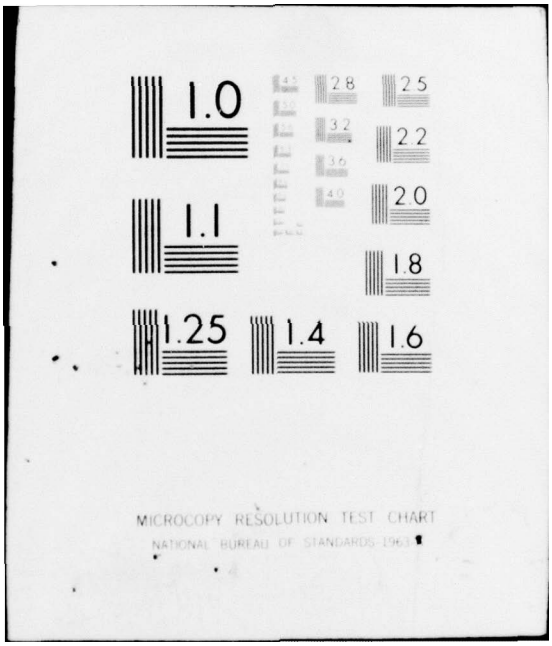
AD-A034 633 NAVY EXPERIMENTAL DIVING UNIT PANAMA CITY FLA F/G 6/17
EVALUATION OF THE HEALTHWAYS MODEL 1971 CAPILLARY-TUBE DEPTH GA--ETC(U)
MAR 76 D J SCHMITT

UNCLASSIFIED NEDU-10-76 NL

1 OF 1
AD A034633

END
DATE FILMED
2-77


1.0
1.1
1.25
1.4
1.6
1.8
2.0
2.2
2.5
2.8
3.2
3.6
4.0
MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS 1963

NAVY EXPERIMENTAL DIVING UNIT

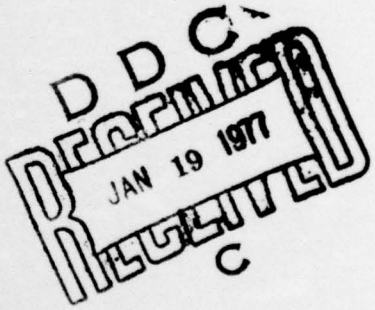
DEPARTMENT OF THE NAVY
NAVY EXPERIMENTAL DIVING UNIT
Panama City, Florida 32401

NAVY EXPERIMENTAL DIVING UNIT
REPORT 10-76

EVALUATION OF THE HEALTHWAYS MODEL 1971 CAPILLARY-TUBE DEPTH GAUGE

D. J. SCHMITT

March 1976



Approved for public release; distribution unlimited

Submitted:

D. J. Schmitt

D. J. SCHMITT
T & E Dept.

Reviewed:

J. G. MALEC
LCDR, RN
T & E Dept. Head

Approved:

J. MICHAEL RINGELBERG
CDR, USN
Commanding Officer

ABSTRACT

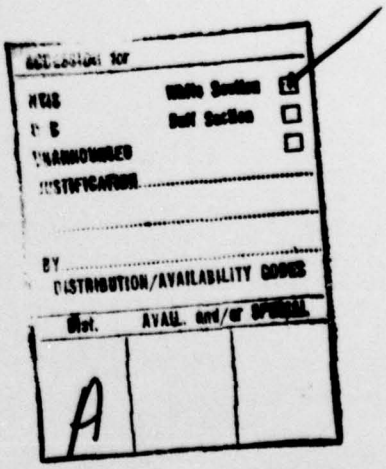
The Healthways Diving Company submitted two model 1971 capillary-tube depth gauges to the Navy Experimental Diving Unit for test and evaluation.

Although the tests proved the gauge to be accurate, they also disclosed a problem with the dial face. Inasmuch as the dial is secured with only one screw, there is a real danger of the dial turning if the screw loosens or if the rubber mounting case is compressed.

The Healthways Model 1971 capillary-tube depth gauge is not recommended for Navy approval.

TABLE OF CONTENTS

	Page
ABSTRACT	ii
INTRODUCTION	1
TEST EQUIPMENT	1
TEST PROCEDURE	1
RESULTS	1
MAN-HOURS REQUIRED FOR TEST	1
CONCLUSIONS AND RECOMMENDATIONS	2



UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE	READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER: NEDU REPORT NO. 10-76	2. GOVT ACCESSION NO. / 3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle): Test and Evaluation of the Healthways Model 1971 Capillary-Tube Depth Gauge.	5. TYPE OF REPORT & PERIOD COVERED: Final rept. / 6. PERFORMING ORG. REPORT NUMBER
7. AUTHOR(s): D. J. Schmitt	8. CONTRACT OR GRANT NUMBER(s)
9. PERFORMING ORGANIZATION NAME AND ADDRESS: Navy Experimental Diving Unit, Panama City, Florida 32401	10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
11. CONTROLLING OFFICE NAME AND ADDRESS	12. REPORT DATE: Mar[illegible]76 / 13. NUMBER OF PAGES: 4
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office): 9p.	15. SECURITY CLASS. (of this report): Unclassified / 15a. DECLASSIFICATION/DOWNGRADING SCHEDULE
16. DISTRIBUTION STATEMENT (of this Report): Approved for public release; distribution unlimited.	
17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report): NEDU-10-76	
18. SUPPLEMENTARY NOTES	
19. KEY WORDS (Continue on reverse side if necessary and identify by block number): Depth Gauge; Evaluation	

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

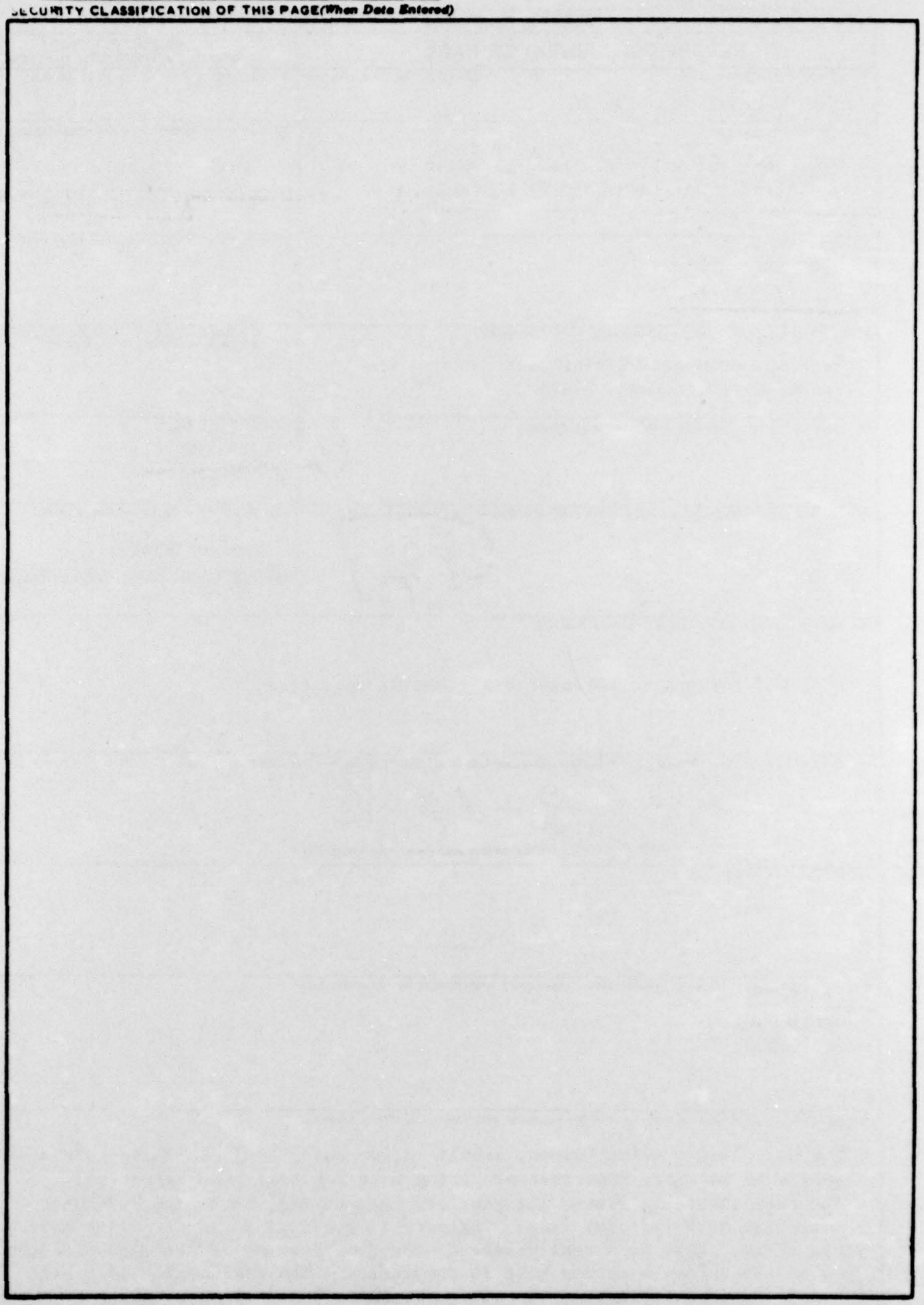
The Healthways Diving Company submitted two model 1971 capillary-tube depth gauges to the Navy Experimental Diving Unit for test and evaluation. Although the tests proved the gauge to be accurate, they also disclosed a problem with the dial face. Inasmuch as the dial is secured with only one screw, there is a real danger of the dial turning if the screw loosens or if the rubber mounting case is compressed. The Healthways Model 1971 capillary-tube depth gauge is not recommended for Navy approval.

DD FORM 1 JAN 73 1473 EDITION OF 1 NOV 65 IS OBSOLETE S/N 0102-014-6601

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

253650



INTRODUCTION

The Healthways Diving Company submitted two model 1971 capillary-tube SCUBA depth gauges for test and evaluation by the Navy Experimental Diving Unit in March 1976.

The capillary-tube depth gauge operation, based on Boyle's Law (a gas at constant temperature varies inversely with pressure), uses a water column. Its depth range is 0 to 250 feet of sea water (fsw).

TEST EQUIPMENT

A Bethlehem chamber, model 18.3610HP, serial No. 76.1018, and test gauge 25546-25011-GAG were required to test the capillary-tube depth gauges. The test gauge calibration is given in Figure 1. Calibration date was 1 March 1976.

TEST PROCEDURE

The depth gauges were placed in a pan and then covered with fresh water. The pan was placed in the Bethlehem chamber, which was then pressurized with high-pressure air to the depths shown in Table 1. The gauges were tested to 250 fsw. Gauge readings were achieved by looking through the chamber window.

RESULTS

Results of the tests of the two capillary-tube depth gauges are given in Table 1.

MAN-HOURS REQUIRED FOR TEST

Man-hours required for test were as follows:

	Man-hours
Chamber operation, 3 men, 2 hours	6
Reporting manuscript, 1 man, 3 hours	3
Duplicating, 1 man, 1 hour	1
TOTAL	10 Man-hours

CONCLUSIONS AND RECOMMENDATIONS

Readings on the Healthways capillary-tube depth gauges were very accurate. However, each dial face, although easy to read, *is secured by only one screw* in its center. If this screw should loosen or if the rubber mounting case were compressed, the dial would turn, and the gauge would be useless. (If the dial were secured in two locations instead of just one, the dial face could be kept from turning.) The Healthways capillary-tube depth gauge in its present configuration, therefore, cannot be recommended for Navy approval.

TEST GAUGE

PART NUMBER 25546-25011 GAG SERIAL NUMBER 10,52-1

PRESSURE RANGE 200 P.S.I. ACCURACY ± 1/4 % FULL SCALE (± -1.1 P.S.I.)

CALIBRATION

INCREASING PRESSURE		
Applied Press.	Indicated Press.	Difference
0	0.00	0.00
30	30.26	+.26
60	59.63	-.37
90	89.66	-.34
120	119.7	-.3
150	149.5	-.5
180	178.89	-1.11
200	198.9	-1.1

FIGURE 1. CALIBRATION OF TEST GAUGE

TABLE 1

TEST RESULTS OF HEALTHWAYS CAPILLARY-TUBE DEPTH GAUGES, MODEL 1971

Test Depth (ft)	Test 1		Test 2	
	Gauge 1	Gauge 2	Gauge 1	Gauge 2
0	0	0	0	0
20	20	19	20	20
50	50	48	50	50
70	70	68	70	70
80	80	75	80	80
100	100	96	100	100
150	150	140	150	150
200	200	190	200	200
250	250	250	250	250
150	150	150	150	150
100	100	100	100	100
50	48	50	50	50
0	0	0	0	0