

mine and depth - charge

THE TROUBLESHOOTER

▶ Bibliography No. 6

▶ How to torque

▶ Moisture barriers



AN OFFICIAL NAVORD PUBLICATION

in this issue . . .

mine and depth - charge

THE TROUBLESHOOTER

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George A. Harper, CAPT, USN Officer-in-Charge
Haines A. Miller Technical Director
Thomas R. Nevitt Editor
D. Jack LaBar Art Director

REGULAR FEATURE

Job Right 5

ARTICLES

How To Use A Torque Wrench 1
Moisture Barriers 2
Viet Cong Floating Mine 3
Keep Your AN/PSM-4 Meter On The Level 4

COVER PHOTO: Not some monster from the deep but a drill section from a Drill Mine Mk 57 after 49 days underwater. At that it could be considered a monster by the mine crew called upon to overhaul it. The extended underwater drill life of Mines Mk 56-57 raises some questions of whether anti-fouling paint will be required as SOP for these drill mines.

1 JANUARY 1967

The Troubleshooter, an official NAVORD publication, contains technical information pertinent to the assembly, testing, and delivery of US naval depth charges and mines. It is both authoritative and directive in nature, and reference may be made to a particular issue as the authority for adoption of ideas promulgated therein.

Troubleshooter is also the official journal of the Rudminde Program a world-wide defect-reporting campaign designed to promote a high level of undersea warfare readiness in US naval depth charges and mines. The Program's basic instrument is NAVORD Form 8500/5 (I-63). Everyone who encounters problems with these weapons should report them via this form direct to the Naval Mine Engineering Facility as prescribed by NAVORDINST 8500.8.

ARTHUR R. GRALLA
Rear Admiral U.S. Navy
Commander, Ordnance Systems Command

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THE OFFICIAL JOURNAL OF THE RUDMINDE PROGRAM

HOW TO USE A TORQUE WRENCH

TORQUE IS APPLIED every day by everybody. Every time a water tap is turned or the cap is screwed on a catsup bottle, for example, it is being measured unconsciously, by feel, and governed unconsciously through the lengths of handles and the person's strength.

In many instances the mineman applies torque to fastenings where his measurement is by feel, usually defined as "hand-tight" or "secure." Consciously or unconsciously, in such instances he is governed by the design of fastening such as a knurled nut or a wing nut, or by the length of the wrench (the smaller the bolt or screw the shorter the wrench) and of course by his strength. A heavy-handed sailor can wring off most any but the largest bolts if he sets his muscle to it. So always he must be governed by common sense.

It is when we are called upon to meet a requirement where the end-point of torque is critical enough to measure by a torque wrench that the "twist and leave" philosophy must be abandoned. Such requirements fall into two broad areas: 1) when two surfaces are brought together for a sealant property against leakage, as in tail-cover fastenings; and 2) when a fastening is required to be tightened to its ultimate pre-load design strength, as in the case of suspension lugs. In such cases there is simply no substitute for the torque wrench.

The operation of torque wrenches is not complicated. To use one properly, though, the mechanic must possess a basic knowledge of torquing mechanics and, as with any precision measuring tool, must exercise a reasonable amount of care and skill. In Troubleshooter 2-66 some rules for the care of torque wrenches were given. Here, in response to numerous requests, are some tips for their use.

► Force Application – When using a torque wrench, the force must be applied with a smooth steady pull up to the specified torque. Rapid or jerky pull up can result in considerable error in the torque values actually applied.

► Reading Torque – With the indicating-dial type of wrench torque is read on the dial at the same time the force is being applied.

► Head-End Tightening – When a fastening is tightened from the head end some of the applied torque is absorbed in turning the bolt in the hole. The amount of torque absorbed will vary depending on the clearance in the hole, "slipperiness" of parts, and alignment of the parts. For this reason torque values are generally specified for tightening fastenings on the nut end. In some instances, of course, there is no choice but to tighten from the head end. On these occasions fastenings should be tightened to the high limit of the torque value specified.

► New Nuts – It is good practice in torquing, especially in torquing new bolts and nuts, to first tighten the fastening to the specified torque, then loosen by backing approximately half a turn, then again come up to the specified torque. This aids in cleaning and smoothing the threads and, provides a more accurate torque application

► Aligning for Cotter Pins – When a nut is to be locked against loosening by a cotter pin or wire the nut should be tightened to the low limit of the specified torque, and the hole then aligned by a tightening operation. Never loosen a castellated nut to obtain alignment.

► Thread Lubrication – Threads should always be clean and free from nicks, burrs, paint, grease, or oil to obtain the correct tension or pre-load on the bolt when it is tightened to a specified torque. True, there are some applications where lubrication or anti-seize compound is used on the threads. In such cases the maintenance manuals should always be consulted for compatible torque values.

► Damaged Threads – Studs with damaged threads should be replaced whenever possible. When not, the threads should be chased. Often, however, this is not possible in field maintenance. To overcome the problem of properly torquing a nut on a stud where thread damage is present, and therefore increases the rundown resistance of the nut, add the run-down resistance to the specified torque. The run-down resistance should be measured on the last rotation before the nut seats. For example, if

(continued on page 4)

TORQUE-WRENCH CALIBRATION

Last time we talked about torque wrenches (Issue 2-66) the rule was to calibrate them every three months. Now the Metrology Engineering Center at Pomona, with the idea of lightening the load, have reviewed their data and made these changes to the Metrology Requirement List (NAVWEPS 17-35 MTL-1) which Navy Calibration Labs use as their guide to calibration cycles:

- Torque tools manufactured by Richmond and Sturdevant to be calibrated every six months. -1
- Torque tools manufactured by Snap-On Tools, Inc., to be calibrated every three months
- Torque tools manufactured by APCO-Mossberg and Torque Controls to be calibrated on a 30-day cycle.

For most mine facilities a 30-day calibration cycle would be prohibitive since tools would either be in the calibration lab or in transit most of the time. Rather, the goal should be to purge these short-cycle torque wrenches from the system, and to this end the General Services Administration (GSA) is initiating action to restrict these 30-day cycle tools from issue.

Meanwhile when you need to replace torque wrenches you should specify the vendor and thereby escape this 30-day turn-around. Otherwise FSNs 5120-242-3264 (50-0-50 ft-lbs) and 5120-230-6380 (150-0-150-in-lbs) could produce torque wrenches manufactured by any of the above manufacturers. GSA has also requested that torque wrenches which have failed qualification or calibration be returned to the nearest GSA regional office with a report giving reason for return. In exchange GSA will send you a free replacement.

MOISTURE BARRIERS

A LOT OF WATER, several NAVORD instructions, and some pertinent Troubleshooters have gone over the dam since we last discussed moisture barriers for mine-case openings. That was back in Issue 2-59 when no one had yet dreamed of Assembly Conditions A, B, etc. Now these conditions are with us and it has been decided that moisture barriers will be required on all mines in Conditions A through D inclusive. So here we go again.

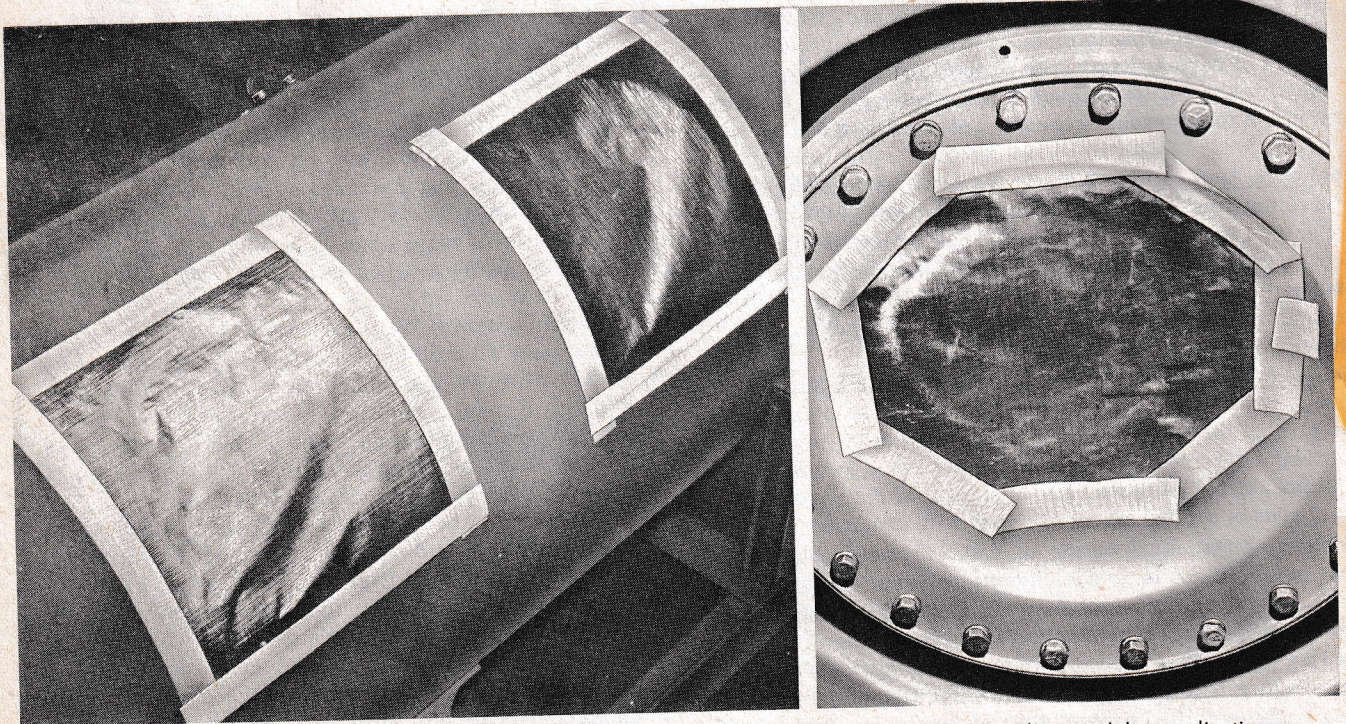
Before applying the barriers, fastenings for all watertight case openings should be torqued to 5 lb-ft for mines assembled to Conditions B, C, and D or to 16-20 lb-ft for Condition A . . . always with that inevitable exception: filling-hole covers, whose fastenings should never be tightened or loosened.

The purpose is to protect the rubber diaphragms of components such as hydrophones, extenders, clock starters, arming devices, hydrostatic switches etc. from the effects of long-term exposure to the atmosphere. Squares of the barrier material cut to appropriate size and taped on all edges make a simple job of openings in the sides of cylindrical mines, such as clock and extender wells. Tail covers call for more trimming and shaping. For the Mk 52 and 55 mines' tail covers the protruding cross members make it necessary to deal with hydrophones, pressure detectors, and depth compensators individually, depending on the mod involved. Shown here is a tail cover dressed in barriers for a Mk 52 or 55 Mod 4 or 6.

From this it will be seen that moisture barriers will also be required when the several sections that make up Mark 56 and 57 mines are assembled to Conditions C or D, as well as when these sections are married in the transition to Conditions A or B. Note that in these, as in 52/55s, hydrophones and depth compensators will be installed in tail covers for Conditions A through D but pressure detectors will be installed in A, B, and C only. Barriers must fit snug around the safety bars installed over the arming devices and hydrostatic switches in Condition A 57s.

Approved materials are named in the explanations accompanying the illustrations. Some general rules to remember, pending incorporation of specific details on assembly conditions in the technical manuals for the various mines, are:

- ▶ Refer to Bulletin 095 for instructions on gasket and O-ring replacement, greasing and cleaning flanges of watertight openings, torque requirements, etc.
- ▶ Clean adhesive surfaces and use new material when replacing barriers that have been removed to permit maintenance, or conversion from one assembly condition to another.
- ▶ Be sure to remove barriers from tail covers before installing flight gear on air-laid mines . . . and from all openings before delivery to aircraft or submarines.



An example of the use of a square patch of barrier material as applied to clock and extender wells. On right is tailplate application on Mine Mk 36 Mod 2. Tape to use in all cases is pressure-sensitive, adhesive, cloth-backed 'Ordnance tape,' just reinstated by GSA; MIL-T-22085, 8135-003-0009 for 2-inch-wide 60-yd roll.

TO DETACH your bibliography for use as a handy desk guide grasp all the blue pages together, and pull free. (A single staple holds the T-Shooter and Bibliography together.)

BIBLIOGRAPHY NO. 6

for depth charges & mines

SUPPLEMENT TO TROUBLESHOOTER 4-66

FOREWORD: BIBLIOGRAPHY NO. 6

As in Bibliograph No. 5, it seems desirable to reiterate a philosophy that has been overlooked in some quarters. To wit: Sections 1 and 2, to the best of our knowledge, for every weapon included therein, list every available technical publication that assembly activities need in their possession in order to be 100% combat ready. Thus it has been our purpose, in Bibliography No. 5, and again in this one, to eliminate further research by our readers to unearth necessary Bulletins, Instructions, Notices, Ordalts, etc.

In short, we're saying that any technical pub that's not listed is either not available, or not necessary to weapon assembly, or both. If we've missed something we think we should be gigged for failing to inform our readers, rather than our readers being gigged for not being informed. We think any posing of requirements in excess of these listings, for technical publications specific to the weapons, are simply not valid.

We have made no changes in the format of Bibliography No. 6, and the two-digit interim change system for OPs and ODs is still in effect. It's explained in the introduc-

tion to Section 6, and on backs of the title pages of all the mine-assembly OPs, so we'll say no more here. Again Sections 1 and 2 list the OPs, ODs, etc., but not the latest revisions and changes. Instead you turn to Section 1 or 2 to learn what publication you need for what purpose with which weapon. That will give you a basic publication number, like OP 1808 Volume 1. If you want to know more you can then turn to Section 6. There you will learn how to get OP 1808 Vol 1., and will find listed the prescribed revision, all interim and permanent changes, the Cog-I stock number for requisitioning each, and (via footnotes) any special info we felt you should have about that book.

The same applies to all the pubs listed throughout this bibliography. As before, part of this plan derives from the fact that all of the information subject to frequent change is now concentrated in a single section: Section 6. In this way the bibliography also provides a complete listing of pubs in pub number sequence.

New in Bibliography No. 6 is a listing of overhaul specifications (OVSSs).

CONTENTS

SECTION 1: Mine Assembly & Test Instructions	1
SECTION 2: Depth-Charge Assembly, Test, & Use	7
SECTION 3: Test-Set Calibration Instructions	8
SECTION 4: General Reference Publications	10
Pubs for Mine Tests	
SECTION 5: Allowance Lists	11
SECTION 6: Pubs Status & Ordering Info	11
NAVORD OPs	11
Forms	15
Troubleshooters	15
Ordalts & ODs	15
T-Shooter Bulletins	16
Overhaul Specifications (OVSSs)	17

IS THIS BIBLIOGRAPHY OUR LAST?

Probably so, and if you read the editorial (Rudminde Report) in Troubleshooter 3-66 you'll know why: the new OP 3504 will ultimately include a volume that we hope will do the job better, and will be a permanent part of the authorized configuration control data resultant from NMEF's integrated logistics management system.

Truthfully, though, we hate to see the Bibliography's demise. It's turned out to be the handiest piece of gear on ye editor's desk and we know from many kind Rudmindes and notes that plenty of others feel the same way.

That being the case, we definitely want users to continue to report errors in this one, and we'll definitely try to keep all hands advised of any important changes between now and the time we release Op 3504 Volume 6. When we do, we hope you'll like it. We hope you'll find that it will do all this Bibliography does and more.

SECTION 1:

Note that this section lists basic publication only. To learn the authorized revision number, etc. for a listed pub, see Section 6.

MINE ASSEMBLY & TEST

Controlled Mine System Mk 2 Mod O

Acoustic System 6-0: OP 1854
System Installation & Mine Mk 51 Assy: OP 1930 Vol 1
Operation: OP 1930 Vol 3
Gen'l Requisites: OD 9682
Class B Tests
 Firing Mechanism: OP 1930 Vol 1
 Other Components: OP 1930 Vol 1
Maintenance Requirements: OP 1930 Vol 2
Opn'l Characteristics: In opn'l manual
Shipboard Handling: In assy manual
Ordalts: None
T-Shooter Bulletins: Nos. 043, 092, 095
T-Shooter Articles: 1-63 p3

Mine Mk 6 Mods O,4,7,8,10, & 11 (Surface-Laid)

Service Assembly: OP 1853 Vol 1
Drill Assembly: OP 1853 Vol 2
Configuration Data: OP 3504
Class B Tests
 Firing Mechanism: OP 605
 Other Components: OP 1452
Maintenance Requirements: OPs 1860, 3379, & 3388
Opn'l Characteristics: OP 2637
Shipboard Handling: In assy manual
Ordalts: 2886 - Case 6-3 to 6-5
 3107 - Anchors 6-0, 3, 6, 7 to 6-5, 10, 8, 14
 3109 - Anchors 16-0 to 16-1
 10016 - Test Set 127-3 to 127-4
T-Shooter Bulletins: Nos. 017, 043, 046, 078, 081
 084, 085, 092, 095
T-Shooter Articles: Issue 1-63 p3

Mine Mk 6 Mod 14 (Surface-Laid)

Service Assembly: OP 1853 Vol 3
Drill Assembly: None
Configuration Data: OP 3504
Class B Tests
 Firing Mechanism: In assy manual
 Other Components: OP 1452
Maintenance Requirements: OPs 1860, 3379, & 3388
Opn'l Characteristics: OP 2637
Shipboard Handling: In assy manual
Ordalts: 3107 - Anchors 6-0, 3, 6, 7 to 6-5, 10, 8, 14
 3109 - Anchors 16-0 to 16-1
 10016 - Test Set 127-3 to 127-4
T-Shooter Bulletins: Nos. 029, 030, 043, 046, 078
 081, 084, 085, 092, 095
T-Shooter Articles: Issue 1-63 p3; 2-66 p13

Mine Mk 6 Mod 15 (Surface-Laid)

Service Assembly: OP 1853 Vol 4

Drill Assembly: None
Configuration Data: OP 3504
Class B Tests
 Firing Mechanism: In assy manual
 Other Components: OP 1452
Maintenance Requirements: OPs 1860, 3379, & 3388
Opn'l Characteristics: In assy manual
Shipboard Handling: In assy manual
Ordalts: 3107 - Anchors 6-0, 3, 6, 7 to 6-5, 10, 8, 14
 3109 - Anchors 16-0 to 16-1
 10088 - Extender 12-3 to 12-12
 10089 - Clock Starter 1-3 to 1-13
T-Shooter Bulletins: Nos. 029, 043, 046, 078, 081,
 084, 085, 092, 095
T-Shooter Articles: Issue 1-63 p3; 2-66 p 13

Mine Mk 10 Mod 3 (Sub-Laid)

Service Assembly: OP 948
Drill Assembly: OP 1878
Configuration Data: OP 3504
Class B Tests
 Firing Mechanism: OP 1905
 Other Components: OP 1452
Maintenance Requirements: Ops 1860, 3379, & 3388
Submarine Loading Instns: Not released, see assy manual
Opn'l Characteristics: OP 2637
Ordalts: 3152 - Anchor Mk 10, 1, 3, 5; replace jaws
 3462 - Case 10-3; alter guide latch, safety bar
 3564 - Anchor 10-3; guide plate lanyard, etc.
 3808 - Case 10-3, 6, 7, 8, 9, 10 alterations
T-Shooter Bulletins: Nos. 027, 029, 030, 043, 046,
 078, 081, 084, 085, 092,
 095
T-Shooter Articles: Issue 1-63 p3

Mine Mk 10 Mod 9 (Air-Laid)

Service Assembly: OP 948
Drill Assembly: None
Configuration Data: OP 3504
Class B Tests
 Firing Mechanism: OP 1905
 Other Components: OP 1452
Maintenance Requirements: OPs 1860, 3379, & 3388
Prep for Aircraft Delivery: OP 3232
Opn'l Characteristics: OP 2637
Ballistic Tables: OP 1459
Ordalts: 2972 - Case 10-3, 6, 7; alter mooring arm, etc.
 3152 - Anchor 10-3, 6, 7, 8, 9, 10; replace jaws
 3808 - Case 10-3, 6, 7, 8, 9, 10; improvement
 3865 - Anchor 10-5; install lanyard, etc.
T-Shooter Bulletins: Nos. 027, 029, 030, 043, 046,
 092, 095, 096
T-Shooter Articles: Issue 1-63 p3; 3-64 p3

Mine Mk 18 Mod O (Surface-Laid)

Service Assembly: OP 902
Drill Assembly: CH 1 to OP 902
Configuration Data: OP 3504
Class B Tests
 Firing Mechanism: OP 2567
 Other Components: OP 1452
Maintenance Requirements: OPs 1860, 3379, & 3388
Opn'l Characteristics: OP 2637
Shipboard Handling: In assy manual
Ordalts: None
T-Shooter Bulletins: Nos. 029, 030, 043, 046, 092, 095
T-Shooter Articles: Issue 1-63 p3; 3-64 p3

Mine Mk 25 Mod O (Air-Laid)

Service Assembly: OP 956 Vol 1
Drill Assembly: OP 1816 Vol 1
Configuration Data: OP 3504
Class B Tests
 Firing Mechanism: OP 2567
 Other Components: OP 1452
Maintenance Requirements: OPs 1860, 3379, & 3388
Prep for Aircraft Delivery: OP 3232
Opn'l Characteristics: OP 2637
Ballistic Tables: OPs 1394, 1459, 2562, & 2843
Ordalts: 3147 - Alter Circuit Breaker 1-0
 4377 - Control Unit 66-0 to 66-1
 10016 - Test Set 127-3 to 127-4
 10108 - Control Unit 66-1 to 66-2
 10117 - Test Set 246-0 to 246-1
T-Shooter Bulletins: Nos. 004, 029, 030, 031, 043, 046, 078, 081, 084, 085, 092, 094, 095, 096
T-Shooter Articles: Issue 1-63 pp3,7; 2-63 p20; 3-64 p3

Mine Mk 25 Mod I (Air-Laid)

Service Assembly: OP 1797 Vol 1
Drill Assembly: OP 1816 Vol 2
Configuration Data: OP 3504
Class B Tests
 Firing Mechanism: OP 2567
 Other Components: OP 1452
Maintenance Requirements: OPs 1860, 3379, & 3388
Prep for Aircraft Delivery: OP 3232
Opn'l Characteristics: OP 2637
Ballistic Tables: OPs 1459, 2562, & 2843
Ordalts: 4377 - Control Unit 66-0 to 66-1
 4441 - Firing Mech A5-2
 10016 - Test Set 127-3 to 127-4
 10108 - Control Unit 66-1 to 66-2
 10117 - Test Set 246-0 to 246-1
T-Shooter Bulletins: Nos. 004, 029, 030, 031, 043, 046, 078, 079, 081, 084, 085, 092, 094, 095, 096
T-Shooter Articles: Issue 1-63 pp3,7; 2-63 p 20

Mine Mk 25 Mod 2 (Air-Laid)

Service Assembly: OP 1765 Vol 1
Drill Assembly: OP 1816 Vol 3
Configuration Data: OP 3504
Class B Tests
 Firing Mechanism: OP 2567
 Other Components: OP 1452
Maintenance Requirements: OPs 1860, 3379, & 3388
Prep for Aircraft Delivery: OP 3232
Opn'l Characteristics: OP 2637
Ballistic Tables: OPs 1459, 2562, & 2843
Ordalts: 2903 - Control Box 13-0 to 13-1
 4377 - Control Unit 66-0 to 66-1
 10016 - Test Set 127-3 to 127-4
 10108 - Control Unit 66-1 to 66-2
 10117 - Test Set 246-0 to 246-1
T-Shooter Bulletins: Nos. 004, 029, 030, 031, 043, 046, 052, 078, 081, 084, 085, 092, 094, 095, 096
T-Shooter Articles: Issue 1-63 p3; 2-63 p20; 3-64 p3

Mine Mk 27 Mod 2 (Sub-Laid)

Vehicle Assembly: OP 1935 Vol 1
Mine Assembly: OP 1935 Vol 2
Drill Assembly: None
Ballasting Instructions: OD 10577
Gyro Mech: OD 10574
Configuration Data: OP 3504
Class B Tests
 Firing Mechanism: OP 2567
 Other Components: OP 1452
Maintenance Requirements: OPs 1860, 3379, & 3388
Special Workshop Equip: ODs 10769, 10770, 10771, 10772
Submarine Loading Instns: None; see assy manual
Opn'l Characteristics: OP 2637
Ordalts: 3655 & 3656 - Fusible link flood valves
 3794 - Alter Gyro Mk 36
 3837 - Alter Exercise Head Mk 66
 3860 - Alter Test Stand Mk 3
 3861 - Alter Test Stand Mk 4
 3862 - Alter Test Stand Mk 5
 3863 - Alter Test Stand Mk 7
 3864 - Alter Counter 1-0
 4127 - Alter Cable, Test Stand Mks 3 & 4
 4211 - Alter Thermal Relay 24-0
T-Shooter Bulletins: Nos. 029, 030, 031, 043, 046, 076, 078, 081, 084, 085, 092, 095
T-Shooter Articles: Issue 1-63 p3; 3-64 pp3,10; 3-65 p4; 4-65 p2

Mine Mk 27 Mod 3 (Sub-Laid)

Vehicle Assembly: OP 1935 Vol 1
Mine Assembly: OP 1935 Vol 3

Drill Assembly: None
Ballasting Instructions: OD 10577
Gyro Mech: OD 10574
Configuration Data: OP 3504
Class B Tests
 Firing Mechanism: OP 2567, OP 1844
 Other Components: OP 1452
Maintenance Requirements: OPs 1860, 3379, & 3388
Special Workshop Equip: ODs 10769, 10770, 10771, 10772
Submarine Loading Instns: None; see assy manual
Opn'l Characteristics: OP 2637
Ordalts: 3655 & 3656 - Fusible link flood valves
 3794 - Alter Gyro Mk 36
 3837 - Alter Exercise Head Mk 66
 3860 - Alter Test Stand Mk 3
 3861 - Alter Test Stand Mk 4
 3862 - Alter Test Stand Mk 5
 3863 - Alter Test Stand Mk 7
 3864 - Alter Counter Mk 1
 4127 - Alter Cable, Test Stands Mks 3 & 4
 4211 - Alter Thermal Relay 24-0
T-Shooter Bulletins: Nos. 029, 030, 031, 043, 046,
 052, 076, 078, 081, 084,
 085, 092, 095
T-Shooter Articles: Issue 1-63 p3; 3-64 pp3,10;
 3-65 p4; 4-65 p2

Mine Mk 27 Mod 4 (Sub-Laid)

Vehicle Assembly: OP 2363 Vol 1
Mine Assembly: OP 2363 Vol 2
Drill Assembly: None
Ballasting Instructions: OD 10577
Gyro Mech: ODs 10573, 10575
Configuration Data: OP 3504
Class B Tests
 Firing Mechanism: OP 2567
 Other Components: OP 1452
Maintenance Requirements: OPs 1860, 3379, & 3388
Special Workshop Equip: ODs 10769, 10770, 10771, 10772
Submarine Loading Instns: None; see assy manual
Opn'l Characteristics: OP 2637
Ordalts: 3727 - Alter battery section, Veh 1-0
 3837 - Alter Exercise Head 16-0 & 1
 3860 - Alter Test Stand Mk 3
 3861 - Alter Test Stand Mk 4
 3862 - Alter Test Stand Mk 5
 3863 - Alter Test Stand Mk 7
 3864 - Alter Counter Mk 1
 4127 - Alter Cable, Test Stands Mks 3 & 4
 4211 - Alter Thermal Relay 24-0
T-Shooter Bulletins: Nos. 029, 030, 031, 043, 046, 076,
 078, 081, 084, 085, 092, 095

Mine Mk 27 Mod 5 (Sub-Laid)

Vehicle Assembly: OP 2363 Vol 1
Mine Assembly: OP 2363 Vol 3
Drill Assembly: None
Ballasting Instructions: OD 10577
Gyro Mech: ODs 10573, 10575

Configuration Data - OP 3504
Class B Tests
 Firing Mechanism: OP 2567
 Other Components: OP 1452
Maintenance Requirements: OPs 1860, 3379, & 3388
Special Workshop Equip: ODs 10769, 10770, 10771, 10772
Submarine Loading Instns: None; see assy manual
Opn'l Characteristics: OP 2637
Ordalts: 3727 - Alter battery section, Veh 1-0
 3837 - Alter Exercise Head 61-0 & 1
 3860 - Alter Test Stand Mk 3
 3861 - Alter Test Stand Mk 4
 3862 - Alter Test Stand Mk 5
 3863 - Alter Test Stand Mk 7
 3864 - Alter Counter Mk 1
 4127 - Alter Cable, Test Stands Mks 3 & 4
 4211 - Alter Thermal Relay 24-0
T-Shooter Bulletins: Nos. 029, 030, 031, 043, 046,
 052, 076, 078, 081, 084,
 085, 092, 095
T-Shooter Articles: Issue 1-63 p3; 3-64 pp3,10;
 3-65 p4; 4-65 p2

Mine Mk 36 Mod 1 (Air-Laid)

Service Assembly: OP 1684 Vol 1
Drill Assembly: OP 1816 Vol 4
Configuration Data: OP 3504
Class B Tests
 Firing Mechanism: OP 2567
 Other Components: OP 1452
Maintenance Requirements: OPs 1860, 3379, & 3388
Prep for Aircraft Delivery: OP 3232
Opn'l Characteristics: OP 2637
Ballistic Tables: OPs 1395, 2563, & 2843
Ordalts: 4377 - Control Unit 66-0 to 66-1
 10016 - Test Set 127-3 to 127-4
 10108 - Control Unit 66-1 to 66-2
 10117 - Test Set 246-0 to 246-1
T-Shooter Bulletins: Nos. 004, 014, 018, 019, 021,
 029, 030, 031, 043, 046,
 078, 081, 084, 085, 092,
 094, 095, 096
T-Shooter Articles: Issue 1-63 p3; 2-63 p20; 3-64 p3

Mine Mk 36 Mod 2 (Air-Laid)

Service Assembly: OP 1798 Vol 1
Drill Assembly: OP 1816 Vol 5
Configuration Data: OP 3504
Class B Tests
 Firing Mechanism: OP 2567
 Other Components: OP 1452
Maintenance Requirements: OPs 1860, 3379, & 3388
Prep for Aircraft Delivery: OP 3232
Opn'l Characteristics: OP 2637
Ballistic Tables: OPs 1395, 2563, & 2843
Ordalts: 4377 - Control Unit 66-0 to 66-1
 4441 - Firing Mech A5-2 to A5-3
 10016 - Test Set 127-3 to 127-4
 10108 - Control Unit 66-1 to 66-2
 10117 - Test Set 246-0 to 246-1

T-Shooter Bulletins: Nos. 004, 029, 030, 031, 043,
046, 078, 079, 081, 084,
085, 092, 094, 095, 096

Mine Mk 36 Mod 3 (Air-Laid)

Service Assembly: OP 1892 Vol 1
Drill Assembly: OP 1816 Vol 6
Configuration Data: OP 3504
Class B Tests
 Firing Mechanism: OP 2567
 OP 1844
 Other Components: OP 1452
Maintenance Requirements: OPs 1860, 3379, & 3388
Prep for Aircraft Delivery: OP 3232
Opn'l Characteristics: OP 2637
Ballistic Tables: OPs 1395, 2563, & 2843
Ordalts: 4377 - Control Unit 66-0 to 66-1
 10016 - Test Set 127-3 to 127-4
 10108 - Control Unit 66-1 to 66-2
 10117 - Test Set 246-0 to 246-1
T-Shooter Bulletins: Nos. 004, 018, 029, 030, 031,
 043, 046, 052, 078, 081,
 084, 085, 092, 094, 095,
 096
T-Shooter Articles: Issue 1-63 p3; 2-63 p20; 3-64 p3

Mine Mk 39 Mod O (Air-Laid)

Service Assembly: OP 1736 Vol 1
Drill Assembly: None
Configuration Data: OP 3504
Class B Tests
 Firing Mechanism: OP 2567
 OP 681
 Other Components: OP 1452
Maintenance Requirements: OPs 1860, 3379, & 3388
Prep for Aircraft Delivery: OP 3232
Opn'l Characteristics: OP 2637
Ballistic Tables: OPs 2120, 2595, & 3344
Ordalts: 2839 - Alter Clock Starter 1-1 & 2 to 1-10 & 11
 10016 - Test Set 127-3 to 127-4
T-Shooter Bulletins: Nos. 029, 030, 031, 043, 046,
 078, 081, 084, 085, 092,
 095, 096
T-Shooter Articles: Issue 1-63 pp2,3; 3-64 p3

Mine Mk 41 Mods O, I, & 2 (Air-Laid)

Practice Assembly: NOLR 949 (from NOL/White Oak)
Drill Assembly: None
Configuration Data: OD 7334
Class B Tests
 Firing Mechanism: None
 Other Components: OP 1452
Maintenance Requirements: None
Prep for Aircraft Delivery: None
Opn'l Characteristics: None
Ballistic Tables: OPs 1459, 1394, & 1395
Ordalts: None
T-Shooter Bulletins: None

Mine Mk 49 Mod O (Sub-Laid)

Service Assembly: OP 1807 Vol 1
Drill Assembly: OP 1807 Vol 2
Configuration Data: OP 3504
Class B Tests
 Firing Mechanism: OP 2567
 OP 681
 Other Components: OP 1452
Maintenance Requirements: OPs 1860, 3379, & 3388
Submarine Loading Instns: None; see assy manual
Opn'l Characteristics: OP 2637
Ordalts: 3147 - Alter Circuit Breaker Mk 1
T-Shooter Bulletins: Nos. 029, 030, 031, 043, 046,
 078, 081, 084, 085, 092,
 094, 095
T-Shooter Articles: Issue 1-63 p3; 3-64 p3

Mine Mk 49 Mod I (Sub-Laid)

Service Assembly: OP 1808 Vol 1
Drill Assembly: OP 1808 Vol 2
Configuration Data: OP 3504
Class B Tests
 Firing Mechanism: OP 2567
 Other Components: OP 1452
Maintenance Requirements: OPs 1860, 3379, & 3388
Submarine Loading Instns: None; see assy manual
Opn'l Characteristics: OP 2637
Ordalts: 4441 - Firing Mech A5-2 to A5-3
T-Shooter Bulletins: Nos. 029, 030, 031, 043, 046,
 052, 078, 079, 081, 084,
 085, 092, 095
T-Shooter Articles: Issue 1-63 p3; 3-64 p3

Mine Mk 49 Mod 2 (Sub-Laid)

Service Assembly: OP 1809 Vol 1
Drill Assembly: OP 1809 Vol 2
Configuration Data: OP 3504
Class B Tests
 Firing Mechanism: OP 2567
 OP 1844
 Other Components: OP 1452
Maintenance Requirements: OPs 1860, 3379, & 3388
Submarine Loading Instns: None; see assy manual
Opn'l Characteristics: OP 2637
Ordalts: 2903 - Control Box 13-0 to 13-1
T-Shooter Bulletins: Nos. 029, 030, 031, 043, 046,
 052, 078, 081, 084, 085,
 092, 095
T-Shooter Articles: Issue 1-63 p3; 3-64 p3

Mine Mk 50 Mod O (Air-Laid)

Service Assembly: OP 1811 Vol 1
Drill Assembly: None
Configuration Data: OP 3504
Class B Tests
 Firing Mechanism: OP 2352
 Other Components: OP 1452

Maintenance Requirements: OPs 1860, 3379, & 3388
Prep for Aircraft Delivery: OP 3232
Opn'l Characteristics: OP 2637
Ballistic Tables: OP 1459
Ordalts: 4377 - Control Unit 66-0 to 66-1
4442 - Firing Mech 19-0 to 19-1
4447 - Test Set 194-0 to 194-1
5881 - Test Set 195-0 to 195-1
10108 - Control Unit 66-1 to 66-2
T-Shooter Bulletins: Nos. 029, 043, 046, 079, 081,
084, 085, 092, 095
T-Shooter Articles: Issue 1-63 p3; 1-66 p9

Mine Mk 52 Mods 1 through 6 (Air-Laid)

Service Assembly: OP 2608
Drill Assembly: OP 2608, OP 1816 Vol 7
Configuration Data: OP 3504
Class B Tests
Firing Mechanism: OP 2567
Other Components: OP 1452
Maintenance Requirements: OPs 1860, 3379, & 3388
Prep for Aircraft Delivery: OP 3232
Opn'l Characteristics: OP 2637
Ballistic Tables: OPs 2562 & 2843
Ordalts: 4377 - Control Unit 66-0 to 66-1
5460 - Accessory Set 17-0 to 17-1
10016 - Test Set 127-3 to 127-4
10029 - Accessory Set 1-0 to 1-1
10102 - Test Set 305-0 to 305-1
10108 - Control Unit 66-1 to 66-2
10117 - Test Set 246-0 to 246-1
T-Shooter Bulletins: Nos. 002, 012, 020, 026, 043,
045, 046, 063, 074, 075,
077, 079, 081, 082, 084,
085, 091, 092, 093, 094,
095
T-Shooter Articles: Issue 1-63 p3; 2-63 p20; 3-64 p3

Mine Mk 52 Mod 7 (Air-Laid)

Service Assembly: OP 3208 Vol 1
Drill Assembly: OP 3208 Vol 2
Configuration Data: OP 3504
Class B Tests
Firing Mechanism: OP 2567, OP 3409
Other Components: OP 1452, OP 3409
Maintenance Requirements: OPs 3379 & 3388
Prep for Aircraft Delivery: OP 3232
Opn'l Characteristics: OP 3410
Ballistic Tables: OP 2562
OP 2843
Ordalts: See listing, earlier mods
T-Shooter Bulletins: See listing, earlier mods

Mine Mk 52 Mod 8 (Air -Laid)

Service Assembly: OP 3210 Vol 1
Drill Assembly: OP 3210 Vol 2
Configuration Data: OP 3504

BIBLIOGRAPHY NO. 6

Class B Tests
Firing Mechanism: OP 2567
Other Components: OP 1452 & 3409
Maintenance Requirements: OPs 3379 & 3388
Prep for Aircraft Delivery: OP 3232
Opn'l Characteristics: OP 3410
Ballistic Tables: OPs 2562 & 2843

Mine Mk 53 Mod 0 (Air-Laid)

Service Assembly: OP 2370 Vol 1
Drill Assembly: None
Configuration Data: OP 3504
Class B Tests
Firing Mechanism: In assy manual
Other Components: OP 1452
Maintenance Requirements: OPs 1860 & 3379
Prep for Aircraft Delivery: OP 3232
Opn'l Characteristics: OP 2637
Ballistic Tables: OPs 2563 & 2843
Ordalts: 4377 - Control Unit 66-0 to 66-1
10016 - Test Set 127-3 to 127-4
10108 - Control Unit 66-1 to 66-2
10117 - Test Set 246-0 to 246-1
T-Shooter Bulletins: Nos 043, 046, 081, 085, 092,
095
T-Shooter Articles: Issue 1-63 p3

Mine Mk 55 Mods 1 through 6 (Air-Laid)

Service Assembly: OP 2974
Drill Assembly: OP 2974, OP 1816
Configuration Data: OP 3504
Class B Tests
Firing Mechanism: OP 2567
Other Components: OP 1452
Maintenance Requirements: OPs 1860, 3379, & 3388
Prep for Aircraft Delivery: OP 3232
Opn'l Characteristics: OP 2637
Ballistic Tables: OPs 2562 & 2843
Ordalts: 4377 - Control Unit 66-0 to 66-1
5460 - Accessory Set 17-0 to 17-1
10016 - Test Set 127-3 to 127-4
10029 - Accessory Set 1-0 to 1-1
10102 - Test Set 305-0 to 305-1
10108 - Control Unit 66-1 to 66-2
10117 - Test Set 246-0 to 246-1
T-Shooter Bulletins: Nos. 002, 012, 020, 026, 043,
045, 046, 063, 074, 075,
079, 081, 082, 084, 085,
091, 092, 093, 094, 095
T-Shooter Articles: Issue 1-63 p3; 2-63 p20; 3-64 p3

Mine Mk 55 Mod 7 (Air Laid)

Service Assembly: OP 3209 Vol 1
Drill Assembly: OP 3209 Vol 2
Configuration Data: OP 3504
Class B Tests
Firing Mechanism: OP 2567, OP 3409
Other Components: OP 1452, OP 3409

Maintenance Requirements: OPs 3379 & 3388
Prep for Aircraft Delivery: OP 3232
Opn'l Characteristics: OP 3410
Ballistic Tables: OP 2562
 OP 2843
Ordalts: See listing for earlier mods
T-Shooter Bulletins: See listing for earlier mods

Mine Mk 55 Mod 8 (Air-Laid)

Service Assembly: OP 3211 Vol 1
Drill Assembly: OP 3211 Vol 2
Configuration Data: OP 3504
Class B Tests
 Firing Mechanism: OP 2567, OP 3409
 Other Components: OPs 1452 & 3409
Maintenance Requirements: OPs 3379 & 3388
Prep for Aircraft Delivery: OP 3232
Opn'l Characteristics: OP 3410
Ballistic Tables: OPs 2562 & OP 2843

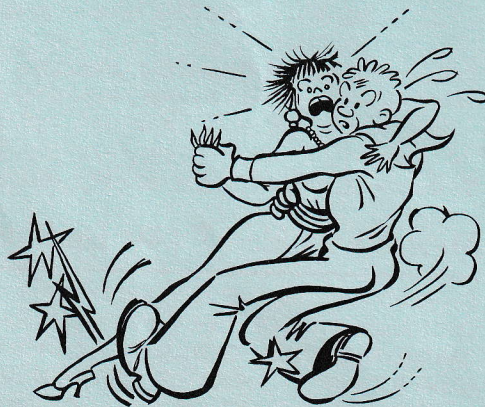
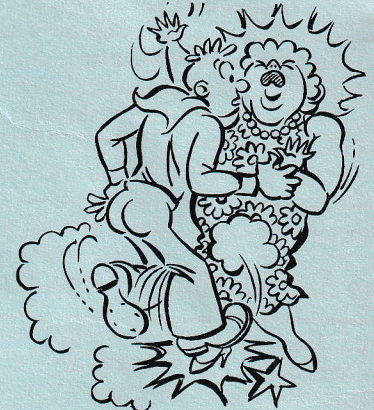
Mine Mk 56 Mod 0 (Air-Laid)

Service Assembly: OP 2572
Drill Assembly: OP 2572
Configuration Data: OP 3504
Class B Tests
 Firing Mechanism: OP 2567, OP 3409
 Other Components: OP 1452, OP 3409

Maintenance Requirements: OP 1860
 OP 3379
Prep for Aircraft Delivery: OP 3232
Opn'l Characteristics: OP 2815, OP 3410
Ballistic Tables: OPs 2562 & 2843
Ordalts: 4377 - Control Unit 66-0 to 66-1
 10016 - Test Set 127-3 to 127-4
 10029 - Accessory Set 1-0 to 1-1
 10108 - Control Unit 66-1 to 66-2
T-Shooter Bulletins: Nos. 002, 043, 046, 081, 084,
 085, 092, 095

Mine Mk 57 Mod 0 (Sub-Laid)

Service Assembly: OP 2718
Drill Assembly: OP 2718
Configuration Data: OP 3504
Class B Tests
 Firing Mechanism: OP 2567, OP 3409
 Other Components: OP 1452, OP 3409
Maintenance Requirements: OPs 1860 & 3379
Submarine Loading Instns: None; see assy manual
Opn'l Characteristics: OP 2816, OP 3410
Ordalts: 10016 - Test Set 127-3 to 127-4
 10029 - Accessory Set 1-0 to 1-1
T-Shooter Bulletins: Nos. 002, 043, 046, 064, 081,
 084, 085, 092, 095, 097
T-Shooter Articles: Issue 1-63 p3; 4-65 p4; 2-66 p12



SECTION 2:

Note that this section lists basic publication only. To learn the authorized revision number, etc. for a listed pub, see Section 6.

DEPTH-CHARGE ASSEMBLY, TEST, & USE

Depth Charge Mk 6 Mods 0, 1, & 2

Assembly: OP 747
Gen'l Requisites: OD 17160
Class B & C Tests: In assy manual
Maintenance Requirements: OPs 1860, 3379, & 3388
Opn'l Characteristics: In assy manual
Shipboard Instructions: In assy manual
Ordalts: 1505 - Booster Extender 6-1, Retainer
1893 - Booster Extender 6-1, Safety Fork
2292 - Arbors 6-0 & 7-0, 1 to 7-4

T-Shooter Bulletins: None
T-Shooter Articles: Issue 4-63 p3

Depth Charge Mk 8 Mods 3, 4, & 5

Assembly: OP 2960
Gen'l Requisites: OD 17160
Class B & C Tests: In assy manual
Maintenance Requirements: OPs 1860, 3379, & 3388
Opn'l Characteristics: In assy manual
Shipboard Instructions: In assy manual
Ordalts: 2292 Arbors 6-0 & 7-0, 1 to 7-4
T-Shooter Bulletins: None
T-Shooter Articles: Issue 4-63 p3

Depth Charge Mk 9 Mods 2, 3, & 4

Assembly: OP 866
Gen'l Requisites: OD 17160
Class B & C Tests: In assy manual
Maintenance Requirements: OPs 1860, 3379, & 3388
Opn'l Characteristics: In assy manual
Shipboard Instructions: In assy manual
Ordalts: 2292 - Arbors 6-0 & 7-0, 1 to 7-4
T-Shooter Bulletins: 013 - Impulse charges
T-Shooter Articles: Issue 4-63 p3

Depth Charge Mk 14 Mod 0

Assembly: OP 669
Gen'l Requisites: OD 17160
Class B & C Tests: In assy manual
Maintenance Requirements: OPs 1860, 3379, & 3388
Opn'l Characteristics: In assy manual
Shipboard Instructions: In assy manual
Ordalts: 10016 - Test Set 127-3 to 127-4
T-Shooter Bulletins: 013 - Impulse charges

Depth Charge Mk 16 Mods 0 & 1

Assembly: OP 2107
Gen'l Requisites: OD 17160
Firing Mech "B" Tests: OP 669
Other B, C Tests: In assy manual
Maintenance Requirements: OPs 1860 & 3379
Opn'l Characteristics: In assy manual
Shipboard Instructions: In assy manual
Ordalts: 10016 - Test Set 127-3 to 127-4
T-Shooter Bulletins: None

12" 75 Rocket Mk 1 Mod 0 (ASP)

Assembly: OP 2027
Gen'l Requisites: None
Class B & C Tests: OP 1792
Maintenance Requirements: OPs 1860
Opn'l Characteristics: OP 1792
Shipboard Instructions: In assy manual
Ordalts: None
Ballistic Tables: OP 1829
T-Shooter Bulletins: None



'Roberts just washed his feet and can't do a thing with 'em!'

SECTION 4: GENERAL REFERENCES

Note that this section lists basic publication only. To learn the authorized revision number, etc. for a listed pub, see Section 6.

- NAVWEPS ORDALT 00: Index of alterations to Ordnance Equipment (Cog I: 0625-000-0003) with Change 1 (0625-000-0004):
- NOLR 1204 Rev 0 Ch 0: Environmental Considerations in Testing Mine and Depth-Charge Influence Mechanisms (available only from NOL/White Oak).
- OD 6678: Operational Assembly Charts for Service and Drill Mines.
- OD 9363: Nomenclature Manual for Mines, Depth Charges, and Associated Equipment.
- OD 9364: Nomenclature Manual for Test Sets, Cable Assemblies, Batteries, and Associated Equipment.
- OD 16135: Navy Ammunition Logistics Codes.
- OD 12067-D: Index to Navy Ammunition Stock, Depth Charges and Accessories.
- OD 12067-G: Index to Navy Ammunition Stock, Mines and Mine Material.
- OD 16086: U.S. Naval Underwater Weapons, Tactical Data (Section B).
- OP 0: Index to Ordnance Publications.
- OP 5: Ammunition Ashore.
Vol 1: Handling, Stowing and Shipping.
Vol 2: Production and Renovation.
Vol 3: Handling at Advance Bases.
- OP 1014: Ordnance Safety Precautions.
- OP 1391: U.S. Naval Mines, Introduction to.
- OP 1631: Ammunition Hazard Classification, Dimensions and weights.
- OP 2165: Navy Ordnance Handbooks.
Vol 1: Transportation Safety.
Vol 2 Part 1: Transportation & Safety Data.
Vol 2 Part 2: Transportation & Safety Data (con't).
- OP 2173: Handling Equipment for Ammunition and Explosives.
Vol 1: Mobile Equipment.
Vol 2: Non-Mobile Equipment.
- OP 2213: Pyrotechnics and Miscellaneous Explosive Items, Descriptions and Uses.
- OP 2238: Identification of Ammunition.
- OP 2239: Driver's Handbook; Explosives and Dangerous Materials.
- OP 2769: Cable Reeling Machine Mk 2 Mod 0, Operation and Maintenance.
- OP 3504: Authorized Configuration Data for Underwater Mines.
Vol 1: Instructions, Cross References.
Vol 2: Material Applications.
Vol 3: Assembly Level Items/Parts.
Vol 4: Bills of Material/Mines.
Vol 5: Test Equipment, Tools.
Vol 6: Reference Documents.
- OPNAVINST 08550.12A: Mine Readiness; guidance for (U).
- OPNAVINST 008550.5F: Mine Distribution and Prepositioning; guidance for (U).
- OPNAVINST PO 5605.20A: CONTAC Publications, Procurement Procedures and Status Information.
- BUWEPSINST 8550.9A: World-Wide Surveillance Program.
- BUWEPSINST 08550.10: Readiness Inspections of Mine Stocking Activities (U).
- BUWEPSINST 8550.11B: Drill Mines & Other Non-Service Mines; supply management of
- BUWEPSINST 8500.8: Report of Unsatisfactory Mines, Depth Charges (RUDMINDE).
- BUWEPSINST 4355.5B: Naval Calibration Program.

Pubs for Mine Tests

The FSMT Guide (A brochure of information and sample documents, authoritative but not directive, assembled to provide guidance and assistance in the planning, administration, conduct and analysis of Fleet Service-Mine Tests): Request from NMEF by letter.

OP 3233: Instrumentation for Underwater-Mine Tests.

BUWEPSINST 8550.5: Installation of Batteries in FSMT mines.

BUWEPSINST 8551.2: Use of Keeper Wires in Fleet Service-Mine Tests.

CINCLANTINST - CINCPACINST 8500.1D: Fleet Service-Mine Test Program.

SECTION 5: ALLOWANCE LISTS

Allowance lists, designated variously by NAVORD LISTS, NAVWEPS LISTS, and ORDLIST numbers are available by letter request from U.S. Navy Ships Parts Control Center, Mechanicsburg, Pa. 17055.

MINES

- NAVWEPS LIST 24220 (8 Dec '60): Assy & Replacement Parts; Drill Mine Mk 6-0
- NAVWEPS LIST 24221 (29 Nov '60): Assy & Replacement Parts, Tools, & Accessories; Drill Mine Mk 10-3
- NAVWEPS LIST 24222 (25 Nov '60): Assy & Replacement Parts and Tools; Drill Mine Mk 18-0
- NAVWEPS LIST 24223 (17 Nov '60): Assy & Replacement Parts, Tools, & Accessories; Drill Mine Mk 49-0,1,2
- NAVWEPS LIST 24224 (27 Nov '60): Assy & Replacement Parts, Tools, & Accessories; Drill Mines Mks 52/55
- NAVWEPS LIST 23922-B (20 Dec '62): Mine Assy & Maintenance Parts
- NAVORD LIST 24036 (11 Mar '57): Assy & Replacement Parts, Tools, & Accessories; Drill Mines Mks 25/36
- NAVORD LIST 23642-A (12 Jan '56): Tools & Test Equip for Controlled Mine System Mk 1 and Acoustic System Mk 6

NAVMINENGRFACINST 8011.1 (15 Jan '66): Allowance List for Mine Test Sets, Tools, and Miscellaneous Equipment*

APL 0-006100043 thru 0-006100055: Special Tools; Mines Mks 6/10/18/27/36/39/52, also K3, K4 Mechs, Needle Fire Mech, Hydrostat Mk 2, Antenna Mk 1-1, also Basic Mine Tool Set

APL 0061 Series: Mine Test-Set Repair-Parts List
 ORDLIST 23107-C: Mine Material for Training Purposes
 ORDLIST 22982-A: Mine Training Material for NROTC
 ORDLIST 22981-B: Mine Training Material for NROTC

DEPTH CHARGES

- NAVORD LIST 22466-G (26 Feb '54): Depth-Charge Material
- NAVORD LIST 22500-D (26 Oct '55): Depth-Charge Material
- ORDLIST 23847: Depth-Charge Material
- NAVORD LIST 24035 (18 Jun '58): Depth-Charge Components & Repair Parts

DEPERMING—DEGAUSSING

- NAVWEPS LIST 24204 (7 Nov '60): Deperming Equip Repair Parts
- NAVORD LIST 23734-C (12 Oct '59): Degaussing Ranging Equip Repair Parts

* Stocked at Naval Mine Engineering Facility (ESI), Yorktown, Va. 23491; supersedes NAVORD LIST 22501-E (29 Apr '58) and BUWEPSINST 08011.15 (22 Jan '64).

SECTION 6: PUBS STATUS & ORDERING INFO

Except for a few special cases, all of the publications referenced elsewhere in this bibliography are grouped in this section according to publication type. (OPs, ODs, Bulletins, etc.) and listed within those groups by publication number, in numerical sequence. In each case the revision which is listed is the only revision specifically authorized for fleet use, unless otherwise noted. In addition to specifying the approved revision, all changes current at time of publication are also listed.

Cog-I publications. The first group of publications consists of NAVORD OPs. OPs and OP changes are stocked in The Navy Supply System under inventory management of the Planning/Control Dept., Naval Supply Depot, Philadelphia, as Cognizance-I items of supply. Stock numbers are listed for each, and these publications should be ordered by stock number, via NAVSTRIPS forwarded direct to NSD/Philadelphia. There is no charge for Cog-I pubs.

About ordering changes. OP changes are stocked as separate items of supply but they receive special automatic processing which should be taken into consideration when ordering. Suppose, for example, you find that you need two copies of Change 2 to OP 1807 Vol 2, to make your copies of that volume complete: Simply order the two copies of the change, by its listed stock number. Suppose, though, you need an extra copy of the OP itself, and you find there are four changes in existence, and you want to be sure you get all the changes too. Do you need to send a separate NAVSTRIP for each change?

You do not. Any time you order an OP by its Cog-I stock number from the NSD, all current changes will be forwarded to you and it whether you ask for them or not. If you also ordered changes separately, you'd end up with an OP with all changes, plus an extra

set of changes for which you have no OP. That's waste.

It will be noted that some change numbers are not consecutive (e.g., the listing under one OP includes Changes 1, 2, 31, and 32, in that order). The reason: for mine and depth-charge publications single-digit changes (e.g., Change 2) are permanent changes, and two-digit changes (e.g., Change 32) are interim changes. For the interim the first digit (in this case the 3) indicates the number of the next permanent change, which will cancel the interim, while the second digit (the 2) indicates that this is the second interim released pending release of that permanent change.

PUBLICATION	COG-I STOCK NO.
OP 0, Rev 36 (Index to Ord Pubs)	0609-000-0040
OP 5: Ammunition Ashore	
Vol 1 Rev 2 (Handl'g, Stow'g, Shipp'g)	0609-000-5100
Ch 1 to OP 5 Vol 1 Rev 2	0609-000-5101
Ch 2 to OP 5 Vol 1 Rev 2	0609-000-5102
Ch 3 to OP 5 Vol 1 Rev 2	0609-000-5103
Vol 2 Rev 0 (Product'n, Renovation)	0609-000-5200
Ch 1 to OP 5 Vol 2 Rev 0	0609-000-5201
Ch 2 to OP 5 Vol 2 Rev 0	0609-000-5202
Vol 3 Rev 0 (Handling, Adv. Bases)	0609-000-5310
Ch 1 to OP 5 Vol 3 Rev 0	None ¹
Ch 2 to OP 5 Vol 3 Rev 0	None ¹
Ch 3 to OP 5 Vol 3 Rev 0	0609-000-5311
Ch 4 to OP 5 Vol 3 Rev 0	0609-000-5312
OP 605 Rev 2 (Fire Mechs, K-type)	0609-060-5000 ²

for footnotes see page 13

OP 669 Rev 2 (D Chg 14-0 Assy)	0609-066-9010	OP 1745 Rev 1 (Projector 15-0 Operation)	0609-174-5000
Ch 11 to 669 Rev 2	0609-066-9011	OP 1765 Vol 1 Rev 3 (Mine 25-2 Assy)	0609-176-5110
OP 681 Rev 1 (Fire Mech M-11)	0609-068-1000	Ch 11 to 1765 Vol 1 Rev 3	0609-176-5111
Ch 1 to 681 Rev 1	0609-068-1001	Ch 12 to 1765 Vol 1 Rev 3	0609-176-5112
Ch 2 to 681 Rev 1	0609-068-1002	OP 1797 Vol 1 Rev 3 (Mine 25-1 Assy)	0609-179-7110
OP 747 Rev 2 (D Chg Mk 6 Assy)	0609-074-7010	Ch 11 to 1797 Vol 1 Rev 3	0609-179-7111
Ch 1 to 747 Rev 2	0609-074-7011	Ch 12 to 1797 Vol 1 Rev 3	0609-179-7112
OP 866 Rev 3 (D Chg Mk 9 Assy)	0609-086-6010	Ch 13 to 1797 Vol 1 Rev 3	0609-179-7113
Ch 1 to 866 Rev 3	0609-086-6011	OP 1798 Vol 1 Rev 3 (Mine 36-2 Assy)	0609-179-8110
Ch 2 to 866 Rev 3	0609-086-6012	Ch 11 to 1798 Vol 1 Rev 3	0609-179-8111
OP 902 Rev 2 (Mine 18-0 Assy)	0609-090-2000	Ch 12 to 1798 Vol 1 Rev 3	0609-179-8112
Ch 1 to 902 Rev 2	see footnote 3	OP 1807 Vol 1 Rev 2 (Mine 49-0 Assy)	0609-180-7110
Ch 2 to 902 Rev 2	0609-090-2002	Ch 1 to 1807 Vol 1 Rev 2	0609-180-7112
Ch 31 to 902 Rev 2	0609-090-2003	Ch 21 to 1807 Vol 1 Rev 2	0609-180-7113
OP 948 Rev 1 (Mine 10-3, 9 Assy)	0609-094-8000	Ch 22 to 1807 Vol 1 Rev 2	0609-180-7114
Ch 1 to 948 Rev 1	0609-094-8001	OP 1807 Vol 2 Rev 1 (Drill 49-0 Assy)	0609-180-7200
Ch 2 to 948 Rev 1	0609-094-8002	Ch 1 to 1807 Vol 2 Rev 1	0609-180-7201
OP 956 Vol 1 Rev 4 (Mine 25-0 Assy)	0609-095-6110	Ch 2 to 1807 Vol 2 Rev 1	0609-180-7202
Ch 1 to 956 Vol 1 Rev 4	0609-095-6112	Ch 31 to 1807 Vol 2 Rev 1	0609-180-7203
Ch 21 to 956 Vol 1 Rev 4	0609-095-6113	Ch 32 to 1807 Vol 2 Rev 1	0609-180-7204
Ch 22 to 956 Vol 1 Rev 4	0609-095-6114	Ch 33 to 1807 Vol 2 Rev 1	0609-180-7205
Ch 23 to 956 Vol 1 Rev 4	0609-095-6115	Ch 34 to 1807 Vol 2 Rev 1	0609-180-7206
OP 1014 Rev 2 (Ord Safety)	0609-106-4001	OP 1808 Vol 1 Rev 2 (Mine 49-1 Assy)	0609-180-8110
OP 1105 Vol 6 Rev 2 (Preservation-Maintenance Ord Equip, Shore Storage)	0609-110-5600	Ch 11 to 1808 Vol 1 Rev 2	0609-180-8111
Ch 1 to 1105 Vol 6 Rev 2	0609-110-5601	Ch 12 to 1808 Vol 1 Rev 2	0609-180-8112
Ch 2 to 1105 Vol 6 Rev 2	0609-110-5602	Ch 13 to 1808 Vol 1 Rev 2	0609-180-8113
Ch 3 to 1105 Vol 6 Rev 2	0609-110-5603	OP 1808 Vol 2 Rev 1 (Drill 49-1 Assy)	0609-180-8200
Ch 4 to 1105 Vol 6 Rev 2	0609-110-5604	Ch 1 to 1808 Vol 2 Rev 1	0609-180-8201
Ch 5 to 1105 Vol 6 Rev 2	0609-110-5605	Ch 2 to 1808 Vol 2 Rev 1	0609-180-8202
OP 1391 Rev 1 (Intro to US Naval Mines	0609-139-1000 ⁴	Ch 31 to 1808 Vol 2 Rev 1	0609-180-8203
Ch 1 to 1391 Rev 1	0609-139-1001	Ch 32 to 1808 Vol 2 Rev 1	0609-180-8204
OP 1394 Rev 1 (Mine 25-0, Ballistics)	0609-139-4000	Ch 33 to 1808 Vol 2 Rev 1	0609-180-8205
OP 1395 Rev 1 (Mine 36-1, 2, 3; Ballistics)	0609-139-5000	Ch 34 to 1808 Vol 2 Rev 1	0609-180-8206
Ch 1 to 1395 Rev 1	0609-139-5001	Ch 35 to 1808 Vol 2 Rev 1	0609-180-8207
Ch 2 to 1395 Rev 1	0609-139-5002	OP 1809 Vol 1 Rev 2 (Mine 49-2 Assy)	0609-180-9103
OP 1452: Mine Components, etc; Class B Tests		Ch 1 to OP 1809 Vol 1 Rev 2	0609-180-9104
Rev 2 (Single Volume)	0609-145-2000 ⁵	Ch 21 to OP 1809 Vol 1 Rev 2	0609-180-9105
Ch 1 to 1452 Rev 2	0609-145-2001 ⁵	OP 1809 Vol 2 Rev 1 (Drill 49-2 Assy)	0609-180-9200
Ch 2 to 1452 Rev 2	0609-145-2002 ⁵	Ch 1 to 1809 Vol 2 Rev 1	0609-180-9201
Ch 3 to 1452 Rev 2	0609-145-2003 ⁵	Ch 21 to 1809 Vol 2 Rev 1	0609-180-9202
Ch 41 to 1452 Rev 2	0609-145-2004 ⁵	Ch 22 to 1809 Vol 2 Rev 1	0609-180-9203
Ch 42 to 1452 Rev 2	0609-145-2005 ⁵	Ch 23 to 1809 Vol 2 Rev 1	0609-180-9204
Rev 3 (5-Vol Preliminary)	Not available	Ch 24 to 1809 Vol 2 Rev 1	0609-180-9205
Rev 4 Vol 1 (Batteries, XPL initiators)	0609-145-2140 ⁵	OP 1811 Rev 1 (Mine 50-0 Assy)	0609-181-1010
Ch 11 to 1452 Vol 1 Rev 4	0609-145-2141 ⁵	Ch 1 to 1811 Rev 1	0609-181-1011
Ch 12 to 1452 Vol 1 Rev 4	0609-145-2142 ⁵	Ch 21 to 1811 Rev 1	0609-181-1021
Ch 13 to 1452 Vol 1 Rev 4	0609-145-2143 ⁵	Ch 22 to 1811 Rev 1	0609-181-1022
Ch 14 to 1452 Vol 1 Rev 4	0609-145-2144 ⁵	Ch 23 to 1811 Rev 1	0609-181-1023
Rev 4 Vol 2 (Hydrostatic Devices)	0609-145-2240 ⁵	Ch 24 to 1811 Rev 1	0609-181-1024
Rev 4 Vol 3 (Flight Gear, Gasketry, etc)	In preparation ⁵	Ch 25 to 1811 Rev 1	0609-181-1025
Rev 4 Vol 4 (Clock-Delay Mechs)	In preparation ⁵	OP 1816 Vol 1 Rev 2 (Drill 25-0 Assy)	0609-181-6100 ⁸
Rev 4 Vol 5 (Search Coils, Relays, etc)	0609-145-2540 ⁵	Ch 1 to 1816 Vol 1 Rev 2	0609-181-6101 ⁸
Ch 11 to 1452 Vol 5 Rev 4	0609-145-2541 ⁵	OP 1816 Vol 2 Rev 2 (Drill 25-1 Assy)	0609-181-6200 ⁸
Ch 12 to 1452 Vol 5 Rev 4	0609-145-2542 ⁵	OP 1816 Vol 3 Rev 2 (Drill 25-2 Assy)	0609-181-6300 ⁸
OP 1459 Rev 1 (Mines 25-1, 2/10-9/50-0, Ballistics)	0609-145-9000	OP 1816 Vol 4 Rev 2 (Drill 36-1 Assy)	0609-181-6400 ⁸
OP 1537 Rev 1 (Degauss: Equipment)	0609-153-7000	OP 1816 Vol 5 Rev 2 (Drill 36-2 Assy)	0609-181-6500 ⁸
OP 1538 Rev 0 (Degauss: Ranging, Calibrat'n)	0609-153-8100	OP 1816 Vol 6 Rev 2 (Drill 36-3 Assy)	0609-181-6600 ⁸
Ch 1 to 1538 Rev 0	see footnote 6	OP 1816 Vol 7 Rev 2 (Drill 52/55 Assy)	0609-181-6700
Ch 2 to 1538 Rev 0	0609-153-8102	Ch 11 to 1816 Vol 7 Rev 2	0609-181-6701
OP 1631 Rev 3 (Ammo Hazard Classification)	0609-163-1104	OP 1844 Rev 1 (Fire Mech A-6/A-8)	0609-184-4000
Ch 1 to 1631 Rev 3	0609-163-1105	Ch 1 to 1844 Rev 1	0609-184-4001
Ch 2 to 1631 Rev 3	0609-163-1106 ⁷	Ch 2 to 1844 Rev 1	0609-184-4002
OP 1684 Vol 1 Rev 2 (Mine 36-1 Assy)	0609-168-4100 ⁷	Ch 3 to 1844 Rev 1	0609-184-4003
Ch 1 to 1684 Vol 1 Rev 2	0609-168-4101	Ch 4 to 1844 Rev 1	0609-184-4004
Ch 21 to 1684 Vol 1 Rev 2	Cancelled	OP 1853 Vol 1 Rev 2 (Mine 6-0 thru 11 Assy)	0609-185-3101
Ch 22 to 1684 Vol 1 Rev 2	0609-168-4103	OP 1853 Vol 2 Rev 2 (Drill 6-0 Assy)	0609-185-3201
OP 1736 Rev 3 (Mine 39-0 Assy)	0609-173-6001	OP 1853 Vol 3 Rev 0 (Mine 6-14 Assy)	0609-185-3300
Ch 11 to 1736 Rev 3	0609-173-6002		

for footnotes see page 13

1853 Vol 4 Rev 0 (Mine 6-15 Assy)	0609-185-3400	OP 1935 Vol 2 Rev 1 (Mine 27-2, XPL Section) .	0609-193-5210
Ch 11 to 1853 Vol 4	0609-185-3401	Ch 11 to 1935 Vol 2 Rev 1	0609-193-5211
Ch 12 to 1853 Vol 4	0609-185-3402	Ch 12 to 1935 Vol 2 Rev 1	0609-193-5212
Ch 13 to 1853 Vol 4	0609-185-3403	OP 1935 Vol 3 Rev 1 (Mine 27-3, XPL Section)	0609-193-5310
OP 1854 Rev 1 (Acoustic System 6-0)	0609-185-4000	OP 2032 Rev 0 (Depth Bomb 54-1, Bomb. Table)	0609-203-2000
OP 1860: Test-Set Calibration		OP 2107 Rev 0 (D Chg 16-0, 1 Assy)	0609-210-7000
Vol 1 Rev 3 (Mk 1 thru 60)	0609-186-0130	OP 2120 Rev 0 (Mine 39-0, Ballistics)	0609-212-0000
Vol 2 Rev 3 (Mk 61 thru 136)	0609-186-0210	Ch 1 to 2120 Rev 0	0609-212-0001
Vol 3 Rev 3 (Mk 137 thru 238)	0609-186-0310	OP 2165: Navy Ordnance Handbooks	
Vol 4 Rev 0 (Mk 239 thru 299)	0609-186-0400	Vol 1 Rev 3 (Transportation Safety)	0609-216-5009
Vol 5 Rev 0 (Mk 300 thru 408)	0609-186-0500	Ch 1 to 2165 Vol 1 Rev 3	0609-216-5010
OP 1878 Rev 1 (Drill 10-3 Assy)	0609-187-8000	Vol 2 Pt 1 Rev 3 (Trans & Storage Data) .	0609-216-5200
Ch 1 to 1878 Rev 1	0609-187-8001	Vol 2 Pt 2 Rev 3 (Trans & Storage Data) .	0609-216-5225
Ch 21 to 1878 Rev 1	0609-187-8002	OP 2173: Handling Equip for Ammo, XPLS	
Ch 22 to 1878 Rev 1	0609-187-8003	Vol 1 Rev 1 (Mobile)	0609-217-3100
Ch 23 to 1878 Rev 1	0609-187-8004	Vol 2 Rev 1 (Non-Mobile)	0609-217-3200
OP 1892 Vol 1 Rev 2 (Mine 36-3 Assy)	0609-189-2110	OP 2213 Rev 1 (Pyrotechnics & Misc. XPLS) . .	0609-221-3007
OP 1905 Rev 1 (Fire Mech M5-1)	0609-190-5000	Ch 1 to 2213 Rev 1	0609-221-3008
Ch 1 to 1905 Rev 1	0609-190-5001	Ch 2 to 2213 Rev 1	0609-221-3009
OP 1930 Vol 1 Rev 0 (Mine Syst 2-0, Install.) .	0609-193-0100	Ch 3 to 2213 Rev 1	0609-221-3010
OP 1930 Vol 2 Rev 0 (Mine Syst 2-0, Mtnce) . .	0609-193-0200	Ch 4 to 2213 Rev 1	0609-221-3011
OP 1930 Vol 3 Rev 0 (Mine Syst 2-0, Opera) . .	0609-193-0300	Ch 5 to 2213 Rev 1	0609-221-3012
OP 1935 Vol 1 Rev 2 (Mine 27-2, 3; Vehicle) . .	0609-193-5110	Ch 6 to 2213 Rev 1	0609-221-3014
Ch 1 to 1935 Vol 1 Rev 2	0609-193-5111	Ch 7 to 2213 Rev 1	0609-221-3015
Ch 21 to 1935 Vol 1 Rev 2	0609-193-5121	OP 2238 Rev 0 (Ammo Identification)	0609-223-8000
Ch 22 to 1935 Vol 1 Rev 2	0609-193-5122	Ch 1 to 2238 Rev 0	0609-223-8001
Ch 23 to 1935 Vol 1 Rev 2	0609-193-5123	OP 2239 Rev 2 (Driver's Handbook; XPLS, etc.)	0609-223-9008 ¹⁰
Ch 24 to 1935 Vol 1 Rev 2	0609-193-5124	OP 2352 Rev 0 (Fire Mech Mk 19)	0609-235-2000
		Ch 1 to 2352 Rev 0	0609-235-2001
		Ch 2 to 2352 Rev 0	0609-235-2002
		Ch 31 to 2352 Rev 0	0609-235-2003

FOOTNOTES FOR SECTION 6

- Changes 1, 2 to OP 5 Vol 3 apparently supplied only with complete copies of Vol 3.
- 2 - Users of OP 605 also require T-Shooter Bulletin 017 from NMEF.
- 3 - Advance copy of assembly manual for Drill Mine Mk 18 (Change 1, published as separate volume) available only from NMEF. Drill Mine is not active; manual is not required in field.
- 4 - OP 1391 still in current stocks but has not been maintained up-to-date. Pending revision, similar info is available from NMEF via confidential BUWEPS Mine Familiarizer.
- 5 - Basically, Rev 2 is still the preferred edition of OP 1452. Preliminary edition of 3rd revision out of stock but approved for use by holders for the tests of few components not included in Rev 2 or 4. Revision 4, of which Vol 1 (Batteries, Sterilizers, and Explosive Devices), Vol 2 (Hydrostatic Devices), and Vol 5 (coils, relays, and counters) have already been released, will be completed in 1967 and does supersede related subject matter in Revisions 2 and 3. For new components not yet approved for service use, use OP 3409.
- 6 - Change 1 to OP 1538 apparently supplied only with complete copies.
- 7 - Rev 4 to OP 1684 scheduled for release in 1967. Advance copies of Rev 3, distributed for selected activities review, not in stock and not approved.
- 8 - Users of OP 1816, volumes 1 thru 6, also require T-Shooter Bulletin 004 from NMEF.
- 9 - Volume 5 of new edition of OP 1860 scheduled for distribution to all mine activities, all calibration labs, first half of 1967.
- 10 - OP 2239 Rev 2 reprinted and includes Ch 1 to old edition. Holders of old edition who wish only Ch 1 use 0609-223-9007.
- 11 - OPs 2572, 2718, 2815, 2816 available only in preliminary edition from NOL, White Oak, Maryland.
- 12 - Rev 1 to OP 2608 scheduled for release in 1967 will include Mine Mk 55, thus replacing Rev 0 to 2608 and Rev 0 to 2974.
- 13 - OPs on individual mine test sets have been incorporated in new edition of OP 1860, scheduled for distribution to all mine activities, all calibration activities, in 1967. Review drafts of test set OPs 2775, 2779, 2792, and 2897 available only from NOL, White Oak.
- 14 - Review draft of OPs 3208, 3209, 3210, 3211 available only from NOL, White Oak.
- 15 - OP 3232, a new basic volume covering mine prep for delivery to all mine-laying aircraft, is scheduled for release first half 1967. This volume, plus new Air Systems Command Mine-Loading check lists, will cancel all current and planned supplements to OP 3232 (for detail see page 1, Troubleshooter 1-66). NASC mine-loading check lists are currently available from NSD/Philadelphia (stock numbers not yet available) as follows: 01-40AL-75-6 (A-1H/J airplane); 01-40AT-75-6 (A-3B); 01-85AD-75-6 (A-6A); 01-45AA-75-6 (A-7A); 01-40AV-75-14 (A-4B/C/E); 01-75PA-75-6 (P-3A/B); 01-75EE-75-6 (SP-2H). Future NASC mine check lists will get automatic distribution to mining missions via NMEF's distro system.
- 16 - OP 3344 in preparation; in interim use NWL Table 03-63-002, available from U.S. Naval Weapons Laboratory, Dahlgren, Va. 22448.
- 17 - OP 3388 not scheduled for release pending further notice.
- 18 - OPs 3409, 3410 provide advance info on material not yet approved for procurement in quantity for service use; available only from Mine Warfare Division, HQ NOSC.
- 19 - OP 3504 scheduled to supersede OD 10,604, all mine general-requisites ODs. Binders and content for volumes 1, 2, and 4 scheduled for release early 1967, others later 1967. For more see Rudminde Report, Troubleshooter 3-66.

OP 2363 Vol 1 Rev 1 (Mine 27-4, 5; Vehicle)	0609-236-3110	OP 2816 Rev 0 (Mine 57-0; Characteristics)	Not assigned
Ch 1 to 2363 Vol 1 Rev 1	0609-236-3114	OP 2843 Rev 0 (Mines 25, 36, 52, 53, 55; Ballistics)	0609-284-3000
OP 2363 Vol 2 Rev 1 (Mine 27-4 War Batty Sec)	0609-236-3210	OP 2897 Rev 0 (Test Set 340-0)	Not assigned 13
Ch 11 to 2363 Vol 2 Rev 1	0609-236-3211	OP 2959 Rev 0 (Mine 39-0; Ballistics)	0609-295-9000
Ch 12 to 2363 Vol 2 Rev 1	0609-236-3212	OP 2960 (D Chg 8-3, 4, 5 Assy)	0609-296-0000
OP 2363 Vol 3 Rev 1 (Mine 27-5 War Batty Sec)	0609-236-3310	OP 2974 Vol 1 Rev 0 (Mine 55-1 thru 6 Assy)	0609-297-4100 ¹²
OP 2370 Rev 0 (Mine 53-0 Assy)	0609-237-0000	Ch 1 to 2974 Vol 1 Rev 0	0609-297-4101 ¹²
Ch 1 to 2370 Rev 0	0609-237-0001	Ch 21 to 2974 Vol 1 Rev 0	0609-297-4102 ¹²
Ch 21 to 2370 Rev 0	0609-237-0002	Ch 22 to 2974 Vol 1 Rev 0	0609-297-4103 ¹²
OP 2386 Rev 1 (D Chg 15; Sound Signal 50)	0609-238-6000	Ch 23 to 2974 Vol 1 Rev 0	0609-297-4104 ¹²
OP 2562 Rev 0 (Mines 25, 52, 55, 56; Ballistics)	0609-256-2000	OP 2974 Vol 2 Rev 0 (Inst. Sheets for Vol 1)	0609-297-4200 ¹²
OP 2563 Rev 0 (Mines 36, 53; Ballistics)	0609-256-3000	Ch 1 to 2974 Vol 2 Rev 0	0609-297-4201 ¹²
OP 2567: Mine Firing Mechanisms		Ch 21 to 2974 Vol 2 Rev 0	0609-297-4202 ¹²
Part 1: Descriptions, Class B Tests		Ch 22 to 2974 Vol 2 Rev 0	0609-297-4203 ¹²
Vol 1 Rev 2 (Mechs A-5 thru M11)	0609-256-7118	Ch 23 to 2974 Vol 2 Rev 0	0609-297-4204 ¹²
Ch 1 to 2567 Part 1 Vol 1 Rev 2	0609-256-7119	OP 3016 Rev 1 (Test Set 406-0)	0609-301-6010 ¹³
Vol 2 Rev 2 (Mechs Mk 19 & higher)	0609-256-7211	Ch 11 to 3016 Rev 1	0609-301-6011 ¹³
Ch 1 to 2567 Part 1 Vol 2 Rev 2	0609-256-7212	OP 3017 Rev 1 (Test Set 407-0)	0609-301-7000 ¹³
Part 2: Principles of Operation		Ch 11 to 3017 Rev 1	0609-301-7001 ¹³
Vol 1 Rev 0 (Mechs A-5 thru M11)	0609-256-7130	Ch 12 to 3017 Rev 1	0609-301-7002 ¹³
Ch 1 to 2567 Part 2 Vol 1 Rev 0	0609-256-7131	OP 3040 Rev 1 (Test Set 408-0)	0609-304-0000 ¹³
Vol 2 Rev 0 (Mechs Mk 19 & higher)	0609-256-7200	Ch 11 to 3040 Rev 1	0609-304-0001 ¹³
Ch 1 to 2567 Part 2 Vol 2 Rev 0	0609-256-7221	OP 3208 Vol 1 (Mine 52-7 Assy)	Not assigned 14
OP 2572 Vol 1 Part 1 (Mine 56-0 Assy)	Not assigned 11	OP 3208 Vol 2 (Drill 52-7 Assy)	Not assigned 14
OP 2572 Vol 1 Part 2 (Inst. Sheets for Part 1)	Not assigned 11	OP 3209 Vol 1 (Mine 55-7 Assy)	Not assigned 14
OP 2572 Vol 2 Part 1 (Drill 56-0 Assy)	Not assigned 11	OP 3209 Vol 2 (Drill 55-7 Assy)	Not assigned 14
OP 2572 Vol 2 Part 2 (Inst. Sheets for Part 1)	Not assigned 11	OP 3210 Vol 1 (Mine 52-8 Assy)	Not assigned 14
OP 2597 Rev 0 (Mine 39-0; Ballistics)	0609-259-5000	OP 3210 Vol 2 (Drill 52-8 Assy)	Not assigned 14
OP 2608 Vol 1 Rev 0 (Mine 52-1 thru 6, Assy)	0609-260-8100 ¹²	OP 3211 Vol 1 (Mine 55-8 Assy)	Not assigned 14
Ch 1 to 2608 Vol 1 Rev 0	0609-260-8101 ¹²	OP 3211 Vol 2 (Drill 55-9 Assy)	Not assigned 14
Ch 21 to 2608 Vol 1 Rev 0	0609-260-8102 ¹²	OP 3232 (Air-laid Mine Preparation)	0609-323-2000 ¹⁵
Ch 22 to 2608 Vol 1 Rev 0	0609-260-8103 ¹²	Supplement A (Checklist, P2E)	0609-323-2001 ¹⁵
Ch 23 to 2608 Vol 1 Rev 0	0609-260-8104 ¹²	Supplement B Rev 1 (Checklist, P2H)	0609-323-2002 ¹⁵
OP 2608 Vol 2 Rev 0 (Inst. Sheets for Vol 1)	0609-260-8200 ¹²	Supplement C (Checklist, A3B)	Interim
Ch 1 to 2608 Vol 2 Rev 0	0609-260-8201 ¹²	Supplement D (Checklist, P58)	Not released 15
Ch 21 to 2608 Vol 2 Rev 0	0609-260-8202 ¹²	Supplement E (Checklist, B57B/C/E)	0609-323-2005 ¹⁵
Ch 22 to 2608 Vol 2 Rev 0	0609-260-8203 ¹²	Supplement F (Checklist, A4C/E)	Interim 15
Ch 23 to 2608 Vol 2 Rev 0	0609-260-8204 ¹²	Supplement G (Checklist, A1H/J)	Interim 15
OP 2637: Opn'l Characteristics, Naval Mines		Supplement H (Checklist, S2A/E)	Not released 15
Vol 1 Rev 1 (Warfare considerations)	0609-263-7100	Supplement I (Checklist, F100D)	0609-323-2009 ¹⁵
Ch 1 to 2637 Vol 1 Rev 1	0609-263-7101	Supplement J (Checklist, F105D)	0609-323-2010 ¹⁵
Vol 2 Rev 1 (Air-laid Mines)	0609-263-7200	Supplement K (Checklist, A1E)	Not released 15
Ch 1 to 2637 Vol 2	Supplied w/vol 2	Supplement L (Checklist, P3A)	Not released 15
Ch 2 to 2637 Vol 2	0609-263-7202	Supplement M (Checklist, A6A)	Not released 15
Vol 3 Rev 0 (Sub-laid Mines)	0609-263-7300	Supplement N (Checklist, F5)	Not released 15
Ch 1 to 2637 Vol 3	Supplied w/vol 3	Supplement O (Checklist, F104)	Not released 15
Vol 4 Rev 0 (Surface-laid Mines)	0609-263-7400	Supplement P (Checklist, B52H)	Not released 15
Ch 1 to 2637 Vol 4	Supplied w/vol 4	Supplement Q (Checklist, CH46A)	Not released 15
Vol 5 Rev 0 (Actuation Data)	0609-263-7500	Supplement R (Checklist, CH47A)	Not released 15
Ch 1 to 2637 Vol 5	Supplied w/vol 5	Supplement S (Checklist, F4B/C)	Not released 15
Ch 2 to 2637 Vol 5	0609-263-7502	Supplement T (Checklist, SH3A)	Not released 15
Ch 3 to 2637 Vol 5	0609-263-7503	Supplement U (Checklist, B47)	Not released 15
OP 2718 Vol 1 Part 1 (Mine 57-0, Assy)	Not assigned 14	Supplement V (Checklist, CH53)	Not released 15
OP 2718 Vol 1 Part 2 (Inst. Sheets for Part 1)	Not assigned 11	Supplement W (Checklist, A7A)	Not released 15
OP 2718 Vol 2 Part 1 (Drill 57-0, Assy)	Not assigned 11	Supplement X (Checklist, F8E)	Not released 15
OP 2718 Vol 2 Part 2 (Inst. Sheets for Part 1)	Not assigned 11	Supplement Y (Checklist, B26K)	Not released 15
OP 2769 Rev 0 (Cable Reeling Machine 2-0)	0609-276-9000	Supplement Z (Checklist, COIN)	Not released 15
OP 2771 Rev 1 (Test Set 303-0)	0609-277-1000	Mineguide No 1 (Sliderule)	0609-323-2036
OP 2773 Rev 1 (Test Set 316-0)	0609-277-3010 ¹³	Ch 1 to Mineguide No 1	0609-323-2037
Ch 11 to 2773 Rev 1	0609-277-3011 ¹³	OP 3233 Rev 0 (Instrumentation for Mine Tests)	0609-323-3000
OP 2775 Rev 0 (Test Set 330-0)	Not assigned 13	Ch 1 to 3233 Rev 0	0609-323-3001
OP 2777 Rev 1 (Test Set 335-0)	0609-277-7010	Ch 2 to 3233 Rev 0	0609-323-3002
Ch 11 to 2777 Rev 1	0609-277-7011 ¹³	Ch 3 to 3233 Rev 0	0609-323-3003
OP 2778 Rev 1 (Test Set 336-0)	0609-277-8000	Ch 41 to 3233 Rev 0	0609-323-3004
OP 2779 Rev 0 (Test Set 347-0)	Not assigned 13	Ch 42 to 3233 Rev 0	0609-323-3005
OP 2780 Rev 1 (Test Set 358-0)	0609-278-0010	Ch 43 to 3233 Rev 0	0609-323-3006
Ch 11 to 2780 Rev 1	0609-278-0011 ¹³	Ch 44 to 3233 Rev 0	0609-323-3007
OP 2792 Rev 0 (Test Set 305-1)	Not assigned 13	Ch 45 to 3233 Rev 0	0609-323-3008
OP 2815 Rev 0 (Mine 56-0; Characteristics)	Not assigned 11	Ch 46 to 3233 Rev 0	0609-323-3009

for footnotes see page 13

OP 3344 (Mine 39-0 Ballistics)	see footnote 16
OP 3379 Vol 1 Rev 0 (Maintenance Guide)	0609-337-9100
Ch 11 to 3379 Vol 1 Rev 0	0609-337-9101
Vol 2 Rev 0 (MRCs, Mines)	0609-337-9200
OP 3388 Vol 1 Rev 0 (Test Set Checkouts)	0609-338-8000 ¹⁷
OP 3409 Rev 0 (New components, Class B tests)	see footnote 18
OP 3410 Rev 0 (Characteristics, new mines)	see footnote 18
OP 3504 (Authorized Configurations, Mines)	
Vol 1 Binder	0609-350-4199 ¹⁹
Vol 1 Rev 0 Text (Cross References)	0609-350-4100 ¹⁹
Vol 2 Binder	0609-350-4299 ¹⁹
Vol 2 Rev 0 Text (Mat'l Applications)	0609-350-4200 ¹⁹
Vol 3 Binder	0609-350-4399 ¹⁹
Vol 3 Rev 0 Text (Assy Level Items)	0609-350-4300 ¹⁹
Vol 4 Binder	0609-350-4499 ¹⁹
Vol 4 Rev 0 Text (Bills of Material)	0609-350-4400 ¹⁹
Vol 5 Binder	0609-350-4599 ¹⁹
Vol 5 Rev 0 Text (Test Equip, Tools)	0609-350-4500 ¹⁹
Vol 6 Binder	0609-350-4699 ¹⁹
Vol 6 Rev 0 Text (Reference Documents)	0609-350-4600 ¹⁹

FORMS

NAVWEPS Form 8500/5 (Rudminde)	0140-850-0050
NAVORD Form 2008 (6/0 Acoust Syst Rec)	0105-301-5100
OPNAV Form 3370 1 (FSMT Mine Sheet 1)	0107-600-9101
OPNAV Form 3370-2 (FSMT Mine Sheet 2)	0107-600-9510
OPNAV Form 3370-3 (FSMT Mine Sheet 3)	0107-600-9520
OPNAV Form 3370-4 (FSMT Mine Sheet 4)	0107-600-9530
OPNAV Form 3370-5 (FSMT Mine Sheet 5)	0107-600-9540

for footnotes see page 13

Ordalts and Navord ODs

NAVORD ODs and Ordalts are stocked at the Central Technical Documents Office, Louisville, Kentucky 40214. They do not have stock numbers, and must be ordered by a written request (letter or card). ODs fall into two categories: those designated by asterisks (*) are manufacturing design documents which should not be requisitioned by field activities other than depots. Those without asterisks are used primarily by field activities.

The many general-requisite-type ODs for underwater mines formerly included in this list have been dropped since they are being superseded early in 1967 by OP 3504 as explained on page 1, Troubleshooter 3-66.

Ordalts, too, fall into two categories. Those designated by asterisks (*) require performance by major depots and should not be requisitioned by field activities; those without asterisks are for performance by depot and field. Stocks of asterisked ODs and Ordalts are purposely small; they would be quickly and needlessly exhausted if field activities fail to comply with the instructions above.

ORDALTS

NO.	SUBJECT	AFFECTED WEPS (MK-MOD)
1505	Booster Extender 6-1; Retainer	D Chg 6
1893	Booster Extender 6-1; Safety Fork	D Chg 6
2292*	Arbors 6-0 & 7-0, 1 to 7-4	D Chg 6/8/9
2839	Clock Starter 1-1, 2 to 1-10, 11	39
2886*	Case 6-3 to 6-5	6-0 thru 11
2903*	Control Box 13-0 to 13-1	25-2/49-2
2972	Alter Case 10-3, 6, 7	10-9
2981	Alter Test Chamber 1-0 & 1	Obsolete
3065	Anchor 10-3 Starting Lever Plate	10-3
3107	Anchors 6-0, 3, 6, 7 to 6-5, 8, 10, 14	6s
3109*	Anchor 16-0 to 16-1	6s
3147	Alter Circuit Breaker 1-0	25-0/49-0
3152	Anchor 10-1, 3, 5; Securing Jaws	10-3, 9
3244	Alter Exercise Head	27s

OPNAV Form 3370-6 (FSMT Mine Sheet 6)	0107-600-9550
OPNAV Form 3370-7 (FSMT Mine Sheet 7)	0107-600-9560
5ND-NMEF Form 2603/16 (Fire Recorder Readout)	Order from NMEF (ESI)
5ND-NMEF Form 2603/33 (Battery History Card)	Order from NMEF (ESI)

TROUBLESHOOTERS

Troubleshooter is a quarterly technical periodical on mines, published by NMEF and stocked in Cog-I at NSD/Philadelphia. Issues earlier than 1-63 are superseded and therefore obsolete, but still available (while they last) to interested activities.

Troubleshooter 1-63	0618-266-1630
Troubleshooter 2-63	0618-267-2630
Troubleshooter 3-63	0618-267-3630
Troubleshooter 4-63	0618-267-4630
Troubleshooter 1-64	0618-268-1640
Troubleshooter 2-64	0618-268-2640
Troubleshooter 3-64	0618-268-3640
Troubleshooter 4-64	0618-268-4640
Troubleshooter 1-65	0618-269-1650
Troubleshooter 2-65	0618-269-2650
Troubleshooter 3-65	0618-269-3650
Troubleshooter 4-65	0618-269-4650
Troubleshooter 1-66	0618-270-1660
Troubleshooter 2-66	0618-270-2660
Troubleshooter 3-66	0618-270-3660
Troubleshooter 4-66	0618-270-4660

NO.	SUBJECT	AFFECTED WEPS (MK-MOD)
3462	Case 10-3; Guide Latch, etc.	10-3
3564*	Anchor 10-3; Guide Plate, etc.	10-3
3655(Ch 1)*	Fusible Link Flood Valves	27-2, 3
3656(Ch 1)*	Fusible Link Flood Valves	27-2, 3
3727(Ch 1)*	Alter Battery Section; Veh 1-0	27-4, 5
3794*	Alter Gyro Mk 36	27-2, 3
3808*	Alter Case 10-3, 6, 7, 8, 9, 10	10-3, 9
3837	Alter Exercise Heads Mk 61/66	27s
3860*	Alter Test Stand Mk 3	27s
3861*	Alter Test Stand Mk 4	27s
3862*	Alter Test Stand Mk 5	27s
3863*	Alter Test Stand Mk 7	27s
3864*	Counter Mk 1 Alteration	27s
3865	Alter Anchor 10-5	10-9
4079	Alter Power Panel (LD290974)	27-2, 3
4089*	Releasing Pistol 2-0 to 2-1	6-0 (Drill)
4127*	Alter Cable, Test Stands Mk 3/4	27s
4205*	Alter Cable Assembly CA 956	10-3 (Drill)
4207*	Relocate Safety Officer Switch	Mine System 1-0
4211*	Alter Thermal Relay 24-0	27s
4216*	Alter Test Set Mk 177 Mod 0	25-0, 1/36-2/39-0 49-0, 1/50-0
4377-A*	Control Unit 66-0 to 66-1	All air-laid
4441A(Ch1)	Firing Mech A5-2 to A5-3	25-1/36-2/49-1
4442-A	Firing Mech 19-0 to 19-1	50-0
4447-D*	Test Set 194-0 to 194-1	50-0
5460	Accessory Set 17-0 to 17-1	52s/55s
5881	Test Set 195-0 to 195-1	50-0
10016A(Ch2)	Test Set 127-3 to 127-4	All mines ¹
10029	Accessory Set 1-0 to 1-1	52s/55s/56-0
10088*	Extender 12-3 to 12-12	6-15
10089*	Clock Starter 1-3 to 1-13	6-15
10102(Ch 1)	Test Set 305-0 to 305-1	52s/55s
10108 (Ch1)	Control Unit 66-1 to 66-2	All air-laid
10117 ²	Test Set 246-0 to 246-1	All air-laid

* Before requisitioning copies, see explanation above. Small s after mark number means all active mods.

¹ - Also used by Depots for Depth Charges Mk 14 & 16.

² - Scheduled for release in April 1967.

NAVORD ODs

OD 6678 Rev 6 Ch 1 (Opn'l Assy Charts, Mines)
 OD 7334 Rev 1 Ch 0 (Mine 41-0, 1, 2 General Requisites)
 OD 7550 Rev 0 Ch 0 (Packing Mine Parachutes).
 OD 7573 Rev 0 Ch 0 (Fire Mech M-11 JAN-395A Tubes).
 OD 9363 Rev 0 Ch 0 (Nomenclature Manual, Mines, D Chgs)
 OD 9364 Rev 0 Ch 0 (Nomenclature Manual, Test Sets, Cables)
 OD 9367 Rev 2 Ch 0 (Detector, Magnetic Pole, Mk 10 Mod 0).
 OD 9677 Rev 1 Ch 1 (Matching Transformers, Fire Mech 20-0)*
 OD 9678 Rev 1 Ch 0 (Conditioning, Testing of Sensitive Relays).
 OD 9679 Rev 0 Ch 2 (Selection of Vacuum Tubes Fire Mech 21-0).
 OD 9682 Rev 1 Ch 0 (Mine System 2-0 General Requisites).
 OD 10501 Rev 0 Ch 12 (Control Box 39-1 Test, Assy).
 OD 10573 Rev 0 Ch 1 (Gyro 30-1 Maintenance)*
 OD 10574 Rev 0 Ch 2 (Gyro 36-0 Maintenance)*
 OD 10575 Rev 0 Ch 1 (Gyro 30-0 Modification)*
 OD 10577 Rev 0 Ch 2 (Mine 27-2, 3, 4, 5 Ballasting)

OD 10769 Rev 0 Ch 0 (Torpedo Test Stand 7-0 & Power Panels)
 OD 10770 Rev 0 Ch 0 (Torpedo Test Stand 4-0)
 OD 10771 Rev 0 Ch 0 (Torpedo Test Stand 3-0)
 OD 10772 Rev 0 Ch 0 (Torpedo Test Amplifier, TS-824/U)
 OD 12053 Rev 0 Ch 0 (CD 14-4 Assy)*
 OD 12054 Rev 0 Ch 0 (SE 3-3 Assy)*
 OD 12067: Index, Ammunition Stocks
 Vol D - Rev 2 Ch 3 (D Chgs and Accessories)
 Vol G - Rev 2 Ch 3 (Mines and Material)
 OD 12836 Rev 0 Ch 0 (Drill 57, Leak Test)
 OD 12838 Rev 1 Ch 0 (Fire Mech 26-0 Assy)*
 OD 15510 Rev 0 Ch 5 (Fire Mech 26-0 Tests)*
 OD 16086 Rev 0 Ch 0 (Underwater Weapon Tactical Data)
 OD 17160 Rev 0 Ch 0 (D Chgs, General Requisites)
 OD 23789 Rev 0 Ch 0 (Drop Shock Tester)*
 OD 37092 Rev 0 Ch 0 (XPL-Driver Test Set 314-0)*

Troubleshooter Bulletins

All T-Shooter Bulletins are listed here including those that have been cancelled so you can discard bulletins no longer in effect and explain missing numbers in your files. T-Shooter Bulletins are stocked by The Naval Mine Engineering Facility (ESI), Yorktown, Virginia 23491. All bulletins are automatically cancelled three years from date of release.

NO.	SUBJECT	AFFECTED WEPS (MK-MOD)	
001	Test Set 195-0, Resistor Added †	50-0	27-2, 4
002	Battery BA-1383/U Defect	52s/55s/56-0/57-0	Mk 10 thru 49
003	Parapak 12-2 Preferred †	25-0/36-1, 2, 3	50-0
004	E-Rings	Drill 25-0, 1, 2, 3	All magnetic mines
005	A-6/A-8 Tests †	25-2/27-3, 4/36-3/49-2	Air-laid
006	Mines Mk 52 Correction †	52s	52/55-2, 3, 4, 5, 6
007	Test Sets 61-2/97-2 Cable †	25-1/36-2/49-1	25-1/30-2/49-1
008	Battery BA-250/U Test	D Chg 14-0	All mines
009	Explosive Initiator Tests †	All mines	52/55-3, 4, 6
010	Extender Mk 14 Test †	Mk 6 thru 49, except Mk 6-14	52s
011	Battery Load Voltage Relaxed †	All mines	All mines
012	Test Set Mk 217-1	52s/55s	All mines
013	Impulse Charge Weights †	D Chg 9-2, 3, 4 D Chg 14-0	All air-laid mines
014	CD-10, CD-12 Switch Tests	36-1	All air-laid mines
015	Sensitivity SW Mk 3 Installation †	25-1/36-2	All sub-laid mines
016	Sensitivity SW Mk 3 Installation †	49-1	50-0
017	Firing Mech K-4 Test	6-0, 4, 7, 8, 10, 11	25-2/27-3, 5/36-3/49-2
018	Detonator Installation	36-1, 3	All mines
019	Bleeder Installation	36-1	52s/55s
020	Firing Mech 21-0 Ground Check	52s/55s	52/55-2, 3, 4, 5, 6
021	Firing Mech M9-1 Spacer	36-1	50-0/52s/55s
022	Jumper Plug Function †	49-0	27s
023	Detonator Circuit Test †	49-0	25-0, 1/39-0/49-0/50-0
024	SE-3 Washer †	25-0, 1/36-2/39-0/ 49-0/50-0	25-0, 1/39-0/49-0/50-0
025	Detonator Test †	39-0	25-0
026	Clock Delay CD-18 Test	52s/55s	25-1/36-2
027	Fusing Firing Mech M 5-1	10-3, 9	All mines
028	Mine Assembly Change †	39-0	52/55-3, 4, 6
029	Clock Delay Test	6-14, 15 thru 50	57-0
030	Clock Delay Storage	6-14, Mk 10 thru 49	57-0
031	CD 12, CD 17 Switch Test	Mk 25 thru 49	52s/55s/56-0/57-0
032	Gaging Extender Mk 14-0, 1, 2 †	Mk 10 thru 49	25s/27-3, 5/36-1, 2/ 39-0/49s/50-0
033	SE-3 Mounting Screws †	39-0	25s
034	CA-585, CA-631 Attachment †	39-0	50-0/52s/55s
035	Circuit Break Test †	39-0	56-0/57-0
036	HS-4 Test †		25-1/36-2/49-1
037	SD-4 Coding †		49s
038	Hydrostatic SW 22-1 †		Sub-laid mines
039	Magnetic Firing Mech Tests †		52s/55s
040	Carriers for Crated Mines †		55s/56-0
041	Control Box 39-1 Instructions †		27s
042	Test Set 61-2, 97-2 Adapter †		Parapak 33-0 Orientation
043	Air Dryer Reactivation		52s
044	CA-54 obsolete (Set Mk 127) †		6s thru 49s
045	Case Mk 52, Defect		All acoustic mines
046	Test Set Calibration		All mines
047	Receiver Mk 16 Operation †		All mines
048	Mineguide Correction †		All mines
049	Correction to 040 †		All mines
050	WEPFILM 21-64 †		All mines
051	Release Mech 30-0 to 31-0		All mines
052	Relay Mk 25 & SR-7 Installation		All mines
053	CA-967 obsolete (Set Mk 127) †		All mines
054	Test Set 250-0 Checkout †		All mines
055	Control Box 39-1 Test †		All mines
056	Arming Device Mk 5 Test †		All mines
057	Joint Screws †		All mines
058	Relay SR-7-2 Test †		All mines
059	SE 3-3 Limits †		All mines
060	CA-530 Fit On SD-4-1 †		All mines
061	Test Set 97-2 Calibration †		All mines
062	Test Set 384-0 Issue †		All mines
063	Test Set 265-0 Adaptor		All mines
064	Detector Mk 10 Test		All mines
065	O-Rings, Mine Mk 57-0		All mines
066	CD 21-0 Interim Test		All mines
067	CD 22-0 Interim Test		All mines
068	HS 110-0 Interim Test		All mines
069	HS 22, Arming Device Mk 5 Test †		All mines
070	Firing Mech 26-0 Test †		All mines
071	Cables obsolete, Test Set 61-2 †		All mines
072	Explosive Fitting 2-1 Use †		All mines
073	WEPFILM 21-64 Distribution †		All mines
074	Test Set 263 Meters		All mines
075	Bomb-Rack Spacer: Supply		All mines
076	Thermal Relay 24-0 Fuse Wire		All mines
077	Parapak 33-0 Orientation		All mines
078	CS and Extender Flange Holes		All mines
079	Acoustic Firing Mech Tests		All mines
080	Cal Lab Insulation Resistance Tests		All mines
081	Fire-Mech Container Markings		All mines

* Before requisitioning copies, see explanation page 15. † Cancelled vs current publications. Small s after mark number means all active mods.

	Accessory Set 17-0 Hazard	52/55-3, 4, 6, 7	090	XPL Fitting 20-0 Retaining Ring	Drill 25s/36s/52s/55s
083	Test Set 127-4 Stock Number †	All mines	091	Booster Mk 18-1, Renovation	52s/55s
084	Air Dryer 10-1 to Code H	All except 18, 53	092	Class B Test Policy	All mines
085	Fire Mechs: B Tests	All mines	093	Junction Box Mk 35-0, Repair	52s/55s
086	Sens Relays: Nomenclature, Tests †	18-0/25-2/27s/36-3/49-2	094	Float Mk 17, Cap Fastenings	Air-laid mines
087	BA-1359 Approval	56-0/57-0	095	Mine Case Openings, Preservation	All mines
088	Ship Counter Mk 10: B Tests †	52s/55s/56-0/57-0	096	Safety Locks, Use	10-9/25s/36s/39-0
089	Bibliography 5 Corrections †	All mines	097	OP 2718 Vol 1 Rev 1 Correction	57-0

† Cancelled vs current publications.

Overhaul Specifications (OVSS)

Overhaul Specifications (OVSS) are published by NMEF. They are published only as needs arise but are thereafter maintained current. Prepared as guides for use in performance of depot-level rework and repair, OVSS are not distributed to intermediate or organizational-level maintenance activities (definitions per OP 3379), nor is there any requirement for mining missions at those levels to hold copies. Such activities should not, therefore, request copies, since stocks are purposely too small to support such requests. Depot-level activities can obtain copies direct from NMEF (ESI).

All OVSS so far published are listed below . . . including those (identified by asterisk [*]) which have been cancelled or superseded . . . so depots can confirm whether their OVS catalogs are up-to-date and complete.

OVS NUMBER	COMPONENT	AFFECTED MINE (MK-MOD)			
001	Mine Mk 53 Mod 0	53-0	036	Delay CD 8-0	6-14, 15/25s/27-3, 5/36-2, 3/49s
002	Relay TD 16-0	10s	037 B	Delay CD 14-4	25s/27-3, 5/36-1, 2/39-0/49s/50-0
003	Test Set Mk 61 Mod 2	25-1/36-2/49-1	038 A	Starter CS 1-4	10-9/25s/36s/18-0
	Relay Mk 24-0	27-3, 5	039	Extender Mk 16-0	50-0
	Firing Mech K4-1	see OVS 029	040 A	Starter CS 1-9	10-3/27s/49s
006	Firing Mech M-9-0	27-2, 4/36-1	041 A	Extender Mk 12-10	6-14
007*	Firing Mech K4-1	see OVS 029	042 †	Relay SR 7-2	25-2/27-3, 5/36-3/49-2
008	Firing Mech 16-0, 1	51-0	043 A	D-Charge Pistol Mk 12-0	D-Charge 14
009*	Delay CD 14-6	see OVS 030	044	Firing Mech Mk 20-0, 1	52/55-2, 3, 5, 6
010	Delay CD 12-1	see OVS 035	045(Ch 1)	Extender Mk 14-1	6-0, 4, 7, 8, 10, 11/18-0/25s/36s/39-0
011*	Delay CD 10-1	see OVS 048	046 A	D-Charge Pistol 6-0, 1	D-Charge 6-0, 1/8-3, 4/9-2, 3
012*	Hydro Switch Mk 22-1	see OVS 052	047	Delay Mk 12-0	25s/27s/36s/49s
013 A	Relay SR 7-2/Mk 25-0	25-2/27-3, 5/36-3/49-2	048	Delay Mk 10-1	27-2, 4/36-1
014*	Delay CD 12-0	see OVS 047	049	Delay Mk 4-0	18-0
015*	Relay SR 7-2	see OVS 042	050	Firing Mech Mk 22-1	52/55-3, 4, 6
016 A	Relay SR 7-1	27-2, 4	051(Ch 1)	Relay SR 6-1	36-1
017*	D-Charge Pistol Mk 6-2	see OVS 031	052	Hydro Switch Mk 22-1	50-0
018*	Relay SR 6-1	see OVS 051	053	Delay CD 9-1	10s
019*	Delay CD 18-0	see OVS 034	054	Delay CD 17-0	39-0
020	Relay SR 9-0	25-2 (A-6 Fire Mech)	055	Firing Mech Mk 21-0	52/55-1, 4, 5, 6
021*	Delay CD 9-1	see OVS 053	056A	Booster Extender Mk 6-0, 1, 2	D-Charge 6s/8s/9s/16-0
022*	Firing Mech Mk 20-0, 1	see OVS 044	057B(Ch 1)	Parapak Mk 24-0	55-1, 2, 3, 4, 5, 6
023	Firing Mech M-9-2	18-0	058B(Ch 1)	Parapak Mk 26-0	25s
024 A	Ship Counter 10-0	52/55-1, 2, 3, 4, 5, 6/56-0	059A(Ch 1)	Parapak Mk 20-0	52-1, 2, 3, 4, 5, 6
025*	D-Charge Pistol Mk 12-0	see OVS 043	060	Control Box Mk 15-0	27-3, 5/36-3
026	D-Charge Pistol Mk 15-1	12"75 Rocket	061	Transmitter Mk 62-0	All FSMT
027 B	Firing Mech A-4-0	D-Charge 14-0	062	Firing Mech A-6-3/A-8-1	25-2/49-2/27-3, 5/36-3
028*	Booster Extender 6-0, 1, 2	see OVS 056	063	Firing Mech M5-2	10s
029	Firing Mech K 4-1	6-4, 7, 8, 10, 11	064	Extender Mk 14-0, 2	6-0, 4, 7, 8, 10, 11/10s/25s/27s/36s/39-0/49s
030 A	Delay CD 14-6	25s/27-3, 5/36-1, 2	065	Sterilizer Mk 10-0	52s/55s/56-0/57-0
031 A	D-Charge Pistol 6-2	D-Charge 6-2/8-5/9-4	066	Delay CD 19-0	56-0/57-0
032*	Booster Extender 6-0, 1, 2	see OVS 056	067	Junction Box Mk 35-0	52/55-1, 2, 3, 4, 5, 6
033	Firing Mech M 11-4, 5	25-0/39-0/49s/50-0	068	Circuit Break Mk 1-0	25-0/49-0
034(Ch 1)	Delay CD 18-0	52s/55s/56-0/57-0/39-0/49-0	069	Mine Case Mk 10-6 (XPL)	10-9
035	Delay CD 12-1	39-0	070	Accessory Set Mk 10-0 (w/Set 263)	52s/55s
			071	Float Mk 15-1	All Drill
			072	Case Mk 39-0 (XPL)	39-0
			073	Case Mk 50-0	50-0
			074(Ch 1)	Firing Mech A-5-2, 3	25-1/36-2/49-1
			075	Sensitivity Switch Mk 5-1	25-0/39-0/49-0
			076	Case Mk 6-0 (XPL)	6-4, 7, 8, 14, 15
			077(Ch 1)	Hydrophone MI-4-0	25-1/36-2/49-1
			078	Ship Counter Mk 10-0, 1	52/55-1, 2, 3, 4, 5, 6
			079	Hydrophone MI-7-0	56-0/57-0
			080	Case 9-4 (XPL)	D-Charge 9s/14-0
			081	D-Charge Booster 6-1, 2, 4(XPL)	D-Charge 6s/8s/9s/16-0
			082(Ch 1)	Firing Mech Mk 19-1	50-0
			083	Depth Compensator Mk 3-0	52/55-1, 3, 4, 5, 6

where * 'Affected Mine' column refers to another OVS instead of listing a weapon, the OVS has been superseded by the OVS to which the 'Affected Mine' column refers. Affected weapon(s) will be the same. Small s after mark number means all active mods cancelled.



ARE YOU HAPPY ABOUT PUBS DISTRIBUTION?

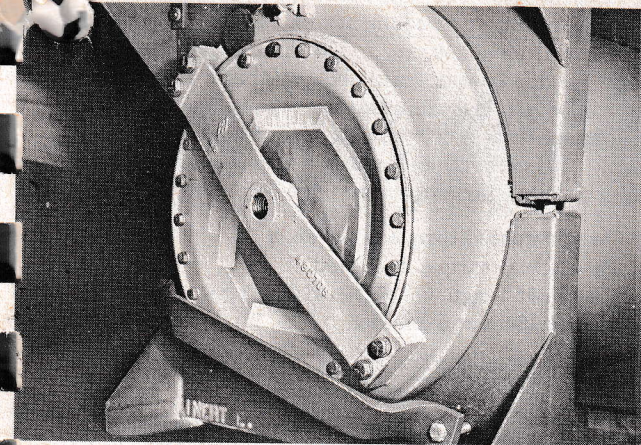
If not it may be your own fault. Regardless of stock point, the initial distributions of all mine publications except those controlled by the Mine Warfare Division, NOSC (e.g., OPs 2637, 3409, 3410, and manuals on mines and equipment not yet accepted by CNO for service use) are performed by automated machinery at NSD/Philadelphia, and a special post office whose sole activity is the distribution of Navy pubs.

The machinery is operated by master control tapes which contain, among others, eight distribution formulae tailored to mining interests. These formulae and the distributions effected by them are monitored and controlled by NMEF.

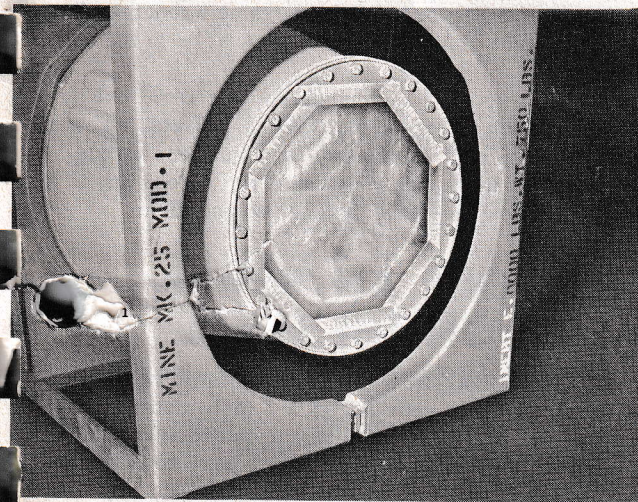
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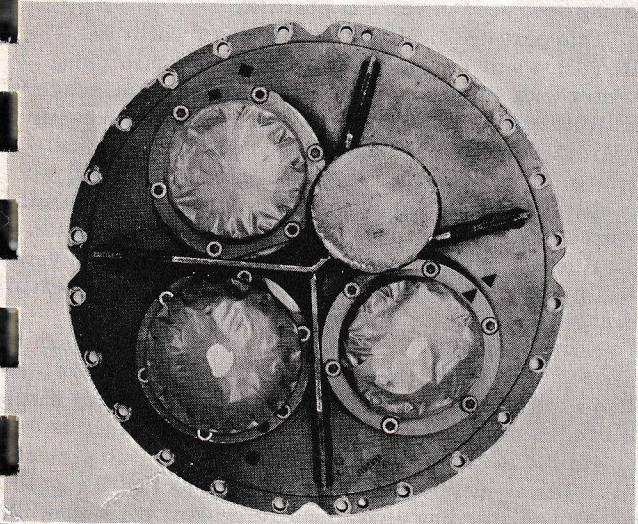
<u>DIST LIST NO.</u>	<u>DESCRIPTION</u>
WO58160000	Periodical: The Troubleshooter. Also occasional Bulletins of especially wide interest.
WO58160100	Weapon assembly manuals, changes, check lists, etc., pertinent to submarine-laid mines.
WO58160200	Weapon assembly manuals, changes, check lists, etc., pertinent to air-laid mines.
WO58160300	Weapon assembly manuals and changes pertinent to surface-laid mines.
WO58160400	Bulletins, field-performance ordalts, manuals pertinent to all mines (e.g., OPs 1452, 2567, 1860), etc.
WO58160500	Manuals, bulletins, changes, etc. pertinent to depth-charges.
WO58160600	Releases pertinent to aircraft squadrons and activities which have mining, but not mine assembly, missions.
WO58160700	Releases pertinent to submarine squadrons and activities which have mining, but not mine assembly, missions.
TS2D160800	Releases pertinent to laboratory calibration of test sets: restricted to rework activities and labs participating in the mine test-set calibration program.



Barrier material should be applied to tailplate of Mine Mk 49-1 to protect Hydrophone MI-4, by using a 9½-inch square patch with corners cut off 2¾ inches from points.



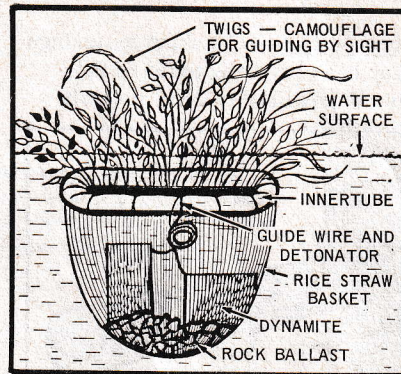
Install moisture barriers over hydrophone in Mine Mk 25-1 using 13-inch square patch with corners trimmed 3¾ inches from points.



Apply barrier material to 52/55 tail covers, cut material to size of components and seal all around with tape. Barrier material MIL-B-131, 8135-282-0565, comes 3 ft wide in 200-yd roll.

VIET CONG FLOATING MINE

Fill for the construction of a top-priority airstrip was needed at a site on the Bassac River, in an area of Vietnam that was not secure from the enemy. The job was assigned to the Dredging Subdivision (yet) of the Vietnam Directorate of Navigation. The Viet Cong had



improved a new type of floating mine which was guided downstream by a tag wire and was detonated electrically when it reached its target. This mine was hampering transportation and patrols on the river and was a serious menace to the dredge assigned

to the project. To obviate the danger, Sol Brown (Maritime Adviser and Chief of Ports and Waterways Section of USAID Public Works Division) obtained from the Navy some old 8-in-mesh mine nets, which were hung completely around the dredge on 11-ft outriggers set in sleeves welded to the hull of the dredge. Thus the mine net, draped like a hula skirt, became part of the operating dredge, and provided constant protection for it. The dredge operated continuously in three shifts a day for 14 months to complete this project. Although many other craft were damaged and sunk by mines, the dredge KIEN GIANG operated in safety. This is believed to be a unique use of mine nets to protect a hydraulic suction dredge operating under combat conditions. (Reported in *The Military Engineer* by Sol H. Brown.)



"Not missing, but stationed at Indian Island Annex, NAD Bangor, Bremerton, Washington," writes LT. B.J. Smith, who sends this photo of his unit to let fellow minemen know where they are. Left to right are:

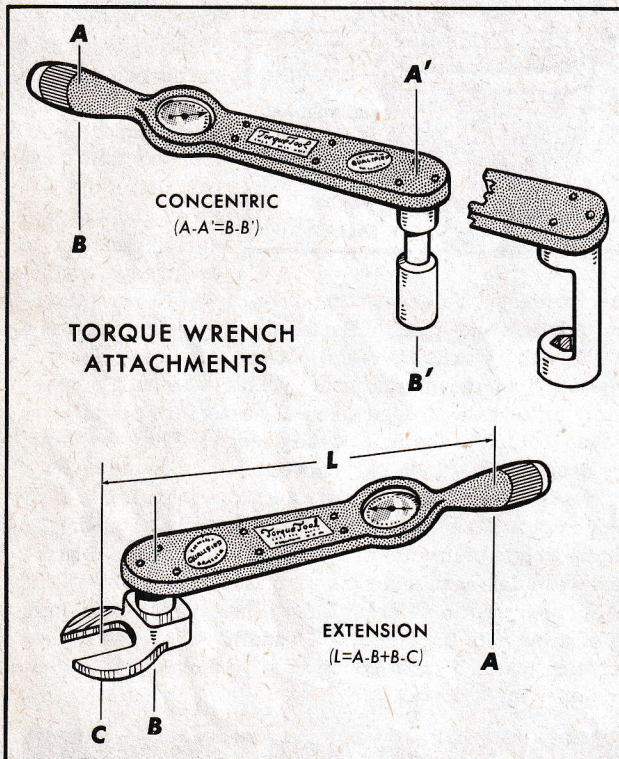
MNC J. Alonzo, LT. B.J. Smith, Mine Division Officer, MN3 E.A. Boening, TMCS C.M. Edwards, Leading Chief, MN2 R.A. Shaw, MN2 N.R. Fantasia, MN2 G. Mason, and MN2 F.D. Bartram. Absent when the picture was taken is TMCS J.H. Keen.

TORQUE

(continued from page 1)

325 pound-inches of torque has been specified for an application, and run-down resistance due to thread damage is found to be 25 pound-inches, the nut should be torqued to 325 pound-inches plus 25 pound-inches, or 350 pound-inches.

► **How To Check Pre-Torqued Nuts** – Checking fastenings to determine whether they have been tightened to the specified torque value is not possible to do accurately



because a fastening that has been tightened to a specified torque will require approximately ten percent more torque (more than was originally applied) to overcome friction and start the fastening turning. When there is doubt as to whether a fastening has been tightened to the correct torque, then, the fastening should be backed off from a half to a full turn and then retightened to the correct torque value. A torque wrench should not be used for the back-off operation

► **Use of Attachments** – Many torque-wrench applications will require the use of attachments such as adapters and extensions to reach fastenings in places of limited accessibility, or to allow positioning the torque wrench so that the dial can be easily read.

► **Concentric Attachments** – The use of an attachment which operates concentrically with the drive square of the torque wrench presents no particular problem since the effective length of the wrench is neither extended nor shortened. The torque applied to the fastening in such cases will therefore be the torque indicated on the torque-wrench dial.

► **Non-concentric Attachments** – On some torque applications it will be necessary to use a torque-wrench attachment that does not operate concentrically with the wrench drive square. In such cases, such as when using an elongated crows foot, the attachment adds to the lever length. To determine a correct torque reading in such cases use this formula:

T_w – Indicated torque on wrench
T_a – Actual torque specified
L – Lever length
A – Attachment extension

$$\text{Then } T_w = \frac{T_a \times L}{L + A}$$

In using the formula the lever length "L" is a critical factor. On a flexible-beam-type wrench with a pivoted grip, this dimension is fixed and the pivot point of the grip determines the point of force application, and thus the length of the lever. On rigid-frame wrenches, however, the point of force application must be in the center of the grip.

There are other attachments not in general use by minemen, such as torque multipliers, offsets, and angle extensions, as well as pre-set and adjustable torque wrenches. If by chance you should run across any of these learn how they work before you use them.

KEEP YOUR AN/PSM-4 METER ON THE LEVEL

YOU CAN LENGTHEN the life and minimize out-of-service time of your AN/PSM-4 multimeter by using it properly. Calibration laboratories are receiving a number of these multimeters that require repair to meter movements before they can be properly calibrated. In most cases the meter has failed to zero properly because of worn pivots and bearings attributable to the meters having been used in vertical position.

This perhaps should not be a problem but it is. The AN/PSM-4's meter incorporates an exceptionally long pointer with inadequate counterbalance (a common fault of all large-scale low-cost meter movements) and after a period of use this results in rapid wear and eventual failure, meantime requiring frequent bearing readjustment. The problem is considerably lessened if the meter is used in a horizontal position. Also, since the meter is calibrated in the horizontal position, using it in a vertical position can induce considerable measurement error on some of the meter's scales.

Now all Navy calibration laboratories have been advised to apply a "Limited Use" decal to these meters. Also a tag will be attached indicating that the meter should be used in the horizontal position if rated accuracy is to be attained. This applies to AN/PSM-4s through series "D". Newer meters are expected to have a more rugged mechanism, pending a complete re-design, but meanwhile custodians of those which do not have the lab decal should attach a typed tag or label reading "Use meter in a horizontal position whenever possible."

Do You do this Job Right?

BATTERY HOOK-UP SOP

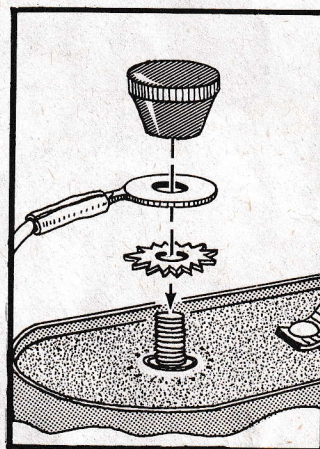
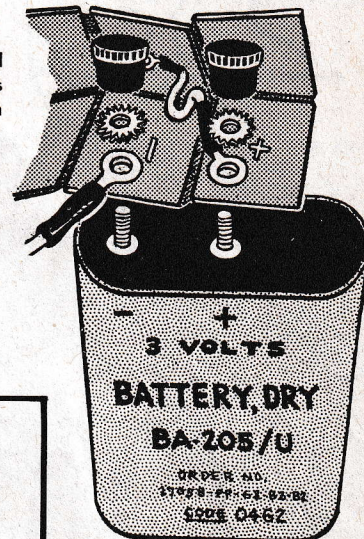
SOME QUESTIONS, unlike old soldiers, not only don't die . . . they don't even fade away. Witness Rudminde from Chief J. D. Hallstrom (NAVMAG Sanfran 96650) and MN2 Don Allgor at MCAS Sanfran 96664, both pointing out that an answer we gave back in T-Shooter 4-64 was fine as far as it went, but that it didn't go far enough (ignored card-type connectors), showed internal-tooth lockwashers (external-tooth so-called "starwashers" are now standard), and was not consistent with the mine-assembly OPs (namely 1684 Vol 1 Rev 2, 1892 Vol 1 Rev 2, 1798 Vol 1 Rev 3, and 956 Vol 1 Rev 4).

So what's the rub? "Our production-quality inspector," writes Hallstrom, "says we do it by the book," concluding rightly that it's up to NMEF to write the books.

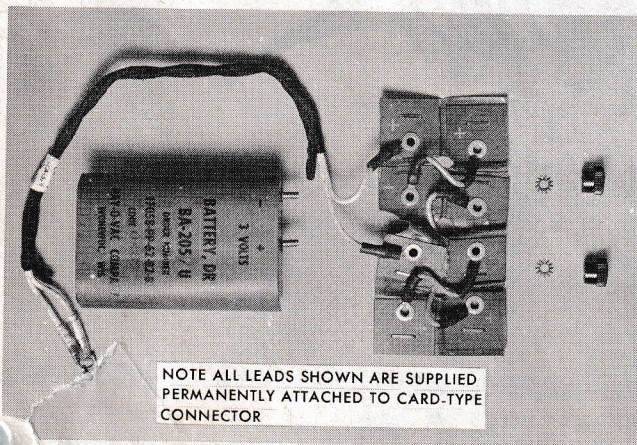
Therefore, then, we have an SOP which to the best of our knowledge will fit all cases: the card-type connectors such as are found on Cables CA-535, 546, and 579, as well as the garden-variety lug-type found on the others. The washers we show are starwashers (external-tooth lockwashers) such as are now supplied on virtually all screw type battery terminals, but the order of installation should not change if somewhere internal-tooth washers should happen to be supplied in their place.

Note that in each instance only the one lockwasher supplied on the battery terminal is required,

At right is section of a typical card-type connector. Card goes on battery terminals first, then lockwasher, then nut.



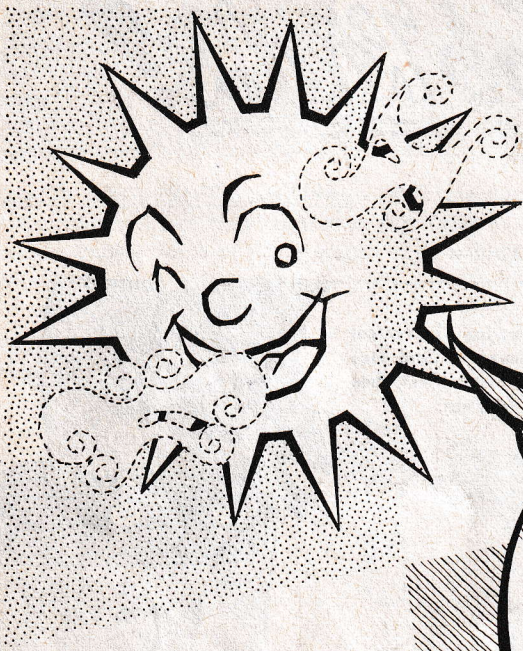
The lockwasher goes on first, followed by lug, then nut, when connection is typical cable lug to terminal post.



and all that's important is that it be installed where it can best prevent the battery terminal nut from vibrating loose. Thus where the cable has lugs the lockwasher should always go under the lug. Where the cable terminates in a card the lockwasher should always go on top of the card.

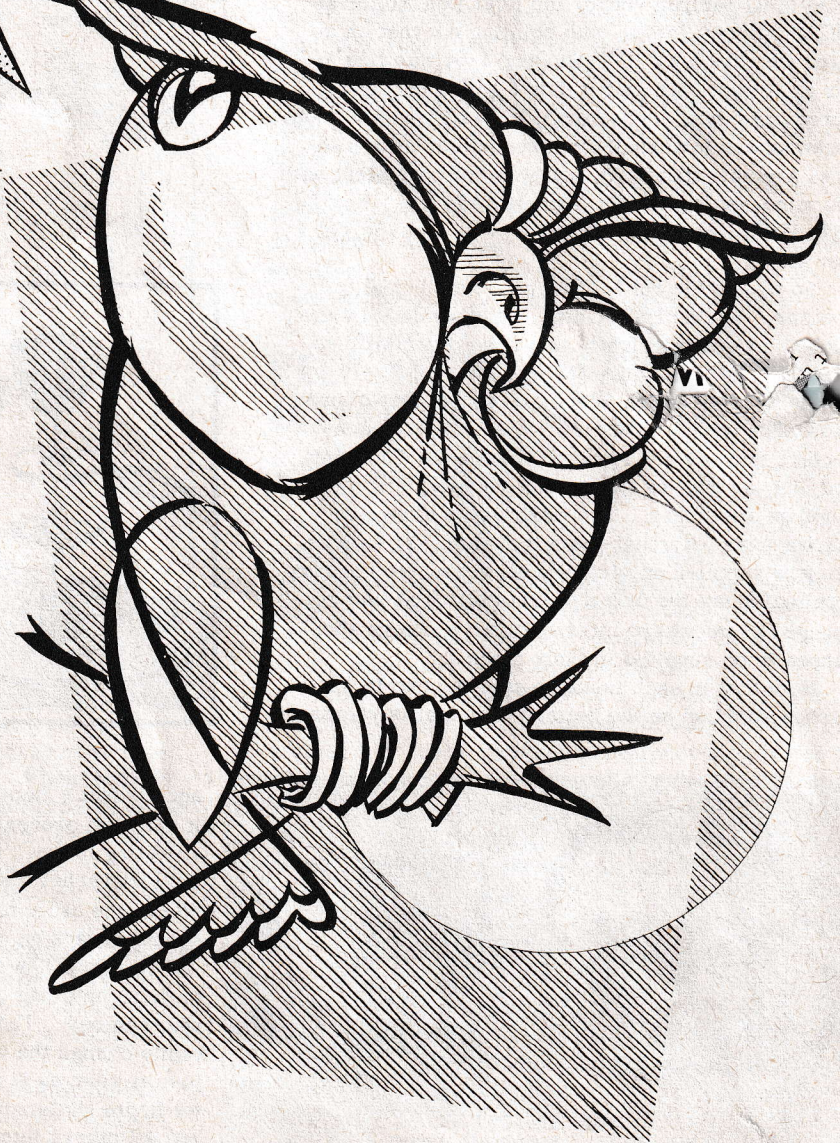
To this SOP we can find no exception applicable to the connecting of cables to batteries in underwater mines. That being the case we will most certainly change the various assembly OPs to agree just as soon as it is practical to do so. Meanwhile we invite Hallstrom's production-quality inspector and all others interested in quality (e.g., maximum reliability) to adopt the installations as we show them here.

The Editor



YOU'RE NOT
SO SMART ...

TO WORK
IN
THE
DARK



use

RUDMINDE!