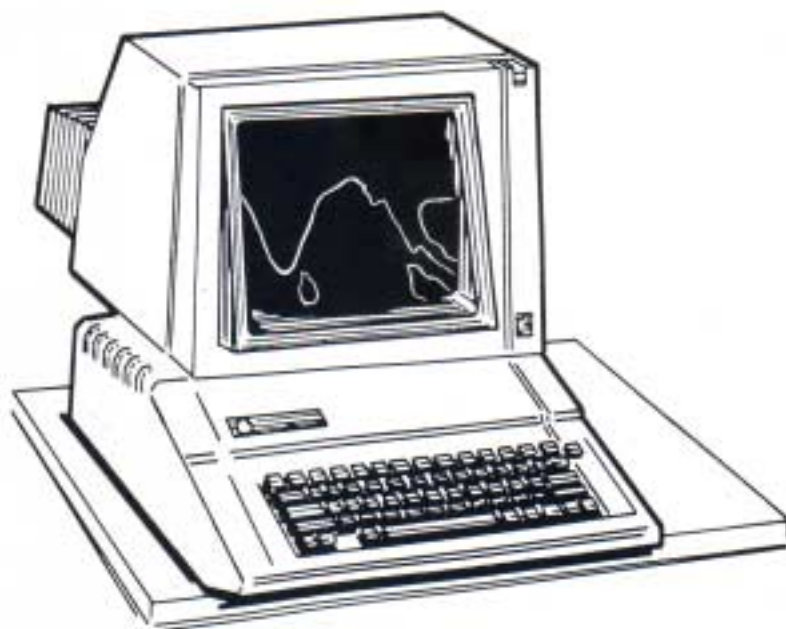


Bay of Bengal Fisheries Information System (BOBFINS) Users' Manual



BAY OF BENGAL PROGRAMME

BOBP/MAG/5

MARINE FISHERY RESOURCES MANAGEMENT

RAS/81/051

BAY OF BENGAL FISHERIES

INFORMATION SYSTEM (BOBFINS) :

USER'S MANUAL

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The Bay of Bengal Fisheries Information System (BOBFINS) is a data base management system for Apple IIe, designed for compilation and analysis of fisheries statistics.

It is anticipated that this system will improve the quality and increase the quantum of fisheries information that can be produced by the countries around the Bay of Bengal, facilitate exchange of fisheries data and information among the participating countries and also enhance the possibilities of carrying out stock assessments at national and regional levels.

This system has been prepared by the Marine Fishery Resources Management Project (RAS/81/051) of the Bay of Bengal Programme. This project is funded by UNDP and executed by FAO. The project has already provided an Apple IIe micro computer to each of the participating countries and a basic training course on its usage, for biologists from these countries.

This document and the data base system have not been officially cleared by the governments concerned or the FAO.

(i)

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1. PREAMBLE

The fisheries statistics collection system applied, the kinds of statistical data collected and the degree of reliability of the statistics, differ among countries bordering the Bay of Bengal and participating in the Marine Fishery Resources Management Project (RAS/81/051).

Fisheries statistics being an essential basis for stock assessment and management of fishery resources, the Marine Fishery Resources Management Project has placed high emphasis on the initial process of improving data collection and analysis.

The Bay of Bengal Fisheries Information System (BOBFINS) is a database system designed to aid data analysis of fisheries information on an Apple IIe micro computer.

The BOBFINS package evolves a standardized system of data analysis in the participating countries. With the BOBFINS package, fishery statistics and analysis could be compiled with only a fraction of the effort and time taken at present. Some countries which normally take a number of years to prepare their fisheries statistical reports, will be able to do so within a few months with the use of BOBFINS.

BOBFINS is designed to store, retrieve, sort and analyse large quantities of data. In an application that is processing intensive like BOBFINS, the user should note that the limitations of the micro computer hardware available tend to slow down the performance.

In order to speed up disk input/output operations and make dealing with large files more convenient, BOBFINS is now implemented on a Sider hard disk with a capacity of 10 MB. Users without access to the hard disk drive, can use the diskette version which will need data and programs to be manipulated across several diskettes.

However, attempts have been made to provide a set of user friendly interactive programs for the benefit of biologists and statisticians without specialised training in computer programming. Step by step instructions will be displayed by the monitor, on the procedure to be followed.

Lists of country codes, species codes, gear codes and grid (or area) codes, to be used with this system, have also been prepared by the project, but users may apply their own codes, if they so desire. If these codes are independently developed, it is important that two or more countries in the region do not use the same area code or use different species codes for the same species, if their data are to be exchanged or pooled at any stage. Though there is a choice for the unit of measurement of catch, this unit must be the same, if the data from different countries are to be combined for analysis,

BOBFINS User's Manual will guide you step by step through the basics of operating the "BOBFINS" application program. This manual assumes that the reader is familiar with the normal operation of an Apple IIe. (Else, we recommend that you read the Apple IIe Owner's Manual first.)

BOBFINS programs are designed to run interactively from a computer terminal. That is, the programs respond immediately to your instructions. Hence, the user will find the operations self-explanatory.

2. OBJECTIVES

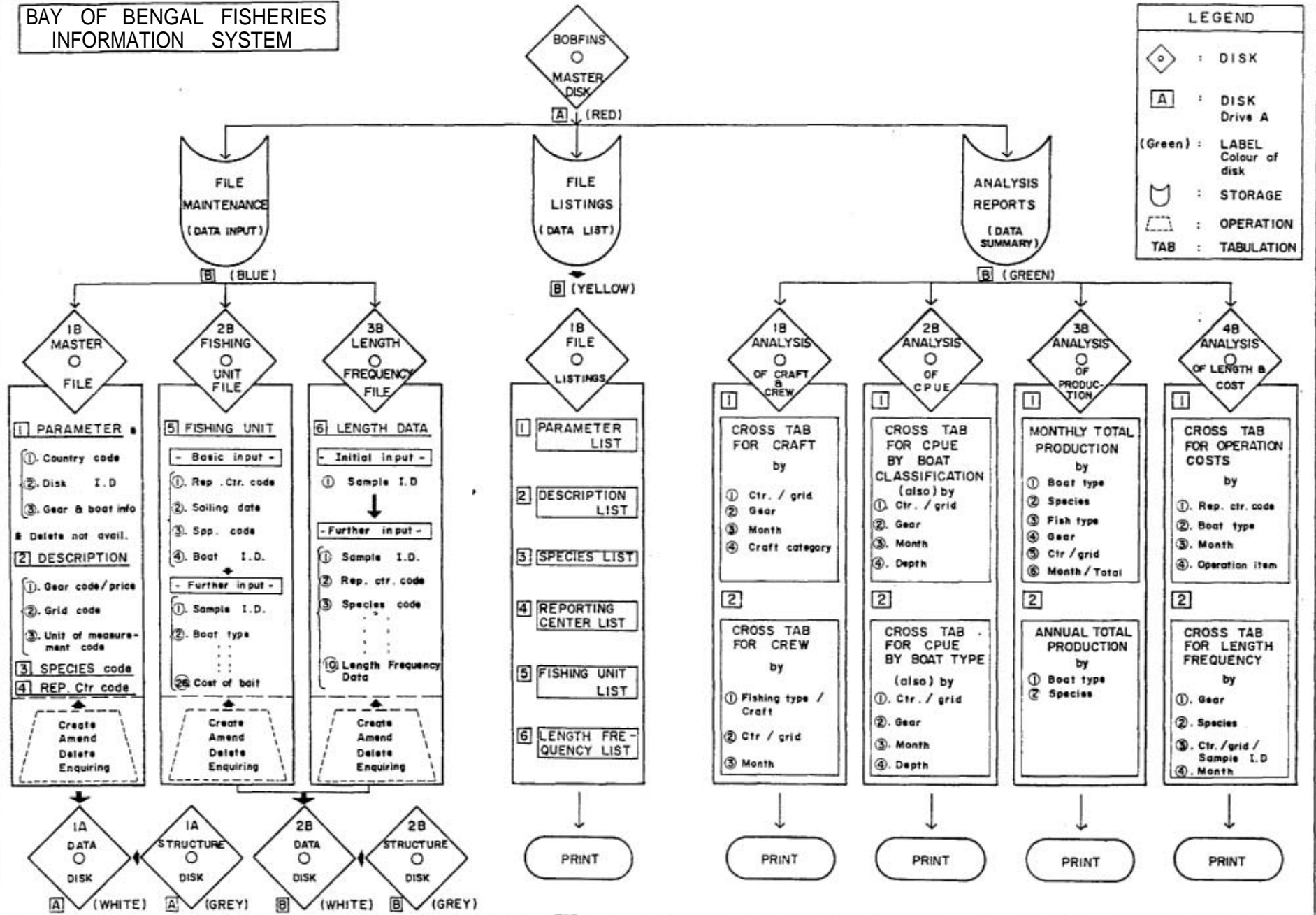
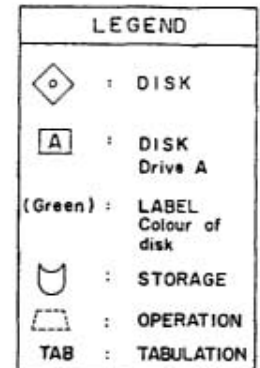
The primary objectives of the 'BOBFINS' programs are:

- a) to provide a convenient method of compiling fisheries statistics and expediting analysis for general and research purposes;
- b) to encourage improved data collection and output of information;
- c) to provide a standard system of data compilation and analysis, among the countries in the project area; and
- d) to facilitate exchange of data between countries or pooling of data for joint analyses.

With the required data, this system provides the following estimates:

- (i) catch and catch rates, by species, gear, craft, area and season;
- (ii) fishing effort, by type of gear, type and size of craft, area and season;
- (iii) annual and monthly total production for a specific area or country, by species, fishing method and craft;
- (iv) catch and catch rates of species for various types of gear and craft, according to depth ranges;
- (v) length frequency distribution by species according to gear type and size of craft, area and season;
- (vi) cost and earnings in different fishing methods and fishing craft analysis;
- (vii) survey data also may be analysed for catch and catch rates of individual species, according to the fishing method, area, season and depth ranges.

BAY OF BENGAL FISHERIES INFORMATION SYSTEM



3. GENERAL INFORMATION

BOBFINS now comes to you in two versions - a hard disk version and a floppy-diskette version.

If more than one year's transaction data are desired to be stored, then users are advised to use a hard disk with a capacity of 10 MB. Users should note that the hard disk read and write operations are about twice as fast as the corresponding floppy-disk operations. However, for the benefit of users without access to a hard disk, a floppy-disk version of BOBFINS is also available. This manual covers user's instructions for both versions in general. In the diskette version, when a particular disk has to be used, the manual will specify this. But hard disk version users can ignore this.

Data entry in BOBFINS is handled by menu driven creation programs which automatically check the validity of all data fields before a record is written on the disk file. Numerous checks are performed by BOBFINS to check whether the fields conform to the proper format and whether the corresponding data exist in the other master files as well. These checks will tend to slow down the input procedure but ensure that no 'garbage' is taken into the data file.

The "create" command of dbase II allows quick data entry to dbase II data files without performing any of these above mentioned checks. This method may therefore appear to be rather quick to the user, but will not check any validity and will not update the index files of BOBFINS. BOBFINS users are not expected to have a prior knowledge of index file handling by dbase II.

Data editing in BOBFINS is also handled by menu driven programs giving the "amend" option which will check the validity of all newly edited fields. If however, the user tries to edit data by dbase II "edit" command, the data records will be edited faster, but without a corresponding update in the index file and without any proper validation.

If the user resorts to these quick methods of using "create" and "edit" commands, then there is a possibility of getting numerous error messages like "record out of range", "end of file found unexpectedly" etc.

Hence, we strongly recommend that BOBFINS users do not use any direct dbase II commands directly with BOBFINS although their use may tend to appear to be a much faster approach.

BOBFINS programs are designed to run interactively from the terminal responding to users instructions immediately. Thus user will need only to follow the step by step operations given on the screen, referring the BOBFINS user's manual.

3.1 HARDWARE requirements

1. APPLE ILe 64K PROCESSOR WITH 128K RAM EXPANSION
ANDKEYBOARD.
2. APPLE IIe NUMERIC PAD (optional)
3. APPLE IIe MONITOR
4. DISK II DISK DRIVE
5. SIDER HARD DISK DRIVE (Optional for diskette version)
6. EPSON RX - 80 F/T MATRIX BIDIRECTIONAL PRINTER
7. SINGLE SIDED DOUBLE DENSITY MINI FLOPPY DISKETTES

3 . 2 BOBFINS hard disk version

This is implemented on the First Class Peripherals Sider 10 MB fixed disk drive. The Sider supports only four operating systems, namely DOS, Apple PRODOS, CP/M and Apple Pascal. The Sider has been partitioned allowing 8.86 MB for CP/M which in turn has been detailed to four volumes, namely, A, B, C, D.

The transaction files of BOBFINS are found in Volume A which has a size of 1023. The master files of BOBFINS are found in volume B which has a size of 103. Volumes C and D have been allocated 2 each. All the programs in BOBFINS are found in volume A.

Users should note that when working with hard-disk and the disk II disk drive, these CP/M volumes of the hard-disk are taken as drives A, B, C and D. The disk II disk drive then becomes drives E and F. BOBFINS hard disk version only needs the hard disk to operate and hence the disk II drive (drives E, F) need not have diskettes in them for normal function of BOBFINS. However users are strongly recommended to make and set aside a separate set of back-ups of the hard disk version.

3.3 BOBFINS diskette version

Before you start executing the diskette version of BOBFINS, check whether you have the following mini floppy diskettes with you.

1. BOBFINS master disk (drive A)
2. BOBFINS file maintenance programs disk 1B (Master Files)
3. BOBFINS file maintenance programs disk 2B (Fishing Units File)
4. BOBFINS file maintenance programs disk 3B (Length Frequency File)
5. BOBFINS file listings program disk 1B
6. BOBFINS analysis programs disk 1B
7. BOBFINS analysis programs disk 2B
8. BOBFINS analysis programs disk 3B
9. BOBFINS analysis programs disk 4B

These nine diskettes contain all the programs of the BOBFINS system. To protect the programs on these diskettes from accidental erasure, they have been covered with a write-protect tab. This allows the computer to only read the information on these diskettes.

In addition you will need at least 2 data diskettes to enter your BOBFINS data. Data diskette for **master** data will go into the drive 'B' (name it as data diskette '1B') and the data diskette for transaction data will go into the drive 'A' (name it as data diskette '2A'). Since the data diskettes are used to write and change the information that you enter, the two data diskettes will not have this write protect tab.

The file structures of the data are contained in two structure diskettes (named '1B' & '2A'). These two structure diskettes are required to make new data diskettes once the existing data diskettes are full.

A CP/M master diskette will also be necessary for backing up purposes.

3.4 Handling diskettes

Label all the diskettes. It is better to write on the label before attaching it to the diskette. To write on a label already attached to a diskette, use a felt-tip pen. Do not press hard. Do not write on an attached label with a pencil or ball-point pen. Do not use an eraser on the label. Never touch the surface of the diskette itself. When you are not using a diskette, keep it in a paper envelope, store diskettes upright in their envelopes. Do not bend diskettes or attach paper clips to them. Keep diskette away from magnets, electrical devices, direct sunlight, moisture and extreme heat and cold.

Never remove a diskette from the diskette drive while the drive's light is on. Doing so may damage the diskette and its contents. Always remove the diskettes before you turn off the computer and/or the diskette drives.

3.5 Copying diskettes

Diskettes are not permanent. No diskette will last forever since there is a great deal of physical contact between the diskette surface and the inside of its sleeve. The process of making a copy of a diskette is called backing up. Backups are essential and should be done frequently.

If you enter data daily, then backing up should be done daily. Otherwise backup once a session is over, either weekly, monthly or twice a day. The need to have back up copies of all your data diskettes (1B & 2A) cannot be over-emphasized.

As you receive this set of program diskettes, make copies of them and store the original diskettes in a safe place and use the copies.

To copy the contents of a diskette onto another diskette, you can use the COPY utility programme in the CP/M diskette.

Turn on the display unit, insert the CP/M diskette supplied to drive A and close the door of the drive.

Turn the computer on and wait for the A> prompt. Once the prompt appears, type the following -

```
COPY B: = A:
```

Then press return.

The system will reply;

INSERT MASTER DISK INTO DRIVE A:

INSERT SLAVE DISK INTO DRIVE B:

PRESS RETURN TO BEGIN

Remove the CP/M diskette from drive A. Insert the diskette you need to copy (called master disk) into drive A. Insert the backup diskette (called slave disk) into drive B and press return.

After a few seconds, the screen displays

COPY COMPLETE

DO YOU WISH TO MAKE ANOTHER COPY?

If you wish to create more backup copies, type Y, press return and then repeat the above procedure. Else type N and press return. Then the system displays:

INSERT CP/M SYSTEM DISK INTO DRIVE A

HIT RETURN

Insert the CP/M diskette into drive A and press return and wait for the A> prompt.

If the system displays COMMAND ERROR, then retype the command line again and ensure it is in the correct format.

If the system displays DISK I/O ERROR, then the computer is unable to format the diskette due to some reason. Ensure that you have a diskette in the drive and that the diskette drive door is closed properly.

Retype the command line and try again.

If the screen displays

DISK WRITE PROTECTED

then remove the write protect tab from the backup diskette in drive B and try again.

3.6 Data diskettes

The disk II disk drive in your Apple IIe system uses 5-1/4" single sided double density diskettes. One data diskette can hold as much as 126 kilo bytes = 126 x 1024 characters

= 129024 characters of data.

This means that approximately 20 full pages consisting of around 6500 letters per page can be stored in one disk.

The data that the user inputs to the system can be broadly classified into 2 types, viz. master data (in data diskette 1B and transaction data (in data diskette 2A). Master data consist of country codes, boat and gear information, gear codes, grid codes, unit of measurement codes, species codes and reporting centre codes.

Transaction data consist of fishing unit data and length frequency data.

Since a diskette can hold 129024 characters, the disk 1B should have sufficient space to store all the master data.

However, disk 2A has its limitations, In the fishing unit file, one record occupies 171 characters. In the length frequency file, one record occupies 245 characters. If one fishing unit record and one length frequency record are stored in disk, a total of 416 (= 171 + 245) characters will be utilised in the disk. Therefore user Will be able to store only about 310 records in one data disk 2A.

Therefore in the diskette version, the user has to use a new data diskette once the "disk is full" error message appears. For details on how to prepare new data diskettes for use, refer section 3.7 of this manual.

3.7 Structuring data diskettes

As you go on entering your data into data diskette 1B and data diskette 2A, the disks will be full and the system will display error message -

DISK IS FULL.

Then it is time for you to start entering data in a new diskette. Before you use a brand new diskette, you must format and structure the diskette. Use the appropriate structure diskette (1B or 2A) provided for this purpose.

Note that diskette 1B holds master data pertaining to boats file, description file and species file. Diskette 2A holds transaction files (i.e. length frequency file and fishing units file).

Insert CP/M master diskette in drive A and wait for the A> prompt. Type the command

FORMAT

Then press return

The system will reply -

FORMAT DISK IN WHICH DRIVE ?

Enter B: and press return

Insert a new diskette to be formatted in drive B and press return. After a few seconds, the screen displays.

FORMAT COMPLETE

FORMAT DISK IN WHICH DRIVE ?

If you need to format any more diskettes, enter B: and repeat the procedure.

Else press return and wait for the A> prompt. Then type

COPY B: = A:/S

and press return;

System replies;

INSERT MASTER DISK INTO DRIVE A:

INSERT SLAVE DISK INTO DRIVE B:

PRESS RETURN TO BEGIN

Press return and the copying will take place. When the screen displays

COPY COMPLETE

DO YOU WISH TO MAKE ANOTHER COPY ?

Enter N and press return. Then system displays -

INSERT CP/M SYSTEM DISK INTO DRIVE A

HIT RETURN

Press return, wait for the A> prompt and type the command.

COPY B: = A: and press return

When the system replies

INSERT MASTER DISK INTO DRIVE A

INSERT SLAVE DISK INTO DRIVE B

PRESS RETURN TO BEGIN

Take out the CP/M diskette and insert the appropriate structure diskette into drive A and press return.

When the process is complete, remove diskette from drive A, insert CP/M system diskette into drive A and press return.

Your diskette in drive B is now ready to be used as a new data diskette for saving BOBFINS data.

4. SOURCE DOCUMENTS

At present, the fisheries statistical data, the documents and the manner in which they are entered, differ among the participating countries. In general, the source data could be collected from the following documents.

- (a) Historical records, e.g. Annual Fisheries Statistics published by Ministry of Agriculture, Malaysia.
- (b) New data collected by statistics collectors and research workers.

The computerised 'BOBFINS' system needs master data pertaining to the country, boat, gear, grid, species, unit of measurement and reporting centre. Also fishing unit data and length frequency data collected periodically, will be input to the computer.

Since the existing data collected do not conform to a particular format, new source documents will be introduced with this system to arrange the raw data in the same sequence as in the data input program. This expedites data entry and reduces human errors. Data collected in the field may be transferred to this format before entry into the computer, but it would be much more convenient if the field data collection forms are rearranged to this format.

4.1 Statement of addition/correction/deletion to boats file

FORM ☐ A

Create ☐

Amend ☐

Delete ☐

- | | | |
|-----|------------------------------------|--|
| 1. | Boat ID | <input type="text"/> |
| 2. | Boat type (N/I/O/R) | <input type="text"/> |
| 3. | Boat description | <input type="text"/>
<input type="text"/>
<input type="text"/> |
| 4. | Currency unit | <input type="text"/> |
| 5. | Boat price | <input type="text"/> |
| 6. | Gear price | <input type="text"/> |
| 7. | Depreciation % - BOAT (1 dec) | <input type="text"/> |
| 8. | Depreciation % - GEAR (1 dec) | <input type="text"/> |
| 9. | Insurance - BOAT (1 dec) | <input type="text"/> |
| 10. | Insurance - GEAR (1 dec) | <input type="text"/> |
| 11. | Interest (1 dec) | <input type="text"/> |
| 12. | Equipment cost | <input type="text"/> |
| 13. | Fisheries type (0-5) | <input type="text"/> |
| 14. | Horsepower | <input type="text"/> |
| 15. | Gross tonnage of boat (GRT)(1 dec) | <input type="text"/> |
| 16. | Length of boat (LOA) (1 dec) | <input type="text"/> |
| 17. | Unit of fuel | <input type="text"/> |
| 18. | Unit of ice | <input type="text"/> |
| 19. | Unit of bait | <input type="text"/> |

4.2 Statement of addition/correction/deletion to description file

FORM

B

Create ☐

Amend ☐

Delete ☐

GEAR

1. Gear code (G9999)

G				
---	--	--	--	--

- ## 2. Gear description

[illegible]

REGIONS

1. Region or grid code (R3XX99)

R					
---	--	--	--	--	--

- ## 2. Region description

[illegible]

UNITS

1. Unit of measurement code
(U99)

U		
---	--	--

2. Unit of measurement
description

[illegible]

AREAS

1. Area reporting centre code
(X9999)

--	--	--	--	--

- ## 2. Area description

[illegible]

4.3 Statement of addition/correction/deletion to species file

FORM

☐ C

Create ☐

Amend ☐

Delete ☐

1. Species code (9XXX)

--	--	--	--	--

2. Scientific name

3. English name

4. Local name

5. Fish type (D/P/S/O)

--

4.4 Statement of addition / deletion / correction to fishing unit file

FORM D

FISHING UNIT FILE

[illegible]

4.5 Statement of addition/correction/deletion to
length frequency file

FORM ☐ E

Create ☐

Amend ☐

Delete ☐

1. Species code (99XXX)
2. Gear code (G9999)
3. Boat type (N/I/O/R)
4. Area code (X9999)
5. Date (dd/mm/yy)
6. Starting mid length (2 dec)
7. Length interval (cm) (1 dec)
8. Sample wt. (1 dee)
9. Total catch wt. (1 dee)
10. Length frequency data

1 <input type="text"/>	2 <input type="text"/>	3 <input type="text"/>	4 <input type="text"/>	5 <input type="text"/>
6 <input type="text"/>	7 <input type="text"/>	8 <input type="text"/>	9 <input type="text"/>	10 <input type="text"/>
11 <input type="text"/>	12 <input type="text"/>	13 <input type="text"/>	14 <input type="text"/>	15 <input type="text"/>
16 <input type="text"/>	17 <input type="text"/>	18 <input type="text"/>	19 <input type="text"/>	20 <input type="text"/>
21 <input type="text"/>	22 <input type="text"/>	23 <input type="text"/>	24 <input type="text"/>	25 <input type="text"/>
26 <input type="text"/>	27 <input type="text"/>	28 <input type="text"/>	29 <input type="text"/>	30 <input type="text"/>
31 <input type="text"/>	32 <input type="text"/>	33 <input type="text"/>	34 <input type="text"/>	35 <input type="text"/>
36 <input type="text"/>	37 <input type="text"/>	38 <input type="text"/>	39 <input type="text"/>	40 <input type="text"/>
41 <input type="text"/>	42 <input type="text"/>	43 <input type="text"/>	44 <input type="text"/>	45 <input type="text"/>
46 <input type="text"/>	47 <input type="text"/>	48 <input type="text"/>	49 <input type="text"/>	50 <input type="text"/>

5. OPERATING BOBFINS

BOBFINS is a "turnkey system" which will run automatically whenever you boot the Apple IIe using the BOBFINS master diskette. Thus, the BOBFINS master diskette provided to you is a turnkey diskette.

- a) Turn on your video display device
- b) Diskette version users - Insert the 'BOBFINS Master Disk' into drive A and close the drive door properly.

Hard disk users - Turn on the hard disk.

- c) Reach behind the left corner of the computer case and find the power switch with your left hand. Turn your computer on.

For diskette version users only

The power indicator on the keyboard and the small red light on the front of drive A will light up. The disk drive will make whirring sounds as it reads the disk. After a few seconds the sounds will stop and the red light on the disk drive will go out.

For hard disk users only

The hard disk will light up after a few seconds and the main menu utility of the hard disk will appear. BOBFINS package operates in CP/M. Hence user must press 2 to boot into CP/M.

After a few seconds the main menu of BOBFINS will appear. This gives you 5 options: file maintenance, file listings, analysis reports, data recovery and exit from menu. The 'exit' allows you to quit from the processing mode.

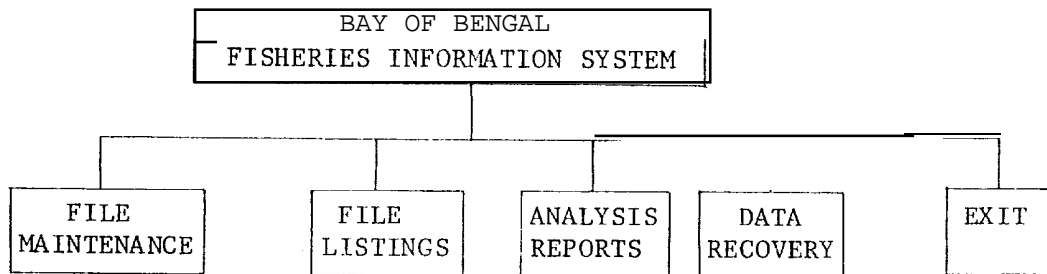
In the diskette version, under exit option A> prompt will appear on the screen. The user can now remove diskettes and turn off the computer.

In the hard disk version, under exit option the main menu **utility** of the hard disk will appear. Press.7 in order to quit and park heads of the hard disk. Then the prompt

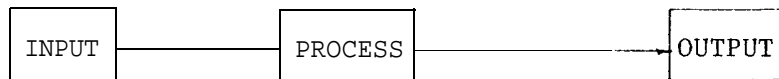
```
DRIVE 1 HEADS ARE PARKED
YOU MAY POWER THE SIDER
DOWN SAFELY NOW
```

appears, at which point user can safely turn off the hard disk and the computer.

Refer Appendix 01 for the screen layout of this main menu.



A normal computer system consists of 3 stages as follows:



In the BOBFINS system, processing stage is involved in both input and output. File maintenance section handles all the input stage and a part of the processing stage to check and verify the records. File listings and analysis reports sections consist of output stage and a part of the processing stage involving all the calculations and sorting necessary to produce the reports.

Hence, user should bear in mind that the extra time the computer takes for input and output involves the ~~time~~ needed for processing data.

5.1 File descriptions

5.1.1 Boat file

File name : BOATFIL

File type : Master

Index file : BOAT ID

This is a database file containing information pertaining to boats viz. boat id, boat type, description, prices of boat and gear, depreciation percentages, insurance, interest, equipment cost, horsepower, GRT, LOA etc.

This file is indexed on the key boat id.

5.1.2. Description file

File name : DESFILE

File type : Master

Index file : DESCODE

This is a data base file indexed on the description code and contains codes and descriptions relevant to gear specifications, grid indicators, degree regions, fishing area specifications and unit of measurements.

5.1.3. Species file

File name : SPEFILE

File type : Master

Index file : SPECODE

This data base file is indexed on the key species code. All the information pertaining to species, such as Species code, Scientific name, English name, Local name and Fish type are included in this file.

5.1.4. Fishing Unit file

File name : UNITFILE
File type : Transaction
Index file : UNIT

This file will contain the information,
regarding fishing units entered periodically.
This file is indexed on reporting centre,
landing data, boat and species code.

5.1.5. Length frequency file

File name : FREFILE
File type : Transaction
Index file : FRE

This is a data base file indexed on species
code, gear code, boat type, area code and date.
This file carries information relevant to
Length frequency data which will be input
periodically.

5.2 File layouts

5.2.1 Boats file

Field No	Name of field	Type	Width	Description
1	Boat ID	C	8	Registration No or Licence No.
2	Boat type	C	1	Non-mechanized, inboard, Out- board, Research vessel.
3	Boat description	C	30	
4	Currency unit	C	3	(Rs, M\$, US\$, Rp, Tk,BHT, Rf, etc.)
5	Boat price	N	8	
6	Gear price	N	7	
7	Depreciation % - boat	N	4 (1 dec)	
8	Depreciation % - gear	N	4 (1 dec)	
9	Insurance % - boat	N	4 (1 dec)	
10	Insurance % - gear	N	4 (1 dec)	
11	Interest %	N	4 (1 dec)	
12	Equipment cost	N	7	
13	Fisheries type	N	1	Traditional small- scale, large-scale, sports, fleet operation, not specified
14	Horsepower	N	3	
15	Gross tonnage of boat	N	6 (1 dec)	
16	Length of boat (LOA)	N	5 (1 dec)	
17	Unit of fuel	C	3	
18	Unit of ice	C	3	
19	Unit of bait	C	3	

5.2.2 Description file

Field No	Name of field	Type	Width	Description
1	Description code	C	6	G99 99 Gear Specification Sub code Main code X9999 Area code U99 Unit of measurement R3XX99 Area specification Y-Axis (latitude) X-Axis (longitude) Grid scale indicator (0--3) 0 - 1/6 x 1/6 or 1/4 x 1/4 Degree Region or Grid 1 - 1/2 x 1/2 Degree Region or Grid 2-1 x 1 Degree Region or Grid 3 - 5 x 5 Degree Region or Grid
2.	Description	C	30	Description of the corresponding parameter
	Total		37	

Gear codes to be used are provided in the List of Codes.

Region code

Double alphanumerics are assigned to the grids. Grid codes are provided for 30', 1" and 5' grids as illustrated in figures in Appendix B. Possibility exists for using 10' and 15' grids also. However, only a maximum of 3 grid systems can be chosen by any country and for convenience of comparison between countries, the 30' grid may be used as one common grid system by all.

Unit of measurement

For catch - in, tonnes, instead of kg. strongly recommended in order to keep the total estimates of productions within a reasonable number of digits manageable by the computer's memory capacity.

Effort - in terms of number of hours fished, number of settings/operations, number of hooks used, number of days fished or number of trips.

Catch per unit effort would then be catch (tonnes) per hour, per setting/operation, per hook, per day or per trip.

5.2.3 Species file

Field No	Name of field	Type	Width	Description
1	Species code	C	5	99 xxx Sub code (family & Species ID). Main code - (Order ID).
2	Scientific name	C	40	Scientific name of the species.
3	English name	C	40	English name of the species.
4	Local name	C	40	Local name of the species
5	Fish type	C	1	"D" - Demersal "P" - Pelagic "S" - Shell fish "O" - Others

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Species codes are provided in the List of Codes. Use of identical species code for the same species in the different countries or areas will permit combined analysis.

5.2.4 Fishing unit file

Field No	Name of field	Type	Width	Description
1	Reporting centre code	C	5	x9999 - Pointer to description file
2	Landing date	C	6	ddmmyy
3	Species code	C	5	99XXX - Pointer to species file
4	Boat ID	c	8	Registration No. Licence No. etc
5	Grid indicator	C	6	R3XX99 - Pointer to description file
6	Gear code	C	5	G9999 - Pointer to description file
7	Sample catch	N	9 (2 dec)	
8	Unit of measurement of catch	C	3	U99
9	Sample effort	N	9 (2 dec)	
10	Unit of measurement of effort	C	3	U99
11	Units of effort per boat	N	6 (1 dec)	Hooks/sets/operations/ hrs/days per trip or no. of trips.
12	Fishing depth (m)	N	3	Depth from surface in meters
13	Crew size	N	2	No. of crew
14	Average no. of trips per month	N	2	The total no. of trips per month made by fishing units with the same type/ no. of fishing units operating with same gear type
15	Boats with same type	N	4	Number of boats with same gear type in operation at the reporting centre.

Cost and earnings information

16	Crew share	N	7 (2 dec)	Wages of crew for a trip.
17	Skipper's additional share	N	7 (2 dec)	
18	Amt. of fuel consumed	N	5 (1 dec)	
19	Cost of fuel/unit	M	6 (2 dec)	
20	Amt. of ice used	N	6 (1 dec)	
21	Cost of ice/unit	N	5 (1 dec)	
22	Amt. of bait used	N	4	
23	Cost of bait/unit	N	6 (2 dec)	
24	Fish price at landing point	N	8 (2 dec)	
25	Retail price/unit	N	8 (2 dec)	
26	Wholesale price/unit	N	8 (2 dec)	
27	Maintenance amount	N	8 (2 dec)	

Information extracted from other files

28	Fish type	C	1	(D/P/S/O)
29	Boat type	C	1	(N/I/O/R)
30	Horsepower	N	3	
31	GRT of boat	N	6 (1 dec)	
32	LOA of boat	N	5 (1 dec)	

5.2.5 Length frequency file

Field No.	Name of field	Type	Width	Description
1.	Species code	C	5	99XXX - Pointer Species file
2.	Gear code	C	5	G9999 - Pointer to Description file
3.	Boat type	C	1	N/I/O/R
4.	Area code	C	5	x9999
5.	Date	C	6	ddmmyy
6.	Starting mid length	N	6	(2 dec)
7.	Length interval	N	4	(1 dec)
8.	Sample weight	N	5	(1 dec)
9.	Total catch wt.	N	7	(1 dec)
10.	Length frequency data	C	200	
Total			----- 244 -----	

5.3 File Maintenance

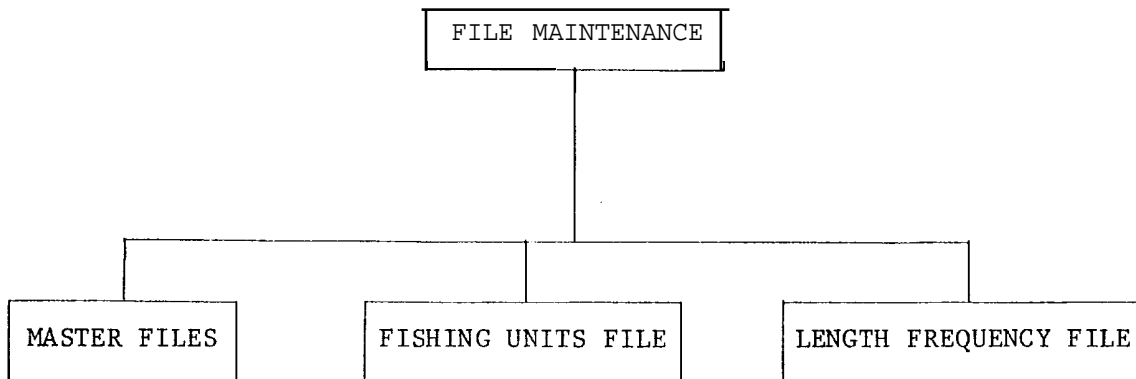
The FILE MAINTENANCE section is divided into three sub-sections, namely -

5.3.1 FILE MAINTENANCE - MASTER FILES

5.3.2 FILE MAINTENANCE - FISHING UNITS FILE

5.3.3 FILE MAINTENANCE - LENGTH FREQUENCY FILE

Refer appendix 02 for the screen layout.



5.3.1 File maintenance - Master files

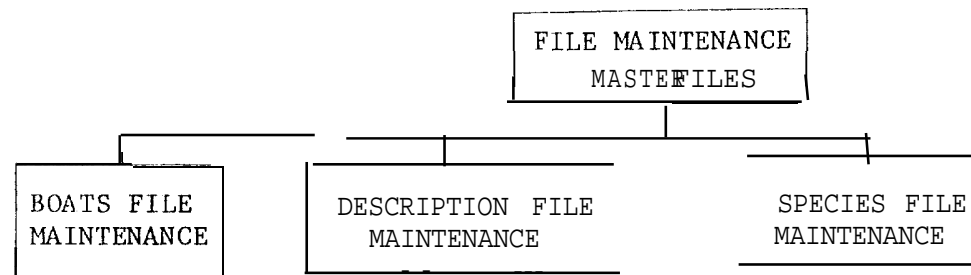
FILE MAINTENANCE - MASTER FILES is divided into three programs namely -

5.3.1.1. BOATS FILE MAINTENANCE

5.3.1.2. DESCRIPTION FILE MAINTENANCE

5.3.1.3. SPECIES FILE MAINTENANCE

Refer Appendix 03 for the screen layout..



5.3.1.1 BOATS FILE MAINTENANCE

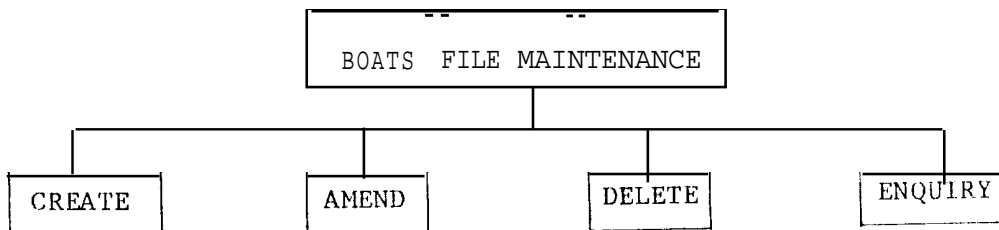
This program provides four options

5.3.1.1.1. CREATE

5.3.1.1.2. AMEND

5.3.1.1.3. DELETE

5.3.1.1.4. ENQUIRY



5.3.1.1.1 Create

CREATE allows the user to add more records to the BOAT FILE.

5.3.1.1.2 Amend

AMEND provides for the editing of one or more fields in the records in the BOATS FILE.

5.3.1.1.3 Delete

DELETE provides for the removal of unnecessary records from the BOATS FILE.

5.3.1.1.4 Enquiry

ENQUIRY provides for the display of the contents of the records in the BOATS FILE.

5.3.1.2 Description file maintenance

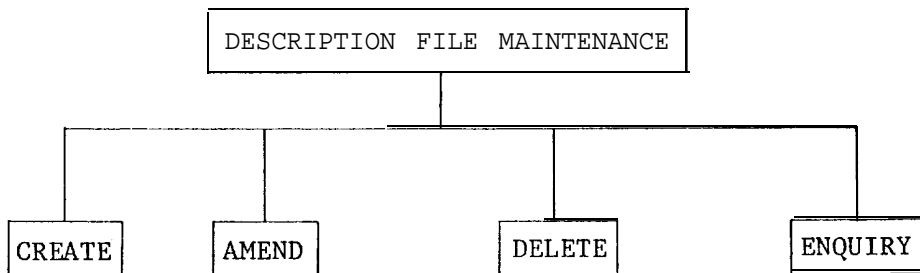
This program provides for four options -

5.3.1.2.1. CREATE

5.3.1.2.2. AMEND

5.3.1.2.3. DELETE

5.3.1.2.4. ENQUIRY



5.3.1.2.1 Create

CREATE allows you to add more records to the DESCRIPTION FILE.

5.3.1.2.2 Amend

AMEND provides for the editing of one or more fields of the records of the DESCRIPTION FILE.

5.3.1.2.3 Delete

DELETE provides for the removal of unnecessary records from the DESCRIPTION FILE.

5.3.1.2.4 Enquiry

ENQUIRY provides for the display of the contents of the records of the DESCRIPTION FILE.

5.3.1.3 Species file maintenance

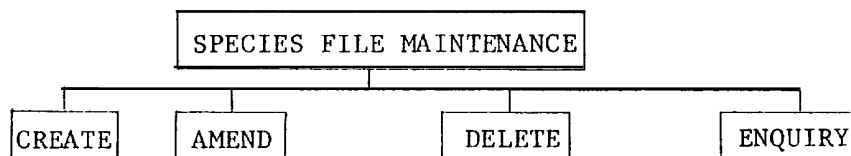
This program provides four options

5.3.1.3.1. CREATE

5.3.1.3.2. AmEND

5.3.1.3.3. DELETE

5.3.1.3.4. ENQUIRY



5.3.1.3.1 Create

CREATE allows you to add more records to the SPECIES FILE.

5.3.1.3.2 Amend

AMEND provides for the editing one or more fields of the records of the SPECIES FILE.

5.3.1.2.3 Delete

DELETE provides for the removal of records (if any) from the SPECIES FILE.

5.3.1.2.4 Enquiry

ENQUIRY provides for the display of the contents of the records in the SPECIES FILE.

5.3.2. Fishing units file maintenance

This program provides four options

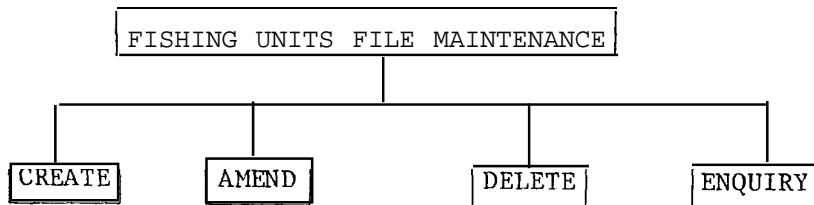
5.3.2.1. CREATE

5.3.2.2. AMEND

5.3.2.3. DELETE

5.3.2.4. ENQUIRY

(Refer appendix 04 for the screen layout).



5.3.2.1 Create

CREATE provides for the addition of more records to the FISHING UNIT FILE

5.3.2.2 Amend

AMEND provides for the editing of one or more fields of the records of the FISHING UNIT FILE.

5.3.2.3 Delete

DELETE provides for the removal of the records (if any) from the FISHING UNIT FILE.

5.3.2.4 Enquiry

ENQUIRY provides the facility to view the contents of the records of the FLSHING UNIT FILE.

5.3.3. Length frequency file maintenance

This program provides four options

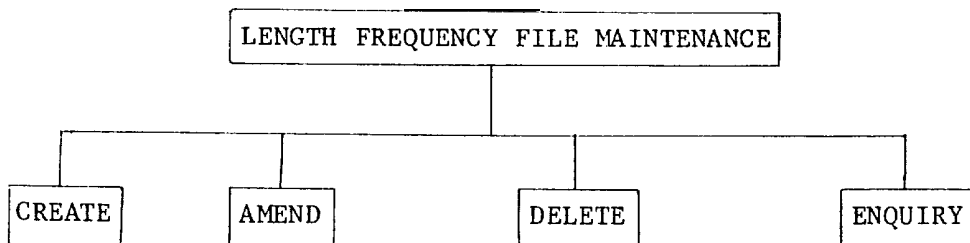
5.3.3.1 CREATE

5.3.3.2 AMEND

5.3.3.3 DELETE

5.3.3.4 ENQUIRY

(Refer appendix 05 for the screen layout)



5.3.3.1 Create

CREATE enables you to add more records to the LENGTH FREQUENCY FILE

5.3.3.2 Amend

AMEND allows you to edit one or more fields of the records of the LENGTH FREQUENCY FILE.

5.3.3.3 Delete

DELETE makes it possible for you to remove the records (if any) from the LENGTH FREQUENCY FILE.

5.3.3.4 Enquiry

ENQUIRY permits the user to display the contents of the records of the LENGTH FREQUENCY FILE.

5.4 File listings

The file LISTINGS section is divided into five programs, namely

5.4.1 BOATS FILE LIST

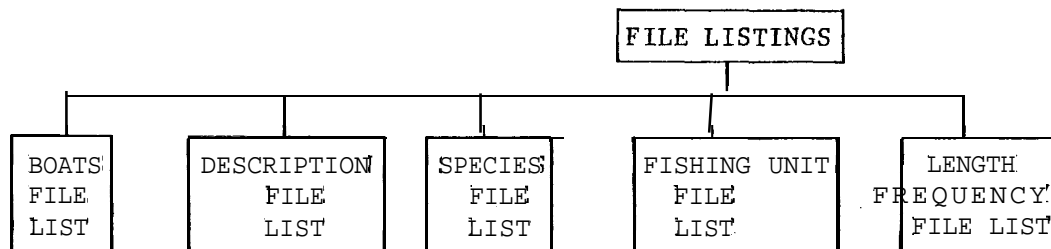
5.4.2 DESCRIPTION FILE LIST

5.4.3 SPECIES FILE LIST

5.4.4 FISHING UNIT FILE

5.4.5 LENGTH FREQUENCY FILE LIST

(Refer Appendix 26 for the screen layout).



5.4.1. Boats file list

This program reads the records in the BOATS FILE and lists them as shown in Appendix 27.

5.4.2. Description file list

This program prints the entire DESCRIPTION FILE or a section of the DESCRIPTION FILE. 50 records are printed per page.

(Refer Appendix 28).

5.4.3. Species file list

This program prints the entire SPECIES FILE or a section of the SPECIES FILE. Three records *are* printed per page. (Refer Appendix 29).

5.4.4. Fishing unit file list

This program prints the entire FISHING UNIT FILE or a section of the FISHING UNIT FILE. Two records are printed per page. (Refer Appendix 30). The program gives the option of printing a dbase listing of fishing unit file.

5.4.5. Length frequency file list

This program prints the entire LENGTH FREQUENCY FILE or a section of the LENGTH FREQUENCY FILE. Three records are printed per page.

(Refer Appendix 31).

5.5 Output reports

The system produces 7 analysis reports as follows:

5.5.1 Analysis of craft

5.5.2 Analysis of crew

5.5.3 Analysis of CPUE by depth and boat classification

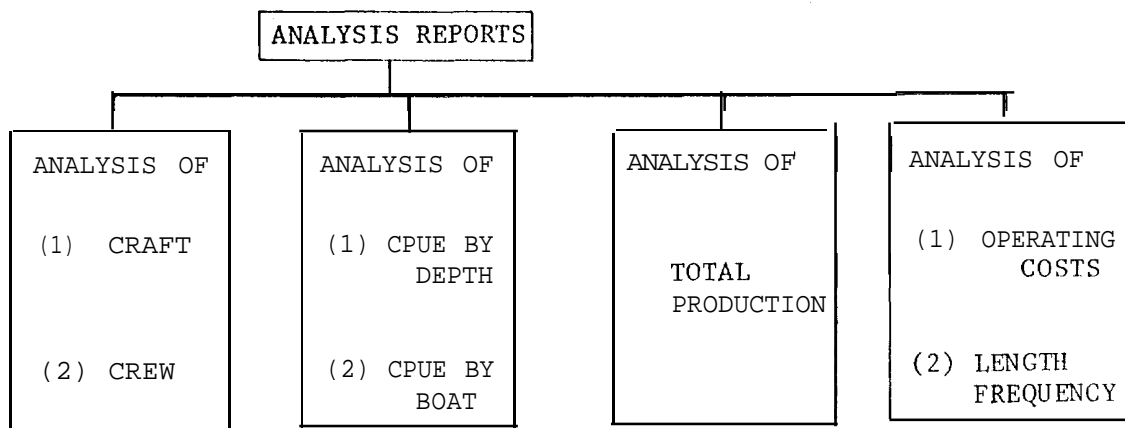
5.5.4 Analysis of CPUE by depth and boat type

5.5.5 Analysis of total production

5.5.6 Analysis of operating costs

5.5.7 Analysis of length frequency

Refer. Appendix 32 for the screen layout



5.6 Data recovery

If data entry is interrupted by power failures, the full record contents may not be written on the disk. Then the number of records in the data file may differ from the number of records in the indexed data file, thus giving rise to error messages of the form "record out of range" or "end of file found unexpectedly." If the user comes across an error message of this form, this program could be called from the main menu and executed to recover and reorganise the data files. Even without the error messages appearing, if the user wishes to check whether the data files are in order, this program could be executed. However, user should bear in mind that if the original data file is corrupted for some reason, then this program will not be able to reindex and recover the data file. Thus, the user is strongly recommended to keep a separate set of back-up disks for data always and to back up the disk onto a separate new disk just before running this data recovery program. For more details on how to operate this program, refer to Section 9.

6. FILE MAINTENANCE OPERATION

6.1 Boats file maintenance

- (1) DISK USED : BOBFINS file maintenance programs disk 1B
(Master file)
- (2) FUNCTION : Maintaining updated information on the boats
file.
- (3) SUBFUNCTIONS :
 - i. Boats file - CREATE
 - ii. Boats file - AMEND
 - iii. Boats file - DELETE
 - iv. Boats file - ENQUIRY

6.1.1 Boats file - Create

User may select the BOATS FILE - CREATE program by inputting 1 and "C", for FILE and MODE respectively in the file maintenance menu. (Appendix 03). BOATS FILE - CREATE screen will appear and allows the user to input 19 fields (refer Appendix 06). If return is pressed for boat ID, the File Maintenance Menu will appear again.

FIELD	VALIDATION
BOAT ID	Unique name (registration no or license no.) (Maximum of 8 characters)
BOAT TYPE	N/I/O/R
BOAT DESCRIPTION	(Maximum of 30 characters)
CURRENCY UNIT	Rs, M\$, US\$, Rp, T, BHT, Rf etc. (Maximum of 3 characters)
BOAT PRICE	0-99999999
GEAR PRICE	0-9999999
DEPRECIATION % - BOAT	0.0 - 99.9
DEPRECIATION % - GEAR	0.0 - 99.9
INSURANCE % - BOAT	0.0 - 99.9
INSURANCE % -GEAR	0.0 - 99.9
INTEREST %	0.0 - 99.9
EQUIPMENT COST	0 - 9999999 (cost of fish finders, radio, hauling devices, navigation equipment etc)
FISHERIES TYPE (0-5)	(Numeric in the range 0-5) 0 - not specified 1- traditional 2- small scale 3 - large scale 4- sports 5 - fleet operation
HORSE POWER	Numeric in the range 0-999 (not applicable for non-mechanized boats) Press return for zero
GROSS TONNAGE OF BOAT (CRT)	Numerid in the range 0-9999.9
LENGTH OF BOAT (LOA)	Numeric in the range 0-999.9
UNIT OF FUEL	(Maximum of 3 characters)
UNIT OF ICE	(Maximum of 3 characters)
UNIT OF BAIT	(Maximum of 3 characters)

6.1.2 Boats file - Amend

User may select the BOATS FILE - AMEND program by inputting land "A" for FILE and MODE respectively in the file maintenance menu (Appendix 03). When BOAT ID is entered the corresponding record will be displayed allowing the user to amend. Field no. is prompted, so that user can select the respective field to be edited. Program will display File Maintenance Menu when return is pressed for the Field No. (Refer appendix 07 for the screen layout)

FIELD	VALIDATION
1. BOAT ID	(Maximum of 8 characters)
2. BOAT TYPE	N/I/O/R (default = N)
3. BOAT DESCRIPTION	(Maximum of 30 characters)
4. CURRENCY UNIT	(Maximum of 33 characters)
5. BOAT PRICE	0 - 99999999
6. GEAR PRICE	0 - 99999999
7. DEPRECIATION % - BOAT	0.0 - 99.9
8. DEPRECIATION % - GEAR	0.0 - 99.9
9. INSURANCE % - BOAT	0.0 - 99.9
10. INSURANCE % - GEAR	0.0 - 99.9
11. INTEREST %	0.0 - 99.9
12. EQUIPMENT COST	0 - 99999999
13. FISHERIES TYPE (0-5)	Numeric in the range 0-5 0 - not specified 1 - traditional 2 - small scale 3 - large scale 4 - sports 5 - fleet operation
14. HORSE POWER	0-999
15. MOSS TONNAGE OF BOAT (GRT)	0-9999.9
16. LENGTH OF BOAT (LOA)	0-999.9
17. UNIT OF FUEL	(Maximum of 3 characters)
18. UNIT OF ICE	(Maximum of 3 characters)
19. UNIT OF BAIT	(Maximum of 3 characters)
ENTER FIELD NO (1-5)	(return for exit)

6.1.3 Boats file - Delete

The BOATS FILE - DELETE program can be selected by entering 1 and "D" for FILE and MODE respectively in the file maintenance menu (Appendix 03). Input the BOAT ID of the record the user wishes to delete. Program will display the record contents and prompt "Is it OK to delete (Y/N)?" If the user wishes to delete the record, enter "Y" and the record will be deleted. Then the computer will prompt for the boat ID of the next record. If user does not wish to delete the record enter "N" and the computer will ask for the boat ID of the next record. If return is pressed here, the File Maintenance Menu will appear. (Refer appendix 08 for the screen layout)

6.1.4 Boats file - Enquiry

User may select the BOATS FILE - ENQUIRY program by inputting 1 and "E" for FILE and MODE respectively in the file maintenance menu (Appendix 03). When BOAT ID is entered, program will display record contents with a prompt DEPRESS RETURN KEY. When RETURN is depressed the File Maintenance Menu will be displayed. (Refer appendix 09 for the screen layout).

6.2 Description file maintenance

- (1) DISK USED : BOBFINS file maintenance programs disk IB
(master files)
- (2) FUNCTION : Maintaining updated information on the
Description File
- (3) SUBFUNCTIONS: i. Description file - CREATE
ii. Description file - AMEND
iii. Description file - DELETE
iv. Description file - ENQUIRY

6.2.1 Description file - Create

User may select the DESCRIPTION FILE - CREATE program by inputting 2 and "C" for FILE and MODE respectively in the file maintenance menu (Appendix 03). Three types of descriptions i.e. GEAR TYPE, AREA GRID, UNIT OF MEASUREMENT are entered through this program, (Refer Appendix 10.) When return key is depressed for description code, the File Maintenance Menu will appear.

FIELD	VALIDATION
DESCRIPTION CODE	(Return to Exit)
GEAR CODE (G9999)	If first character = "G", the next four characters must be numeric.
GRID CODE (R3AA99)	If first character = "R" second character must be numeric and in the range 0 - 3 third and fourth characters must be alphabetic and fifth and sixth characters must be numeric.
UOM OF MEASUREMENT CODE (U99)	If first character = "U", second and third characters must be numeric.
AREA CODE (A9999)	If first character = country code next four characters must be numeric.
DESCRIPTION	(Maximum of 30 characters!)

6.2.2 Description file - Amend

User may select the DESCRIPTION FILE - AMEND program by inputting 2 and "A" for FILE, MODE respectively in the file maintenance menu (Appendix 03). Input the DESCRIPTION CODE to select the record to be amended. The prompt "edit description (Y/N) ?" appears, If "Y" is entered description can be amended. If "N" is entered the program will prompt for the next record to be amended. When return is depressed for the DESCRIPTION CODE, the Program will get back to File Maintenance Menu.

(Refer Appendix 11 for the screen layout).

FIELD	VALIDATION
<hr/>	
1. DESCRIPTION CODE	(Return to exit)
GEAR CODE (G9999)	If first character = "G" the next four characters must be numeric.
REGION CODE (R3AA99)	If first character = "R" second character must be numeric and in the range 0-3, third and fourth characters must be alphabetic and fifth and sixth characters must be numeric.
AREA CODE (A9999)	If first character = country code next four characters should be numeric.
UNIT OF MEASUREMENT CODE (U99)	If first character = "U" second and third characters must be numeric.
2. DESCRIPTION	(Maximum of 30 characters)
EDIT DESCRIPTION (Y/N)	Y = enter description N = get back to next record

6.2.3 Description file - Delete

User may select the DESCRIPTION FILE - DELETE program by inputting 2 and 'D' for FILE and MODE respectively in the file maintenance menu (Appendix 03). Input the DESCRIPTION CODE to select the record to be deleted. Program will prompt "IS IT O/K TO DELETE? (Y/N)" after displaying the record contents (Appendix 12). If user enters "Y", the record will be deleted and the system will prompt for the next record to be deleted. If user enters "N", then the system will prompt for the next record to be deleted. The program will get back to the File Maintenance Menu when return key is pressed for DESCRIPTION CODE.

6.2.4 Description file - Enquiry

User may select the DESCRIPTION FILE - ENQUIRY program by inputting 2 and "E" for FILE and MODE respectively in the file maintenance menu (Appendix 03). Input the DESCRIPTION CODE to select the record. Programme will display record contents and the prompt DEPRESS RETURN KEY TO CONTINUE (Appendix 13). When RETURN is depressed, the program will prompt for the next record to be enquired. Program will display File Maintenance Menu when return is pressed for DESCRIPTION CODE.

6.3 Species file maintenance

- (1) DISK USED: BOBFINS file maintenance programs disk 1B
(Master files)
- (2) FUNCTION : Maintaining updated information on the species file
- (3) SUBFUNCTIONS:
 - i. Species file - CREATE
 - ii. Species file - AMEND
 - iii. Species file - DELETE
 - iv. Species file - ENQUIRY

6.3.1 Species file - Create

User can select the SPECIES FILE - CREATE program by inputting 3 and "C" for FILE and MODE respectively in the file maintenance menu (Appendix 03). Program allows input of five fields (refer Appendix 14). When return key is depressed for SPECIES CODE, the File Maintenance Menu will appear.

FIELD	VALIDATION
SPECIES CODE (99xxx)	First two characters are numeric and the last three are alphabetic. Duplicates not allowed. (Return to exit).
SCIENTIFIC NAME	(Maximum of 40 characters)
ENGLISH NAME	(Maximum of 40 characters)
LOCAL NAME	(Maximum of 40 characters)
FISH TYPE (D/P/S/O)	"D" for Demersal fish "P" for Pelagic fish "S" for Shell fish or others "0" for others

6.3.2 Species file - Amend

User may select the SPECIES FILE - AMEND program by inputting "3" and "A" for FILE and MODE respectively in the file maintenance menu (Appendix 3). Input the SPECIES CODE to select the record to be amended. All fields except SPECIES CODE can be amended through this program. The field no. is prompted, so that the user can select respective fields to be amended (Appendix 15). Program will prompt for the next record to be amended when RETURN is entered for ENTER FIELD NO. Program will display File Maintenance Menu when RETURN is depressed for the SPECIES CODE.

FIELD	VALIDATION

1. SPECIES CODE; (99Xxx)	First two characters must be numeric' and next three alphabetic. (Return to exit)
2. SCIENTIFIC NAME	(Maximum of 40 characters)
3. ENGLISH NAME	(Maximum of 40 characters)
4. LOCAL NAME	(Maximum of 40 characters)
5. FISH TYPE	"D " P" " S " "O"
ENTER FIELD NO. (2-5)	(Return to get next record)

6.3.3 Species file - Delete

User may select the SPECIES FILE - DELETE program by inputting 3 and "D" for FILE and MODE respectively in the file maintenance menu (Appendix 16). Input the SPECIES CODE to select the record to be deleted. The record contents will be displayed and the program will prompt ,IS IT O/K TO DELETE ? (Y/N). (Appendix 16). If user enters "Y", the record will be deleted and the system will prompt for the next record to be deleted. If the user enters "N" the system will prompt for the next record to be deleted. Program will display File Maintenance Menu if return is pressed for SPECIES CODE.

6.3.4 Species file - Enquiry

User may select the SPECIES FILE - ENQUIRY program by inputting 3 and "E" for the FILE and MODE respectively (Appendix 03). Input the SPECIES CODE to select the record to be displayed and the program will display record contents. Program will prompt DEPRESS RETURN KEY (Appendix 17). If RETURN is depressed, the program will prompt for the next record to be enquired. Program will get back to the File Maintenance Menu if return is pressed for SPECIES CODE.

6.4 Fishing unit file Maintenance

- (1) DISK USED : BOBFINS file maintenance programs disk 2B
(Fishing unit file)
- (2) FUNCTION : Maintaining updated information on Fishing unit
File
- (3) SUBFUNCTIONS :
 - i. Fishing unit file - CREATE
 - ii. Fishing unit file - AMEND
 - iii. Fishing unit file - DELETE
 - iv. Fishing unit file - ENQUIRY

6.4.1 Fishing unit file - Create

User may select the FISHING UNIT FILE - CREATE program by inputting 1 and "C" for FILE and MODE respectively in the file maintenance menu (Appendix 04). Refer Appendix 18 for the screen layout. Program will display File Maintenance Menu when return is pressed for REPORTING CENTRE.

This program allows the input of 27 data fields, of which the first 4 fields, namely reporting centre, landing date, species code and boat ID form the main key pointer to the file. Once this key is established, the amend program does not allow edit facilities for these 4 fields. Hence the user is given the option of editing these 4 fields in the creation program itself before a record is established in the disk with this key. After these four primary fields comprising the key are entered, the program displays the prompt "Above entries OK (Y/N)?" By entering 'N' at this stage, the user can go back to enter these 4 fields again. If however, user wishes to quit the data entry, press return for reporting centre and exit to the menu. If edit or exit is not required, then enter 'Y' to indicate that the 4 entries are OK.

Next, the user can enter data for the next nine fields. Then the prompt "costs and earnings information input (Y/N)" appears. If "Y" is entered, the program accepts data for the next nine fields. Enter "N" if costs and earnings data are not available. Once this data entry is over, again the prompt "Above entries OK (Y/N)?" appears. To edit the above 18 fields, enter 'N' and start adjusting. To quit data entry enter 'N' and press return for gear code. Here the program will guide the user by displaying the message "enter return to quit". If all entries are OK then enter 'Y'. Then the screen will clear and allows the user to enter catch data along with the unit of measure and the prices for all the species caught.

For species code if zero is entered data entry for that record is completed. Next the prompt "writing records on disk-HOLD ON" is displayed warning the user that the records contents are now being saved on the diskette. User has to wait patiently until the red light of the disk drive goes off, User should bear in mind that this program is running on an Apple IIe micro computer and hence this is the minimum time the computer needs to process the record contents after checking the validity of every field.

In this file 'Sample Effort' is the fishing effort of the boat or boats sampled on one occasion. This sample effort can be for any number of boats and any number of trips. The corresponding 'catch' and the 'sample effort' are used for estimating the catch per unit effort.

Many samples taken for a particular month, gear, area and species are considered for calculating the mean catch per unit effort.

The item "Units of Effort/Boat" is used only for standardizing the various units of effort, used in the CPUE calculation, to that of the effort in terms of one fishing trip, so that it may be raised by the "Average number of trips per month x number of boats with the same gear" to estimate the total catch or production for that month. Hence "Units of Effort/Boat" must be expressed as average number of hooks, hours, sets or days (per trip per boat). The same unit of measurement should be used in entering values under both items mentioned above. If information on precise units of effort is not available, then number of trips may be used as sample effort to obtain CPUE as catch/boat/trip. However, it must be remembered that this CPUE value has extremely low precision due to the fact that a trip may involve variable number of days, sets, hrs etc. which will produce highly variable CPUE values.

The "Units of Effort/Boat" will have the same value as "Sample Effort" if the sample is taken only for one trip of one boat. The former value must be obtained by -

- (a) interviewing the fishermen
- (b) making direct observations of fishing operation and/or estimating from fishing logs or records.

FIELD	VALIDATION
REPORTING CENTRE (A9999)	(Return to exit) The first character is alphabetic and the remaining four are numeric. Must exist in the description file.
DATE (dd/mm/yy)	Return - Defaults to today's data. Valid date format.
SPECIES CODE (99AAA)	Must exist in species file.
BOAT ID. (Reg./Licence No)	Must exist in boats file
GEAR CODE (G9999)	First character is "G". The rest four numerics. Must exist in description file.
GRID IND/BLOCK NO (R3AA99)	First character is "R", second is numeric in the range 0 - 3, third and fourth are alphabetic and fifth and sixth are numerics. Must exist in description file.
SAMPLE EFFORT	Cannot be zero or spaces. Numeric in the range 0.999999.99 Expressed as no. of hooks, sets, operations, hours fished, days or no. of trips.
UOM OF EFFORT (U99)	Must exist in the description file.
UNITS OF EFFORT/BOAT/TRIP	Numeric in the range 0 - 9999.9 no. of hooks, sets, operations, hrs or days per trip. .
FISHING DEPTH	Numeric in the range 0 - 999. If unspecified press return. Value must be in metres.
AVERAGE NO. OF TRIPS/MONTH	Numeric in the range 1 - 99. Cannot be zero and space.
NO.OF BOATS OPERATING WITH SIMILAR GEAR TYPE	Numeric in the range 1 - 9999 Cannot be zero or space.
CREW SHARE	Wages of crew for a trip Numeric in the range 0-9999.99
SKIPPER'S ADDITIONAL SHARE	Numeric in the range 0-9999.99
AMOUNT OF FUEL USED PER TRIP	Numeric in the range 0-999.9 If zero press return. (Not available for non-mechanised boats).

FIELD	VALIDATION
COST OF FUEL/UNIT	Numeric in the range 0-999.99
AMOUNT OF ICE PER TRIP	Numeric in the range 0-9999.9
COST OF ICE/UNIT	Numeric in the range 0-999.9
AMOUNT OF BAIT PER TRIP	Numeric in the range 0-9999
COST OF BAIT/UNIT	Numeric in the range 0-999.99
SPECIES CODE	Species code entered first will appear. Next enter the rest of species. Enter ZERO to end.
SAMPLE CATCH	Numeric in the range 0-999999.99
UOM	Unit of measure of catch Must exist in the description file
FISH PRICE AT LANDING POINT	Numeric in the range of 0-99999.99
RETAIL PRICE	Numeric in the range of 0-99999.99
WHOLESALE PRICE	Numeric in the range of 0-99999.99

6.4.2 Fishing unit file - Amend

User may select the FISHING UNIT FILE - AMEND program by inputting 1, "A" for FILE and MODE respectively in the file maintenance menu (Appendix 4). Input REPORTING CENTRE, BOAT ID., DATE and SPECIES CODE to select the record to be amended. All the fields in this file except reporting centre, boat id,, date, species code and sample Id., are allowed to be edited. The program will display the contents of the record and prompt for the field number to be amended. Then user can select the necessary field via ENTER FIELD NO. (Appendix 19). This program will prompt for the next record to be amended if return is pressed for ENTER FIELD NO. The program will display File Maintenance Menu if return is depressed for REPORTING CENTRE.

FIELD	VALIDATION

1. * REPORTING CENTRE (A9999)	(Return to exit) The first character is alphabetic and the rest four are numeric. Must exist in the description file.
2. * LANDING DATE (dd/mm/yy)	Return - defaults to today's date.
3. * SPECIES CODE (99AAA)	Must exist in the species file.
4. * BOAT ID. (Reg./Licence No.)	Must exist in the boats file.
5. GEAR CODE (G9999) (R3AA99)	First character is "G". The rest four are numerics. Must exist in description file.
6. GRID IND./BLOCK NO.	First character is "R". Second is numeric in the range 0-3. Third and fourth are alphabetic and fifth and sixth are numerics. Must exist in description file.
7. SAMPLE EFFORT	Numeric in the range 0-999999.99
8. UOM OF EFFORT	U99 - Must exist in description file.
9. UNITS OF EFFORT/BOAT	Hooks/sets/operations/hrs./ days, per trip or number of trips.
10. FISHING DEPTH	Numeric in the range 0-999. If unspecified, press return. Value must be in metres.

(*) All these 4 files together should exist in the Fishing Unit File.

FIELD	VALIDATION
11. CREW SIZE	Numeric in the range 1-99. Cannot be zero or space.
12. AVERAGE NO. OF TRIPS/MONTH	Numeric in the range 1-99. Cannot be zero and space.
13. NO. OF BOATS OPERATING WITH SIMILAR GEAR TYPE	Numeric in the range 1-9999. Cannot be zero and space
14. SAMPLE CATCH	Numeric in the range 0-999999.99
15. UOM OF CATCH	Must exist in the description file.
16. FISH PRICE AT LANDING POINT	Numeric in the range 0-99999.99
17. RETAIL PRICE/UNIT	Numeric in the range 0-99999.99
18. WHOLESALE PRICE/UNIT	Numeric in the range 0-99999.99
19. MAINTENANCE AMOUNT	Numeric in the range 0-99999.99
20. CREW SHARE	Numeric in the range 0-9999.99
21. SKIPPER'S ADDITIONAL SHARE	Numeric in the range 0-9999.99
22. AMOUNT OF FUEL USED PER TRIP	Numeric in the range 0-999.9 (Not applicable for non-mechanised boats).
23. COST OF FUEL/UNIT	Numeric in the range 0-999.99
24. AMOUNT OF ICE PER TRIP	Numeric in the range 0-9999.9
25. COST OF ICE/UNIT	Numeric in the range 0-999.9
26. AMOUNT OF BAIT	Numeric in the range 0-9999
27. COST OF BAIT/UNIT	Numeric in the range 0-999.99
ENTER FIELD NO. (6-27)	Return to get next record.

6.4.3 Fishing unit file - Delete

User may select the FISHING UNIT FILE - DELETE program by inputting 1, "D" for FILE & MODE respectively in the File Maintenance Menu (Appendix 4). Input REPORTING CENTRE, DATE, BOAT ID., and SPECIES CODE to select the record to be deleted. Program will display the contents of the record and prompt IS IT O/K to DELETE ? (Y/N?). (Appendix 20). If the user wishes to delete, enter "Y" and the record will be deleted and the system will prompt for the next record to be deleted. If the record need not be deleted, enter "N" and the system will prompt for the next record to be deleted. Program will display File Maintenance Menu if return is pressed for the REPORTING CENTRE.

6.4.4 Fishing unit file - Enquiry

User may select the FISHING UNIT FILE - ENQUIRY program by inputting 1, "E" for FILE and MODE respectively in the file maintenance menu (Appendix 4). Input REPORTING CENTRE, DATE, BOAT ID., and SPECIES CODE to select the record to be enquired. Program will display the contents of the record and prompt DEPRESS RETURN KEY. If the user depresses RETURN the program will prompt for the next record to be enquired. (Appendix 21). Program will display File Maintenance Menu if return is pressed for REPORTING CENTRE.

6.5 Length frequency file maintenance

- (1) DISK USED : BOBFINS file maintenance programs disk 3B
(length frequency file)
- (2) FUNCTION : Maintaining updated information on length
frequency sample file.
- (3) SUBFUNCTIONS:
 - i. Length frequency sample file - CREATE
 - ii. Length frequency sample file - AMEND
 - iii. Length frequency sample file - DELETE
 - iv. Length frequency sample file - ENQUIRY

6.5.1 Length frequency file - Create

User may select the LENGTH FREQUENCY FILE - CREATE program by inputting 1 and "C" for SELECT FILE and MODE respectively in the file maintenance menu (Appendix 5). Refer Appendix 22 for the screen layout. Program will display File Maintenance Menu when return is pressed for species code.

FIELD	VALIDATION
SPECIES CODE (99AAA)	First two characters must be numeric and the rest three alphabetic. Must exist in Species file.
GEAR CODE (G9999)	First character is "G". The next four are numerics. Must exist in Description file.
BOAT TYPE	N/I/O/R
REPORTING CENTRE (A9999)	First character must be alphabetic and the rest four numerics. Must exist in description file.
DATE (dd/mm/yy)	Space - defaults to today's date. Should be valid date format.
STARTING MID LENGTH	Numeric 0 - 999.99 Default value is zero. Should be in centimeters.
LENGTH INTERVAL	Numeric 0 - 99.9 Default value is zero. Should be in centimeters.
SAMPLE WEIGHT	Numeric 0-999.9
TOTAL CATCH WT	Numeric 0 - 99999.9
FREQUENCY DATA	Numeric (0 - 9999) Default value is zero. (Should enter 9999 to exit).

6.5.2 Length frequency file - Amend

User may select the LENGTH FREQUENCY FILE - AMEND program by inputting 1, "A" to FILE and MODE respectively in the file maintenance menu (Appendix 5). Input species code, gear code, boat type and area code to select the record to be amended. The rest of the fields can be amended. Field number is prompted so that user can select the necessary field via ENTER FIELD NO. (Appendix 23). The program will prompt for the next record to be amended when return is pressed for ENTER FIELD NO. The program will display File Maintenance Menu when return is pressed for species code.

FIELD	VALIDATION
1. SPECIES CODE (99AAA)	First two characters must be numeric and the rest alphabetic. Must exist in the Species file.
2. GEAR CODE (G9999)	The first character is "G". The next four numeric. Must exist in Description file.
3. BOAT TYPE	N/I/O/R.
4. REPORTING CENTRE (A9999)	First character must be alphabetic and the rest four numeric. Must exist in description file.
5. DATE (dd/mm/yy)	Space - Defaults to today's date. Should be valid date format.
6. SAMPLE WT	Numeric 0 - 999.9
7. TOTAL CATCH WT	Numeric 0 - 99999.9
a. STARTING LENGTH	Numeric 0 - 999.99 Default value is zero. Should be in centimeters.
9. LENGTH INTERVAL	Numeric 0 - 99.9 Default value is zero Should be in centimeters.
10 to 59. FREQUENCY DATA	Numeric (0 - 9999) default value is zero.
ENTER FIELD NO. (2-59)	(Return to get next record)

6.5.3 Length frequency file - Delete

User may select the LENGTH FREQUENCY FILE - DELETE program by inputting 1 and "D" to FILE and MODE respectively in file maintenance menu (Appendix 5). Input SAMPLE ID. to select the record to be deleted. Program will prompt IS IT O/K TO DELETE? (Y/N ?) after displaying the record contents (Appendix 24). If the user wishes to delete the record enter "y" and the record will be deleted and the system will prompt for the next record to be deleted. If the record need not be deleted, enter "N" and the system will prompt for the next record to be deleted. Program will display File Maintenance Menu when return is pressed for species code.

6.5.4 Length frequency file - Enquiry

User may select the LENGTH FREQUENCY FILE - ENQUIRY program by inputting 1 and "E" to FILE and MODE respectively in the file maintenance menu (Appendix 5)'. User can input SAMPLE ID. to select the record to be enquired. Program will prompt. DEPRESS RETURN KEY after displaying the contents of the record (Appendix 25). If the user depresses RETURN the program will prompt for the next record to be enquired. Program will display File Maintenance Menu if return is pressed for species code.

7. FILE LISTINGS OPERATION

DISK USED: BOBFINS file listings program disk 1B.
(Refer Appendix 26 for the screen layout)

7.1 Boats file list

This program gives a dbase listing of the contents of the records in Boats File.

User should select the boats file listing by the input of 1 for the select file option in the file listings menu (refer appendix 27).

7.2 Description file list

Select the description file listing by inputting 2 for the select file option in the file listing menu as shown in Appendix 28.

This program accepts STARTING VALUE and ENDING VALUE of description codes (gear/areas/units of measurement) and prints the details of all the records from the STARTING VALUE to the ENDING VALUE.

If the STARTING VALUE = G and ENDING VALUE = G then the details of all the GEAR are printed,

If the STARTING VALUE = R and ENDING VALUE = R then the details of all the AREAS are printed.

If the STARTING VALUE = U and ENDING VALUE = U then the details of the UNITS OF MEASUREMENT are printed.

If the STARTING VALUE = G then the details of all the records from the beginning of the file up to the ENDING VALUE are printed.

If the ENDING VALUE = U, the details of all the records from the STARTING VALUE to the end of file are printed.

If STARTING VALUE = G and ENDING VALUE = U then the details of all the records in the file will be printed.

60 records per page will be printed.

7.3 Species file list

User should select species file listing by inputting 3 for the select file option in the file listings menu as shown in the Appendix 29. This program accepts STARTING VALUE and ENDING VALUE of species codes and prints the details of all the records from the STARTING VALUE to ENDING VALUE.

If the STARTING VALUE = return, then the details of the records from the beginning of the file up to ENDING VALUE are printed.

If the ENDING VALUE = return then the details of the records from the STARTING VALUE to end of file are printed.

If the STARTING VALUE = return and ENDING VALUE = return, then the details of all the records from the beginning of the file to the end of file are printed.

The headings will be printed on each page with the page number.

7.4 Fishing unit file list

User can select the fishing unit file listing by inputting 4 for the select file option in the file listings menu as shown in Appendix 30. Then user can select either a detailed listing or a dBASE II listing of the records by entering 1 or 2.

This program accepts STARTING VALUES and ENDING VALUES of reporting centre, date, boat ID, and species code and prints the details of all the records from the STARTING VALUES to ENDING VALUES.

This program sorts the fishing unit file records in the ascending order of the fields reporting centre, landing date, boat id and species code. Then the records falling within the range of starting and ending values will be listed.

If the STARTING REPORTING CENTRE = return and ENDING REPORTING CENTRE = return, the details of all the records from the beginning of the file to the end of the file are printed.

If the STARTING REPORTING CENTRE = return and the ENDING VALUES are entered, the details of all the records from the beginning of the files to the ENDING VALUES are printed.

If the STARTING VALUES are entered and the ENDING REPORTING CENTRE = return, the details of all the records from the STARTING VALUES to the end of file are printed.

User should note that the records will be listed according to the sorted order of reporting centre, landing date, boat id and species code within the starting and ending values. If different reporting centres are entered by the user for starting value and ending value, then all the records in between (including same reporting centre but different landing date) these values will be listed by the program. In the detailed listing the codes and names will be printed in detail.

The geographical region name, gear name, reporting centre name and unit of measurement are taken from the description file. Species name is taken from the species file.

Two records per page are printed and headings will be printed on each page with the page number. A sample output is shown in Appendix 44 of system specifications.

Boat type will be either non-mechanised, inboard engine, outboard engine or research vessel.

Fisheries will be categorised as not specified, traditional, small scale, large scale, sport or fleet operation.

In the dbase II list of records the headings of the fields will be printed in the order they appear. The data records will then be printed under the respective columns. This listing is given for the user to check data entry errors in one glance.

7.5 Length frequency file list

User may select this length frequency file listing by inputting 5 for the select file option in the file listings menu as shown in Appendix 31.

Length frequency data can be listed either by species or gear or area code or by sampling data. User may select this option by entering a number between 1 and 4. If 5 is entered file listing menu can be obtained. The records will be printed in the order they have been input to the disk. 3 records per page are printed. Reporting centre and gear will be taken from the Description file and the species name from the species file.

8. ANALYSIS REPORTS OPERATION

The Analysis Reports Menu (shown in Appendix 32) gives the operator the option to produce 4 types of analysis. Exit option will bring back the main menu in Appendix 1.

8.1 Analysis of craft

DISK USED: BOBFINS analysis programs disk 1B.

Operator has the option to choose analysis of craft either by area or grid.

This program accepts starting area/grid, gear, date and ending area/grid, gear and date (Appendix 33).

Within the accepted range of starting and ending values, records from the fishing unit file are extracted and a new file is created so that no two records will have the same reporting centre/grid, date and boat id. This new file is sorted in ascending order of reporting centre/grid, gear and date and then used to produce this analysis report.

The following reports are produced.

- (i) Detailed analysis of craft categories by gear and area/grid for a selected period.
- (ii) Analysis summary of craft for gear for a selected period.
- (iii) Analysis summary of craft for areas for a selected period.

8.2 Analysis of crew

The user has the options to choose analysis of crew either by Fisheries or Craft and by Area or Grid.

As shown in Appendix 34, the user inputs the starting area/grid, gear date and ending area/grid, gear and date. The fishing unit file records within this given range are extracted and a new file is created so that no two records will have the same reporting centre/grid, date and boat ID. This new file is sorted in ascending order of reporting centre/grid, gear and date and then used to produce this analysis.

The following reports will be produced.

- (i) Detailed analysis of crew by craft or fisheries, gears and by area or grid for a selected period.
- (ii) Analysis summary of crew for gear for a selected period.
- (iii) Analysis summary of crew for areas/grid for a selected period.

8.3 Analysis of CPUE by depth and boat classification

DISK USED: BOBFINS Analysis disk 2B

The Operator is given the option to choose analysis either by Area or Grid and by length/weight/horse power of the boat.

If data entry for boat classification (length/wt/hp) was not made, then user can only obtain analysis of CPUE by boat type (Section 6.4).

If depth classification was not available, then data should have been entered with zero depth. Then choose 0-10 as the depth range in the report.

This program accepts starting area/grid, gear, species, date and ending area/grid, gear, species and date, along with the starting length/weight horse power and a maximum of 6 interval sizes. (Refer Appendix 35.)

The horse power value for non-mechanized boats is taken in as zero automatically when the data is being entered. If the user wishes to obtain analysis of CPUE by horse power for boats other than non-mechanised boats, then do not use zero as the starting interval. However, if the user wishes to get analysis of CPUE by horse power for all boats including non-mechanized ones, then zero could be entered as the starting interval.

User is given the option to select the necessary reports by entering a digit between 1 and 8. If 9 is pressed the program goes back to the analysis reports menu (refer Appendix 36). Each report could be either displayed on the screen by pressing 'D' or printed on hard copy by pressing 'P'.

The following reports will be produced in this program.

- (i) Detailed analysis

Detailed analysis of catch per unit effort by depth, boat length/weight/horse power, gear, area/grid and species for a selected period.
- (ii) Monthly combined average

Average catch per unit effort for the Period.
- (iii) Species combined analysis

Detailed analysis of catch per unit effort for all the species by depth, boat length/weight/horse power, gear and area/grid for a selected period.
- (iv) Species combined monthly average

Average catch per unit effort for all the species for the accepted period.
- (v) Area combined analysis

Detailed analysis of CPUE for all the areas by species, gear type by depth and length/weight/horse power for a selected period.
- (vi) Area combined monthly average

Average catch per unit effort for all the species for a selected period.
- (vii) Species and area combined analysis

Detailed Analysis of CPUE for all the species and all the areas/grid by depth and length/weight/horse power and by gear for a selected period.
- (viii) Species and area combined monthly average

Average catch per unit effort for all the species and all areas/grid for a selected period.

8.4 Analysis of CPUE by depth and boat type

DISK USED; BOBFINS analysis program disk 2B.

The analysis of catch per unit effort is done either by area/grid.

The program accepts starting area/grid, gear, species, date and ending area/grid, gear, species and date.
(Refer Appendix 37).

User is given the option to select the necessary reports by pressing a digit from 1 to 8 (refer Appendix 38). If 9 is entered, the program goes back to the analysis report menu. Each report could be either displayed on the screen or printed on hard copy.

The following reports will be produced.

(i) Detailed analysis

Detailed analysis of CPUE by depth, boat type, species, gear and area/grid for a selected period.

(ii) Monthly combined average

Average catch per unit effort for the selected period.

(iii) Species combined analysis

Detailed analysis of CPUE for all the species by depth, boat type, gear and area/grid for the selected period.

(iv) Species combined monthly average

Average catch per unit effort for all the species for the selected period.

(v) Area combined analysis

Detailed analysis of CPUE for all the areas by gear, by depth, boat type and species for a selected period.

(vi) Area combined monthly average

Average catch per unit effort for all the areas for the selected period.

(vii) Species and area combined analysis

Detailed analysis of CPUE for all the species, and all areas/grids by depth, gear and boat type for the selected period.

(viii) Species and area combined monthly average

Average catch per unit effort for all the species and all areas/grids for the selected period.

8.5 Analysis of total production

This program allows analysis of total production by area or grid by accepting STARTING AREA/GRID, GEAR, SPECIES, DATE and ENDING AREA/GRID, **GEAR**, SPECIES, DATE (Appendix 39).

The user is given the option to select the necessary reports by pressing a digit from 1 to 7. If 8 is entered, the program goes back to the analysis reports menu (refer Appendix 40). Each report could be either displayed on the screen or printed on hard copy.

The following 7 reports are produced in this program.

(i) Detailed analysis

Analysis of total production and effort by area/grid, gear type, species, and boat type for each month in the accepted period.

(ii) Species combined analysis

Analysis of total production for all the species by area/grid, gear type, fish type and boat type for each month in the accepted period.

(iii) Fish type and species combined analysis

Analysis of total production by gear type, area/grid, and boat type for each month for all the species and all the fish types for the selected period.

(iv) Gear and species combined analysis

Analysis of total production by area/grid, fish type, boat type for all the species and all gear types for each month in the selected period.

(v) Fish type, gear and species combined analysis

Analysis of total production by area/grid and boat type for all the species, all the fish types and all the gear types for each month in the selected period.

(vi) Gear, species and area combined analysis

Analysis of total production by fish type and boat type for all the species, all gear types and all areas/grids for each month in the accepted period.

(vii) Fish type, gear, species and area combined analysis

Analysis of total production by boat type for all species, all gear types, all areas/grids, all fish types for each month in the accepted period.

8.6 Analysis of operating costs

DISK USED: BOBFINS analysis program disk 4B

This program accepts REPORTING CENTRE, BOAT ID. STARTING DATE and ENDING DATE as shown in Appendix 41. The STARTING DATE and ENDING DATE range should not exceed more than six months for each analysis. Analysis for 12 months may be carried out in two stages by re-running this program for the second half of the year.

The following calculations are done starting from the 1st record of the new file.

$$(1) \text{ DEPRECIATION} = \frac{(\text{BOAT PRICE} \times \text{BOAT DEP}) - (\text{GEAR PRICE} \times \text{GEAR DEP})}{100 \times 12}$$

$$(2) \text{ INSURANCE} = \frac{(\text{BOAT INS.} \times \text{BOAT PRICE}) + (\text{GEAR PRICE} \times \text{GEAR INS.})}{100 \times 12}$$

$$(3) \text{ INTEREST} = \frac{(\text{BOAT PRICE} + \text{GEAR PRICE}) \times \text{INTEREST} + \text{EQUIPMENT COST}}{100 \times 12}$$

$$(4) \text{ MAINTENANCE} = \text{MAINTENANCE AMOUNT}$$

$$(5) \text{ COST OF FUEL} = \text{AMOUNT OF FUEL CONSUMED PER TRIP} \times \text{FUEL COST PER UNIT} \times \text{AVERAGE NO. OF TRIP/MTHS}$$

$$(6) \text{ COST OF ICE} = \text{AMOUNT OF ICE PER TRIP} \times \text{ICE COST PER UNIT} \times \text{AVERAGE NO. OF TRIPS/MTH}$$

$$(7) \text{ BAIT COST} = \text{AMOUNT OF BAIT PER TRIP} \times \text{BAIT COST PER UNIT} \times \text{AVERAGE NO. OF TRIPS/MTH}$$

$$(8) \text{ CREW WAGES} = \text{TOTAL CREW WAGE/TRIP} \times \text{AVERAGE NO. OF TRIPS/MTH}$$

$$(9) \text{ GROSS EARNINGS} = \text{SAMPLE CATCH} \times \text{FISH PRICE AT LANDING POINT} \times \text{AVERAGE NO. OF TRIPS/MTH.}$$

$$(10) \quad \text{TOTAL MONTHLY COSTS} = \text{DEPRECIATION} + \text{INSURANCE} + \text{INTEREST} + \\ \text{MAINTENANCE} + \text{COST OF FUEL} + \text{COST OF ICE} + \\ \text{BAIT COST} + \text{CREW WAGES},$$

$$(11) \quad \text{PROFIT} = \text{ACCUMULATED GROSS EARNINGS} - \text{TOTAL MONTHLY COSTS}.$$

For each month in the accepted period all the calculations from (1) to (11) are repeated.

8.7 Analysis of length frequency

DISK USED: BOBFINS analysis program disk 4B

This program accepts gear type, species, starting area, date and ending area, date, as in Appendix 42.

Next the prompt "do you wish to raise the frequencies to the fleet (Y/N)? " appears. If 'N' is entered, the system replies "enter P to print or Q to quit" Else if 'Y' is entered, another prompt "again raise these raised frequencies to the monthly production (Y/N)" appears. If Y is entered the message "Then note that the monthly production figures for all the areas will have to be entered separately" will appear. Then the final message "enter P to print or Q to quit." appears. If Q is entered the system exits to the original analysis menu. If P is entered the following reports will be output.

(i) Detailed analysis of length frequency data raised to the fleet by area for gear & species for the selected period., This will be followed by the % length frequencies.

(ii) Summary of length frequency data raised to the fleet for the selected period by gear, area and species. The % length frequencies will also be printed.

(iii) Summary of length frequency data raised to the fleet for all the areas by gear and species for the selected period and the % length frequencies.

(iv) Summary of length frequency data raised to the fleet for areas and the selected period by gear and species and the % length frequencies.

Length frequency = Length frequency x raising
raised to the fleet of the sample factor

Raising = Catch wt. of the specie; by area, season & gear
Factor Sample wt. for length frequency of that species
for the same area, season and gear.

If "Y" is entered for the second raising, then the following reports will be printed in addition.

(v) detailed analysis of length frequency data raised to the monthly production by area for gear and species for the selected period.

(vi) Summary of length frequency data raised to the monthly production for the selected period by gear, area and species. This will be followed by the % length frequencies.

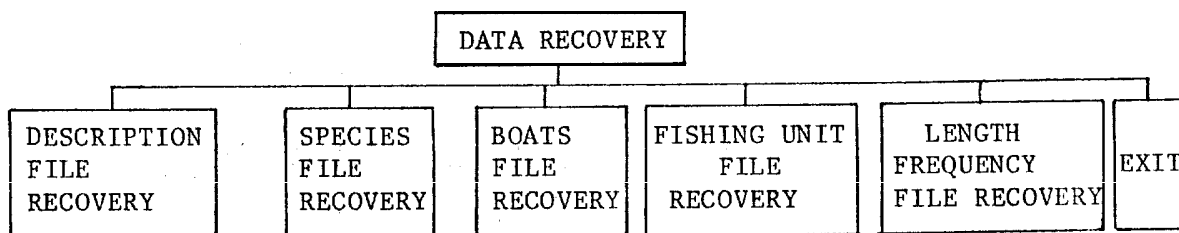
(vii) Summary of length frequency data raised to the monthly production for all the areas by gear & species for the selected period and the % length frequencies.

(viii) Summary of length frequency data raised to the monthly production for all the areas and the selected period by gear and species and the % length frequencies.

Length frequency data raised to the monthly production	=	Length frequency data raised to the fleet	\times $\frac{\text{production}}{\text{total catch}}$
--	---	--	---

9. DATA RECOVERY OPERATION

Enter 4 from the BOBFINS main menu to choose this option. The screen displays a brief description about this program and if the user wishes to proceed, then enter 'Y'. If 'N' is entered at this stage, you can exit to main menu. From the data recovery menu which appears user may select the file to be reindexed or exit to main menu (refer Appendix 43). If 1, 2 or 3 is entered, then the user should insert data disk 2B into the disk drive 'B'. If 4 or 5 is entered, then insert data disk '1A' into the disk drive 'B'. Then the program will count the data records in the file and in the indexed data file separately. If they match then there is no need to reindex. Otherwise the program displays the number of records in the data file and asks the user whether he wishes to destroy the index file and reindex the data file. If 'Y' is entered reindexing takes place and the program gives back the main menu. If 'N' is entered program quits to main menu without reindexing.



10. ALTERNATIVE SYSTEM (OPTIONAL)

The existing method used by BOBFINS package to calculate production is as follows:

$$\begin{array}{lcl} \text{Production} & = & \frac{\text{Sample catch}}{\text{Sample effort}} \times \text{Effort} \times \text{No. of boats} \times \text{Average no.} \\ \text{per month} & & \text{per trip} \quad \text{with same} \quad \text{of trips} \\ & & \text{gear type} \quad \text{per mth.} \end{array}$$

In special cases (eg. Bangladesh) where the data for all the fields in the fishing unit file cannot be made available due to some reason, BOBFINS gives the user an alternative system to be used. Two additional diskettes named as file maintenance disk '2B' (alternative method) and analysis programs '3B' (alternative method) will replace the normal file maintenance disk '2B' and analysis disk '3B'. All the other data entry except fishing unit file will remain the same. The entry "unit of effort" in fishing unit file will not be required in this alternative method. The terms catch and effort will appear as landing and number of boats. Number of boats operating with similar gear type will be termed as number of boats landing on sampling day. The average number of trips per month will be termed as calendar days per month. Other than these terms all the other entries in the fishing unit file will be the same as in the normal case. These new terms will appear on all the create/amend/delete/enquiry programs. User should bear in mind that the file structure of the fishing unit file remains the same in this alternative method. Hence if the user wishes to change over from the normal system to alternative method, then the existing data in the normal system should be called for in the amend program and amended record by record. The unit of effort field can be neglected in the alternative method. On the output side, all the other analysis programs except the production analysis, remains the same, When printing the production reports in the alternative method, user should remember to insert the special disk '3B' (alternative method) into disk drive 'B'. Then the operation of the program remains the same.

This alternative system provides the user with a calculation of landing per month as follow :

$$\begin{array}{lcl} \text{Landing} & = & \frac{\text{Landing by boats sampled}}{\text{No. of boats sampled}} \times \text{No. of boats} \times \text{No. of days} \\ \text{per month} & & \text{landed per} \quad \text{per} \\ & & \text{day} \quad \text{month} \end{array}$$

The total production report will use the above calculation in this alternative system. The fields unit of effort (or number of days per trip) and average number of trips per month are not used for the calculations of production and hence will not be in the fishing unit file in this alternative method. However user should hear in mind that this method of estimation does not compensate for variability of the duration of each fishing trip and the number of settings made per trip.

Screen layouts

Appendix 1

BAY OF BENGAL FISHERIES INFORMATION SYSTEM (hard disk version)

1. FILE MAINTENANCE
2. FILE LISTINGS
3. ANALYSIS REPORTS
4. DATA RECOVERY
5. EXIT

SELECT (1-5)

Appendix 2

RAY OF BENGAL FISHERIES INFORMATION SYSTEM (hard disk version)

FILE MAINTENANCE

1. MASTER FILES - DESCRIPTION FILE
SPECIES FILE
BOATS FILE
2. FISHING UNITS FILE
3. LENGTH FREQUENCY FILE
4. EXIT

SELECT (1-4)

BAY OF BENGAL FISHERIES INFORMATION SYSTEM

DATE: 01/01/87

FILE MAINTENANCE (hard disk version)

- | | | |
|----|-------------------|----------------|
| 1. | BOATS FILE | CREATE -- C |
| 2. | DESCRIPTION FILE | AMEND - A |
| 3. | SPECIES FILE | DELETE - D |
| 4. | EXIT | |
| | SELECT FILE (1-4) | MODE (C/A/D/E) |

BAY OF BENGAL FISHERIES INFORMATION SYSTEM

DATE : 01/01/87

FILE MAINTENANCE (hard disk version)

- | | | |
|----|--------------------|----------------|
| 1. | FISHING UNITS FILE | CREATE -- C |
| | | AMEND - A |
| | | DELETE - D |
| | | ENQUIRY - E |
| 2. | EXIT | |
| | SELECT FILE (1-2) | MODE (C/A/D/E) |

BAY OF BENGAL FISHERIES INFORMATION SYSTEM

DATE: 01/01/87

FILE MAINTENANCE (hard disk version)

1. LENGTH FREQUENCY FILE
CREATE - C
AMEND - A
DELETE - D
ENQUIRY- E
2. EXIT
SELECT FILE (1-2) MODE (C/A/D/E)

Appendix 6

BOATS FILE - CREATE

DATE: 01/01/87

BOAT ID	:	BOAT TYPE (N/l/O/R)	:
BOAT DESCRIPTION	:		
CURRENCY UNIT	:		
BOAT - PRICE	:	GEAR - PRICE	:
- DEP%	:	- DEP. %	:
- INS. %	:	- INS. %	:
INTEREST %	:	EQUIPMENT COST	:
FISHERIES (0-5)	:	HORSE POWER	:
GRT OF BOAT	:	LOA OF BOAT (m)	:
UNIT OF FUEL	:		
UNIT OF ICE	:		
UNIT OF BAIT	:		

BOATS FILE - AMEND

DATE: 01/01/87

1.	BOAT ID	:	2.	BOAT TYPE (N/I/O/R):	:
3.	BOAT DESCRIPTION	:			
4.	CURRENCY UNIT	:			
5.	BOAT PRICE	:	6.	GEAR - PRICE	:
7.	- DEP. %	:	8.	- DEP. %	:
9.	- INS. %	:	10.	- INS. %	:
11.	INTEREST %	:	12.	EQUIPMENT COST	:
13.	FISHERIES (0-5)	:	14.	HORSE POWER	:
15.	GRT OF BOAT	:	16.	LOA OF BOAT (m)	:
17.	UNIT OF FUEL	:			
18.	UNIT OF ICE	:			
19.	UNIT OF BAIT	:			

ENTER FIELD NO. (2-19):

Appendix 8

BOATS FILE - DELETE

DATE: 01/01/87

BOAT ID	:	BOAT TYPE (N/I/O/R):	:
BOAT DESCRIPTION	:		
CURRENCY UNIT	:		
BOAT - PRICE	:	GEAR - PRICE	:
- DEP. %	:	- DEP. %	:
- INS. %	:	- INS. %	:
INTEREST %	:	EQUIPMENT COST	:
FISHERIES (0-5)	:	HORSE POWER	:
GRT OF BOAT	:	LOA OF BOAT(m)	:
UNIT OF FUEL	:		
UNIT OF ICE	:		
UNIT OF BAIT	:		

IS IT O.K. TO DELETE (Y/N)?

BOATS FILE - ENQUIRY

DATE: 01/01/87

BOAT ID : BOAT TYPE (N/I/O/R):
BOAT DESCRIPTION :
CURRENCY UNIT :

BOAT - PRICE : GEAR - PRICE :
- DEP.% : - DEP.% :
- INS.% : - INS.% :

INTEREST % : EQUIPMENT COST :
FISHERIES (0-5) : HORSE POWER :
GRT OF BOAT : LOA OF BOAT (m) :

UNIT OF FUEL :
UNIT OF ICE :
UNIT OF BAIT :

PRESS RETURN TO CONTINUE

DESCRIPTION FILE - CREATE

DATE: 01/01/86

DESCRIPTION CODE :
GEAR CODE (G9999)
REGION CODE(R3AA99)
AREA CODE (A9999)
UOM CODE (U99)

DESCRIPTION :

DESCRIPTION FILE - AMEND

DATE: 01/01/87

1. DESCRIPTION CODE :

GEAR CODE (G9999)

REGION CODE(R3AA99)

AREA CODE (A9999)

UOM CODE (U99)

2. DESCRIPTION :

EDIT DESCRIPTION (Y/N)?

DESCRIPTION FILE - DELETION

DATE: 01/01/87

DESCRIPTION CODE :

GEAR CODE (G9999)

REGION CODE (R3AA99)

AREA CODE (A9999)

UOM CODE (U99)

DESCRIPTION :

IS IT O/K TO DELETE (Y/N) ?

DESCRIPTION FILE - ENQUIRY

DATE: 01/01/87

DESCRIPTION CODE :
GEAR CODE (G9999)
REGION CODE (R3AA99)
AREA CODE (A9999)
UOM CODE (U99)

DESCRIPTION :

DEPRESS RETURN KEY TO CONTINUE

SPECIES FILE - CREATE

DATE : 01/01/87

SPECIES CODE :
SCIENTIFIC NAME :
ENGLISH NAME :
LOCAL NAME :
FISH TYPE (D/P/S/O):

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SPECIES FILE - AMENDDATE 01/01/87

1. SPECIES CODE :
2. SCIENTIFIC NAME :
3. ENGLISH NAME :
4. LOCAL NAME :
5. FISH TYPE (D/P/S/O) :

ENTER FIELD NO. (2-5)

SPECIES FILE - DELETIONDATE 01/01/87

SPECIES CODE :

SCIENTIFIC NAME :

ENGLISH NAME :

LOCAL NAME :

FISH TYPE :

IS IT O/K TO DELETE (Y/N)?

SPECIES FILE - ENQUIRY

DATE : 01/01/87

SPECIES CODE :
SCIENTIFIC NAME :
ENGLISH NAME :
LOCAL NAME :
FISH TYPE :

DEPRESS RETURN KEY TO CONTINUE

FISHING UNITS FILE - CREATE

DATE: 01/01/87

REPORTING CENTRE (A9999) :	LANDING DATE (DD/MM/YY) :
SPECIES CODE (99AAA) :	BOAT ID. (REG/LICEN NO.) :
GEAR CODE (G9999) :	GRID. IND/BLOCK NO (R3AA99) :
SAMPLE EFFORT :	UOM OF EFFORT (U99) :
UNITS OF EFFORT/BOAT (hooks, sets, days, hrs etc. per trip) :	
FISHING DEPTH (m) :	CREW SIZE :
AVERAGE NO OF TRIPS/MTH1 :	BOATS WITH SAME GEAR TYPE :
CREW SHARE :	SKIPPER'S ADDITIONAL SHARE :
AMOUNT OF FUEL -	COST OF FUEL/UNIT :
AMOUNT OF ICE .	COST OF ICE/UNIT :
AMOUNT OF BAIT :	COST OF BAIT/UNIT :
MAINTENANCE AMOUNT :	

ABOVE ENTRIES O.K.? (Y/N)

FISHING UNITS FILE - AMEND

DATE: 01/01/87

1. REPORTING CENTRE (A9999) :	2. LANDING DATE (DD/MM/YY) :
3. SPECIES CODE (99AAA) :	4. BOAT ID. (REG.LICEN NO.) :
5. GEAR CODE :	6. GRID.IND./BLOCK (R3AA99) :
7. SAMPLE EFFORT :	8. UOM OF EFFORT :
9. UNITS OF EFFORT/BOAT :	
10. FISHING DEPTH (m) :	11. CREW SIZE :
12. AVERAGE NO OF TRIPS/MTH :	13. BOATS WITH SAME GEARTYPE :
14. SAMPLE CATCH :	15. UOM OF CATCH :
16. PRICE AT LANDING PT. :	17. RETAIL PRICE/UNIT :
18. WHOLESALE PRICE/UNIT :	19. MAINTENANCE AMOUNT :
20. CREW SHARE :	21. SKIPPER'S ADDITIONAL SHARE :
22. AMOUNT OF FUEL :	23. COST OF FUEL/UNIT :
24. AMOUNT OF ICE :	25. COST OF ICE/UNIT :
26. AMOUNT OF BAIT :	27. COST OF BAIT/UNIT :

ENTER FIELD NO. (5-27)

FISHING UNITS FILE - DELETION

DATE: 01/01/87

REPORTING CENTRE (A9999) :	LANDING DATE (DD MM YY) :
SPECIES CODE (99AAAA) :	BOAT ID. (REG LLCEN NO.) :
GEAR CODE :	GRID.IND./BLOCK No. :
SAMPLE EFFORT :	UOM OF EFFORT :
UNITS OF EFFORT/BOAT :	
FISHING DEPTH (m) :	CREW SIZE :
AVERAGE NO OF TRIPS/MTH :	BOATS WITH SAME GEAR TYPE :
SAMPLE CATCH :	UOM OF CATCH :
PRICE AT LANDING PT. :	RETAIL PRICE/UNIT :
WHOLESALE PRICE/UNIT :	MAINTENANCE AMOUNT :
CREW SHARE :	SKIPPER'S ADDITIONAL SHARE :
AMOUNT OF FUEL :	COST OF FUEL/UNIT :
AMOUNT OF ICE :	COST OF ICE/UNIT :
AMOUNT OF BAIT :	COST OF BAIT/UNIT :

IS IT O/K TO DELETE (Y/N) :

FISHING UNITS FILE - ENQUIRY

DATE: 01/01/87

REPORTING CENTRE (A9999) :	LANDING DATE (DD/MM/YY) :
SPECIES CODE (99AAA) :	BOAT ID. (REG/LICEN NO.) :
GEAR CODE :	GRID. IND./BLOCK NO. :
SAMPLE EFFORT :	UOM OF EFFORT :
UNITS OF EFFORT/BOAT :	
FISHING DEPTH (m) :	CREW SIZE :
AVERAGE NO OF TRIPS/MTH :	BOATS WITH SAME GEAR TYPE :
SAMPLE CATCH :	UOM OF CATCH :
PRICE AT LANDING PT. :	RETAIL PRICE/UNIT :
WHOLESALE PRICE/UNIT :	MAINTENANCE AMOUNT :
CREW SHARE :	SKIPPER'S ADDITIONAL SHARE :
AMOUNT OF FUEL :	COST OF FUEL/UNIT :
AMOUNT OF ICE :	COST OF ICE/UNIT :
AMOUNT OF BAIT :	COST OF BAIT/UNIT :

DEPRESS RETURN KEY TO CONTINUE

LENGTH FREQUENCY FILE - CREATE

DATE: 01/01/87

SPECIES CODE (99AAA) :	GEAR CODE (G9999) :
BOAT TYPE (N/I/O/R) :	AREA CODE (A9999) :
DATE (DD/MM/YY) :	
SAMPLE WT. :	TOTAL CATCH WT. :
STARTING LENGTH (cm) :	LENGTH INTERVAL (cm) :

NO. OF INTERVALS L E N G T H F R E Q U E N C Y D A T A

01 ----- 10 :

11 ----- 20 :

21 ----- 30 :

31 ----- 40 :

41 ----- 50 :

ENTER 9999 TO EXIT

LENGTH FREQUENCY FILE - AMEND

DATE: 01/01/87

1. SPECIES CODE (99AAA)	:	2. GEAR CODE (G9999)	:
3. BoAt TyPe (N/I/O/R)	:	4. AREA CODE (A9999)	:
5. DATE (DD/MM/YY)	:		
6. SAMPLE WT.	:	7. TOTAL CATCH WT.	:
8. STARTING LENGTH (cm)	:	9. LENGTH INTERVAL (cm)	:

NO. OF INTERVALS L E N G T H F R E Q U E N C Y D A T A

10 ----- 19 :

20 ----- 29 :

30 ----- 39 :

40 ----- 49 :

50 ----- 59 :

ENTER FIELD NO. (6-59) :

LENGTH FREQUENCY FILE - DELETE

DATE 01/01/87

SPECIES CODE (99AAA)	:	GEAR CODE (G9999)	:
BOAT TYPE (N/I/O/R)	:	AREA CODE (A9999)	:
DATE (DD/MM/YY)	:		
SAMPLE WT.	:	TOTAL CATCH WT.	:
STARTING LENGTH (cm)	:	LENGTH INTERVAL (cm)	:

NO. OF INTERVALS L E N G T H F R E Q U E N C Y D A T A

01 ----- 10 :

11 ----- 20 :

21 ----- 30 :

31 --_----- 40 :

41 ----- 50 :

IS IT O.K. TO DELETE (Y/N) :

LENGTH FREQUENCY FILE - ENQUIRY

DATE: 01/01/87

SPECIES CODE (99AAA) : GEAR CODE (G9999) :
 BOAT TYPE (N/I/O/R) : AREA CODE (A9999) :
 DATE (DD/MM/YY) :
 SAMPLE WT. : TOTAL CATCH WT. :
 STARTING LENGTH (cm) : LENGTH INTERVAL (cm) :

NO. OF INTERVALS L E N G T H F R E Q U E N C Y D A T A

01 ----- 10 :

11 ----- 20 :

21 ----- 30 :

31 ----- 40 :

41 --_----- 50 :

DEPRESS RETURN KEY TO CONTINUE

BAY OF BENGAL FISHERIES INFORMATION SYSTEM

DATE: 01/01/87

FILE LISTING MENU (hard disk version)

1. BOATS FILE
2. DESCRIPTION FILE
3. SPECIES FILE
4. FISHING UNIT FILE
5. LENGTH FREQUENCY FILE
6. EXIT

SELECT FILE (1-6)

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BAY OF BENGAL FISHERIES INFORMATION SYSTEM

DATE: 01/01/87

FILE LISTING MENU (hard disk version)

1. BOATS FILE
2. DESCRIPTION FILE
3. SPECIES FILE
4. FISHING UNIT FILE
5. LENGTH FREQUENCY FILE
6. EXIT

SELECT FILE (1-6)

STARTING BOAT ID. OR RETURN
 ENDING BOAT ID. OR RETURN

SET THE PRINTER ON-----

BAY OF BENGAL FISHERIES INFORMATION SYSTEM

DATE: 01/01/87

FILE LISTING MENU (hard disk version)

1. BOATS FILE
2. DESCRIPTION FILE
3. SPECIES FILE
4. FISHING UNIT FILE
5. LENGTH FREQUENCY FILE
6. EXIT

SELECT FILE(1-6)

STARTING DESCRIPTION CODE
 ENDING DESCRIPTION CODE

SET THE PRINTER ON -----

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BAY OF BENGAL FISHERIES INFORMATION SYSTEMDATE:01/01/87FILE LISTING MENU (hard disk version)

1. BOATS FILE
2. DESCRIPTION FILE
3. SPECIES FILE
4. FISHING UNIT FILE
5. LENGTH FREQUENCY FILE
6. EXIT

SELECT FILE (1-6)

STARTING SPECIES CODE OR RETURN
 ENDING SPECIES CODE OR RETURN

SET THE PRINTER ON -----

BAY OF BENGAL FISHERIES INFORMATION SYSTEMDATE: 01/01/87FILE LISTING MENU (hard disk version)

1. BOATS FILE
2. DESCRIPTION FILE
3. SPECIES FILE
4. FISHING UNIT FILE
5. LENGTH FREQUENCY FILE
6. EXIT

SELECT FILE (1-6)

ENTER 1 FOR DETAILED LISTING OR 2 FOR dBASE II LISTING

STARTING REPORTING CENTRE (A9999)

DATE (DD/MM/YY)

BOAT ID.

SPECIES CODE (99AAA)

ENDING REPORTING CENTRE (A9999)

DATE (DD/MM/YY)

BOAT ID.

SPECIES CODE (99AAA)

SET THE PRINTER ON -----

BAY OF BENGAL FISHERIES INFORMATION SYSTEM

DATE: 01/01/87

FILE LISTING MENU (hard disk version)

1. BOATS FILE
2. DESCRIPTION FILE
3. SPECIES FILE
4. FISHING UNIT FILE
5. LENGTH FREQUENCY FILE
6. EXIT

SELECT FILE (1-6)

LENGTH FREQUENCY FILE LISTING OPTIONS

1. BY SPECIES
2. BY GEAR
3. BY AREA CODE
4. BY SAMPLING DATE
5. EXIT

SELECT OPTION (1-5)

BAY OF BENGAL FISHERIES INFORMATION SYSTEM

DATE: 01/01/87

ANALYSIS REPORTS (hard disk version)

1. ANALYSIS OF CRAFTS
 2. ANALYSIS OF CREW
 3. ANALYSIS OF CPUE BY DEPTH, BOAT CLASSIFICATION
 4. ANALYSIS OF CPUE BY DEPTH, BOAT TYPE
 5. ANALYSIS OF TOTAL PRODUCTION
 6. ANALYSIS OF OPERATING COSTS
 7. ANALYSIS OF LENGTH FREQUENCY
 8. EXIT
- SELECT (1-8)

BAY OF BENGAL FISHERIES INFORMATION SYSTEM' DATE : 01/01/87

ANALYSIS OF OPERATING CRAFTS

ANALYSIS BY AREA OR GRID (AREA=A, GRID=G) :

STARTING AREA CODE (A9999) :
GEAR TYPE (G9999) :
DATE YY/MM :

ENDING AREA CODE (A9999) :
GEAR TYPE (G9999) :
DATE YY/MM :

* DO YOU WANT A PRINTOUT (Y/N)

BAY OF BENGAL FISHERIES INFORMATION SYSTEM DATE: 01/01/87

ANALYSIS OF NUMBER OF CREW

BY FISHERIES OR CRAFTS (FISHERIES=F, CRAFTS=C) :

BY AREA OR GRID (AREA=A, GRID=G) :

STARTING AREA CODE (A9999) :
GEAR TYPE (G9999) :
DATE YY/MM :

ENDING AREA CODE (A9999) :
GEAR TYPE (G9999) :
DATE YY/MM :

* DO YOU WANT A PRINTOUT (Y/N)

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BAY OF BENGAL FISHERIES INFORMATION SYSTEM DATE: 01/01/87
 ANALYSIS OF CATCH PER UNIT EFFORT BY DEPTH AND BOAT CLASSIFICATION/TYPE

ANALYSIS BY LENGTH/WEIGHT/HORSE POWER (L/W/H) :
 ANALYSIS BY AREA OR GRID (AREA=A, GRID=G) :

STARTING AREA CODE (A9999)	:	STARTING BOAT LENGTH :
GEAR TYPE (G9999)	:	
SPECIES (99AAA)	:	1ST INTERVAL SIZE :
DATE YY/MM	:	2ND INTERVAL SIZE :
		3RD INTERVAL SIZE :
ENDING AREA CODE (A9999)	:	4TH INTERVAL SIZE :
GEAR TYPE (G9999)	:	5TH INTERVAL SIZE :
SPECIES (99AAA)	:	6TH INTERVAL SIZE :
DATE YY/MM	:	
ENDING DEPTH (400)	:	

MULTIPLES OF 10 IF < 150
 MULTIPLES OF 25 IF > 150

BAY OF BENGAL FISHERIES INFORMATION SYSTEM DATE: 01/01/87
 ANALYSIS MENU OF CPUE BY DEPTH & BOAT CLASSIFICATION/TYPE

- 1 DETAILED ANALYSIS
- 2 MONTH COMBINED AVERAGE
- 3 SPECIES COMBINED ANALYSIS
- 4 SPECIES COMBINED MONTHLY AVERAGE
- 5 AREA COMBINED ANALYSIS
- 6 AREA COMBINED MONTHLY AVERAGE
- 7 SPECIES & AREA COMBINED ANALYSIS
- 8 SPECIES & AREA COMBINED MONTHLY AVERAGE
- 9 EXIT TO ANALYSIS MENU

PICK YOUR CHOICE (1-9)

(D) FOR DISPLAY, c (P) "FOR PRINT HARD COPY

BAY OF BENGAL FISHERIES INFORMATION SYSTEM

DATE: 01/01/87

ANALYSIS OF CATCH PER UNIT EFFORT BY DEPTH AND BOAT TYPE

ANALYSIS BY AREA OR GRID (ARE=A, GRID=G) :

STARTING AREA CODE (A9999) :
GEAR TYPE (G9999) :
SPECIES (99AAA) :
DATE YY/MM :

ENDING AREA CODE (A9999) :
GEAR TYPE (G9999) :
SPECIES (99AAA) :
DATE YY/MM :
ENDING DEPTH (400) :

MULTIPLES OF 10 IF DEPTH<150

MULTIPLES OF 25 IF DEPTH>150

BAY OF BENGAL FISHERIES INFORMATION SYSTEM

DATE: 01/01/87

ANALYSIS MENU OF CPUE BY DEPTH & BOAT CLASSIFICATION/TYPE

- 1 DETAILED ANALYSIS
- 2 MONTH COMBINED AVERAGE
- 3 SPECIES COMBINED ANALYSIS
- 4 SPECIES COMBINED MONTHLY AVERAGE
- 5 AREA COMBINED ANALYSIS
- 6 AREA COMBINED MONTHLY AVERAGE
- 7 SPECIES & AREA COMBINED ANALYSIS
- 8 SPECIES & AREA COMBINED MONTHLY AVERAGE
- 9 EXIT TO ANALYSIS MENU

PICK YOUR CHOICE (1-9)

(D) FOR DISPLAY, (P) FOR PRINT HARD COPY

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BAY OF BENGAL FISERIES INFORMATION SYSTEM

DATE: 01/01/87

TOTAL PRODUCTION ANALYSIS

ANALYSIS BY AREA OR GRID (AREA=A, GRID=G) :

STARTING AREA CODE (A9999)	:
GEAR TYPE (69999)	:
SPECIES (99AAA)	:
DATE YY/MM	:

ENDING AREA CODE (A9999)	:
GEAR TYPE (G9999)	:
SPECIES (99AAA)	:
DATE YY/MM	:

BAY OF BENGAL FISHERIES INFORMATION SYSTEM

DATE: 01/01/87

ANALYSIS MENU OF TOTAL MONTHLY PRODUCTION

- 1 DETAILED ANALYSIS ,
- 2 SPECIES COMBINED ANALYSIS
- 3 FISH TYPE & SPECIES COMBINED ANALYSIS
- 4 GEAR & SPECIES COMBINED ANALYSIS
- 5 FISH TYPE, GEAR & SPECIES COMBINED ANALYSIS
- 6 GEAR, SPECIES & AREA COMBINED ANALYSIS
- 7 FISH TYPE, GEAR, SPECIES & AREA COMBINED ANALYSIS

8 EXIT TO ANALYSIS MENU

PICK YOUR CHOICE (1-8)

(D) FOR DISPLAY, (P) TO PRINT HARD COPY

(*) SET THE PRINTER ON _____

Appendix 41

BAY OF BENGAL FISHERIES INFORMATION SYSTEM

DATE: 01/01/87

OPERATING COST ANALYSIS

REPORTING CENTRE (A9999) :
BOAT ID. (XXXXXXXX) :
STARTING DATE YY/MM :
ENDING DATE YY/MM :

(STARTING DATE AND ENDING DATE RANGE SHOULD NOT EXCEED MORE THAN 6 MONTHS)

(*) DO YOU WANT A PRINTOUT (Y/N)

Appendix 42

BAY OF BENGAL FISHERIES INFORMATION SYSTEM

DATE:-01/01/87

LENGTH FREQUENCY ANALYSIS

GEAR TYPE (G9999) :
SPECIES (99AAA) :
STARTING AREA CODE (A9999) :
DATE (YY/MM) :
ENDING AREA CODE (A9999) :
DATE (YY/MM) :

DO YOU WISH TO RAISE THE FREQUENCIES TO THE FLEET (Y/N):
AGAIN RAISE THESE RAISED FREQUENCIES TO THE MONTHLY PRODUCTION (Y/N)

then note that the monthly production figures for all the areas
will have to be entered separately.

(*) ENTER P TO PRINT OR Q TO QUIT

BAY OF BENGAL FISHERIES INFORMATION SYSTEM

DATA RECOVERY

THIS PROGRAM WILL CHECK WHETHER YOUR DATA FILES ARE IN ORDER.
RUN THIS PROGRAM IF YOUR DATA ENTRY WAS INTERRUPTED BY ANY
KIND OF POWER FAILURES OR IF YOU FIND THE ERROR MESSAGES
'RECORD OUT OF RANGE' OR 'END OF FILE FOUND UNEXPECTEDLY'

OTHERWISE YOU NEED NOT RUN THIS PARTICULAR PROGRAM
DO YOU WISH TO PROCEED NOW (Y/N)?

DATA RECOVERY MENU

1. DESCRIPTION FILE
2. SPECIES FILE
3. BOATS FILE
4. FISHING UNIT FILE
5. LENGTH FREQUENCY FILE
6. EXIT

SELECT (1-6)

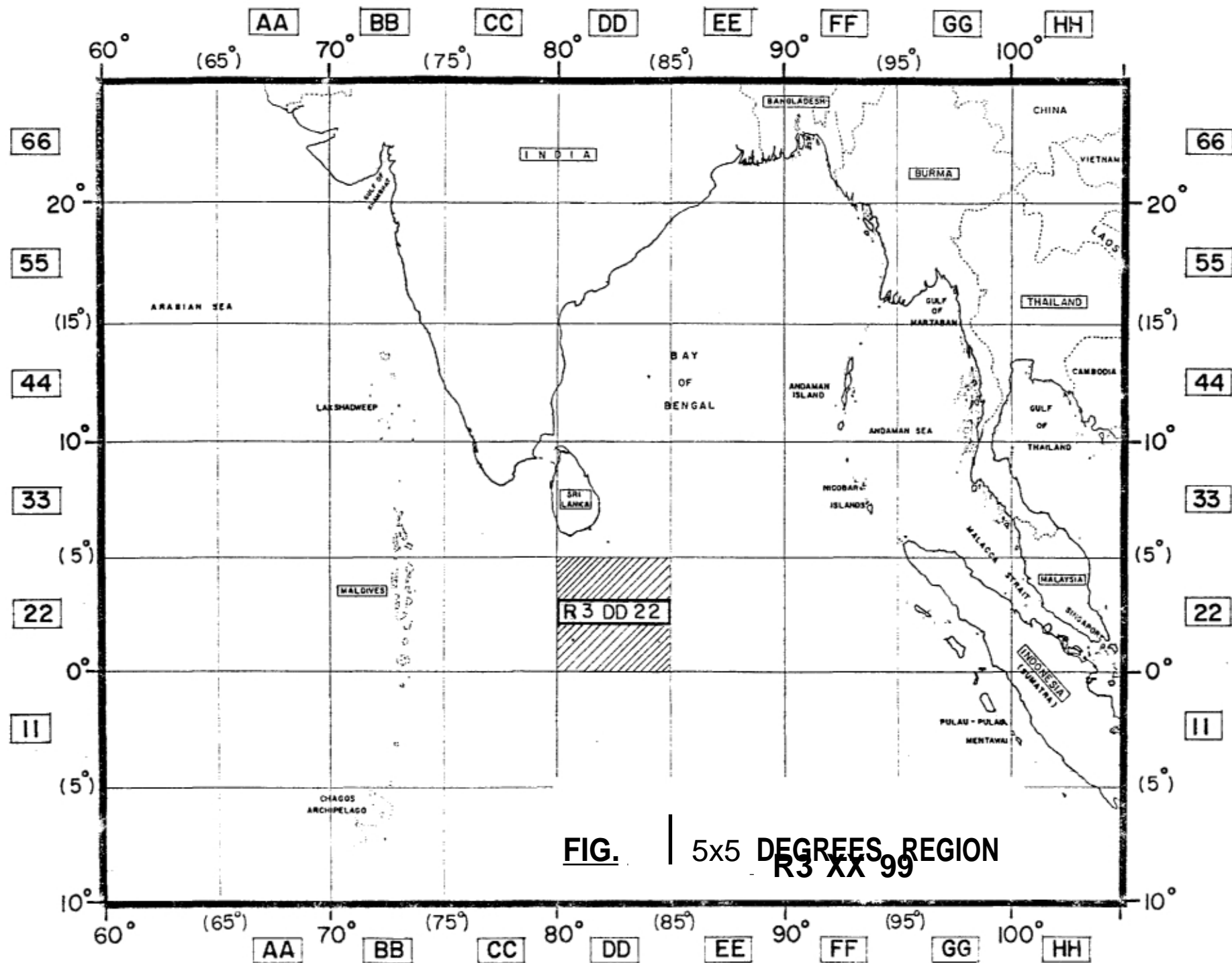


FIG. | 5x5 DEGREES REGION
R3 XX 99

