

No 19.79.1.31.....

- NEW PROPOSAL
- CONTINUING PROJECT
- FINAL REPORT
- PROGRESS REPORT

FISHING INDUSTRY RESEARCH TRUST ACCOUNT

TITLE OF PROPOSAL/PROJECT: Echo Sounder, Elementary Sonar and Radar Operation 1981

ORGANISATION: N.S.W. State Fisheries

PERSON(S) RESPONSIBLE: Dr.D.D. Francois

YEAR	SOUGHT	GRANTED
<u>1980/81</u>	<u></u>	<u>\$1,500</u>
<u></u>	<u></u>	<u></u>
<u></u>	<u></u>	<u></u>

~~RELATED APPLICATIONS:~~ Nil Capital Items

RECEIVED 30 / June / 1982

DISTRIBUTED 10 July / 1982

..... *Judith Ross*

for Secretary
Fishing Industry Research Council

ECHO SOUNDER, ELEMENTARY SONAR AND RADAR OPERATION

1981

The 1981 Echo Sounder, Sonar, Radar Operations and Navigation Course was held over a two week period from April 27 to May 8, 1981.

The first week of the course (Radar and Navigation) was held at the Sydney Technical College School of Navigation. This involved a five (5) full days using the sophisticated navigational aids at the College under the tutalige of Captain Flinders.

The second week (Echo Sounder and Sonar) was held at N.S.W. State Fisheries' Gore Bay Complex at Wollstonecraft. This involved work on board our research vessel "Kapala" and study in a lecture situation. Two nights of relevant films were also staged.

A total of 16 students attended the course from various parts of the eastern coast. Most were totally inexperienced as fishermen and to them the instruction was valuable if not vital. A syllabus and list of lecturers is attached.

The lectures were drawn from a number of fields both government, academic and private enterprise.

During the week a display of the latest equipment was also staged and made available for demonstration to the students.

ECHO SOUNDER, ELEMENTARY SONAR AND RADAR OPERATION

APRIL 27 - MAY 8, 1981.

Mr. G. Hagelstein	18 Anderton Street, Coffs Harbour, 2450.
Mr. R. B. Piggott	190 Johnston Road, Bass Hill, 2197.
Mr. S. L. Cain	99 Charles Street, Iluka, 2460.
Mr. M. Cullen	Charles Street, Iluka, 2460.
Mr. R. Miller	Flat 2/19 Gosport Street, Cronulla, 2230.
Mr. U. Stukoff	5/6 Epping Road, Lane Cove, 2066.
Mr. M. Kerr	Lot 1, Geoffrey Street, Crowdy Head, 2427.
Mr. D. J. H. Ingle	P.O. Box 613, Coffs Harbour, 2450.
Ms. M. Bass	118 Pennant Hills Road, North Parramatta, 2151.
Mr. J. Oram	78 Ritchie Crescent, Taree, 2430.
Mr. A. Roberts	C/- Post Office, Palmers Island, 2460.
Mr. J. Burrows	243 Addison Road, Marrickville, 2208.
Mr. R. B. Simpson	41 Oxley Drive, Paradise Point, 4216.
Mr. B. O'Connell	99 Charles Street, Iluka, 2460.

1981

ECHO SOUNDER, SONAR, RADAR AND NAVIGATION COURSE

LIST OF LECTURERS

BILL OWEN:

Group Marketing Manager, Marine & Aviation Division, A.W.A. Ltd., will be lecturing on the following topics:-

Introduction to echo sounding, netsondes and sonar.
Factors affecting the echogramme.
Special features of echo sounders.
Sonar: the echogramme.
Factors affecting the echogramme.

JOHN HILL:

Consultant, Department of Electrical Engineering, University of Melbourne, will be lecturing on the following topics:-

How an echo sounder works.
Sonar: the echogramme.
Stages in fishing operations.

BRIAN MCDONALD:

A Director of Marine Navaid Systems Aust. Pty. Ltd., will be lecturing on the following topics:-

The Echo Sounder - The echogramme.
Factors affecting the echogramme.
The major components of an echo sounder.

TERRY GORMAN:

Senior Biologist, Marine Resources, N.S.W. State Fisheries, will be lecturing on the following topics:-

The netsounder programme.
Principal types of netsounders and their applications.
Use of netsondes in New South Wales.

S Y L L A B U S

ECHO SOUNDER AND SONAR OPERATIONS COURSE

12 SHIRLEY ROAD, WOLLSTONECRAFT, SYDNEY.

Time	Unit	Subject Heading	Synopsis	Lecturer
9.00 am	1.0	INTRODUCTION TO ECHO SOUNDING, NETSONDS AND SONAR	Brief summary of ultrasonic fish finding equipment indicating the main differences between them, their particular applications and their limitations. Correct care and maintenance of equipment and procedures for installation.	BILL OWEN
10.00 am	2.0	<u>THE ECHO SOUNDER</u> THE ECHOGRAMME	A detailed description of the echo sounder picture giving the reasons for the characteristic appearance of the features found on an echogramme. The differences between wet and dry paper.	BRIAN McDONALD
11.00 am	3.1	FACTORS AFFECTING THE ECHOGRAMME	Frequency, pulse length, beam width, paper speed, stylus speed, rough seas, aeration, pitching, rolling, nature of the sea bed - rocky, soft, uneven, undulating, sloping, level, ghosting, false echoes. Interference from ship and propeller noise and other echo sounders.	BRIAN McDONALD
11.45 am	3.2	FACTORS AFFECTING THE ECHOGRAMME	Fish schools, dense schools above the bottom, isolated schools above the bottom, dense schools on the bottom, individual fish close to the bottom. Appearance of single fish in the centre and edge of the beam. Ship passing over stationary fish. Fish and ship in motion.	BILL OWEN
12.00			Lunch	
2.00 pm to 4.00 pm			Practical echo sounder training on board "Kapala".	
5.30 pm to 8.00 pm		FILM NIGHT	General fishing films	

Time	Unit	Subject Heading	Synopsis	Lecturer
9.00 am	4.0	HOW AN ECHO SOUNDER WORKS	What is sound, propagation of sound, wave length, frequency, ultra sound, velocity of sound in water, method of measuring distance by sound, common frequencies used by echo sounders: weakness of returning echo, absorption and dispersion, amplification, transmitting power, beam width, pulse lengths, side lobes, reverberation, resolution.	JOHN HILL
9.45 am	5.0	THE MAJOR COMPONENTS OF AN ECHO SOUNDER	Types of transducers. Size in relation to: frequency, power, beam width, pulse length. Cavitation. Selecting transducers. Amplifier: its function and intelligent use of gain. Transmitter: its function. Display units: description of various types, i.e. paper C.R.T., flashing light, digital, meter, and their advantages and disadvantages for commercial fishing.	BRIAN McDONALD
10.30 am	6.0	SPECIAL FEATURES OF ECHO SOUNDERS	White line, grey line, bottom lock, "memory" in C.R.T., narrow, medium and wide beam sounders and their application in fishing and bottom discrimination. Side lobes and their use. Phased scales. Transducer systems including phased away and stabilised units. "Colour" displays.	BILL OWEN
11.15 am	7.0	GENERAL DISCUSSION	Examples of local recordings discussed and explained. General question and answers.	TERRY CORNAN
12.00			Lunch	
2.00 pm to 4.00 pm			Practical echo sounder training on board "Kapala".	
5.30 pm to 8.00 pm		FILM NIGHT	General fishing films.	

Time	Unit	Subject Heading	Synopsis	Lecturer
9.00 am	8.0	THE NETSOUNDER ECHOGRAMME 40 mins	A description of the echo sounder picture as displayed by the netsounder. The base line, i.e. headrope, the footrope, the sea bed, the sea surface. Fish echoes: signal loss. Trawl track displays on echo sounders - difference in time in such displays.	TERRY GORMAN
9.45 am	9.0	PRINCIPAL TYPES OF NETSOUNDERS AND THEIR APPLICATION	Simple netsonds displays, multi-netsonds displays. Types of transmission, their advantages and disadvantages. Development of fishing tactics using information from netsonds and echo sounders. The development of fishing tactics. The combined use of sonar, echo sounder and netsounder - where to aim the net. Use of temperature read out.	TERRY GORMAN
10.30 am	10.0	USE OF NETSONDES IN N.S.W.	Local examples of netsounder recording on Jack mackerel, pilchards, lightfish and nannygai.	TERRY GORMAN
11.15 am	11.0	<u>SONAR</u> THE ECHOGRAMME	A detailed description of the echogramme from a sonar set giving the reasons for the characteristics of the recording. The difference between it and an echo sounder recording. Changing scales, sounding vertically, interference noises, ships wake, fish echoes, bottom echoes.	JOHN HILL
12.00			Lunch	
2.00 pm to 4.00 pm			Practical training on "Kapala" with netsond and sonar.	

Time	Unit	Subject Heading	Synopsis	Lecturer
9.00 am	12.0	FACTORS AFFECTING THE ECHOGRAMME	Frequency, pulse length, beam width, output power, behaviour of the sound beam in water, i.e. refraction. Effect of heavy idling and pitching. Correct positioning of the transducer.	BILL OWEN
9.45 am	13.0	STAGES IN THE FISHING OPERATION	Methods of searching, use of high power long pulse. Automatic searching target location, use of audio signal: doppler effect. Estimation of target size, observation of target movement. Catching phase - use of low power short pulse, rapid scanning, wide sonar beam, rapid transmission.	JOHN HILL
10.30 am	14.0	DISCUSSION OF LOCAL SITUATION	Slides of echo recordings and discussion of tactics using sonar to catch fish off N.S.W.	TERRY GORGIAN
11.00 am			Practical sonar training on "Kapala".	
5.30 pm		BARBECUE	A barbecue will be held in the Courtyard of Fisheries House, 211 Kent Street, Sydney.	

Time	Unit	Subject Heading	Synopsis	Lecturer
7.00 am to 7.00 pm			At sea on "Kapala" deep water trawling.	
