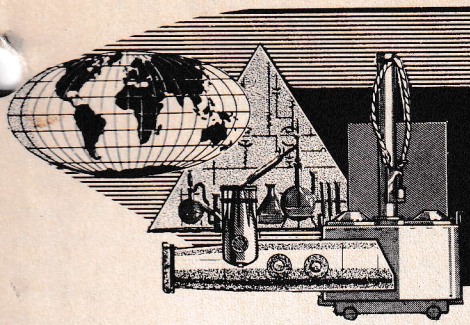
I-0618-267-2630

C-4

No. 2-63

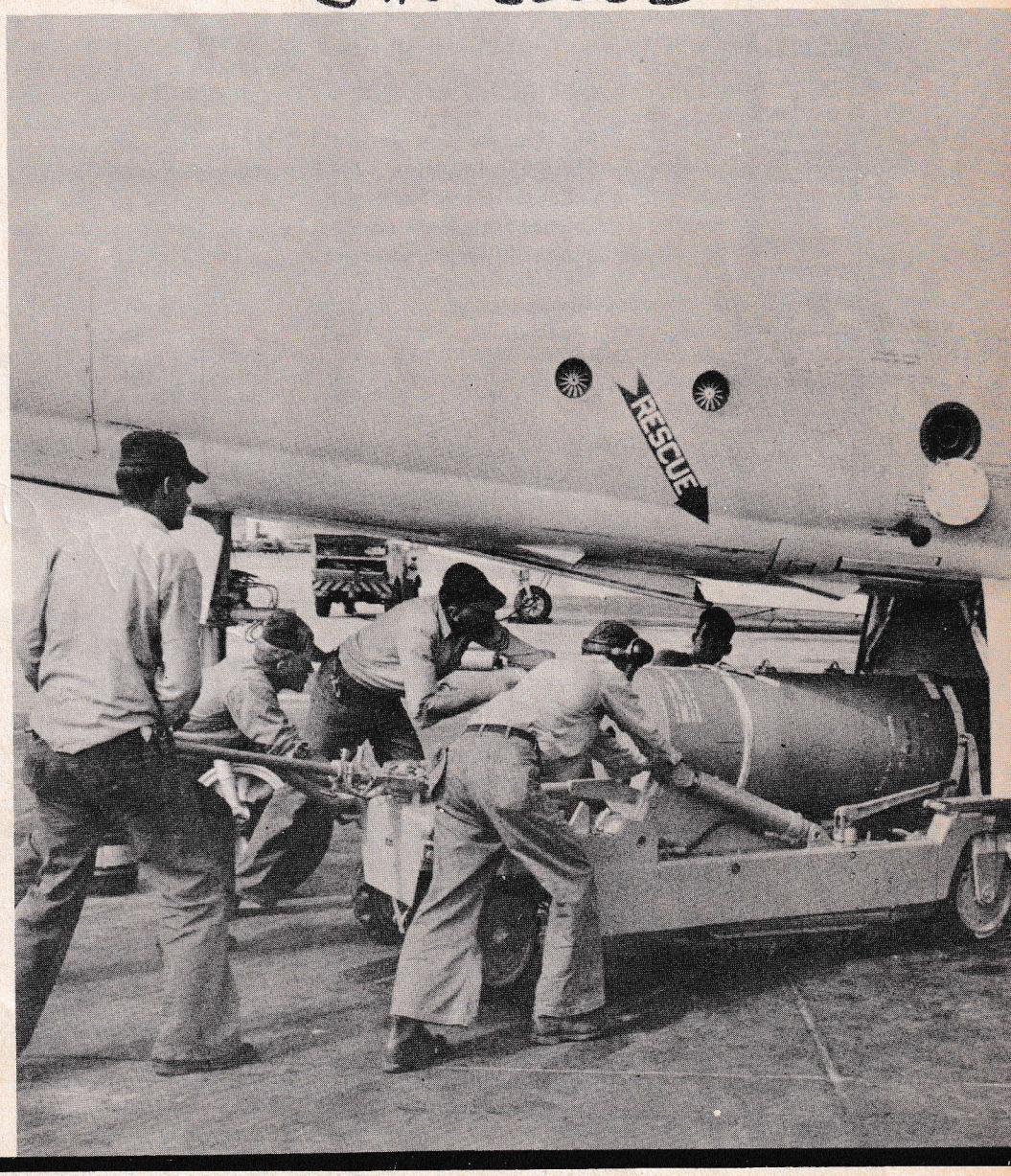


mine and depth-charge

THE TROUBLESHOOTER

CANCELLED

- ▶ FSMTP Report, 1963
- ▶ O-Ring Review
- ▶ Control Unit Mark 66 Mod 1



AN OFFICIAL *BUWEPS* PUBLICATION

in this issue . . .

THE TROUBLESHOOTER

mine and depth charge

Published by the Naval Mine Engineering Facility, Yorktown, Virginia.

Frederick F. Jewett, CDR., USN....Officer-in-Charge
Haines A. Miller.....Technical Director
Frank N. Potter.....Editor
Roland R. Rollins.....Art Director

REGULAR FEATURES

ARTICLES

COVER PHOTO: Was this one a dud? Did any personnel errors slip into its assembly? Fleet Service-Mine Tests give us some very serious answers. See pages 10 through 15.

1 APRIL 1963

By direction of the Chief, Bureau of Naval Weapons, Troubleshooter is an official BUWEPS publication. Technical content pertinent to the assembly, testing, and delivery of US naval depth charges and mines is both authoritative and directive in nature, and reference may therefore be made to a particular issue as the authority for adoption of ideas promulgated therein. Content which does not fall in this category is reasonably verified before publication but is not to be considered official nor representative of official BUWEPS doctrine.

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 NAVWEPS Form 8500/5 (1-63). Everyone who encounters problems with these weapons is encouraged to report them via this form direct to the Naval Mine Engineering Facility as prescribed by BUWEPSINST 8500.8.

Troubleshooter is published quarterly by the Naval Mine Engineering Facility's Publications Division and printed by NPPSO-5ND, as approved by the Secretary of the Navy on 21 February 1962. Contributions, questions, address changes, and requests for regular distribution should be addressed to: Editor, The Troubleshooter, Naval Mine Engineering Facility (Code Ts-2), Yorktown, Virginia, U.S.A. Request copies of back issues from the Naval Supply Depot, 5801 Tabor Ave., Philadelphia, as instructed in NAVSANDA Publication 2002.

THE OFFICIAL JOURNAL OF THE *RUDMINDE* PROGRAM

RUDMINDE REPORT TO THE FLEET

What's Been Reported? What's Being Done?

SHORT—BUT NOT SO SWEET

We've been getting a rash of Rudmindes reporting incomplete shipments of material. In a few cases, these shortages were due to incorrect design documentation—and we're correcting this. But most shortages were the result of personnel errors, such as improper identification of parts and parts not ordered.

Often, the receipt of an incomplete shipment has resulted in someone's pushing the panic button. This throws the supply system into high-cost emergency procedures. Frequently, incomplete shipments mean that the receiving activity can't meet scheduled deadlines for delivery of completed weapons. This, in turn, can force the cancellation of scheduled ship and aircraft services—hard enough to get in the first place.

Lack of proper parts can affect mine readiness as surely as can defective ones.

Material not in the proper place at the right time spells waste in many ways. Keep those Rudmindes coming and we'll get to the bottom of any case of short shipment you tell us about. It's up to all of us to make sure that "all systems are go" to keep mine readiness a reality.

RUDMINDES TELL THE EDITOR

If you have a particular shipping problem that needs some explanation from us, it may not be as uncommon as you think it is. Perhaps the trouble needs treatment in the T-Shooter.

We plan to publish more articles like the ones about those O-rings and those control units you'll find in this issue. An article about ordering might be helpful. It's up to you to clue us on your article needs via Rudminde.

IN THE SPIRIT OF '76

BUWEPSINST 8500.8 of 18 Jan 1963 (which cancels NAVORDINST 8500.7 of 10 July 1957) lets us know that there's a new Rudminde form—or at least that NAVORD Form 2776, on the face of it, has a new designation. It's NAVWEPS Form 8500/5 (1-63). On the back of it, handily, there are detailed instructions for filling it out.

What should you do with all those old NAVORD Form 2776s you have on hand? Use them until NAVWEPS Form 8500/5s are available. They'll be in the supply system soon. Order them from the appropriate supply point in accordance with NAVSANDA Publication 2002.

. . . but how do you get your OPs?

Dick Moulton, MN1 on yonder Pacific shore, recently routed a Rudminde that made our editorial heart bleed. Then came more, not from Dick, but from other minemen befuddled by fruitless attempts to acquire one or two copies of this or that OP.

Some had written BUWEPS. Some had written NOL. Some had written the Naval Gun Factory, some NWSO, and several had written to all. None, of course, had any luck because these are all the wrong places to write. Not only that, more than half had written to request OPs whose current status is NG. That's bad!

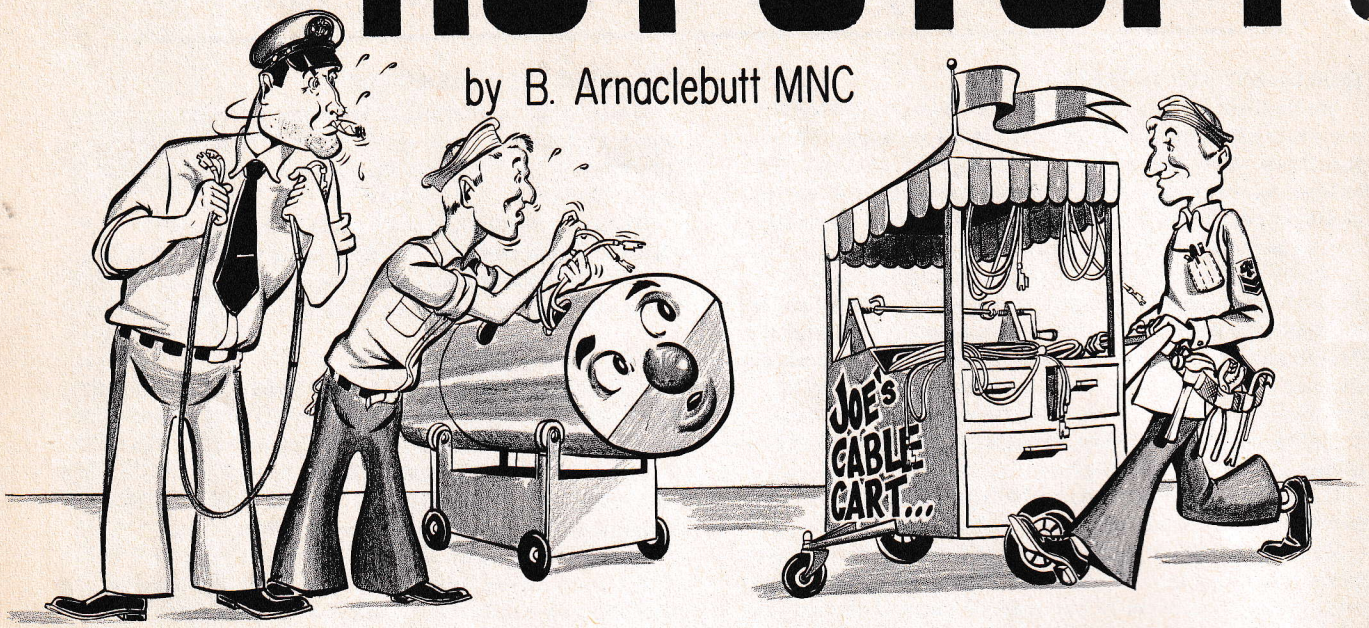
So what's to be done? The first step is to consult the bibliography you just received in T-Shooter 1-63 (page 10). That goes for depth charges too. It is the only, repeat—only, document that will give you the current status of your assembly OPs.

Next, you should know that these OPs are now stocked in cognizance I. This means that for each there's a cog I stock number. These numbers look like and are used just like federal stock numbers. You use 'em on a regular NAVSTRIP (DD Form 1348) to requisition whatever publications you want from the one and only supplier of official mine and depth-charge OPs: The Naval Supply Depot, 5801 Tabor Avenue, Philadelphia. This goes for forms too, except that for most there'll be a requisitioning point closer than Philly. In any case this brings us to the question of where to find the stock numbers. Some day, we're told, you'll find them printed right on all cog I forms. As for new OPs published by NMEF, we're printing them right under the black line that runs across the top of the title page. T-Shooter too: In T-Shooter Index No. 1, and on the cover of this and all forthcoming issues, you'll find the stock number to use for NAVSTRIP. To get other pub stock numbers you need NAVSANDA Publication 2002, an index to all cog I forms and pubs. And that's about as far as we can go with this last-minute-before-printing-scoop.

In our next issue we'll give you some real gnat's-hair advice on using NAVSTRIP for cognizance I and will list stock numbers for all back T-Shooters and all known changes and OPs on depth charges and on mines. Until then, just remember that nothing we've said here applies to ODs.

HOT STUFF

by B. Arnaclebutt MNC



NOTE: Information in this feature has been verified by BUWEPS' design-cognizant agency for depth-charges and mines. Except where otherwise indicated readers are therefore authorized to adopt these ideas and procedures pending preparation of changes and revisions to master design documentation.

The seemy side

Dear Barn Acles:

There's this Cable CA-30 used in OA 5 of Mine Mark 25-2. The cable, we've got; the right lugs on the battery end, we haven't. We've been drilling larger holes in these lugs to make them fit the battery terminals. Seems as if it would be a simple matter to have proper lugs on a cable. At least, it seems as if there ought to be an FSN by which we could order the correct lugs.

T. A. B. MN1

Dear T. A. B.:

This fly has been in the ointment for a long time. Cable-lug misfits come about for reasons too numerous to mention here. The remedy, of course, is to make cable assemblies with the proper lugs in the first place—and we're doing our best to see to it that the drawings are right when cable procurement is made. In the second place, the expedient is "make-do". Drilling out the too-small lugs is acceptable if it doesn't weaken the lugs too much. In case you'd like to have a fist-full of the proper lugs for replacement purposes, it would be fine to have an FSN when you order. But an FSN for this #8 round-type lug, we haven't. So, use MS 35436-32; it should do.

B. arnaclebutt

TB patience

Dear B. Butt:

OP 1452 2d Rev states that "Terminal blocks for Mark 14-type extenders come in two sizes; terminal blocks for extenders of more recent production are larger than older terminal blocks and are not interchangeable. Electrical connections are, however, identical."

The electrical connections may be the same as far as location and circuitry go, but the large TB is the only one that will accept the lugs of CA-417 used in Mines Mark 10-3, 7 and 9—also Mine Mark 39-0. How about changing that OP 1452?

N. I. P. MN2

Dear B. Arnacle Butt:

Cable CA-417, used in all mods of Mine Mark 10, sometimes has large lugs, sometimes has small. Also, the terminal block of Extender Mark 14 is sometimes small, sometimes large. This mix-up makes for misfits when large lugs meet small blocks.

Can't we get some cable-terminal block compatibility in mine design?

T. U. K. MN2

Dear NIP and TUK:

As I said in "The seemy side," cable-lug misfits have been the proverbial thorn from as far back as we care to think about it. I don't know how it happened, but there are two different sized terminal lugs 12-Z-7001-2055 used on CA-417s. One lug is 0.316 inch wide and the other is 0.346 inch. There are also, as you say, two different sized terminal blocks used on Extender Mark 14. The smaller block is 0.316 to 0.322 inch between barriers; the larger block, 0.392 to 0.398 inch between barriers. You don't need all these measurements, though, to know you've got trouble with large lugs and a small block. What will help, however, is to know it's okay to trim enough from each side of the large lugs to fit them between the barriers on the small block. Proceed mate.

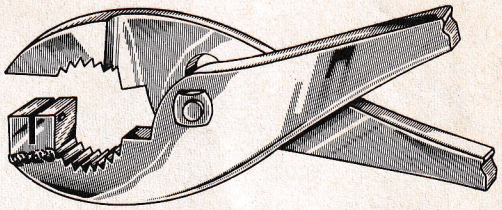
An investigation of mine-cable assemblies back in '59 dug up a weird assortment of lug bugaboos but, as I said, new procurement will eventually clean up most of this mess. Meanwhile, back at the bench, use dikes, files, drills, or those easy-to-make lug-altering pliers (see below) when you need to. Maybe you'll even have to solder or crimp on different lugs once in a while.

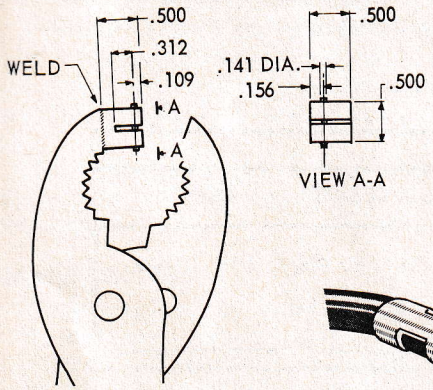
Whatever you do, if you come across lugs that're too big for the TB they're supposed to be screwed onto, don't force 'em; you'll just be asking for trouble later on; TBs with broken barriers are all they're cracked up to be: scrap! The Fleet Service-Mine Test Discrepancy Report in this issue features broken barriers as a source of potential trouble.

B. Arnaclebutt

How to make . . . A HANDY LUG-ALTERING TOOL

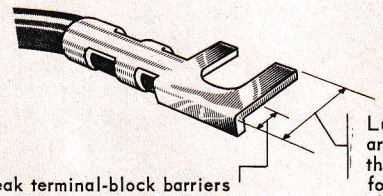
THERE WAS SOME TALK about including these modified pliers in the Basic Tool Set for Mines, but the latest word is that they won't be. This means you make your own—if you haven't already done so. They are for flag-type lugs that're too big to fit between the TB barriers.





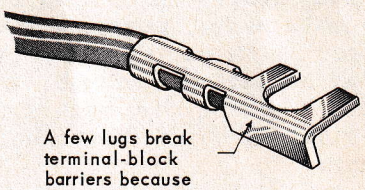
TO MAKE: Use standard Pliers, 10-inch, Federal Specification GGG-P-00471 (NAVY SHIPS) Type II, Class 2, Style A. Weld a half-inch cube of steel to one jaw as shown, then cut a 0.035-inch slot (use hacksaw) approximately 0.400-inch deep, centered in the face of the cube. Next drill a 9/64-inch hole (#28 drill) as shown. Insert a pin (#7 AWG steel wire) in the drilled hole and secure by peening the pin's outer ends.

TO USE: Place flag-type lug's prongs in the tool's slot so that the pin takes the normal position of a terminal screw in the lug, then squeeze the pliers' jaws closed thus reducing the width between the lug's bent side and the bottom of the "U" formed by its prongs (lower right). Most oversize lugs will fit terminal blocks without damage when so bent, but occasionally the ends of a lug's prongs will also have to be trimmed a few thousandths (file or snip) after using this tool.



Most lugs that break terminal-block barriers do so because the width here is too great.

Lug's proportions are changed like this after re-forming with tool shown.



A few lugs break terminal-block barriers because the width here is too great.

Body English

Dear B. Arnacle Butt:

In Test Set Mark 127-3, CA-92's wire end at connector pin "J" comes in contact with the "body" nut of the amphenol causing terminal "J" to ground to the test set chassis. During testing, this shows up as low leakage resistance. Shouldn't sleeving have been used during manufacture? We taped it.

G. F. M. MN1

Dear G. F. M.:

You're right. Sleeving should have been used. The drawing calls for sleeving over the connectors. If time permits, disassemble the connector, unsolder the connections, install size 9 black sleeving; then resolder and reassemble. Black plastic electrical tape will do temporarily.

B. Arnaclebutt

Gold and Silver Waltz

Dear Maestro:

OP 1935 Vol 2 does not agree with OP 2363 Vol 2 regarding the colors of CA-308's leads; nor does either of them agree with the CA-308s we have in stock. On ours, the long leads are gold (+) and silver (-) and the jumper (lead with short ends) is black. Also, some of our CA-308s have tape on their lug sleeves bearing + markings where the sleeves underneath have - markings, and vice versa.

This switcheroo of markings is okay circuit-wise. The only difference is in the way the cable routes to the cable clamps near the jumpered end of the batteries; but cable slack takes care of that. Care to comment?

T. T. MN1

Dear T. T.:

That switcheroo is too tricky. What if the tapes accidentally come off the long leads at one end of the cable but not at the other end? Reversed polarity, that's what!

When you come across a taped-end CA-308, pull those tapes off. Make sure the sleeves on either end of each long lead are marked the same, and that the jumper lead ends are marked + and -. As for the lead colors, forget 'em. Go only by the sleeve markings. Make the color cross-outs for CA-308 in OPs 1935 and 2363 Vols 2 as Clark Starter tells you in Pub-S-Crawlin'.

B. Barnacleburst

Greasy kid stuff

Dear Barnacles:

In three issues of the T-Shooter, we've been told to grease the threads of case-opening fastenings. When I learned how to assemble mines, greasing such threads was taboo. With me, it still is! I say that clean threads are enough. If they're not clean, I chase them with a tap or a die. They've got to be dry to hold properly. Right?

P. A. T. MN1

Dear P. A. T.:

Right! Once upon a time, greasing seemed to be the answer to some case opening problems; but further research reveals that grease should not be used on the threads of these fastenings.

The specified torque limits are based on dry assembly and take into consideration such things as the variable of thread friction due to class of fit and the use of a plated nut (instead of an otherwise equivalent steel one) which could change the tension developed. So, imagine then, the tension change greased threads can cause—especially if the threads have been polished by several prior tightenings and loosenings.

Lubricating screw threads will throw torque readings way off in relation to desired tension and play hob with gaskets. By reducing the friction of the screw threads, lubrication can even cause fastenings to fail entirely.

Do not, I repeat not, grease the threads of fastenings that get torqued; but do make sure that the threads are clean, free from rust, reasonably dry, and chased where necessary. Then, only, can you be sure that your torque readings will be reasonably acceptable.

What about that requirement for Anti-Seize Compound FSN 1350-605-7651 on those aluminum fastenings—like on the Mark 10 mines? Keep right on using it!

B. Barnacleburst

Butterfingers

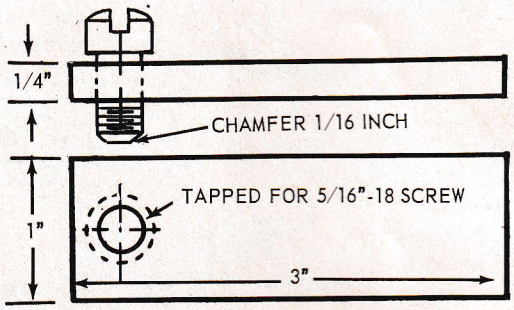
Dear B. Butt:

Starting that blunt-ended screw up into the threaded hole in Mark 25, 39, 40, 43, and 44 signals, used in Mark 15-0 and 1 floats for Drill mines Mark 25, 36, 52, and 55, can be a fiddling bother. Why not furnish a screw with a tapered end?

O. O. P. MN1

Dear Thumbs:

A good idea but, until that Screw, Fillister Head, 5/16" x 7/8"—18 DWG 1420208 Signal Assembly Anchor Drill Mine Float Mark 15 Mod 0/1 shows up with a tapered end, here's what you can do to any blunt-enders that seem to need guidance:



Get yourself a piece of 1/4-inch steel or brass about 1 by 3 inches. In one end (see sketch) drill and tap a hole to take that 5/16" screw. Clamp the other end in a vise and turn the end of the screw through enough so that you can chamfer it with a file about 1/16 inch at a 45° angle. When you back the screw out, you'll chase the end threads clean.

B. Barnacleburst

CABLE CALL

If you have a Test Chamber Mark 4 Mod 1, take a look at its cable CA-59. If the insulation appears deteriorated or damaged in any way (note especially the white lead) send in a Rudminde right away. We need to determine whether or not this condition is common and the result of defective material, so that we can take corrective measures.

Pub-S-Crawlin'

with Clark Starter, MN2

NOTE: Holders of NAVWEPS OPs and ODs on depth charges and mines are authorized to make the write-in changes given here. All reflect change directives verified by the design-cognizant agency for incorporation in forthcoming official BUWEPS Publication Changes which upon release automatically supersede pre-dated information given here.

THEY'RE NOT IN THE INDEX

Pub-S-Crawlin' change items have not been included in Troubleshooter Index Number 1 because, once you've made these advance corrections, additions, and deletions in your publications, there is no need to refer to them again in your T-Shooter copies—except as subsequent Pub-S-Crawlin' items may indicate.

Sometimes a later Pub-S-Crawlin' item may appear very much the same as a previous one; but a thorough check will reveal a word or number change, or an additional sentence or step, that must be cranked into your pub.

Official changes or pub revisons will eventually reflect the advance publication information that appears in Pub-S-Crawlin'.

VOLUME CONTROL

Change 1s, recently issued for OPs 1807, 1808, and 1809, designated these service-mine OPs as Vols 1, to avoid confusion between them and the drill-mine OPs 1807, 1808, and 1809 Vols 2. A Change 2 to OPs 1807, 1808, and 1809 Vols 1 will eventually bring their content up-to-date. In the meantime, keep your copies corrected by making the pertinent write-in changes called out in this section of your Troubleshooters.

M-5s a la MOD

There is some confusion because OD 12067-G, the Index to Navy Ammunition Stock, Underwater-Mine Components, lists Firing Mechanism M-5 Mod 1 for use in Mines Mark 10 Mods 3 and 9 and also lists a Firing Mechanism M-5 Mod 2, but does not state the mine or mines in which this Mod 2 should be used. Actually, the Mod 1 and the Mod 2 are about equally reliable and either one can be used satisfactorily.

Several publications list M-5 Mod 1 but not Mod 2. Changes to these pubs will eventually list Mod 2 as the preferred mechanism with Mod 1 as the alternate.

REPORT REPEAL

The reporting requirement of NAVORD FORM 1955 Rev 10-54 (Depth Charge Report) contained in BUORD-INST 8530.3B of 14 October 1957 was canceled by BUWEPSINST 8015.4A of 20 November 1961, for Fleet units and overseas bases; and for Continental United States activities, by BUWEPSINST 8015.5 of January 1962.

CANCELED BUT NOT KILLED

The BUWEPS NOTICES listed below have been canceled for record purposes only. If you no longer have copies of them, the Troubleshooter references included will tell you what to do.

BUWEPS NOTICE 8551, 25 July 1961, "Air-laid mines in Fleet Service Mine Tests; use of keeper wires on" (T-Shooter 1-61, page 13 "Do You do this Job Right?")

BUWEPS NOTICE 8550, 3 January 1962, "Hand-wound clock-delay mechanisms; storing and shipping of" (T-Shooter 2-62, page 16; "Oh Min!" and 1-62, page 6, "Hickory, dickory, clock").

BUWEPS NOTICE 8551, 16 May 1962, "Mines, Underwater, Drill, Mark 52 and Mark 55 assembly; EXPLOSIVE SAFETY HAZARD during" (T-Shooter 2-62, page 13, "How to save maybe your right eye").

PENCILS AND PENS

Now move on to the latest round-up of write-in pubs corrections.

▶ **MASS CHANGE:** Under Tests of Assembled Mines, in the OPs listed below, the following sentences should be added to the Voltage Polarity Test as indicated:
(1) CAUTION: If CA-714's phone plug is not fully inserted in the test set's jack, the connections will be reversed and the meter will give the wrong indication of voltage polarity.
(2) If the needle does not deflect, or if it deflects in the wrong direction, the mine has been improperly assembled, a component is defective, or CA-714's phone plug is not fully inserted in the test set's jack.

OP 956 3d Rev (Mine Mark 25-0): On page 50, after paragraph c under Voltage Polarity Test, add (1); in paragraph d, change the second sentence to read (2). Make same changes to item 24 in back of book.
OP 1797 2d Rev (Mine Mark 25-1): On page 57, after paragraph 48c, add (1); in paragraph 48d, change the second sentence to read (2). Make same changes to item 24 in back of book.
OP 1765 2d Rev (Mine Mark 25-2): On page 49, after paragraph 42c, add (1); in paragraph 42d, change the second sentence to read (2). Make same changes to item 24 in back of book.
OP 1807 1st Rev (Mine Mark 49-0): On page 41, after paragraph 4 under Voltage Polarity Test, add (1); in paragraph 6, change the second sentence to read (2). Make same changes to item 27 in back of book.
OP 1808 1st Rev (Mine Mark 49-1): On page 45, after paragraph 4 under Voltage Polarity Test, add (1); in paragraph 6, change the second sentence to read (2). Make same changes to item 25 in back of book.
OP 1809 1st Rev (Mine Mark 49-2): On page 40, after paragraph 4 under Voltage Polarity Test, add (1); in paragraph 6, change second sentence to read (2). Make same changes to item 20 in back of book.
OP 1811 (Mine Mark 50-0): On page 19, after the sixth line under Voltage Polarity Test, add (1); in paragraph 4, change the second sentence to read (2). Make same changes to item 2 in back of book.

▶ **NAVORDINST 8500.7:** This publication has been superseded and canceled by BUWEPSINST 8500.8 of 18 Jan '63.

▶ **NAVORDLIST 23922 Rev A 5 May 1959:** Change to make Item 22 Strap top Left and Item 31 Strap top Right. Only Left and Right are reversed. The numbers are correct.

▶ **OD 7568 2d Rev (Mine Mark 49-0):** On sheet 44, change description of item 257.0 to read: Screw, machine, pan-head, steel, zinc plated, No. 6-32NC-2A x 5/8"; in the used with column, add 211.0; in the general arrangement column, cross out 12-Z-1084-119 and write in MS 35225-31; in the code number column, cross out Z43-S-65837-7270 and write in G5305-043-6666.

▶ **OD 9364 (Test Set Nomenclature):** On page 1-78, in the second line of the paragraph on Test Set Mark 157 Mod 0, cross out 25 and 1 and write in 23.75 and 2.5. Add the following at the end of the paragraph on Test Set Mark 157 Mod 1: LD 486201, Assembly Drawing 1800296, OS 11538.

▶ **OP 948 1st Rev (Mine Mark 10-3,7,9):** On page 3, in table 1, add: Firing Mechanism M-5 Mod 2 (Red) as the preferred component and indicate Mod 1 (Red) as the alternate A, and Firing Mechanism M-5 Mod 2 (Blue) as the preferred component and Mod 1 (Blue) as the alternate A.
On page 26, figure 19, cross out Mod 1 and write in Mod 2. In the paragraph under Firing Mechanism, cross out the two references to Firing Mechanism M-5's Mod 1 and write in Mod 2.
On page 48, paragraph 18, cross out Mod 1 for Firing Mechanism M-5 and write in Mod 2.
On page 52, change the 3d line of table 10's middle column to read: White, yellow or brown with black tracer. (The white may have turned to yellow or brown with age.)
On page 59, paragraph 44, line 2, cross out 1 and write in 2.
On page 84, after G, cross out Mod 1 and write in Mod 2.

▶ **OP 956 3d Rev (Mine Mark 25-0):** On page 56, in the WARNING after paragraph 53, cross out DC-8 and write in CD-8.

▶ **OP 1797 2d Rev (Mine Mark 25-1):** On page 24, column 2, line 6, cross out 1779 and write in 1799.

▶ **OP 1807 1st Rev (Mine Mark 49-0):** On page 50 and in item 40 in the back of the book, cross out step 18 and renumber steps 19, 20, 21, and 22 as 18, 19, 20, and 21.

▶ **OP 1853 Vol 1 1st Rev (Mine Mark 6):** On page 3, under Differences Between Mods, in paragraph 6, line 10, cross out Table 1 and write in Table 2.
On page 5-6, in Table 2, under Flooder Assembly Mark 1 Mod 1, cross out SINKING VALUE and write in SINKING VALVE.

▶ **OP 1892 1st Rev (Mine Mark 36-3):** In Appendix A on page 47, add the following as a new item C:
C. Charge:
Type_____
Weight_____
Reletter present items C through L as D through M; in the NOTE at the top of the page, in lines 4 and 6, cross out C and J and write in D and K.

▶ **OP 1935 Vol 1 1st Rev (Mine Mark 27-2,3):** On page 72, after the first sentence of paragraph 26, add: NOTE: Use either the vacuum-air-nitrogen Distribution System DWG 1443811 or the portable Test Stand DWG 656071 for this test. In the NOTE at the end of paragraph 26, cross out the last two sentences and write in When pressure test-

ing, apply a soap-and-water solution to the area suspected to be leaking; watch for bubbles.

▶ **OP 1935 Vol 2 (Mine Mark 27-2):** On page 63, in figure 19, cross out the color call-outs for CA-308: yellow, white, and black.

On page 64, in the second line of step 4, cross out the word yellow and the word black. In the second line of step 8, cross out the first word white and the second word white.

On page 73, in the Color column block of table 5 referring to CA-308, cross out the word yellow and the word black.

▶ **OP 1935 Vol 3 1st Rev (Mine Mark 27-3):** On page 66, in paragraph 2 under Battery Installation, cross out felt and write in rubber.

▶ **OP 2129 (Mine Mark 6-14):** On page 5, under Extender Mark 12 Mod 11, line 8, cross out 12 and write in 11.

▶ **OP 2363 Vol 1 (Mine Mark 27-4,5):** On page 66, after the first sentence under Vacuum Test, add NOTE: Use either the vacuum-air-nitrogen Distribution System DWG 1443811 or the portable Test Stand DWG 656071 for this test.

On page 164, cross out step 7.b.(7). Change step 8 to read:

8. Final assembly of sections and components
   - a. Mine mechanism and associated components
     - (1) Remove arming leads from mine mechanism cover, and remove cover. ____
     - (2) Install and test mine mechanisms and components per appropriate directives. ____
     - (3) After completing all mine mechanism testing, connect arming leads to one of the following, depending upon which is used in the assembly:
       - (a) Arming studs on cover plate ____
       - (b) Arming studs on adapter ____
   - b. Afterbody and war battery section
     - (1) Make sure the angle fire setting unit indicator is on zero and that socket zeros are aligned with the shell indexes. ____
     - (2) Set depth at 20 feet. ____
     - (3) Set distance at 1000 yards. ____
     - (4) Cage gyro. ____
     - (5) Make sure there is no voltage between terminals 44 and 45 on 7-point terminal board. ____
     - (6) Connect battery discharge relay terminals to 44 and 45 on 7-point terminal board. ____
     - (7) Join afterbody to the war battery section and install all joint screws. Pull sections together evenly being careful not to damage the joint ring gasket. ____
   - c. Flood valves
     - (1) Make sure each set of flood valves indicates an open circuit. ____
     - (2) Disconnect each shipping plug and connect a nonexplosive type flood valve to each set of flood valve leads. ____
     - (3) Install each flood valve in its adapter and secure in position with snap ring. ____
   - d. War battery section and warhead
     Join the war battery section to the warhead and install all joint screws. Pull sections together evenly being careful not to damage the joint ring gasket. ____

▶ **OP 2363 Vol 2 (Mine Mark 27-4):** On page 61, in the second line of step 4, cross out the word white and the word black.

On page 62, in figure 19, cross out the color call-outs for CA-308: white, yellow, and black.

On page 63, in the second line of step 8, cross out the word yellow and the word white.

On page 71, in the Color column of table 5 referring to CA-308, cross out the word yellow and the word black.

▶ **OPNAVINST 08550.3A 30 Jun 1961:** was superseded by ATP-5 Allied Minelaying Doctrine. OPNAVNOTE 5215 31 Aug 1961 canceled OPNAVINST 08550.3A 30 Jun 1961.

▶ **TROUBLESHOOTER 1-58:** In the box on page 18, after One Stopwatch, cross out CG and write in HC.

▶ **TROUBLESHOOTER 2-59:** At the bottom of page 21, cross out GF8030-266-387 and write in GF8030-281-2345.

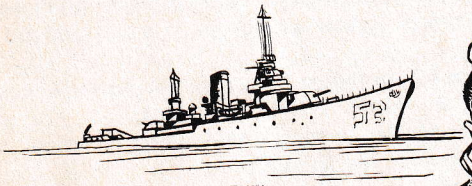
▶ **TROUBLESHOOTER 1-60:** On page 5, in column three of the article at the bottom of the page, change lines four through eight to read: other end of CA-93, to the right-and left-hand batteries; the WHITE/RED (+) lead to one battery's positive terminal; and the WHITE/BLACK (-) lead to the other battery's negative terminal.

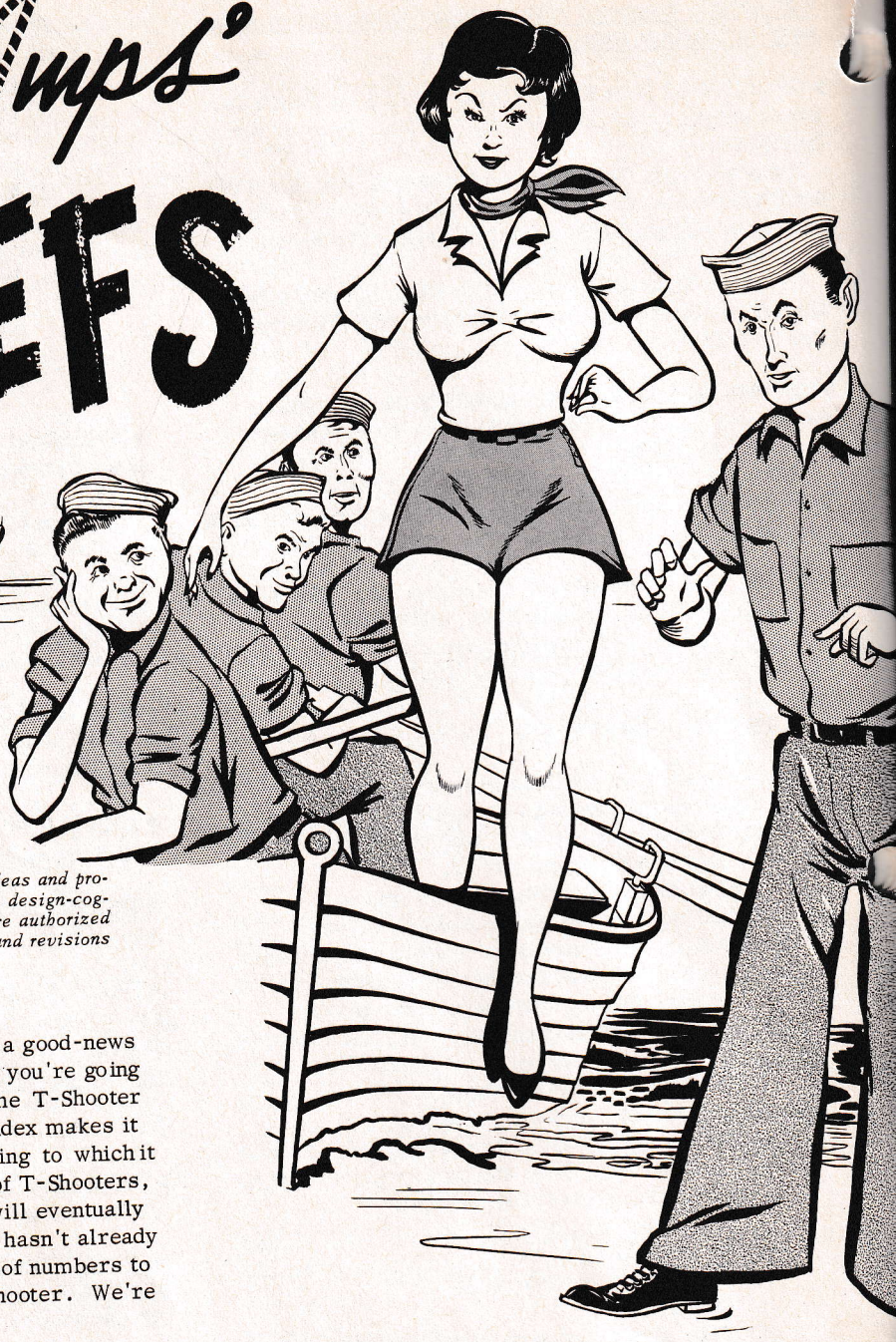
▶ **TROUBLESHOOTER 1-62:** On page 15, in third line of the OP 1808 item, cross out 16 and write in 1b.

▶ **TROUBLESHOOTER 2-62:** On page 6, cross out the item about OD 16135. This error was in the 1st Rev of this OD but does not appear in the 2d Rev.

▶ **TROUBLESHOOTER 4-62:** On page 13, in line 6 under OP 1765, make it item 3, instead of 30.

Millie Amps' BRIEFS





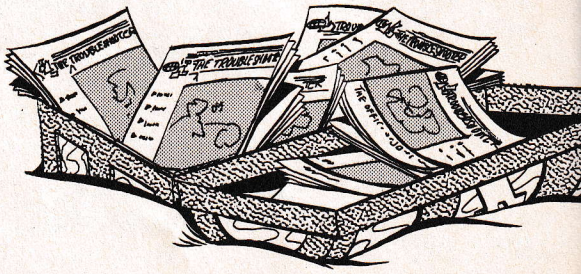
NOTE: Except where otherwise indicated, the ideas and procedures in this feature have been verified by the design-cognizant agency for depth charges and mines and are authorized for readers' use pending preparation of changes and revisions to master design documentation.

Freebies

There's nothing I like better than being a good-news girl. This time the wonderful word is that you're going to be able to get all those back issues of the T-Shooter you've been asking for. That handy new index makes it a real must that all of you have everything to which it refers. Maybe you do have a complete file of T-Shooters, but chances are that fair wear and tear will eventually bring about the need for fresh copies—it it hasn't already done so. So watch in T-Shooter for a list of numbers to use for ordering those back issues of T-Shooter. We're reprinting the ones in short supply.

Two milliamps, no less!

It's a fact that many, if not most, of the Mark 65-1 test sets aren't wired according to DWG 489983, Specification C-MIL-T-21673 (NOrd), and OP 1860 Vol 3 1st Rev. The difference is in the Battery 1 (BA-35/U) circuit. Sets manufactured by the Naval Gun Factory (NGF) are correct, drawing-wise, in that the battery is located in a circuit with a continuous drain on the battery. Sets made by the Self Winding Clock Company (SWCC) use a portion of the a.c. OFF-ON switch (S-2) to close the



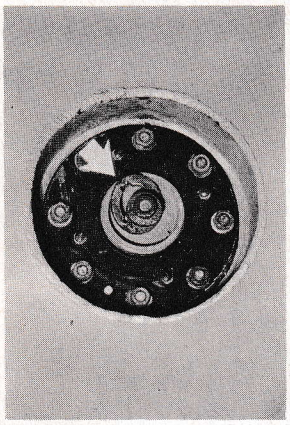
battery circuit only when the switch is in the ON position.

The circuit of the SWCC sets, it would seem, saves battery life; but the small current drain in the NGF sets (only 2 milliamps) is really insignificant. When future procurement becomes necessary, design changes may be introduced.

If you happen to have one of the NGF Mark 65-test sets, don't attempt to modify it; 'tisn't worth the candle.

Has piston, won't travel

In T-Shooter 2-62, the "Job Right" article said that, when the arming wire safety lock's tabs become weakened so they won't hold the retainer during the water-impact shock of planting, the retainer tends to drift enough to get in the way of the piston nut and prevent full piston travel.



This has brought the comment: "It may be so for all I know, but to me it sounds like confusion. How about a picture?" Here 'tis! The arrow points to the retainer and you can see how that piston nut is hung up on it. Just goes to show how carelessness with a two-bit item can make a dud out of a dillion-dollar mine. This issue's "Job Right" article has the latest word on these arming wire safety locks.

A boon to bottom lookers

A surprising number of my pen pals, including Al Campbell who had some wonderful things to say about T-Shooter (thanks Al), have asked for more info on the underwater metal detector we mentioned on page 1 of Issue 4-62.

The gadget, shown here complete with a scuba-equipped thriller, is a Goldak underwater metal detector Model UD-11. Using transistorized circuits that four common flashlight batteries are said to keep operating for "hundreds of hours," it weighs 13 pounds in air, is weightless underwater, and is usable to 100-foot depths. Detection is limited to electrically conductive metals (not too much of a limitation) and advertised uses are: the recovery of inadvertently deep-sixed cameras, coins, fishing gear, outboards, etc., as well as items not-so-inadvertently deep-sixed, such as sunken ships.

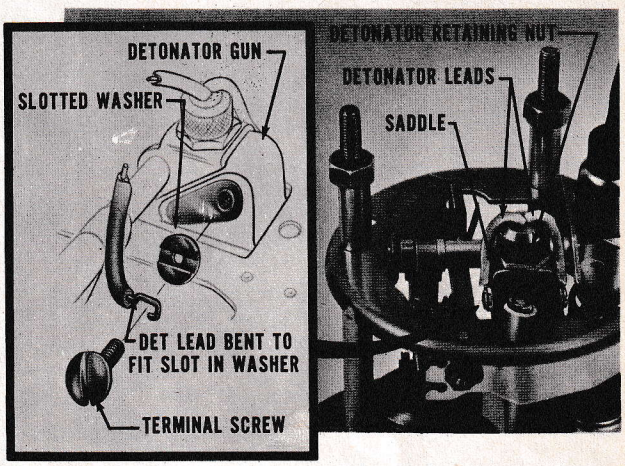
Chances are it could be a real deal for those of you who evidenced interest as skin-diving hobbyists, but those who wondered about its use in recovering planted mines may be too optimistic. In principle the UD-11 idea is good, and the manufacturer states a capability to detect one square foot of metal at 2-1/2 feet and a 50-horse outboard at 6 feet.

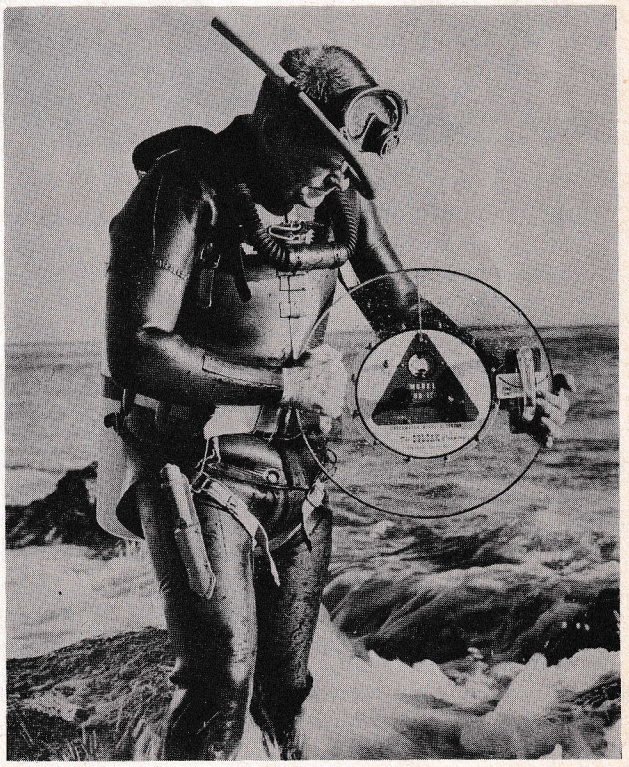
By comparison, our present ultrasonic pingers are still humdingers.

Make it EASY as ABC

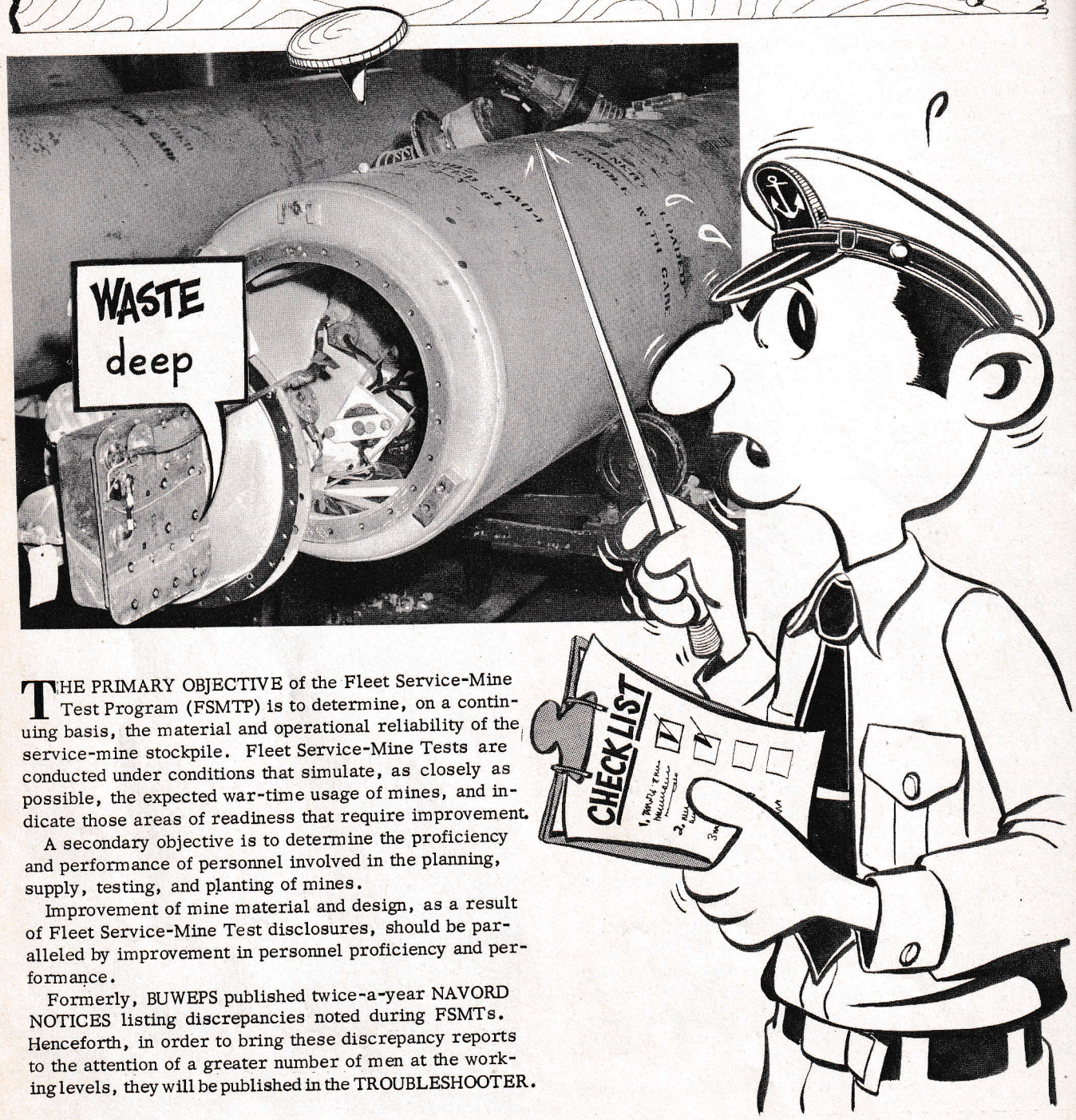
Back in T-Shooter 1-59 we showed a solid-brass slotted washer and how it's used on the detonator gun for the Mark 12-0 depth charge pistol. But, says Chief K. E. Harder of Navy 3923, it would be nice to know the FSN for this item.

So get out your copy of T-Shooter 1-59, turn to page 25, and write in M1340-671-5155 for the slotted washer DWG 1509095 shown there. This is how you'll find it listed in the new OP 669 due for release in April 1963.





DISCREPANCY REPORT
FLEET SERVICE MINE TEST-FISCAL YEAR 1962



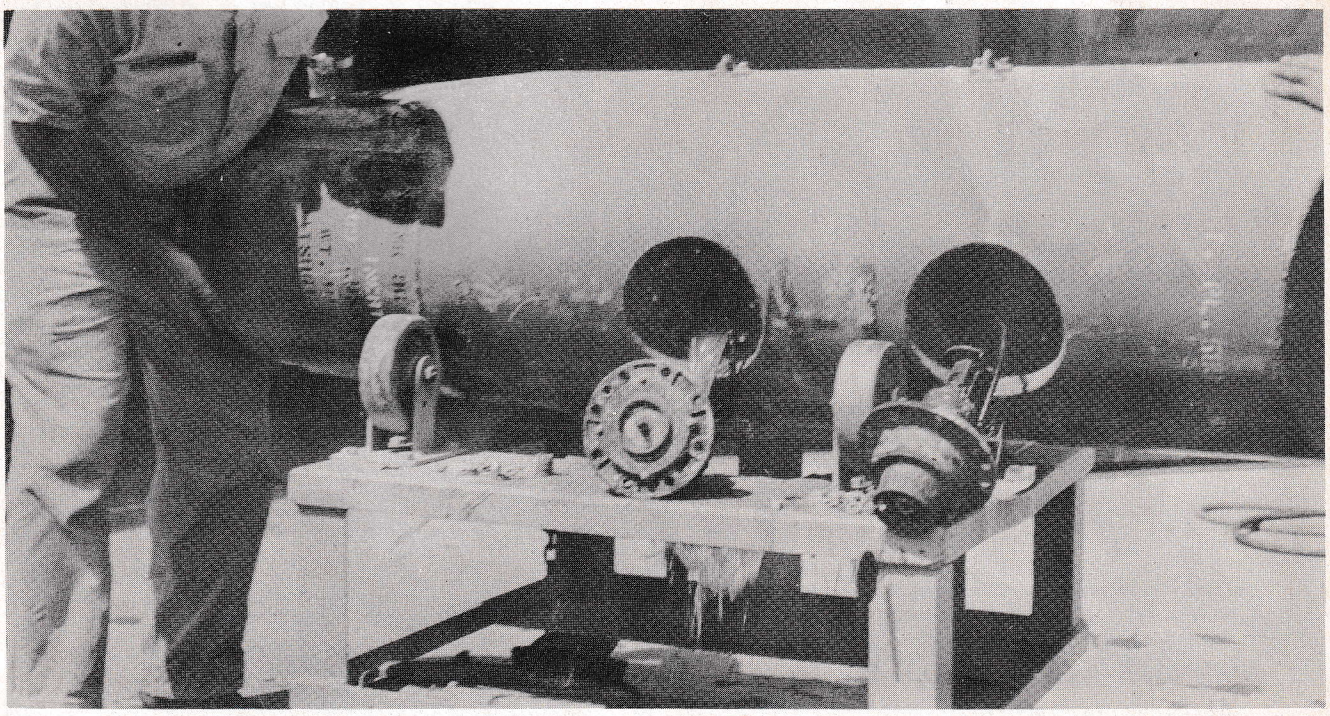
THE PRIMARY OBJECTIVE of the Fleet Service-Mine Test Program (FSMTP) is to determine, on a continuing basis, the material and operational reliability of the service-mine stockpile. Fleet Service-Mine Tests are conducted under conditions that simulate, as closely as possible, the expected war-time usage of mines, and indicate those areas of readiness that require improvement.

A secondary objective is to determine the proficiency and performance of personnel involved in the planning, supply, testing, and planting of mines.

Improvement of mine material and design, as a result of Fleet Service-Mine Test disclosures, should be paralleled by improvement in personnel proficiency and performance.

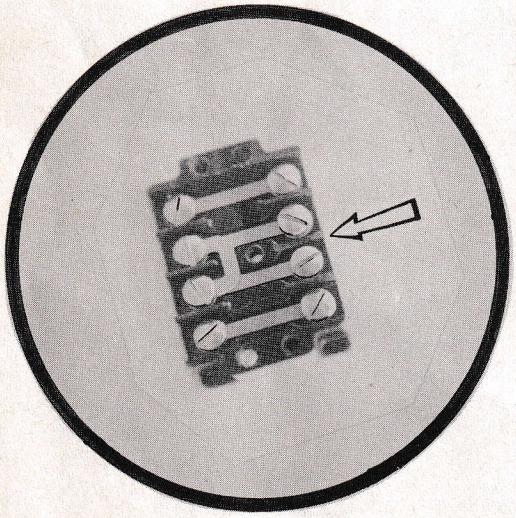
Formerly, BUWEPS published twice-a-year NAVORD NOTICES listing discrepancies noted during FSMTs. Henceforth, in order to bring these discrepancy reports to the attention of a greater number of men at the working levels, they will be published in the TROUBLESHOOTER.

DISCREPANCY	CAUSE	RESULT
Shortage of mine material at the assembly activity.	Oversight of planning personnel during preparation of material lists.	Increased message traffic and priority shipment of material to meet scheduled delivery date.
Use of outdated component test and mine assembly check-off sheets.	Check-off sheets not kept up-to-date with current OPs.	Incorrect test and assembly procedures.
Incorrect material shipped from assembly activity to final preparation unit.	Incorrect markings on shipping containers.	Distrust, ill will, and increased administrative work load in procuring correct material.
Extender and clock starter ring and clamping nut not tightened sufficiently to prevent leakage of water around diaphragm seats.	Prescribed procedures for replacing diaphragms and subsequent leak testing were not followed.	High percentage of mine failure due to water leaking into the mine cases.
Only five of the 30 nuts required were used for securing the mine tail cover.	Carelessness. Failure to use an adequate check-off list.	Mine case flooded, causing premature actuation of the mine.
Insufficient quantity and poor quality of spare components shipped with mines.	Either one, or a combination of the following reasons: 1) Components not tested before shipment; 2) Quantity shipped not in accordance with NAVORD OD allowances; 3) prescribed allowances inadequate.	Control sample mines are robbed of components, negating the intended purpose of these mines. The work load, during final preparation, is increased.
Piston of Clock Starter bent to the extent that the arming wire safety lock and arming wire could not be installed.	Carelessness during handling, assembly, and/or inspection of mines before shipment.	Replacement of the defective unit necessary before mine could be installed in aircraft.



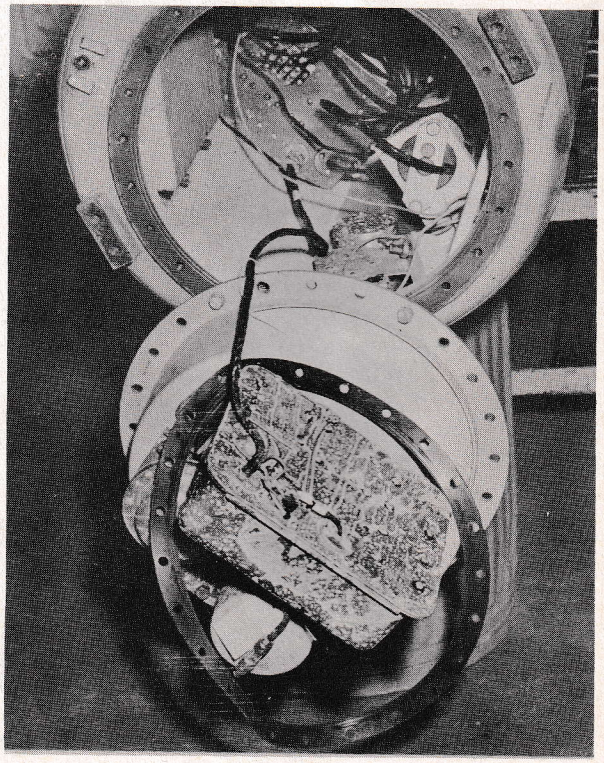
Water leaked into this mine because prescribed diaphragm replacement and test procedures were not followed.

DISCREPANCY	CAUSE	RESULT
Arming wire hole in piston out of alignment with holes in the extender cap, thereby precluding installation of arming wire.	Inadequate visual inspection during preassembly tests.	Replacement of defective unit necessary before mine could be installed in aircraft.
Batteries handled roughly and removed from moisture-proof bags before completion of thawing.	Inadequate supervision and training of personnel.	Low insulation resistance because of condensation.
Clock delay mechanisms handled by their cable assemblies.	Personnel not properly trained and supervised. Failure to appreciate the susceptibility of sensitive mine components to damage from rough handling before installation in mines.	Physical damage to components; often undetected.
Lockwashers installed between the clock starter and clock delay instead of under the nuts used to secure the clock starter to the clock delay.	Failure to follow assembly procedure prescribed by OP.	Possible loosening of clock starter and clock delay assembly because of vibration, thereby causing mine arming failure and a dud mine.
Bakelite terminal separators on terminal blocks broken.	Rough handling and/or inadequate packaging. Visual inspection not properly made.	Chances of short circuits between terminal connections increased.
Sterilizer Device SD 4-1 resistor carriage loose.	Carelessness and lack of attention to assembly details.	Possible loss of mine sterilization feature which increases the risk of casualities during subsequent check sweeping or mine clearance operations.



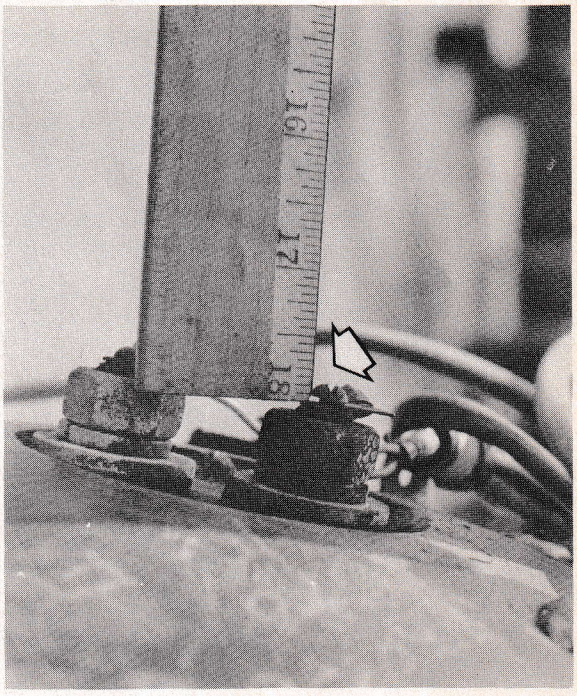
Forcing oversized lugs onto terminal blocks can also cause this barrier (separator) breakage. (See "TB patience" in HOT STUFF, in this issue.

Following proper procedures could have prevented this.



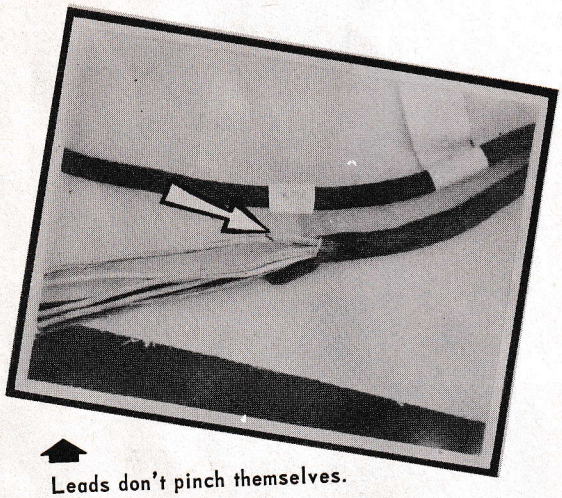
DISCREPANCY	CAUSE	RESULT
Batteries BA/249U crushed and loosened in brackets during installation or mine planting	Design deficiency. The thin wall of the battery will not withstand pressure exerted by bracket when tightened and/or shock of water impact during planting.	Damaged batteries; possible mine failure
Metal anti-premature fuse-holder not replaced with bakelite fuse holder in Mine Mark 10. Metal fuse holder not taped.	Failure to follow procedure prescribed by OP 948.	Possibility of bare metal fuse holder shorting electrical connections on Terminal Block, TB-7 Mod 0, during mine planting.
Soldered ends of 5-ohm 25-watt resistor mounted on Terminal Block TB-7 in Mine Mark 10 not taped.	Failure to follow instructions prescribed by OP 948, page 52.	Shock of mine planting could cause the resistor to loosen in its mounting bracket and short circuit against the mounting plate.
Slug installed in CD-12 Mod 0 "A" lead fuseholder instead of Slo-Blo fuse in Mine Mark 27 Mod 4.	Inadequate check list, or not used.	Dud Mine—SS-9 reset coil energized, preventing movement of SS-9 wipers.
Pressure seals in Mine Mark 27 extension cover not tightened.	Instructions for checking torque on pressure seals not included in OP 2363 Volume 2.	Mine mechanism compartment flooded flooded with sea water.
Terminal connection improperly made at arming circuit stud on Mine Mark 27 Mod 4 extension cover.	Terminal screw was too long and bottomed in arming circuit stud before a tight connection was obtained.	Possible mine arming failure; dud mine.

A picture of personnel error. Pressure seals in extension cover weren't tightened.

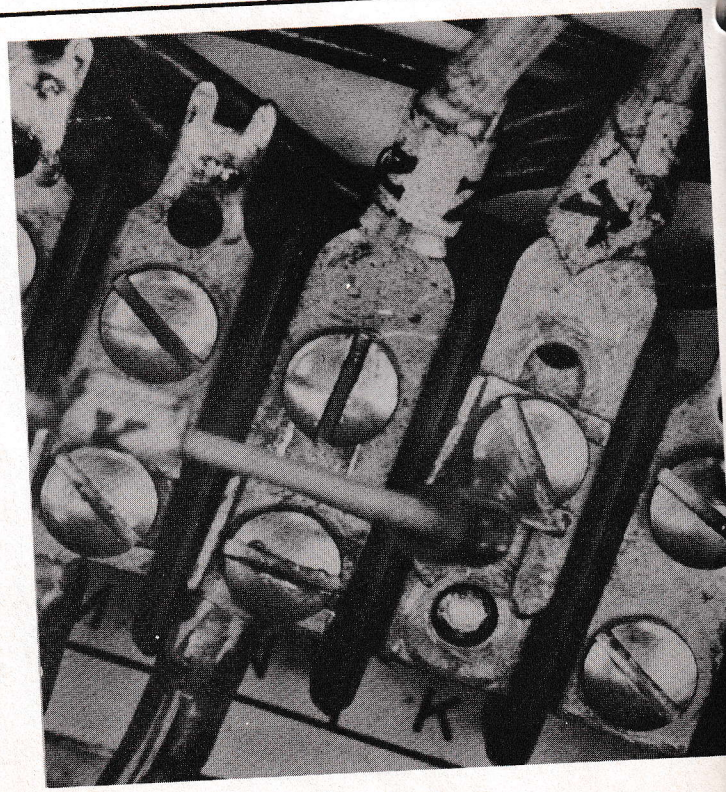


How much time would it have taken to replace this screw with a shorter one? Loose connections can cause duds!

DISCREPANCY	CAUSE	RESULT
Mine Mark 27 propulsion Battery Mark 33 Mod 0 terminal connections very loose.	Carelessness.	Could cause vehicle and mine failure.
Mine cases stenciled "DET NOT INSTALLED" instead of "DETONATOR NOT INSTALLED"	Disregard of prescribed stenciling instructions.	Possible safety hazard to unfamiliar personnel who might recover and open a mine with an unexploded detonator.
Crimped connections of leads to mine-fire recorders and sonar transmitters (pingers) poorly made.	Carelessness, or failure to appreciate the importance of tight electrical connections.	Intermittent, or open mine instrumentation circuits which adversely affects transmitter operation/signal output and validity of mine-fire recorder readings.
Components installed improperly (upside down, cushions reversed, etc.), amphenol plugs loose, leads pinched, cables routed incorrectly, nuts and bolts adrift in the case, and broken terminal screws.	Inattention to assembly details prescribed by OPs.	Possible short circuits, open circuits, damage to components during mine planting, and mine failure.
Mine Mark 27 check-off sheets not filled in completely and accurately.	Prescribed procedural steps were not performed, or negligence in completing the check-off sheets.	Questionable component test and assembly information.
Test data not correctly recorded on OPNAV Forms 3370-5 and 3370-6.	Errors in transferring information from rough notes to forms, confusion in interpreting column headings on these forms, or indifference.	Nonavailability of test data essential for evaluation of mine performance.

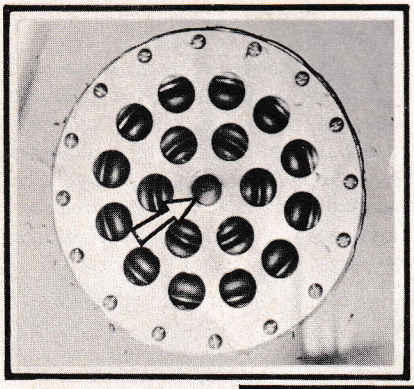


Leads don't pinch themselves.

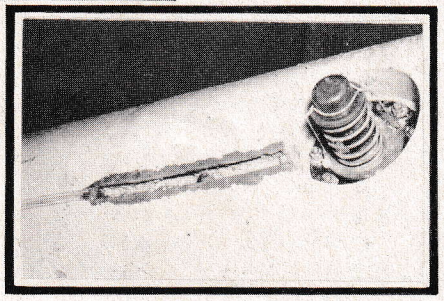


"Make-do" is taboo! If you can't back out a broken terminal screw, replace the block.

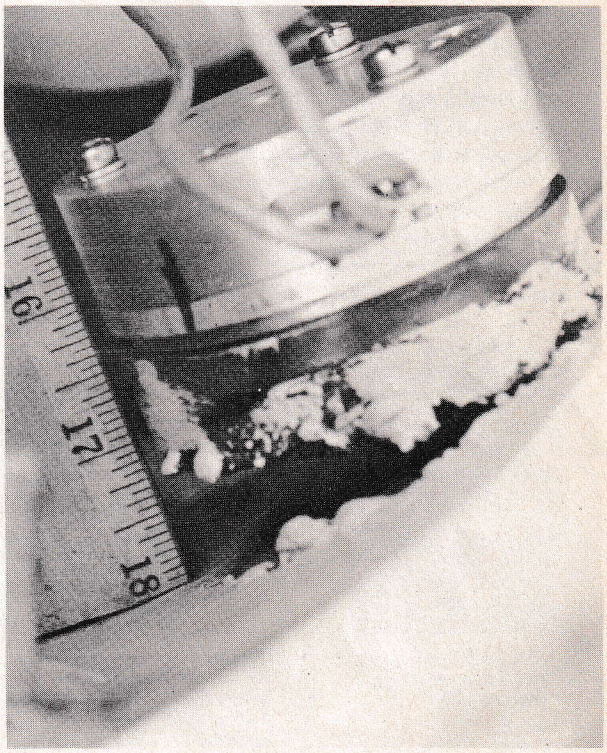
DISCREPANCY	RESULT	CAUSE
Ship counter and sensitivity settings reversed.	Carelessness.	Wasted effort in minefield planning; mine would not perform as intended.
Hoisting sling for 1000 pound stores used to load 2000 pound mines.	Carelessness, inadequate supervision.	Safety hazard to personnel and possible damage to material.
Mine finishing order specified the wrong mine operational assembly (OA) number.	Mine finishing order in error.	Mines could not have been installed in assigned aircraft, necessitating correction of error by message.
Parachute pack studs broken off Firing Mechanisms A-6 and A-8 diaphragm guard plates.	Shock of parachute opening and/or release of parachute from mine upon water impact.	Discrepancy reported as material defect.
Explosive compartment of Mine Case Mark 49 ripped open by tripping latch when ejected from the torpedo tubes.	Improper tube loading procedure which allowed the tripping latch to engage the edge of the clock well.	A type of casualty which could be disasterous with an explosive-loaded mine.
Detonator missing from mine and unaccounted for.	Not installed in the mine during final preparation for planting, or removed from the mine and thrown over the side by recovery personnel.	Confusion and uncertainty in analysis and reporting of test results.
Mine tail covers damaged during recovery operations.	Improper handling.	Difficulty in removing tail covers from mines.
Sonar transmitter (pinger) ring not welded in mine case properly.	Failure to follow welding instructions in NMEF Transistor Pinger Manual TE-3-57 (First Rev.)	Weld breaks during mine planting, reduced or loss of signal output, and increased effort in locating mine for recovery.



This broken parapak-locating stud may have been due to defective material.



Suppose this had been an explosive-loaded mine? Proper torpedo-tube loading procedure would have prevented the tripping latch from doing this.



Whose weld was this?

O-RINGS

. . . .Thanks to LTJG Wm. G. Cherry

The proper use of O-rings in mines and depth charges cannot be overemphasized; their importance to weapon readiness cannot be overstressed. Too often, the report of a mine failure does not point out that the trouble could be traced to improper O-ring inspection or installation.

In mines, O-rings function primarily as static sealing devices and, in this capacity, offer several advantages over other types of gaskets. They are usually more economical, save space and, when they are installed in grooves, can withstand greater compression and are better protected; thus they provide a better and longer lasting seal. Furthermore, O-rings can be used to exert a sideways sealing pressure such as is accomplished by the packing O-rings used on signal-tube punch caps and in the "corner" or "shoulder" O-ring locations found in the more recently designed mines.

O-rings are not a new development. Packing rings with circular cross section were used in the late 1800s. Early O-rings were made from rubber and had limited application, due to rubber's incompatibility with various fluids, gases, and other environmental conditions. With the development of modern oil-and-chemical-resistant elastometers (such as neoprene), O-rings are now usually made of material that is not only a superior replacement for rubber, but can be used where rubber could not serve. All O-ring material is pliable and will distort to increase sealing efficiency as pressure on it is increased.

Basically, an O-ring operates to create zero clearance; thus functioning to make up for manufacture and application tolerances encountered in the assembly of various part surfaces, especially those whose joining requires a water and/or gas-tight seal.

The tolerances to be accomodated and the desired torque of the fastenings determine the thickness diameter and the material of the O-ring and the size of the groove designed to hold it. Because of these factors, only that O-ring specified for a particular application should be used. Also, O-ring stock should be reasonably fresh. Deteriorated or used O-rings should be discarded.

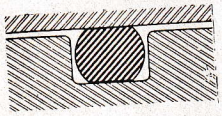
▶ When installing O-rings, follow these general rules:

Examine new O-rings. Reject all that appear defective or deteriorated. Do not accept O-rings that are poorly packaged.

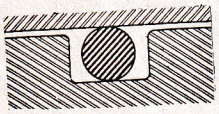
▶ Examine O-ring grooves for burrs, nicks, corrosion, and contamination. If the groove cannot be properly dressed and cleaned, reject the part or component. Use care when removing a used O-ring from its groove. The removing tool shown in the accompanying illustration is excellent for the purpose. It can be made locally and can be used for all sizes of O-rings.

▶ Before installing an O-ring, lubricate it with silicone grease, W6850-702-4297. Do not use bearing grease.

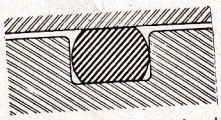
▶ After fitting an O-ring in place, gently work or roll it to remove any possible twist. Never use a sharp tool or instrument when installing, removing, or adjusting O-rings.



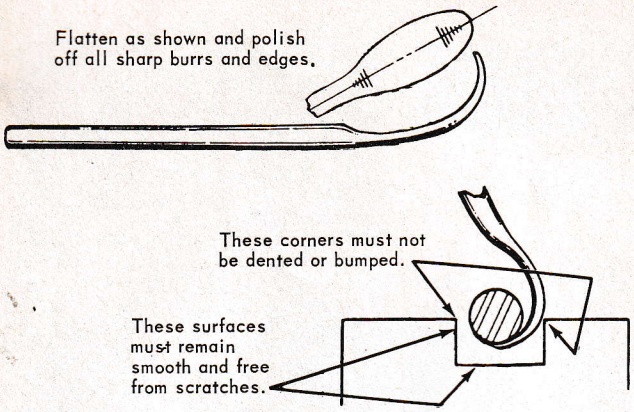
Correct size O-ring provides proper interference fit between O-ring and metal surface.



Too small an O-ring results in an ineffective seal.



Too large an O-ring leads to installation problems, excessive friction, and deformation of the ring in its groove.



Similar O-rings may come in different colors. This has no significance in mine assembly; it merely indicates who manufactured the ring. O-rings are now usually dusted with talc to keep them from sticking to each other in shipment or storage. Neither the color not the talc indicates silicone treatment.

O-rings should not be stored under conditions of extreme temperature or humidity, nor in such a way as to change their shapes—specifically, sharp bends that could stretch outer surfaces and compress inner ones. Rubber O-rings, especially, should be carefully stored so that they do not come in contact with grease, oil, solvents, or their fumes.

LTJG William G. Cherry, formerly of COMINPAC, Long Beach, read about O-rings in the June, 1962, issue of APPROACH and thought that a similar article on O-rings would be useful in TROUBLESHOOTER. His idea was most welcome and we hope that it will help others of you to become better acquainted with these most important, if common, mine items. If you have any subject that you'd like to see discussed in your TROUBLESHOOTER, we sure want to hear from you too.

DANGER IN DEPTH CHARGES

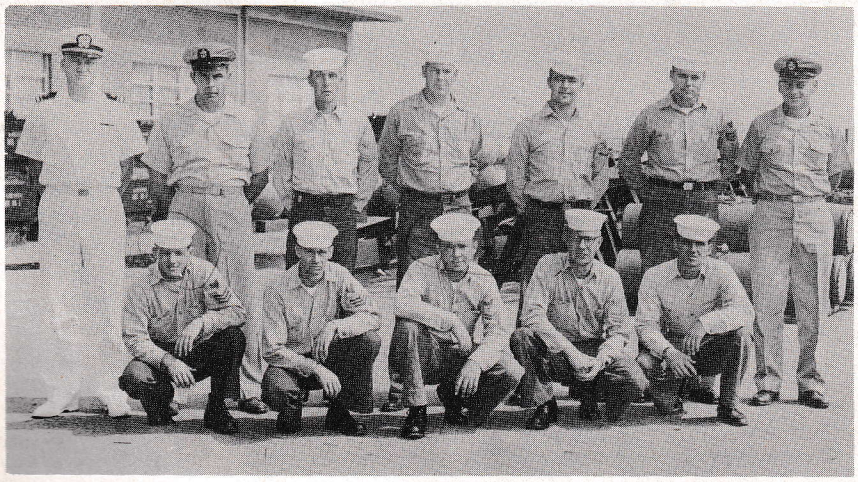
Several times during the past two years we have emphasized the need to check depth-charge boosters carefully before, during, and after their installation in the charges. . . especially Boosters Mark 6 used in all mods of Depth Charges Mark 8 and 9.

But apparently a careful inspection isn't enough. Apparently they can look good when installed and still become dangerous in no time at all. At least that's the complaint in a rash of Rudmindes that have been rolling in: Booster cans split, booster cans chafed clean through, and TNT spilling out in the charges' tubes, on the deck, and scattering hither and yon.

Now this is not a condition to take lightly. TNT is TNT! Therefore we again remind everybody who handles them to issue, install, and approve only Mark 6 Boosters that look absolutely sound. Next, do something that we're going to call for in your depth-charge OPs: order yourself some "fish-paper insulation" from standard stock (Z1350-093-0693) and wrap the boosters in it (1 layer, none covering the detonator pocket please) before you install them in the charges' central tubes.

Sounds fishy? Not so! We have good reason to believe that this is all it will take to keep those boosters from chafing themselves into such a dangerous condition when they're installed in charges on a constantly vibrating afterdeck aboard ship.

Try it and see.

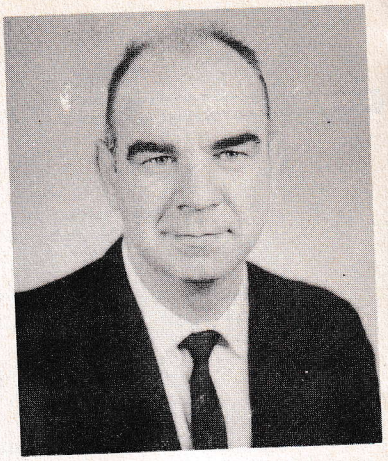


MEN OF THE MINES LAB, Minecraft Support Unit, Charleston, S.C.: L to R: back row—LTJG A. R. Boreen; A. R. Stewart, MNC; S. E. Truett, MN1; R. J. Smith, MN2; J. E. Patrick, MN3; M.L. Bryan, MN1; F.E. Wooten, MNC. front row—R. C. Chapin, MN1; D. T. Frank, MN1; H. Morrow, MN2; A.B. Hinman, MN1; H. R. Maddocks, MN3. Absent at time of photo—J.D. Hallstrom, MNC; J.H. Connell, MN1; M.E. Rollins, MN2; W.R. Sturgill, MN2.

About the...

CONTROL UNIT MARK 66 MOD 1

-by H. E. Sanders

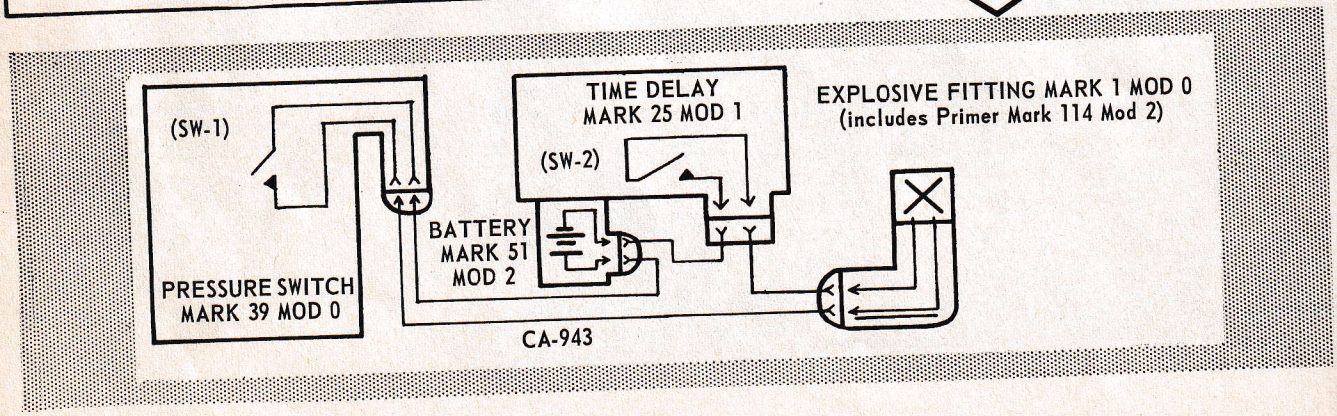


BECAUSE THERE HAS BEEN confusion concerning the operation and construction of Control Unit Mark 66's Mod 1, this article has been written to explain some of the gray areas, straighten out several misconceptions, and present new information in advance of publication changes.

Control Unit Mark 66 Mod 1 is a delay-action device for parachute packs used in certain operational assemblies. Operationally, it is similar to Control Unit Mark 66 Mod 0 which it replaces. Early Mod 1s differed little from the Mod 0, but current production is unlike the Mod 0 in the following respects:

MOD 1	MOD 0
Rectangular hole in cover plate for viewing barometric pressure setting	Magnifying lens in cover plate for viewing barometric pressure setting
Flat Corprene gasket	O-ring and positioning bracket
Pressure Switch Mark 39-0 Rugged, reliable, and compact; longer shelf life. Single fixed contact that closes against a fixed disc contact on the bellows assembly	Pressure Switch Mark 5-0 Two fixed contacts that close against a floating disc contact on the bellows assembly
Time Delay Mark 25-1 Striker with flattened end (ties in with change in Battery Mark 51-1 that converted it to 51-2	Time Delay Mark 25-0 Hemispherical firing pin
Battery Mark 51-2 Convex diaphragm with imbedded center rivet whose round head forms a transposed firing pin. The flat end of the rivet shank mates against the flattened end of the striker. The meeting of the flat surfaces of the striker and the diaphragm rivet assures reliable battery-primer firing even when there is as much as 0.057-inch misalignment between the striker and the axis of the anvil within the battery primer.	Battery Mark 51-1 Flat copper diaphragm

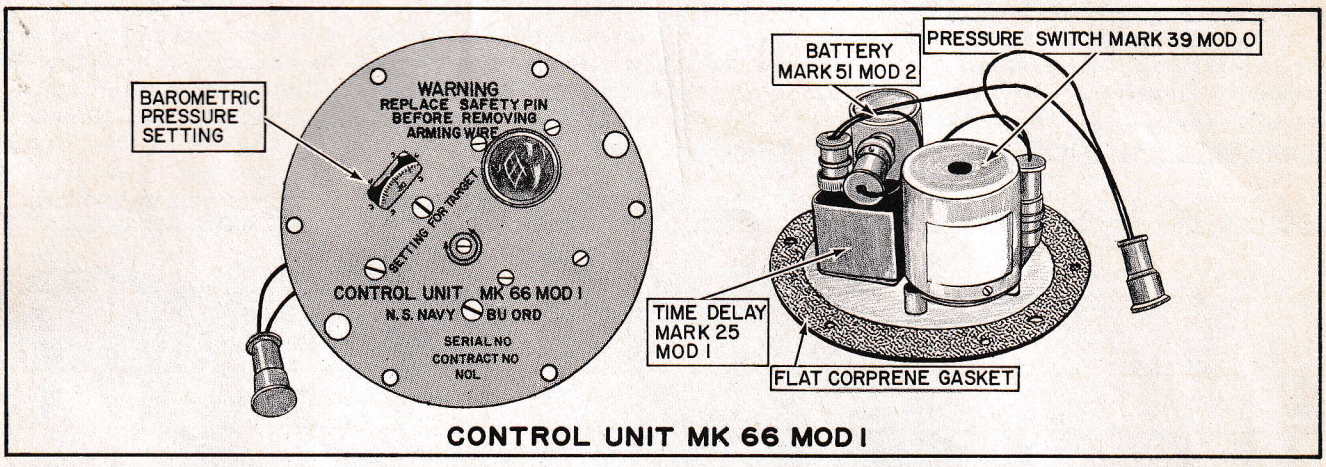
SCHEMATICALLY, CONTROL UNIT MARK 66-1 LOOKS LIKE THIS:



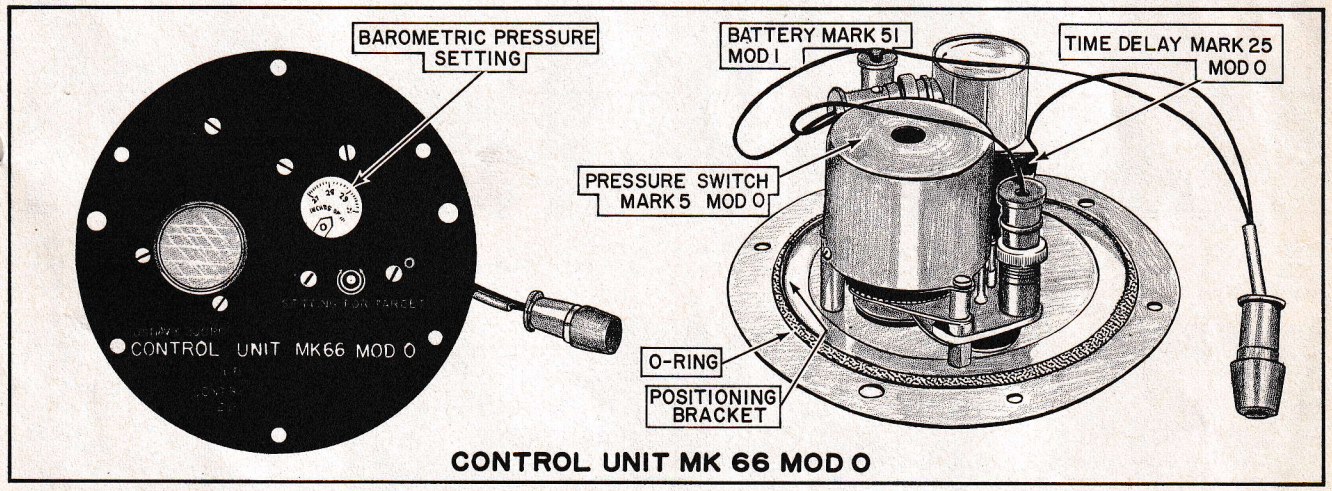
Four components (two switches, a battery, and an electrically detonated primer) are connected in a simple series circuit. Switch 1 (located in Pressure Switch Mark 39-0) is closed at low altitudes and open at high altitudes. Switch 2 (located in Time Delay Mark 25-1) is always open before removal of the arming wire. Battery Mark 51-2 has an insignificant voltage until after the arming wire is pulled.

When the striker is released it, in turn, releases a geared rack that moves downward toward a switch (Switch 2) located in the base of the Time Delay 25-1. Movement of the rack is slowed by an escapement, the operation of which delays the rack's closing of Switch 2 by about one second.

When the mine is dropped from a low altitude, Switch 1 is already closed and the battery fires the (electrical)



CONTROL UNIT MK 66 MOD 1

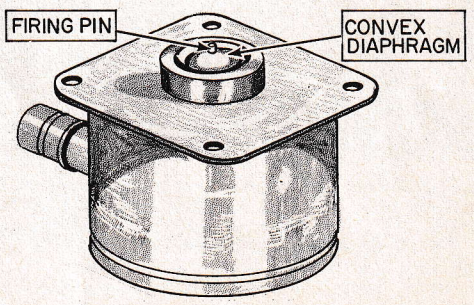


CONTROL UNIT MK 66 MOD 0

HOW CONTROL UNIT MARK 66 MOD 1 OPERATES

When a mine using a Control Unit Mark 66 Mod 1 is dropped from an aircraft, the arming wire is pulled from the top of the Time Delay Mark 25-1; the striker is impelled forcibly against the firing pin secured to the diaphragm of Battery Mark 51-2; the firing pin is driven into Primer Mark 101-3 between the firing pin and an anvil in this (percussion-type) primer; the primer fires down into the battery and ignites chemical-impregnated heat pads which melt the electrolyte in two thermal cells, producing electrical energy capable of maintaining a minimum of 1.25 volts across a 5-ohm load for at least a 5-second interval at any time between 3 and 90 seconds after actuation.

BATTERY MARK 51 MOD 2



Primer Mark 114-2 in Explosive Fitting Mark 1-0 which opens the pack at the instant Switch 2 closes. When the mine is dropped from above a certain higher altitude, Switch 2 closes about one second after the arming wire is pulled; but Switch 1 does not close until the barometric switch senses that the mine has dropped sufficiently. At this time, Switch 1 closes and fires the primer in the explosive fitting to open the pack.

The barometric switch operating point is adjusted by turning a setting screw on the Control Unit Mark 66-1's cover. If information is provided regarding the atmospheric pressure expected at the target (planting) area, the barometric switches are set to this pressure (inches of mercury). Should information regarding the target atmospheric pressure not be available, it is extremely important that all control units have the same arbitrary pressure setting. If they don't, parachutes will blossom at random altitudes and the mines will be affected to varying extents by wind drift. What was intended to be a planned and spaced pattern could then become a random pattern subject to countermining and inadequate coverage. Result: a reduced minefield threat.

PERIODIC TESTING OF CONTROL UNIT MARK 66s

Although OP 1452 and Field Test Data Sheets require that Control Unit 66s installed in fully assembled mines be tested every two weeks, this frequency is not necessary. The testing interval should be extended to three months. Pertinent publications will be changed accordingly.

MAKING THE SCENE in T-Shooter are men stationed at Navy 117. L to R: standing—LTJG A. J. Ristori; Sherwell, MNSN; Carvajal, MN2; Helms, MNSN; Wright, MNCA; kneeling—Spoon, MN1; Guy, MN2 Miller, SN.

And since so many gunnersmates convert to MNs, we're showing three GMs lucky enough to be serving with minemen. L to R: Cosenza, GMG2; Ringo, SN; Essency, GMG2.

NAVY 3002. Count 'em. This biggest-so-far group photo shows the men of the Mine/Torpedo Division. L to R: front row—C.E. Gouer, MN1; J.S. Elmore, MN1; J.W. Carroll, MN2; J.A. Lemieux, MN3; J.R. Brown, MNCM; Lt. J.W. Koerber; C.K. Adams, MN2; R.H. Catlett, TM3 with Lucy (E-1); J.J. Riddle, MN2; J.B. Ramsour, TM1; J.F. McDonough, MN2. middle row—J.H. Keen, MNCA; S.L. Kosewski, MNCA; B.G. Case, MN1; P.J. Sake, Jr., TM2; C. Sing, Jr., MN1; K.F. Kleckner, MN2; M.K. Travelstead, MN2; M.C. James, MNSN; O. McCoy, TM2; J.O. McGimsey, MNCA; J.R. Gilroy, MNCA. back row—J.S. Turley, MN3; V.L. Skarboe, MN3; R.A. Shaw, MN3; F.L. Quick, MNSN; J.J. Troxel, MN3; J.O. Ross, TM3; N.E. Wicke, MNSN; G. A. Simpson, TM3; B.F. McCoy, MN2; T.H. Delfs, TM1. not present—J.T. Kennedy, MN1; R.E. Rothstein, MN1; B.G. Gates, MN2.

Do You do this Job Right?

SINCE OUR "Job Right" article on arming wire safety locks appeared in the 2-62 issue (page 17), we've had much comment concerning their packaging. What we said, among other things, was: "each should be wrapped individually, packaged two to a box, each box sealed with tape, and the boxes packed in shipping containers such that overall weight does not exceed 75 pounds." —per DWG 385484.

This is where we unsuspectingly raised the curtain on one of the most varied package shows ever seen in the mine business. One activity listed the following inspection tally:

1. Two wooden boxes containing 18 cartons per box. Each carton is sealed and contains 12 locks packed 4 to the layer and each layer is separated by a cardboard spacer. The locks were not individually wrapped.
2. One wooden box containing 12 cartons and one box containing 9 cartons. Each carton is sealed and contains 18 locks individually sealed in barrier paper, six locks per layer, and the layers separated by barrier paper.
3. One cardboard carton containing 20 locks individually wrapped in thin tissue paper. No layer separators used.
4. One wooden box containing 8 cartons. Each carton is sealed and contains 60 locks packed 20 per layer. Layers are separated by cardboard spacers. Locks are not individually wrapped.
5. One sealed cardboard carton containing 20 locks packed in 3 layers, each layer separated by barrier paper. Locks are not individually wrapped.
6. Two non-sealed carboard cartons containing a total of 116 locks. One carton has wadding separating the layers. The other carton has no separating material. Locks are not individually wrapped.

A random sampling of the locks in the first five groups was taken and visual inspection revealed no defects.

JUMBLE CRUMBLE

All the locks in the last group were inspected. Twelve were found to have damaged retainer plates.

Obviously, the above methods of packaging don't agree with the much more stringent requirements of DWG 385484, although some of the packaging does reflect a fair degree of care that resulted in the locks arriving in good condition.

Now, if this reporting activity went strictly by the requirements as set forth in our 2-62 Troubleshooter article, they'd have to reject their entire stock. This would not only leave them without the locks they currently need, but would also mean, at $1.70 per lock, a total of some $2431.00 replacement expense. Furthermore, they couldn't be sure that their replacement order would bring them locks packaged per the DWG.

The story is much the same elsewhere. Numerous reports from field activities, stating that they are receiving improperly packaged safety locks have been brought to the attention of the shipping activities. A limited investigation, however, revealed that basic stocks of the locks are not packaged according to the DWG.

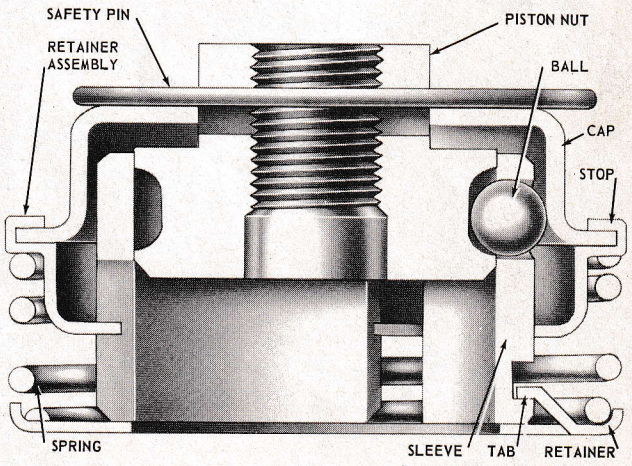
On January 14, 1963, NMEF wrote to OSO regarding this situation. On January 21, OSO requested NWS/Yorktown, NAD/Hawthorne, and NAD/Oahu to inspect their stocks of arming wire safety locks for separation of retainers from their mating sleeves and to repackage, according to the DWG, those locks found suitable for issue. Until your existing field stocks of these locks are either used or rejected, and until all safety locks are received packaged according to DWG 385484, very careful field inspection is a must.

LOCK PICKING TAKES PATIENCE

Locks that are so improperly packaged as to arrive adrift in their containers should be given close inspection on all points noted below. However, all safety locks, regardless of their packaging, should be looked over, inside and out, particularly for corrosion, and kept stored as free from humidity as possible. Then...

Before installing any safety locks, always examine them for corrosion, jammed locking balls, springs seated unevenly on their retainers, dents in the sheet-metal stampings, distorted or loose tabs, or burrs in the slots.

the Editor



A TOUCHING STORY..

THE FIRST BLIND MAN TOUCHED THE LIFTING EYE AND SAID: "A MINE IS LIKE A HARD DOUGHNUT!" THE SECOND FELT THE HORN AND SAID: "A MINE IS SOME SORT OF A COOKIE CUTTER!" NUMBER THREE FINGERED THE PLUMMET AND ANNOUNCED: "A MINE IS NOTHING MORE THAN A LITTLE BOMB!" STILL ANOTHER TOOK HOLD OF THE ANCHOR AND CLAIMED: "A MINE IS SIMPLY A PACKING BOX."... THE LAST BLIND MAN SPUN THE LAUNCHING WHEELS AND LAUGHED: "A MINE IS A ROLLER SKATE!".... BUT A MAN WHO COULD SEE SAW IT WAS A SICK MARK SIX AND SENT IN A RUDMINDE TO FIND OUT HOW TO CURE IT!!...