FRENCH - INDONESIAN COOPERATIVE INVESTIGATION IN PHYSICAL OCEANOGRAPHY

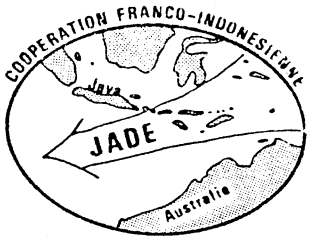
JADE 93 CRUISE

on board the

"BARUNA JAYA - I"

22 April - 9 May 1993

CRUISE REPORT



Michèle FIEUX
LODYC

on board R/V Baruna Jaya I
8 May 1993

OBJECTIVES OF THE CRUISE

The JADE 93 cruise is carried out under the "Arrangement between the Government of the Republic of France and the Government of the Republic of Indonesia on Scientific and Technological Cooperation" signed in Jakarta on July 13th,1988, extended for three years from July 13th,1991.

The JADE 93 cruise on board the "Baruna Jaya I" is the fourth JADE program cruise. The first cruise was carried out in August 1989 on board the "Marion Dufresne", followed by JADE 90 on board the "Baruna Jaya I" in september 1990 and by JADE 92 on board the "Marion Dufresne" and the "Baruna Jaya I" in February - March 1992.

The overall objectives of the JADE (Java Australia Dynamic Experiment) programme is the study of the throughflow between the Pacific ocean and the Indian ocean and its variability. For that purpose, two currentmeters moorings and two pressure gauge moorings were launched in the Timor channel last year during the JADE 92 cruise. The JADE 93 specific objectives were, first, to retrieve the moorings and second to carry out CTD stations in the channels connecting the Banda sea and the Indian ocean, particularly in the Timor channel and in the Sawu sea.

SUMMARY OF THE CRUISE

The "Baruna Jaya 1" left Jakarta on the 22nd of April 1993 at 10.30. The LIPI and BPPT teams, with Franck Miraux, embarked in Jakarta. The equipment sent from France for the cruise had been embarked there. Dr. A.Gani Ilahude (co-chief scientist) and six french scientists, Michèle Fieux (co-chief scientist), Robert Molcard, Maurice Amaudric Du Chaffaut, Claire Lévy, Jacky Lanoisellé (from LODYC) and Claudie Bournot (from the technical division of INSU), joined the ship in Banyuwangi on the 25th of April. We left Banyuwangi at 5.00 on the same day towards mooring M1 (Figure 1) to start with the retrieval work .

Retrieval of the moorings

We arrived in the Timor channel, at the position of mooring M1, at 19.45 on the 27th of April. The engine was completely stopped to listen to the mooring release. Thanks to the GPS (which gives an accurate position) and to distances got in interrogating the acoustic release with its control unit, the mooring was located. We stopped the listening till the early morning to preserve the batteries. The drift was 1.5 knot to the west. At 5.00, one hour before the sunrise, on the 28th of April, we started the second listening. The drift then was 1.1 knot to the SSW and we confirmed the position found the day before (11°15'59"S - 122°54'30"E) which was

slightly different from the launching position (11°15'52"S - 122°54'40"E)(Figure 3). Then we went upstream to drift slightly south of the mooring in order not to drift on it when we will trigger it and not to have the buoys on the side of the rising sun. The upper buoy of the mooring came at the surface at 6.30 at 50m from the ship on the bow port side as predicted. The rubber boat was launched to tie a rope on the upper buoy and the mooring was retrieved with the use of the A-frame and the winch. At 9.10, the first 8 instruments were on board and we discovered that the cable was cut between an orange float and the Mors currentmeter n°488 (Figure 2). We came back towards the supposed drift of the mooring and found the 4 yellow Benthos floats to which we sent the rubber boat and got it back on board at 9.50. The release was still attached to them but the currentmeter was missing. The parafil cable had been cut most probably when the mooring came up tangled.

We then steamed towards mooring M3 which was composed of only one instrument : a release-pressure gauge as mooring M4. M3 was launched in 140m depth at 11°02'26"S-122°55'59"E, on the northern side of the Timor channel. We start the first listening at 12.30 and made 4 passages, the last one just over the mooring, but nothing surfaced, although the release answered "executed". It seems that the release had been obstructed perhaps by barnacles which have grown over for one year or perhaps because the release did not stand vertical on the rough coral bottom. It was too late to start dragging on that day, so we steamed towards mooring M2.

We arrived on mooring M2 at 19.45 and started the first listening of the release, without stopping completely the engine this time, only the propeller. The release answered correctly and the distances were coherent, so we stopped the interrogation at 20.19. The drift was towards the SW. During the night, before the interrogations, the drift was still 1 knot towards the SW. The next morning, on the 29th of April, at 5.00, one hour before sunrise, we started again the interrogations. The first passage gave a position of the mooring (11°24'50"S-122°58'48"E) a little south of the launching position (11°24'43"S-122°58'52"E)(Figure 4). It was still a little too dark when we were close to the mooring, so we moved 600m upstream in order to drift slightly south of the mooring as for mooring M1. At the second passage we triggered the release when we were between the mooring and the sun. At 6.18, the upper buoy reached the surface at 100m from the ship on the front starboard side as predicted. The last yellow buoys arrived at the surface at 6.29. The rubber boat was sent to grasp a rope on the upper buoy and the retrieving went on smoothly, while the rubber boat was watching the end of the mooring, in case it would drift apart like the day before. At 8.30 all the instruments of mooring M2 were on board.

We steamed towards mooring M4 (similar to mooring M3) launched on the southern side of the Timor channel, in 225m depth, at 11°45'04"S-

123°15'48"E (Figure 1). We arrived near the mooring at 11.00 and started the first listening which gave the actual position (11°45'08"S-123°15'52") 200m in the SE of the launching position. We made 3 passages, the last one just over the mooring and triggered the release many times which answered executed, but the mooring would not move from the bottom. We decided to drag for it with the heavy cable installed on the winch at the rear, equipped with 100 kgs weight at its end. We started at 14.00 the first dragging and tried a second one at 16.33 (Figure 5) without success. It seems that the problems to recover the shallow moorings are similar: the releases are either stuck in barnacles which have grown around the release clutch or the releases are not vertical enough to release the weight.

When the dragging cable was back on board, ready to start the CTD section across the Timor channel, the CTD was not giving any signal (although it was working the day before). So, we steamed back towards the M3 mooring.

On the 30th of April, we made another listening between 5.51 and 6.22 to confirm the position of the mooring, while the connection between the CTD cable and the CTD was soldered again and the ground wire interchanged (white is the ground). The drift was 0.5 knot westward (Figure 7). Then we started to drag at 7.47, turning twice around the mooring, the dragging was over at 9.51 without success. We listened to the release again to be sure that it had not moved, it was still at the same position stuck on the bottom. In the case of moorings M3 and M4 which are very short above the bottom (3m, including the instrument and the floats) the success in getting them back by dragging with a cable has very little chance.

At that time it became impossible to make the whole CTD program and the CTD was still under repair. So we decided to steam towards Ombi strait between east Alor and Timor and concentrate on this area.

During the transit, the data of the ADCP 514 (Acoustic Doppler Current Profiler) from the mooring M2 were extracted on the portable computer(PC). The 5 Aanderaa currentmeter recorded magnetic tapes were read with the special reader, transferred to a PC, and put on diskettes. Since the beginning of the cruise, we were working on the transformation of the acquisition program of the CTD data on a HP 9000 computer to a PC, in order to enable our Indonesian collegues to work on the PC they have at their laboratory, but it was not possible to install because the connecting cable was not available on board. We have brought, from France, another HP CTD data acquisition program and its transformation program to a PC, but tentatives to run it on the HP were unsuccessful .

CTD sections

The CTD work started on the easternmost section between Timor and east Alor, in the narrowest part of 15 miles width. We arrived at station 1 at

15.00 on the 1st of May. The depth was changing very quickly, from 1000m to 650m. We recorded the bathymetry while crossing the channel in order to get the shape of the strait which will be useful when computing the transports across. Six CTD stations were done between Timor and east Alor (Figure 1) with 12 samplings, for salinity, oxygen, nitrate, phosphate and silicate measurements, at each cast which went down most of the time to 1000db, but the ends stations 1 and 6 where the bottom was shallower (see the list of the stations). The section was finished at 23.19 Then repeated casts (without sampling to gain time) were made at the location of stations 2 and 5, six times (stations 7 to 18); it was finished at 19.40 on the 2nd of May. There was no salinity data on station 7. A repeated complete section (with samplings) was carried out again from Timor to east Alor (stations 19 to 24). We moved westward to a second section into the Sawu sea, between west Alor and Timor (Figure 1) that we started at 7.00 on the 3rd of May: stations 25 to 30. A third section westwards was started at 19.40 on the 3rd of May, between Batek island on the coast of Timor and Kawula, west of Alor strait. Most of the stations reached 1000db depending on the depth, but stations 32 and 33, in the deep part of the section, were done down to 3000db with two casts (0-300db and 0-3000db) to get the characteristics of the deep water in the Sawu basin. Unfortunately, the data of station 34 were lost on the computer, we have only the 12 sampling data. The last station 36 was finished at 12.35 on the 4th of May. To return to Jakarta we went through the beautiful Alor strait. The CTD stations were done quickly and carefully by the well organized Indonesian team (Praditya and Agustin were responsible for the two CTD watches). The oxygen measurements were carried out right after the station in the wet lab. The salinity and nutrients measurements were done in the stabilized temperature container with a Beckman salinometer associated with normal water calibrations and a technicon chain respectively, under the lead of Mardanis.

During the CTD work, the currentmeter data were retrieved from the instruments and copied on a PC and on diskettes. On the 1st of May, while transfering data from the second ADCP, nearly at the end, after more than two hours and a half, a battery exploded inside the ADCP destroying the inside and blowing an aching gas in the wet laboratory where it was processed. It was the first time we are aware of such an incident and we will inform as soon as possible the manufacturer in order to avoid such an incident in the future. The currentmeters were put back in their boxes (that we had transferred on board during the JADE 92 cruise from the Marion Dufresne) on the 4th of May.

Copies of the currentmeter data and processing programs were made to give to our Indonesian collegues. Copies of the CTD data were done to transform them in a PC readable format in France and send them back to our collegues afterwards.

After the end of the work at sea, we explained the mooring technology to the interested participants: how to design a mooring, how to calculate the buoyancy, how to retrieve it, how to interrogate and trigger a release. A copy of the program to compute the tensions along the cable has been given.

Summary of the retrieval problems : the two pressure gauges n°489 and 490 did not come up and the Mors currentmeter n° 488, which was at 1750m on mooring M1, was lost on the bottom during the retrieval.

Summary of the data retrieval problems : the Mors currentmeter n° 478 at 270m on mooring M1 had a broken rotor and did not record the pressure, the Mors currentmeter n° 476 at 670m on mooring M2 was on off since the launching, the Aanderaa currentmeter n° 5813 at 1575m on mooring M1 seemed to have developed a leak on the bottom and the records apparently stopped two months after the deployment, one battery of the ADCP n°531 at 250m on mooring M1 exploded during the retrieval of the data, so, for the moment we have only 11 months of data. We hope to get the missing data from the memory boards which have been extracted from the intrument after the explosion and which do not seem to be destroyed. They will be sent back to the manufacturer for data to be extracted.

SOME PRELIMINARY RESULTS

Currentmeter data

The ADCP moorings seem to have not oscillated more than 60 m in the vertical, from a first look at the data. They oscillated with the tidal frequency . The depth oscillations had been recorded by the pressure sensor on each Mors currentmeter. An example of the data from the ADCP is given on Figure 8a. Comparison of current speed components from the ADCP and from the Mors currentmeter just below shows good coherence (Figures 8b and 9).

CTD data

1) Timor-East Alor section

The salinity decreases between the surface (32.5 <S<33) and 100m where it reaches around 34.5. It is only very close to the coast of Alor (st.6) that the salinity lower than 34.5 reaches 150m. Below 100m down to the bottom the salinity values are very close. It is particularly steady below 500m (Figure 10). The temperature profiles show a mixed layer down to 40m only on the Timor side (st.19), the thermocline is sharper on the Timor side than on the Alor side (st.24) (Figure 11). The repeated stations at the

location of station 2 show a large variability down to 100m and a smaller variability between 100m and 450m (Figure 12); below 450m, salinity and temperature are very steady. From 450m to the bottom, the salinity varies only between 34.55 and 34.61, and the temperature decreases steadily. On the northern side of the strait, at the location of station 5, the variability reaches 180m instead of 100m in the south of the strait (Figure 13).

Section Timor-West Alor

The low salinity water reaches more than 200m in the northern part of the section while it reaches only 100m in the south near Timor. Below, between 350m and 500m there is a slight increase in salinity (Figure 14) which could correspond to the influence of the northwest Indian ocean water which was seen entering the Sawu sea through the Sumba channel last year.

Section Timor-Kawula

The station 36 close to Kawula has a very shallow low salinity layer (around 20m) contrary to the station 31 in the south (around 90m). The salinity decrease in the surface layer is not steady like in the east Alor-Timor section. The temperature-salinity diagrams show higher variability in the water masses characteristics at intermediate depths, between 200m and 500m, than in the sections eastward (Figures 15 and 16).

The sections have been drawn by our Indonesian collegues and the salinity sections are shown on Figures 17 and 18.

CONCLUSION

The JADE 93 cruise, despite the loss of three instruments, was quite successful. We retrieved 17 instruments out of 20 launched last year and particularly the two most important ones, the ADCPs which will give continuous current measurements in the most active upper layer. The achievement of three CTD sections across the eastern end of the Sawu sea and the estimation of the 24h variability in the Ombi strait will permit to study the evolution of the water masses characteristics in the Sawu sea, one of the passage of the throughflow. We particularly appreciated the enthusiasm at work of our Indonesian collegues and their warm welcome on board.

ACKNOWLEDGMENTS

We greatly appreciate the well organized and hard work done by the Indonesian team (from LIPI and BPPT) led by Dr. A.Gani Ilahude, on the

CTD stations, with Praditya, Agustin and their team, and on the salinity, oxygen and nutrients measurements, with Mardanis and his team, and their great help they gave us during the retrieval of the moorings.

Captain Handoko and his crew receive all our thanks for their warm hospitality and their willingful support particularly in the difficult retrieving work.

We wish to thank Marc Pain, Scientific Attaché at the French Embassy for his continuous help in the organization of the cruise.

Franck Miraux gets all our gratitude for his enthusiastic participation in the work and the training on board and for his help in the preparation of the cruise .

We acknowledge the great support of INSU which permit us to get the specific equipment for this programme and who authorized the very efficient participation of Claudie Bournot that we greatly appreciate.

Professor M.T.Zen and his team of BPPT have been supporting this Franco-Indonesian cooperative programme since the beginning and have put a lot of continuous efforts in the fulfilment of the scientific cooperation, we wish to thank them particularly warmly at the end of this successful cruise.

Figures captions

Figure 1 - Map of JADE 93 cruise showing the location of the moorings in the Timor channel and the location of the three hydrological sections in the Savu sea.

Figure 2 - Moorings M1 and M2

Figure 3 - Ship drifts during the retrieval of mooring M1.

Figure 4 - Ship drifts during the retrieval of mooring M2.

Figure 5 - Ship drifts during the positioning of mooring M4, and dragging tracks

Figure 6 - Ship drifts during the positioning of mooring M3.

Figure 7 - Dragging tracks of mooring M3.

Figure 8a - Example of ADCP n°514 current data from mooring M2.

Figure 8b - Example of east-west component of the current from the ADCP n°514 of mooring M2 .

Figure 9 - Example of east-west component of the current from Mors currentmeter n° 482 of mooring M2.

Figure 10 - Salinity profiles for stations 19 to 24 between Timor and east Alor.

Figure 11 - Temperature profiles for stations 19 to 24 between Timor and east Alor.

Figure 12 - Salinity profiles for repeated stations at station 2 location.

Figure 13 - Salinity profiles for repeated stations at station 5 location.

Figure 14 - Temperature-salinity diagrams for the stations 25 to 30.

Figure 15 - Temperature-salinity diagrams for the stations 31 to 36.

Figure 16 - Temperature-salinity diagrams for the stations 1 to 6.

Figure 17 - Salinity section between Timor and east Alor (drawn by the LIPI team).

Figure 18 - Salinity section between Timor and west Alor (drawn by the LIPI team).

Positions of the moorings

M1 : 11°15'59"S - 122°54'30"E
M2 : 11°24'50"S - 122°58'48"E
M3 : 11°02'30"S - 122°56'02"E
M4 : 11°45'08"S - 123°15'52"E

List of the stations

St1	8°36'45"S-125°08'42"E,	7.12	1/5/93	357m	600db
St2	8°30'31"S-125°09'06"E	8.49		3269m	1000db
St3	8°29'02"S-125°08'31"E	10.38		3310m	1000db
St4	8°27'01"S-125°07'54"E	12.05		2927m	1000db 8.26
St5	8°23'10"S-125°07'18"E	13.30		1009m	800db
St6	8°22'07"S-125°07'06"E	14.42		330m	253db
St7	8°23'24"S-125°07'17"E	15.34		1479m	1000db
St8	8°32'00"S-125°09'00"E	17.16		3250m	1000db
St9	8°23'54"S-125°07'15"E	19.32		1480m	1000db
St10	8°32'08"S-125°29'27"E	21.12		3253m	1000db
St11	8°23'25"S-125°07'12"E	22.49		1436m	1000db
St12	8°32'07"S-125°09'05"E	00.21	2/5	3253m	1000db
St13	8°23'34"S-125°07'13"E	02.11		1206m	1000db
St14	8°32'01"S-125°09'31"E	03.40		3256m	1000db
St15	8°23'40"S-125°07'22"E	5.22		1363m	1000db
St16	8°32'34"S-125°08'43"E	07.19		3227m	800db
St17	8°23'26"S-125°07'15"E	09.01		1489m	1000db
St18	8°32'08"S-125°09'07"E	10.33		3247m	1000db
St19	8°35'04"S-125°10'04"E	11.49		1734m	1000db
St20	8°31'55"S-125°08'59"E	13.07		3256m	1000db
St21	8°28'58"S-125°08'31"E	14.24		3309m	1000db
St22	8°26'06"S-125°08'00"E	15.49		2970m	1000db
St23	8°23'30"S-125°07'05"E	17.08		1450m	1000db
St24	8°22'05"S-125°06'29"E	18.28		326m	250db
St25	8°29'14"S-124°27'19"E	23.24		625m	597db
St26	8°32'34"S-124°28'45"E	00.35,	3/5	2411m	1000db
St27	8°38'26"S-124°30'49"E	2.26		3093m	1000db
St28	8°46'17"S-124°32'39"E	4.07		3339m	1000db
St29	8°54'35"S-124°36'10"E	5.49		3720m	1000db
St30	9°01'21"S-124°38'35"E	7.26		715m	600db
St31	9°14'03"S-123°57'24"E	11.45		1274m	1000db
St32	9°04'25"S-123°52'41"E	14.39		3290m	3000db
St33	8°54'25"S-123°47'30"E	19.52		3248m	3000db
St34	8°44'29"S-123°42'22"E	0.18,	4/5	3252m	no data
St35	8°39'19"S-123°39'33"E	1.58		3083m	1000db
St36	8°35'33"S-123°36'00"E	3.24		2200m	1000db

MOUILLAGES JADE 92/93 : COURANTOMETRES MORS

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Après moult péripéties, neuf courantomètres MORS ont pu être initialisés à bord du N/O "Marion DUFRESNE", juste avant le déploiement des mouillages les 10 et 11 mars 1992. Tous ont été programmés pour une acquisition à :
* **voie 1** : courant cadence **1 h**, intégration **20 mn**
* **voie 2** : pression cadence **1 h**
* **voie 3** : température cadence **1 h.**
L'horloge interne a été calée sur l'**heure TU** du bord, les dates programmables de "START" et de "STOP" ont été **invalidées.**

Lors du relevage, l'aspect général de tous les appareils semble correct, notamment la peinture de tous les courantomètres a bien tenu , ce qui n'est pas le cas pour les largueurs acoustiques AR661CC.
Par contre, sur tous les courantomètres, les anodes, fixées par colliers rilsan sur les tirants latéraux avec reprise souple sur la tape supérieure, ont disparu. (défaut de montage : à revoir impérativement, car, en l'absence des anodes, les tirants ont été bien "décapés".

On note également que sur le courantomètre SN**478** (en tête du mouillage M1, sous l'ADCP), le rotor n'est plus maintenu dans la crapaudine supérieure; un démontage ultérieur a permis de constater que la crapaudine était ébréchée et que le pivot supérieur du rotor avait disparu. Une visualisation rapide des données vitesse situe l'incident aux environs du 14 Mars 1993.

Le courantomètre SN **488**, le plus profond du mouillage M1 a été perdu.

Des problèmes successifs (plantage du programme OCEANSOFT en cours de transfert), nous ont amenés à transférer systématiquement la totalité de la mémoire.

Le tableau ci-dessous récapitule les points principaux du transfert, à noter :
- SN **478** : courantomètre de tête du mouillage M1 : absence de données sur la voie 2 (pression), visiblement dûe à la non-validation de cette voie.
- SN **476** : courantomètre en milieu de M2 : appareil sur OFF au relevage ! Initialement prévu sur le mouillage M1, cet appareil a été mis en marche au même moment que les autres courantomètres de cette ligne (soit le 10 Mars 92 à 0 h 00 TU). Finalement inséré dans la ligne M2, son contacteur ON/OFF a été malencontreusement remis sur OFF lors de la mise en marche des autres appareils M2 (soit le 11 Mars 1992 à 0 h 00). Ceci explique la présence de 24 records.

On constate des différences dans le nombre des cycles d'acquisition, ceci est lié à la dérive de l'horloge interne des courantomètres ; cette dérive diffère d'un appareil à l'autre. La dérive maximale constatée sur le SN481 avoisine une avance de 35 secondes / jour !!!

A bord du BARUNA JAYA I, le 3 MAI 1993

CB/JL

N° cour. M1 ou M2	date heure mise ON	date heure mise OFF	heure arrêt affichée	batterie %	nbre cycle oceansoft	nbre cycle théorique	dérive horloge	OBS
483 - M1	10/03/92 00h56'46"	28/04/93 08h56'	28/04/93 09h16'46"	91	V1 : 9944 V2 : 9945 V3 : 9945	9943 ou 9944	1 ou 2 cycle	
478 - M1	09/03/92 23h56'42"	28/04/93 08h56'	28/04/93 08h56'42"	80	V1 : 9945 V2 : N.V. V3 : 9945	9944 ou 9945	0 ou 1 cycle	rotor H.S. V2 : non validée
479 - M1	09/03/92 23h59'27"	28/04/93 08h56'	28/04/93 08h59'27"	74	V1 : 9945 V2 : 9945 V3 : 9945	9944 ou 9945	0 ou 1 cycle	
481 - M1	10/03/92 00h00'20"	28/04/93 08h56'	28/04/93 12h00'20"	71	V1 : 9948 V2 : 9948 V3 : 9948	9944 ou 9945	3 ou 4 cycle	
476 - M2	09/03/92 23h58'26"	mis sur OFF à la mise à l'eau		99	V1 : 24 V2 : 25 V3 : 25	enregistrements effectués dans l'air, à bord du bateau		
475 - M2	10/03/92 23h57'27"	29/04/93 05h29'22"	29/04/93 05h57'27"	93	V1 : 9942 V2 : 9942 V3 : 9942	9941	1 cycle	
482 - M2	10/03/92 23h58'17"	29/04/93 05h28'14"	29/04/93 08h10'43"	75	V1 : 9944 V2 : 9945 V3 : 9945	9941	3 ET 4 cycles	pb d'heure entre col. 2 et 4
477 - M2	11/03/92 00h00'20"	29/04/93 05h27'55"	29/04/93 06h20'20"	79	V1: 9942 V2 : 9943 V3 : 9943	9941	1 ET 2 cycles	

* Les heures exprimées, le sont en T.U.

JADE 92/93 - ***Tableau récapitulatif de l'état des courantomètres MORS MC360***

JADE 92/93 - RCM 5 AANDERAA

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RAPPEL :

5 courantomètres Aa ont été installés sur les 2 lignes de mouillage M1 et M2 en mars 92.

N° courantomètre	Ligne de mouillage	Immersion (m)	GDH initialisation (h. TU)
4254	M1	470	10/03/92
4259	M1	870	00 h 00
5813	M1	1575	
4034	M2	470	11/03/92
4031	M2	925	00 h 00

RELEVAGE :

M1 a été récupéré le 27 avril 93 à 22 h 30 TU et M2 le 28 avril à 22 h 18 TU.
Après nettoyage, les appareils ont été ouverts et arrêtés juste après un cycle de fonctionnement, ensuite les bandes magnétiques ont été transférées sur disquettes.

N° courantomètre	GDH arrêt (h. TU)	tension pile (V)	N cycles théoriques	N échantillon donné par lecteur Aa
4254	28/04/93 - 11 h 53	8,42	9947	*
4259	28/04/93 - 11 h 56	8,53	9947	9626 *
5813	28/04/93 - 12 h 02	8,27	9948	2227
4034	29/04/93 - 08 h 39	8,48	9944	9945
4031	29/04/93 - 08 h 43	8,18	9944	9945

* : Non significatif, problème de "glissement" de bande pour relancer le lecteur.

REMARQUES :

Examen visuel à l'ouverture :

5813 - une pâte blanche stagne au fond du corps - consistance genre graisse silicone. Petite micro-fuite à l'emboitement de la tape inférieure ? Un peu de cette pâte est ramenée à Paris pour analyse.
Peu de bande magnétique sur la bobine réceptrice; l'appareil a dû s'arrêter au bout de 2 ou 3 mois.

4259 - Propre. Toute la bande est enregistrée. Les derniers tours sont hors bobine réceptrice (diamètre un peu juste); on les replace à la main.

4254 - Propre. Derniers tours hors bobine réceptrice; on les replace à la main.

4034 et **4031** : R.A.S.

La fin du transfert les 5813 et 4259 a posé quelques problèmes; certainement dû au fait que la bande a été manipulée à la main - pourtant avec beaucoup de précautions.

A bord du Baruna Jaya I, le 7 avril 93.

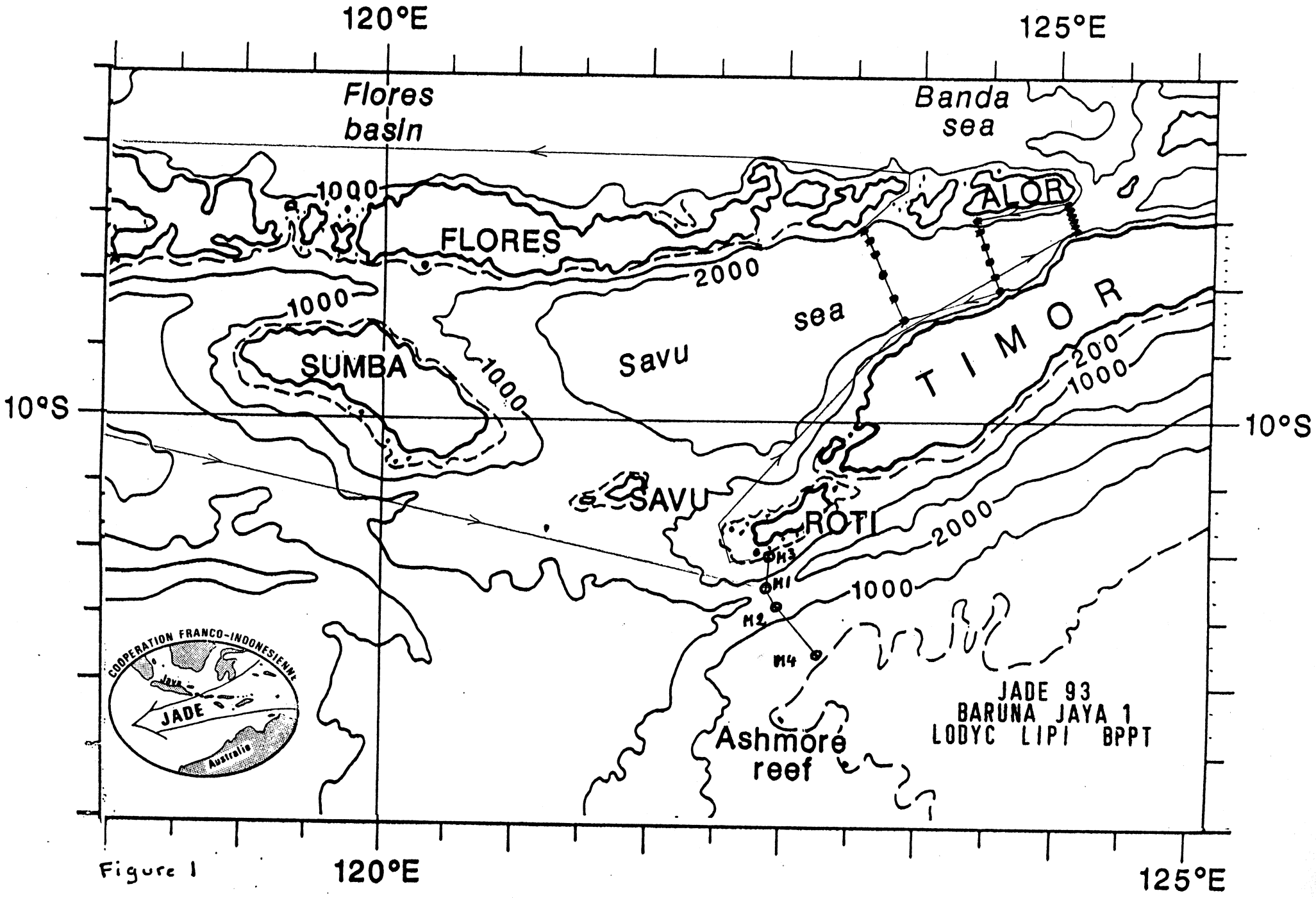

120°E
125°E
Flores
basin
Banda
sea
1000
FLORES
ALOR
2000
1000
sea
Savu
SUMBA
1000
T I M O R
200
1000
10°S
10°S
SAVU
ROTI
2000
M3
M1
1000
M2
M4
JADE 93
BARUNA JAYA 1
LODYC LIPI BPPT
Ashmore
reef
COOPERATION FRANCO-INDONESIENNE
Java
JADE
Australia
120°E
125°E

Figure 1

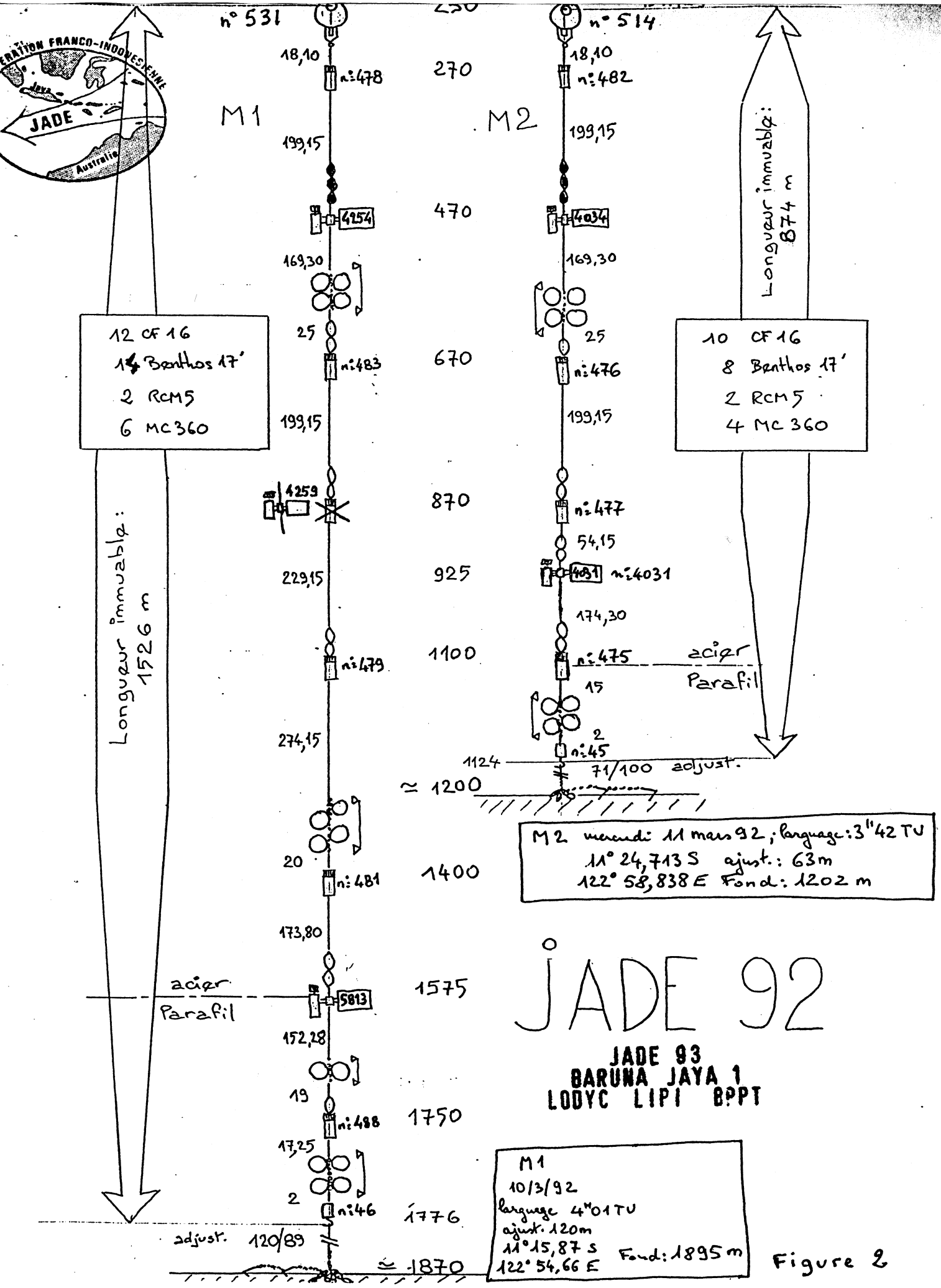

n° 531
n° 514
M1
M2
18,10
n:478
270
18,10
n:482
199,15
199,15
4254
470
4034
169,30
169,30
25
25
n:483
670
n:476
199,15
199,15
4259
870
n:477
54,15
229,15
925
481
n:4031
174,30
n:479
1100
n:475
acier
Parafil
15
274,15
2
n:45
1124
71/100 adjust.
≃ 1200
20
n:481
1400
173,80
acier
Parafil
5813
1575
152,28
19
n:488
1750
17,25
2
n:46
1776
adjust. 120/89
≃ 1870
12 CF 16
1 Benthos 17'
2 RCM5
6 MC360
10 CF 16
8 Benthos 17'
2 RCM5
4 MC 360
Longueur immuable: 1526 m
Longueur immuable: 874 m
M2 mercredi 11 mars 92 ; largage: 3"42 TU
11° 24,713 S ajust.: 63m
122° 58,838 E Fond: 1202 m
JADE 92
JADE 93
BARUNA JAYA 1
LODYC LIPI BPPT
M1
10/3/92
largage 4"01 TU
ajust. 120m
11° 15,87 S
122° 54,66 E
Fond: 1895 m

Figure 2

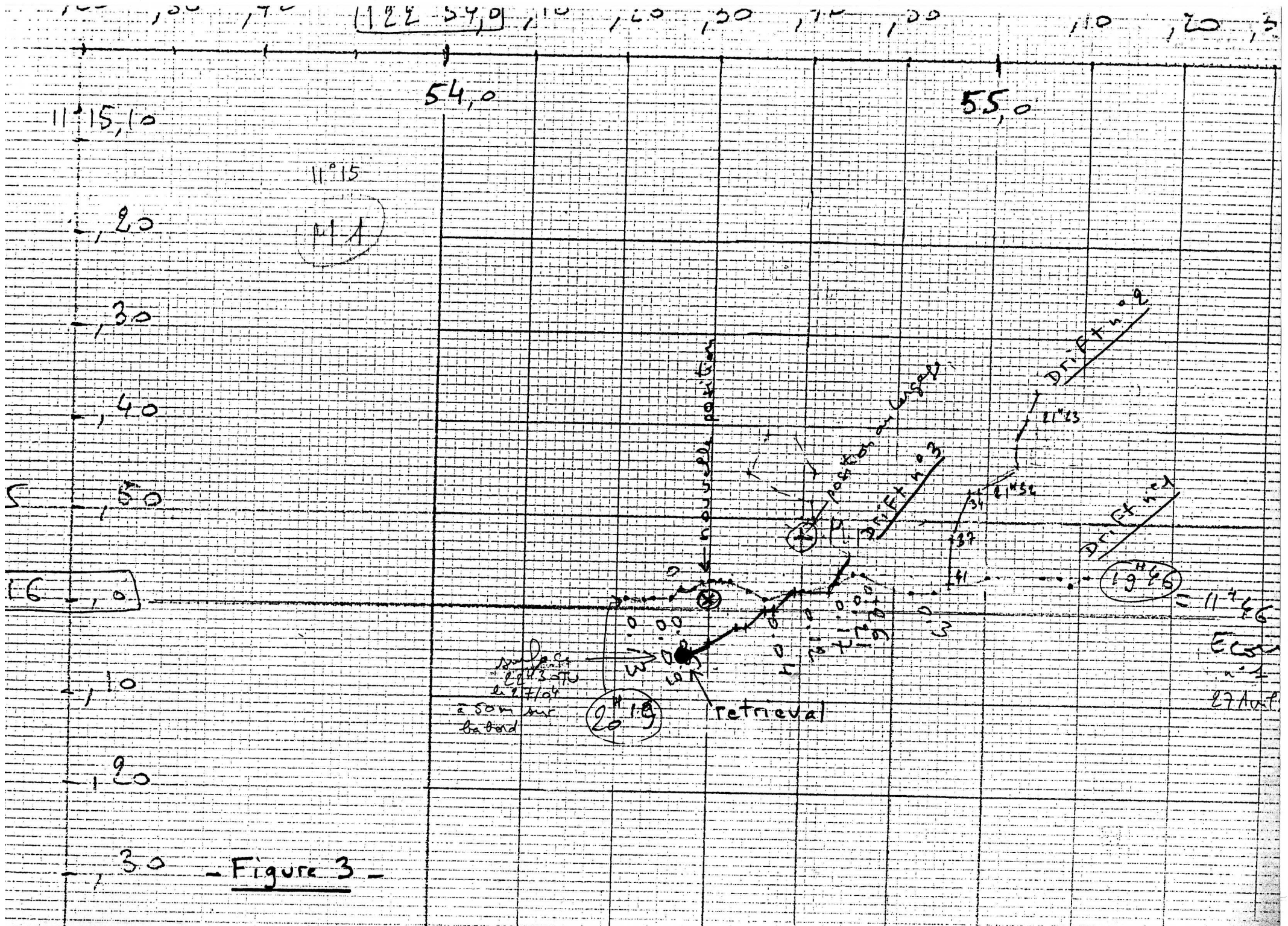
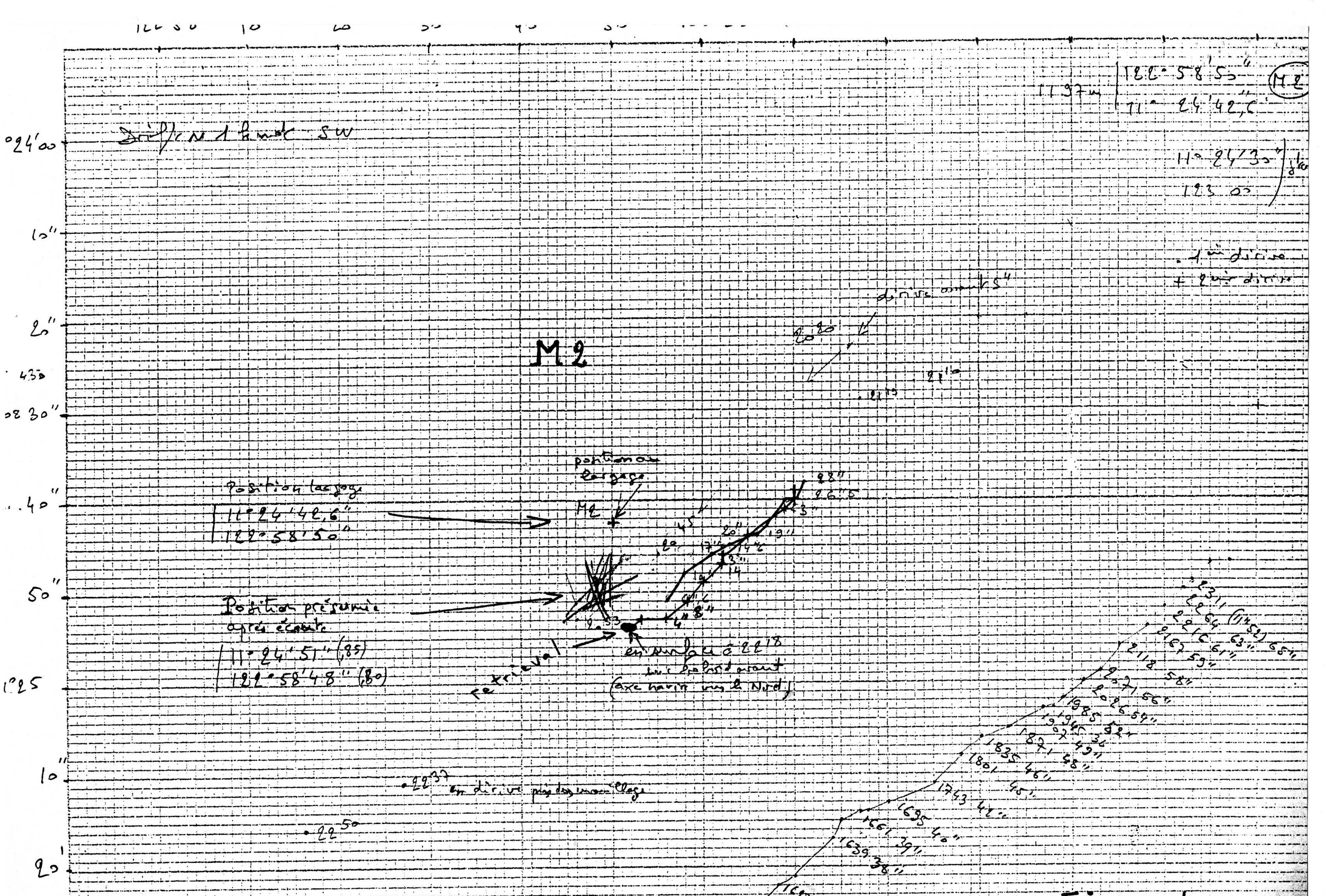
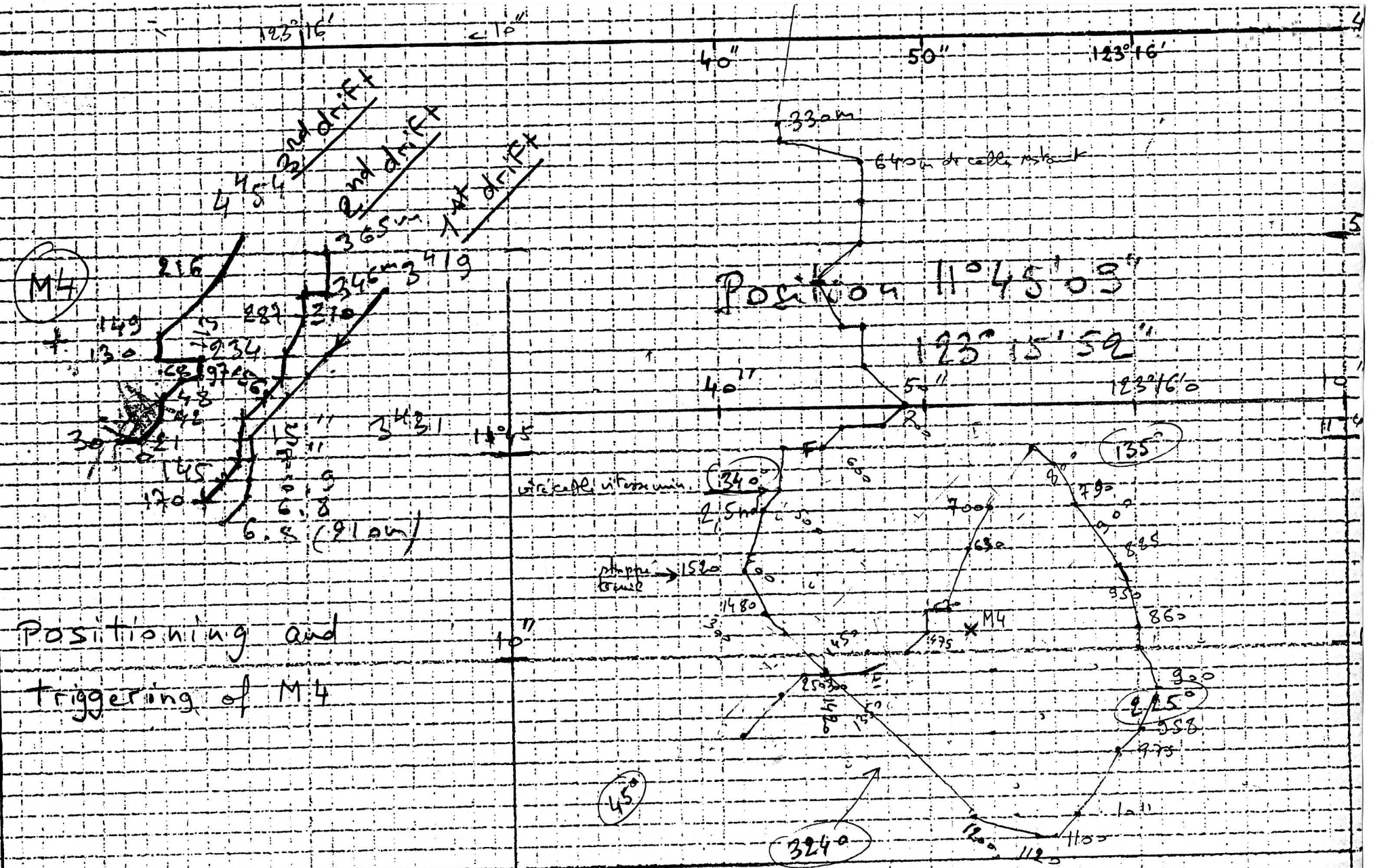


Figure 3

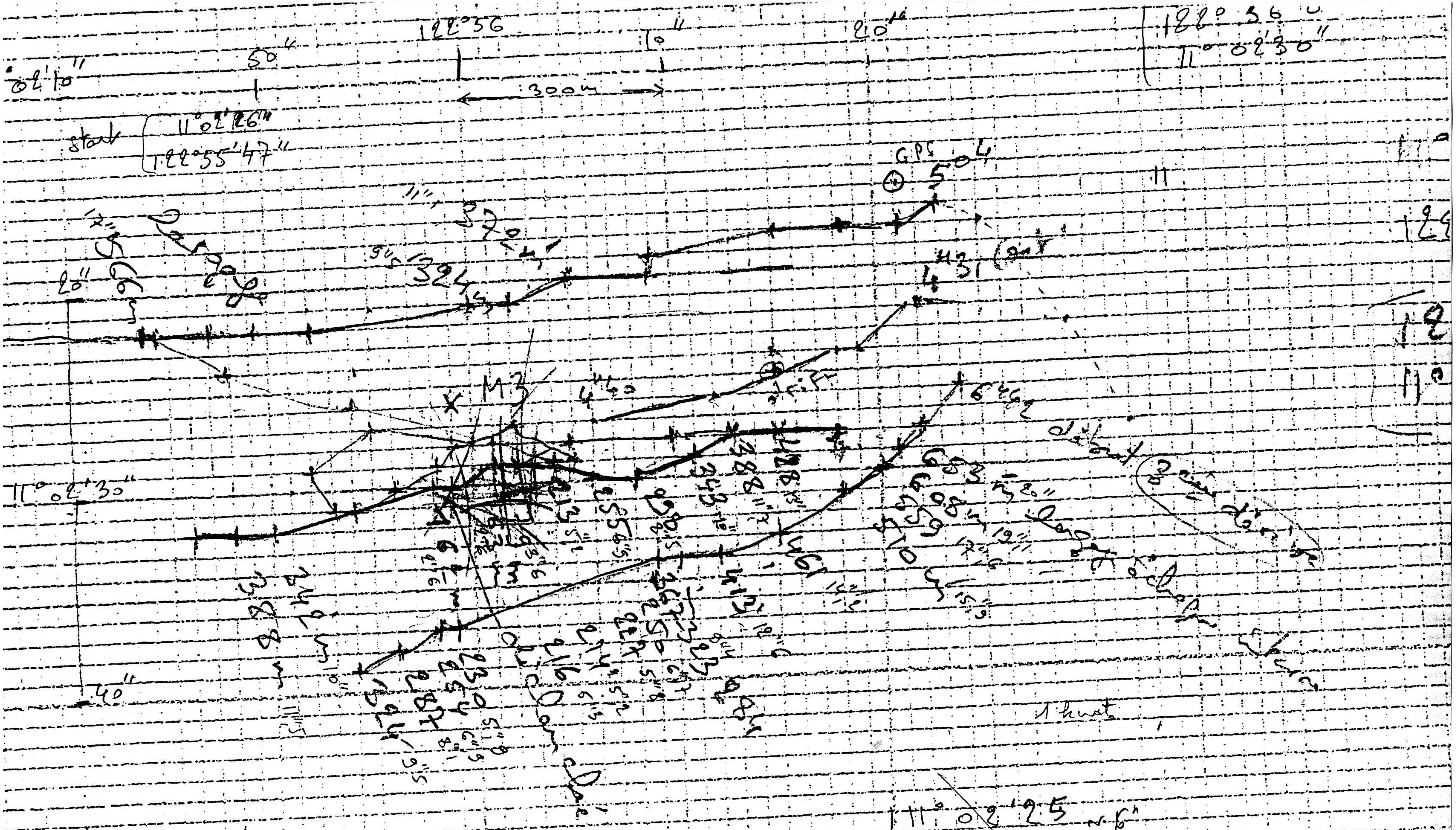

M2
Position présumée après écoute
11° 24' 51" (85)
121° 58' 48" (80)
Position largage
11° 24' 42,6"
122° 58' 50"
en surface à 22 18
(axe navire vers le Nord)
1ère dérive
+ 2ème dérive
en dérive
Dérive vent SW

— Figure 4 —



Positioning and triggering of M4

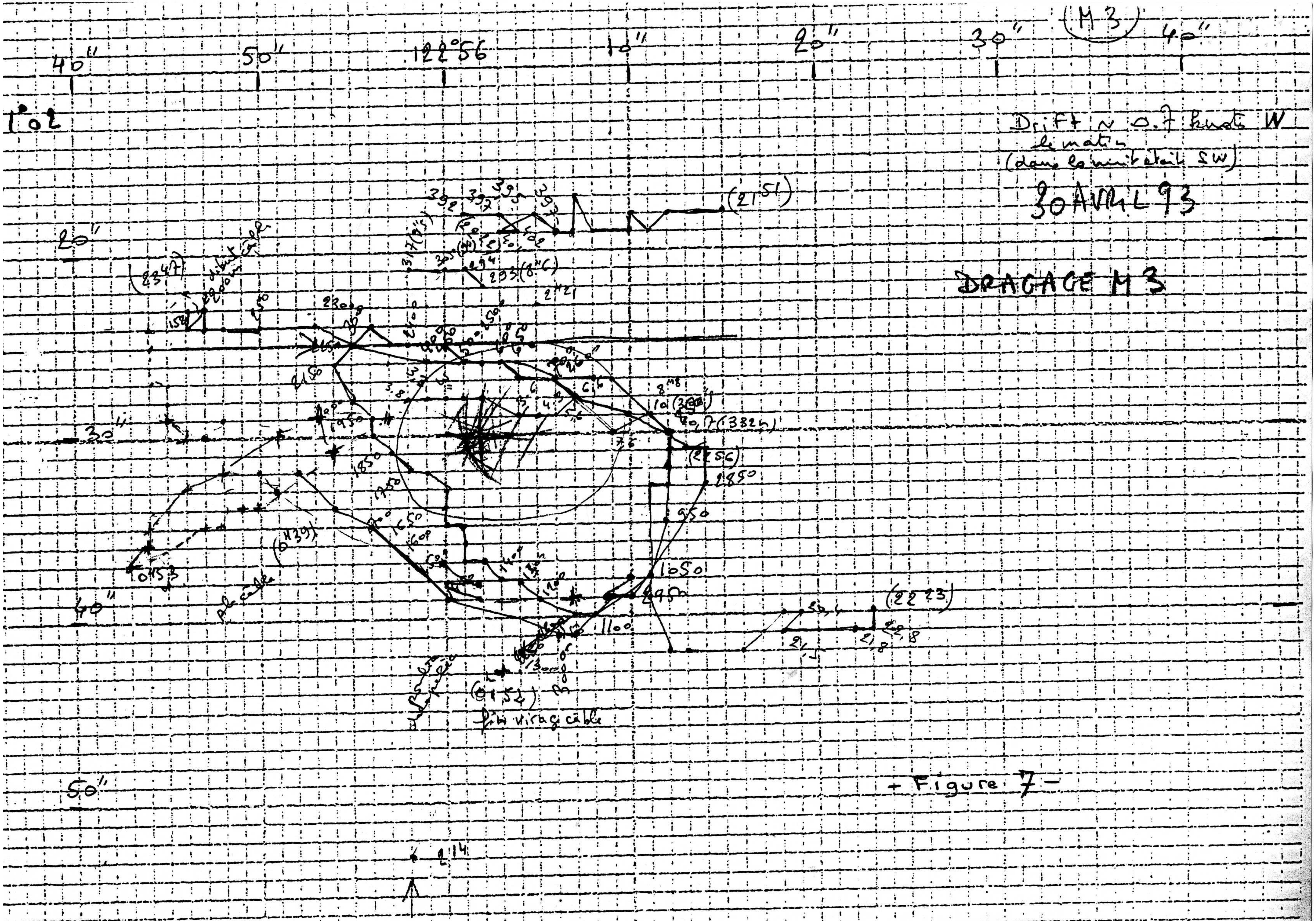
-Figure 5-



Positioning of M3

- Figure 6 -

11°02'30,5" 122°56'01,5"

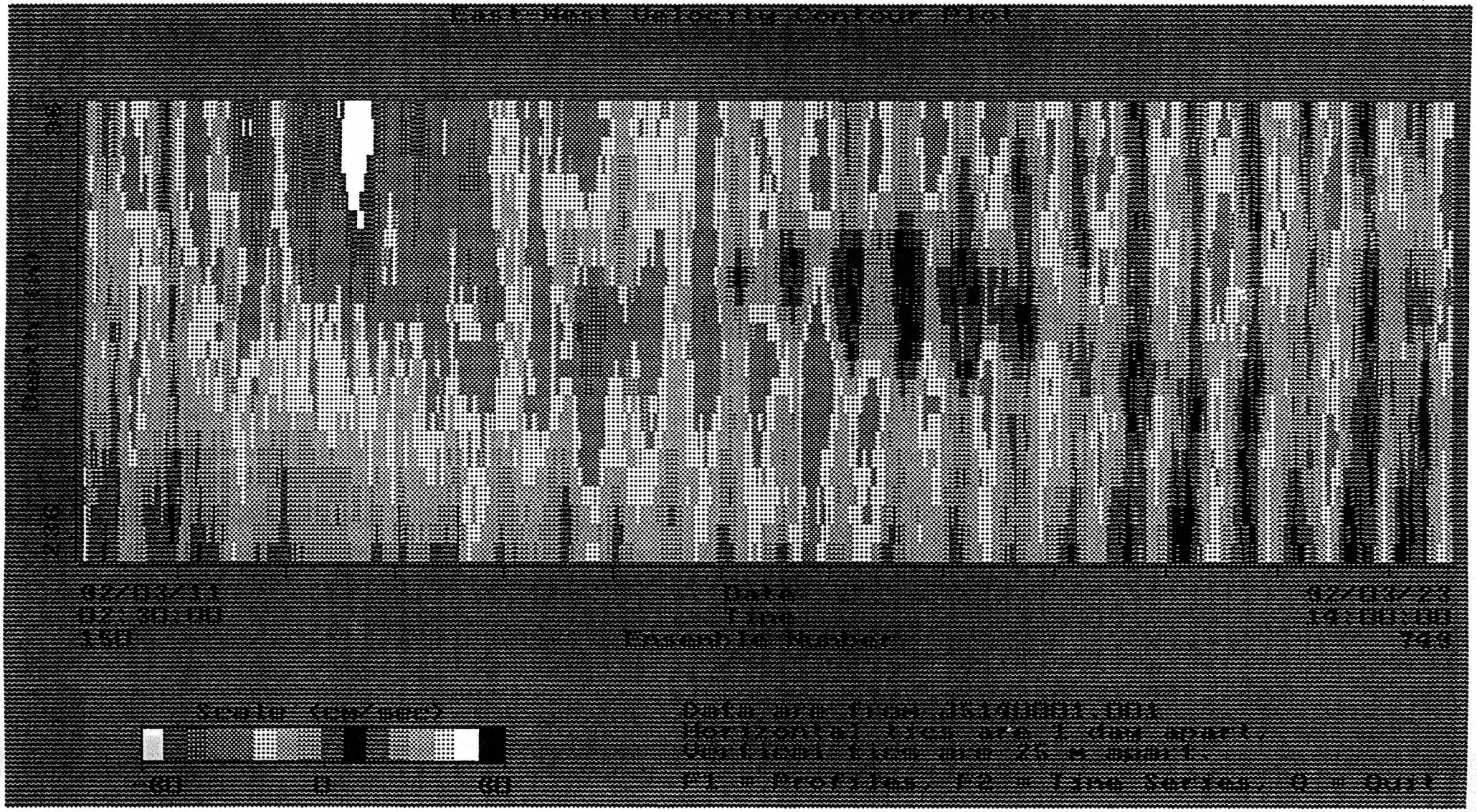


M3
40"
50"
122°56
10"
20"
30"
40"
1°02
Drift N 0.7 Kuds W
le matin
(dans la nuit était SW)
30 AVRIL 93
DRAGAGE M3
20"
30"
40"
50"
(21 51)
(22 56)
(22 23)
1050
1100
950
fin virage câble

- Figure 7 -

ADCP data

Figure 8a



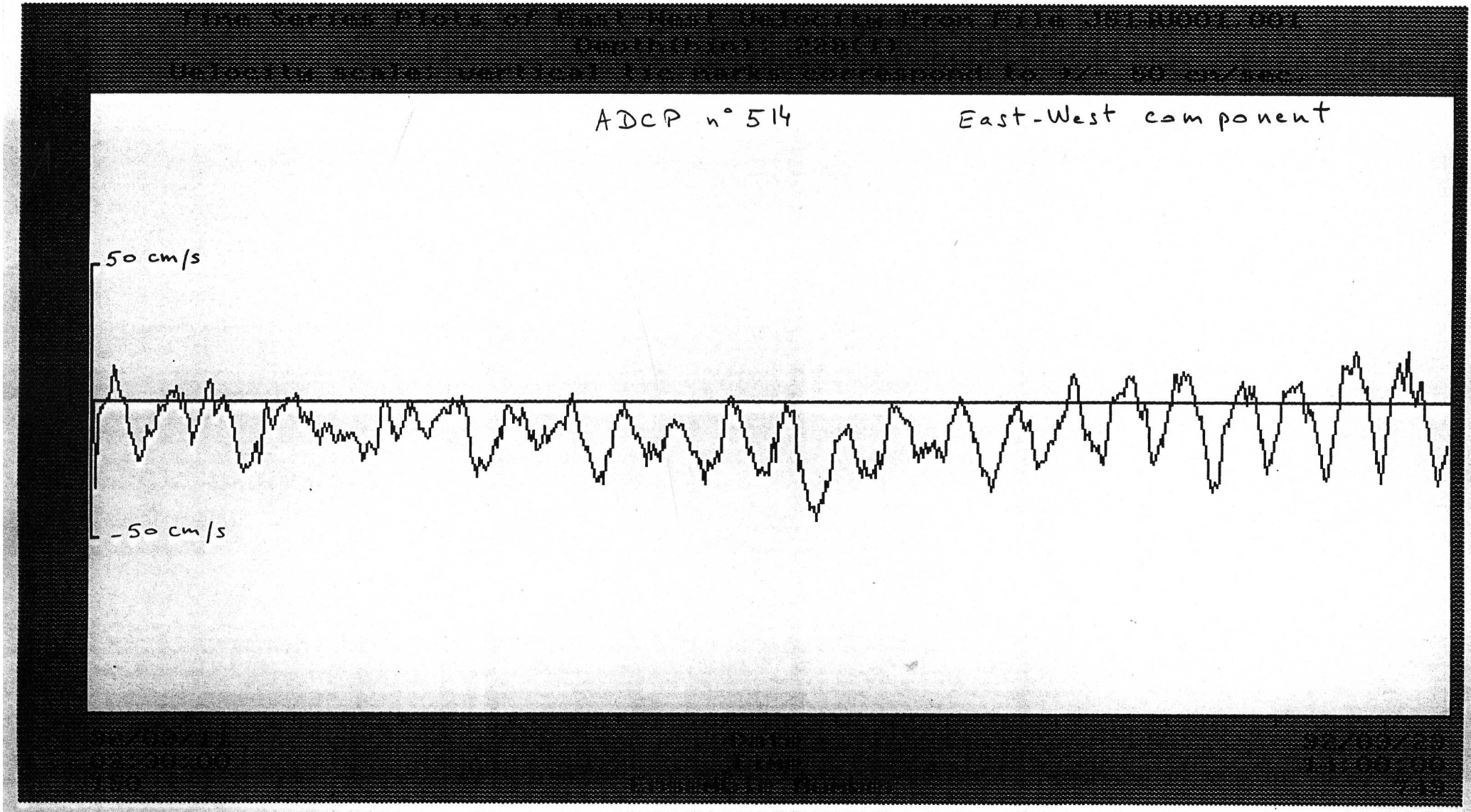


Figure 8 b

M_2 270 m

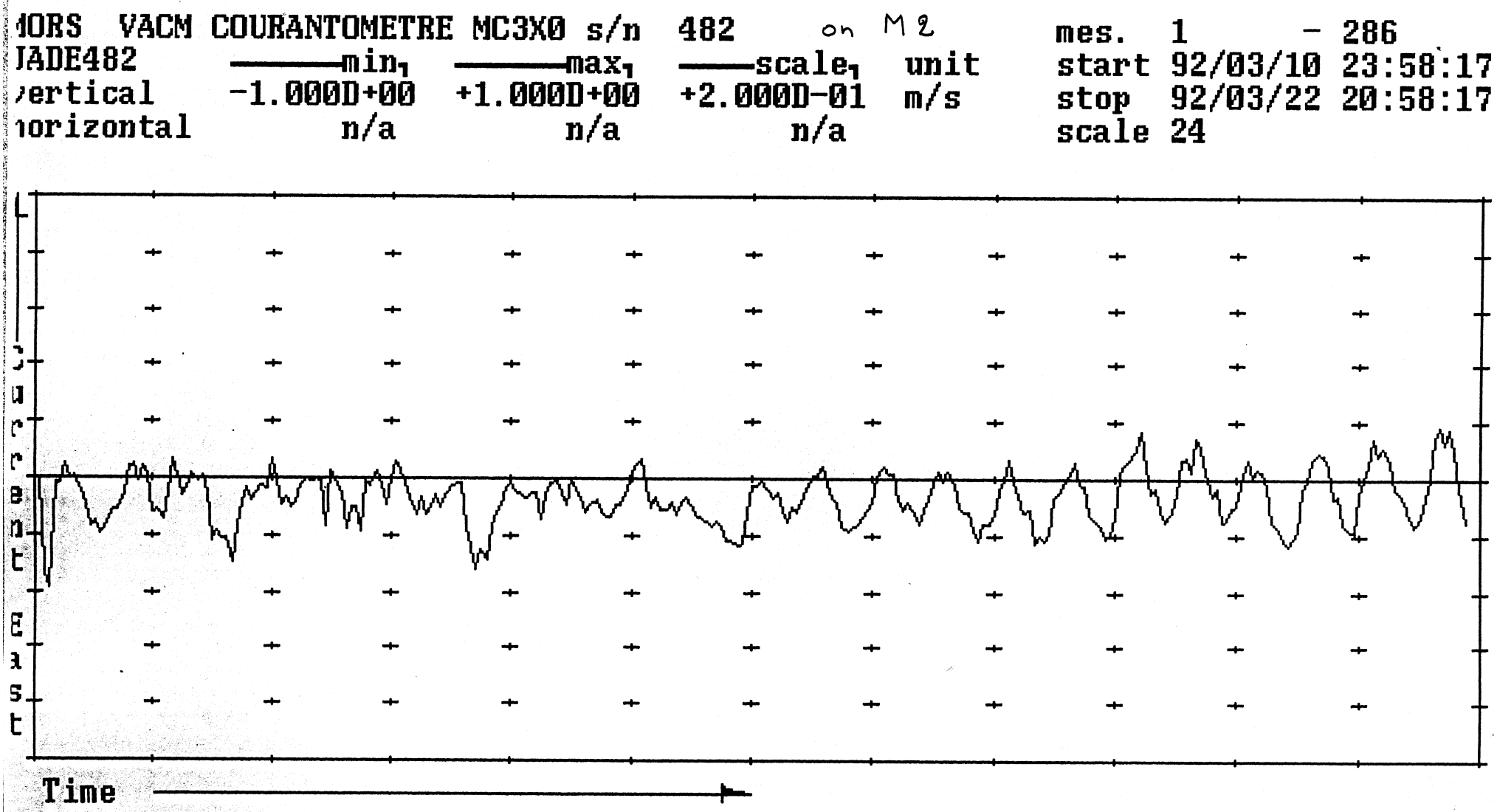
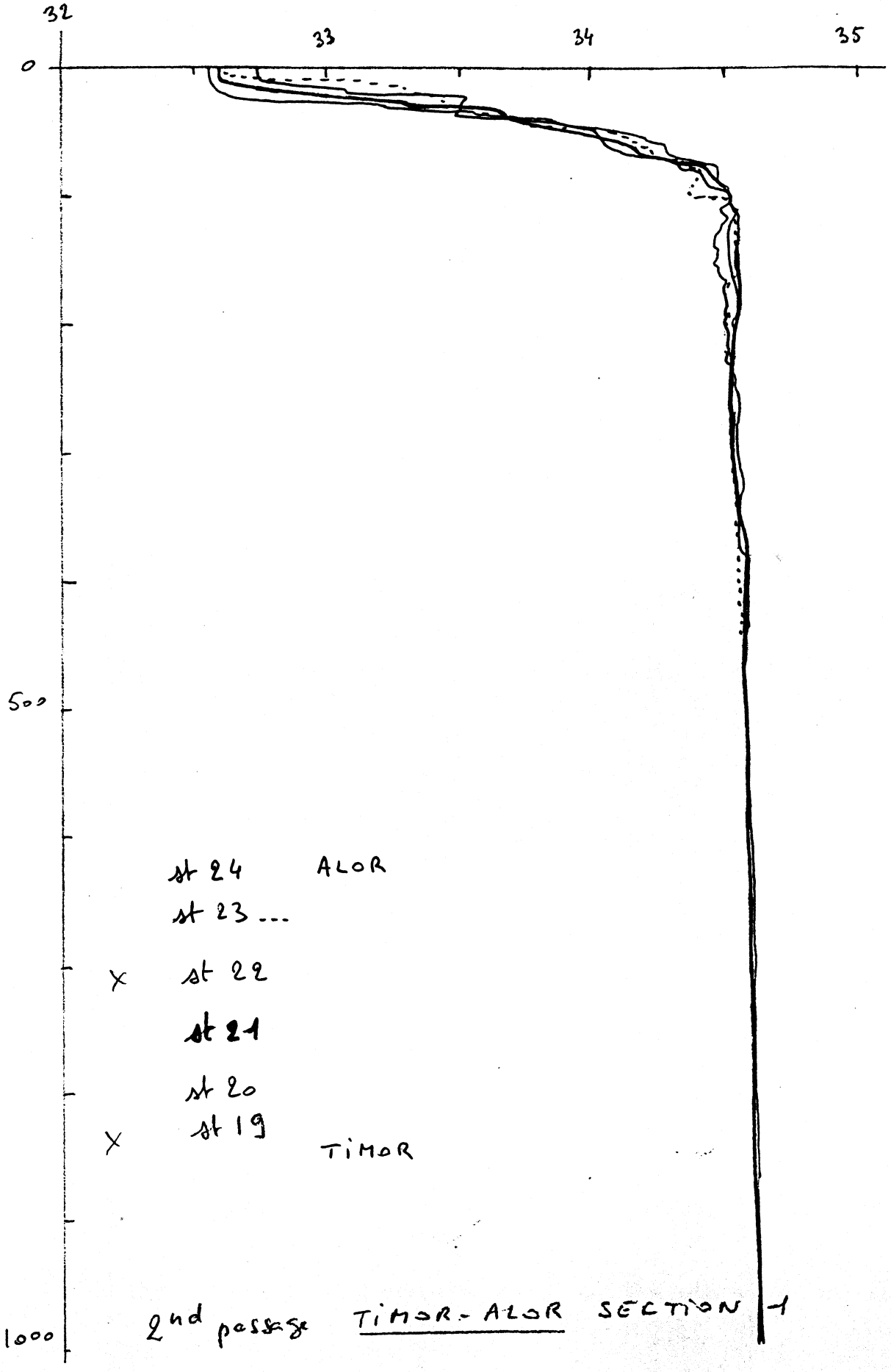


Figure 9

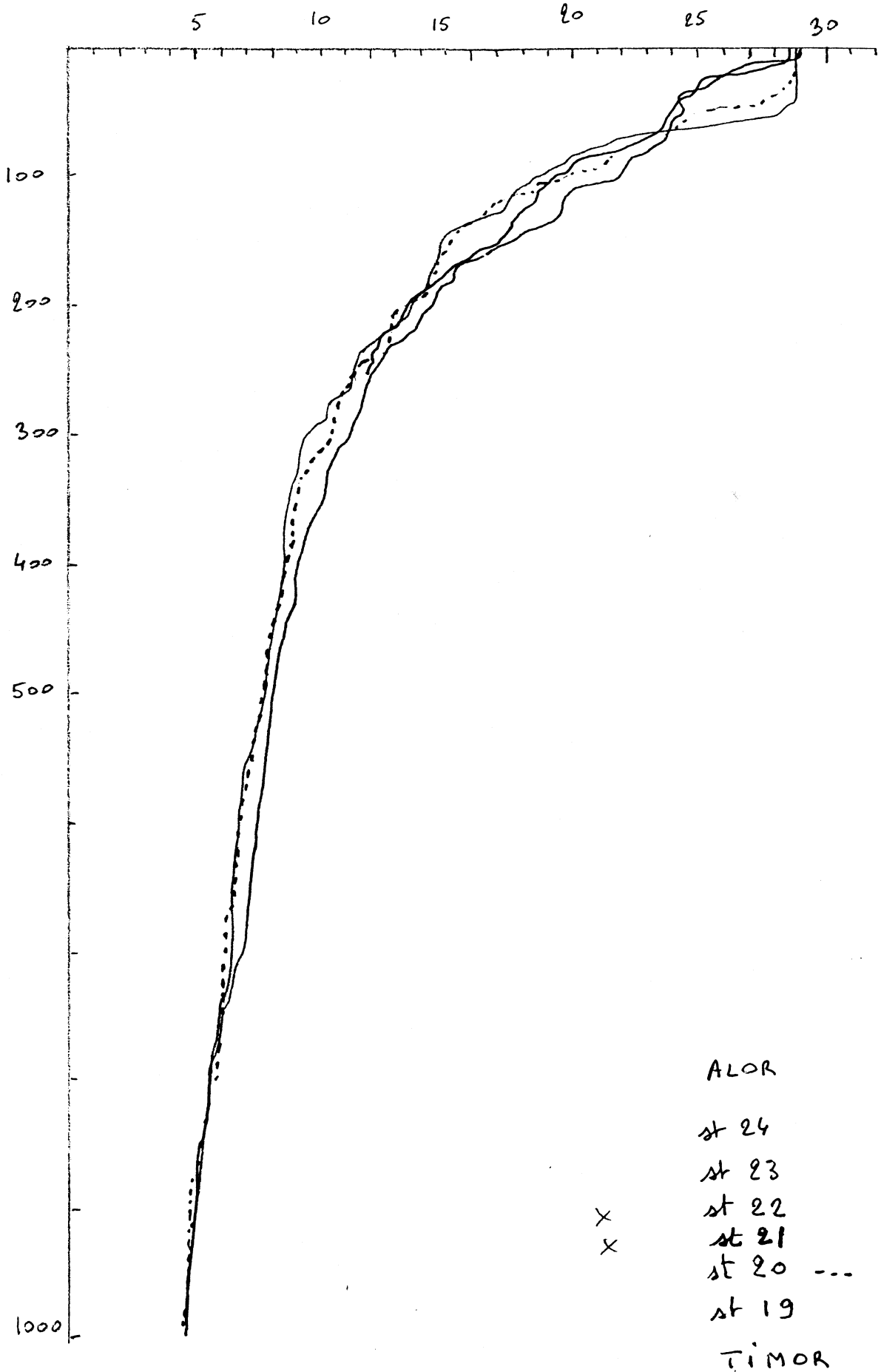
SALINITY PROFILES



2nd passage TIMOR - ALOR SECTION 1

- Figure 10 -

TEMPERATURE PROFILE

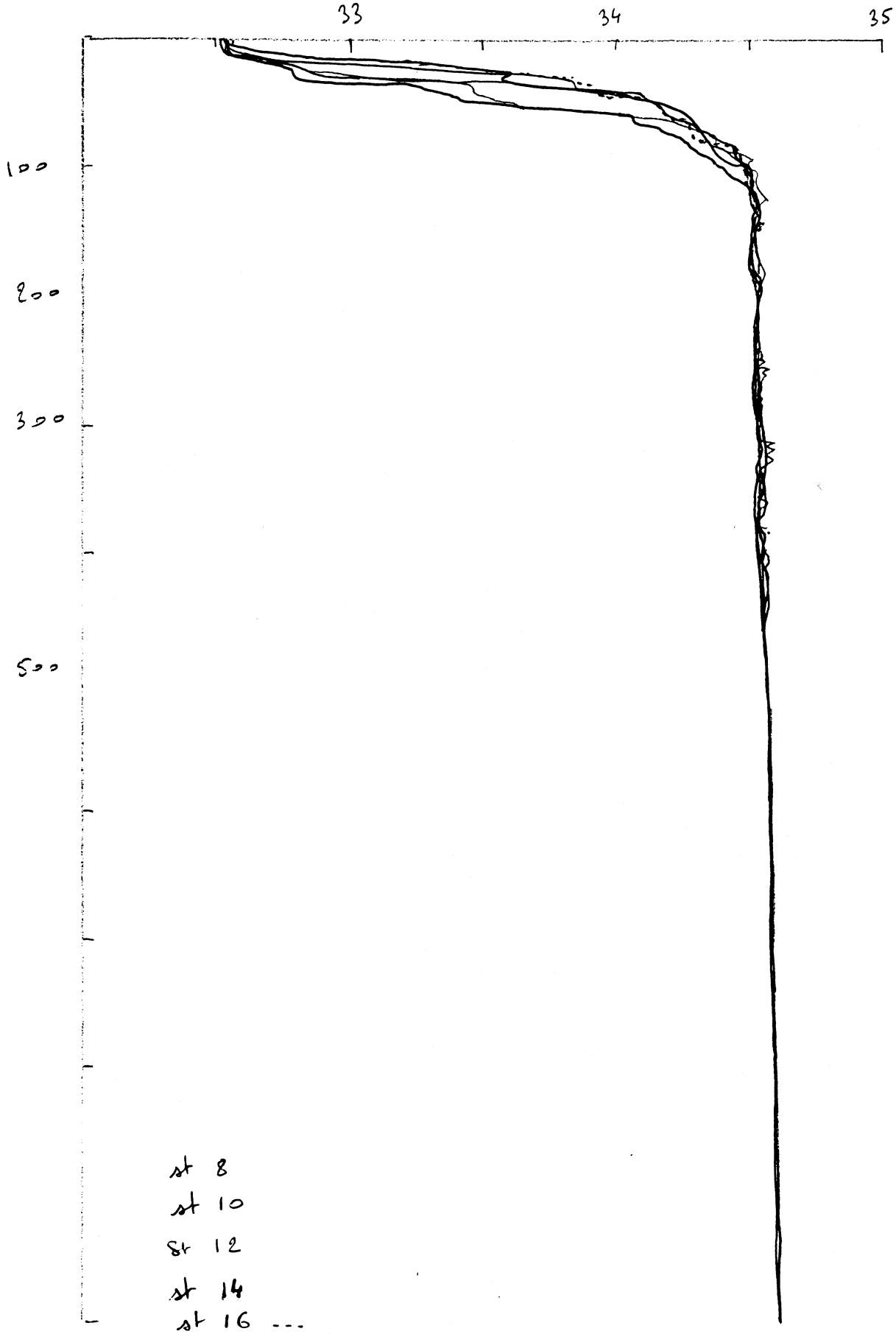


- Figure 11 -

ALOR - TIMOR Section 1

REPETITION STATION 8

SALINITY

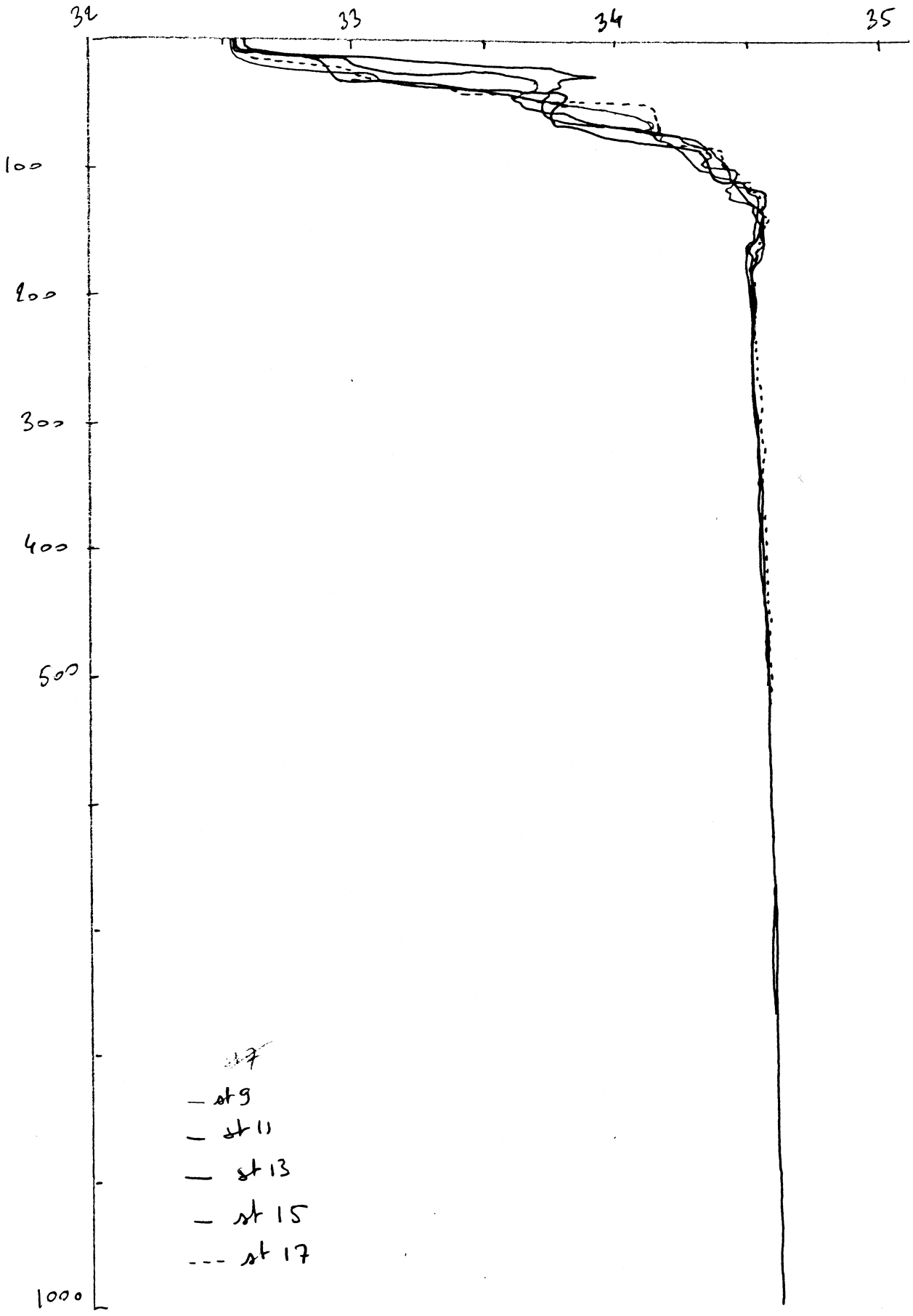


- Figure 12 -

ALOR - TIMOR section 1

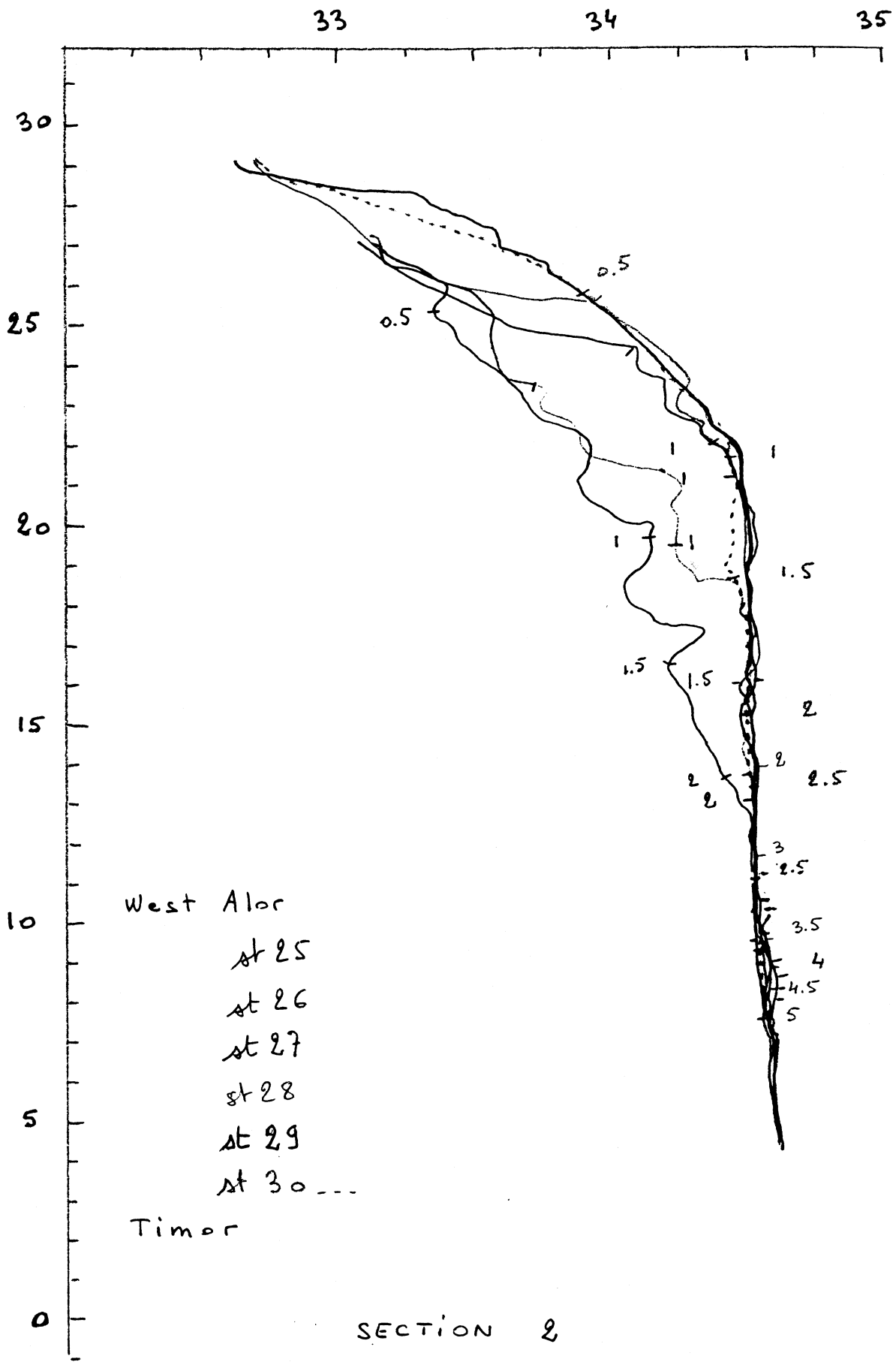
REPETITION STATION 5

SALINITY



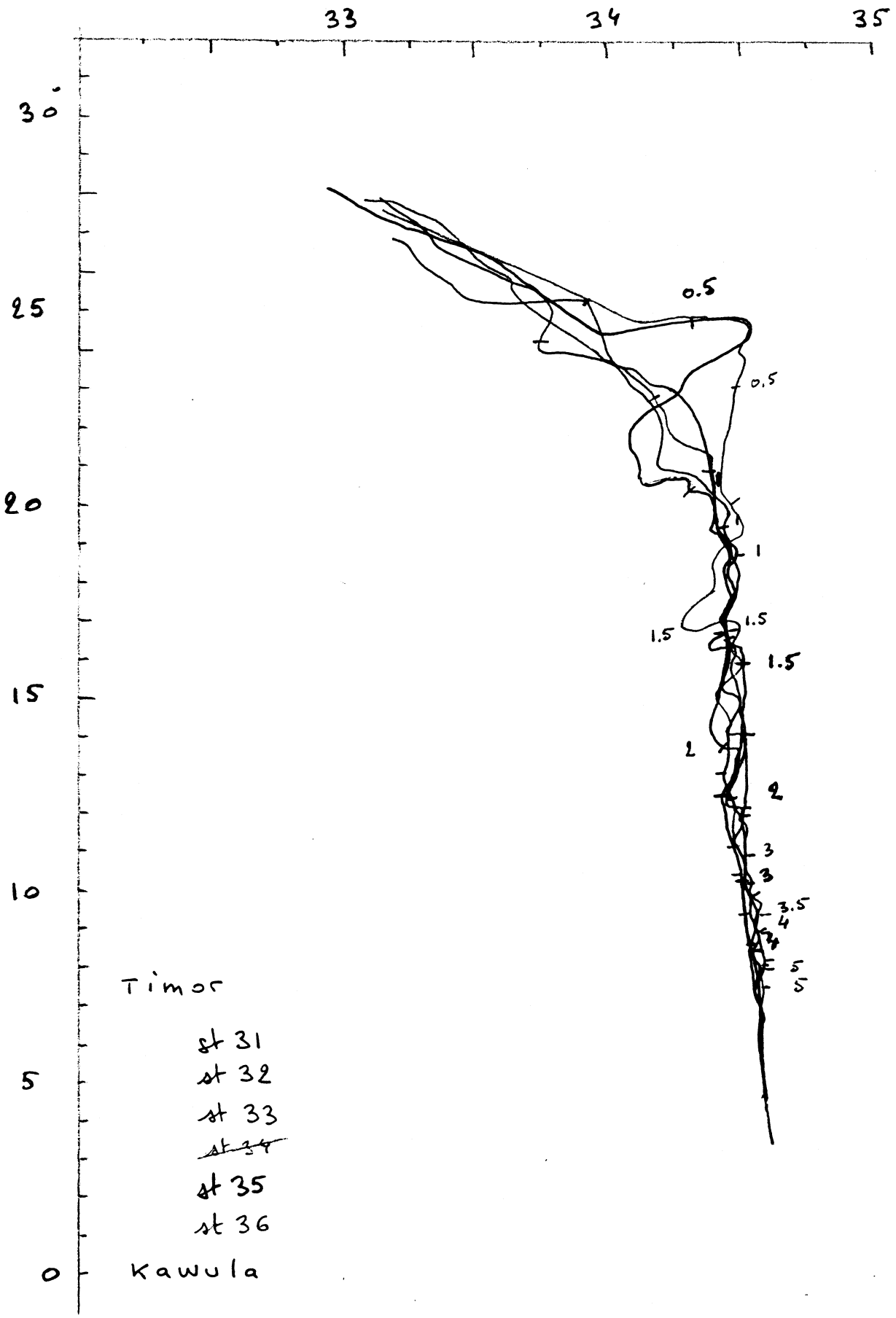
- Figure 13 -

T - S diagrams



– Figure 14 –

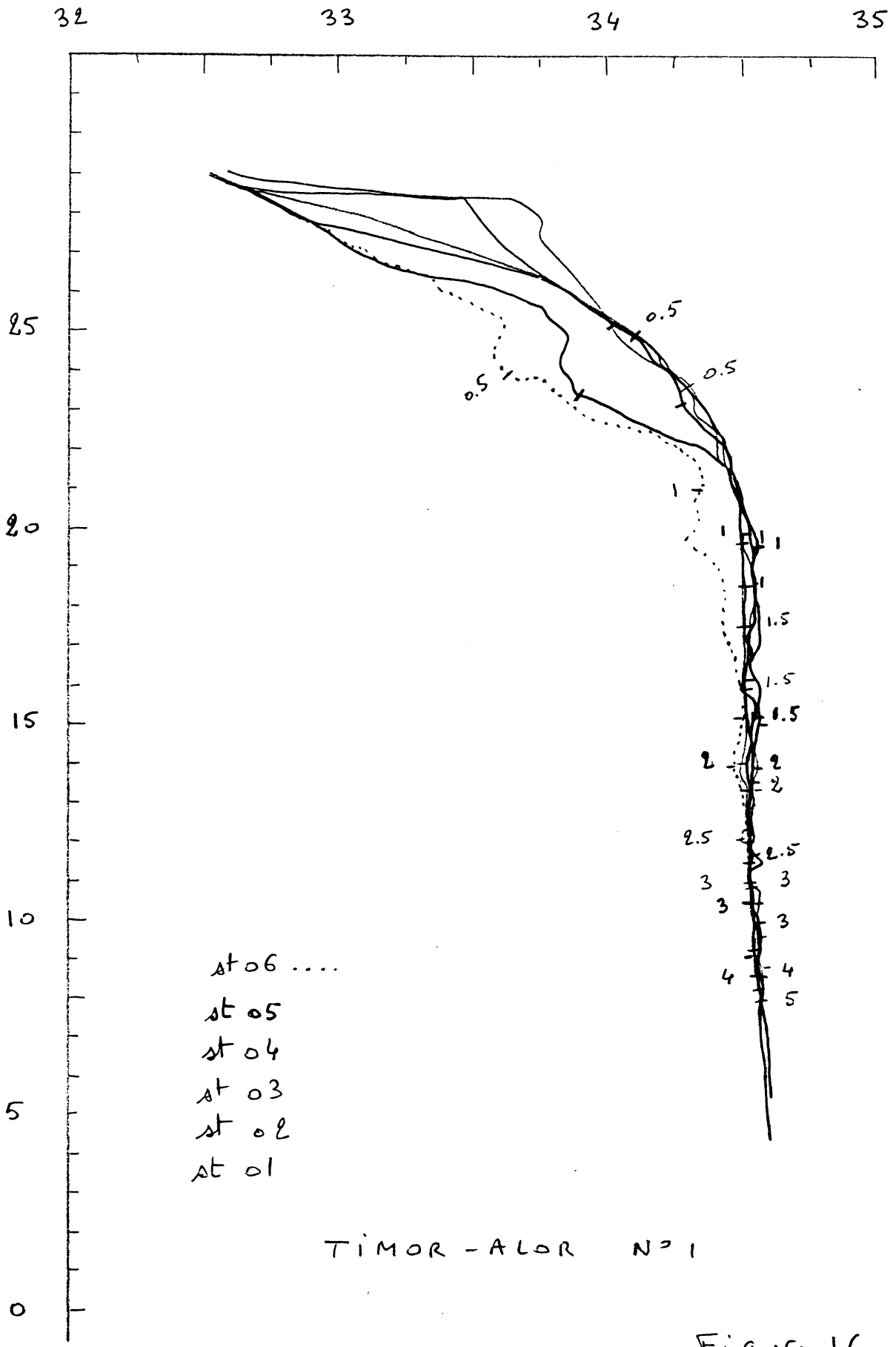
T-S diagrams



SECTION 3

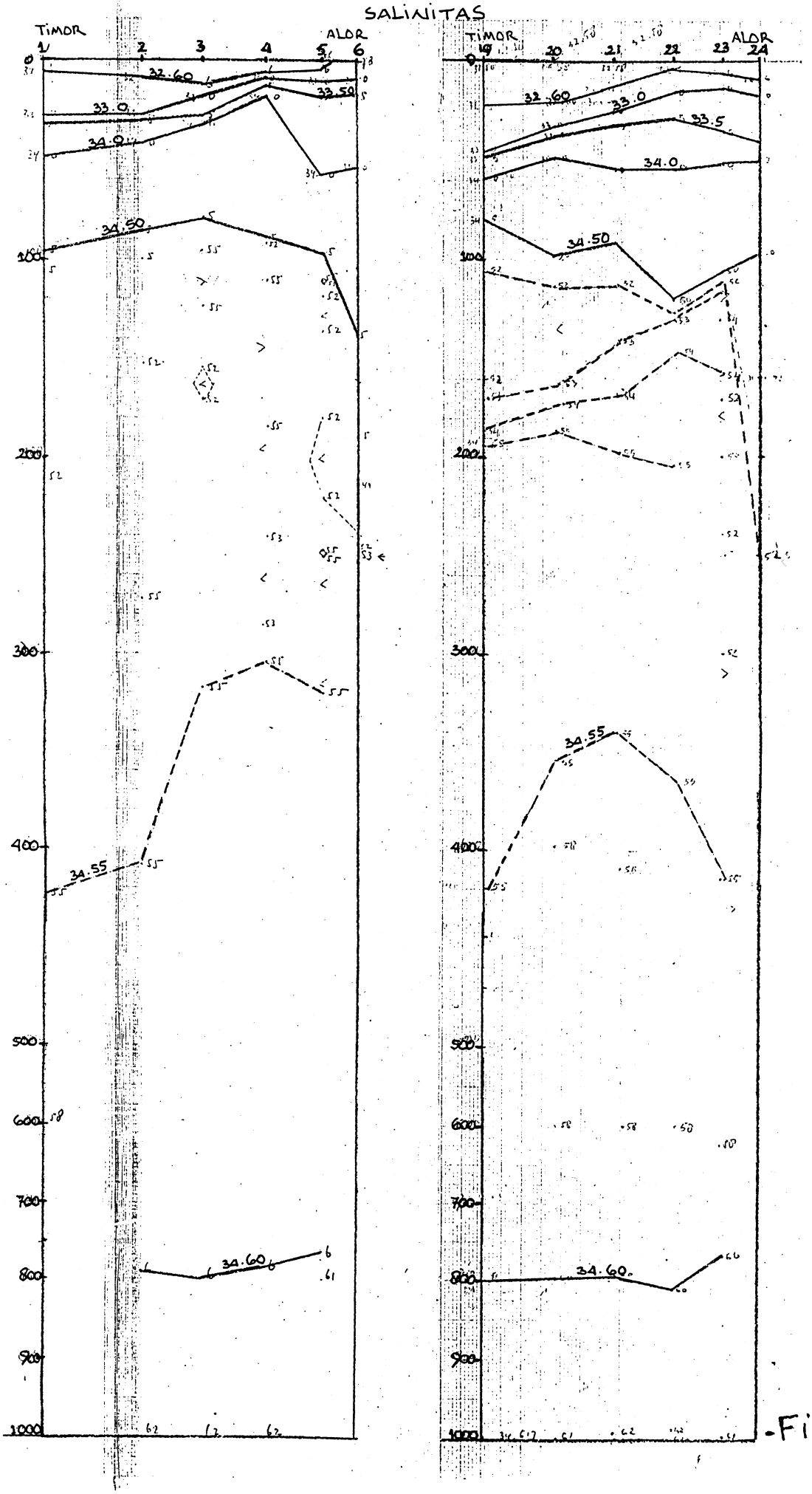
- Figure 15 -

T - S diagrams



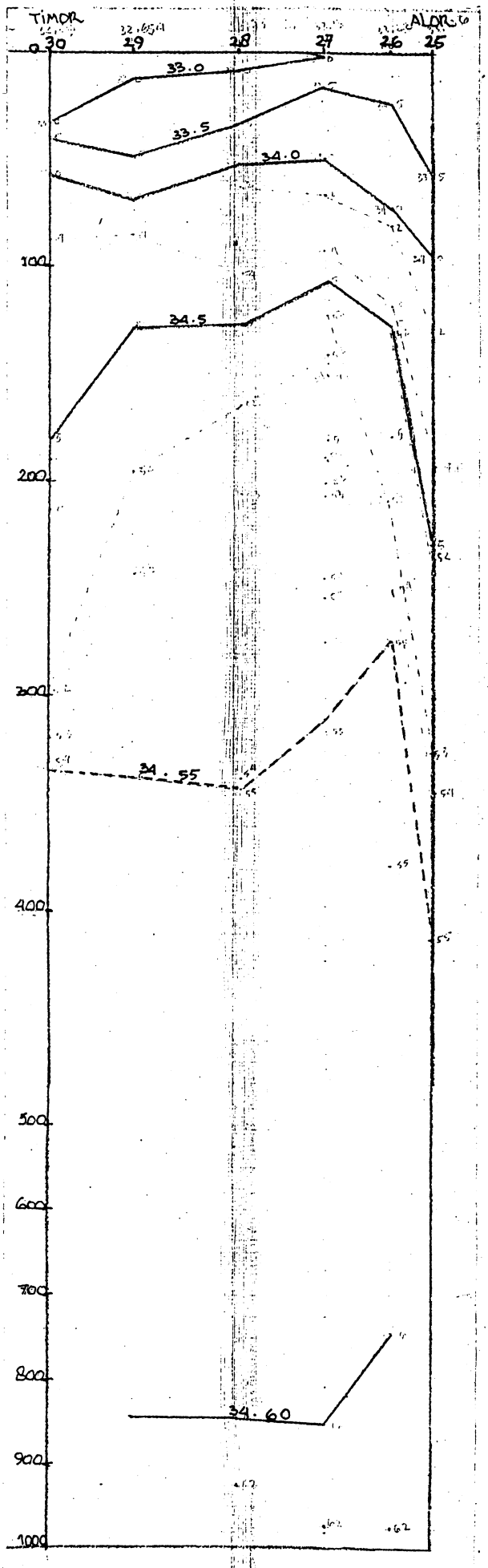
TIMOR - ALOR N° 1

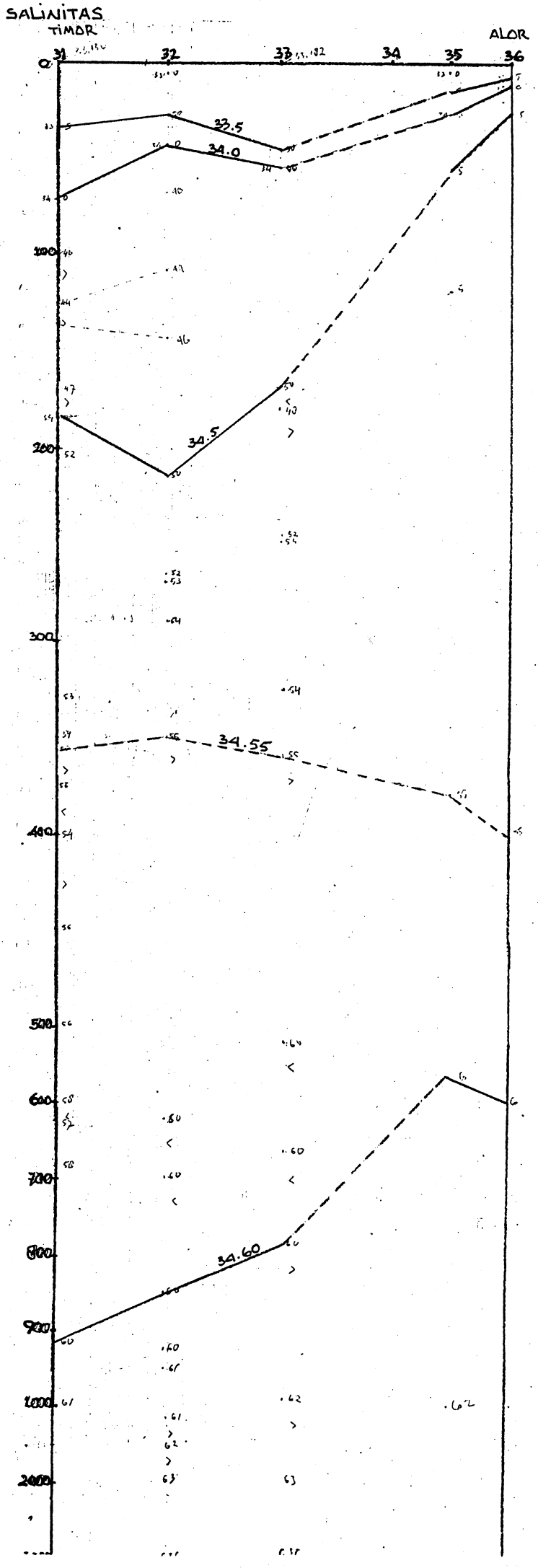
— Figure 16 —



section 1

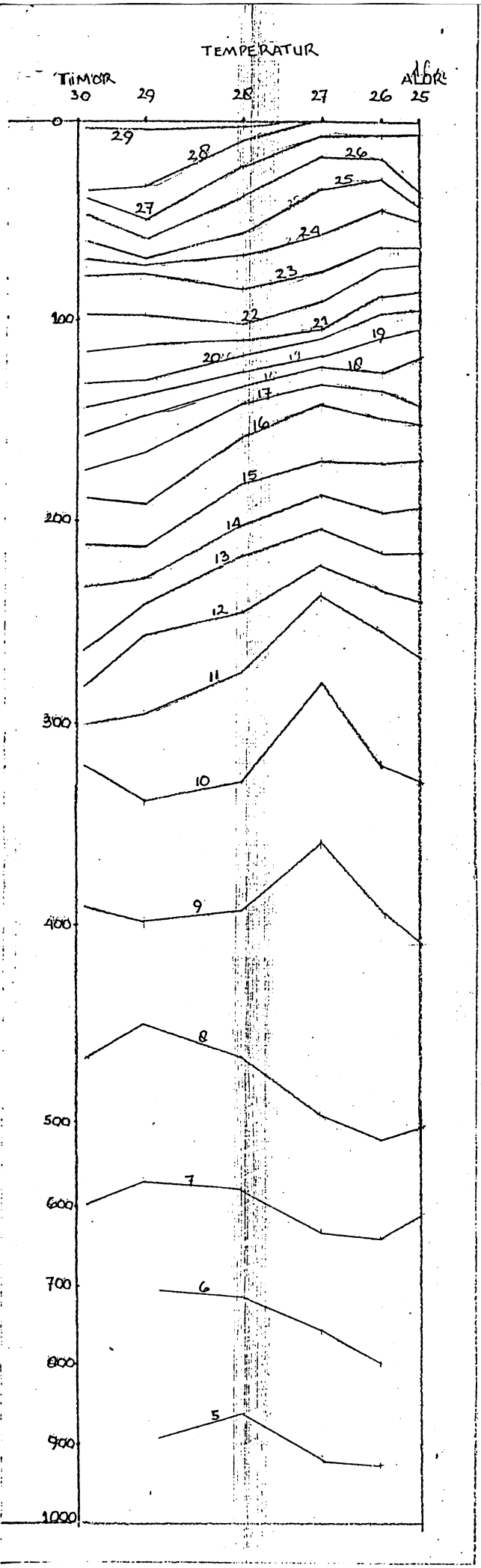
-FIGURE 17-


TIMOR
ALOR
30
29
28
27
26
25
33.0
33.5
34.0
34.5
34.55
34.60
100
200
300
400
500
600
700
800
900
1000

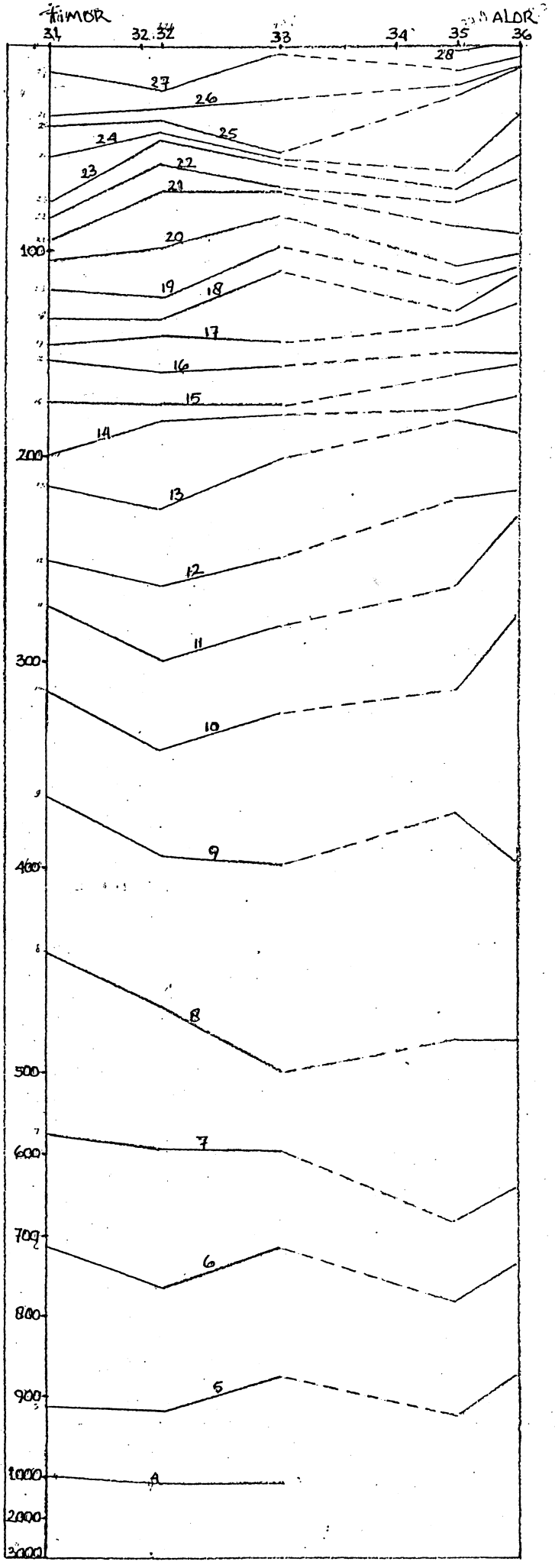

SALINITAS
TIMOR
ALOR
31
32
33
34
35
36
33.5
34.0
34.5
34.55
34.60
100
200
300
400
500
600
700
800
900
1000
2000

-FIGURE 18-

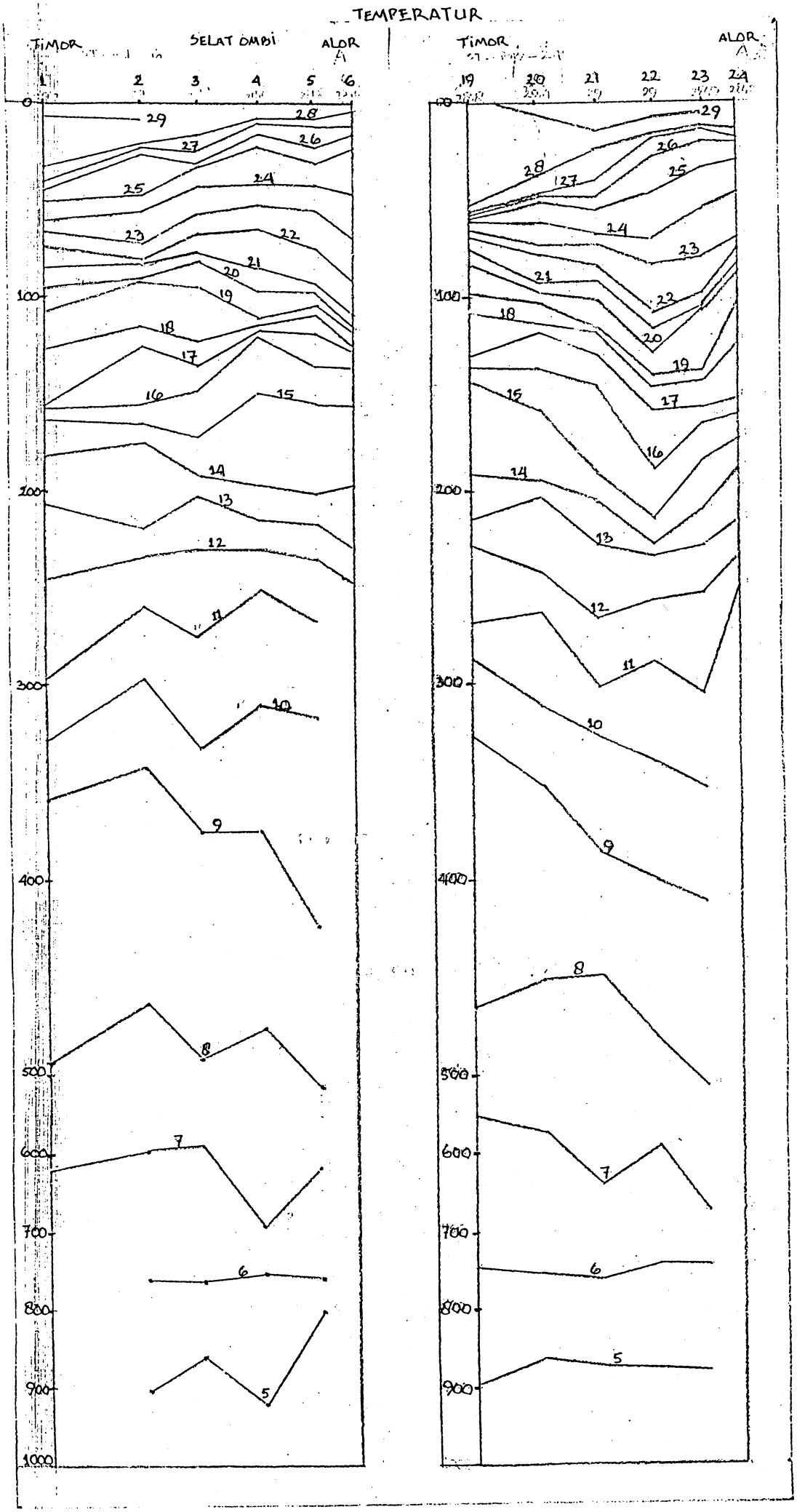
TEMPERATUR



TEMPERATUR



TEMPERATUR


TIMOR
SELAT OMBI
ALOR
TIMOR
ALOR
1
2
3
4
5
6
19
20
21
22
23
24
0
100
200
300
400
500
600
700
800
900
1000
29
28
27
26
25
24
23
22
21
20
19
18
17
16
15
14
13
12
11
10
9
8
7
6
5

IMPLEMENTING ARRANGEMENT

Between

THE FRENCH EXECUTIVE COMMITTEE FOR FRENCH-INDONESIAN COOPERATION IN OCEANOLOGY (REPUBLIC OF FRANCE)

and

THE AGENCY FOR THE ASSESSMENT AND APPLICATION OF TECHNOLOGY (REPUBLIC OF INDONESIA)

Concerning

THE JADE 93 CRUISE OF THE INDONESIAN RESEARCH VESSEL BARUNA JAYA I

LAMPIRAN III.2

DAFTAR NAMA-NAMA ANGGOTA DISHIDROS MABES TNI-AL
PADA SURVAI MINA ZEE 06-1992

No.	NAMA	PANGKAT/KORPS/NRP/NBI	KETERANGAN
1.	H a n d o k o	Letkol Laut (P) 7048/P	Komandan
2.	G o e n a d i	Mayor Laut (T) 7572/P	Kadep Sin
3.	E. Suprihariyanto	Lettu Laut (P) 10208/P	Ws. Palaksa
4.	M. Suprayitno	Lettu Laut (T) 10202/P	Kadiv MPK
5.	A. Wawan Gardiawan	Lettu Laut (P) 9183/P	Kadep Opssur
6.	Budi Siswanto	Lettu Laut (P) 9266/P	Kadep Log
7.	S u g i a n t o	Lettu Laut (P) 9299/P	Kadep Eka
8.	Aji Normanihadi	Letda Laut (T) 10110/P	Kadiv MPB
9.	Suharyanto	Serka ERA Nrp. 54565	Ba Sonar
10.	S u s i l o	Serka ESO Nrp. 54566	Ba Sonar
11.	S u g e n g	Serka MBT Nrp. 54593	Ba Dep Sin
12.	Mudjianto	Serka MDL Nrp. 54594	Ba Dep Sin
13.	Y. Gunadi	Sertu EKU Nrp. 58719	Ba Komputer
14.	T.S. Purnomo	Serda MDL Nrp. 53698	Ba Dep Sin
15.	Saidani Husein	Serda BEK Nrp. 54844	Ba Dep Log
16.	Nurul Komaril	Serda LKA Nrp. 54978	Ba Dep Sin
17.	M. Siregar	Serda BAH Nrp. 61957	Ba Dep Ops
18.	Agus Kurniawan	Serda KOM Nrp. 71802	Ba Komunikasi
19.	R. Hastungkoro	Serda NAV Nrp. 73673	Ba Navigasi
20.	Bambang. H.S.	Kopda MDL Nrp. 59318	Ta Dep Sin
21.	Nur Ngali	Kopda KOM Nrp. 59641	Ta Komunikasi
22.	Sunyata	Kopda MMI Nrp. 59879	Ta Dep Sin
23.	Edy Suyanto	Kopda BAH Nrp. 60125	Ta Dep Ops
24.	Sutaman	Kopda SEA Nrp. 60202	Ta DPB
25.	Agus Supriyanto	Kls RUM Nrp. 57789	Ta Kesehatan
26.	Herry Purnomo P	Kls MDL Nrp. 59208	Ta Dep Sin
27.	S u g o n d o	Kls TTB Nrp. 59815	Ta Masak
28.	Edy Kamulyan	Kls BAH Nrp. 60131	Ta Komandemen
29.	M u s t a k i m	Kls LKA Nrp. 66501	Ta Elektro
30.	M u s i r a n	Kls BAH Nrp. 67301	Ta Dep Ops
31.	H.T. Karel	Kls BAH Nrp. 67303	Ta Dep Ops
32.	T r u b u s	Kls BAH Nrp. 67304	Ta Dep Ops
33.	S. Prayitno	Kls PTR Nrp. 67374	Ta Dep Ops
34.	S u m i r a n	Kld ISY Nrp. 69535	Ta Dep Ops
35.	S u b a r n i	Kld SPK Nrp. 69323	Ta Dep Sin

JADE 93 IMPLEMENTING ARRANGEMENT

The French Executive committee for French-Indonesian cooperation in Oceanography and the Agency for the Assessment and Application of Technology (BPPT) wishing to reach an agreement (Memorandum of Understanding) for a research cruise in Timor and Sawu basins to be carried out under the "Arrangement between the Government of the Republic of France and the Government of the Republic of Indonesia on Scientific and Technological Cooperation", signed in Jakarta on July 13th, 1988, extended for three years beginning from July 13th, 1991 (exchange of diplomatic letters dated on February 26th and April 8th, 1991).

agree as follows:

ARTICLE I

OBJECTIVES OF THE PROJECT

The general scientific objectives is to study the dynamic and the water masses characteristics of the Timor and Sawu seas related to the Pacific-Indian throughflow under the influence of monsoon variability. The JADE 93 cruise is the continuation of the JADE 89, JADE 90 and JADE 92 cruises carried out in 1989 on board the Marion Dufresne, in 1990 on board the Baruna Jaya 1 and in 1992 on board the Marion Dufresne and the Baruna Jaya 1. The JADE 93 cruise consists basically of direct current measurements in the Timor strait and repeated CTD measurements in Timor strait and in the Sawu sea, between Alor and Timor, and between Sumba and Flores.

Main issues of JADE 93 cruise are :

Estimation of the transport through the Timor trench, from the surface to the bottom, and its annual variability.

Estimation of the correlated slope of the sea level at the same location which would hopefully enable to monitor the transport at a much lower cost , on a long time scale.

A continuing training of the Indonesian scientists, technicians and crew, which have been well engaged in the preceeding JADE cruises and subsequent stays of Indonesian scientists in France.

ARTICLE II

ACTIVITIES

1 . SURVEY AREA (see the map included)

The main survey areas are :

a) The western part of the Timor basin, between the continental shelf of Australia and Roti island where are the four moorings.

b) the Sawu sea :
- between Alor and Timor , at the eastern entrance of the Sawu sea where the channel to monitor is narrower.
- between Sumba and Flores where water coming from the west has been detected in 1992.

2 . ACTIVITIES OF THE PROJECT

- The priority of the activities to carry out during the cruise is to retrieve the four moorings launched in March 1992 in the Timor strait : two deep subsurface moorings with several currentmeters including ADCP (Acoustic Doppler Current Profiler) and two shallower moorings including only a pressure gauge on each side of the strait.

- The second priority is to make repeated CTD (conductivity, temperature , depth profiler) stations in the Timor strait, at the positions of the JADE 92 stations 32, 33 and 34 to get the variability (due to tidal activity) during 24 hours on each station. Then to go to the east of the Sawu sea to make repeated stations between Alor and Timor to get the water masses characteristics and their variability during 24 hours. At last to make repeated stations in the Sumba strait and between Sumba and Savu, Savu and Roti.

3 . CRUISE SCHEDULE

The duration of the JADE 93 cruise is 18 days from Jakarta to Jakarta, including a stop in Banyuwangi to embark French and Indonesian participants.

The JADE 93 cruise is scheduled to start on the 22nd of April 1993 with a stop in Banyuwangi on the 25th of April (which will leave 15 days between Banyuwangi and Jakarta).

ARTICLE III

RESEARCH VESSEL

The project will be carried out on the Indonesian research vessel BARUNA JAYA I belonging to the BPPT.

ARTICLE IV

PARTICIPANTS

Participation in the project shall be as follow :

a) INSU CNRS will provide the French scientific and technical party (6 persons)

b) Indonesian party : scientists, engineers and technicians from Indonesian agencies selected and coordinated by BPPT and LIPI (one Indonesian student will arrive in France on April to learn french and then start his study next October).

BPPT will take care of the visas and authorisations for non-Indonesian participants.

A list of the participants is given in Appendix I.

French chief scientist is Michèle FIEUX in charge of the retrieval procedure, Indonesian chief scientist is Abdul Gani ILAHUDE in charge of the CTD procedure.

SCIENTIFIC EQUIPMENT

Scientific equipment brought by the french team for the moorings remain the property of French Governmental Agencies which have sent these equipments for the duration of the cruise.
The french equipment needed on board for the cruise will be sent by air to Jakarta. The Indonesian party will take care of it and embark it on board before leaving Jakarta (absolutely necessary for the cruise).
BPPT will help the return to France of these equipments as soon as possible after the end of the cruise and before the end of June 1993.
The required ship equipment is listed in Appendix 2.

ARTICLE V

DATA PROCESSING AND REPORTING

1 . Current meters records will be extracted on board and copies will be made for each party.

2 . CTD measurements will be copied for the two parties.

3 . A cruise report will be written by the co-chief scientists at the end of the cruise.

4 . Data collected during JADE 93 cruise will serve as a base for the PhD of the Indonesian student starting in France in 1993 and who has already spent one month and a half in the French laboratory (LODYC, University Paris).

5 . Publications and presentations of the results in international journals and symposiums should mention that the results are based on the joint project between the Indonesian side and the LODYC which is supported by the French-Indonesian Committee and BPPT.

ARTICLE VI

COSTS

1 . The total charge of the cruise for the French Government, excluding salaries for french participants will be up to , from which a lump sum of will be paid by the french Government to BPPT for the cruise.

2 . Salaries, transportation and daily allowances for the French participants, as well as the shipping and running cost of their own instrumentation will be borne by their respective agencies.

3 . All other expenses necessary to carry out the project will be borne by the Indonesian part.

4 . All the eventual damages to equipment will be in charge of its respective owner.

ARTICLE VII

LAWS AND REGULATIONS INVOLVED

Activities conducted under this agreement shall be subjected to the laws and regulations of the respective countries and of international law.

ARTICLE VIII

DURATION

This Implementing Arrangement shall enter into force from the date of its signature until all work is completed.

On behalf of the French Executive Committee for French-Indonesian Cooperation in Oceanology
Republic of France

Michel HOUDART
French Executive Secretary
of the Committee

Michèle FIEUX
Co-Chief Scientist

On behalf of the Indonesian National Committee of Ocean Technology
Republic of Indonesia

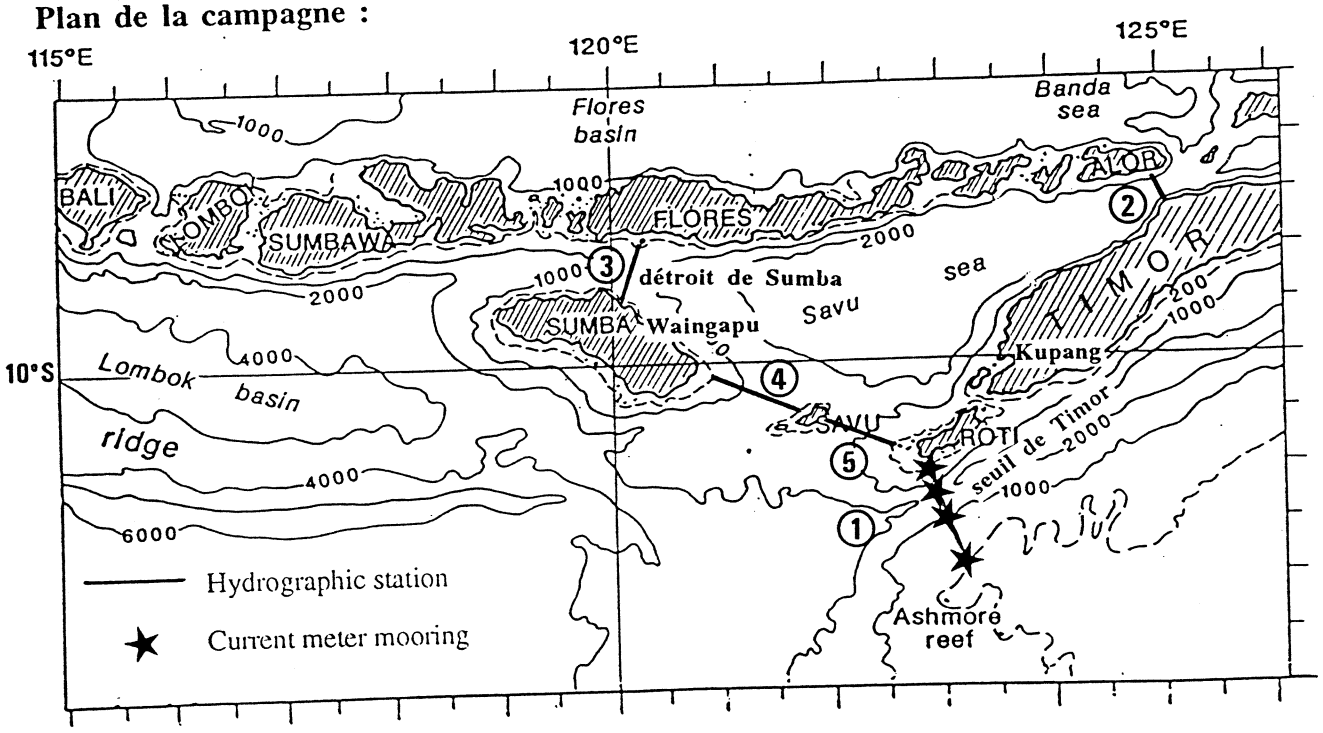
Idwan SOEHARDI
Indonesian Executive Secretary
of the Committee

Dipl. Ing. Basri GANIE
Project Officer of R/V Baruna Jaya I,II,III

On behalf of the Embassy
of the Government of France
in Indonesia

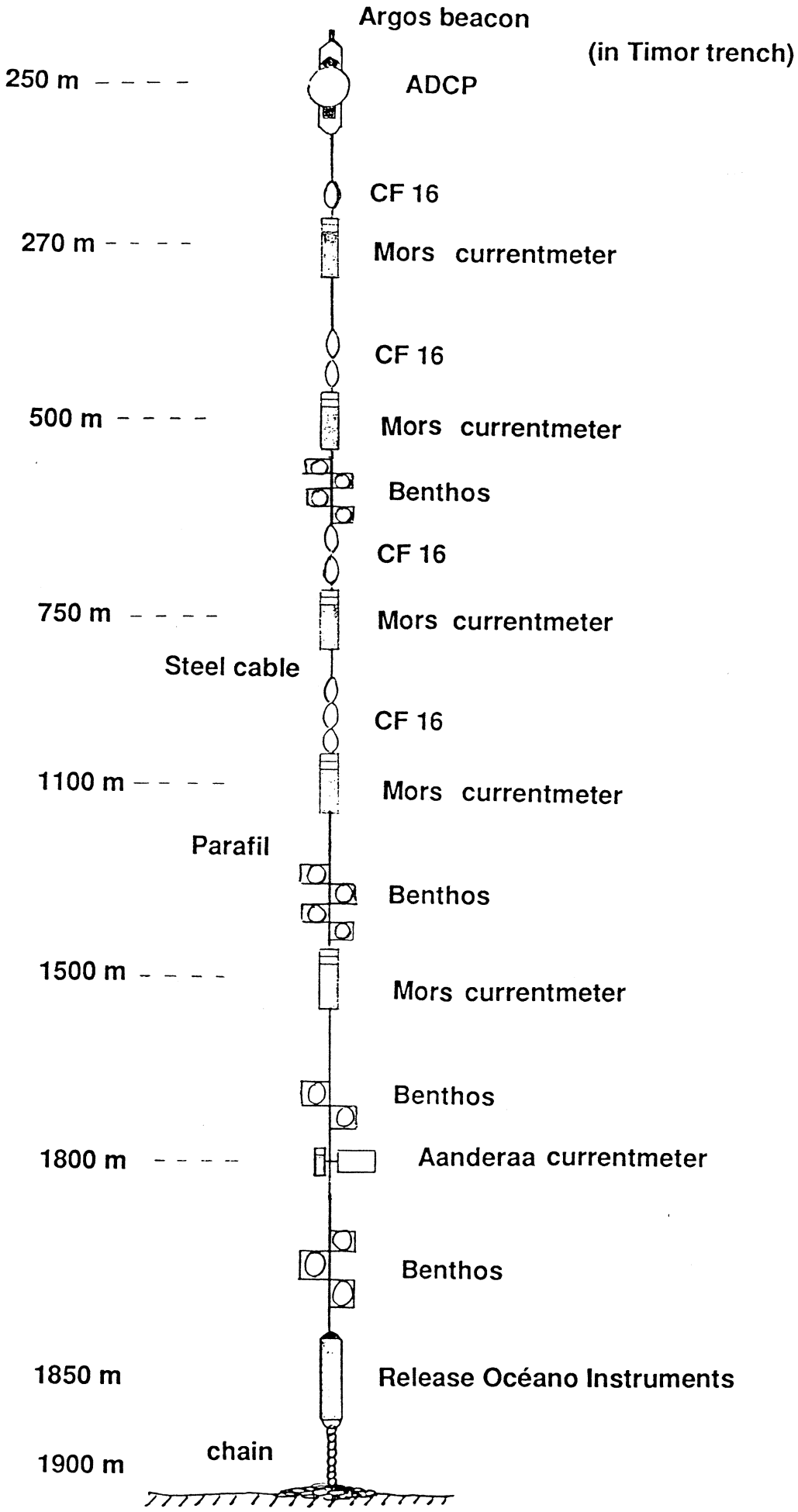
Marc PAIN
Attaché Scientifique

Plan de la campagne :



THE JADE 93 CRUISE

JADE MOORING



Appendix I

LIST of FRENCH PARTICIPANTS

Michèle FIEUX , (LODYC), Co-Chief scientist

Robert MOLCARD, (LODYC)

Maurice AMAUDRIC DU CHAFFAUT, (LODYC)

Claire LEVY, (LODYC)

Jacques LANOISELLE, (LODYC)

Claudie BOURNOT, (INSU)

Franck MIRAUX, (BPPT)

Appendix II

REQUIRED INSTRUMENTATION

A) " Baruna Jaya I" equipment necessary:

- normal oceanographic research vessel equipment in working condition including:
  . swinging stern gantry
  . 6 T crane
  . precision echosounder
  . GPS (Global Positioning Systeme)
  . radar Decca
  . CTD Guildline with on board acquisition system and rosette sampler, salinometer
  . zodiac (rubber dinghy with engine) to grab the moorings
  . 6000 m of big cable to drag in case the releases do not work (the same as in JADE 90)
  . check the 6000 m cable meter

- french equipement left on board the Baruna Jaya 1 in March 92:
  . ADCP, currentmeters and acoustics releases cases
  . big grapnel and small grapnel in case of dragging

B) French equipment which will be sent for the cruise (to retrieve and put on board in Jakarta before leaving Jakarta):

. 2 acoustic remote control Oceano Instruments TT 301 with hydrophone and 30 m cable.
. OAR receiver and Argos receiver
. GPS satellite portable navigator set
. large diameter pulley
. Toshiba PC, Zenith PC
. Aanderaa tape currentmeter reader
. normal water ampoules
. Tools boxes