sedimentation processes in the light of paleocirculation system and paleontological implication.

D. Marine Pollution

It is understood that the matters of marine pollution have been undertaken by the IOC working committee for GIPME.

3. Training, Education and Mutual Assistance

It is recognised that, although the IOC Working Committee for TEMA is involved with TEMA projects of a great nature, it will be essential for the research programmes, identified above to include TEMA components. These TEMA components should be specifically directed at improving the capabilities of the developing countries of the Western Pacific region so that they can more effectively participate in these research programmes.

ORGANIZATION OF WESTPAC

The IOC should establish a subsidiary body for WESTPAC, membership in which should be open to all interested Member States of the Commission. This subsidiary body should meet regularly every one to three years to review and update the scientific objectives of WESTPAC and to provide broad general coordination of the programmes of research. This body should establish sub-groups when necessary, to manage specific programmes of research.

WESTPAC will require the services of one full-time professional staff person and appropriate administrative support. WESTPAC and its sub-groups should work closely with the IOC's other subsidiary bodies, with other UN agencies, and with other interested scientific groups to assure that the WESTPAC programme of research is effectively coordinated with other related activities in the region.

IOC Member States which are interested in participating in WESTPAC should be encouraged to provide extra-budgetary financial resources to stimulate the effective and rapid implementation of the programmes of research.

Proposed Terms of Reference for WESTPAC

The IOC subsidiary body for WESTPAC is to:

(1) Plan and coordinate long-term scientific research programmes necessary to attain its objectives;

(2) Facilitate and expendite the various activities conducted under the programmes of research;

(3) Evaluate and assess the results of the programmes of research as they become available;

(4) Regularly update the programmes of research in the light of the above evaluation and assessment;

(5) Facilitate the exchange of data and ensure dissemination of scientific results;

(6) Assist the participating States in the improvement of their capabilities to effectively participate in the programmes of research;

(7) Coordinate the programmes of research with related activities of interested intergovernmental and other organizations.

USSR PROPOSALS FOR WIDENING EXPEDITIONARY AND SCIENTIFIC RESEARCHES IN THE WESTERN PACIFIC UNDER "WESTPAC", 1977 ~ 1990

The WP programme has to be an organic extension of works on Kuroshio study (CSK - CIK) which were implemented in 1965 ~ 1975. Future works by this programme must be agreed with the approved projects such as CUEA (coastal upwelling), GEOSECS (geochemical study of the ocean) and others. These research projects and the proposed WP programme should be regarded as a part of a total global investigations of the ocean.

Because of specific peculiarities of the West Pacific and adjacent seas, as well as because of their great impact on weather and climate of the continents and economy of bordering countries this programme may be considered as an indipendent one having joined some different programmes, such as NOPMARS (study of out-lying seas of the North Pacific), MEDOB (material exchange and dispersal through the oceanic borders) and MESTA (study of marine ecosystem in tropical regions).

The West Pacific bordering directly the Japan shores and the Kuril Islands is characterized by extreme complexity of space distribution and time variations of oceanological elements. In the first place, it depends on existing hydrological front (subarctic front - Kuroshio front) which is formed in the result of interaction between cold Oyashio subarctic waters, warm subtropical waters transfering by Kuroshio and deep ocean waters, as well as it depends on interaction between the Pacific ocean and the Sea of Japan, the Sea of Okhotsk and the Bering sea through the Sangarskiy, Kurilskiy and Kamchatskiy Straits.

The West Pacific water structure is inhomogeneous and subjected to a relatively abrupt space and time variations. The regions of maximum gradients of oceanological characteristics, variations of intensity, power and position of seasonal and main thermocline, halocline and intermediate ocean layers, complicated water dynamics have undoubtedly their effect upon distribution of various oceanological productivity.

The natural conditions of the West Pacific, the Far East seas and adjacent regions of the Asian continent are also under a great impact of meteorological and hydrological processes developing in atmosphere and West Pacific. For example: change of dry and rainy years, water reserves in the rivers, floods

are the result of complicated interaction "ocean - atmosphere" in subarctic front area and various exchanges between the basic circulation systems by mass, energy and moisture.

The International study on Kuroshio and adjacent regions of the Pacific ocean by the Intergovernmental Oceanographical Committee programme with PAO and WMO cooperation was conducted to the West of 155°E between 43°N and the Equator during 1965 ~ 1970. The works by short programme were prolonged in 1970 ~ 1973.

A wide information was collected in the result of expenditionary works and its processing and analysis allowed to consider various problems of physical oceanology and hydrobiology.

A number of organizations from the USSR Hydrometeorological Service, Academy of Sciences, Ministry of Fishery et al. has cooperated in working out the scientific projects on the West Pacific study. Between the Far East organizations - the Far East Hydrometeorological Research Institute, Tikhookeanskiy Oceanological Institute of the Far East Scientific Centre of the Academy of Sciences of the USSR, the Institute of Fishery and Oceanography, the Far East University, the Hydrographical Service on the Pacific Fleet provided strong support in the West Pacific study.

However, the results of obtained data request the widening and detailing of work scales to collect more exact evaluation of various phenomena and processes developing in the West Pacific atmosphere and waters. Nowadays, the problems of Kuroshio location variations, the regularities of hydrophysical fields formation, the transformation of t-s water structure in the frontal zone are not sufficiently studied, as well as Kuroshio water dynamics. There are no summarizing works on study of the frontal zone as a zone of active "ocean - atmosphere" interaction, as well as the works on Kuroshio meandring and interrelation of Kuroshio variability and currents in the Far East seas.

The recent researches revealed that there are still a number of questions on nature and mechanics of the energy transformations in the system "ocean - atmosphere", in spite of some successful results in long-term hydrometeorological forecasts. It appears, that it is not sufficient to obtain a number of registered phenomena but it is necessary to bring out the inner causes and all mechanism of thermodynamic processes. The questions being stated this way, the results of expenditionary investigations can be a real base for working out and modeling the long-term variations of hydrometeorological phenomena.

A number of questions presented below: variability of the productive zone formation and behavior of some kinds of fishes; interrelation between various geophysical fields and some peculiarities of currents in these regions; dependance of pollutants distribution on Kuroshio system; geological and geographical data on the bottom structure, revealing both the general regularities of earth evolution and the future on mineral raw material should be included to the programme on Kuroshio and adjacent regions study.

Taking into account an economical efficiency, it appears that West Pacific and bordering seas study has to be focused on:

I. Study of Kuroshio nature and its effect upon formation of hydrophysical fields in the ocean and seas.

II. Study of the atmospheric processes and interaction "ocean - atmosphere".

III. Fishing oceanography and study of water structure for a rational utilization of biological resources.

IV. Geological and geophysical investigations.

V. Marine pollution study.

The following suggestions are offered for solution of above problems:

I.1. To study position and structure of Kuroshio front; regularities of the basic parameters variability.

I.2. To study small and large scale variations of t-s water structure, evaluation of processes causing it; to study small-scale turbulence and thin structure of the basic hydrophysical fields.

I.3. To study Kuroshio meandring process, development and destroy of mezoscale vortical formations, effect of large-scale vortical formations upon energy transmission between subtropical and subarctic latitudes.

I.4. To study the process of water transfer and thermal energy transformation in Kuroshio and in the mixing zone caused by dynamic turbulence and convective mixing; to study water and heat exchange of the ocean with the Far East seas through the straits and their effect upon water structure and dynamics of these seas.

I.5. Probability-statistical investigations of Kuroshio region currents from surface to bottom including the inner and

the outlying seas, as well as the regions of underwater heights and ridges; study of interaction and interrelation of the West Pacific system; study of tidal currents, estimation of harmonic constants for tabulation.

I.6. Study of wind waves, Rossby waves and inner waves in the frontal zone, their relation to water dynamics, structure and atmospheric processes.

I.7. Methodical works on comparing the aircosmic and traditional methods for determination of thermal and chemical conditions of the surface waters.

II. Study of the atmospheric processes and interaction "ocean - atmosphere".

II.1. To study the regularities of typhoon origin, development and transfer according to the ocean surface temperature, heat content in water surface layer, marine currents and large-scale circulation of the atmosphere; to work out the numerical models of typhoon formation, development and transfer with regard for variations of environment.

II.2. To study the Far East winter and summer monsoons evolution and vertical structure; to study air exchange between the hemispheres during the different stages of the monsoon circulation; to work out the numerical models of monsoon development.

II.3. To study interaction between the centres of action in the West Pacific and adjacent regions atmosphere.

II.4. To study the regularities of the atmospheric fronts (arctic, polar and intertropical convective zone) formation, dynamics and evolution.

II.5. To study the Aleutian depression structure and regularities of its formation and relation to water circulation; to study deep cyclones in the Aleutian depression.

II.6. To study the Honolulu anticyclone evolution and dynamics, and dismembering of high pressure subtropical zone into independent baric formations.

II.7. To study the processes of transformation of cyclones air masses passing over the ocean surface for working out the calculating and forecasting methods.

II.8. To study the regularities of energy transmission and transformation in the atmospheric boundary layer, to study transmission of energy to the vortexes of various scales.

III. Fishing oceanography and study of water structure for a rational utilization of biological resources.

III.1. Study of long-term and seasonal variability of physical and chemical characteristics of the environment; currents fluctuations and their relation to reproduction and distribution of hydrobionts (environment, primary production, phyto and zooplankton, fishing objects).

III.2. Study of the regularities of formation of high biological productivity regions and concentration of fishing objects in the frontal zones; numerical estimation of the processes having an impact on the oceanic biological productivity and working out the methods of their indication.

III.3. Study of high bioproductivity formation depending on a relief impact on the different structures of currents in the regions with underwater heights and islands archs.

III.4. Study of deep baric formations effect on non-periodic fluctuations of fishing conditions.

III.5. Study of the regularities of development of the basic fishing objects numbers; working out the fishing forecasting methods and recommendations on oceanological data.

III.6. Study of the rate of organic substance development in different seasons in dependence on meteorological and hydrologic conditions; study of primary and bacteriological products.

III.7. Study of phyto and zooplankton as a producer of food reserves; transformation of substance and energy in the pelagic associations (structure, distribution and functions).

III.8. Working out the ecological and mathematical models of ecosystems.

IV. Geological and geophysical investigations.

IV.1. To obtain the new data on bottom measurements and to summarize the West Pacific, the Philippine Sea and the Japan Sea geomorphology data in view of their effect on Kuroshio formation and dynamics.

IV.2. To study bottom precipitations and outputs of the rocks in view of their effect on Kuroshio waters dynamics.

IV.3. To compare the data on thermal flow and the data on Kuroshio water dynamics and structure.

IV.4. To study geological and geophysical structure in Kuroshio and adjacent regions; to reveal the mutual relations between Kuroshio and various geophysical fields (electromagnetic, etc.).

V. Marine pollution study.

V.1. To conduct the hydrochemical background surveys for revealing the most polluted regions of the West Pacific.

V.2. To determine the migration of chemical and toxic combinations coming to the ocean with waste water.

V.3. To study the polluted region and its effect on the basic physical, chemical and biological processes in the marine environment.

V.4. To estimate density of toxical elements and substances in the atmospheric precipitation caused by man technical activity.

V.5. To work out the distance control methods on sea surface pollution.

Expenditionary providing of the WP programme.

The problems to be solved successfully according to the International programme, all the observations obtained previously have to be used and besides, it is necessary to provide systematic natural experiments including background quasisynchronous surveys of the vast aquatoriums for obtaining more detailed knowledge of well-known regularities and processes and to reveal the new ones.

In 1977~1980 the works in the sections should be held twice a year: in summer from July 15 to September 15 at period of maximum water thermal reserves and in winter from January 15 to March 15 at period of minimum water thermal reserves (see a table of the basic benchmark sections).

The surveys time limits (2 summer and 2 winter methods) are due to the fact that the variations of summer warming and winter cooling are minimum and hence, water temperature is more stationary.

The programme of the works in the sections has to comprise:

- the standard oceanographic observations from surface to bottom including complete determination of hydrological and hydrochemical elements and deep currents.
- the 8-terms meteorological observations quickened (every hour) in the hydrological and atmospheric fronts regions.
- actinometric and gradient (in water atmospheric layer) observations;
- upper-air sounding;
- study of primary product and general water productivity;
- water pollution study;
- study of water and atmosphere radioactivity;
- measurement works and special geological and geophysical researches (these works need a special consideration and

coordination with the International programme "Deep-water drilling").

It is reasonable to implement the proposed programme in the following stages (1977~1980, 1981~1985 and 1986~1990) and to make strong efforts for obtaining more exact and comprehensive data on both the scientific and the expenditionary works in the sea, when it is possible.

Study of hydrographical fields will be conducted by means of oceanographic surveys with increased number of hydrological stations in the standard sections.

Study of vertical distribution of temperature, salinity, hydrochemical, biological and physical characteristics will be conducted by measurement in the standard depths by means of serial oceanological devices and continuous sounding. A number of automatic recorders set on autonomous buoys and continuous sounding will be used for study of currents.

In order to work out the calculating theoretical models of various phenomena and processes, they must be approached as far as possible the natural conditions of the West Pacific water basin.

The implementation of this research programme will allow to obtain detailed probability-statistical description of hydrophysical, hydrochemical and geophysical fields, to make up special atlases and charts, to work out the calculating methods of basic oceanological characteristics, to suggest the measures on ocean pollution prevention, etc.

The stations in the sections:

It is necessary to establish the stations in 15 ~ 20 miles distance in the sections between 42° and 33° m.l., in 30 miles distance in the sections across Kuroshio and in 60 miles in the sections located outside of the indicated areas.

Depth of the stations:

1. Depth of suspended stations will be 1500 m. (2000 m., if it is possible).
2. 3 stations will be established in each section to the bottom, if it is possible.

Depth of the observations:

1. The observations at suspended stations will be conducted in the standard depths 0,10,20,30 (or 25 instead of 20 and 30 m.),50,75,100,125,150,175,200,250,300,500,600,700,800,1000, 1200,1500.
2. The additional bottom observations will be conducted in the depths 2000,2500,3000,3500,4000,4500,5000 and the bottom.

Time schedule for the observations:

It is necessary to conduct the observations in all seasons of the year, if it is possible, and simultaneously by the ships of cooperating countries. The ships appearance to the research work area has to be kept within not more than 15 days interval.

Data exchange:

All the meteorological, hydrological, geological, hydrophysical and hydrochemical observational data obtained by the Soviet scientific ships will be sent to Kuroshio data centre (Tokyo) through the World Data Centre for the International data exchange.

Biological observational data will be sent to Regional Marine Biological Centre (Singapore) in accordance with a set form, not later than 3 months after finishing the latest survey.

Works management:

Cooperative works management is sponsored by the International Coordinating Group and within countries-participants by the national coordinators.

IV. AIDE-MEMOIRE OF THE INTERIM STEERING COMMITTEE FOR THE FOURTH CSK SYMPOSIUM, NOUMÉA, NEW CALEDONIA, 4 ~ 5 July 1977

The International Coordination Group (ICG) for CSK, at its Eleventh Meeting held during 30 June ~ 4 July 1977 in Nouméa, discussed the matter of the Fourth CSK Symposium and adopted a Recommendation on this subject (See Summary Report-Rec. 2).

The ICG for CSK also decided to form an Interim Steering Committee for the Fourth CSK Symposium because it felt such a group should start work immediately, rather than wait until the formal Steering Committee is formed by the International Coordinator after consultation with ICC.

The meeting of the Interim Steering Committee was held on July 4 ~ 5, 1977. The list of the participants is attached at the end of this Aide-Memoire.

The Committee approved Recommendation 2 of the ICG. In addition, the following suggestions were made:-

(1) The Symposium should be based upon the fundamental sciences.

(2) The main sessions of the Symposium might deal with:-
(a) physical oceanography;
(b) chemical oceanography;
(c) biological oceanography

and additional sessions should also cover the following inter-disciplinary subjects:-

(d) air-sea interaction;
(e) dynamics of the Kuroshio current;
(f) geochemistry of the waters;
(g) productivity of the sea;
(h) quality of the environment.

(3) In order to plan for future research in the Western Pacific region, the Symposium should also include special sessions on:-

(a) physical, chemical and biological oceanography in those regions which belong to the Western Pacific, but were not covered by the CSK programme;

(b) marine geology and geophysics throughout the WESTPAC region.

The subjects covered by the above sessions should be presented mainly through invited lecturers.

(4) Topics concerning training, education and mutual assistance should also be covered by the Symposium.

(5) Each section of the Symposium should be guided by a chairman. Besides that a scientist should be designated as a special rapporteur of each session to summarize and synthesize its results, in order especially to determine their implications for future WESTPAC research.

(6) At the end of the Symposium, a special session or sessions should be convened to assess the overall results of the CSK and to recommend future research in the WESTPAC region. The keynote papers for these session(s) would be the summaries and syntheses prepared by the special rapporteurs for the earlier sessions. Such special sessions might be convened jointly with following WESTPAC planning activities.

(7) The Steering Committee should receive the manuscripts of all of the invited and contributed papers and should determine which contributed papers should be presented at the Symposium. The Steering Committee may decide to include additional papers in the proceedings and/or in the preprints.

(8) The Steering Committee shall correspond concerning all the questions of preparation of the Symposium with the IOC Secretariat and with National Correspondents designated by the interested countries for this specific task. Until such Correspondents are named, the National Coordinators shall serve as interim contacts.

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V. CRUISE REPORTS (ROSCOP)

ROSCOP (2nd edition)

OCEANOGRAPHY
GENERAL CRUISE INVENTORY

A00
DATA CENTRE: J.O.D.C.
REFERENCE No : R.75044

A - GENERAL INFORMATION ON WORK PERFORMED

A01 Expedition/Project: C S K
Cruise No. or name:

A91 Declared national prog. ? YES ☑ NO ☐ PART ☐
Exchange restricted ? YES ☐ NO ☑ PART ☐

A02 Ship or platform: Takuyo (JDRP)
Platform type: 01

A92 Co-operative programme ? YES ☑ NO ☐ Name: C S K
Co-ordinated internationally? ☑ ☐ By whom? K. Wadati

A03 Country: Japan
A04 Organization: Hydrogr. Dept., MSA(HD,MSA)
A05 Chief scientist(s): I. Noguchi

A06 NAMES AND ADDRESSES OF ORGANIZATIONS AND PERSONS

	Whom to query	Final disposition of data
a	HD, MSA	A HD,MSA
b		B 5-3-1 Tsukiji, Chuo-Ku, Tokyo, Japan
c		C

A07 Date: from: 1,8|1,0|7,5 (DAY MONTH YEAR)
to: 1,6|1,1|7,5

A08 General ocean areas: East China Sea & Philippine Sea
A09 Type(s) of marine zone(s): 06, 07

A10 Geographic area — Latitude ..°..'..'' N/S — Longitude ..°..'..'' E/W
If all data were collected at a fixed station, fill in the co-ordinates

Discipline and type of measurements	Index 10 x 10 Qc	L	G	G	Index 1° x 1°	Discipline and type of measurements	Index 10 x 10 Qc	L	G	G	Index 1° x 1°
HS,HP,HC,P,D,M	1	2	1	2							
	1	3	1	3							

M - METEOROLOGY

	Number	i	I	Format		Number	i	I	Format
M01 Upper air observations					M04 Ice observations				
M02 Incident radiation					M05 Occasional standard measurements	X	a	A	1
M03 Air-sea interface studies					M06 Systematic standard measurements				
					M90 Other measurements				

Remarks

H - HYDROGRAPHY

	HS SURFACE	Number	i	I	Format		NEAR SEA FLOOR (≤ 10 m)	Number	i	I	Format
H01	Continuous temperature recording					H05	Continuous temperature recording				
H02	Continuous salinity recording					H06	Continuous salinity recording				
H03	Discrete temperature measurements	144	a	A	1	H07	Discrete temperature measurements				
H04	Discrete salinity measurements					H08	Discrete salinity measurements				
	HP PHYSICAL						HC CHEMICAL				
H09	Classical oceanographic stations	56	a	A	1	H21	Oxygen	56	a	A	1

H - HYDROGRAPHY (Continued)

	Number	i	l	Format		Number	i	l	Format
H10 Vertical profiles (STD/CTD)					H22 Phosphates	56	a	A	1
H11 sub-surface measurements underway					H23 Total - P				
H12 Mechanical bathythermograph (no. of drops)					H24 Nitrates				
H13 Bathythermograph-expendable (no. of drops)	140	a	A	1,3	H25 Nitrites				
H14 Sound velocity stations					H26 Silicates	56	a	A	1
H15 Acoustic stations					H27 Alkalinity				
H16 Transparency					H28 pH	56	a	A	1
H80 Other measurements					H31 Radioactivity	3	a	A	1

Remarks

P - POLLUTION

P01 Suspended solids					P07 Waste water : BOD				
P02 Heavy metals	20	a	A	1	P08 Waste water : Nitrates				

Remarks

D - DYNAMICS

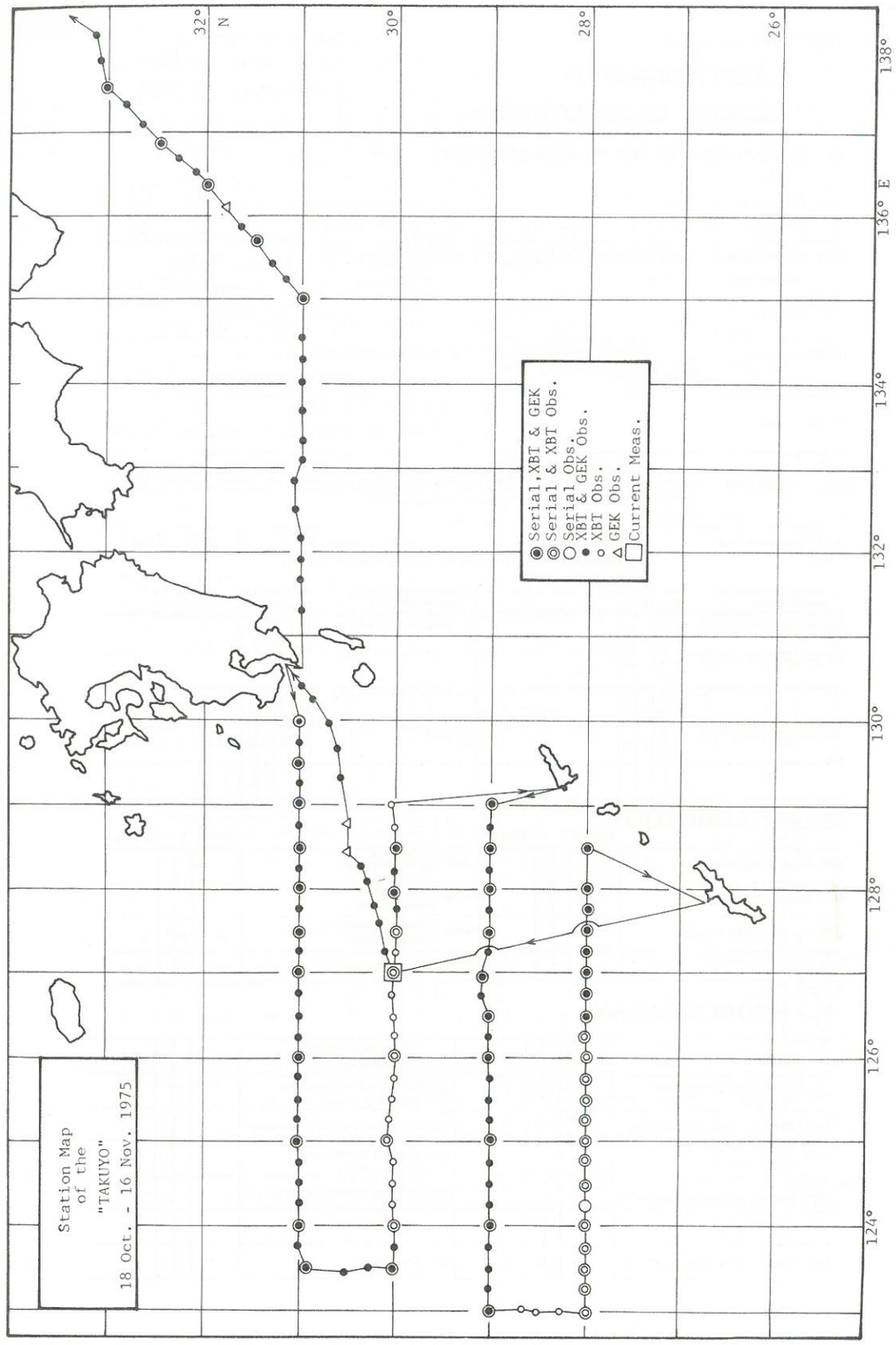
D01 Current meters (no. of stat.)	1	a	A	1	D07 Drift cards (no. released)				
D02 Current meters (average duration of measurement)	3 days	a	A	1	D08 Bottom drifters (no. released)				
D03 Currents measured from ship drift					D09 Tidal observations (duration)				
D04 GEK	107	a	A	1,3	D10 Sea and swell (no. of observations)				
D05 Drifters (number)					D90 Other				
D06 Swallow floats (number)									

B - BIOLOGY

B02 Phytoplankton pigments					B21 Commercial benthic crustacean				
B08 Phytoplankton					B27 Deep scattering layers				
B09 Zooplankton					B28 Acoustical reflections on marine organisms				
B10 Neuston					B29 Biologic sounds				
B11 Nekton					B30 Bioluminescence				
B12 Invertebrate nekton					B31 Vitamin concentrations				
B13 Pelagic eggs and larvae					B32 Aminoacid concentration				
B14 Pelagic fish					B33 Hydrocarbon concentrations				
B18 Zoobenthos					B37 Taggings				

Remarks

B5 TYPES OF STUDIES					B60 Physiology				
B51 Identification					B61 Behaviour				



ROSCOP (2nd edition)

OCEANOGRAPHY

GENERAL CRUISE INVENTORY

A00
DATA CENTRE: J.O.D.C.
REFERENCE No : R.76018

A - GENERAL INFORMATION ON WORK PERFORMED

A01 Expedition/Project: C S K
Cruise No. or name: 76-01

A91 Declared national prog. ? YES ☑ NO ☐ PART ☐
Exchange restricted ? YES ☐ NO ☑ PART ☐

A02 Ship or platform: Ryofu Maru (JGZK)
Platform type: 01

A92 Co-operative programme ? YES ☑ NO ☐ Name: C S K
Co-ordinated internationally? YES ☑ NO ☐ By whom? K. Wadati

A03 Country: Japan

A04 Organization: Marine Dept., JMA(MD,JMA)

A05 Chief scientist(s): Takeo Tsuchida

A06 NAMES AND ADDRESSES OF ORGANIZATIONS AND PERSONS

Whom to query
a MD, JMA
b
c

Final disposition of data
A Marine Dept., Japan Meteorological Agency (MD, JMA)
B 1-3-4 Ohte Machi, Chiyoda Ku, Tokyo
C

A07 Date: from: 1,4|0,1|7,6 (DAY MONTH YEAR)
to: 1,7|0,2|7,6

A08 General ocean areas: NW Pacific, Philippine Sea & East China Sea

A09 Type(s) of marine zone(s): 06, 07

A10 Geographic area — Latitude ..°..'..." N/S — Longitude ...°...'..." E/W

If all data were collected at a fixed station, fill in the co-ordinates

Discipline and type of measurements	Index 10 x 10 Qc	L	G	G	Index 1° x 1°	Discipline and type of measurements	Index 10 x 10 Qc	L	G	G	Index 1° x 1°
M,HS,HP,HC,P,D,B	1	3	1	3		M,HS,HP,HC,P,D,B	3	0	1	3	
M,HS,HP,HC,P,B	1	2	1	3			1	2	1	2	
	1	1	1	3			1	3	1	4	
M,HS,HP,HC,P,D B	1	0	1	3		M,HS	1	3	1	2	

M - METEOROLOGY

	Number	i	I	Format		Number	i	I	Format
M01 Upper air observations					M04 Ice observations				
M02 Incident radiation					M05 Occasional standard measurements				
M03 Air-sea interface studies					M06 Systematic standard measurements	X	a	A	1
					M90 Other measurements				

Remarks

H - HYDROGRAPHY

HS SURFACE	Number	i	I	Format	NEAR SEA FLOOR (≤ 10 m)	Number	i	I	Format
H01 Continuous temperature recording	5500 mile	a	A	3	H05 Continuous temperature recording				
H02 Continuous salinity recording	5500 mile	a	A	3	H06 Continuous salinity recording				
H03 Discrete temperature measurements					H07 Discrete temperature measurements				
H04 Discrete salinity measurements					H08 Discrete salinity measurements				
HP PHYSICAL					HC CHEMICAL				
H09 Classical oceanographic stations	65	a	A	4	H21 Oxygen	65	a	A	4

H - HYDROGRAPHY (Continued)

	Number	i	I	Format		Number	i	I	Format
H10 Vertical profiles (STD/CTD)					H22 Phosphates	56	a	A	4
H11 sub-surface measurements underway					H23 Total - P	14	a	A	4
H12 Mechanical bathythermograph (no. of drops)					H24 Nitrates	14	a	A	4
H13 Bathythermograph-expendable (no. of drops)	95	a	A	3	H25 Nitrites	14	a	A	1
H14 Sound velocity stations					H26 Silicates				
H15 Acoustic stations					H27 Alkalinity				
H16 Transparency	31	a	A	4	H28 pH	14	a	A	4
H80 Other measurements					H30 Trace elements	12	a	A	1
Remarks					H90 Other measurements COD	14	a	A	1

P - POLLUTION

P01 Suspended solids					P07 Waste water : BOD				
P02 Heavy metals	12	a	A	1	P08 Waste water : Nitrates				

Remarks

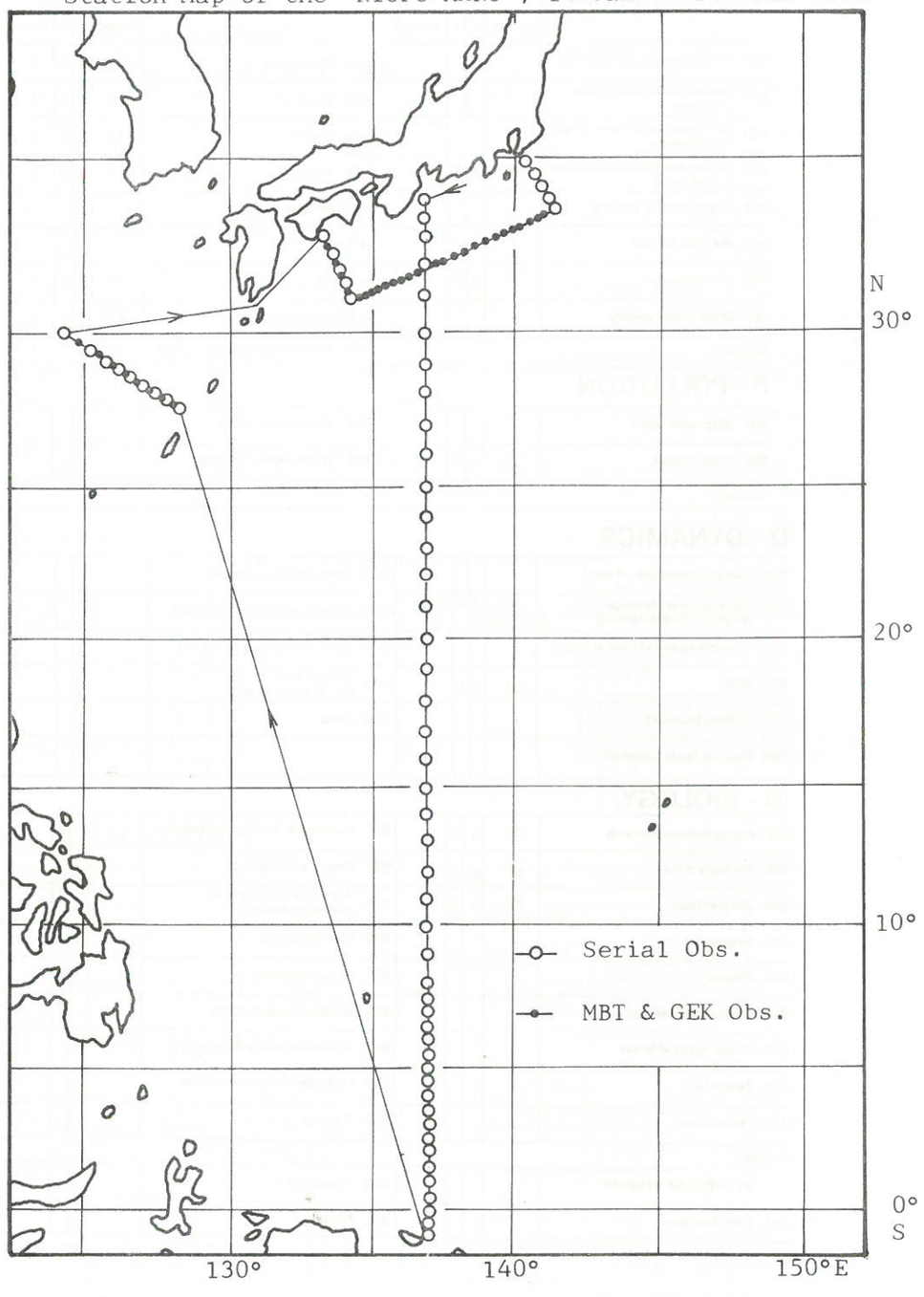
D - DYNAMICS

D01 Current meters (no. of stat.)					D07 Drift cards (no. released)				
D02 Current meters (average duration of measurement)	14 (15min.)	a	A	1	D08 Bottom drifters (no. released)				
D03 Currents measured from ship drift					D09 Tidal observations (duration)				
D04 GEK	45	a	A	1	D10 Sea and swell (no. of observations)				
D05 Drifters (number)					D90 Other				
D06 Swallow floats (number)									

B - BIOLOGY

B02 Phytoplankton pigments	60	a	A	1	B21 Commercial benthic crustacean				
B08 Phytoplankton	60	a	A	1	B27 Deep scattering layers				
B09 Zooplankton	65	a	A	1	B28 Acoustical reflections on marine organisms				
B10 Neuston					B29 Biologic sounds				
B11 Nekton					B30 Bioluminescence				
B12 Invertebrate nekton					B31 Vitamin concentrations				
B13 Pelagic eggs and larvae					B32 Aminoacid concentration				
B14 Pelagic fish					B33 Hydrocarbon concentrations				
B18 Zoobenthos					B37 Taggings				
Remarks									
BS TYPES OF STUDIES					B60 Physiology				
B51 Identification					B61 Behaviour				

Station Map of the "RYOFU MARU", 14 Jan. - 17 Feb. 1976



ROSCOP (2nd edition)

OCEANOGRAPHY

GENERAL CRUISE INVENTORY

A00
DATA CENTRE: J.O.D.C.
REFERENCE No : R.76046

A - GENERAL INFORMATION ON WORK PERFORMED

A01 Expedition/Project: C S K
Cruise No. or name: 76-02

A91 Declared national prog.? YES [✓] NO [ ] PART [ ]
Exchange restricted? [ ] [✓] [ ]

A02 Ship or platform: Kofu Maru (8JNZ)
Platform type: 01

A92 Co-operative programme? YES [✓] NO [ ]
Co-ordinated internationally? [✓] [ ]
Name: C S K
By whom? K. Wadati

A03 Country: Japan

A04 Organization: (HMO) Hakodate Marine Observatory

A05 Chief scientist(s): S. Kuronuma

A06 NAMES AND ADDRESSES OF ORGANIZATIONS AND PERSONS

Whom to query	Final disposition of data
a HMO	A HMO 181 Akagawadoricho, Hakodate, Japan
b MD, JMA	B MD, JMA
c	C

A07 Date: from: 1 0 0 2 7 6 (DAY MONTH YEAR)
to: 2 0 0 3 7 6

A08 General ocean areas: NW Pacific

A09 Type(s) of marine zone(s): 04, 06

A10 Geographic area — Latitude ___ N/S — Longitude ___ E/W

If all data were collected at a fixed station, fill in the co-ordinates

Discipline and type of measurements	Index 10 x 10 Qc	L	G	G	Index 1° x 1°	Discipline and type of measurements	Index 10 x 10 Qc	L	G	G	Index 1° x 1°
M,HS,HP,HC,P,G, D,B	1	4	1	4							
	1	3	1	4							

M - METEOROLOGY

	Number	i	l	Format		Number	i	l	Format
M01 Upper air observations					M04 Ice observations				
M02 Incident radiation					M05 Occasional standard measurements				
M03 Air-sea interface studies					M06 Systematic standard measurements	X	a	A	1
					M90 Other measurements				

Remarks

H - HYDROGRAPHY

HS SURFACE	Number	i	l	Format	NEAR SEA FLOOR (≤ 10 m)	Number	i	l	Format
H01 Continuous temperature recording	X	a	A	3	H05 Continuous temperature recording				
H02 Continuous salinity recording	X	a	A	3	H06 Continuous salinity recording				
H03 Discrete temperature measurements					H07 Discrete temperature measurements				
H04 Discrete salinity measurements					H08 Discrete salinity measurements				
HP PHYSICAL					HC CHEMICAL				
H09 Classical oceanographic stations	23	a	A	1	H21 Oxygen	23	a	A	1

H - HYDROGRAPHY (Continued)

	Number			Format		Number			Format
H10 Vertical profiles (STD/CTD)					H22 Phosphates	23	a	A	1
H11 sub-surface measurements underway					H23 Total - P	23	a	A	1
H12 Mechanical bathythermograph (no. of drops)	62	a	A	8	H24 Nitrates	3	a	A	1
H13 Bathythermograph-expendable (no. of drops)	20	a	A	3	H25 Nitrites	3	a	A	1
H14 Sound velocity stations					H26 Silicates				
H15 Acoustic stations					H27 Alkalinity				
H16 Transparency					H28 pH	3	a	A	1
H80 Other measurements					H31 Radioactivity				

Remarks

P - POLLUTION

P01 Suspended solids					P07 Waste water : BOD				
P02 Heavy metals	2	b	B	1	P08 Waste water : Nitrates				

Remarks

D - DYNAMICS

D01 Current meters (no. of stat.)					D07 Drift cards (no. released)				
D02 Current meters (average duration of measurement)					D08 Bottom drifters (no. released)				
D03 Currents measured from ship drift					D09 Tidal observations (duration)				
D04 GEK	80	a	A	1	D10 Sea and swell (no. of observations)				
D05 Drifters (number)					D90 Other				
D06 Swallow floats (number)									

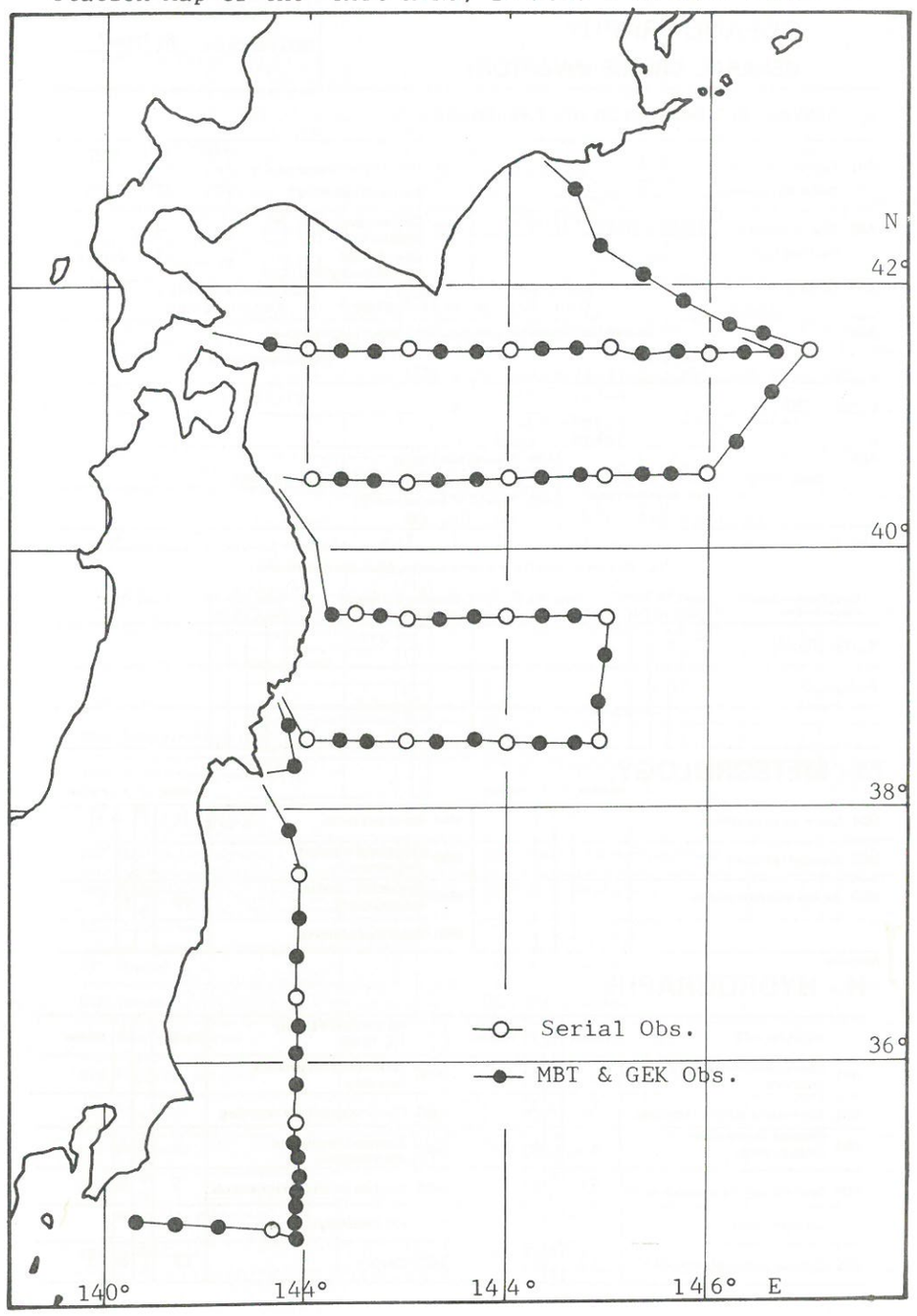
B - BIOLOGY

B02 Phytoplankton pigments	6	a	A	1	B21 Commercial benthic crustacean				
B08 Phytoplankton	6	a	A	1	B27 Deep scattering layers				
B09 Zooplankton	5	a	A	1	B28 Acoustical reflections on marine organisms				
B10 Neuston					B29 Biologic sounds				
B11 Nekton					B30 Bioluminescence				
B12 Invertebrate nekton					B31 Vitamin concentrations				
B13 Pelagic eggs and larvae					B32 Aminoacid concentration				
B14 Pelagic fish					B33 Hydrocarbon concentrations				
B18 Zoobenthos					B37 Taggings				

Remarks

BS TYPES OF STUDIES					B60 Physiology				
B51 Identification					B61 Behaviour				

Station Map of the "KOFU MARU, 10 Feb. - 20 Mar. 1976



ROSCOP (2nd edition)

OCEANOGRAPHY
GENERAL CRUISE INVENTORY

A00
DATA CENTRE: J.O.D.C.
REFERENCE No : R.76042

A - GENERAL INFORMATION ON WORK PERFORMED

A01 Expedition/Project: C S K
Cruise No. or name: 7602

A91 Declared national prog. ? YES [✓] NO [ ] PART [ ]
Exchange restricted ? YES [ ] NO [✓] PART [ ]

A02 Ship or platform: Shumpu Maru (JFDG)
Platform type: 01

A92 Co-operative programme ? YES [✓] NO [ ] Name: C S K
Co-ordinated internationally? [✓] [ ] By whom? K. Wadati

A03 Country: Japan

A04 Organization: (KMO) Kobe Marine Observatory

A05 Chief scientist(s): Kenzo Shuto

A06 NAMES AND ADDRESSES OF ORGANIZATIONS AND PERSONS

Whom to query	Final disposition of data
a KMO 178 Nakayamatedori,Ikutaku, Kobe, Japan	A KMO
b MD, JMA 1-3-4 Otemachi,Chiyoda Ku, Tokyo, Japan	B
c	C

A07 Date (DAY MONTH YEAR): from: 02 02 76 to: 27 02 76

A08 General ocean areas: Inland Sea & Philippine Sea

A09 Type(s) of marine zone(s): 04, 05, 06

A10 Geographic area — Latitude ___ N/S — Longitude ___ E/W

If all data were collected at a fixed station, fill in the co-ordinates

Discipline and type of measurements	Index 10 x 10 Qc	L	G	G	Index 1° x 1°	Discipline and type of measurements	Index 10 x 10 Qc	L	G	G	Index 1° x 1°
M,HS,HP,HC	1	3	1	3							
P,B,G,D	1	2	1	3							

M - METEOROLOGY

	Number	i	I	Format		Number	i	I	Format
M01 Upper air observations					M04 Ice observations				
M02 Incident radiation					M05 Occasional standard measurements				
M03 Air-sea interface studies					M06 Systematic standard measurements	46	a b	A	1
					M90 Other measurements				

Remarks

H - HYDROGRAPHY

	HS SURFACE	Number	i	I	Format		NEAR SEA FLOOR (≤ 10 m)	Number	i	I	Format
H01	Continuous temperature recording	X	a	A	3	H05	Continuous temperature recording				
H02	Continuous salinity recording	X	a	A	3	H06	Continuous salinity recording				
H03	Discrete temperature measurements	85	a b	A	1	H07	Discrete temperature measurements	5	a b	A	1
H04	Discrete salinity measurements	85	a b	A	1	H08	Discrete salinity measurements	5	a b	A	1
	HP PHYSICAL						HC CHEMICAL				
H09	Classical oceanographic stations	13	a b	A	1	H21	Oxygen	13	a b	A	1

H - HYDROGRAPHY (Continued)

		Number	i	I	Format			Number	i	I	Format
H10	Vertical profiles (STD/CTD)					H22	Phosphates	13	a b	A	1
H11	sub-surface measurements underway					H23	Total - P	3	a b	A	1
H12	Mechanical bathythermograph (no. of drops)	39	a b	A	1,8	H24	Nitrates	3	a b	A	1
H13	Bathythermograph-expendable (no. of drops)	12	a b	A	3	H25	Nitrites	13	a b	A	1
H14	Sound velocity stations					H26	Silicates				
H15	Acoustic stations					H27	Alkalinity				
H16	Transparency	7	a b	A	1	H28	pH	8	a b	A	1
H80	Other measurements					H90	Other measurements NH_4-N	3	a b	A	1

Remarks

P - POLLUTION

P01	Suspended solids					P07	Waste water : BOD				
P02	Heavy metals	2	a b	A	1	P08	Waste water : Nitrates				

Remarks

D - DYNAMICS

D01	Current meters (no. of stat.)	1	a b	A	1	D07	Drift cards (no. released)				
D02	Current meters (average duration of measurement)	3 days	a b	A	1.	D08	Bottom drifters (no. released)				
D03	Currents measured from ship drift					D09	Tidal observations (duration)				
D04	GEK	42	a b	A	1	D10	Sea and swell (no. of observations)				
D05	Drifters (number)					D90	Other				
D06	Swallow floats (number)										

*D01; TS-II type 2 current meters
Richardson type 1 current meters

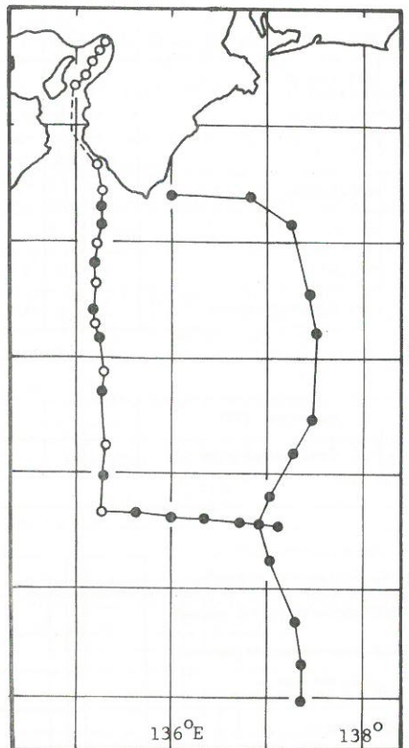
B - BIOLOGY

B02	Phytoplankton pigments	8	a b	A	1	B21	Commercial benthic crustacean				
B08	Phytoplankton	13	a b	A	1	B27	Deep scattering layers				
B09	Zooplankton	13	a b	A	1	B28	Acoustical reflections on marine organisms				
B10	Neuston					B29	Biologic sounds				
B11	Nekton					B30	Bioluminescence				
B12	Invertebrate nekton					B31	Vitamin concentrations				
B13	Pelagic eggs and larvae					B32	Aminoacid concentration				
B14	Pelagic fish					B33	Hydrocarbon concentrations				
B18	Zoobenthos					B37	Taggings				

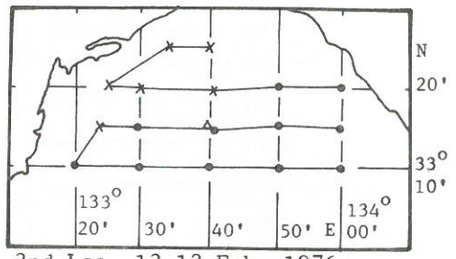
Remarks

	BS TYPES OF STUDIES										
B51	Identification	8	a b	A	1	B60	Physiology				
						B61	Behaviour				

Station Map of the "SHUMPU MARU", 2 - 27 Feb. 1976



1st Leg: 2-7 Feb. 1976

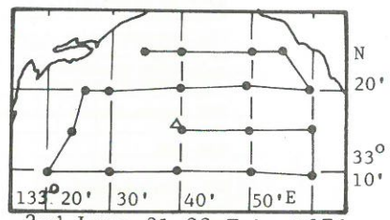


2nd Leg: 12-13 Feb. 1976

—●— GEK Obs.

—×— Surface Obs.

△ Rope-anchored Station



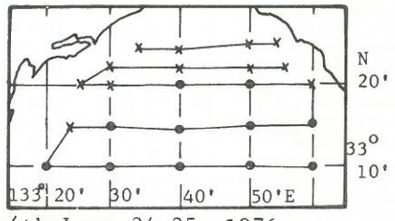
3rd Leg: 21-22 Feb. 1976

—●— MBT Obs.

△ Rope-anchored Station

—○— Serial Obs.

—●— MBT & GEK Obs.
(including XBT Obs.)



4th Leg: 24-25, 1976

—●— GEK Obs.

—×— Surface Obs.

ROSCOP (2nd edition)

OCEANOGRAPHY

GENERAL CRUISE INVENTORY

A00
DATA CENTRE: J.O.D.C.
REFERENCE No : R.76043

A - GENERAL INFORMATION ON WORK PERFORMED

A01 Expedition/Project: C S K
Cruise No. or name: 76-02

A91 Declared national prog.? YES ☑ NO ☐ PART ☐
Exchange restricted? YES ☐ NO ☑ PART ☐

A02 Ship or platform: Chofu Maru (JPQX)
Platform type: 01

A92 Co-operative programme? YES ☑ NO ☐
Co-ordinated internationally? YES ☑ NO ☐
Name: C S K
By whom? K. Wadati

A03 Country: Japan
A04 Organization: (NMO) Nagasaki Marine Observatory
A05 Chief scientist(s):

A06 NAMES AND ADDRESSES OF ORGANIZATIONS AND PERSONS

Whom to query	Final disposition of data
a NMO	A NMO 11-51 Minamiyamate-Machi, Nagasaki, Japan
b	B
c	C

A07 Date: from: 01910217 6 (DAY MONTH YEAR)
to: 21102176

A08 General ocean areas: East China Sea (Tung Hai)
A09 Type(s) of marine zone(s): 07

A10 Geographic area — Latitude ... N/S — Longitude ... E/W
If all data were collected at a fixed station, fill in the co-ordinates

Discipline and type of measurements	Index 10 x 10 Qc	L	G	G	Index 1° x 1°	Discipline and type of measurements	Index 10 x 10 Qc	L	G	G	Index 1° x 1°
M,H,D	1	2	1	2							
	1	3	1	2							

M - METEOROLOGY

		Number	i	I	Format			Number	i	I	Format
M01	Upper air observations					M04	Ice observations				
M02	Incident radiation					M05	Occasional standard measurements				
M03	Air-sea interface studies					M06	Systematic standard measurements	X	a	A	1
						M90	Other measurements				

Remarks

H - HYDROGRAPHY

	HS SURFACE	Number	i	I	Format		NEAR SEA FLOOR (≤ 10 m)	Number	i	I	Format
H01	Continuous temperature recording	X	a	A	3	H05	Continuous temperature recording				
H02	Continuous salinity recording	X	a	A	3	H06	Continuous salinity recording				
H03	Discrete temperature measurements					H07	Discrete temperature measurements	16	a	A	1
H04	Discrete salinity measurements					H08	Discrete salinity measurements	16	a	A	1
	HP PHYSICAL						HC CHEMICAL				
H09	Classical oceanographic stations	23	a	A	1	H21	Oxygen	23	a	A	1

H - HYDROGRAPHY (Continued)

		Number	i	I	Format			Number	i	I	Format
H10	Vertical profiles (STD/CTD)					H22	Phosphates				
H11	sub-surface measurements underway					H23	Total - P				
H12	Mechanical bathythermograph (no. of drops)	42	a	A	8	H24	Nitrates				
H13	Bathythermograph-expendable (no. of drops)	3	a	A	3	H25	Nitrites				
H14	Sound velocity stations					H26	Silicates				
H15	Acoustic stations					H27	Alkalinity				
H16	Transparency	9	a	A	1	H28	pH				
H80	Other measurements					H31	Radioactivity				

Remarks

P - POLLUTION

P01	Suspended solids					P07	Waste water : BOD				
P02	Heavy metals					P08	Waste water : Nitrates				

Remarks

D - DYNAMICS

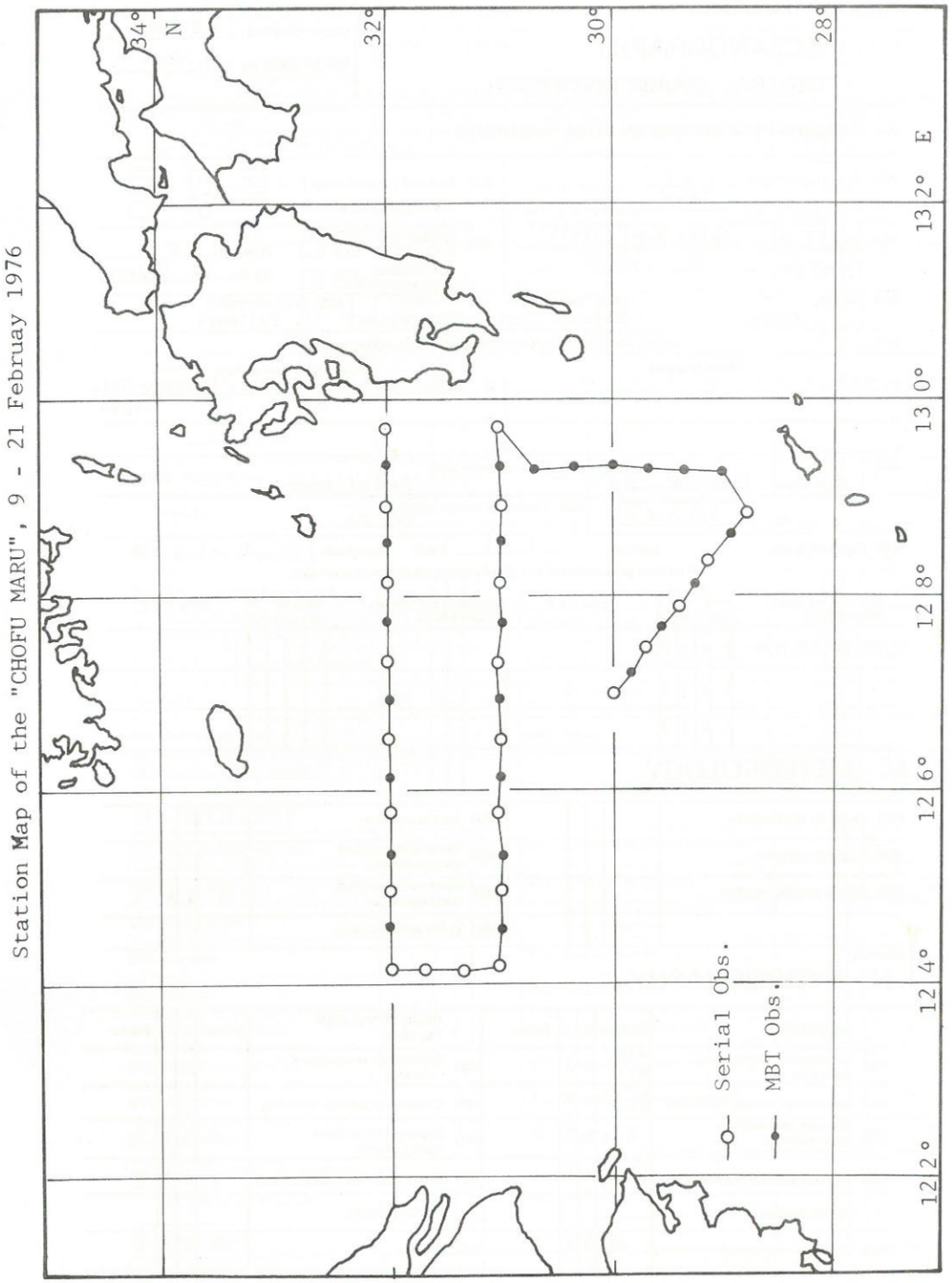
D01	Current meters (no. of stat.)					D07	Drift cards (no. released)				
D02	Current meters (average duration of measurement)					D08	Bottom drifters (no. released)				
D03	Currents measured from ship drift					D09	Tidal observations (duration)				
D04	GEK	29	a	A	1	D10	Sea and swell (no. of observations)				
D05	Drifters (number)					D90	Other				
D06	Swallow floats (number)										

B - BIOLOGY

B02	Phytoplankton pigments					B21	Commercial benthic crustacean				
B08	Phytoplankton					B27	Deep scattering layers				
B09	Zooplankton					B28	Acoustical reflections on marine organisms				
B10	Neuston					B29	Biologic sounds				
B11	Nekton					B30	Bioluminescence				
B12	Invertebrate nekton					B31	Vitamin concentrations				
B13	Pelagic eggs and larvae					B32	Aminoacid concentration				
B14	Pelagic fish					B33	Hydrocarbon concentrations				
B18	Zoobenthos					B37	Taggings				

Remarks

	BS TYPES OF STUDIES					B60	Physiology				
B51	Identification					B61	Behaviour				



ROSCOP (2nd edition)

OCEANOGRAPHY
GENERAL CRUISE INVENTORY

A00
DATA CENTRE: J.O.D.C.
REFERENCE No : R.76041

A - GENERAL INFORMATION ON WORK PERFORMED

A01 Expedition/Project: C S K
Cruise No. or name: 76-01

A91 Declared national prog. ? YES [✓] NO [ ] PART [ ]
Exchange restricted ? YES [ ] NO [✓] PART [ ]

A02 Ship or platform: Seifu Maru (JPVB)
Platform type: 01

A92 Co-operative programme ? YES [✓] NO [ ] Name: C S K
Co-ordinated internationally? YES [✓] NO [ ] By whom? K. Wadati

A03 Country: Japan
A04 Organization: Maizuru Marine Observatory (MMO)
A05 Chief scientist(s): I. Fujiwara

A06 NAMES AND ADDRESSES OF ORGANIZATIONS AND PERSONS

Whom to query
a MMO
b
c

Final disposition of data
A MMO, JMA Shimofukui, Maizuru-Shi, Japan
B
C

A07 Date : from: 10 10 2 76 (DAY MONTH YEAR)
to: 15 10 3 76

A08 General ocean areas: Sea of Japan
A09 Type(s) of marine zone(s): 04, 06

A10 Geographic area — Latitude ___ ° ___ ' N/S — Longitude ___ ° ___ ' E/W
If all data were collected at a fixed station, fill in the co-ordinates

Discipline and type of measurements	Index 10 x 10 Qc	L	G	G	Index 1° x 1°	Discipline and type of measurements	Index 10 x 10 Qc	L	G	G	Index 1° x 1°
M,HS,HP,HC,D,B	1	3	1	2							
	1	3	1	3							
	1	4	1	3							

M - METEOROLOGY

	Number	i	I	Format		Number	i	I	Format
M01 Upper air observations					M04 Ice observations				
M02 Incident radiation					M05 Occasional standard measurements				
M03 Air-sea interface studies					M06 Systematic standard measurements	X	a	A	1
					M90 Other measurements				

Remarks

H - HYDROGRAPHY

HS SURFACE	Number	i	I	Format	NEAR SEA FLOOR (≤ 10 m)	Number	i	I	Format
H01 Continuous temperature recording	4300 mile	a	A	3	H05 Continuous temperature recording				
H02 Continuous salinity recording	4300 mile	a	A	3	H06 Continuous salinity recording				
H03 Discrete temperature measurements	X	a	A	1	H07 Discrete temperature measurements	4	a	A	1
H04 Discrete salinity measurements	X	a	A	1	H08 Discrete salinity measurements	3	a	A	1
HP PHYSICAL					HC CHEMICAL				
H09 Classical oceanographic stations	48	a	A	1	H21 Oxygen	48	a	A	1

H - HYDROGRAPHY (Continued)

	Number	i	I	Format		Number	i	I	Format
H10 Vertical profiles (STD/CTD)					H22 Phosphates	21	a	A	1
H11 sub-surface measurements underway					H23 Total - P	3	a	A	1
H12 Mechanical bathythermograph (no. of drops)	89	a	A	8	H24 Nitrates	3	a	A	1
H13 Bathythermograph-expendable (no. of drops)	13	a	A	8	H25 Nitrites	3	a	A	1
H14 Sound velocity stations					H26 Silicates				
H15 Acoustic stations					H27 Alkalinity				
H16 Transparency	18	a	A	1	H28 pH	3	a	A	1
H80 Other measurements					H31 Radioactivity				

Remarks

P - POLLUTION

P01 Suspended solids					P07 Waste water : BOD				
P02 Heavy metals					P08 Waste water : Nitrates				

Remarks

D - DYNAMICS

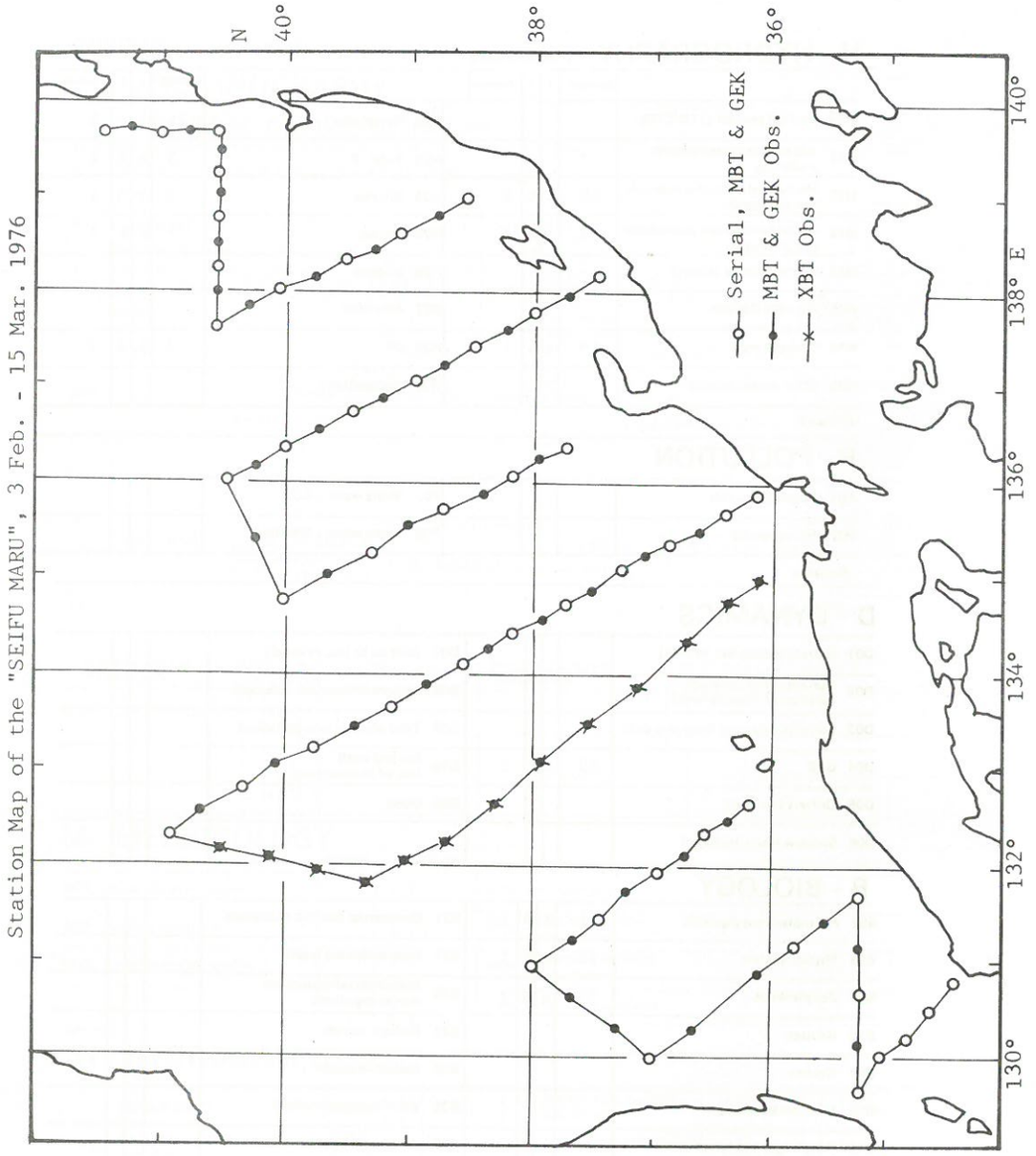
D01 Current meters (no. of stat.)					D07 Drift cards (no. released)				
D02 Current meters (average duration of measurement)					D08 Bottom drifters (no. released)				
D03 Currents measured from ship drift					D09 Tidal observations (duration)				
D04 GEK	89	a	A	1	D10 Sea and swell (no. of observations)				
D05 Drifters (number)					D90 Other				
D06 Swallow floats (number)									

B - BIOLOGY

B02 Phytoplankton pigments	11	a	A	1	B21 Commercial benthic crustacean				
B08 Phytoplankton	11	a	A	1	B27 Deep scattering layers				
B09 Zooplankton	11	a	A	1	B28 Acoustical reflections on marine organisms				
B10 Neuston					B29 Biologic sounds				
B11 Nekton					B30 Bioluminescence				
B12 Invertebrate nekton					B31 Vitamin concentrations				
B13 Pelagic eggs and larvae					B32 Aminoacid concentration				
B14 Pelagic fish					B33 Hydrocarbon concentrations				
B18 Zoobenthos					B37 Taggings				

Remarks Norpac Standard Net

BS TYPES OF STUDIES					B60 Physiology				
B51 Identification					B61 Behaviour				



Station Map of the "SEIFU MARU", 3 Feb. - 15 Mar. 1976

ROSCOP (2nd edition)

OCEANOGRAPHY
GENERAL CRUISE INVENTORY

A00
DATA CENTRE: J.O.D.C.
REFERENCE No : R.76045

A - GENERAL INFORMATION ON WORK PERFORMED

A01 Expedition/Project: C S K
Cruise No. or name: Current Measurement-11th

A02 Ship or platform: Shoyo (JCOD)
Platform type: 01

A91 Declared national prog.? YES ☑ NO ☐ PART ☐
Exchange restricted? YES ☐ NO ☑ PART ☐

A92 Co-operative programme? YES ☑ NO ☐ Name: C S K
Co-ordinated internationally? YES ☑ NO ☐ By whom? K. Wadati

A03 Country: Japan

A04 Organization: Hydrogra.Dept., MSA(HD,MSA)

A05 Chief scientist(s): G. Ueno

A06 NAMES AND ADDRESSES OF ORGANIZATIONS AND PERSONS

Whom to query
a HD, MSA
b
c

Final disposition of data
A HD, MSA 5-3-1 Tsukiji, Chuo-Ku, Tokyo, Japan
B
C

A07 Date: from: 10 03 76 (DAY MONTH YEAR)
to: 24 03 76

A08 General ocean areas: Philippine Sea

A09 Type(s) of marine zone(s): 06

A10 Geographic area — Latitude ... N/S — Longitude ... E/W
If all data were collected at a fixed station, fill in the co-ordinates

Discipline and type of measurements	Index 10 x 10 Oc	L	G	G	Index 1° x 1°	Discipline and type of measurements	Index 10 x 10 Oc	L	G	G	Index 1° x 1°
M,HS,HP,HC,D	1	3	1	3							

M - METEOROLOGY

	Number	i	I	Format		Number	i	I	Format
M01 Upper air observations					M04 Ice observations				
M02 Incident radiation					M05 Occasional standard measurements	X	a	A	1
M03 Air-sea interface studies					M06 Systematic standard measurements				
					M90 Other measurements				

Remarks

H - HYDROGRAPHY

HS SURFACE	Number	i	I	Format	NEAR SEA FLOOR (⩽ 10 m)	Number	i	I	Format
H01 Continuous temperature recording					H05 Continuous temperature recording				
H02 Continuous salinity recording					H06 Continuous salinity recording				
H03 Discrete temperature measurements	73	a	A	1	H07 Discrete temperature measurements				
H04 Discrete salinity measurements					H08 Discrete salinity measurements				
HP PHYSICAL					HC CHEMICAL				
H09 Classical oceanographic stations	18	a	A	1	H21 Oxygen	18	a	A	1

H - HYDROGRAPHY (Continued)

		Number	i	I	Format			Number	i	I	Format
H10	Vertical profiles (STD/CTD)					H22	Phosphates	18	a	A	1
H11	sub-surface measurements underway					H23	Total - P				
H12	Mechanical bathythermograph (no. of drops)	51	a	A	1,8	H24	Nitrates				
H13	Bathythermograph-expendable (no. of drops)	6	a	A	1,3	H25	Nitrites				
H14	Sound velocity stations					H26	Silicates	18	a	A	1
H15	Acoustic stations					H27	Alkalinity				
H16	Transparency					H28	pH	18	a	A	1
H80	Other measurements					H31	Radioactivity				

Remarks

P - POLLUTION

P01	Suspended solids					P07	Waste water : BOD				
P02	Heavy metals					P08	Waste water : Nitrates				

Remarks

D - DYNAMICS

D01	Current meters (no. of stat.)					D07	Drift cards (no. released)				
D02	Current meters (average duration of measurement)					D08	Bottom drifters (no. released)				
D03	Currents measured from ship drift					D09	Tidal observations (duration)				
D04	GEK	73	a	A	1	D10	Sea and swell (no. of observations)				
D05	Drifters (number)					D90	Other				
D06	Swallow floats (number)										

B - BIOLOGY

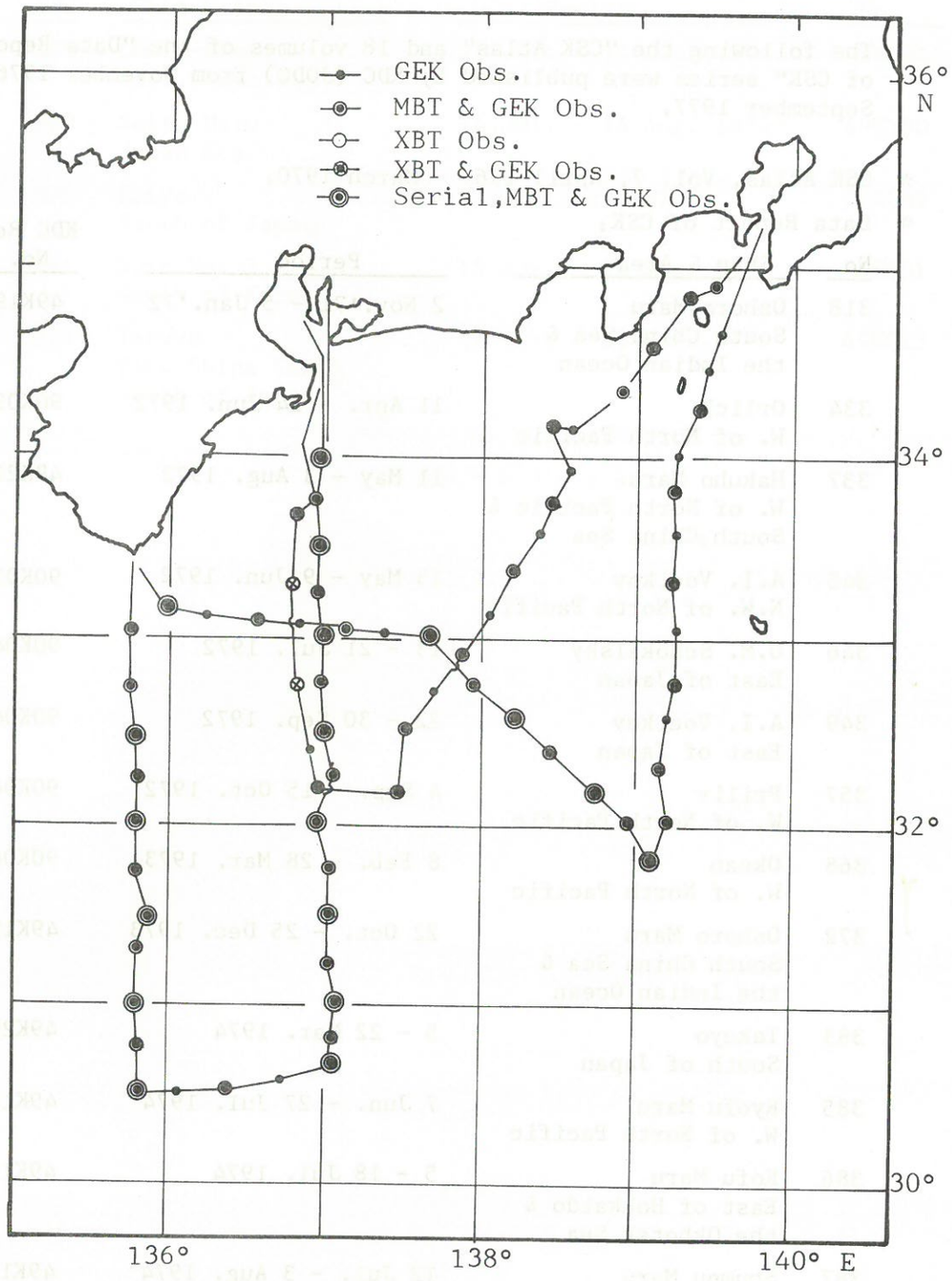
B02	Phytoplankton pigments					B21	Commercial benthic crustacean				
B08	Phytoplankton					B27	Deep scattering layers				
B09	Zooplankton					B28	Acoustical reflections on marine organisms				
B10	Neuston					B29	Biologic sounds				
B11	Nekton					B30	Bioluminescence				
B12	Invertebrate nekton					B31	Vitamin concentrations				
B13	Pelagic eggs and larvae					B32	Aminoacid concentration				
B14	Pelagic fish					B33	Hydrocarbon concentrations				
B18	Zoobenthos					B37	Taggings				

Remarks

	BS TYPES OF STUDIES					B60	Physiology				
B51	Identification					B61	Behaviour				

* Data Format: 1. manuscript or publication, 2. automatic printing
3. graph recording, 4. punched card, 5. punched tape
6. analogue recording on magnetic tape
7. digital recording on magnetic tape
8. photograph, 9. samples, 0. other or unspecified

Station Map of the "SHOYO", 10 - 24 March 1976



VI. PUBLICATIONS

The following the "CSK Atlas" and 18 volumes of the "Data Report of CSK" series were published by KDC (JODC) from November 1976 to September 1977.

* CSK Atlas, Vol. 7, April 1969 - March 1970.

* Data Report of CSK:

No.	Ship & Area	Period	KDC Ref. No.
318	Oshoro Maru South China Sea & the Indian Ocean	2 Nov.'71 - 5 Jan.'72	49K198
334	Orlick W. of North Pacific	11 Apr. - 24 Jun. 1972	90K037
337	Hakuho Maru W. of North Pacific & South China Sea	11 May - 3 Aug. 1972	49K214
345	A.I. Voeikov N.W. of North Pacific	15 May - 9 Jun. 1972	90K039
346	U.M. Schokalsky East of Japan	13 - 21 Jul. 1972	90K040
349	A.I. Voeikov East of Japan	22 - 30 Sep. 1972	90K046
357	Priliv W. of North Pacific	4 Sep. - 15 Oct. 1972	90K048
368	Okean W. of North Pacific	8 Feb. - 28 Mar. 1973	90K047
372	Oshoro Maru South China Sea & the Indian Ocean	22 Oct. - 25 Dec. 1973	49K199
383	Takuyo South of Japan	5 - 22 Mar. 1974	49K206
385	Ryofu Maru W. of North Pacific	7 Jun. - 27 Jul. 1974	49K183
386	Kofu Maru East of Hokkaido & the Okhotsk Sea	5 - 18 Jul. 1974	49K192
387	Shumpu Maru Osaka Bay, the Kii Channel & South of Japan	12 Jul. - 3 Aug. 1974	49K194

No.	Ship & Area	Period	KDC Ref. No.
388	Chofu Maru East China Sea	21 Jul. - 14 Aug. 1974	49K184
389	Seifu Maru Japan Sea	16 Jul. - 14 Aug. 1974	49K190
390	Kaiyo South of Japan	9 - 30 Aug. 1974	49K189
391	Suro No. 3 South of Korea	15 Aug. - 28 Sep. 1974	24K051
394	Takuyo East China Sea & South of Japan	28 Oct. - 26 Nov. 1974	49K213

* * * * * * * * * * * * * *

VII. DATA RECEIVED

Catalogue of Data Received by KDC (JODC), 1 February - 30 September 1977

Mo.Day/Yr.	KDC Ref. No.	Ship Code*	Agency	Period	Area	No. of Stas.	Serial	BTs	Currents	Bottom Topography	Biological
	JAPAN										
04.13/77	49K223	RY	MDJMA	06.11-08.09,1976	W. of Pacific	106	T S O P TP N2 N3 NH PH COD	106	33	D	Phaeo. Chl.a
04.13/77	49K224	RY	MDJMA	01.14-02.21,1977	W. of Pacific	62	T S O P N2 N3 NH PH COD	101	45	D	
04.28/77	49K225	CH	NNOJMA	01.21-02.20,1977	East China Sea	55	T S O P TP N2 N3 NH PH COD	101	59	D	Phaeo. Chl.a
04.28/77	49K226	SI	MMOJMA	02.03-03.15,1977	Japan Sea	32	T S O P TP N2 N3 NH PH COD	82	79	D	Phaeo. Chl.a
04.28/77	49K227	SH	KMOJMA	07.02-07.28,1976	South of Japan	30	T S O P TP N2 N3 NH PH COD	76	75	D	Phaeo. Chl.a
04.28/77	49K228	KO	HMOJMA	08.04-08.30,1976	East of Japan	31	T S O P			D	
05.25/77	49K229	YY	HDMSA	03.09-03.23,1977	South of Japan	24	T S O P Si PH			D	
08.30/77	49K230	CH	NMOJMA	01.28-02.27,1975	East China Sea	38	T S O P TP N2 N3			D	Phaeo. Chl.a
	USSR										
08.30/77	90K056	PL	TINRO	04.20-06.29,1976	N.W. of Pacific	182	T S O P N2 Si			D	

JAPAN

Ship Code* RY Ryofu Maru
CH Chofu Maru
SI Seifu Maru
SH Shumpu Maru
KO Kofu Maru
YY Shoyo

U.S.S.R.

PL Pelamida