Intergovernmental Oceanographic Commission
Reports of Meetings of Experts and Equivalent Bodies

IOC Editorial Board for the International Bathymetric Chart of the Mediterranean and Overlay Sheets

Third Session

Paris, 30 November-4 December 1987

Unesco

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In this Series, entitled

Reports of Meetings of Experts and Equivalent Bodies, which was initiated in 1984 and which is published in English only, unless otherwise specified, the reports of the following meetings have already been issued:

1. Third Meeting of the Central Editorial Board for the Geological/Geophysical Atlases of the Atlantic and Pacific Oceans
2. Fourth Meeting of the Central Editorial Board for the Geological/Geophysical Atlases of the Atlantic and Pacific Oceans
3. Fourth Session of the Joint IOC-WMO-CPPS Working Group on the Investigations of «El Niño» *(Also printed in Spanish)*
4. First Session of the IOC-FAO Guiding Group of Experts on the Programme of Ocean Science in relation to Living Resources
5. First Session of the IOC-UN(OETB) Guiding Group of Experts on the Programme of Ocean Science in relation to Non-Living Resources
6. First Session of the Editorial Board for the International Bathymetric Chart of the Mediterranean and Overlay Sheets
7. First Session of the Joint CCOP (SOPAC)-IOC Working Group on South Pacific Tectonics and Resources
8. First Session of the IODE Group of Experts on Marine Information Management
9. Tenth Session of the Joint CCOP-IOC Working Group on Post-IDOE Studies in East Asian Tectonics and Resources
10. Sixth Session of the IOC-UNEP Group of Experts on Methods, Standards and Intercalibration
11. First Session of the IOC Consultative Group on Ocean Mapping *(Also printed in French and Spanish)*
12. Joint IOC-WMO Meeting for Implementation of IGOSS XBT Ships-of-Opportunity Programmes
13. Second Session of the Joint CCOP/SOPAC-IOC Working Group on South Pacific Tectonics and Resources
14. Third Session of the Group of Experts on Format Development
15. Eleventh Session of the Joint CCOP-IOC Working Group on Post-IDOE Studies of South-East Asian Tectonics and Resources
16. Second Session of the IOC Editorial Board for the International Bathymetric Chart of the Mediterranean and Overlay Sheets
17. Seventh Session of the IOC-UNEP Group of Experts on Methods, Standards and Intercalibration
18. Second Session of the IOC Group of Experts on Effects of Pollutants
19. Primera Reunión del Comité Editorial de la COI para la Carta Batimétrica Internacional del Mar Caribe y Parte del Océano Pacífico frente a Centroamérica *(Spanish only)*
20. Third Session of the Joint CCOP/SOPAC-IOC Working Group on South Pacific Tectonics and Resources
21. Twelfth Session of the Joint CCOP-IOC Working Group on Post-IDOE Studies of South-East Asian Tectonics and Resources
22. Second Session of the IODE Group of Experts on Marine Information Management
23. First Session of the IOC Group of Experts on Marine Geology and Geophysics in the Western Pacific
24. Second Session of the IOC-UN(OETB) Guiding Group of Experts on the Programme of Ocean Science in relation to Non-Living Resources *(Also printed in French and Spanish)*
25. Third Session of the IOC Group of Experts on Effects of Pollutants
26. Eighth Session of the IOC-UNEP Group of Experts on Methods, Standards and Intercalibration
27. Eleventh Session of the Joint IOC-IHO Guiding Committee for the General Bathymetric Chart of the Oceans *(Also printed in French)*
28. Second Session of the IOC-FAO Guiding Group of Experts on the Programme of Ocean Science in Relation to Living Resources
29. First Session of the IOC-IAEA UNEP Group of Experts on Standards and Reference Materials
30. First Session of the IOCARIBE Group of Experts on Recruitment in Tropical Coastal Demersal Communities *(Also printed in Spanish)*
31. Second IOC-WMO Meeting for Implementation of IGOSS XBT Ship-of-Opportunity Programmes
32. Thirteenth Session of the Joint CCOP-IOC Working Group on Post-IDOE Studies of East Asia Tectonics and Resources
33. Second Session of the IOC Task Team on the Global Sea-Level Observing System

TABLE OF CONTENTS

		Page
1.	Opening of the Session	1
2.	Adoption of the Agenda	1
3.	Conduct of the Session, Documentation	1
4.	State of Preparation of the Overlay Sheets	1
5.	Working Arrangements for the Preparation of the Overlay Sheets and Technical Requirements for Them	5
6.	Updating of the Allocation of Responsibilities of the Participants of the Project and Consideration of Arrangements for Keeping a Record of Contributors and Institutions	6
7.	Problems Relevant to the Bathymetry of the Mediterranean	6
8.	Selling Arrangements and Publicity	9
9.	Date and Place of the Next Session	10
10.	Election of the Chairman and Vice-Chairman of the Editorial Board	10
11.	Adoption of the Summary Report	11
12.	Closure of the Session	11

ANNEXES

Annex I	Agenda
Annex II	List of Participants
Annex III	Legend of the Bouguer 2.67 Gravity Anomalies Sheets of the Mediterranean Region
Annex IV	Legend of the Instrumental Seismicity Sheets of the Mediterranean Region
Annex V	Specifications for the IBCM Geological/Geophysical Series
Annex VI	Specification for Reformatting/Plotting IBCM Digital Bathymetry Dataset
Annex VII	List of Abbreviations

1. OPENING OF THE SESSION

1 The Session was opened by the Chairman of the Editorial Board, Professor C. Morelli. The Assistant Secretary of IOC, Dr. V.G. Sedov, welcomed the participants on behalf of the Secretary IOC.

2 The List of Participants is given in Annex II.

3 Apologies were received from Captain S. Val'chuk, Dr. Kuprine and Professor Gennesseaux.

2. ADOPTION OF THE AGENDA

4 Two proposed changes to the Agenda were submitted by correspondence to the Editorial Board by Captain S. Val'chuk to consider under Item 5 the "Draft Minimal List of Basic Items to be Included in Each Map Legend of the IBCM Geological/Geophysical Series" and inclusion in Item 7 a new subitem 7.3 "Coastline to be shown on the IBCM Geological/Geophysical Series",thus removing it from Agenda Item 4.1. The Agenda is attached as Annex I.

3. CONDUCT OF THE SESSION, DOCUMENTATION

5 The participants took note of the available documentation and adopted, with some amendments, the timetable of the Session.

4. STATE OF PREPARATION OF THE OVERLAY SHEETS

4.1 BOUGUER GRAVITY ANOMALIES SHEETS

6 Professor J. Makris provided fair compilations of the ten sheets machine plotted on paper and gave explanations concerning the quality of the depicted data, indicating that new investigations of much better quality were recently made in some regions of the Mediterranean. After some discussion it was decided that inclusion in the sheets of these new data is out of question since any further delay in the sheets' printing is undesirable. It was also acknowledged that redrawing of the sheets on transparent stable plastic would involve considerable delay and that paper distortions, if any, can be easily detected and compensated for in the course of the cartographic process. For the above reasons, the participants decided to ask Captain S. Val'chuk either to accept the fair compilations drawn on paper, or the relevant magnetic tape written in 9 track 1600 bpi IBM compatible form, as ASCII or EBCDIC characters, with known record lengths and blocking factors.

7 The draft legend, also presented by Prof. J. Makris, as well as Captain S. Val'chuk's suggestions regarding the legend, were then considered.

8 After a lengthy discussion on the most proper way to describe the quality of data, etc., the Editorial Board agreed:

9 (i) to adopt the amended version of the legend (see Annex III), with the optional adding of letter "G" to each sheet number (at the Chief Editor's discretion); it was further decided that the scale 1:2 000 000 should be indicated on the Black Sea inset;

10 (ii) to request Professor J. Makris and Dr. M. Sarrailh to prepare within 2 months' time a report on the preparation and content of the gravity compilation bearing in mind that this report will constitute a chapter in a supporting volume on the IBCM and maps in Marine Geology and Geophysics;

11 (iii) to request Professor C. Morelli to prepare within 2 months' time the scientific part of a chapter on the IBCM, with Captain S. Val'chuk preparing the technical part of this chapter;

12 (iv) to confirm Dr. J. Hall as Editor of the Supporting Volume and to request the above conveners to send both draft chapters to him immediately upon completion for editing;

13 (v) to request Captain S. Val'chuk to publish both chapters together with the Gravity Anomaly Overprint Sheets of the IBCM.

14 It was acknowledged that because of the large time span (appr. 4-5 years) between the first and the last series of maps in Marine Geology and Geophysics it would be proper to publish relevant chapters separately, with a view to later assembling them into a single binder. It was felt, however, that the Chief Editor's consent on this matter is needed.

15 Dr. G. Udintsev kindly agreed to handcarry the Bouguer fair compilations and minutes of this session to Captain S. Val'chuk.

4.2 SEISMICITY SHEETS

16 Professor J. Bonnin of the EMSC made a presentation of the state of progress in preparation of the seismicity sheets. A computer file of the epicenters to be reported on the various sheets has been constructed, which includes coding of characteristics of each shock. Three files were used as sources : International Seismological Centre Historical File, 1904-1963 (all events); International Seismological Centre Catalogue, 1964-1975 (magnitude $\geq$ 4); and European-Mediterranean Seismological Centre Lists, 1976-1986 (magnitude $\geq$ 3).

17 A draft legend was presented and considered by the Board. After a lively discussion on the necessity of further subdivision for events at intermediate depths, it was recommended that the depth interval of 60-350 km be further divided into 60-150 km and 150-350 km. For this purpose, it was suggested that an additional symbol, a square, be used

for the very few events with depths exceeding 350 km. The adopted legend is attached as Annex IV.

18 The Editorial Board also recommended that a list of stations with their periods of operation be included in the supporting volume chapter or the seismicity sheets, and possibly the stations printed on the sheets. Small size examples of the future seismicity sheets, produced by Professor J. Bonnin with the help of the French Institut Géographique National, were considered by the participants and received enthusiastic approval.

19 Prof. J. Bonnin informed the participants about his previous intention to have colour separated offset films for each sheet also produced by IGN. It appeared, however, that production of 40 films (4 colour separation films for each sheet) will cost 100.000 FF, which the EMSC cannot afford.

20 The Editorial Board agreed to ask Captain S. Val'chuk whether it is possible to use data on magnetic tape for drawing colour-separated offset films at his department. If this is possible, then the tape could be sent to Captain S. Val'chuk within 2 weeks of his request.

21 Prof. J. Makris volunteered to prepare colour-separated copies of seismicity sheets on paper and send them to Captain S. Val'chuk if the tape cannot be used in the Charts Division.

22 It was estimated that, in the latter case, colour-separated paper copies could be ready by March 1988.

23 Dr. J. Hall volunteered to complete the volume with a bibliography of subjects related to an understanding of the geology and geophysics of the Mediterranean.

24 The participants then discussed whether a single-sheet version of the seismicity map should be printed. It was noted that simple photoreduction of 1:1 000 000 sheets, as was the case with the IBCM, will not be acceptable.

25 Participants felt that preparation of a single-sheet map would be desirable. It was felt, however, that the views of the Chief Editor are needed. So, it was decided to discuss this matter in his presence in Athens in October 1988.

26 Prof. Bonnin informed the Board that the European Geotraverse (EGT) is interested in using the seismic, gravimetric and aeromagnetic information to be shown on the overprint sheets of the IBCM. The Editorial Board agreed to this request, provided that its authorship will be duly noted, and requested the Secretary IOC that the IOC Executive Council be informed of this decision.

4.3 MAGNETIC ANOMALIES

27 Dr. A. Galdenao was invited to present the state of progress of these sheets.

28 He stated that he possesses materials of good quality for most of the western and central Mediterranean, which he has already homogenized. A proper reference surface has not yet been found for all Italy. No data are available for Tunisia, Algeria, Libya and Morocco. If this situation continues then Magsat data reduced to the Earth's surface will be used for these areas. Prof. Burollet said that most of Libya is covered by an aeromagnetic survey but the data have not been published. It was agreed to ask Drs. Udintsev and Kuprin to find out whether these data can be obtained.

29 In the course of the discussion, an agreement was reached between Dr. A. Galdeano and Prof. J. Makris on basic parameters (reference surface, grid, spacing of contours, etc.) for both the eastern and western Mediterranean sheets.

30 As regards the eastern Mediterranean, Prof. J. Makris stated that while there exists sufficient, though unhomogeneous, data for the marine areas, the situation with the land areas is much more problematic. No data are as yet available for Turkey, Libya, Bulgaria, Romania, Yugoslavia and part of Egypt.

31 Only the vertical component of the magnetic field was measured for most of Greece.

32 Dr. G. Udintsev agreed to find out whether some data for the southern Mediterranean can be supplied by the USSR institutions.

33 An in-depth discussion then took place regarding different approaches to data representation in areas covered with poor and/or highly unhomogeneous data. No decision was reached as to whether a patchwork representation of existing data is preferable to a rigorous reanalysis of the original data which will probably take too long and cost too much.

34 It was recognized that the current situation does not permit establishing a realistic date for completion of compilation of the map. It was hoped, however, that the situation will be more clear by October 1988.

4.4 PLIO-QUATERNARY/MESSINIAN SHEETS

35 Professor Burollet made a presentation on behalf of Prof. M. Gennesseaux, of sheets 1-3 and 6-8 of the map, with 200-metre isopach intervals.

36 The Editorial Board noted that the western Mediterranean

.. sheets are nearing completion, and recommended that areas of detailed survey be indicated on the map. Isolated tracks in areas of reconnaissance should be overprinted in grey, subject to proprietory interests.

37 Professor G. Udintsev was asked to handcarry sheets 3 and 8 to Dr. P. Kuprin in order to provide for better coordination in preparation of the eastern and western sheets. The Editorial Board recommended that Prof. M. Gennesseaux should contact his Soviet colleagues in order to further clarify technical details.

38 The Editorial Board considered the proposals of Dr. P. Kuprin concerning the preparation of the sheets and agreed:

39 (i) that preparation of a single-sheet map of Messinian surface structure at the scale of 1:5 000 000 would be useful and asked Dr. Kurpin and Prof. Gennesseaux to undertake its preparation;

40 (ii) to adopt in general the proposal of preparation of small-scale maps or insets to show the structure of Messinian base and maps or insets of thickness of the Messinian sediments;

41 (iii) that the two interpretations of seismic profiles in the Nile fan region should be discussed during the next ICSEM Congress (Athens, 17-22 October 1988).

42 Dr. Udintsev kindly offered to bring the above two interpretations to the attention of Soviet geologists who will attend an All-Union meeting on oceanography (Leningrad, middle of December 1987).

4.5 UNCONSOLIDATED SEA-BED SEDIMENTATION SHEETS

43 Papers submitted by Dr. P. Kuprin entitled "State of Progress in Preparation of the Recent Sedimentation Map" and"Explanatory Note to the Draft Legend", were considered.

44 Prof. C. Morelli undertook to send both documents to the sedimentologists involved in the Mediterranean, accompanying them with a request for data. The Editorial Board also asked the Secretary IOC to do the same.

45 Prof. P. Burollet undertook to send Dr. P. Kuprin data for Tunisia and also to try to have the data for the Algerian shelf and slope sent to him.

46 Dr. J.K. Hall reported that he planned to approach the British Hydrographic Department in Taunton shortly by to obtain copies of the original boat sheets of historical surveys on the continental margins (near ports) of Israel, Lebanon and Syria. These include bottom sample descriptions of an empirical nature which might be of use in the recent

sediment compilations. These would be provided to Dr. Kuprin as digital files of location and sediment type.

5. WORKING ARRANGEMENTS FOR THE PREPARATION OF THE OVERLAY SHEETS AND TECHNICAL REQUIREMENTS FOR THEM

47 Draft specifications for the Overlay Sheets in Marine Geology and Geophysics and a "Draft Minimal List of Basic Items to be included in each map legend" proposed by Captain S. Val'chuk, as well as amendments to the Draft Specifications, were considered.

48 The Editorial Board agreed that a more appropriate name for maps in marine geology and geophysics which are being produced under this project would be "IBCM Geological/Geophysical Series", rather than "IBCM Overlay Sheets in Marine Geology and Geophysics".

49 The Editorial Board adopted, with some amendments, the Specifications (see Annex V) with two appendixes: "Minimal list of basic items to be included in each map legend of the IBCM Geological/Geophysical Series" and "Working arrangements for preparation of the IBCM Geological/Geophysical Series".

6. UP-DATING OF THE ALLOCATION OF RESPONSIBILITIES OF THE PARTICIPANTS OF THE PROJECT AND CONSIDERATION OF ARRANGEMENTS FOR KEEPING A RECORD OF CONTRIBUTORS AND INSTITUTIONS

50 The participants recalled that responsibilities of the project participants have changed since the 2nd Session of the IBCM Disciplinary Group on Overlay Sheets in Marine Geology and Geophysics (1981), when they were first established.

51 The Editorial Board agreed the following list of Scientific Co-ordinators:

1. Bouguer Gravity Anomalies Sheets - Dr. G. Balmino (BGI);
2. Seismicity Sheets - Prof. J. Bonnin (EMSC)
3. Magnetic Anomalies Sheets:
   - sheets 1-3 and 6-8 - Dr. A. Galdeano
   - sheets 4, 5, 9, 10 - Prof. J. Makris
4. Plio-Quaternary Messinian Sheets - Prof. M. Gennesseaux
5. Unconsolidated Sea-Bed Sedimentation Sheets - Prof. P. Kuprin

52 It further decided that the above-mentioned Co-ordinators, rather than the IBCM Secretary, should keep records of contributors to the corresponding maps.

7. PROBLEMS RELEVANT TO THE BATHYMETRY OF THE MEDITERRANEAN

7.1 DIGITIZATION OF IBCM BATHYMETRIC CONTOURS

53 The Editorial Board noted with pleasure that two copies of the magnetic tape of IBCM bathymetric contours, prepared by Petroconsultants S.A., Geneva, had been received by :

54 (i) the Secretary IOC, and

55 (ii) the Chairman of the GEBCO Sub-Committee on Digital Bathymetry.

56 This had been prepared using the GEODAT standard format. A publicity brochure and order form have also been issued by Petroconsultants S.A.

57 Computer plots of all ten sheets of the IBCM, prepared from this tape by the Chairman of the GEBCO Sub-Committee on Digital Bathymetry were presented to the Board and studied with interest. These copies of the plots were then passed to the Director, Bureau Gravimétrique International, Toulouse, for further study with a view to identifying any "discrepancies and ambiguities" thereon, in preparation for the inclusion of this dataset in the GEBCO World Bathymetric Database which is being therein prepared under his direction.

58 An offer from the Chairman of the Sub-Committee to convert the tapes to GF3 format was accepted with gratitutde and he was invited to supply copies of the reformatted tape to all members of the Editorial Board, as well as to the International Hydrographic Bureau, the Bureau Gravimétrique International and the European Mediterranean Seismological Centre, Strasbourg.

59 The Editorial Board then examined a copy of the Petroconsultants publicity brochure, dated August 1986, and order form, dated May 1987, and took note of the following statements therein:

60 (i) "Out of various options, we chose to digitize the 1:1 000 000 scale maps produced by oceanographic survey vessels of various nations as part of a United Nations project".

61 (ii) "Petroconsultants has retained full ownership of the resulting data and is in a position to offer a complete bathymetric coverage from the Bay of Biscay, the entire Mediterranean Sea and the Black Sea at 200-metre intervals with closer inshore intervals".

62 and from the Order Form (a signed statement required from all purchasers of the tape):

63 (iii) "We agree that Petroconsultants retains all rights of ownership of the basic data and that we acquire the right to use such data only on a single central processing unit".

64 The Editorial Board wishes to place on record that it does not accept any of the above statements which it considers are incorrect and unauthorized, particularly in view of the fact that Petroconsultants are offering their tapes for sale at a price of Sw. Fr. 10 000 (or Sw. 1 250 per map).

65 The Editorial Board invited the Secretary IOC to investigate this whole matter further, including the apparent breaking of the copyright printed on the IBCM sheets but taking into account the original correspondence on the subject between Rear Admiral D.C. Kapoor, a former Director IHB, and Dr. C.B. Bär, Shell Internationale Petroleum Maatschappij B.V., The Hague, Netherlands. It was suggested that there are wider considerations that need to be taken into account, in particular the request from the World Digital Database for Environmental Science (WDDES) for incorporation of the GEBCO bathymetric dataset into their larger world database, and subsequent commercial exploitation by Petroconsultants S.A. It might therefore be considered appropriate for the IOC Consultative Group on Ocean Mapping (CGOM) to be asked to make this investigation, acquiring relevant legal advice as necessary.

7.2 STATE OF COMPILATION OF NEW BATHYMETRIC DATA

66 The Secretary IBCM informed the participants that more than 200 plotting sheets on transparent plastic, showing depths, contours and source materials were dispatched to the IHB in 1986 and 1987 by the Head Department of Navigation and Oceanography. These are sheets formerly used for the preparation of the first edition of the IBCM.

67 This was considered to be a positive development, essential for the compilation of new bathymetric data.

68 The Editorial Board recommended that the identification number of plotting sheets and their limits conform to those limits indicated in the Index of areas of responsibility.

69 Dr. J. Hall stated that he may be able to send to the IHB or directly to the responsible hydrographic offices certain "historical data" which he located in various institutions and which he is now processing.

70 Rear-Admiral A. Civetta, Director of the International Hydrographic Bureau, informed the Board of changes which have been accepted and of those that are being discussed within the hydrographic community regarding existing areas of responsibility. The Editorial Board recommended publication of the amended scheme in the Catalogue of Bathymetric Plotting Sheets.

71 Rear-Admiral A. Civetta further informed the Board that maintenance and updating of the GEBCO bathymetric plotting sheets (at 1:1M and 1:250 000) are clearly specified in the IHO Technical Resolution A5.3 and in the GEBCO Regulations.

72 Each Volunteering Hydrographic Office (VHO) is responsible for centralizing oceanic soundings and all the IHO Member States are invited to facilitate the role of these VHOs by notifying these offices of the oceanic soundings they themselves take as well as of any carried out by institutes or organizations within their own country.

73 Furthermore, the IHB publishes annually a "List of information concerning recent bathymetric data" which contains all the information therein received from the IHO Member States during the year; the information could be checked by Volunteering Hydrographic Offices and, if any data are needed, they could be requested directly from the organization concerned.

74 Rear-Admiral A. Civetta stated that proper use of multibeam data cannot be ensured. The IHB is looking for improvement of the data collecting and processing systems so that it would be possible to start effectively incorporating the data acquired with multibeam and similar systems into the hydrographic products.

75 The problem of the identification of an appropriate IHO World Data Centre for Digital Bathymetry is under consideration by the IHB following a proposal from the joint IOC-IHO Guiding Committee for GEBCO. At present, the IHO Committee on Exchange of Digital Data (CEDD)is holding discussions on standardized methods for exchanging digital data and it is felt that, although a format has now been agreed upon, its actual implementation may take some time. Once this problem is solved, a survey will be made throughout the Hydrographic Offices already having a national Data Centre for digital bathymetry in order to identify one that will carry out the work on behalf of the IHO.

7.3 COASTLINE TO BE SHOWN ON THE IBCM GEOLOGICAL/GEOPHYSICAL SERIES

76 The Editorial Board considered the results of a study of the coastline, undertaken by Prof. J. Bonnin and Captain S. Val'chuk and thanked both for the work done.

77 After a prolonged discussion on various aspects of the problem the Editorial Board decided that the IBCM geological/geophysical series should use the same coastline as that shown on the Bathymetric sheets.

8. SELLING ARRANGEMENTS AND PUBLICITY

78 Secretary IBCM informed the participants that he has received a message from "Mezhdunarodnaya Kniga" stating it has stopped selling the IBCM as of the end of 1986.

79 It was understood that a new firm V/O Soyuzkarta will take over the business. However, there is no indication as to when Soyuzkarta will be prepared to start selling the IBCM and Geological/Geophysical Series and how these maps can be ordered. Captain S. Val'chuk is now

trying to reach a firm agreement regarding these selling arrangements.

80 Noting the information of Captain S. Val'chuk that 1000 single-sheet copies of the 1:5 000 000 version of the IBCM has been recently printed, and taking into account that the Bouguer Anomalies Map will be printed in 1988, the participants expressed anxiety about the situation with respect to selling arrangements.

81 The participants also noted that the above situation made the section regarding sales arrangements in the IBCM brochure obsolete.

82 After discussion the Editorial Board decided that some alternative options must be investigated to ascertain the availability of the maps. A number of participants agreed to undertake investigations in their countries, and the Editorial Board requested the IBCM Secretary to investigate the possibility of selling the maps through the IOC or UNESCO.

83 The Editorial Board agreed that publicity of the IBCM must be improved. It was therefore suggested that an amended version of the IBCM brochure be printed, together with a coloured postcard showing the IBCM and giving a brief description of the series and their availability for sale. Dr. J. Hall volunteered to provide a scitex-produced set of 4 colour offset separation films provided a written request was sent, together with the required final image size, and a mint-condition copy of the 1:5M sheet for scanning. Once the map is scanned it will be easy to produce films at several sizes (eg postcard, large postcard, and quarto/folio for other brochures).

84 Upon receipt of the offset films, the Editorial Board would then ask Captain S. Val'chuk to print the card and possibly other materials.

85 The Editorial Board asked Captain S. Val'chuk whether a boxed set of the IBCM could be produced following the example of GEBCO.

86 It was agreed that appropriate international meetings must be used for publicity purposes. The Secretary IBCM was requested to investigate possibility of displaying the IBCM charts and relevant publicity information at the AAPG Mediterranean Basins Conference and Exhibition (Nice, 25-28 September 1988) and at the XXXIst ICSEM Congress (Athens, 17-22 October 1988).

87 The Editorial Board also decided to ask Captain S. Val'chuk to send 200 copies of the single-sheet 1:5M IBCM to the IBCM Secretary for distribution to the participants in the project and for other promotional purposes.

9. DATE AND PLACE OF THE NEXT SESSION

88 Earlier plans for a meeting of the Board in Leningrad to facilitate direct contacts with the personnel involved in actual production of the overlay sheets were set aside because of the delays in preparing the maps. Now that production of the gravity anomalies series is scheduled for mid-1988, with the seismicity series to follow soon after, the Board agreed that the next session should properly be held in Leningrad, and accordingly requested Captain S. Val'chuk to investigate this possibility.

89 The Editorial Board also found it necessary that ad hoc informal consultations between members of the Editorial Board and other experts be held in conjunction with the ICSEM Marine Geology and Geophysics Committee meeting at the XXXIst ICSEM Congress (Athens, 17-22 October 1988). The Editorial Board emphasized that participation of the Chief Editor, Captain S. Val'chuk, at the meeting in Athens is indispensable.

10. ELECTION OF THE CHAIRMAN AND VICE-CHAIRMAN OF THE EDITORIAL BOARD

90 Prof. C. Morelli was re-elected unanimously as Chairman and Prof. J. Makris unanimously as Vice-Chairman of the Editorial Board.

11. ADOPTION OF THE SUMMARY REPORT

91 The Editorial Board considered and adopted the Draft Summary Report.

12. CLOSURE OF THE SESSION

92 The Chairman of the Editorial Board closed the Session on Friday, 4 December 1987.

ANNEX I

AGENDA

1. OPENING OF THE SESSION
2. ADOPTION OF THE AGENDA
3. CONDUCT OF THE SESSION, DOCUMENTATION
4. STATE OF PREPARATION OF THE OVERLAY SHEETS
   - 4.1 BOUGUER GRAVITY ANOMALIES SHEETS
   - 4.2 SEISMICITY SHEETS
   - 4.3 MAGNETIC ANOMALIES SHEETS
   - 4.4 PLIO-QUATERNARY/MESSINIAN SHEETS
   - 4.5 UNCONSOLIDATED SEA-BED SEDIMENTATION SHEETS
5. WORKING ARRANGEMENTS FOR THE PREPARATION OF THE OVERLAY SHEETS AND TECHNICAL REQUIREMENTS FOR THEM
6. UP-DATING OF THE ALLOCATION OF RESPONSIBILITIES OF THE PARTICIPANTS OF THE PROJECT AND CONSIDERATION OF ARRANGEMENTS FOR KEEPING A RECORD OF CONTRIBUTORS AND INSTITUTIONS
7. PROBLEMS RELEVANT TO THE BATHYMETRY OF THE MEDITERRANEAN
   - 7.1 DIGITIZATION OF THE IBCM BATHYMETRY
   - 7.2 STATE OF COMPILATION OF NEW BATHYMETRIC DATA
   - 7.3 COASTLINE TO BE SHOWN ON THE IBCM GEOLOGICAL/GEOPHYSICAL SERIES
8. SELLING ARRANGEMENTS AND PUBLICITY
9. DATE AND PLACE OF THE NEXT SESSION
10. ELECTION OF THE CHAIRMAN AND VICE-CHAIRMAN OF THE EDITORIAL BOARD
11. ADOPTION OF THE SUMMARY REPORT
12. CLOSURE OF THE SESSION

ANNEX II

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ANNEX III

LEGEND OF THE BOUGUER 2.67 GRAVITY ANOMALIES SHEETS

OF THE MEDITERRANEAN REGION

INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION
INTERNATIONAL BATHYMETRIC CHART OF THE MEDITERRANEAN (IBCM)
GEOLOGICAL/GEOPHYSICAL SERIES

BOUGUER 2.67 GRAVITY ANOMALIES OF THE MEDITERRANEAN REGION

SOURCES OF LAND DATA

Sheets 1-3, 6-8 : Bureau Gravimétrique International, Toulouse (Dr. M. Sarrailh)

Sheets 4-5, 9-10: Institut für Geophysik, Hamburg (Prof. J. Makris)

SOURCES OF SEA DATA

Mediterranean : Morelli et al. Boll. Geof. Teor. Appl. 1975

Bay of Biscay, Black sea : Bureau Gravimétrique International (BGI)

(red) POSITIVE (blue) NEGATIVE

contour interval : 10 MGALS

reference system : IGSN 71

normal gravity 1967 formula

terrain correction for sheets 4, 5, 9 and 10 to 167 kms

Mercator Projection. Scale 1:1,000,000 at 38° latitude
Heights and depths in metres
Bathymetric contours from the 'International Bathymetric Chart of the Mediterranean'
Published by the Head Department of Navigation and Oceanography USSR Ministry of Defence under the authority of the IOC (of Unesco)

ANNEX IV

LEGEND OF THE INSTRUMENTAL SEISMICITY SHEETS

OF THE MEDITERRANEAN REGION

Yvette LEGROS - Jean BONNIN

- Sources : I.S.C. Historical File, 1904-1963 (all events)

  I.S.C. Catalogue, 1964-1975 (magnitude ≥ 4)

  E.S.M.C. Lists, 1976-1986 (magnitude ≥ 3)

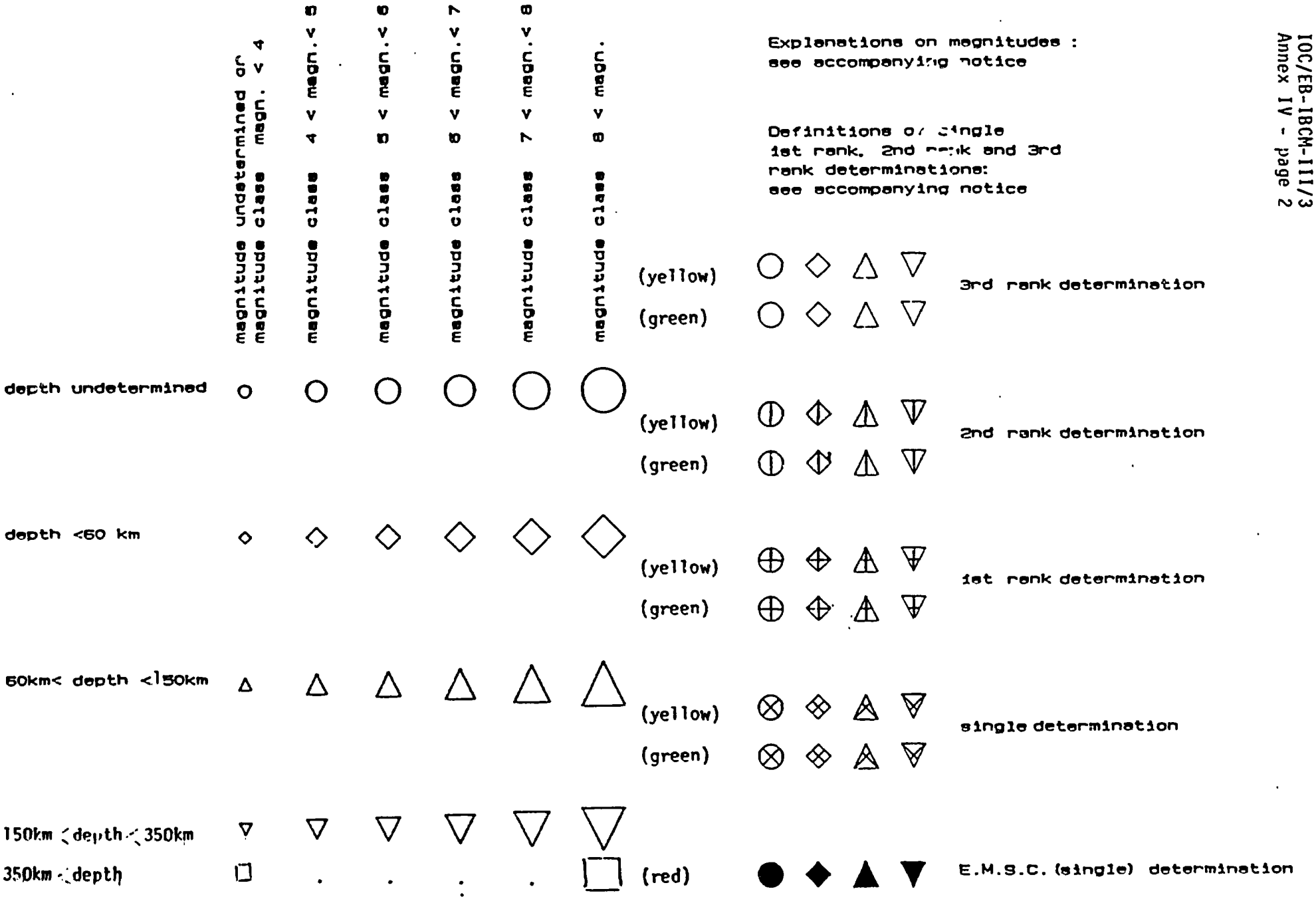
- Determinations : If several for one event (1904-1976), shown is the one reported by the agency identified as the "best reporting agency" for the period of event's occurence.

- Magnitudes : Magnitude threshold varies from one source to another (see under "Sources")when several magnitudes are reported for the same event, an averaged value is shown.

Warning : Because of irregular areal coverage of seismographic stations, the seismic activity shown is certainly not statistically homogeneous. For the period 1976-1986 (for which the threshold magnitude has been put at 3), the marginal zones of the overall region could have experienced events which are not shown on the map.

Explanations on magnitudes :
see accompanying notice

Definitions of single
1st rank, 2nd rank and 3rd
rank determinations:
see accompanying notice



ANNEX V

SPECIFICATIONS
FOR THE IBCM GEOLOGICAL/GEOPHYSICAL SERIES

SECTION 100 - GENERAL

101 - Introduction

A. The International Bathymetric Chart of the Mediterranean Geological/ Geophysical Series are being prepared under the authority of the Intergovernmental Oceanographic Commission, as a part of its regional mapping project for the Mediterranean, and with the support of the International Commission for the Scientific Exploration of the Mediterranean Sea.

B. The International Bathymetric Chart of the Mediterranean shall be used as a basic chart for the Geological/Geophysical Series. Geological and geophysical parameters shall be presented with the IBCM bathymetry and topography shown as a muted background.

SECTION 200 - BASIC SPECIFICATIONS

201 - Projection, scale, graticule, size, numbering of sheets and language

A. Projection, scale, etc. shall be the same as for the IBCM (articles 201 - 205 of the IBCM Specifications).

B. Black Sea inset at a scale 1:2,000,000 shall appear on the upper part of the sheets No 5 of each map of the series.

C. Numbering of sheets of each map of the series shall be the same as for the IBCM but with an appropriate prefix added.

D. All maps will be in two variants:English/French and Russian equivalent.

202 - Colours

A. The code of colours to be used on any particular map of the series will be chosen taking into consideration the colours used on similar most authoritative published maps.

B. Care shall be taken to limit to a minimum the number of colours to be used on any map.

C. Colour backgrounds will not normally be used to depict either land or sea. A single-colour background for land can be used only in cases where parameters that are being depicted on a given map are restricted to the sea. In the latter case, the background for land will be of the same colour as that on the IBCM on the scale of 1:5,000,000.

D. The code of colours will be chosen by the Chief Editor, who will take into consideration proposals of the Scientific Co-ordinators of the maps and the Editorial Board recommendations. Final decisions on the code of colours will be taken by the Editorial Board, when adopting the colour proofs.

203 - Bathymetry and Undersea Feature Names

A. Bathymetry and Undersea Feature Names will be shown as they appear on the IBCM.

B. No sounding tracks or areas of detailed surveys will be shown.

204 - Topography and Geographical Names

A. Topography and geographical names will be shown as they appear on the IBCM.

B. Coastline appearing on the IBCM will be used.

205 - Marginal information

A. All marginal information will be in both English and French, on the English/French variant and in Russian on the Russian variant.

B. It will include:

1. The name and logo of the Intergovernmental Oceanographic Commission

2. The general titles of maps, as follows*:

(i) International Bathymetric Chart of the Mediterranean (IBCM) Geological/Geophysical Series, Bouguer 2.67 Gravity Anomalies of the Mediterranean Region

(ii) International Bathymetric Chart of the Mediterranean (IBCM) Geological/Geophysical Series, Seismicity of the Mediterranean Region

(iii) International Bathymetric Chart of the Mediterranean (IBCM) Geological/Geophysical Series, Magnetic Anomalies of the Mediterranean Region

(iv) International Bathymetric Chart of the Mediterranean (IBCM) Geological/Geophysical Series, Plio-Quaternary/ Messinian Sediments of the Mediterranean Region

(v) International Bathymetric Chart of the Mediterranean (IBCM) Geological/Geophysical Series, Unconsolidated Sea-bed Surface Sediments of the Mediterranean Sea

*Titles (ii) to (v) are liable to alteration on later occasions.

3. Place (Leningrad) and date of publication of each sheet of the series

4. The Statement 'Published by the Head Department of Navigation and Oceanography, Ministry of Defence, USSR, under the authority of the IOC (of Unesco)'

5. The information contained in the 'Minimal List of Basic Items to be included in each map legend of the IBCM Geological/Geophysical Series' (Appendix 1).

SECTION 300 - BOUGUER 2.67 GRAVITY ANOMALIES MAP

301 - Definitions of information specifically pertaining to the Bouguer Anomalies Map, and, where appropriate, of the ways it should be depicted on the map. To be filled in by the Scientific Co-ordinator(s) of the map, in accordance with the "Minimal List of Basic Items to be included in each map legend of the IBCM Geological/Geophysical Series" (Appendix 1).

SECTION 400 - SEISMICITY MAP

401 - Definitions of the information specifically pertaining to the Seismicity Map and, where appropriate, of the ways it should be depicted on the map. To be filled in by the Scientific Co-ordinator(s) of the map, in accordance with the "Minimal List of Basic Items to be included in each map legend of the IBCM Geological/Geophysical Series" (Appendix 1).

SECTION 500 - MAGNETIC ANOMALIES MAP

501 - Definitions of the information specifically pertaining to the Magnetic Anomalies Map and, where appropriate, of the ways it should be depicted on the map. To be filled in by the Scientific Co-ordinator(s) of the map, in accordance with the "Minimal List of Basic Items to be included in each map legend of the IBCM Geological/Geophysical Series" (Appendix 1).

SECTION 600 - PLIO-QUATERNARY/MESSINIAN SEDIMENTS MAP

601 - Definitions of the information specifically pertaining to the Plio-Quaternary/Messinian Map and, where appropriate, of the ways it should be depicted on the map. To be filled in by the Scientific Co-ordinator(s) of the map, in accordance with the "Minimal List of Basic Items to be included in each map legend of the IBCM Geological/Geophysical Series" (Appendix 1).

SECTION 700 - UNCONSOLIDATED SEA-BED SURFACE SEDIMENTS MAP

700 - Definitions of the information specifically pertaining to the Unconsolidated Sea-bed Surface Sediments Map, and, where appropriate, of the ways it should be depicted on the map. To be filled in by the Scientific Co-ordinator of the map, in accordance with the "Minimal List of Basic Items to be included in each map legend of the IBCM Geological/Geophysical Series" (Appendix 1).

Appendix 1

MINIMAL LIST OF BASIC ITEMS TO BE INCLUDED IN EACH MAP LEGEND OF THE IBCM GEOLOGICAL/GEOPHYSICAL SERIES

1. The general title of the map, as shown in Subsection 205.B.2 of the Specifications, shall appear on all 10 sheets of each map of the series.

2. An assembly diagram shall be shown on all 10 sheets of each map of the series.

3. The following obligatory information shall appear on each sheet or in its margins, depending on the special features of the sheet:

   - projection, scale, sheet number and sheet dimensions along the neat lines;
   - the statement 'Bathymetric Contours from the International Bathymetric Chart of the Mediterranean';
   - units of measurement for depths, heights and for the information specifically pertaining to a given map;
   - symbols and abbreviations;
   - code of colours;
   - sources of detailed surveys;
   - name of the Scientific Co-ordinator of a map, the institution where a sheet was compiled, and names of sheet compilers, etc.;
   - lists of contributors, contributing institutions;
   - reference datum (cartographic and, where appropriate, geophysical);
   - contour interval;
   - the statement: "Series prepared with the support of the International Commission for the Scientific Exploration of the Mediterranean Sea";
   - brief explanatory note on the quality of the depicted data (by the Scientific Co-ordinator).

Appendix 2

WORKING ARRANGEMENTS FOR PREPARATION OF THE IBCM GEOLOGICAL/GEOPHYSICAL SERIES

1. The Scientific Co-ordinator of a particular map of the series will specify at an early stage of the work acceptable standards, methods of presentation, etc., for the data to be submitted to him by contributors, institutions, etc.

   These requirements will also be made available to the Chairman EB-IBCM and the IBCM Secretary.

2. The draft legend for a particular map will be prepared by the Scientific Co-ordinator of the map and submitted to the EB-IBCM for consideration at the earliest possible stage. The governing principle is that a legend and a map detailed concept will be approved by the EB-IBCM not later than at its Session immediately preceding the deadline for completion of compilation of a map (approximately one year in advance).

3. Scientific Co-ordinators of maps will submit fair compilations for adoption in due time, accompanying them with a legend and any other specific to the particular map textual information, etc., destined to be shown on the margins of the map.

   Fair compilations to be transferred to the Chief Editor, should satisfy the following requirements:

   (i) they may be drawn on paper. Sheet numbers will be indicated and neatline corners marked; Black Sea inset drawn at a scale 1:2,000,000 can be presented either as an integral part of a fair compilation sheet No 5, or on a separate sheet, to be incorporated into sheet No 5 by the Editor.

   (ii) if there are any colour backgrounds to be shown on the map (to depict data or its quality, etc.), then:

   - the relevant isolines or lines showing borders of areas, to be depicted in particular colours, will be drawn on fair compilation sheets, and proper reference will be made to the code of colours appearing in the legend.

4. Fair compilations, legend, etc. will be either handed over to the Chief Editor at the EB-IBCM Session at which they were approved, or, if this is inappropriate, despatched to him later via the IBCM Secretary.

ANNEX VI

SPECIFICATION FOR REFORMATTING/PLOTTING IBCM DIGITAL BATHYMETRY DATASET

1. INTRODUCTION

In 1983, Petroconsultants Ltd. digitized the bathymetric contours and coastlines from polyester transparencies of the 10 sheets of the International Bathymetric Chart of the Mediterranean (IBCM) at a scale of 1:1 million. In June 1987 a magnetic tape copy of the dataset was supplied to the Chairman of the GEBCO Sub-Committee on Digital Bathymetry for evaluation on behalf of the IBCM community. This evaluation included a) reformatting the data from the Petroconsultants delivery format GEODAT into the IOC General Format GF3 and b) plotting the contours out at the same scale and projection as the published charts. This note contains a brief specification of the reformatting and plotting work.

1.1 FILES AND MAPS

The Petroconsultants tape contained eleven files - a single header file describing the contents of the tape followed by ten data files; one for each of the published sheets :

File No	IBCM Sheet No	Sheet Boundaries South	North	West	East
2	1	38.5°N	46.0°N	6.0°W	2.5°E
3	2	38.5°N	46.0°N	2.5°E	11.0°E
4	3	38.5°N	46.0°N	11.0°E	19.5°E
5	4	38.5°N	46.0°N	19.5°E	28.0°E
6	5*	38.5°N	46.0°N	28.0°E	36.5°E
7	6	30.0°N	38.5°N	6.0°W	2.5°E
8	7	30.0°N	38.5°N	2.5°E	11.0°E
9	8	30.0°N	38.5°N	11.0°E	19.5°E
10	9	30.0°N	38.5°N	19.5°E	28.0°E
11	10	30.0°N	38.5°N	28.0°E	36.5°E
	*Black Sea	40.0°N	47.5°N	27.25°E	42.38°E

1.2 DIGITIZING ACCURACY

Petroconsultants digitization standards were as follows:

(a) all digitized points to be no more than 1.0 mm from their intended location on the source map

(b) ninety per cent of the digitized points to be no more than 0.3 mm from their intended location on the source map

(c) no location on the source map contours to be more than 0.5 mm along the perpendicular from the imaginery line joining the preceding point and the succeeding point in the sequence describing the contour

(d) maximum distance between successive digitized points to be 1.0 mm.

The GEODAT storage format allows geographic position to be stored with precision up to 0.0001 seconds. However, in view of the above it was decided, in the conversion to GF3, to round values off the nearest 0.0001 degrees (N.B. at the scale of the IBCM charts 0.0001° latitude is approximately 0.012 mm while 0.001° longitude is approximately 0.009 mm).

2. SOURCE FORMAT - PETROCONSULTANTS GEODAT FORMAT

(The GEODAT format is a general purpose, cartographic, format-only those elements that relate to the transfer of the IBCM data from GEODAT to GF3 are identified below)

logical record size = 80 bytes

Each data file consists of a sequence of contour strings. Each contour string is arranged as follows:

(a) it starts off with 5 header records, each identified by 'LA' in bytes 1-2, followed by the appropriate sequence no '01' to '05' in bytes 3-4

(b) followed by n attribute records each identified by 'LD01' in bytes 1-4, where n is given in bytes 29-30 of record 'LA01'

(c) followed by m contour point records, each identified by 'LP01' in bytes 1-4, where m is given in bytes 31-35 of record 'LA01'

The following fields are relevant:

Record	Bytes	Comments
LA01	29-30	12 - no of following attribute records (i.e. LD01 records)
	31-35	15 - no of following contour point records (i.e. LP01 records) i.e. no of points in the contour string
	36	I1 - string closure ('1' = point '2' = self closing string '3' = normal string with two distinct end points)
LA02	-	contents to be ignored
LA03	-	contents to be ignored
LA04	29-41	A1, I3, I2, F7.4 longitude of first point in string in form TDDDMMSS.SSSS In above and following fields T = 'E' or 'W' (or 'N' or 'S') DDD (or DD) = degrees MM = minutes SS.SSSS = seconds

	42-53	A1, 2I2, F7.4 latitude of first point in string in form TDDMMSS.SSSS
LA05	29-41	A1, I3, I2, F7.4 longitude of last point in string in form TDDDMMSS.SSSS
	42-53	A1, 2I2, F7.4 latitude of last point in string in form TDDMMSS.SSSS
LD01	27-28	I2 - sequence no of attribute record
	29-32	I4 - attribute code e.g. '1010' = date of creation of string '7010' = country code '6010' = depth
	33-onwards	content and format depends on entry in bytes 29-32; if equal to '6010' then bytes 33-44 contain the depth appropriate to the contour string in format (I2, F10.0) where I2 = units code for depth 01 = meters 02 = fathoms 03 = yards F10.0 = depth In the IBCM dataset, each contour string usually has 3 attribute records, one each for attributes 1010, 7010 and 6010 - the first two can be ignored. If the record for attribute '6010' is missing, the depth is assumed to be zero, i.e. the contour string represents a coastline, river, lake or canal.
LP01	-	(Each LP01 record contains the geographic co-ordinates of one point in the contour string)
	31-43	A1, I3, I2, F7.4 longitude of contour point in form TDDDMMSS.SSSS
	44-56	A1, 2I2, F7.4 latitude of contour point in form TDDMMSS.SSSS

3. TARGET FORMAT - GF3 SUBSET FOR DIGITIZED CONTOUR MAPS

80 byte GF3 data cyles to be formatted as follows:

Bytes	Format	Comments
1-6	I6	sea floor depth (whole metres) - set to zero for coastline, rivers, lakes or canals
7	1X	blank
8	I1	contour continuation flag: set to '1' if data cycle represents the start of a new contour line or '2' if

		it is continuation of a contour from the preceding data cycle
9	1X	blank
10	I1	no of coordinate pairs (i.e. contour points) stored in the data cycle
11-74	4(2I8)	up to four pairs of geographic latitude and longitude values - each value in units of 0.0001° with the convention East+ve, West-ve (North+ve). For each pair, the latitude value precedes the longitude value
75-80	6X	blanks

4. MAPPING FROM GEODAT CONTOUR STRINGS TO GF3 DATA CYCLES

In general, a new GF3 data cycle is started at the beginning of each GEODAT contour string (but see footnote below) with the continuation flag (byte 8) set to '1' and the sea floor depth (bytes 1-6) taken, in whole metres, from bytes 33-44 in the GEODAT attribute record, identified by an attribute code of '6010'. If the appropriate '6010' attribute record is missing from the beginning of the GEODAT contour string, the sea floor depth is set to zero metres. The latitude and longitude values of each GEODAT contour point are then converted from degrees, minutes and seconds into units of 0.0001 degrees, rounding as appropriate - these values are then mapped 4 at a time into GF3 data cycles (with the convention East and North+ve).

Footnote: in checks through the GEODAT files it was noticed that many of the longer contour lines were broken down into a number of separate contour strings each with 123 contour points. (The maximum contour string length noted was 124 contour points). So as to recover the continuity of these contours it is necessary, at the beginning of each GEODAT contour string, to check the coordinates of the first contour point in the string against the last contour point in the preceding contour string. If these coordinates are identical and the depth values for each string is the same, then the contour string should be treated as a continuation of the preceding contour string.

5. PLOTTING SPECIFICATIONS

Each file to be plotted out at the same scale, projection and geographic coverage (limits as in 1.1) as the corresponding published sheet.

Projection = Mercator

Scale = 1:1,000,000 at 38° latitude

Sheet width = 8.5° longitude = 75.0 cms

Sheet margins= tick marks at one minute intervals; annotation, including N/S, E/W, every degree

Sheet grid = two degrees intervals (at even degrees) of latitude and longitude

Contours of zero depth (i.e. coastlines, lakes, rivers and canals) to be plotted in black.

In general, the IBCM sheets have contours at 50m, 100m, 200m and thereafter at intervals of 200m - a number of sheets also have a 20m contour. Exceptions to this are as follows:

Sheet 1 : (Bay of Biscay) contours at 20m intervals up to 200m, thereafter at 200m intervals

Sheet 2 : (Special survey area) contours at 20m intervals between 2300m and 2800m

Sheet 3 : Contours at 20m intervals up to 200m in the Adriatic

To minimize software development, the contours to be colour coded rather than labelled thus :

0m	black	2600m	red
20m	red	2800m	green
50m	green	3000m	black (dashed)
100m	blue	3200m	blue
200m	black (dashed)	3400m	red
400m	red	3600m	green
600m	green	3800m	blue
800m	blue	4000m	black (dashed)
1000m	black (dashed)	4200m	red
1200m	red	4400m	green
1400m	green	4600m	blue
1600m	blue	4800m	red
1800m	red	5000m	black (dashed)
2000m	black (dashed)	5200m	green
2200m	green	5400m	blue
2400m	blue		

The above list covers the standard/common IBCM contours - other contours will be coded as a dashed line in the colour of the next lowest standard contour. Thus, for example, contours of 60m and 80m will both be dashed blue lines.

Note : For sheet 5 an additional plot is required for the Black Sea.

Projection = Marcator (40 to 47.5°N; 27.25 to 42.38°E)
Scale = 1:2,000,000 at 38°N
Sheet width = 15.13° longitude = 71.7cms

Grand Finale : Single map of IBCM at 1:5 million
Sheet limits 30-46°N; 6°W-36.5°E
Sheet width = 42.5° longitude = 74.9cms
Margin annotation ; tick marks every 0.25°
annotation every 2° on even degrees

Grid 2°

Contours to be plotted : 0 (black), 200m (red), 1000m (green), 2000m (blue), 3000m (red), 4000m (green), 5000m (blue)

ANNEX VII

LIST OF ABBREVIATIONS

AAPG - American Association of Petroleum Geologists

BGI - Bureau Gravimétrique International

CEDD - Committee on Exchange of Digital Data (IHO)

CGOM - Consultative Group on Ocean Mapping (IOC)

EGT - European Geotraverse

EMSC - European Mediterranean Seismological Centre

IBCM - International Bathymetric Chart of the Mediterranean

ICSEM - International Commission for the Scientific Exploration of the Mediterranean Sea

IGN - Institut Géographique National (France)

IHB - International Hydrographic Bureau

IHO - International Hydrographic Organization

IOC - Intergovernmental Oceanographic Commission

VHO - Voluntee··ing Hydrographic Office

WDDES - World Digital Database for Environmental Science