

*mine and depth - charge*

# THE TROUBLESHOOTER

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**THE OFFICIAL JOURNAL OF THE RUDMINDE PROGRAM**



*in this issue . . .*

*mine and depth charge*

# THE TROUBLESHOOTER

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COVER PHOTO: R. F. Smith MN3 and S. A. Silker MNSN check out clock starters and extenders before assembly of Mk 25 and 36 mines for a fleet test. Efficient setup is typical of NAF NAHA's testing facilities.

Rudminde is a world-wide troubleshooting campaign designed to achieve and maintain a high level of undersea warfare readiness through the discovery and correction of material defects, through refinement of weapon design, and through encouragement of the unique knowledge and skills demanded of highly specialized segments of the U.S. Navy and Coast Guard. The basic instrument of the program is Navord Form 2776—"Report of Unsatisfactory or Defective Mines, Depth-Charges, or Associated Equipment." Anyone who encounters problems with these weapons is encouraged to report them to the Naval Mine Engineering Facility using this Form, as prescribed in NAVORD INST 8500.7.

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# SOUNDINGS

## The Changing Scene In Undersea Warfare

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**MAYBE GOOD FOR MINES?** Exploration of methods for joining dissimilar metals by General Dynamics/Astronautics as an aid to space-age engineers may very well affect the design of improved, lightweight, compact components for air-laid mines.

In tests of explosive bonding stainless steel has been effectively joined to aluminum, aluminum to titanium, also aluminum to itself.

The explosive method involves setting a gap between the surfaces to be joined, then detonating an explosive charge against one of them. This brings the surfaces together with an angular (shearing) motion, while intense heat results from compression of air within the gap.

The combined heat and shearing impact causes surfaces to "ripple" in a phenomenon known as "surface jetting." A welded (fused) or joined (through mechanical or frictional adhesion) bond results.

**SUBSURFACE SOUND SPEED:** Already in use at some Navy installations, are NOL's sound velocity tables for sea water, a first in comprehensive high-precision measurements.

The data are compiled in a standard reference guide useful for the study of underwater acoustics, thermodynamics, and oceanography. The tables take into account the effects of salinity, temperature, and pressure on sound velocity at all depths in over 99.8 per cent of the world's oceans.

**BUOY TAKES WAVE'S MEASUREMENTS:** The Light Military Electronics Department of the General Electric Company at Cornell University has been working in improving a wave-height measuring device for the Navy's Transobuoy System. The transobuoy is a floating automatic weather station for deep-ocean use. The device employs an inertial sensor to detect wave motion. The same principles of operation will be applied by the G. E. group to the Boat-type Automatic Weather Station, AN/SMT-1, known as "NOMAD I." In addition to the G. E. effort, NRL is presently conducting tests at Barbados in the West Indies using pressure heads supported approximately 1,000 feet under the floating Transobuoy to determine the wave spectra that can be obtained by pressure measurements. The wave-height measurements will first be categorized according to the International Sea-State Code, so as to obtain some degree of comparison of the different methods employed.

**BOMB'S RUSH:** When a Miami department store discovered what appeared to be a bomb on the premises, they

called NOL's Testing Facility in Ft. Lauderdale.

The Facility, which frequently tests and recovers mines, promptly dispatched LTJG Clarence T. Smith, diving officer and head of the EOD unit, who supervised removal of the bomb and its transfer by helicopter to a deserted island in Biscayne Bay where he then took part in the disarming. As it turned out, the bomb was a hoax. But that wasn't determined until after Smith had been exposed to what could just as well have been a blast to eternity.

Understandably, Smith was cited by the Miami police.

**LESS BUT NOT FEWER:** Visitors to the Pentagon's C-ring near the seventh corridor of the fourth floor are in for a surprising spectacle: graying senior Navy officers chinning on an improvised horizontal bar and broad-jumping in the hall. The reason: orders from Adm. George W. Anderson Jr., new CNO, for all hands to get squared with President Kennedy's physical fitness program.

Anderson (6 feet 4 inches and trim) stated that there were senior captains and flag officers "who were formerly sharp and alert [who have] become ponderous and slow."

Also in evidence are desk-tied brass crowding into the badminton courts and into the pool and calisthenics room during the lunch hours and after work. Extending throughout the Department of Defense, the program will be hardest on overweight personnel, who will be required to adhere to weight standards. Waves and women marines will be required to "maintain proper health, physical poise, and good personal appearance."

The first reported Pentagon casualty: 26-year-old Lt. Charles Larson, Civil Relations Branch, who slipped on the asphalt-tiled deck trying to outdo his mates in the broad jump. Reportedly he spent an uncomfortable week-end humoring a severe case of lower backache.

**INNER SPACE:** With the successful return of John Glenn to terra firma there has been considerable speculation as to our next venture into space. Understandably, anticipation is largely concerned with future exploits of our astronauts, tending to overlook forthcoming ventures into the unknown that may be equally hazardous and enlightening—explorations by our "bathynauts."

The Go Date is tentatively set for early 1963. The capsule will be a 50-foot hull of aluminum over steel designed by Reynolds Metal and now under construction by General Dynamics. Expected to withstand pressures at 3-mile ocean depths and still remain buoyant, the \$2-million vessel will carry a crew of two scientists who



will be able to scan the ocean floor through port holes forward, and a third crewman (a pilot) who will sit amidships with no outside view. Tentatively named Aluminaut, the vessel will be operated by the Woods Hole Oceanographic Institute in behalf of the Office of Naval Research. It will be capable of exploring a now unknown area of ocean floor somewhat greater than the entire land area of the earth!

Others investigating materials for deep-sea hulls are Aerojet General (fiberglass) and Battelle Memorial Institute (welding methods for titanium alloy). A smaller deep-sea vessel is General Mills' 19-foot Seapup, a two-man sub capable of exploration at 6,000-foot depths.

**P. O. P. to P. O. P.:** "Point of pick to point of pack" alliteratively tells what a new handling apparatus can do.

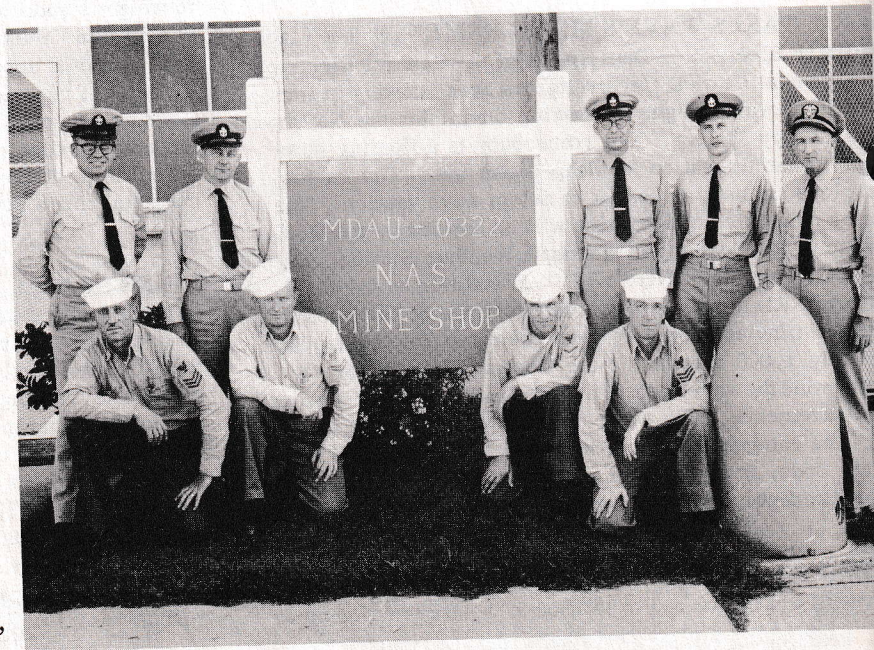
This automatic conveyor system, designed by the Navy, is capable of picking out items from a store of over one million articles and delivering them to a packaging area.

The system, a new concept in warehouse materials handling, directs the processing on a series of conveyors, diverters, sorters, and certain electronic devices.

Small versions of this system are successfully operating at Norfolk and Bayonne.

**RIVER LITTER:** Bugged by a "bomb" he discovered in the Patuxent River near the NOL Test Facility at Solomons, a Maryland fisherman was thanked for reporting his find. It was a plaster-filled Mk 9-0 dummy depth charge that had been dropped into the restricted area at the Facility in 1952 during the normal course of an ordnance

**THOSE "LIKE'N'GRIBE" SHEETS**  
you men sent in told us you were mighty interested in who was where and doing what in the mine business. Last issue we ran a group shot of Navy 3867. Now, here's MDAU 0322. Who's next? Could be a picture of you and your gang—if we had one. How about making the scene in T-Shooter by mailing us that photo you just took—or the one you'll be taking in the next few days—so we can make the next issue a real collectors' edition. Meanwhile here are (standing L to R) A. W. Niederbaumer MN1, W. C. Carter MN2, R. D. Nicoson MN3, J. D. Patrick MN1. Kneeling in front (L to R) are R. B. Walker MNCA, F. A. McCarthy MNCS, C. E. Gilpin MNC, W. J. Mehard MNCA, and F. B. Owen CWO/4.



evaluation program. It did, however, contain an unfired detonator.

Two other objects, discovered in the Town Point Cove area of Solomons and reported as being live mines turned out to have no connection with ordnance.

**METAL WITH METTLE:** A new alloy that may prove to be excellent material for non-magnetic tools needed in mine disposal and other underwater ordnance work is being tested by the Navy. In addition to being non-magnetic, "Nitinol" (Titanium and nickel) is corrosion resistant, can be hardened to nearly the hardness of tool steel and is lightweight.

Nitinol can be welded, a quality that gives it a wide range of uses, especially in aircraft and space vehicles. Other uses of this adaptable alloy could include kitchenware, automobile and boat trim, and jewelry.

**SPAT WITH A 'GATOR:** A Captain H. E. Motley and two other Army men trucking on down a Georgia road got out of their vehicle and accosted a crusty character who asked no more than to share the road. One of the men poked a canoe paddle at the traveller whereupon said paddle suffered an immediate fracture. The men then beat a hasty retreat to their truck, but before they could get under way, the six-foot gator had slid under the truck and snapped off the tail pipe, then the muffler, and was chomping on the rear axle. The Motley crew pulled into Ft. Stewart with an embarrassing loud roar of exhaust but with a quiet determination not to fool with any more lowly amphibians, even in a three-to-one encounter.



# RUDMINDE REPORT TO THE FLEET

## *What's Been Reported?*

## *What's Being Done?*

### Invocation

Every once in a while one of our readers from Upper West Overshoe or some such unlikely address manages to drop into our office for a chat. At first, most are taken aback by the prominent display of ye editor's Ph D degree. In this case that means piled higher and deeper.

Once we've managed to draw a cup of Joe, though, and excavate a pack of filter tips from under the litter of "documents" on the desk, we usually get off on a pretty good gam.

But not so last week.

"I like reading T-Shooter all right," sez the burly gentleman on the other side of the piles. "But it seems like to me that all you ever talk about is little things . . . an upside-down lockwasher here, some damp dessicant there, maybe the pros and cons of whether some one-penny lock-ring should have been used more than once. Now how come you don't concentrate on some big things."

"—Big like what?"

"Like—well, like maybe explaining how minefield plans are worked up or a real study of what's wrong with the basic design of our self-propelled submarine-planted mines. Something like that."

### Sermon on the (a)mount

Now there's one thing we don't do in the course of these gams, and that's preach.

But not so last week.

Granted, plenty of T-Shooter readers are interested in the newer mine designs, and in the big picture on many phases of mine warfare. We know this and we certainly don't turn thumbs down on any such information when it's dope we can publish unclassified.

But then, just as we were about to explain this to the gentleman from Overshoe, we had a fleeting vision of the parade of Rudmindes we'd reviewed in the course of getting three years' T-Shooter issues to press. Big things? Not three in a carload! Instead, by the hundreds, they concern little things that need to be done right if the work done by those whose careers are devoted to weapon designing and mine-warfare planning is ever to produce big results. And suddenly we'd mounted a pulpit!

First among the little things we hopped on was the matter of correct use of E-rings covered in 2-60 . . . three-for-a-penny gadgets used on flight-gear release mechanisms. Simple to install? Sure. But just consider what happens to operating costs and budgets and warfare readiness when you've get men installing them in such a way that million-dollar planes get beat up in the course of delivery for planting, and mines costing thousands end up on the bottom as duds? "Don't you people out in West Overshoe think this is pretty important?" we asked.

Then there was the matter of getting a batch of explosive-loaded depth charges out of the hands of the destroyer forces simply for the lack of some little squares of sheetmetal where their nose-ring supports joined their cases. This may not have had an earth-shaking effect on the progress of the cold war in Berlin. But if nothing had been done about it we'll wager there'd be some destroyers in the fleet whose after-deck profiles wouldn't look anything like the silhouettes published in "Jane's Fighting Ships."

Once started, we went on through issue after issue: a treatment for dollys to prevent crushed minemen's feet and maybe keep a mine from blowing up a complete MDAU . . . a simple change to a paragraph in an OP to keep a detonator from permanently rearranging somebody's face . . . the addition of a two-bit resistor to keep otherwise dependable bought-and-paid-for weapons from firing before the target ships were close enough to be critically damaged by the blast . . . a simple change in the connection of a cable lead that may prevent a U. S. Navy skin diver from being consigned to a watery grave . . .

We could cite any number of these little things, but by now we're sure you're getting the point. Today—right now—our Navy has got the ships and facilities and equipment that spell strength and the ability to win in West Overshoe or anywhere else.

These are our "big" things and we're convinced they're the world's best. But that does not guarantee that they're ready for war.

Why? Because every last one of our big things is cursed with a hundred little things waiting to louse up the works, and the only thing ever invented that can stop them is men. Not men who simply fill billets. Not even men who devote their lives to sweating out the big things, though we thank God we've got good ones.

### Benediction

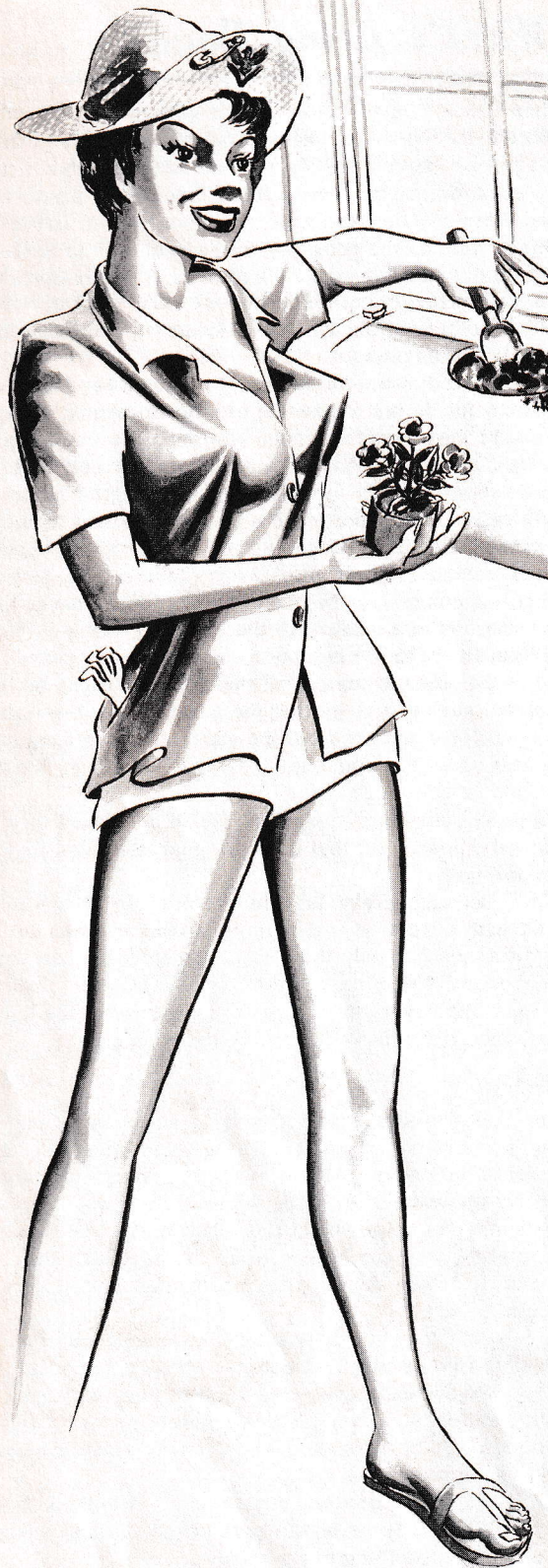
It's upon a special breed that falls somewhere inbetween that our country and our lives depend most heavily in the situation today. Men who are big enough to understand the importance of little things. Men who take it upon themselves to do something about every last detail that could affect our ability to be "fustest with the mostest" if a day should come when the button gets pressed.

This is the key to real warfare readiness and this, we think, explains why T-Shooter—whose prime mission is warfare readiness—has been so busy with so many little things. They're the things we pick up from Rudmindes sent by MNs and TMs who take pride in seeing that their weapons work right.

Does this, gentle reader, include you? We think that it should. Like it says on the back cover, almost everybody can find something to Rudminde.

—Amen.





# Millie Amps' BRIEFS

## *C'est la guerre*

Lately we've had a lot of Rudmindes about damaged shipments and missing parts: busted BA-249/Us, Mk 3-0 fins without U-bolts, A-5-2 firing mechs with studs missing or rusted and broken away from plates, Mk 1-0 test stands received with smashed pressure gage, safety valve, and pressure-pot valves broken.

All this adds up to a terrific loss of time and money—not to mention what it does to mine-warfare readiness—so we're pleased that so many of you have given us the chance to do something about it.

Remember, handling procedures and packaging design are also part of our job here at NMEF. And like my favorite engineer says, equipment that's too easily damaged by mere handling may not be reliable when it comes to the real thing!

## *Ohm cookin'*

When calibrating a Mk 177-0 test set Clarence Rhine discovered that resistors R-49 through R-68 were 1000-ohm jobs, not the 10-ohm 2-watt ones called for by ORDALT 4216. Could be. But the 1000-ohm 1-watt resistors are required to forestall early contact failures in the microswitches that close the capacitor-shorting circuits.

So this makes ORDALT 4216 wrong about the resistors. It is being changed—along with other pertinent publications. Meanwhile, thank you C. R.



*Hoist publications*

For what it's worth, the LDs, drawings, and general requisites for Mine Mk 52 all mods, calling for Bomb Lug, Suspension, Mk 2 Mod 0, DWG 1211687 should be changed to call for the superseding item: Lug, Suspension, Mk 6 Mod 0, DWG 1252628. One may be just as good as the other when it comes to uplift, but somehow the latest number is usually nicer. Don't you think?

*Shorty George*

We noted, says G. A. Clark, that a CA-531's second strain loop (BA-205/U's in 49-0 mines) was anchored directly on a battery terminal. This, observed Clark, was neither according to Hoyle nor to OP 1807 1st Rev which, as a matter of fact, completely ignores this particular loop. So Clark "followed" the OP by ignoring the loop.

Did he do right? You bet. It's not that strain loops don't mean anything, but in this case the cable is too short, and I just don't dig looped lugs. Not even on batteries.

The cure? We've corrected the master drawing for CA-531 and whenever new cables are procured you'll get hook-up instructions to make everything right. Meantime "follow" your OP just like GC.

*Bigger is better*

The holes in some bleeder-assembly mounts, says B. T. Busby, just don't line up for the studs like a good mount should. He also found that the Mk 36-1 mine's SR-6 can brackets didn't quite fit the studs on the M-9-1's compartment cover. This can happen with other parts too, like we mentioned about TB-24s in "The Hole Man of the Mounting" back in T-Shooter 3-60, and in "A Reaming That Helps" in #2-59.

The answer in each case is to do exactly what BT did with his bleeders. Ream 'em.

*The bronze bust*

When he saw a silver-colored mooring-cable extension—OP 948 says it should be bronze—James F. Donough at Navy 3002 felt that here was something he could get his teeth into! The answer, Jim, is that OP 948 is right: bronze cable extensions Z1350-038-5514 (DWG 363016-5) are exactly what you should be using for service mines Mk 10. But with the drill 10s there's a problem—the cables part just when they're needed most: during drill-mine recovery.

BUWEPS' answer has been to provide mooring-cable extensions of stainless steel, Z1350-701-5281 (DWG 1672080), for drill use. Like bronze, the SS is non-magnetic. It's also a lot tougher for when the handling gets rough!

*21 is legal*

A new Clock Delay, Mk 21 Mod 0, will appear in the new OPs for Mk 52 and 55 mines. Updated general requisites will also list this Mk 21 clock as the preferred item. Be that as it may, Mk 18 clocks are still good. Use 'em as long as they last.

*Falsie alarm*

It's a healthy sign when stalwarts making their way through the MN and TM rates in this droll age of store-bought eyelashes, mail-order fingernails, foam-rubber clavicles, and the two-way stretch, refuse to accept look-alikes as actually being alike without making sure. That's what good Chief H. P. Menser at NAD Earle did, bless his soul. And he couldn't have checked in a better place!

What happened, it seems, is that he had to reject some A-4 firing mechanisms (Depth Charge Mk 14) for noise. SOP in this case is to replace the 1662 (oscillator tube) but when he ordered 1662s he was sent 3A4s and told to use them as electronically identical substitutes. And he almost did. Then, because this was contrary to his OP, he decided to check with us first.

Well, look-alikes they are but substitutes they are not. The 3A4s were disapproved for A-4 mechanisms a long time ago in favor of the ruggedized industrial version designated 1662, for which the stock number is N5960-262-0280.

So caveat emptor, fellows. That means things may not be what they seem. All that glitters is not gold. Look before you leap!

*millie amps*





# Pub-S-Crawlin'

with Clark Starter, MN2

## An official whodunnit?

The mineman's time-honored G-book may never win any prizes for the cleverness of its plot, but with the distribution of change 2 to the first revision it appears to have taken on a certain air of mystery nevertheless. As a result, we've had a surprising amount of correspondence from readers seeking clues. On such query, from Senior Chief Jim Powers, started like this:

"Change 2 to OD 12067G 1st Rev., on pages 108 and 109, lists sets of mine components, less cases, for various mine marks, mods, and operational assemblies. The questions that arise from a mineman's point of view are: a) Are these component sets available to fleet activities now that they are listed in the G-book?..."

As the series of dots indicates, the good chief then proceeded with questions b, c, d, e, and f.

But the answer to his a really covers them all, and as near as I can determine the answer is that it's all a mistake... such sets were never intended to be listed in the G-book, should not have been incorporated in change 2 or any other change thereto, and you cannot—repeat, cannot—get such sets by ordering them from any supply activity, anywhere.

If I'm wrong about this, I hope someone will correct me real soon.

## A book of solutions

If your outfit plays any part in the Fleet Service-Mine Test Program you may recently have received a rather austere loose-leaf pamphlet prepared by NMEF's Data Review and Analysis Division. Its title is an odd one:

▶ **OD 7325 3d Rev (Serv & Drill Mines Mk 18-0):** On sheet 19, in the 7th column for the first item, the FSN should be G5310-543-2705 not G5310-194-0742.

▶ **OD16135 (Ammo Logistics Codes):** On page VII, paragraph 2, line 13 refers to NAVORDINST 4440.6A. This is a typo. It should read NAVORDINST 4400.6B.

▶ **OP 948 1st Rev (Mines Mk 10-3, 7, and 9):** On page 39, in paragraph 6b, the third sentence should read: Make sure the nose pad's eye hole faces in the same direction as the clock and extender well openings.

▶ **OP 956 3d Rev (Mine Mk 25-0):** On page 5, in the second column of table 3, the 13th item should read: None instead of not CD-1 Mod 0.

On page 73, column 1, under Delay Arming and Sterilizing Mechanism, the first paragraph (referring to CD-1 Mod 0) should be crossed out.

▶ **OP 1452 2d Rev (Mine Accessories):** On page 13, the following should be added after step b in the second

column and on page 155 after step b in the first column: NOTE: When testing Extenders Mk 14 Mods 0, 1, or 2 use the Extender Testing Tool, a piston-travel gage that shows positively whether these extenders meet minimum operating requirements. The tool's cap Z1350-859-0721 (DWG 2231128) fits on the extender flange and the small end of the tool's rod Z1350-859-0722 (DWG 2231129) seats in the extender socket. The extender is considered to be sufficiently extended when the rod's lower annular groove is flush with or above the cap's upper surface, and sufficiently retracted when the rod's upper annular groove is flush with or below the cap's upper surface.

Brochure on the Fleet Service-Mine Test Program. But once you get past the title what you'll find is about as informative a guide as you're likely to see on what has long been a rather difficult subject to digest. To quote the foreword verbatim:

"This brochure provides guidance in the planning, administration, conduct, and analysis of Fleet Service-Mine tests.

"Briefly, the chapters on planning, logistics, and administration provide the uninitiated with echelon structure, command relationships, administration policy, and material-procurement procedures, so that they may quickly assume assigned responsibilities in the...program. The breakdown of the test into phases includes suggested guidelines and technical considerations which may be of use to all units actively engaged in the conduct of a Fleet Service-Mine Test.

"Nothing in this brochure is intended to contradict or supersede any official directive promulgated by Fleet and Force Commanders. Suggestions or corrections are solicited in order to keep this publication up-dated and to improve the effectiveness of the...program."

That is exactly what it says and that, according to the many fine letters from those who have used it, is exactly what it does, complete with samples of the many forms that must be filled out and letters that must be written as FSMT proceeds from paper plans to post-recovery analysis.

So if you didn't get a copy or need an extra, by all means drop us a card. Meanwhile, pending release of official changes, here are our latest advance corrections:

On page 127, item d under Materials for Filling SD Mechanisms should be crossed out and the letter designations for the remaining items suitably renumbered. Also, item n under Filling Procedure should be crossed out; item o then becomes n.

▶ **OP 1765 2d Rev (Mine Mk 25-2):** On page 6, in the second column of table 3, the 11th item should read: None instead of CD-1 Mod 0.

The operational assembly numbers in the captions for



figures 13 and 14 are switched. They should be switched back so that the series beginning with 02 is with figure 14; and the one beginning with 01, with figure 13.

On page 72, column 2, under Delay Arming and Sterilizing Mechanism, the first paragraph (referring to CD-1 Mod 0) should be crossed out.

▶ **OP 1797 2d Rev (Mine Mk 25-1):** On page 8, in the second column of table 3, the 7th item should read: None instead of CD-1 Mod 0.

On page 64, paragraph 62b should read: Connect an independent voltmeter to Det 1 and Det 2 on the extender terminal block and check for voltage. Do not use Test Set Mk 97's voltmeter. There must be no voltage present.

The above change should also be made to Item 29 in the back of the book.

On page 84, column 1, under Delay Arming and Sterilizing Mechanisms, the first paragraph (referring to CD-1 Mod 0) should be crossed out.

▶ **OP 1798 2d Rev (Mine Mk 36-2):** On page 5, in the second column of table 3 the 8th item should read: None instead of CD-1 Mod 0.

On page 57, paragraph 52, tells you to "Proceed to paragraph 52." This is merely a typo. You should, of course, go to paragraph 53.

On page 63, paragraph 64b should read: Connect an independent voltmeter to Det 1 and Det 2 on the extender terminal block and check for voltage. Do not use Test Set Mk 97's voltmeter. There must be no voltage present.

The above change should also be made to Item 25 in the back of the book.

On page 81, column 1, under Delay Arming and Sterilizing Mechanisms, the first paragraph (referring to CD-1 Mod 0) should be crossed out.

▶ **OP 1808 1st Rev (Mine Mk 49-1):** On page 51, under Detonator Installation, paragraph 2 should read: Connect an independent voltmeter to Det 1 and Det 2 on the extender terminal block and check for voltage. Do not use Test Set Mk 97's voltmeter. There must be no voltage present. This also applies to Item 34 in back of the book.

▶ **OP 1853 Vol 1 Adv copy of 1 July 1958 (Mine Mk 6-0, 4, 7, 8, 10, 11):** On page 29, in the 13th line, the specified depths should be 18 to 32 feet, not 15 to 35.

On page 60, in the 6th line, the specified depths should be between 20 and 30 feet, not 15 and 35.

▶ **OP 1853 Vol 3 Adv copy of 1 July 1958 (Drill Mines Mk 6-0 and 16-1):** In the introduction, the section on Operation During Planting should specify 18 to 32 feet, not 15 to 35.

▶ **OP 1878 1st Rev (Drill Mine Mk 10-3):** On page 49, line 5 of paragraph 8 (at the top of the page) should refer to the three-conductor cable of CA-211, not the two-conductor cable of CA-102.

On page 98, step 3 under Case Balancing should read: Insert the nose-pad eye in the mine case's nose so that the eye hole faces in the same direction as the clock and extender well openings. Secure with three 9/16-inch

aluminum nuts (one on every third stud . This correction applies also to Instruction Sheet A-5 page 2.

On page 105, the mooring-cable extension call-out in fig. 42 should read STAINLESS-STEEL MOORING-CABLE EXTENSION (NON-MAGNETIC) Z1350-701-5281 DWG 1672080. (Bronze mooring-cable extensions will no longer be used on Mk 10-3 drill mines.)

The above corrections should also be made to fig. 1 in Instruction Sheet A-7.

Step 20 on page 201 should become step 10 on page 200. Present steps 10—19 should be renumbered 11—20.

On page 206, figure 68 was what printers call "flopped." A change page will eventually be issued to correct this.

On page 208, step 22 should refer to table 17 not 16.

On page 210, step 5 should refer to table 18, not 17.

On page 211, steps 2 and 4 should refer to table 17, not 16.

▶ **OP 1892 1st Rev (Mine Mk 36-3):** On page 16, in columns 2 and 3 of table 4, the 4th items "Clock Delay CD-1 Mod 0" and "Not to be used unless specified by assembly directive," should be crossed out and None should be written in their places.

On page 22, in paragraph 22b, the three bolts should be identified as 1½-inch G5305-637-4041.

▶ **OP 2352 (Firing Mech Mk 19-0):** On page 13 the last sentence in the second column should state a fixed-grid bias voltage of 60.7, not 67.5.

▶ **OP 2974 Vol 1 (Mine Mk 55-0 thru 6):** If you have a copy of this preliminary OP the following changes should be made to figure 5-5: 1) Pressure Detector Mk 1 Mod 0's P18 should be renumbered P12. 2) F(SE) of Pressure Detector Mk 1 Mod 0's P12 (formerly P18) should connect to Firing Mechanism Mk 22 Mod 1's J502-P13 terminal 6 instead of 7. 3) B of Depth Compensator Mk 3 Mod 0's P18 (from S3) should terminate at 7 of Firing Mechanism Mk 22 Mod 1's J502-P13 instead of at 6. 4) Firing Mechanism Mk 20 (upper left of drawing) should be Mod 1.

Figure 6-5 should also have Pressure Detector Mk 1 Mod 0's P18 renumbered P12. If you're confused, read these instructions again comparing figures 5-5 and 6-5 with figures 2-4 and 8-5. Figures 2-4 and 8-5 are right; 5-5 and 6-5 are wrong.

▶ **TROUBLESHOOTER No. 2-61:** On page 15 change the reference in the last line of the item for OD 7331 to read page 64 not 65.

▶ **TROUBLESHOOTER 3-61:** Page 14, item on OD 7333 2d Rev should have read: On sheet 33, after item 240.0 in the Description column, a No. 8-32 NC-2 x 3/4 screw is listed. This should be No. 8-32 NC-2 x 5/8 screw. In the General Arrangement column the number should be MS 35224-46, not 12-Z-1084-142.

Item OD 12067-D 1st Rev should, of course, refer to Depth Charges not Drill Mines.

And, after OP 948, those figures should refer to feet not inches.



# BIBLIOGRAPHY FOR DEPTH CHARGES AND MINES

Lately we've been amazed at the increasing incidence of four different symptoms of the old lacka-info disease: 1) Rudmindex that show us that the reporting activity is using an outdated technical manual for the job; 2) requests for extra copies of outdated OPs; 3) reports of failures that wouldn't have happened if the activity had inserted the latest change in the OP they used; and, at the opposite pole; 4) requests for manuals of which only limited editions have ever been printed, which are simply not available anywhere, and are often so new that they're not yet approved for official use.

Our answer has been to supply what we can whenever we can, and to

refer all hands to the latest revision of BUWEPSINST 8500.1, the Bibliography for Depth Charges and Mines. Yet all too often this recommendation is greeted by comments like, "Whazzat? We never seen it! Who do you have to know to get on the list?"

Well, here it is . . . telling you exactly which OP, which revision, and how many changes apply to each mine and depth-charge mark and mod. This is an exact transcription of the latest official revision, which will be distributed sometime between now and next June. Use it. Also check page 13 to be sure your file of BUWEPS Notices and In-

structions is up-to-date.

## Section I: Surface-laid mines

Mine Mk Mod	Desc. and Assembly	Rev.	Chg.	Firing Mech.	Rev.	Chg.	Operational Characteristics	Rev.	Chg.	Ballistic table	Rev.	Chg.	General Requisites	Rev.	Chg.	Drill Mine Assy.	Rev.	Chg.
Controlled Mine System 1 0	OP 1854 OP 1883 OP 1893	1 0 1	0 1 4	—	—	—	OP 1896	0	0	—	—	—	OD 7335	2	0	—	—	—
Controlled Mine System 2 0	OP 1854 OP 1930 Vol. 1 Vol. 2	1 0 <sup>b</sup> 0 <sup>b</sup>	0 0 0	—	—	—	OP 1930 Vol. 3	0 <sup>b</sup>	0	—	—	—	OD 9682	0	0	—	—	—
6 0	OP 1853 Vol. 1	0 <sup>c</sup>	0	OP 605	2 <sup>d</sup>	0	OP 2637 Vols 1-5	0 <sup>f</sup>	0	None	—	—	OD 7309	2	1	OP 1853 Vol. 2	0 <sup>c</sup>	0
6 4	OP 1853 Vol. 1	0 <sup>c</sup>	0	OP 605	2 <sup>d</sup>	0	OP 2637 Vols 1-5	0 <sup>f</sup>	0	None	—	—	OD 7311	2	0	None	—	—
6 7	OP 1853 Vol. 1	0 <sup>c</sup>	0	OP 605	2 <sup>d</sup>	0	OP 2637 Vols 1-5	0 <sup>f</sup>	0	None	—	—	OD 7312	2	0	None	—	—
6 8	OP 1853 Vol. 1	0 <sup>c</sup>	0	OP 605	2 <sup>d</sup>	0	OP 2637 Vols 1-5	0 <sup>f</sup>	0	None	—	—	OD 7313	2	0	None	—	—
6 10	OP 1853 Vol. 1	0 <sup>c</sup>	0	OP 605	2 <sup>d</sup>	0	OP 2637 Vols 1-5	0 <sup>f</sup>	0	None	—	—	OD 7314	2	1	None	—	—
				OP 605	2 <sup>d</sup>	0	OP 2637			None	—	—	OD 7315	2	0	None	—	—



6	14	OP 2129	0	1	OP 2129	0	1	OP 2129	0 <sup>j</sup>	1	None	—	—	—	—	—	—
18	0	OP 902	2	2 <sup>g</sup>	OP 670 <sup>s</sup>	0	3	OP 693	0 <sup>j</sup>	0	None	—	—	—	—	—	—

**Section II: Submarine-laid mines**

10	3	OP 948	1	0	OP 1905	1	1	NOLR 771	0	1	None	—	—	—	—	—	—
27	2	OP 1935 Vol 1 Vol 2	1 <sup>h</sup>	5 0	OP 678 <sup>s</sup>	0	1	OP 2354	0 <sup>j</sup>	0	None	—	—	—	—	—	—
27	3	OP 1935 Vol 1 Vol 3	1 <sup>h</sup>	5 0	OP 1844	1	2	OP 2412	0 <sup>j</sup>	0	None	—	—	—	—	—	—
27	4	OP 2363 Vol 1 Vol 2	0 <sup>h</sup>	6 2	OP 678 <sup>s</sup>	0	1	OP 2354	0 <sup>j</sup>	0	None	—	—	—	—	—	—
27	5	OP 2363 Vol 1 Vol 3	0 <sup>h</sup>	6 2	OP 1844	1	2	OP 2412	0 <sup>j</sup>	0	None	—	—	—	—	—	—
49	0	OP 1807	1	0	OP 681 <sup>s</sup>	1	2	OP 2551	0 <sup>j</sup>	0	None	—	—	—	—	—	—
49	1	OP 1808	1	0	OP 1799 <sup>s</sup>	1	0	OP 2000	0 <sup>j</sup>	0	None	—	—	—	—	—	—
49	2	OP 1809	1	0	OP 1844	1	2	OP 2413	0 <sup>j</sup>	0	None	—	—	—	—	—	—
57	0 <sup>m</sup>	OP 2718 Vol 1	0 <sup>m</sup>	0	OP 2567	0 <sup>s</sup>	0	OP 2816	0 <sup>e</sup>	0	None	—	—	—	—	—	—

**Section III: Air-laid mines**

10	9	OP 948	1	0	OP 1905	1	1	NOLR 771	0	1	OP 1459	1	0	OD 7320	2	0	OP 948	1	0
25	0	OP 956	3	0	OP 681 <sup>s</sup>	1	2	OP 2052	0 <sup>j</sup>	0	OP 1394	1	0	OD 7302 Vol 1 Vol 2	4 1 1	1 1	OP 1816	0 <sup>j</sup>	1
25	1	OP 1797	2	1	OP 1799 <sup>s</sup>	1	0	OP 2000	0 <sup>j</sup>	0	OP 1459	1	0	OD 7303 Vol 1 Vol 2	3 1 1	1 0	OP 1816	0 <sup>j</sup>	1
25	2	OP 1765	2	0	OP 1844	1	2	OP 2108	0 <sup>j</sup>	0	OP 1459	1	0	OD 7304 Vol 1 Vol 2	3 1 1	1 1	OP 1816	0 <sup>j</sup>	1

For footnotes see page 12.



Mine Mk Mod	Desc. and Assembly	Rev.	Chg.	Firing Mech.	Rev.	Chg.	Operational Characteristics	Rev.	Chg.	Ballistic table	Rev.	Chg.	General Requisites	Rev.	Chg.	Drill Mine Assy.	Rev.	Chg.
36 1	OP 1684	2 <sup>b</sup>	0	OP 678 <sup>s</sup>	0	1	OP 679	0 <sup>j</sup>	0	OP 1395 OP 2563	1 0	2 0	OD 7306 Vol 1	5	1	OP 1816	0 <sup>l</sup>	1
36 2	OP 1798	2	1	OP 1799 <sup>s</sup>	1	0	OP 2000	0 <sup>j</sup>	0	OP 1395 OP 2563	1 0	2 0	OD 7331 Vol 1 Vol 2	4 1	1 1	OP 1816	0 <sup>l</sup>	1
36 3	OP 1892	1	1	OP 1844	1	2	OP 1885	0 <sup>j</sup>	0	OP 1395 OP 2563	1 0	2 0	OD 7332	4	1	OP 1816	0 <sup>l</sup>	1
39 0	OP 1736	2	0	OP 681 <sup>s</sup>	1	2	OP 1919	0 <sup>j</sup>	0	OP 2120 OP 2595	0 0	1 0	OD 7333	2	1	None	—	—
41 0,1,2	NOLR 949	0	1	None	—	—	None	—	—	NOLR 949	0	1	OD 7334	1	0	None	—	—
50 0	OP 1811	0	1	OP 2352	0	1	OP 2353	0 <sup>j</sup>	0	OP 1459	1	0	OD 7337	3	0	OP 1811	0	1
52 0	OP 2608 Vol 1 Vol 2	0 <sup>n</sup> 0 <sup>n</sup>	0 0	OP 9169 <sup>s</sup>	0	0	NOLR 1222	0 <sup>j</sup>	0	OP 2562	0	0	OD 9670	1	0	OP 2608 <sup>o</sup> Vol 1 Vol 2	0 <sup>n</sup> 0 <sup>n</sup>	0 0
52 1	OP 2608 Vol 1 Vol 2	0 <sup>n</sup> 0 <sup>n</sup>	0 0	OD 9168 <sup>s</sup>	0	0	NOLR 1220	0 <sup>j</sup>	0	OP 2562	0	0	OD 9671	1	0	OP 2608 <sup>o</sup> Vol 1 Vol 2	0 <sup>n</sup> 0 <sup>n</sup>	0 0
52 2	OP 2608 Vol 1 Vol 2	0 <sup>n</sup> 0 <sup>n</sup>	0 0	OD 9167 <sup>s</sup>	0	0	OP 2310	0 <sup>k</sup>	0	OP 2562	0	0	OD 9672	1	0	OP 2608 <sup>o</sup> Vol 1 Vol 2	0 <sup>n</sup> 0 <sup>n</sup>	0 0
52 3	OP 2608 Vol 1 Vol 2	0 <sup>n</sup> 0 <sup>n</sup>	0 0	OD 9169 <sup>t</sup>	0	0	OP 2805	0 <sup>k</sup>	0	OP 2562	0	0	OD 9673	1	0	OP 2608 <sup>o</sup> Vol 1 Vol 2	0 <sup>n</sup> 0 <sup>n</sup>	0 0
52 4	OP 2608 Vol 1 Vol 2	0 <sup>n</sup> 0 <sup>n</sup>	0 0	OD 9169 <sup>t</sup>	0	0	OP 2805	0 <sup>k</sup>	0	OP 2562	0	0	OD 9674	1	0	OP 2608 <sup>o</sup> Vol 1 Vol 2	0 <sup>n</sup> 0 <sup>n</sup>	0 0
52 5	OP 2608 Vol 1 Vol 2	0 <sup>n</sup> 0 <sup>n</sup>	0 0	OD 9167 <sup>s</sup> OD 9168 <sup>s</sup>	0 0	0 0	OP 2805	0 <sup>k</sup>	0	OP 2562	0	0	OD 9675	1	0	OP 2608 <sup>o</sup> Vol 1 Vol 2	0 <sup>n</sup> 0 <sup>n</sup>	0 0
52 6	OP 2608 Vol 1 Vol 2	0 <sup>n</sup> 0 <sup>n</sup>	0 0	OD 9167 <sup>s</sup> OD 9168 <sup>s</sup> OD 9169 <sup>t</sup>	0 0 0	0 0 0	OP 2805	0 <sup>k</sup>	0	OP 2562	0	0	OD 9676	1	0	OP 2608 <sup>o</sup> Vol 1 Vol 2	0 <sup>n</sup> 0 <sup>n</sup>	0 0
53 0	OP 2370	0	0	OP 2370	0	0	OP 2370	0	0	OP 2563	0	0	OD 9350	1	1	None	—	—
55 0	OP 2974 Vol 1 Vol 2	0 <sup>n</sup> 0 <sup>n</sup>	0 0	OD 9169 <sup>t</sup>	0	0	OP 2806	0 <sup>k</sup>	0	OP 1395	1	2	OD 10504	1	0	OP 2974 <sup>f</sup> Vol 1 Vol 2	0 <sup>n</sup> 0 <sup>n</sup>	0 0



55	1	OP 2974 Vol 1 Vol 2	0 <sup>n</sup> 0 <sup>n</sup>	0 0	OD 9168 <sup>s</sup>	0 0	OP 2806	0 <sup>k</sup>	0	OP 1395	1	2	OD 10505	1	0	OP 2974 <sup>o</sup> Vol 1 Vol 2	0 <sup>n</sup> 0 <sup>n</sup>
55	2	OP 2974 Vol 1 Vol 2	0 <sup>n</sup> 0 <sup>n</sup>	0 0	OD 9167 <sup>s</sup>	0 0	OP 2806	0 <sup>k</sup>	0	OP 1395	1	2	OD 10506	1	0	OP 2974 <sup>o</sup> Vol 1 Vol 2	0 <sup>n</sup> 0 <sup>n</sup>
55	3	OP 2974 Vol 1 Vol 2	0 <sup>n</sup> 0 <sup>n</sup>	0 0	OD 9167 <sup>s</sup> OD 9169 <sup>t</sup>	0 0	OP 2806	0 <sup>k</sup>	0	OP 1395	1	2	OD 10507	1	0	OP 2974 <sup>o</sup> Vol 1 Vol 2	0 <sup>n</sup> 0 <sup>n</sup>
55	4	OP 2974 Vol 1 Vol 2	0 <sup>n</sup> 0 <sup>n</sup>	0 0	OD 9168 <sup>s</sup> OD 9169 <sup>t</sup>	0 0	OP 2806	0 <sup>k</sup>	0	OP 1395	1	2	OD 10508	1	0	OP 2974 <sup>o</sup> Vol 1 Vol 2	0 <sup>n</sup> 0 <sup>n</sup>
55	5	OP 2974 Vol 1 Vol 2	0 <sup>n</sup> 0 <sup>n</sup>	0 0	OD 9167 <sup>s</sup> OD 9168 <sup>s</sup>	0 0	OP 2806	0 <sup>k</sup>	0	OP 1395	1	2	OD 10509	1	0	OP 2974 <sup>o</sup> Vol 1 Vol 2	0 <sup>n</sup> 0 <sup>n</sup>
55	6	OP 2974 Vol 1 Vol 2	0 <sup>n</sup> 0 <sup>n</sup>	0 0	OD 9167 <sup>s</sup> OD 9168 <sup>s</sup> OD 9169 <sup>t</sup>	0 0 0	OP 2806	0 <sup>k</sup>	0	OP 1395	1	2	OD 10510	1	0	OP 2974 <sup>o</sup> Vol 1 Vol 2	0 <sup>n</sup> 0 <sup>n</sup>
56	0 <sup>m</sup>	OP 2572	0 <sup>m</sup>	0	OP 2567	0 <sup>s</sup>	OP 2637 Vols 1-5	0 <sup>p</sup>	0	OP 2562	0	0	OD 9353	0	0	OP 2572 <sup>n</sup>	0

TROUBLESHOOTER 2-62

Section IV: Depth Charges

Weapon Mk Mod	Desc. and Assembly	Rev.	Chg.	Firing Mech.	Rev.	Chg.	Operational Character- istics	Rev.	Chg.	Ballistic table	Rev.	Chg.	General Requisites	Rev.	Chg.	Drill Mine Assy.	Rev.	Chg.
6	0	OP 747	1 <sup>b</sup>	4	OP 747	1 <sup>b</sup>	4	OP 747	4	N/A	—	—	OD 17160	0	0	N/A	—	—
8	3, 4, 5	OP 2960	0 <sup>a</sup>	0	OP 747	1 <sup>b</sup>	4	OP 2960	4	N/A	—	—	OD 17160	0	0	N/A	—	—
9	4	OP 866	2 <sup>b</sup>	3	OP 747	1 <sup>b</sup>	4	OP 866	4	N/A	—	—	OD 17160	0	0	N/A	—	—
14	0	OP 669 OP 1577	1 <sup>b</sup> 0 <sup>b</sup>	4 3	NOLR 926	0	0	OP 669	4	N/A	—	—	OD 17160	0	0	N/A	—	—
15	0-10	OP 2386	1	0	—	—	—	OP 2386	0	N/A	—	—	OD 17160	0	0	N/A	—	—
16	0	OP 2107	0	0	OP 747	1 <sup>b</sup>	4	OP 2107	4	N/A	—	—	OD 17160	0	0	N/A	—	—
16	1	OP 2107	0	0	NOLR 926	0	0	OP 2107	0	N/A	—	—	OD 17160	0	0	N/A	—	—
Signal, Under- water-Sound, 50-0 & 1	OP 2386	1	0	—	—	—	—	OP 2386	1	N/A	—	—	OD 17160	0	0	N/A	—	—
12.75 Rocket 1 0 (ASP)	OP 2027 OP 1792	1 0 <sup>q</sup>	0 3	OP 1792	0 <sup>q</sup>	3	OP 1792	3	OP 1792	0 <sup>q</sup>	3	OP 1829	—	—	—	N/A	—	—

For footnotes see page 12.



## Section V: Related publications

PUBLICATION	REV.	CHGS.	TITLE
NAVORD LIST 0 (Jan. 1960)	1	0	Index of NAVORD Allowance Lists (Mine section, page 4)
NOLR 1216	0	2	New Mine Components and Accessories
OD 6678	5	0	Operational Assembly Charts for Service and Drill Mines
OD 9363	0	0	Nomenclature Manual for Mines, Depth Charges, and Associated Equipment
OD 9364	0	0	Nomenclature Manual for Test Sets, Cable Assemblies, Batteries, and Associated Equipment
OD 10, 000	0	1	U. S. Naval Mines, Schematic Wiring Diagrams
OD 10, 604 Vol. 1	2	0	Active Assembly Material for Service Mines and Drill Mines Mks 6 thru 50
OD 10, 604 Vol. 2	0	0	Active Assembly Material for Service Mines and Drill Mines Mks 51 thru 55
OD 12067-D	1	1	Index to Navy Ammunition Stock, Depth Charges and Accessories
OD 12067-G	1	2	Index to Navy Ammunition Stock, Mines and Mine Material
OD 16086	0	0	U. S. Naval Underwater Weapons, Operational Characteristics and Tactical Data (Section B)
OP 1105 Vol. 6	2	0	Preservation and Preservation-Maintenance of Ordnance Equipment in Shore Storage
OP 1118	2	0	Instructions for Installation of U. S. Naval Mines in U. S. Naval Aircraft
OP 1391	1	1	U. S. Naval Mines
OP 1452	2	3	Mine Accessories; Description and Instructions for Testing
OP 1631	2	0	Ammunition Hazard Classification, Dimensions and Weights (Chaps. 14 and 15)
OP 1860	0	0	Mine and Depth-Charge Test Sets
OP 2213	0	0	Pyrotechnics and Miscellaneous Explosive Items
OP 2238	0	0	Identification of Ammunition
OP 2567	0 <sup>s</sup>	0	U. S. Naval Mine Firing Mechanisms, Descriptions and Instructions for Testing
ORD 696	0 <sup>b</sup>	0	Operational Characteristics of U. S. Naval Mines

NOTE: For a list of current BUWEPS Notices and Instructions see page 13.

## FOOTNOTES

- a-New manual in preparation; not yet available.
- b-New revision in preparation.
- c-1853 dated Nov '52 is official. First revisions dated 1 July '58 and 15 Sep '60 out of stock but also approved for use by holders pending release of official 1st revision.
- d-Advance copy to 3d revision out of stock but approved for use by holders pending release of OP 2567, for which see footnote s.
- e-Not yet in print. Advance copies, released to selected activities, now out of stock.
- f-Out of stock; new revision in preparation.
- g-Change 1 is advance copy of a separate, complete assembly manual for Drill Mine Mk 18, available from Naval Mine Engineering Facility, Yorktown, Va.
- h-Advance or preliminary copies of next revision approved for use by holders; reprints to be available after 30 June 1962.
- i-Advance copy to 1st revision out of stock but approved for use by holders; special editions of OPs 1807 Vol. 2, 1808 Vol. 2, and 1809 Vol. 2 also out of stock

but preferred for use by holders pending a new printing thereof.

j-OP 2637 Vols. 1-5 is out of stock but preferred for use by holders. Non-holders use listed manual pending official release of 1st revision to OP 2637.

k-OP 2637 Vols. 1-5 is out of stock but preferred for use by holders. If you haven't OP 2637, use advance copy or preliminary edition of listed publication, also out of stock pending official release of 1st revision to OP 2637.

l-Advance copy to 1st revision dated 9 Apr '58 and special edition of 1st revision dated 15 Sep '60 out of stock but approved for use by holders pending reprint of official 1st revision. Special edition preferred. All 1816s pertain to use of old-style drill gear (Float Mk 15) only.

m-Mine not yet released for service use. Non-official advance copies of assembly manual released to selected activities, now out of stock.

n-OPs 2608 and 2974 published in preliminary editions only; distributed for use of selected activities pending release of official manual. Out of stock.

o-Covers use with new universal drill gear (Float Mk 17) only. For use with older drill gear (Float Mk 15) use advance copy to 1st revision of OP 1816 dated 9 Apr '58 or special edition dated 15 Sep '60, both of which are out of stock pending reprint of 1st revision.

p-Out of stock pending preparation of 1st revision.

q-Preliminary edition available pending preparation of official manual.

r-Advance copy to 2d revision out of stock but approved for use by holders pending preparation of new official manuals.

s-OP 2567, a new manual to supersede all mine firing-mechanism manuals, is in preparation. Partial copies of a preliminary edition, covering pre-issue tests of mechanisms where indicated by references to this footnote and now out of stock, have been distributed to selected activities for comments and advance info pending release of official manual.

t-Fire Mech 22-1 (preferred item) also covered in preliminary OP 2567, for which see footnote s. Fire Mech 22-0 (use until stocks exhausted) covered only in listed publication.



## CURRENT BUWEPS INSTRUCTIONS AND NOTICES

Here, supplementing the bibliographical information on the preceding pages, is a list of current BUWEPS Notices and Instructions on mines and depth charges. We're not convinced that this list is complete but it's the best dope we've been able to get. If you know of any needed additions, please let us know too.

BUWEPSINST 8500.3 pub 15 Nov '60: Rubber and metal diaphragms in assembled mines and depth charges, protection of. Cancellation date: none.

BUWEPSINST 8500.4 pub 10 Mar '61: Investigations of incompatibilities between source inspection and reinspection of mine and depth-charge material reported by NWS Yorktown and NAD Hawthorne; procedure for. Cancellation date: none.

BUWEPSINST 8550.2 pub 3 Aug '60: Cable Assembly CA-919 (DWG 1275103) for Mine Test Set Mk 26 Mod 2; procedure for modification of. Cancellation date: none.

BUWEPSINST 8550.5 pub 19 Sep '61: Installation of batteries in mines for Fleet Service-Mine Tests. Cancellation date: none.

BUWEPSINST 8550.6 pub 13 Nov '61: Test mines, explosive-charge limitations when recovery is required. Cancellation date: none.

BUWEPSINST 8551.1 pub 14 Mar '61: Mines Mk 52 and Mk 55; recovery of. Cancellation date: none.

BUWEPSINST 8553.1 pub 15 Nov '60: Explosive Fitting

Mk 2 Mod 1, removal of shorting bar from. Cancellation date: none.

BUWEPSNOTE 8550 pub 3 Jan '62: Hand-wound clock-delay mechanisms; storing and shipping of. Cancellation date 30 Nov '62.

BUWEPSNOTE 8550 pub 19 Jan '62: Discrepancies noted during Fleet Service-Mine Tests, first half FY 1961. Cancellation date: 30 Jun '62.

BUWEPSNOTE 8551 pub 25 Jul '61: Air-laid mines in Fleet Service-Mine Tests; use of keeper wires on. Cancellation date: 31 Jul '62.

BUWEPSNOTE 8551 pub 30 Mar '62: Mine Mk 25 Mods 0, 1, or 2 assembled with Mine Fin Mk 9 Mod 0 (Operational Assemblies 21, 22, 23 and 24); information on. Cancellation date: 31 Jan '63.

BUWEPSNOTE 8553 pub 17 Nov '61: Explosive Fitting Mk 2 Mod 1; removal of limitation on use of. Cancellation date: 30 Jun '62.

BUWEPSNOTE 8554 pub 13 Sep '61: Magnetizer and tester for magents used in Mine Firing Mechanism K-4 all Mods; instructions for calibration of: Cancellation date: 30 Jun '62.

### HOW TO SAVE MAYBE YOUR RIGHT EYE

Those of you who have been connecting cables CA-958 to the cutter and signal explosive fittings in Mk 15 floats these many years (and who hasn't) may be in for a shock when you try to hook the thing up to a Drill Mine Mk 52 or 55. It could even be worse.

You could follow the present instructions in advance copies to OP 1816 to the letter and promptly blow the cutter's explosive fitting. This could be bad.

The reason is to be found in the Cable Assembly CA-99 used in the 52 and 55 drills. In it there is a self-contained 250-mike 10-volt capacitor. Now bear in mind that CA-99 is hooked up in the cutter circuit, that OP 1816 calls for an ohmmeter check of the circuit immediately before connecting CA-958 to the cutter's explosive fitting, and that many of the ohmmeters we use put out as much as  $7\frac{1}{2}$  volts. Under these circumstances you can see where plenty of energy can be absorbed by the capacitor.

The normal chain of events would be for the capacitor to discharge through a paralleled 0.1-meg resistor, and if you wait long enough it will. But the R-C time constant is such that this can take two minutes, during a goodly portion of which the potential will remain great enough to cause that accident you don't need and we don't want. So what's to do?

The solution may be a bit bothersome but we hope every last holder of first revisions of OP 1816 will do all hands a favor by taking care of it right now. Like this:

► If yours is an advance copy dated 9 April 1958, limber

up your trusty typewriter and copy the material under Explosive Fitting Installation on pages 89, 91, and 92 in such a way that you insert the instructions for the voltage check (now steps 4 through 8 on pages 89 and 91) in between steps 13 and 14 on page 92.

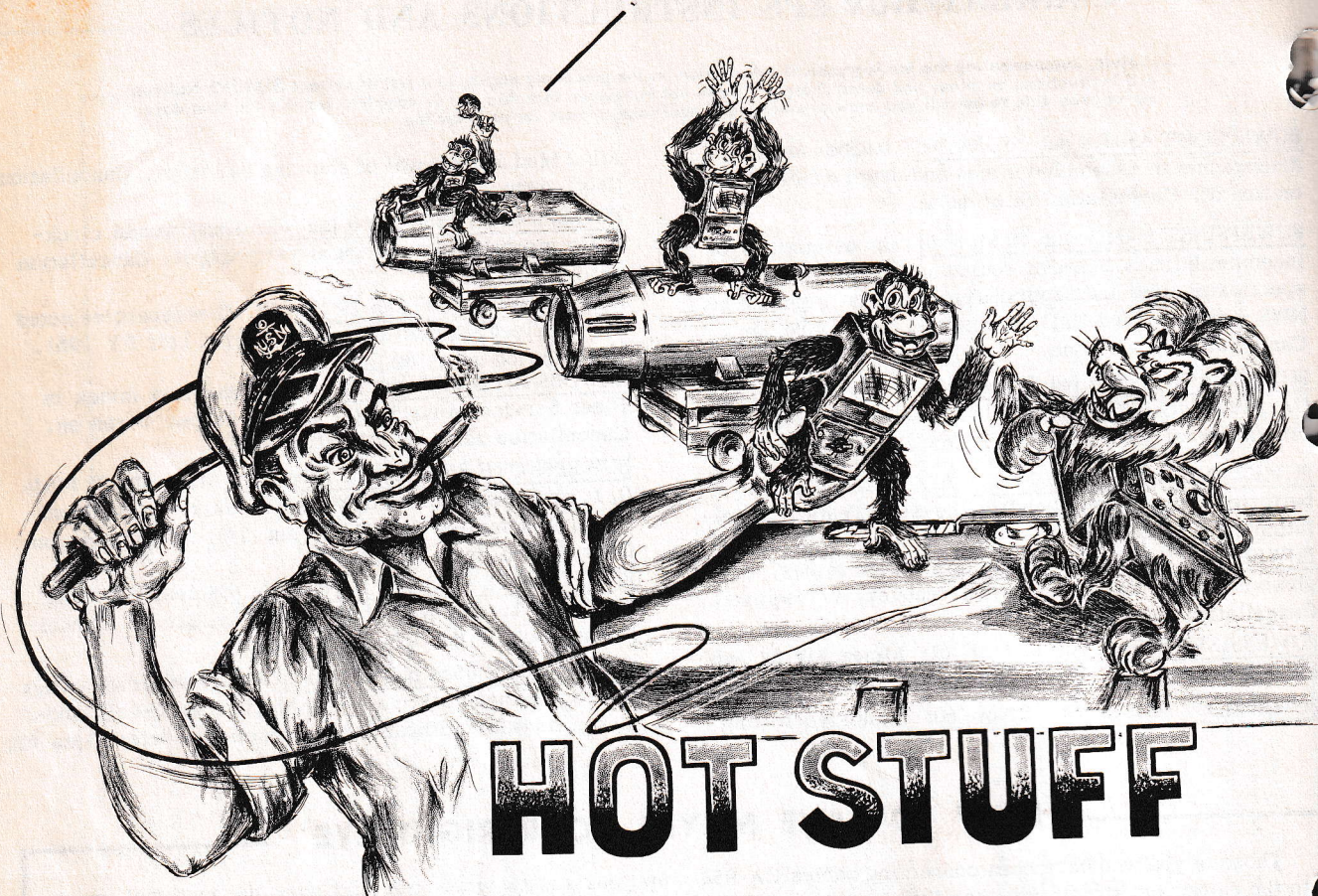
► If yours is a scarce special edition of the first revision dated 15 September 1960, copy the material under Explosive Fitting Installation on pages 74, 76, and 77 of Volume 7 in such a way that you insert the instructions for the voltage check (now steps 4 through 8 on pages 74 and 76) in between steps 13 and 14 on page 77.

► For either book type on only one side of the paper, and finish the job by reading your copy to a buddy holding the original to be sure you haven't added any errors. Then staple or paste your new pages over the ones now in your book.

Quite soon now you'll be receiving a new revision to OP 1816 in which this correction has already been made. Meantime this reversing the sequence of resistance and voltage checks will give your voltmeter a chance to eat off any voltage from CA-99's capacitor. Its needle may momentarily swing upscale or downscale depending on which leads you hook up to, but by maintaining connections until it reads zero you'll know for sure that that capacitor is discharged and it's safe to proceed.

You might write a note to that effect on one of your new pages. When you get to see him you might also thank B. G. Gotshall, MN1 at Long Beach, for reporting the potential hazard you'll have squelched.





### Circuits parade

Dear Barnacles:

I say a voltmeter's a voltmeter. Whether it's in Test Set Mk 97 or not, it still measures voltage. So why do you so consistently specify separate voltmeters for final detonator-circuit tests?

T. E. D., MN2

Dear Ted,

Ah Spring! Buds on the bushes, pollywogs in the pond, crocuses croaking, and all of a sudden some jokers want to trip the light fantastic through det tests.

It's also the time of year when the circus hits the road, but that's no excuse for monkey shines among the mine circuits...like for instance where Test Set Mk 97 is used. Remember, in the operational tests of mines 25-1, 36-2, and 49-1 this set's voltmeter gives you an indication of firing voltage. That's fine. But remember, too, that you then have dummy plugs substituting for your CD-14s, test cables connected to the firing mechs, etc., etc. So this is no time for a test to determine whether det installation will be safe. Not when so many connections must then be switched before some mother's son goes ahead with the job.

It's later, after all operating connections have been restored, that the det-circuit test must be performed.

14

And at this stage you'd have to re-connect the entire set to get the 97's voltmeter circuit to work, disconnecting some of the mine's firing circuit and thereby defeating the purpose (safety) of the pre-det-installation check.

Unfortunately OPs 1797, 1798, and 1808 now say simply that you should use a voltmeter. What they should specify is an independent voltmeter, such as your AN/PSM-4A includes. And they will. Meanwhile PUB-S-CRAWLIN' in this issue tells you where.

*B. Amadebutt*

### Pass da lettle lugs, Luigi

Dear B. Butt:

CA-404 that connects to the TB-7-0 in Mk 10-3, 7, and 9 mines' sinking devices has lugs too large to fit this TB.

G. U. L. MN2

Dear Gus,

Yours is by far the most common of all mine-cable gripes. Back in T-Shooter 1-60 (page 13) we showed how to make a cable-lug shrinker that provides many a fix. On some cables, though, the only answer is to install smaller lugs. For your CA-404s the replacement is Z-7001-2101.

*B. Amadebutt*

TROUBLESHOOTER 2-6



## Howdoyagetta Floogle Street ?

Dear B. Arnaclebutt:

OP 1452, page 118, 2d column (under description of SD mechanisms) says that when an SD mechanism is used in parallel with a CD-14, the CD-14 sterilizing cam should be set at the average time of the resistor used. OP 1765, page 31 doesn't agree with this. What's the latest on this perennial see-saw?

P. O. W. MNC

Dear Chief,

BUWEPSINST 8550.3 of 20 Sept 1960 (wrongly numbered 8550.4 in the identification symbols and soon to be cancelled) actually called for the average time. But forget it—because BUWEPS has now reconsidered, and has concluded that average time could excessively limit the "live" period of the mine.

What they say now is that all pertinent publications should call for setting the clock at the nominal time of the sterilizer. BUWEPSNOTE 5215 of 2 Jan. '62 makes this official.

*B. Arnaclebutt*

## Fixer elixir

Dear B. Butt:

The DA switches of some CD-14-6s are sluggish, and many make poor contact when closed. What about increasing the length of the cam separation sleeve from 0.090 to 0.110? Seems as if that would help. Or maybe a 0.020 flat washer inserted in future models at time of procurement?

J. C. P., MN2

Dear J. C. P.,

Could very well be. In any case you can be sure we'll give your suggestions a good going over at such time as new 14s may be procured. Meantime, though, the best we can advise is to use "Quietrol" (the stuff radio and TV repairmen use on variable pots) on the cam posts. It helps.

*B. Arnaclebutt*

## Now ain't that a hole in the head!

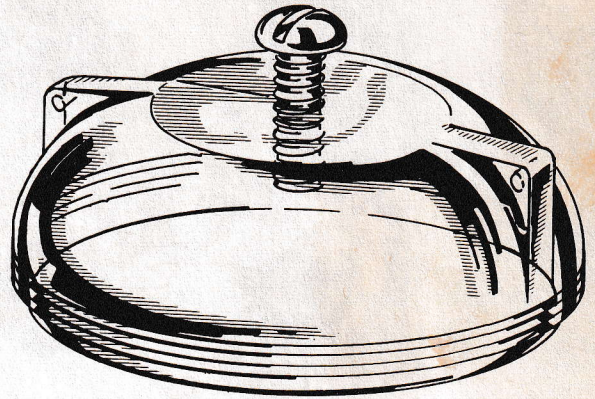
Dear Buttster,

No doubt you've heard plenty of gripes since your first issue. Well here's another. How come a Clock-Starter Depressor Z1350-093-1043 costs \$52.00? We take an old CS cover (Z1350-038-6732), drill and tap a hole for a 3/8"-16 screw in its head, and produce an equal tool for 65 cents. Is this genius?

W. J. M., Jr., MNCA

Dear Bill,

I don't know whether it's genius, but I do know that at



that price it's justified. The gripe, I mean. Also the one from J. L. Harris at Navy #955 on the same thing.

The answer, let's hope, is that somebody merely hit a wrong key or two on a typewriter or card puncher. Anyhow, we'll try to get 'er fixed up. For the record, though, I think everybody should know how to make their own depressors like yours. For the few who haven't done it already it's shown on this page. Many thanks.

*B. Arnaclebutt*

## Sam, the sleeves!

Dear B. Arnaclebutt:

One of our A-6-3 firing mechs was fouled up because the sleeve on the 300-mike condenser didn't cover the terminal lug, letting the lug short on the housing. What we did was replace the sleeve with a longer one and bend the lug clear.

K. E. H. MN1

Dear Ken,

Yours is our first Rudminde on this one. But if short sleeves turn up regularly we'll sure change the drawings before any new procurement of these mechs. Meantime, needless to say, your sleeve fix was just right.

*B. Arnaclebutt*

## The 18th hole

Dear Barnacles:

Since Bleeder Assembly Z5905-691-4643 is the one to use on Mines Mk 25-2; 27-2,3,4, and 5; 36-1 and 3; and 49-2, is Bleeder Assembly Z5905-093-0722 now obsolete?

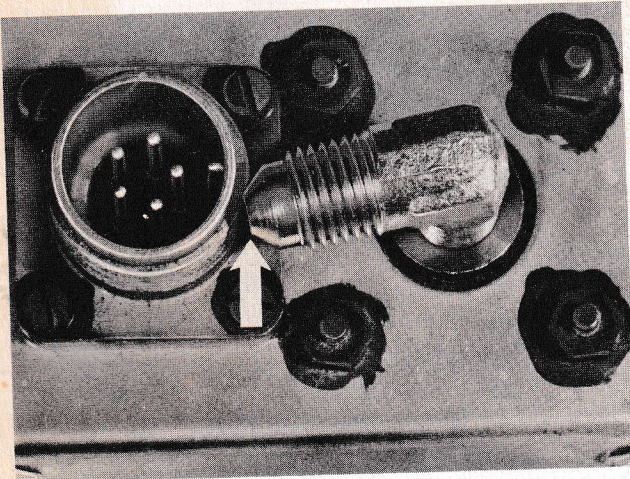
T. O. T., MN1

Dear T. O. T.,

Nope. But it's specified exclusively for use in mine Mk 18-0.

*B. Arnaclebutt*





### Elbow room

Dear B. Arnacles:

As you can see from the attached photo, when we tried to screw the elbow fittings into the Mk 3-1 sensitivity switches for some Mk 36-2 mines, 11 out of 20 bugged the threads on the amphenol connector. Did somebody send us a bunch of rejects . . . or what?

B. R. O.

Dear B. R. O.,

They're mostly "or what" . . . crude standard-stock fittings with over-generous top tolerances that are nevertheless okay for 99 percent of the applications where these ells are used. That being the case, I can't promise you won't run into more, but probably not too many.

So it'll be a bother, Brother, but the best you can do is to try another when you find one that's too big, and turn the rejects back to supply for other uses. In fact, all hands may soon see a BUWEPSNOTE telling them to screen their stocks to be sure they have one acceptable ell for each 3-1 sensitivity switch on hand. This, of course, won't make long ells get shorter, but there is also a last resort:

In an emergency, with no ells short enough to fit, you could remove the amphenol's mounting screws, tighten one of those oversize ells in position, and then secure the amphenol again. If you have to resort to this, don't forget to put fresh glyptal on the amphenol's screws. Also, don't forget to Rudminde again.

*B. Arnacles*

### Red, white, and black

Dear B. Butt:

The three leads of CA-470 (used with Test Set Mk 384-0, the new clock-timing panel) are marked "+" (red), "6V" (black),

and "12V" (white). Wouldn't it help avoid confusion if they were marked "-", "+6V", and "+12V"?

T. I. P.

Dear T. I. P.,

Egad, NO! What it would do is reverse the polarity to the clocks' winding motors, make them run backwards, and bust up the works for sure.

But take heart. As a result of your recommendation we are changing DWG 1273620 to show the 6V and 12V leads as negative. The + lead is the common positive and had better stay that way. CA-470s now in the field should be marked this way too.

*B. Arnacles*

### Oh Min!

Dear B. Butt:

T-Shooter 1-62 recommends that CD 12 and 17 should be wound to maximum setting for storage. BUWEPSNOTE 8550 of 24 May 1961 and 3 Jan 1962 both state "Wind to the minimum setting."

J. R. B. MN1

Dear Bruce,

What a revoltin' development! I didn't miss it either—after the goof had been printed. When you get that 1-62 T-Shooter out and cross out maximum and write in minimum, I hope you don't forget to add (approximately 1½ to 2 turns of the key) like those BUWEPSNOTES also say.

*B. Arnacles*

### Let's do it

Dear Barnacles:

T-Shooter 4-60 said that NMEF was studying field recommendations that clocks be wound after mine recovery. Any hot flashes

T. I. C. MN1

Dear T. I. C.,

The word is: Wind 'em! As soon as they come aboard. Just make sure the extenders (if used) have retracted, then remove the clock starters and wind the clock delays to START.

The reason: CDs left armed not only cause batteries to deteriorate and perhaps leak electrolyte on other components, they can also cause firing mechs and circuit breaks to wear out as a result of looks received when the mine is moved or stored near motorized equipment.

This applies to all drill and inert-loaded FSMT mines.

*B. Arnacles*

TROUBLESHOOTER 2-62



# Do You do this Job Right?

**P**EOPLE STILL DON'T BELIEVE. In T-Shooter 4-61 Barnacles explained why the use of arming-wire safety locks is mandatory on all air-laid mines, yet people still want to use something else. In T-Shooter 1-58 we explained about arming-wire lead but had to repeat the scoop in a feature in 4-61.

And now comes the business of handling and shipping these locks. We've talked about it in several issues, shown pix of shipments packed all wrong, yet the latest FSMT results show an increasing dud rate attributed to avoidable mishandling of these same safety locks.

## Let's face facts

These locks, if in good shape when installed, will stand up under pressures to 4,000 pounds. What you have to watch out for, though, is the effect of rough handling on the three bent tabs that hold the retainer to the sleeve (see illustration lower right). Any rough handling before installation and those tabs get bent and let the retainer become wobbly on the sleeve. Sound crazy? Tests show that a mere 18-inch drop onto a concrete deck can weaken them enough so they won't hold the retainer during the water-impact shock of planting.

And what happens then? The retainer tends to drift enough to get in the way of the piston nut and prevent full piston-rod travel. The mine doesn't arm.

## Remember the Maine...

Mines are for war. Live mines, that is. Not duds. Maybe in peacetime it's easy to shrug off a drop in reliability—to figure it's a temporary or isolated thing that'll go away if you ignore it.

But maybe it won't. I'm talking now to you at the depots who pack and ship these locks to the advance-base guys. Maybe the locks you ship this month, by the time they're used, will be deciding factors somewhere as to whether an enemy mission is accomplished or given the Davey Jones. The way you can help make the difference is simple:

- ▶ Remember that there is only one right way to package these locks: each should be wrapped individually, packaged two to a box, each box sealed with tape, and the boxes packaged in shipping containers such that overall weight does not exceed 75 pounds.
- ▶ Do not take locks out of their sealed containers. Don't even break seals. If you come across some unsealed ones, report them for disposition. Don't ship 'em.
- ▶ If some of the locks get a severe drop in the course of preparing a shipment, even though they're packaged, re-

ject them. Remember, we've got a lot more mines. And they cost a lot less!

## ...and also Pearl Harbor

Now a word to those of you who unpack and use safety locks, especially AOs:

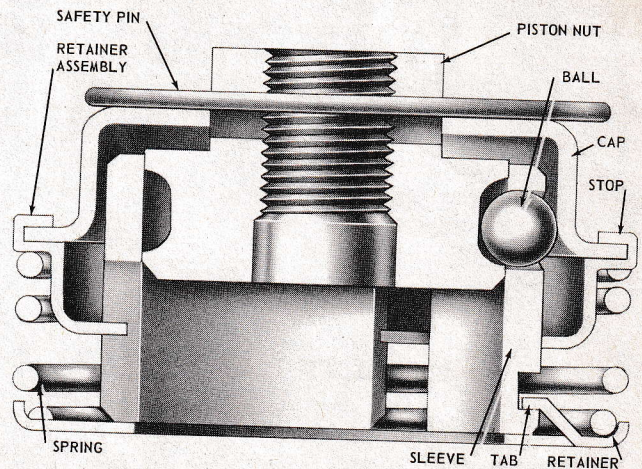
- ▶ Do not—repeat, do not—break the seal on a box until you're ready to install a lock on a mine. If you receive locks in unsealed boxes, reject them. Sounds picky but that's the way this cookie must crumble.
- ▶ Before you install, inspect. Reject any lock that has any corrosion inside or out, that has a jammed locking ball, a spring that's not evenly seated on its retainer, any dents in the sheetmetal stampings, distorted or loose tabs, or burrs in the slots.
- ▶ Reject any lock that gets dropped more than about 18 inches after its been removed from the box. Never mind how perfect it may appear on the surface.

## But is this official?

All that remains is to install the lock right and get the arming wire leading off at a proper angle. For this I refer you to the feature article on duds in T-Shooter 4-61 and the further references listed there.

And now, for those who wonder whether the foregoing is true blue, there's a BUWEPINST in the mill to back up what's been said about inspecting and handling, and there's also the detailed authority on safety-lock packaging: DWG 385484.

*The Editor*







**Almost everybody**  
**can find something to Rudminde!**