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**Southern Ocean Panel**

Bremerhaven - May 12-14, 1986

**Brief Executive Minutes**

Leg 113 (Weddell Sea)

1. Panel requests that Leg 113 be delayed up to 10 days to optimize the prospect of sea-ice conditions, particularly at W4.
2. Additional sites in the vicinity of W4 were proposed by K. Hinz, D. Fuetterer and H. Dostmann, resulting from recent site survey of Polarstern. Panel decided that no more than the original allotted 14 days be given to W4 objectives.
3. Sites in S. Orkney transect should not be dropped in favor of W10.
4. Because of likelihood of time loss due to ice conditions (icebergs and sea ice) and weather during Leg 113, several scenarios were developed in which certain sites (or partial sites) are not drilled and/or W10 and W11 are drilled.

<u>Primary Proposal</u>	<u>Days</u>	<u>No. or partial W5</u>	<u>New W4 objectives no W5</u>	<u>No</u>	<u>W4s</u>
W1	3.6	W1 3.6	W1 3.6	W1	3.6
W2	4.7	W2 4.7	W2 4.7	W2	4.7
W4	11.2	W4 11.2	WII/2 ~6.0		
W4A	2.6	W4A 2.6	I/1 8.5		
			I/3 10.0		
W5	12.0	W5 ?	W5 -	W5	12.0
W6	3.8	W6 3.8	W6 3.8	W6	3.8
W7	2.5	W7 2.5	W7 2.5	W7	2.5
W8	<u>2.1</u>	W8 <u>2.1</u>	W8 <u>2.1</u>	W8	2.1
	42.5	30.5	41.3	W10*	2.0
		W5 up to 12 days depending on weather lost.		W11	<u>6.0</u>
					38.7

\*2 passage

5. Alternate W5 sites will be developed as formal sites. These will be further east in the Weddell Basin where the turbidite sequence is thinner. Thus the deep, primary targets will be more accessible to the drill bit. This new site will also provide greater flexibility if there is late sea-ice breakout at W4.

6. Panel recommends logging W4 and W5.
7. Panel supports ancillary programs using picket ship as long as these, in no way, interfere with the primary duties of the picket ship. Preference should be given to programs that support drilling objectives.
8. PCOM is asked to provide guidelines to co-chiefs, regarding the drilling of the South Orkney sites during Leg 114, if these are not completed during Leg 113.

#### Kerguelen Sites

9. Panel would like to reiterate its position that its highest priority for the two Kerguelen legs is completion of a north-south transect for this interpretation of Antarctic water mass and glacial history, including basement drilling in the northern and southern Kerguelen.
10. Objectives of Kerguelen-Prydz Bay are higher than Site S8b - but S8b is very highly ranked. S8b needs to be considered within the context of the other Indian Ocean objectives including Broken Ridge.
11. Can older parts of the northern Kerguelen sequence be drilled on Broken Ridge? (conjugate ridges before Anomaly 18). Panel requests that the various panels carefully examine this possibility.

#### South Pacific Sector

12. Proposals in vicinity of Australia and East Antarctica were examined in detail. (Other South Pacific objectives will be examined when results of South Pacific Workshop are completed and circulated.) Panel rated very highly a north-south transect that includes southern Australian and Wilkes Land - Adelie margins and the Australian discordance "cold-spot" objectives.
13. Ross Sea preliminary proposal also ranked very highly.

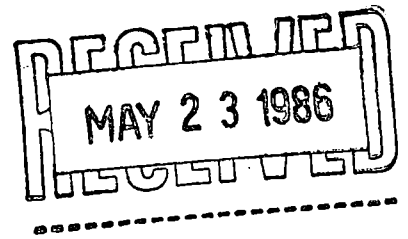
#### Panel Membership

Dr. E. Suess has resigned. Suggest replacement by Dr. D. DeMaster (Duke University) or Dr. K. Cochran (SUNY, Stony Brook).

Following next meeting Dr. H. Dick will resign. Suggest replacement by Dr. M. Fisk (OSU).

J. Kennett will resign as Chairman following November meeting. Drs. P. Barker and D. Elliot are suggested to PCOM for consideration.

May 22, 1986



**Southern Ocean Panel**

**Draft Minutes of Meeting - May 12-14, 1986**

**Bremerhaven**

Participants

Peter F. Barker  
Helmut Beiersdorf  
Brian Bornhold  
Paul Ciesielski  
Henry J. B. Dick  
David H. Elliot  
Dieter Fuetterer  
Reinhard Jung

K. Kaminuma  
James Kennett (Chairman)  
John LaBrecque  
Lucien LeClaire  
Suzanne O'Connell  
Erwin Suess  
Wilfreid Weigel

First Day Only

Karl Hinz  
J. B. Willcox

Minutes of the last meeting, held at Woods Hole, September 19-20, 1985, were approved.

The Chairman discussed the agenda for the meeting, noting the important decisions that have to be taken and that rotation of the Panel members must be considered.

Dr. Suzanne O'Connell presented the TAMU report. Leg 105 in Baffin Bay was accompanied by an ice picket boat, and she described the functions of that vessel (assessing the size and drift of the bergs). Discussion of the ice picket boat for Leg 113 ensued. TAMU is about to sign a contract for a vessel. The opportunity or desirability of a science program on that vessel was noted, and one preferred will be discussed later in the meeting.

Dr. O'Connell also reported on the science programs of the recently completed legs and those planned for the remainder of this year, and on the technological improvements and innovations such as the digitized borehole camera.

Dr. Helmut Beirsdorf presented the PCOM report. The European Science Foundation has officially joined; the Nordic council, with Norway the dominant partner, represents half the contribution. There was some discussion of the guide that PCOM uses for prioritization, and the Panel was pleased to hear that a COSOD II was planned for July, 1987, in Strasbourg. The future drilling after the two Kerguelen legs was discussed, particularly with reference to transit south of Australia or through the East Indies and the need for 15 months lead time for many legs which require drilling permission. The role of the Thematic Panel versus the Regional Panel was discussed, and it was noted that panel chairmen should meet regularly.

Dr. Beirsdorf reported a PCOM resolution that stated that Prydz Bay had been given high priority by SOHP and N. Kerguelen high priority by the Tectonic Panel. This provoked response from SOP which believes that the objectives for Kerguelen drilling have not been totally understood; a resolution reiterating the SOP view was drafted and reads:

In response to the PCOM minutes of 17 February, 1986, the SOP would like to reiterate its position that its highest priority for the two Kerguelen legs is completion of a north-south transect for the interpretation of Antarctic water mass and glacial history, including basement drilling in northern and southern Kerguelen.

Dr. Karl Hinz reported on the recent cruise of the Polarstern during which 6,200 km of MCS data were obtained from the Maud Rise and Caird Coast. A new drilling proposal has been formulated and submitted to ODP. The basic objectives of this proposal are the same as those originally forwarded by SOP to ODP (PCOM, SOHP etc.), but different sites are proposed for W4, alternates for W4, and an alternate for W5. The proposed W4 sites add up to 2,800 m of drilling, and the proposed alternate W5 to 2,400 m.

Considerable discussion ensued about whether the new proposed sites offer advantages over the old, and whether any can be combined in order to cut down total drilling time and core recovery. In the light of the allotted drilling time for W4, on the PCOM approved schedule, it became apparent that although the thicker sections offered a more complete recovery, that could only be achieved by sacrificing other high priority sites. The Panel decided that other sites should not be sacrificed, and therefore the W4 sites must be such that all objectives can be met in the allotted 14 days. Similarly, the proposed alternate W5 was rejected because it would require too much time.

There was also considerable discussion about the relative merits of W5 and other sites, and if ice conditions meant that one or more sites should be abandoned, which sites should these be? The discussion centered on the scientific returns of W5, bearing in mind that the site would have to be continuously cored and that the upper and middle parts are likely to be dominated by distal turbidites with or without hemipelagics. If so, does the existing W5 justify the allotted drilling time? The conclusion was reached that the upper part of the section is likely to be of much less value than the lower part which, on the other hand, will be an important deep water site for at least Paleogene History, will be complementary to the shallow water sites, and may contain a record that can be interpreted in terms of climatic and oceanographic evolution.

The Maud Rise Sites (W1 and W2) were reviewed in the light of the new data, and no reason seems to suggest any changes. Hinz will prepare the site survey information.

Dr. Peter Barker reviewed the recently acquired MCS data for the South Orkneys (W7 and W8). These data show that sites can be chosen that avoid terrigenous input from the S. Orkneys block. Barker will provide site survey data and site locations. Barker will also provide information for a contingency Site W8A (to NW of W8) which will probably have a late Pliocene to Quaternary section probably not preserved in W8 itself.

Dr. Erwin Suess reviewed the results of recent work in the Bransfield Strait. Although the Panel recognizes that this is a most important site for geochemical objectives, the consensus is that the S. Orkneys transect should not be dropped in favor of W10.

During the course of the day there was much discussion of the ice condition that might be encountered and the potential impact on the science program. As a result, a set of scenarios for the drilling leg were formulated (see Table below). These scenarios include abandoning various sites and picking up W10 and W11.

<u>Primary Proposal</u> <u>Days</u>	<u>No. or partial W5</u>	<u>New W4 objectives</u> <u>no W5</u>	<u>No</u>	<u>W4s</u>
W1 3.6	W1 3.6	W1 3.6	W1	3.6
W2 4.7	W2 4.7	W2 4.7	W2	4.7
W4 11.2	W4 11.2	WII/2 ~6.0		
W4A 2.6	W4A 2.6	I/1 8.5		—
		I/3 10.0		
W5 12.0	W5 ?	W5 —	W5	12.0
W6 3.8	W6 3.8	W6 3.8	W6	3.8
W7 2.5	W7 2.5	W7 2.5	W7	2.5
W8 <u>2.1</u>	W8 <u>2.1</u>	W8 <u>2.1</u>	W8	2.1
42.5	30.5	41.3	W10*	2.0
	W5 up to 12 days depending on weather lost.		W11	<u>6.0</u>
				38.7
				*2 passage

Dr. Barker will develop (using additional data to be sent by Dr. LaBrecque) alternate W5 sites further to the east in the Weddell Basin. In this region, much thinner turbidite sequences exist on crust of late Cretaceous age. Thus the deep, primary targets will be more accessible to the drill bit. A location further to the east will also provide greater flexibility in the drilling program by allowing W5 to be drilled before W4 if there is a late sea-ice breakout in the vicinity of W4.

The extent of logging the Weddell leg sites was again discussed at length. Dr. Jung presented a summary of the frequent downhole logging tools, the measurements taken and the inferences that can be drawn regarding composition, lithology etc. The tight schedule for Leg 113 makes logging all holes impractical if the primary objectives are to be met. It is recognized that logging would be of particular value in those holes where recovery could be poor, i.e. in land/turbidite sequences such as the Caird margin (W4) and the central Weddell Sea (W5). The panel feels that logging those holes will fulfill the needs of Leg 113 and satisfy the requirement of the Downhole Panel that logging be conducted for W4 and W5.

The ancillary proposal for science to be conducted from the picket boat was discussed, and the ramifications of such science programs were addressed by Dr. O'Connell for TAMU and Dr. Beiersdorf for PCOM. The Southern Ocean Panel preferred two resolutions:

1). The Southern Ocean Panel supports in principle that science be conducted from the picket ship, urges that preference be given to those programs that support the objectives of Legs 113 and 114, and recommends that no program be supported if it interferes with the primary duties of the picket ship.

2). The Southern Ocean Panel supports in principle that TAMU seek the option of the picket ship supporting science during Legs 113 and 114.

The Southern Ocean Panel regards the Bigg's proposal as scientifically valuable but peripheral to the main objectives of Legs 113 and 114, and would not rate it as highly as a well prepared proposal for geophysical surveys in the vicinity of the drill sites.

Further discussion of the ice problems of the Weddell Sea followed, and Barker presented tables of data on ice conditions at the various sites for the last 10 years (see attachment). In view of the record of ice conditions, the Panel supported the following request to PCOM:

The Southern Ocean Panel requests that PCOM consider delaying the start of Leg 113 up to 10 days in order to optimize the prospects for ice conditions, particularly at W4.

The Panel recognized the inherent uncertainties that stem from ice problems and have developed various scenarios for alternate Leg 113 schedules. In addition, Barker will develop alternate W5 sites, as formal proposals, to provide greater flexibility.

Also, a contingency site with new objectives, will be developed by Ciesielski and LaBrecque for drilling north of the South Sandwich Fracture Zone and east of the southern end of the South Sandwich Trench. Site SA1, further north of the above site, also constitutes a contingency site.

LaBrecque reported on site surveys planned for Leg 114. Polar Duke will be used for a 35-day site survey cruise of the western sites (SA1 through SA6) during August and early September. The Conrad will be available for a two week cruise in mid to late October for the eastern sites (SA7 through SA9). Discussion of the conjugate Sites SA3 and SA7 led to the recommendation by LaBrecque that suitable sites on Anomaly 22 be sought during these cruises. Other sites are not in need of significant relocation.

The question of ranking of Leg 114 sites versus Leg 113 sites was raised, but this had been largely dealt with in earlier decisions that all Leg 114 sites have lower rank than any Leg 113 sites. Nevertheless, the question of guidelines for Leg 114 co-chiefs regarding fulfilling remaining objectives of Leg 113 remains open. It was felt that a single site on the S. Orkneys probably would not warrant diversion of Leg 114, but two sites would. The entire scenario needs to be presented to PCOM for their comments and discussion, and provision of guidelines to the Leg 113 co-chiefs.

The Kerguelen Plateau and Prydz Bay legs were reviewed in the light of new MCS data presented by Dr. L. LeClaire (France) and Site S8b was reevaluated.

Recently acquired Japanese MCS data from off the continental shelf at Prydz Bay was reviewed, but there appeared to be no compelling reason to change the proposed sites based on the Australian data. However, the Australian data need further processing before specific sites can be developed that meet ODP requirements.

After a review of Australian single channel seismic lines from southern Kerguelen Plateau, Sites KP6 and KP10 site proposals were revised by positioning them on the R/V Rig Seismic Cruise 2 lines which pass on or near the original KP6 and KP10 sites. These two sites still represent a composite Neogene to basement sequence which serves as a southern component of the north-south transect. New KP6 and KP10 site characteristics are as follows:

Site KP6 on R/V Rig Seismic Cruise 2 single channel seismic line - F107, 2030Z; objective: expanded Neogene through ?Oligocene above middle Eocene break-up unconformity (~750 m) + less than 50 m penetration of unconformity.

Site KP10 on R/V Rig Seismic Cruise 2 single channel seismic line - F104, 1330Z; early Neogene to basement, ~550 m of Miocene - mid Eocene, ~200 m of Paleogene, ?m of Cretaceous + basement.

- 4) Wannesson *et al.* Adelie Coast.  
 Objectives: a) Early spreading history.  
 b) Dating of major unconformities.  
 c) Paleoenvironments.  
 d) Initiation of glaciation.
- 5) Eittrheim *et al.* Wilkes Land margin.  
 Objectives: a) Identification of the oldest oceanic crust.  
 b) Dating of regional unconformities.

This proposal and the Wannesson proposal were considered together because they address broadly similar objectives in adjacent areas.

- 6) Langmuir. Australian-Antarctic discordance "cold-spot."  
 Objectives: a) Sampling the oceanic crust to establish the age and duration of a plume signature that is associated with a topographic low in the mid-ocean ridge.

The Panel reviewed these proposals together and identified a potential Australia-Antarctic transect, along a flow line if possible, that would address

- a) passive margin evolution.
- b) paleoceanographic development of the gateway between Australia and Antarctica.
- c) paleoenvironmental evolution of the Southern Ocean in this sector.
- d) lithospheric anomalies.
- e) contrasting margin evolution resulting from ice loading.

The Panel decided that the proponents of the Ceduna Platform, discordance and Antarctic margin drilling should be asked to modify their proposals in the light of the need to develop a coherent plan for this region. A letter (copy attached) will have been sent to the proponents outlining the views of the Panel and seeking their help in preparing a revised set of sites that would accommodate this transect and could be presented to PCOM as a package. The present proposals will be sent to the proponents in order that the framework for the transect can be better appreciated.

The Panel rated this proposed transect package very highly. The South Tasman Rise proposal was rated next, recognizing that it addresses generic problems in transcurrent margin evolution. The Otway Basin proposal was given a lower ranking because of apparent problems stemming from the transcurrent nature of the margin. The Panel recognizes that the Otway Basin and the South Tasman Rise have the potential for addressing fundamental questions in transcurrent margin evolution as well as providing additional much needed information on paleoceanographic history through this gateway.

The Panel also reviewed a preliminary proposal, which it is believed will be submitted as a formal proposal to ODP within a month, for Ross Sea drilling. This proposal, which addresses questions of the Mesozoic-Cenozoic evolution of Antarctica, tectonism in the Ross Sea - Transantarctic Mountain sector, relations of uplift of the Transantarctic Mountains to glaciation, and high latitude biostratigraphy, was rated very highly.

The Panel enthusiastically endorsed the suggestion that there should be an International Conference on Southern Ocean and Antarctic Margin Problems after the South Atlantic (Legs 113 and 114) and Indian Ocean legs are completed and data analysis is well underway; the suggested date is summer 1989. This will be placed on the Agendas for the SCAR Working Groups on geology and on geophysics for their consideration at SCAR XIX in San Diego, June 16-20, 1986.

A review of Sites KP11 and KP12A revealed no new and available seismic data. New French lines have been taken in the vicinity of KP12A. However, these records are currently still unavailable.

A general discussion of the legs primary objectives followed: Should only the top and bottom of the Prydz Bay sequence be drilled? Should older parts of the Kerguelen sequence be drilled on Broken Ridge (this ridge was conjugate before Anomaly 18; more information on the structure and geology of Broken Ridge is needed)? The consensus of the Panel was that the objectives of the Kerguelen Plateau - Prydz Bay legs still take precedence over Site S8b. The Panel strongly supports the objectives of Site S8b but feels it needs to be rated in the context of IOP objectives as well.

Reports on the South Pacific and Antarctic Margin workshop were presented to the Panel. Ciesielski, Dick and Elliot gave brief presentations on the objectives and potential sites for, respectively, sediment and ocean history, lithosphere, and tectonics. The formal proposals in hand were then evaluated; the proposals are:

- 1). Hinz et al. South Tasman Rise.  
Objectives: a) Timing of Gondwanaland fragmentation.  
b) Depositional environments during fragmentation.  
c) Age and nature of an erosional surface on faulted basement blocks.  
d) Nature, age and origin of regional seismic unconformities.

A telephone call to Hinz established that the primary intent is to understand the relations of small, V-shaped basins to the early stages of separation which appear to be transtensional in character. Two sites are proposed with a third as an alternate.

- 2). Willcox et al. Otway Basin.  
Objectives: a) Dating of breakup.  
b) Depositional environments.  
c) Dating of regional unconformities.  
d) Detailed biostratigraphy.

In the ensuing discussion the Panel perceived two major difficulties. The first concerned the great stratigraphic thickness to be sampled, and the second concerned the fact that this is a transcurrent boundary and not orthogonal to the flow lines.

- 3). Veevers and Branson. Ceduna Platform, Great Australian Bight.  
Objectives: a) Unconformities.  
b) Subsidence history.  
c) History of rifted margin adjacent to very slow spreading MOR.  
d) Stratigraphic record from restricted ocean to open ocean.

The Panel views this proposal more favorably because the sites are better placed to address the evolution of a passive margin, and the sites also address other questions such as identification of unconformities.



The Southern Oceans Regional Panel of ODP has been assessing proposals in the Australian-East Antarctic region, in preparation for a PCOM meeting in August. At this meeting PCOM will discuss the possibility of JOIDES Resolution passing south of Australia, rather than north. Among the proposals considered were:

1. AADS and 6 Ceduna Plateau (Great Australian Bight) by Veevers and Branson;
2. AM 1 to 3 Adelie Land margin (East Antarctica) by Wannesson et al.;
3. WL 1 to 3 Wilkes Land margin (East Antarctica) by Eittreim et al.;

Also, a proposal,

4. To drill the Australian Discordance "cold-spot" (L6: Langmuir) had been considered at a previous SOP meeting.

The first three proposals have major objectives in common, and contain additional aims which may be more effectively addressed at one of the other locations. The SOP considers that, in combination, these proposals rank very highly, and would urge the proponents to consider consolidating their objectives. In addition, SOP considers that the fourth proposal could also be combined to some extent, either by shifting the other three westward onto the trace of the Discordance or by adding one or more dedicated sites to the others proposed.

SOP considers that:

(1) The questions of the age of the oldest magnetic anomalies, the position of the continent-ocean boundary and the nature (?restricted circulation) of the oldest post-rift sediments could be addressed in the Wilkes/Adelie margin area, using 2 or 3 sites with sediments not too thick.

(2) The same sites would provide a record of Antarctic climatic evolution.

(3) The shallower part of one of the holes proposed in the Ceduna Basin (provided that seismic profiles were made available) would yield a paleoclimatic record from the northern margin of the widening ocean, for comparison with (2) above. Drilling to 1,500 m here is unlikely to be considered realistic given the likely weather and hole conditions.

(4) The first three proponents should consider if their objectives could be attained along a mantle flow line from the Discordance (i.e. at the southern margin near 120° to 128°E). If not, Langmuir should consider if he would like to see one or two holes in moderately thin sediments added to the 4 or so proposed here, to pursue the cold spot story. The addition of one rather than two holes would need to be justified.

Further information, proponents should contact the following Panel members:

Eittreim	LaBrecque
Wannesson	Suess
Veevers	Ciesielski
Langmuir	Dick

This letter (to proponents) encloses a copy of the other three proposals concerned.

If any kind of combined proposal is produced, it should be sent to Tony Mayer at the JOI Office, Graduate School of Oceanography, University of Rhode Island, before (well before if possible) the end of July.

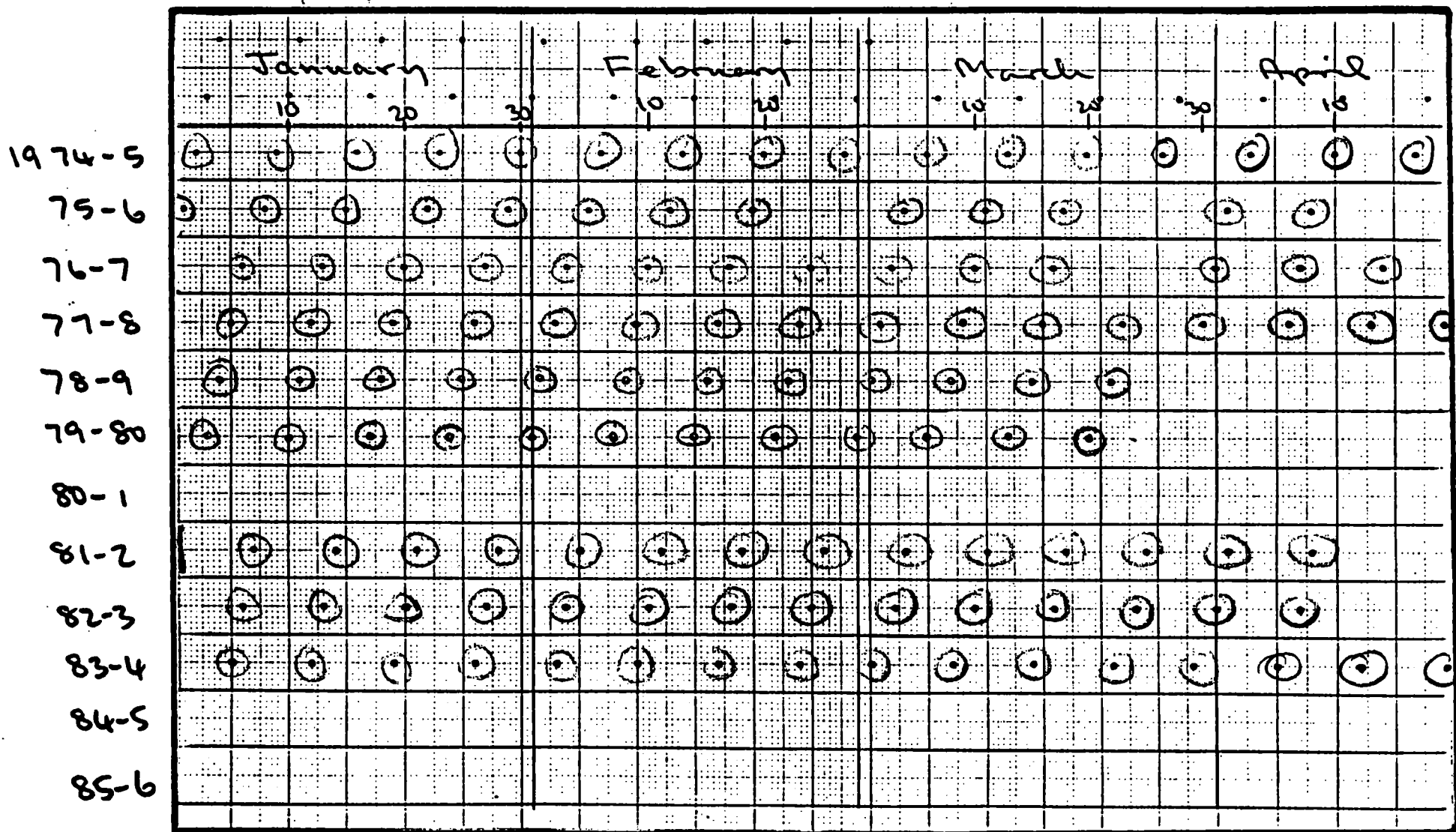
cc: 4 proponents  
4 contacts  
PCOM Chairman (+ Tony Mayer)  
IOP Chairman

The next meeting of the Panel has been tentatively set for Nov. 19-21 in Houston. The dates may be changed when the dates of the South Atlantic workshop are known.

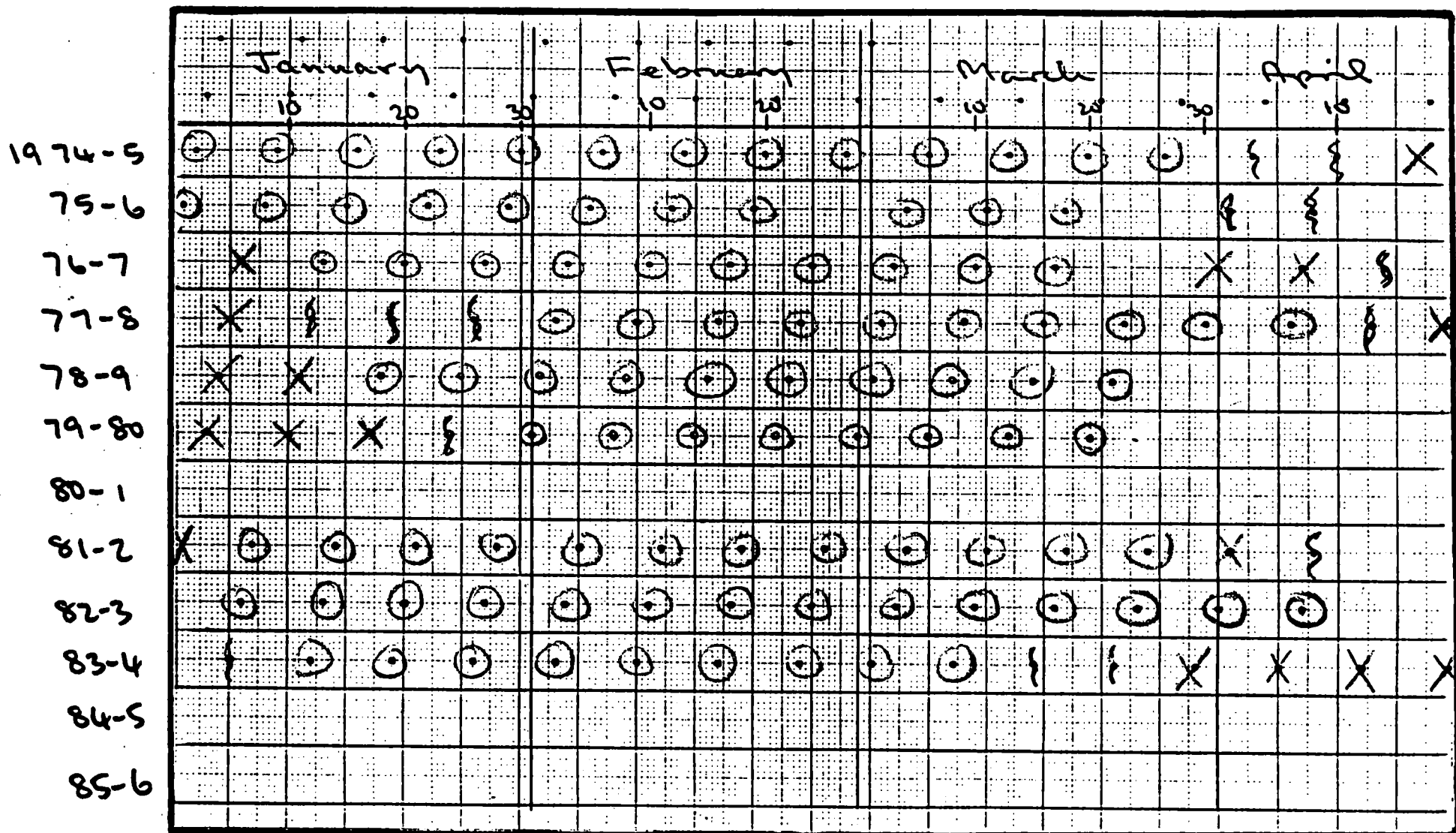
The rotation of members was considered. Dr. E. Suess has resigned, on the conclusion of this meeting. Dr. David DeMaster or Dr. Kirk Cochran will be suggested to PCOM as possible replacements. Dr. H. Dick will rotate off after the next Panel meeting; suggested replacement is Dr. M. Fisk.

Dr. J. Kennett indicated his intention of resigning as chairman after the next Panel meeting. Dr. P. Barker and Dr. D. Elliot will be recommended to PCOM for consideration.

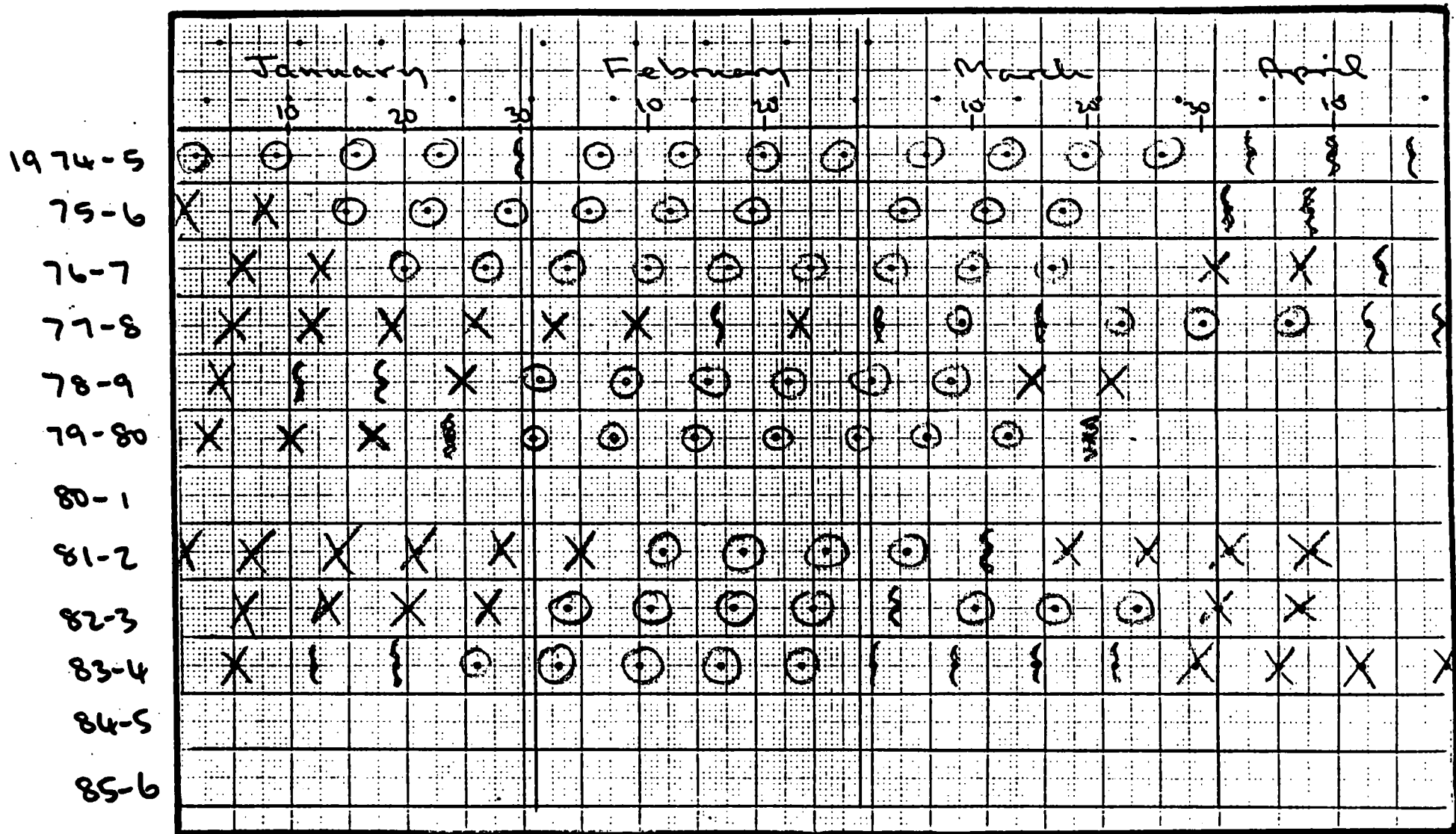
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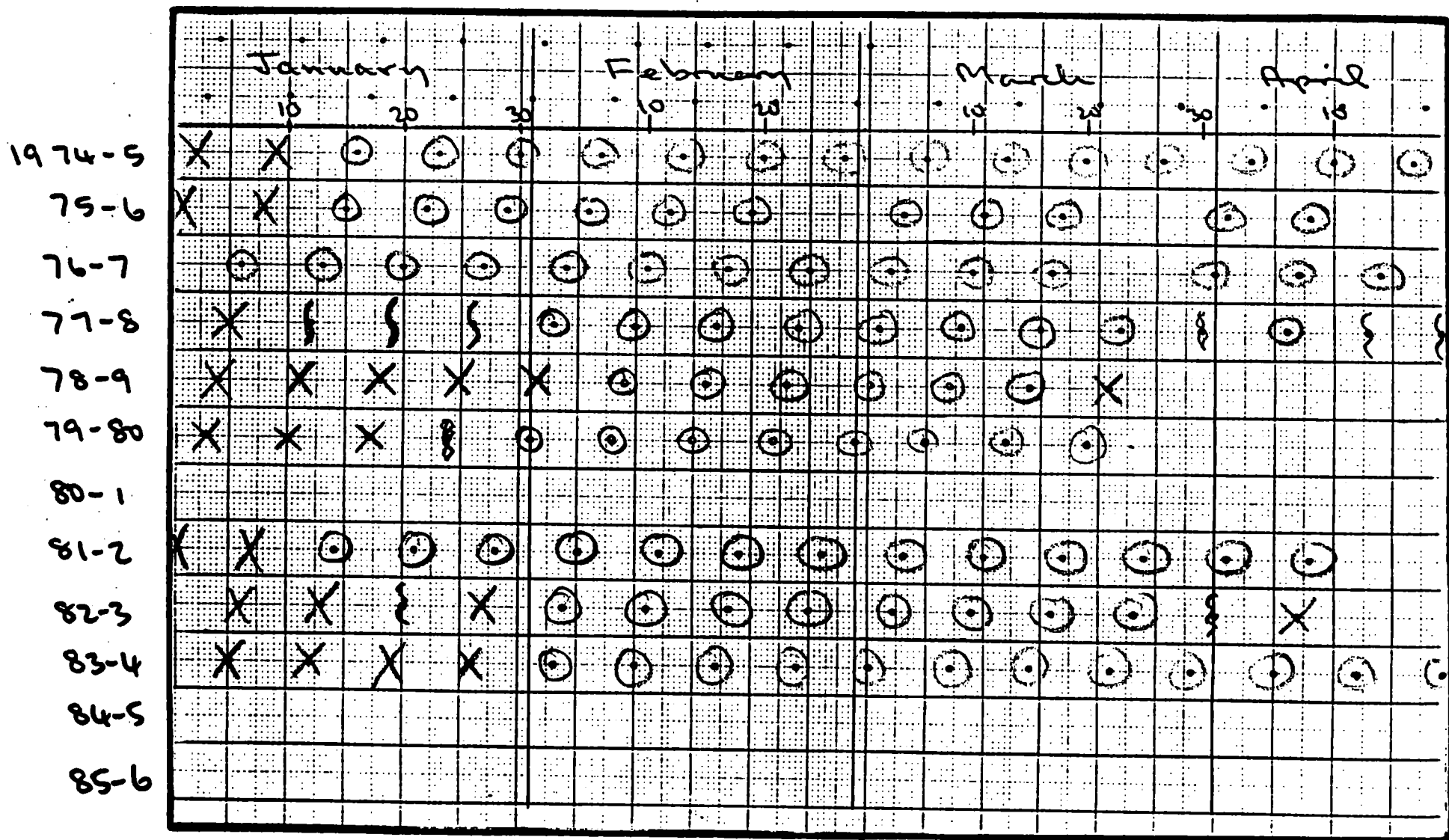
SEA ICE DISTRIBUTION. AREA: W1,2 . ~ 65°S 1°E  
Maud Rise



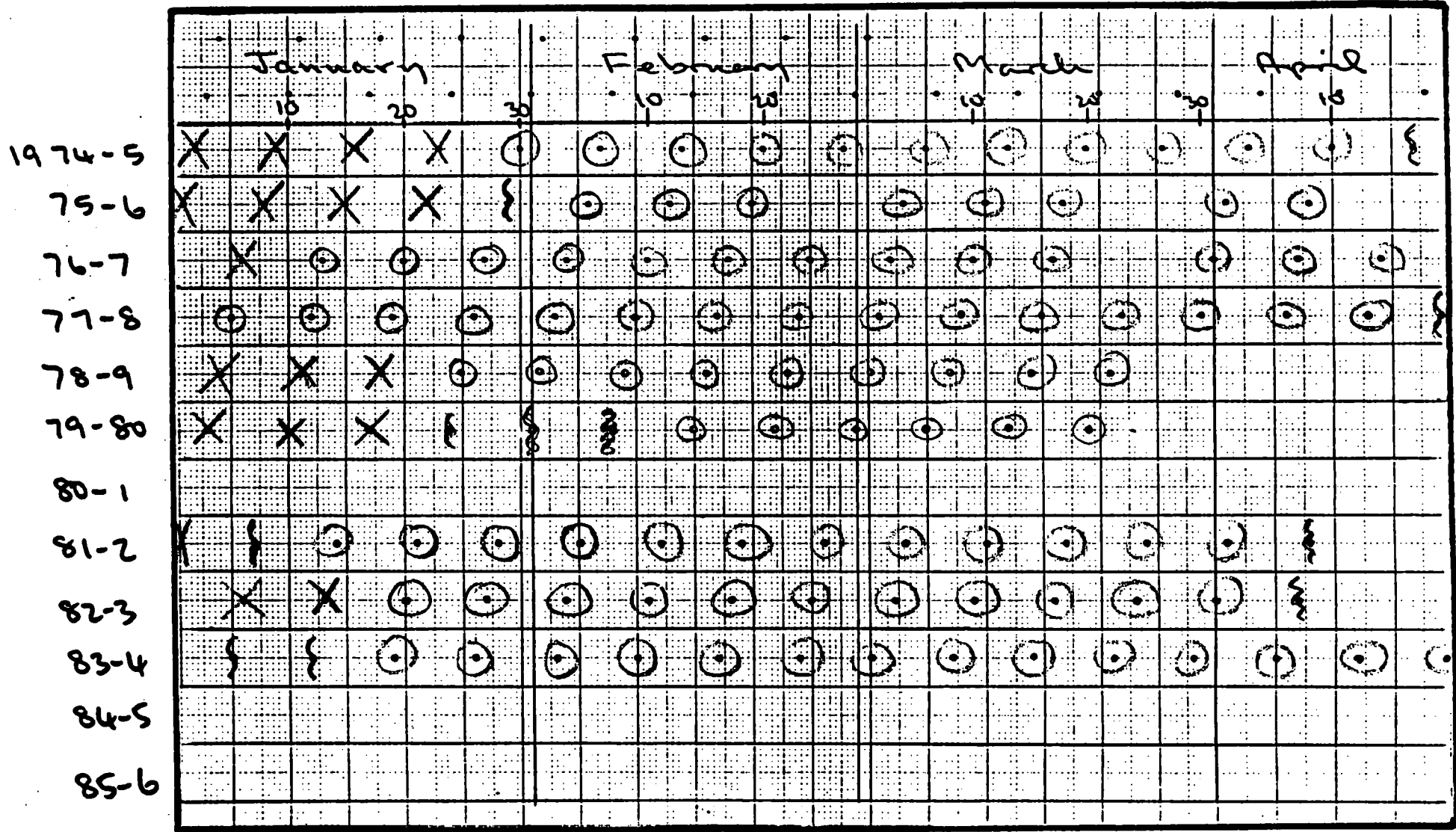
SEA ICE DISTRIBUTION. AREA: W3 67.6°S 11°E  
Astrid Ridge



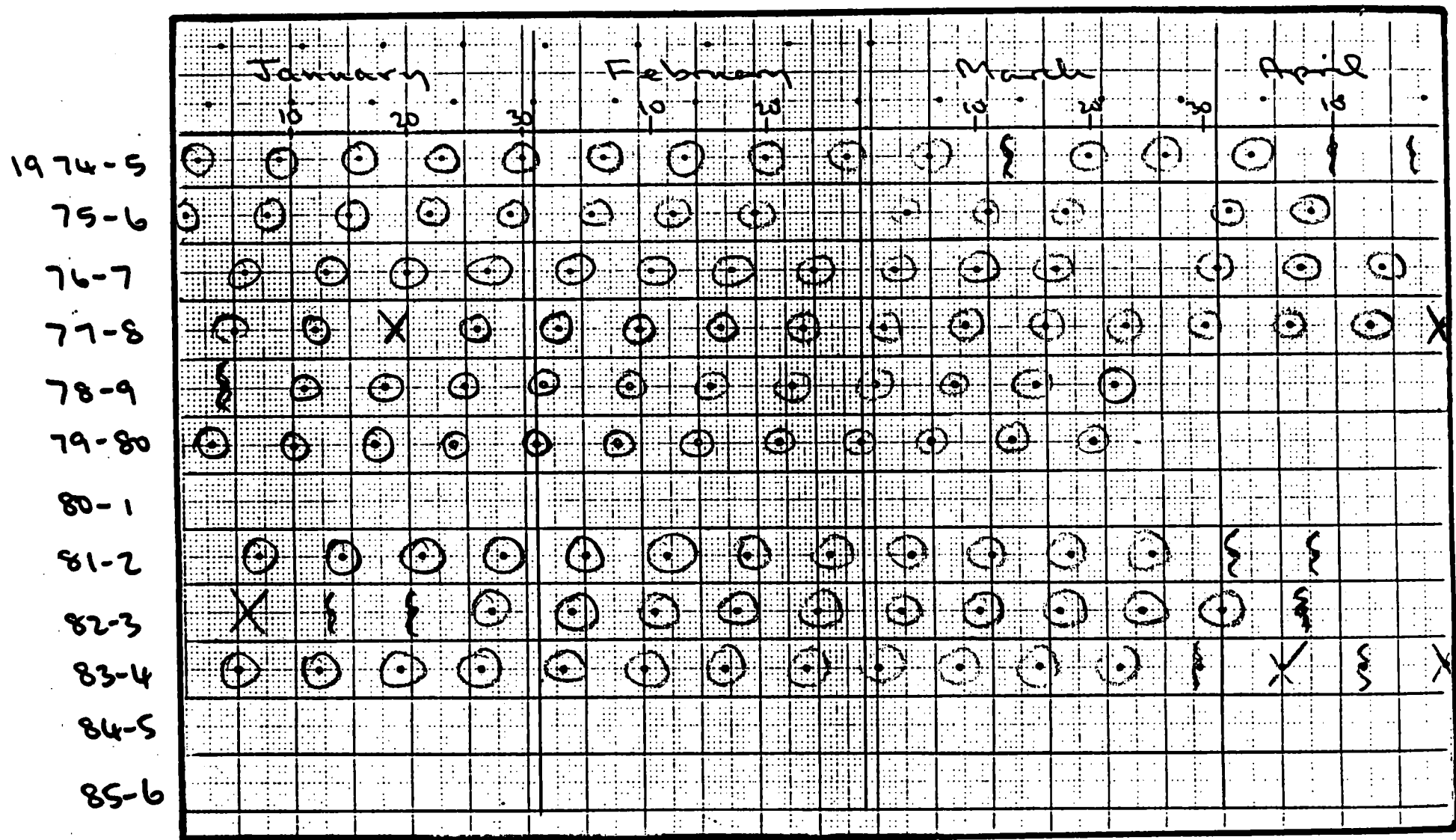
SEA ICE DISTRIBUTION. AREA: W4 70.5°S 14°W  
Eastern Weddell margin



SEA ICE DISTRIBUTION. AREA: WSC 65.4°S 37°W  
Weddell Basin

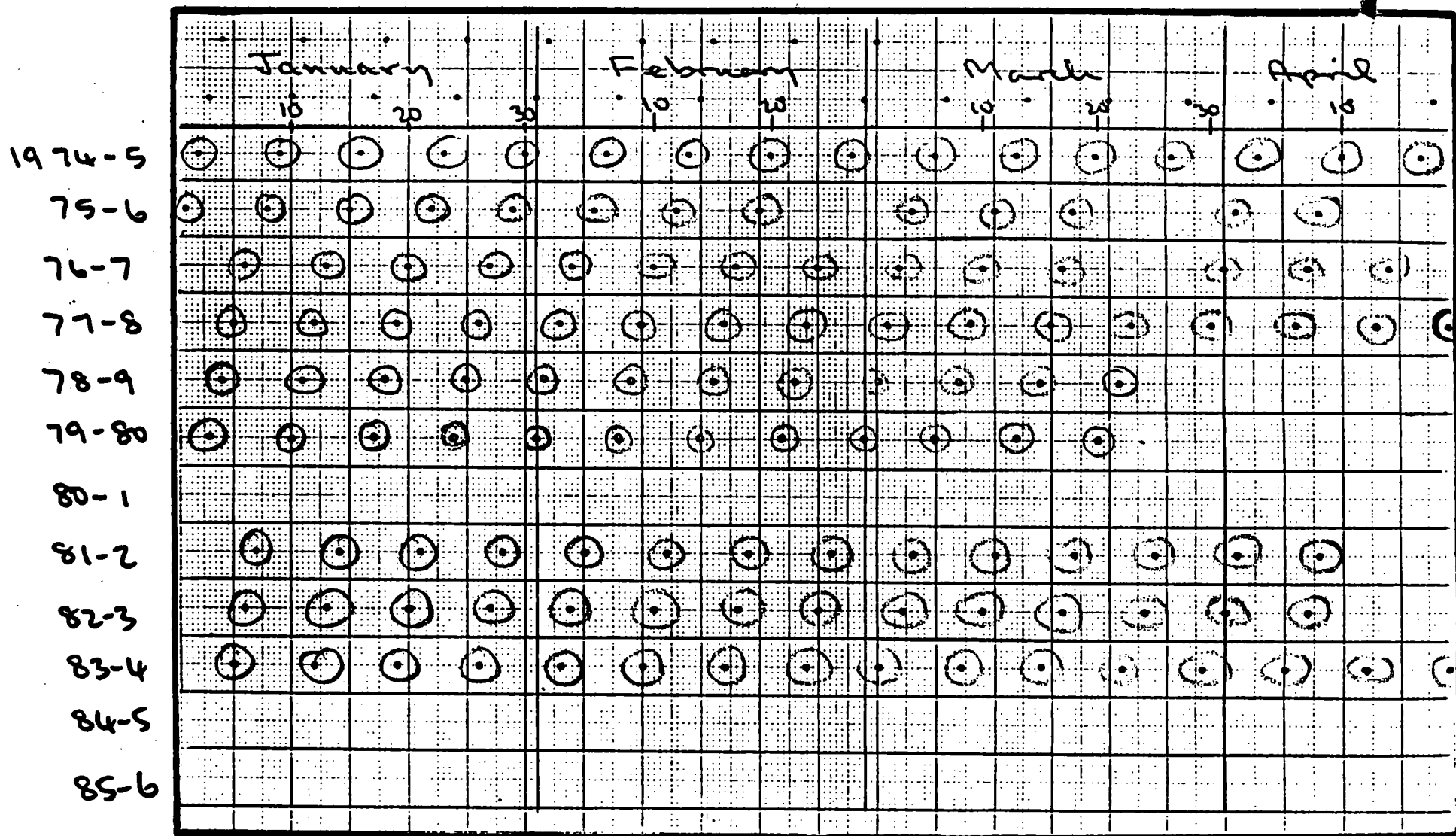


SEA ICE DISTRIBUTION. AREA: W6-W8 62°S 42°W  
SE margin S Okmen block



SEA ICE DISTRIBUTION. AREA: W10 62.3°S 57.5°W  
Bransfield Strait





SEA ICE DISTRIBUTION. AREA: W11 59.6°S 54.3°W  
Southern Drake Passage