

*mine and depth-charge*

# THE TROUBLESHOOTER

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THE OFFICIAL JOURNAL OF THE *RUDMINDE* PROGRAM

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mine and depth-charge

# THE TROUBLESHOOTER

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COVER PICTURE: Gunner Strikers R.V. Le Tourneau (left) and A.A. Roseth hike a Depth Charge Mk 9 Mod 6 into the launching tracks of the USS STRONG (DD 758) in preparation for tests. For more about tests, see story on page 9.

The Rudminde Program 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 program is sponsored by the Bureau of Ordnance.

The basic instrument of the program is Navord Form 2776—"Report of Unsatisfactory or Defective Mines, Depth-Charges, or Associated Equipment"—supplies of which can be requested from NSC Norfolk or NSC Oakland. Anyone who encounters problems with these weapons is encouraged to report them to the Naval Mine Engineering Facility using this Form. Instructions for its use and handling are contained in NAVORD INST. 8500.7.

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# THE OFFICIAL JOURNAL OF THE RUDMINDE PROGRAM



# SOUNDINGS

## The Changing Scene In Undersea Warfare

### PROGRESS REPORT

**NEW DRILL MINES APPROVED:** CNO has recently approved inert-loaded Drill Mines Mk 51 Mods 0 and 1 for use in exercises that involve Controlled Mine Systems Mk 1 Mods 0 and 1. Actuation is indicated by Signals Mk 26 being sent to the surface from Projectors Mk 18, installed in the mines.

**DEPTH-CHARGE CHANGED:** Practice Depth-Charge Mk 15 Mod 12 has been redesignated Signal, Underwater, Mk 50 Mod 0. To avoid possible hazards and confusion in Fleet use, the new nomenclature is now mandatory when referring to this device.

**UPS AND DOWNS:** Mine Mk 56-0 is in an advanced development phase, undergoing technical evaluation by BUORD after having come through high-speed launching tests with apparent success. Meanwhile BUORD evaluation of Mine Mk 57-0, the first to use a fiberglass case, is nearly complete.

Yet the picture may not be too bright—at least for the time being. Although OPDEVFOR has scheduled evaluation of the Drill Mine 57-0, it now looks as though cutbacks in research and development funds will result in little attention for mine systems Mk 55, 56, 57, and 59 during this fiscal year. Also at the questionable stage are experimental mines XG-10 (six have been built and one field-tested satisfactorily) and XA-19A, for which breadboard and engineering models have already been built.

Meanwhile the DuKane Corp. is turning out the new Controlled Mine System Mk 2-0. Installation of the first production model is already complete.

**FSMTP AIRED:** Typifying recent renewed interest in mines, BUORD representatives included a rundown of the Fleet Service Mine Test Program as part of a formal presentation

made to OPNAV this year.

**OPERATION SIMPLIFICATION:** First it was NMD/Yorktown, whose name was officially changed to the Naval Weapons Station (T-SHOOTER 1-58). Next came the venerable Naval Gun Factory in Washington, now renamed the Naval Weapons Plant. Touching a still higher level was a SECNAV notice dated 22 August 59 naming RADM PAUL D. STROOP as chief of a new "Bureau of Naval Weapons."

Reflecting inevitable changes in technology and eliminating what have gradually become unavoidable areas of overlapping effort, BUWEPS (official short title of the new bureau) will combine two familiar organizations—BUORD and BUAER.

Consolidation is already underway, and is expected to be fairly complete by the first of the year. Until then, Fleet personnel should continue addressing bureau-level communications to BUORD or BUAER.

### SCIENCE IS GREAT

**POLARIS STREAKS OUT:** Given little national publicity was the fact that the Navy's Polaris, planned for ultimate submarine launching, flew 950 miles in a recent test-firing from Cape Canaveral, Fla. This was only 250 miles short of the solid-fuel-propelled IRBM's planned 1200-mile range. NMEF, we're proud to report, has been doing important calibration work in connection with Polaris experiments.

**SLICK TRICK:** U. S. warships—without infringing on freedom of the seas—are keeping a close watch on Russian submarines in the Atlantic, tracking them day and night and "pinging" on them with sonar. This can be heard on the Red's own sonar, letting them know that when they surface or send up their snorkels—which periodically they must—a U. S. Navy patrol plane can be overhead taking pix.

**NO PLACE TO HIDE:** The advantages of a submarine-launched missile such as Navy's IRBM Polaris have become more evident than ever with the announcement that Atlas ICBM payloads have lately been dropping less than five miles from their South Atlantic targets. On one hand this makes SAC strategists happy. But it also makes them worried. If we can do it, they figure, Russia can too.

So SAC is now redrafting its plans for fixed ICBM missile bases. Figuring the Reds could pinpoint them, knock them out even in concrete underground installations, SAC is looking toward development of mobile launchers on railroad flatcars and inland waterway barges. This would destine future Air Force missilemen to constant shifting from one rail stop to another, or even to constant floating about on the Great Lakes.

**HATS OFF TO A NAVY CIVILIAN:** "I saw those great big monstrosities and I thought there must be a simpler way to do it." Thus WILLIAM J. THALER, 33-year-old civil servant working with the Office of Naval Research, explains his own low-cost "Ionospheric Bounce" attack warning system, as compared to our \$400 million, 16-story-high BMEWS (Ballistic Missile Early Warning System) radars, now being constructed along the Arctic Circle.

Project Teepee (named from Thaler's Project) is quite simple when seen in hindsight. The Marconi effect (radio signals bounced back to earth by a layer that surrounds it called the ionosphere) has long made ham radio operators' long-distance conversations possible. And from ionospheric physics it is also well known that there's a certain amount of back-scatter when a low-frequency radio signal is bounced back and forth around the world. Most of the signal's energy, of course, propagates forward. But a fraction is scattered backward to the transmitter each time it is deflected off the ionosphere or the earth. (This is why U. S. radio listeners sometimes



pick up European Voice-of-America broadcasts to Poland loud and clear.)

So much for the known. From his own work in plasma physics, Thaler deduced that hot gasses of a rocket exhaust or nuclear fireball are in reality tiny ionospheres, composed of the same electrically charged particles as the natural ionosphere. And he figured they would show up on scopes as back-scatter, clearly distinguishable from the back-scatter of the natural ionosphere.

With this, \$10,000, and a borrowed dipole antenna, Thaler went to work on his system in 1957. Since then—using only 15 to 50 kilowatts power—his transmitter-receivers at Patuxent, Md., have scoped the telltale exhausts of rockets launched 700 miles over the horizon at Cape Canaveral, and are reputed to have bounced beams 6000 miles around the world to pick up missile and sputnik blast-offs in Russia!

Thaler modestly insists his present back-scatter detection isn't a system at all, and the Navy is already thinking of an even more startling means of detection. Using the moon as an electronic mirror, a new 600-foot radio telescope now being erected at Sugar Grove, W. Va., is expected to detect Russian missile tests at the moment of engine ignition.

Nevertheless Thaler's Project Teepee would allow as much as 30 minutes warning time for our SAC bombers and anti-missile missiles. Against 5500-mph Russian missiles, that's 15 precious minutes earlier warning than our far more expensive and cumbersome present system allows!

## PENTAGON PANDOWDY

**HOME BY CHRISTMAS?** Some think Defense Secretary McElroy is packing his bags for an early departure. For one thing, he's set a Nov. 26 deadline for the 1961 defense budget, usually not due until Christmas Day. He has also taken a short cut that's reported to have the Joint Chiefs of Staff worried.

Instead of starting with military needs and then figuring the costs, the Secretary decided to set a ceiling of about \$41 billion and tell the services to split it.

**CHOP, CHOP, CHOP:** After being carried sky high by the Russian Sputnik, the defense-spending lid has obviously been recovered and clamped back in place. As a result the Navy in mid-August cancelled all remaining orders for the mine-laying Seamaster jet, hoping to save \$72 million out of the original \$470 million program. Only a few days earlier, the Convair Division of General Dynamics was told the Air Force would buy only 32 of the 40 originally planned B-58 Hustlers, saving a probable \$200 million. And it was only a few days before that that the Air Force and Navy squelched plans to produce high-energy "exotic" rocket fuels after outlays of over \$200 million.

Yet this probably does not mean that the proposed \$41 billion defense budget can or will be reduced. To quote Defense Secretary McElroy, "We are going to have to make some pretty rugged decisions in order to retain defense spending . . . at the present level." Later he added, "We are up against the justification of programs, and if they are marginal they probably are going to have to disappear."

So who will be hurt?

"Obviously no one's about to guess that one of his own programs will suffer," said one executive high in defense. "But I sure as hell wouldn't want to guarantee anything."

**THE OLD GET OLDER:** In spite of cutbacks, the Navy and its contractors are in comparatively good shape in the Fiscal 1961 budget. Polaris missiles are on order, the subs to fire them will continue to be built at \$100 million each, and an all-out fight to get \$345 million to finish a second nuclear carrier (for which Congress has already granted \$35 million) may end in success.

It's conventional ships that will be taking the licking. To the dismay of Navy top brass, these ships are growing older and older with less and less chance for early replacement.

**MORE UNIFICATION?** Again Congressmen are steamed up about interservice rivalry, to wit: Senator Engle's recent call for a single service with a single uniform and a single

chief of staff. Some now feel Ike's 1958 reorganization only scratched the surface, and that interservice bickering at budget time is as bad as ever—at times, even worse.

Privately some top Department of Defense officials are admitting it too, claiming only Congress can bring peace to the Pentagon . . . *maybe*.

**GLOBAL COMMAND:** Latest Joint Chiefs idea is an emergency striking force made up of crack Army troops and Marines, with transport planes and ships especially earmarked for its use, ever ready to answer limited-war fire-alarms anywhere. Behind this idea, of course, is Congressional and private criticism that the Joint Chiefs have no unified plans for limited (meaning non-nuclear) war.

**A RED POLARIS TOO?** This question stirred the Pentagon in mid-August when fabulous Admiral ARLEIGH A. BURKE, beginning an unprecedented third term as CNO, told newsmen casually over coffee that he thought Russia had subs which could launch both ballistic and guided missiles.

The most alarming previous statement from a responsible naval source had been Vice Admiral HYMAN RICKOVER's rather mild statement before a Congressional subcommittee that he would "certainly assume" the Russians had a short-range non-ballistic missile.

"He has a right to his own opinion," said Defense Secretary McElroy good-naturedly of what turned out to be another of Admiral Burke's "bomb shells." "But," added the Secretary soberly, "agreed intelligence would not say the Russians have submarine based, long-range ballistic missiles and I think most people would agree."

After that, debate flared relentlessly through the Pentagon corridors. Even Admiral Burke's missile experts were divided, and one veteran admiral summed it up for newsmen saying "Hell, we may never know till we see one . . ."

Then, about two weeks later, came a Central Intelligence Agency report crediting the Red Navy with having "several" subs equipped to fire small, solid-fuel ballistic missile.

The range: from 100 to 200 miles.



# RUDMINDE REPORT TO THE FLEET

## What's Been Reported?

## What's Being Done?

**I**N T-SHOOTER 1-59 we included some pink questionnaires for our readers to fill out and mail in. Now I—your editor, one JACK KOMAN—want to say to all of you, *ten thousand thanks!*

Your response has been really terrific. With none of the usual prizes to offer or jingles to complete, we hadn't dared expect anything like the number of replies we've had. Nor did we have any idea so many of you would have read the T-SHOOTER cover-to-cover like you said, nor that so many could possibly like our efforts so well, nor that we'd get such straight-from-the-shoulder statements of criticism, nor such a flood of truly useable, truly fresh, new ideas.

Best of all were the letters so many of you took time to write. Like I've said many times, only the readers can make a magazine a success. Now we know we can't fail because our readers are tops. So again—from all of us at NMEF—*thanks a lot!*

### Writers aboard

Perhaps the best news for T-SHOOTER readers is the fact that at last we have two technical writers assigned. Not only will you be seeing some of their stuff when the next issue comes your way, but you'll be getting your T-SHOOTER quarterly like most of you asked, and without our having to kill four pages as had to be done to get this issue out.

One thing you'll find missing this time is *Contributions From The Fleet*, which so many of you picked as first choice. But don't give up. We may not have "Contributions" we can use every time, but a raft of fine ideas and good pix have already been mailed in and you'll surely be seeing some of them later—after our engineers have given them the ol' eagle-eye.

### We go "official" at last

As expected, we've also been peppered with questions as to whether T-SHOOTER information is official or not. Now—for the first time—I can

report that it is, *with the complete blessing of BUORD.*

That doesn't mean that you're free to go ahead and act on *everything* you read about here. Sometimes we report to you—just to keep you posted—on problems that we think have been solved but haven't had time to really make sure. Like the fix for the Mark 36 on page 5 of No. 1-59, for example: we said it would be official if and when you received more details in a NAVORD INSTRUCTION, and that's what we meant.

Then there's our *Soundings* column. As a conglomeration of news items it's as factual as we know how to make it. But we hardly think anyone would think of considering it "official," which it surely is not.

So what is?

Our technical information as found in special articles like the one in this issue on case openings, in our *Defect Tables*, in CLARK STARTER's *Pub-S-Crawlin'* and his *Pubs Tables*, in tender *Millie Amps' Briefs*, and in the incredible cloud of *Hot Stuff* that emanates from our old loudmouth, B. ARNACLEBUTT. Except when these state otherwise, the scoop they give you is official—approved by NMEF and BUORD—and from that you'll know that your other official publications will shortly be changed to agree. 'Nuff said?

### Rudmindes at work

Are you one of the many who've sent Rudmindes to NMEF, but have never seen any T-SHOOTER items or positive action as a result?

Several times now we've explained that many of the Rudmindes we receive are merely logged in and filed, either because the nature of the problem seems minor, or else because we figure that even though your problem was a big one, it's probably not very wide-spread.

*Yet we've also said that it's important to report every single discrepancy no matter how minor . . .* that when enough of you had reported the same sort of problem, we'd look into it regardless of how minor those early Rudmindes may have seemed

when they came in. And now it's beginning to happen. Here are some programs we thought you'd like to know about, not because they're the results of any one Rudminde, but because they are results of the accumulated hundreds you may have thought were forgotten:

▶ A study of the air-delivery system for mines has been scheduled by NMEF this fiscal year. Every last aspect of this troublesome operation will be carefully examined, starting with minor hardware such as solenoids, arming-wire safety locks, arming wires, and Fahnestock clips, and ending we know not where.

▶ A study of packaging standards for components is already underway. We're looking hard at the hardware being shipped in for evaluation in the world-wide surveillance program, and working toward standardization of good protective packaging for materiel at all advance bases. One idea under consideration right now is a portable canning machine costing about \$150 that could can clock-delays, sensitrol relays, etc.

▶ Another area where your Rudmindes have been doing some good is in the business of advance-base test-set calibration and repair. Beginning with the "C" type sets, we're looking toward a program whereby advance-base personnel—with suitable training, spare parts, and troubleshooting guides—will ultimately be in a position to properly calibrate and maintain at least this relatively simple test equipment.

▶ Plans for advance-base shops that will be standard in layout, construction design, and equipment, have been discussed with a civilian architectural engineering firm. Undoubtedly it will be some time before anything concrete reaches Bureau level on this, but we thought you'd like to know that it's being given some thought.

So much for good things to come. While you're waiting, keep those Rudmindes pouring in. And now let's take a look at the defects you've reported since the last T-SHOOTER went to press. ➤



# DEFECTS REPORT

ITEM	USED WITH	REPORTED DEFECT	REMARKS
Battery BA-241/U	Mine Mk 25-1, 36-2, 49-1	Failed during operational test of Mine Mk 25-1, but tested OK on Test Set Mk 127-3.	Too soon to say what might have been wrong here; watch for scoop on this test set in next T-Shooter issue.
Cable Assembly CA-30	Mine Mk 25-2	Terminal lugs too small to fit on battery terminals.	BUORD has ordered #8 lugs 12-Z-7001-2730 installed on battery-ends of all CA-30s at Yorktown, Hawthorne, and Oahu. This should end problem.
Cable Assembly CA-338	Flooder Assembly Mk 1-1 in Mines Mk 6-0, 4, 7, 8, 10, 11; 16-1	Terminal lugs too large for TB on flooder assembly's sinking valve.	Replacement with Lug 12-Z-7001-2087 will do the job. We're recommending BUORD have all CA-388s screened to make this change.
Case, Mine Mk 36-2	Mine Mk 36-1, 2, 3	Welds broken on studs in firing mechanism compartment; in some cases, studs are missing.	Several loyal minemen have sent ideas and tool designs to solve this one. We'll sift out the best, give credit, pix. & lowdown next issue, if possible. Meanwhile don't hammer on loaded cases—report all defectives to BUORD for disposition promptly.
Circuit Break Mk 2 Mod 1	Mine Mk 39-0	Insulation resistance low; caused mine battery to discharge in one hour.	We have no specific answer on this right now but we do wonder what criteria were used in making this decision. Also suggest re-reading "All Hands Hear This," page 10 of T-Shooter 1-59.
Clock Delay Test Panel OE-SK-1377	Timing test of all clock delays	1. For CD-12-0 hook-up, test panel reads: "Omit Red and Red W/T, tie Green W/T and RG." 2. What does panel designation Blue W/T-Blk W/T-ORG W/T mean?	1. This is an engraving error on the panel. It should read: "Omit Red and Red W/T, tie Green W/T and ORG." 2. It means those three leads should be tied together. J.M. Dickison, NAD/Hawthorne, sent us a sharp idea on rewiring CD test panels. We'll have more to report on it later.
Depth-Charges Mks 6 & 9	N/A	Won't explode.	See "T-Shooter Goes To Sea," this issue.
Firing Mechanism A-5 Mod 2	Mine Mk 25-1, 36-2, 49-1	1. Failed to fire on electrical and acoustical test. 2. Failed to countermine on electrical and acoustical test. 3. Failed to fire within limits. 4. Failed to countermine within limits. 5. Failed to fire on mine operational test.	We called in 17 fleet rejects; brought 11 within limits by adjustment as outlined in OP 1799 1st Rev., appendix A. Recommend others who have troubles try same.
Firing Mechanism A-6 Mod 1	Mine Mk 25-2, 49-2	1. Failed pressure-look test. 2. Failed overall operational test. 3. Leaking oil. 4. SR-9 drop-out time too long. 5. MD-9 motor current high.	All A-6-1s, A-8-0s being replaced by A-6-3s and A-8-1s which have been screened for these defects. Look for a NAVORDINST with new preassembly tests about the time you read this, changes to OPs on mines that use these mechs to follow. Old preassembly and operational test procedures are not right for new mods.
Firing Mechanism A-8 Mod 0	Mine Mk 27-3, 5; 36-3	Various defects similar to those for A-6 mech reported.	See remarks for Firing Mechanism A-6, above.



# THROUGH RUDMINDE

ITEM	USED WITH	REPORTED DEFECT	REMARKS
Firing Mechanism K-4 Mod 1	Mines Mk 6-0, 4, 7, 8, 10, 11; 16-1	Failed insulation resistance test between H terminal and case.	This trouble is widespread. For a slow but sure answer, see "Insulation Frustration" in HOT STUFF, this issue.
Firing Mechanism M-5 Mod 1	Mine Mk 10-3, 7, 9	Failed static and rocking test.	Mod 1s are being converted to Mod 2s which should meet all the test requirements okay. For more on the M-5, see "Shake It" in MILLIE'S BRIEFS, this issue.
Firing Mechanism M-9 Mod 2	Mine Mk 18-0	Failed sensitivity test when tested to limits in NAVORD INST. 08550.16 of 1 May 1958.	This makes a real guessing game; maybe would have been accepted using new SR limits coming via NAVORDINST soon, also via new (3d) revision to OP 1452.
Float D-4 Mod 6	Mines Mk 6-0, 4, 7, 8, 10, 11; 16-1	Eyebolt crown nut secured with brass instead of copper cotter pin.	Many instances of improper assembly, poor wiring, etc. reported on this item. Get advance copy to 1st Rev. of OP 1853 for best assembly and inspection scoop.
Float Mk 15-0	Drill Mines Mk 25, 36, 52, 55	O-ring for cutter too large.	GM5330-530-2007 is the O-ring to use here. Floats will be screened before future shipments.
Gasket DWG 1227597 (Tail Cover)	Mines Mk 25-0, 1, 2; 49-0, 1, 2	Issuing activity supplied gasket 1227597 instead of 369032-1.	Gasket 1509758 replaces both of these gaskets and is now in stock. By all means see feature article on "Case Openings," this issue.
Mine Mk 10-9	N/A	Failed to moor properly; mine cases floated to surface after planting.	An NMEF observer checked these at the site; attributes failure to: 1) Hydrostat Mk 2-2 failure; 2) failure to install safety pin in the hydrostat; 3) plants that were too shallow for hydrostat setting. If you handle 10-9s watch for these slip-ups!
Retainer Assembly DWG 883359	Firing Mechanism A-5 Mod 2	Out-of-round, and excessive weld bead inside.	No action on this one yet; will investigate if more Rudminde warrant.
Test Chamber Mk 4-1	Test Set Mk 32-1	Open circuits, will not test detonators.	Close breech (chamber empty of course), loosen the barrel's retaining straps, see if you can't get a closed circuit via ohmmeter by rotating the barrel. When you do, secure the straps. If this doesn't lick the problem, sound off again.
Test Set Mk 8-1	Firing Mechanism Mk 9-0, 2	Operating instructions specify $123 \pm 12$ seconds for overall cycling time.	Should be $108 \pm 10$ seconds. Get Revision D of BUORD DWG 1476058 for latest instructions; all affected OPs will be changed to agree.
Test Set Mk 26-1	Firing Mechanism M-11, all mods.	Adapter cable CA-652 not included as part of test set.	We've recommended BUORD include it in this set, also in Mod 2.
Test Set Mk 61-2	Firing Mechanism A-5 Mods 0, 1, 2	Unable to calibrate; recommend new calibration instructions and test-set replacement plan.	We're working on a test-set calibration and replacement program for the mine force. See page 3 this issue, also watch for news in future T-Shooter issues.
Test Set Mk 75-1	Clock Delay CD-14 Mods 3, 4, 6	Meter calibrated to 300 milliamps full scale, accepts clock delays with excessive motor current between 250 and 270 milliamps.	See "Calibration Modification" on page 9 in T-Shooter 1-59. Test Set Mk 75 Mod 2 will not give you this trouble. If you have trouble getting Mod 2s, let us know.





### Cool Rule

Dear B. Arnaclebutt,

What a business! Out here we've got three sets of instructions for using Test Set 195-0 to test the batteries in Firing Mechanisms Mk 19-0. These are the requirements and test procedure (RTP) in DWG 1170713, the Operating Instructions in DWG 491060, and the battery-test instructions in OP 2352. They're sure different from each other. Which ones are right?

A.S.F., MN3

Dear A. S. F.,

Where—but where—did you collect all this merchandise? In the first place, use of RTPs by field activities is out. Actually they're on the way to being discontinued, will gradually be giving way to MIL SPECS and OSs.

But in any case the specs they contain are for use by the manufacturers of the set, the design activities who conduct preproduction evaluations, government inspectors at manufacturer's plants, and sometimes by quality evaluation laboratories, rework contractors, etc. From this you can see that people in field activities who use the set (as opposed to checking its performance or quality) have no business using the set's RTP.

This brings us to operating instructions. Ideally these should all be the same, whether you pick 'em off a drawing, off the instruction card that comes in the set, or out of an OP. Unfortunately, though, they haven't

all been kept up-to-date like they should. The ones that have gotten the best attention are those in the OPs, so let's make us up a little rule: *always test mines and mine components using the test instruction in the OP that tells you to test.*

Navord Instruction 8550.17 draws the line on such questions as this. Read it over. Meanwhile we'll try to cook up an article for a future issue that will define the several kinds of tests that take place and explain just who does what when.

*B. Arnaclebutt*

### Happy To Chute It To You

Dear Chief,

In OP 2310, Operational Characteristics, Mine Mk 52 Mod 2, I read on page 1: "Both assemblies use the SAME parachute pack...." In OP 2283, Description and Instructions for Assembling and Testing Mine Mk 52 Mod 2, it says TWO parachute packs (Mk 20 Mod 0 and Mk 20 Mod 1) can be used with this mine. Should OP 2310 be saying "packs" instead of "pack"? Or isn't it that simple?

A.C.H., MN3

Dear A. C. H.,

Could be that simple, yes. Mods 0 and 1 of Parapak Mk 20 are interchangeable in use, although the chutes they contain are made from different material. Pack 20-0 has a nylon chute Mk 17 Mod 2, and is preferred

to the saponified acetate chute Mk 17 Mod 1 used in Parapak Mk 20 Mod 1.

Yep, that's right! We told you all about those chutes on pages 12 and 13 of T-SHOOTER 1-58.

*B. Arnaclebutt*

### Insulation Frustration

Dear Barnacles,

Everywhere I've been in the mine force we've had to patch up K-4 firing mechanisms because so many of those bleeding rubber insulating packings DWG 343028-2 leak, giving low insulation resistance between H terminal and the case. At my last station we used to swipe replacements out of junked mechanisms, but where I am now I've run into a new angle. All our chief did was clean the old ones in solvent, and darned if those K-4-1s didn't check out okay when we got them put back together!

What I'm getting at is that there ought to be a Navord Instruction or some dope added to OP 605 to tell all of us everywhere the one best way to patch these things up. Think you can do it?

J.M.R., MN1

Dear J. M. R.,

Your NAVORD INSTRUCTION is already in print, but reading it isn't going to make you stand up and cheer. The number is 8550.17 and it says that the only outfits authorized to tear those mechs down are NAD/Oahu, NAD/Hawthorne, and NWS/York



town. Of course it doesn't say this in clear, pat terms like you and I understand, but nevertheless that's the Instruction's intent. I know because I talked with the guys that wrote it and that's what they said!

Now don't think I don't know what you're thinking. Every mineman in the business has taken a crack at making those K-4s act right, including myself. But that, my friend, don't make it legal. Besides, the word isn't all bad. . .

I'm told that K-4s are gradually being overhauled, and now I find that new packings of silicone rubber (DWG 1706175) have been procured. I've got some samples on my desk right now and they look like the answer to a K-4 mechanic's prayer. So let's compromise. . .

The instructions you want would violate BUORD policy. But I solemnly give you my promise that by the time you read this, I'll have done something to see that a set of these new silicone packings will get installed in

every K-4 that's reworked at BUORD request from now on.

In exchange, how's about seeing that we get a ruddy Rudminde on every last defective K-4 you find, and that every one of 'em gets reported pronto to BUORD for disposition.

Have I got me a deal?

*B. Amalebut*

### Now, He Tells Us

Dear Chief,

Whenever we open Mines Mk 36-3 for post-recovery analysis, we find that the air-dryers have broken adrift and thrown silica gel all over the place. Something oughta be done, No?

T.O.F., MN3

Dear T. O. F.,

Something oughta be done, Yes. In fact LEROY BARKER and SHANNON HARNAGE sent a Rudminde from

NAD/Hawthorne on the same thing, complete with sketches of a bracket they designed to hold those air dryers in place. Naturally, this made the old chief plenty happy. But the fact is there's long been a retainer in the supply system that does the job fine, only it had never been called for in the mine-assembly OPs until NOL put out advance copy for the 3d revision of OP 1684 (Mine Mk 36-1).

Now, thanks to you loyal Rudminers, changes to OPs 1798 and 1892 will soon be telling everyone to install it in Mines Mk 36-2 and 36-3 too.

The gadget to get is listed in the G-Book as Retainer, Air Dryer, DWG 1706134, FSN 1350-607-0530. Install it in the mines as we show it here and I'll guarantee those air dryers will all stand up fine to the shock of the mine hitting the water.

*B. Amalebut*

SEARCH-COIL TUBE

NUT, 1/2-13  
G5310-260-7897

SEARCH-COIL  
TUBE BRACE

SEARCH-COIL  
TUBE STRAP

BOLT, 1/2-13 X 2-INCH  
G5306-174-9464

LOCK WASHER, 1/2-INCH  
ZR 997-12-Z-3038-27

AIR DRYER MK 10 MOD 1

RETAINER, AIR DRYER  
DWG 1706134 FSN 1350-607-0530

Air-Dryer Retainer DWG 1706134 installed in Mine Mark 36.



## A Reaming That Helps

Dear Butt,

How are we supposed to install Circuit Breaks 1-0 in Mines Mk 25-0 when the studs in the case are too short? We've got some where so few threads come through the CB's flange that we can't catch the threads with the jam nuts, even if we leave off the washers and strain loops that OP 956 says should go under those nuts.

T.D., MN3

Dear T. D.,

I'm going to go out on a limb and bet that if you'd looked really close, you'd have found out those studs are plenty long. The trouble is that the mounting holes are a little undersize in some stockpiled CBs. Now where the studs' diameters have been reduced a bit by the dies that cut the threads on 'em, the holes in the CBs will slide on okay. But then the CBs hang up when they reach the studs' unthreaded portion, instead of sliding all the way home like they should.

So try this: ream the CB's holes out to a full half-inch diameter be-

## ...in which we goofed

There's an old saw that says "I'd rather be right than president." Then there's another that goes: "He who never made a mistake never did anything." Whichever side you take, the fact is that we goofed twice in No. 1-59... first on page 16 where we credited Paul Leonard with that clock- and extender-puller. His full name is Paul Leonard MACKEY, MDAU 0305.

We did it again on page 25. Like Chief Ray Smith of Navy 3002 says, the Mk 35-1 depth-charge det we mentioned has been replaced by Detonator Mk 35 Mod 3.

Plenty of others wrote into complain that we weren't mailing enough copies. We have another old saw to go with this one: "The wheel that squeaks loudest is the first to get grease!" Thus our distribution list has been changed to comply with these requests, but we'll wager plenty of others have been getting short-changed without letting us know.

So what about it, lads. Why not send a letter or post-card to make sure your squeaks are heard here loud and clear!

*The Editor*

fore installation, or run 'em through with a half-inch drill if a reamer's not handy. This'll let the CB slide home, and you'll end up with beaucoup room for strain loops, washers, and nuts.

If I'm wrong, you're free to take the next logical step: *reject the CBs and ream me!*

*B. Arnacbutt*

## Detrimental Journey

Dear Butts,

Just the other day, for about the umpteenth time in my career, I found myself chewing out a man for testing booster insulation after the detonator had been installed in a mine. When I got through he pointed out meekly that he'd only done exactly what OP 956, 3d Rev. says to do. And dang it, he's right!

Now, Chief, you tell me---what's to keep his ohmmeter from firing a hot detonator off right in his face?

G.R., MNC

Dear G. R.,

Except for the grace of God and a chief who's right on the ball, *nothing*. So here's what let's do:

*First, don't anybody let any man—working anywhere on any mine—check booster insulation using an ohmmeter after a detonator has been installed. Have 'em check for 1000-ohms resistance before det installation and let it go at that.*

Meanwhile I'll see if I can't get the ball rolling on changes to OPs 902, your 956, 1684, 1765, 1807, 1808, 1809, 1853, 1892, and 1935, so that this needless and dangerous practice will nowhere be prescribed.

Okay?

*B. Arnacbutt*

## Zilch Is The Word

Dear B-Butt,

About those tables in OPs 1809 and 1684 for setting delay-arming time—they say to set the CD-14 for three days whenever the desired setting for the CD-12 is three to ten days. Then there's OPs 956, 1736, 1765, 1797, and 1798. These all

say to set the CD-14 at ZERO when you set the CD-12s for three to ten days.

I'm assuming 1809 and 1884 are wrong. After all, if you're going to set the CD-14 at zero, why bother to put it in the mine at all?

N.O.B., MN2

Dear "Navel Operations Base,"

I'll gladly give you A for effort, but the best I can give you for the setting of your CD-14s is zero!

In other words, OPs 956, 1736, 1765, 1797, and 1798 are *right on the beam on this point*. So is the first revision to OP 1809, and this leads me to believe that you must still be using the old, unrevised edition. I'm also quite sure that the new 1684—when it gets to the printer—will have had this matter squared.

Your question as to why a CD-14 is needed when the DA-setting is zero shows you're forgetting that the 14's most important function is to control sterilization. Thus its S-switches have got to be "in there and pitching," even in mines where its delay-arming function is zilch.

*B. Arnacbutt*

## We Dig

Dear B. Arnacbutt,

Man, that OP 948 is like very far out where it says on page 69, par. 56b, that we should get "opens" in the det circuits of Mines Mk 10-3. What we've got is the 1st Revision to this book. Is there another that's newest and greatest?

F.E.S., MN2

Dear F. E. S.,

Man, you really some on. Like the beat of that det-circuit jazz should come through loud and clear at 10 ohms resistance, *not* with an open.

You can dig more on this subject by glimming page 20 of T-SHOOTER 1-59, 5th item, where this problem was bopped big except that our editor flipped a digit and mentioned page 59 instead of 69 like he should. What a square!

*B. Arnacbutt*



# Troubleshooter goes to Sea



## IT FINALLY HAD TO HAPPEN.

One of the main reasons ye T-SHOOTER editor took on this T-Shooting job was the prospect of getting outside these four ugly walls to meet some of you guys face-to-face . . . and hopes of occasionally feeling a deck under his feet once again.

What finally brought it about was a rash of Rudmines reporting that Depth-Charges Mk 6 and Mk 9 were continually refusing to explode under service conditions. Here at NMEF we don't take this sort of thing lightly, and it wasn't long before our Technical Director, Mr. HAINES A. MILLER, penned a memo to our Test Engineering Department.

In part the TD's memo said, "You are hereby assigned responsibility for . . . an evaluation of these depth-charges to find the cause of failure and to recommend corrective measures. It is requested that a complete task-plan be devised whereby you can assure, through elimination, just what the cause of failure is."

It didn't take any reading between the lines to figure out what he meant by that one, so the "process of elimination" was begun at once at the source: an NMEF engineer hot-footed it aboard some of the tin cans from which the Rudmines had come.

Among the men he queried, only those on the USS Hood ventured much in the way of diagnosis. They said their sonar had been on when a couple of the charges were dropped, and that via sonar they'd heard some minor explosions—maybe boosters going off—even though the charges were duds. Not much to go on there.

The next stop was NAD/Earle, at Red Bank, New Jersey. Here we were able to get some charges and boosters that had been off-loaded

from the USS BRISTOL, which had reported some failures. From Earle we also got sample components out of the same lots from which the USS HOOD—which had also reported quite a few failures—had last been supplied. These were shipped down to NMEF and added to samplings taken from Yorktown stocks.

## Testing begins

Back at NMEF we then got the ball rolling by running a series of explosive-level (Brisance) tests of various Mk 53-0 detonators. Every last one we tried was above minimum requirements.

Thinking maybe the Hood's "sonar explanation" could mean that inert-loaded cases had somehow gotten mixed in with stocks of the Real McCoys, we next had NWS/Y start X-raying sample boosters and main charges. Meanwhile our chemists analyzed some main charges for sensitivity while our test engineering crew cooked up a special test set of their own, and went to work checking the operation of pistols and booster-extendors.

From all this, again we learned nothing—at least nothing that explained why so many charges were duds. We found no inert-loaded boosters or cases, and chemically the explosives were okay. We found no pistols that didn't check out good like they should. We did find two extendors whose bellows ruptured at air pressures as low as 4 to 10 psi where they'd been weakened by corrosion. But we could only find 2 out of 120, so we were still no closer to pay-dirt than when we began.

## Next step: the explosive train

Over at the Army's Fort Eustis,

about five miles from NMEF, they have a nice big barricaded hole in the ground where you can explode almost anything without getting hurt.

And that's what we did. Into inert-loaded cases we installed all the live components that make up the depth-charge firing-train—pistols, detonators, booster-extendors, and boosters. Then—substituting compressed nitrogen for water-pressure, and with carefully contrived instrumentation to tell us just what was happening inside each charge—we fired them off one-by-one.

The result: Every booster-extender extended its booster. Every pistol fired its detonator. Every detonator fired its booster, and we packed up and came home somewhat less sure as to whether or not we knew whatever it was we thought we did from Fort Eustis' hole-in-the-ground!

## The real thing

Now fun's fun, and all that, but if you've spent much time in the company of sharp engineers you are well aware that they don't look at anything without considering every last angle there is. And that goes for our test engineering crew.

All the gear that had been checked had worked fine, but they nevertheless had accumulated a log of possible explanations for the failures. And to check them out, they needed one more ingredient—actual service conditions.

These were provided by the Commander, Destroyer Force Atlantic, who had the USS STRONG, DD 758, assigned to provide whatever actual service conditions we needed.

The engineers then decided to drop 28 live charges—5 made up of material that had come from the USS



BRISTOL, 8 from the HOOD, 8 from NWS/Y stocks and, to add even more realism, 7 that had had absolutely no checking by us . . . made up from the regular issue gear that had been half way around the world with the STRONG.

With all weapons aboard and secured, we then headed for the open sea to see what we could see. And what we saw was almost incredible.

One by one, fourteen charges set for 300 feet dropped over the STRONG's taffrail and into her wake. One by one the fourteen charges exploded, our engineers' faces getting longer with each bang.

Then the skipper upped our speed to 25 knots and another 14 charges, set for 30 feet, got the deep six. And again we had fourteen explosions with nary a hitch!

### An answer of sorts

On one hand, this perfect record was all to the good. What we learned from all our experimenting and testing — and we feel very certain of this — is that the components that make up the Mk 6 and 9 depth-charges are extremely rugged and reliable gear. So what, then, accounts for all the Rudmines complaining of failures?

Look at it like this. Two of the 120 booster-extendors we checked had had it. But this adds up too small a percentage to worry about.

Then we also found quite a few pistols that were a bit out of limits. This was probably the result of poorly calibrated adjusting equipment somewhere along the line, yet none were so far out as to keep them from working pretty much as they should.

The answer, we've decided, lies in the official printed instructions, which are technically correct but darn hard to follow and understand . . . and — in addition to this or maybe because of it — errors in handling made by Fleet personnel.

Here, then, are some things to think about when you handle these charges:

▶ Look twice at gear that comes aboard direct from ammo depots. In wartime you'd be getting this stuff from tenders shortly after thorough testing, whereas at the shore stations it only gets routine surveillance (maybe every two years) at the discretion

of BUORD. So at least make sure it looks to be in pretty good shape.

▶ Even though the gear is real rugged, handle it with care. When you come into port, don't put the stuff in damp magazines or damaged ready-service lockers, as is too often done.

▶ Take a hard look at booster-extender bellows. If you find discolored solder joints, that's okay. But if you find a corroded bellows or a collection of rust and corrosion, don't install the thing in a weapon.

▶ Make sure you've got plenty of good gaskets aboard, and make sure the mating surfaces between which you install them are in good shape (see article on openings, this issue).

▶ Don't make the mistake of setting the pistol's inner dial for depths greater than 300 feet, then leaving the outer dial on SAFE when the weapon is launched. This way the charge couldn't possibly explode (see OP 747, pages 44-45).

▶ When setting for 300-foot depth or less, make sure you set the pistol's inner dial properly with a screwdriver first, else the setting already on it will govern firing depth (see OP 747, page 44).

▶ When you ready a charge, make sure the plain safety-cover (identified in OP 747 on page 26) gets removed from the pistol. If you're firing from a K-gun, replace it with nothing. But if the charge is to be launched from tracks you must remember to install a knobbed safety cover in its place.

▶ Be sure when installing charges in launching tracks that a knobbed safety-fork gets installed on the booster-extendors, in place of the plain or lanyard-type forks used when the charges are fired from K-guns. Page 55 of OP 747 identifies both.

### Over the side

So men, there you are. We can't guarantee these precautions will solve all of your problems, but we think any attention you give them is sure going to help. If it doesn't, keep the Rudmines coming in.

Meanwhile our thanks to Captain W. G. HURLEY and the men of the STRONG for their enthusiasm, cooperation, and many good cups of joe.







**Charges come aboard:** At Anchorage EX2, Hampton Roads, YTF delivers charges to USS STRONG (DD-758).

**We head out:** The morning haze not yet completely burned off, the STRONG leaves the coast of Virginia astern as crew positions charges tracks.

**Let's do that job right:** Chief Gunners Mate N. R. West, wearing canvas, takes a look-see as Gunner Strikers Van Tosky (left) Le Tourneau begin installing extenders and boosters.

**A chief's work is never done:** Finding there were no proper flange sockets aboard, Chief West — changed into work-khakis as day grew warm — shows Le Tourneau how to cut them out of rubber sheet with hammer . . . not regulation but they worked! (In civvies taking notes is your T-SHOOTER editor.)

**They crew:** Sticking close to the lee rail in case of "offshore emergencies" are NMEF observers . . . T-SHOOTER editor Jack Koman (left); J. Meredith Alston, test engineer; Tom Mazza, electrical engineer, Kermit Edwards, design engineer; and LCDR Paul D. Mantides, NMEF's Assistant O-in-C.

**Next-to-last step:** Torpedoman's Mate C. E. Fields cocks a pistol, readying it for detonator installation.

**End:** Gunner Striker R. A. Cope (standing) and Torpedoman's Mate C. E. Fields (left) and C. E. Banker install pistols in charges in launching track.





Let's talk about those...

# Mine and depth-charge

# Case

**D**ESIGN ENGINEERS KNOW that case openings won't stay weather-tight — let alone watertight — merely because gaskets have been installed and the fastenings run up to specified torque.

They also know why.

But they also know that *know-how* is only half the battle, and that constant troubles being observed throughout the Fleet point the need for an article on *do-how*. So now, men — *here's-how!*

## Danger — don't touch!

As one of the old hands in our mine shop was heard explaining to a bright young man just last week, "*Keep yer cotton-pickin' wrenches off'n the cotton-pickin' filling-hole fastenings.*"

That goes for plaster-loaded cases and explosive-loaded cases too, and it holds good for everyone except the men whose job is to reclaim explosives.

Sure, these openings may weep

some under water. But this won't hurt a thing inside the explosive portion, whereas a weapon blowing off in your face will have a specific effect on the most important specific in the mine business. Namely YOU!

NAVORD INST. 8550.9 is worth your reading on this subject. So is chapter 4 of NAVPERS 10063, called *The Gentle Art — Handling Explosives*.

## Save the pieces

When it comes to openings other than filling holes, nine times out of ten you've got to open 'em before you can close them. So first make sure you've got a tote-box or an empty clock-delay can handy in which to put all the small parts.

Also remember that when you or someone else gets around to closing that opening, proper torque on the fastenings is a mighty important affair.

To get proper torque the fastenings have all got to work smoothly, so now's the time to make sure they will. Is there a nut or capscrew that comes off hard? Then chase the threads down with a tap or die. If this won't smooth things out get a new nut or bolt. Get it and try it *before* you give the old one the deep six, though, just to be sure.

Next, consider the gasket. If it's shot or if you can't get it off without shredding it then it's just got to go.

Cold-flow at work: like gasket here, most rubber and neoprene gaskets flow, relaxing torque. If you periodically restore torque, gasket spreads, tears internally, and well opening leaks.

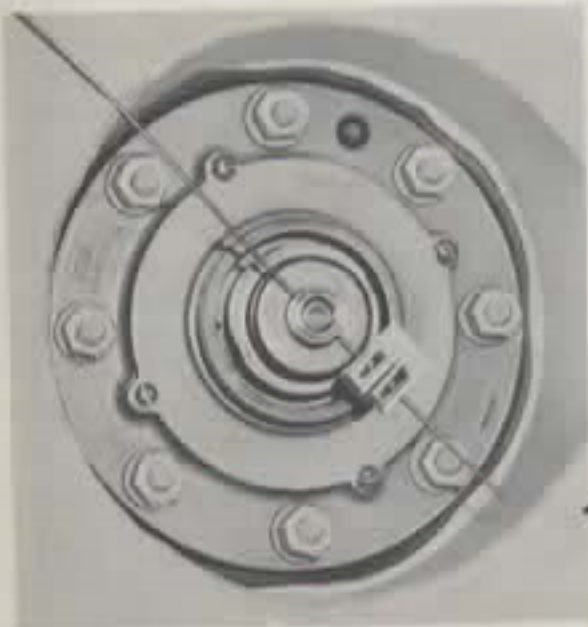
Even if your orders only call for partial assembly of the weapon for use at a much later date, it's still got to go. Just remember that the rubber has got to have some spring left in it. If it's gushy and sticky and soft or if it feels hard to your thumb nail, give it the heave.

O-Rings, in this sense, are gaskets too. Don't leave them in their grooves if that's where they stick. Remove 'em gently as you can, and make sure they, too, look and feel sound before you decide not to replace them with new.

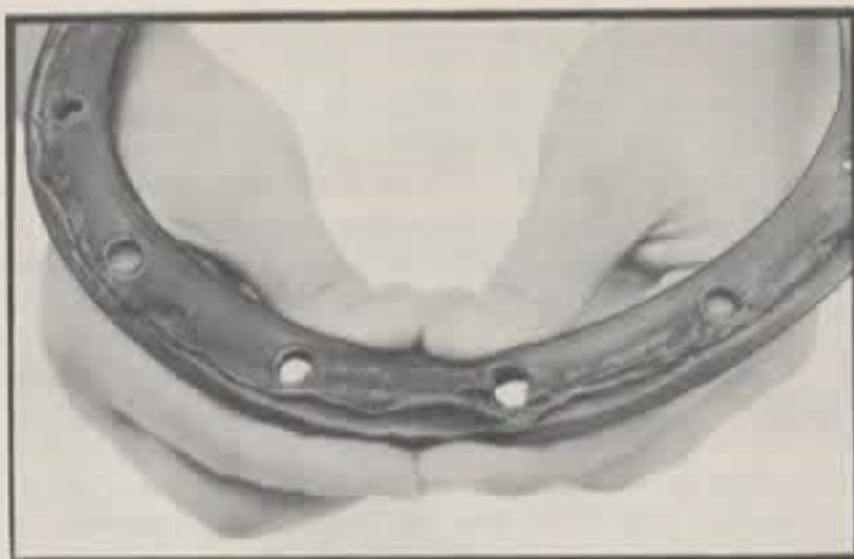
And now, while we're on the subject of gaskets, let's settle an age-old rhubarb once and for all...

## Ring-type vs full-type

Without stopping to count, we'll wager there are still plenty of ODs and OPs that specify ring-type gaskets either as preferred or alternate assembly items. By ring-type what we mean is a gasket that has no holes for the fastenings to pass through — a gasket that fits *inside* the circle of capscrews or studs. This







This is how gasket looked after removal from recovered mine shown at bottom of page 12. Instructions here prevent effects of cold-flow such as this.

# Openings

type, friends, went out with the horse . . . not because it doesn't seal good like a waterstop should, but because it has an unhealthy tendency to make extender and clock-starter flanges crack. After their fastenings are set up to torque, that is.

So the word is to heave ring-type gaskets and use only the so-called full-type—the kind that have holes for the capscrews or studs.

That also goes for all mods of Mines Mk 25 and 49. Lately NAVORD INST. 8550.13 has been telling you to use ring-type gasket DWG 369032-1 for the tail-plates of these mines. Now we're telling you this scoop is for the birds. BUORD has recently procured a brand new full-type gasket for these mines. It's gasket DWG 1509758 and it's in the stockpile and it's the only one you should use.

Whatever you do, don't use tail-plate gasket DWG 1227597 for your 25s and 49s. This one's a full-type gasket all right, but it's way below hardness specifications.

On gaskets, here's still another word to the wise. We've seen some depth-charges being dropped with the

protective cork shipping gaskets installed. This means somebody goofed. The only gaskets approved for these water-tight openings are gaskets of rubber, or the synthetic that looks just like it—neoprene.

## Next comes a field day

Now it's pretty obvious that the mechanism wells of planted weapons shouldn't leak, especially under service conditions, which for mines can mean remaining lethal under water for as much as two years.

Well, it's just as important for these same wells to be moisture-tight during storage, especially when clock-delays and mine firing mechanisms or depth-charge pistols, booster-extendors, etc., are installed.

The answer, friends, is a field day, short and sweet. First, file off any jagged edges that will interfere with a good gasket seat or—inside the well—could snag the sheathing of electrical cables.

After that, remembering you should use only antispark tools on explosive-loaded cases, use a wire brush,

scraper, and plenty of armstrong method on any areas that show signs of rust or corrosion, especially if you find either on a surface where the gasket will lay.

Then there's the phonographic grooves that encircle some mechanism wells. These grooves have absolutely got to be clean, yet you shouldn't get so ambitious that you add any transverse scratches or grooves of your own. By "transverse" we mean a scratch or groove that radiates *across* the gasket surface, out from the center.

In fact, you should reject any case that has a transverse groove that's more than about a thirty-second of an inch deep. Reject whether it's an opening that has phonographic grooves or not, and whether you gouged it out yourself or found it had been done by a laddie "who got there afore ye." If you don't, we'll be planting one more dud.

## Now, George, the paint

Naturally with a war on and urgent prep orders in your hand, the last



thing on your mind would be paint.

But peacetime, thank God, is naturally different. Chances are some bare spots will be staring you in the face if your field day on the tube or well was well done, and some paint on these spots will save Uncle dough.

To get ready, clean out the well and any surfaces you worked on, using a clean rag and some solvent (Stoddard WX6-850-0264-5771 smells bad but works fine.)

Next, a coat of zinc chromate primer on the bare spots will delay subsequent rusting and brighten things up. Color Y, MIL-G-8585A, is the standard item for this, and the right way to use it is to keep the coat thin — thin enough that the color of the metal tends to show through.

This goes, too, for any chromate that's already there. If there's a thick solid yellow coat on the mating surface it's much too much. Scrape it off, clean up with your wire brush, then apply a *thin* coat just like we said. The worst thing you could possibly do would be to slop it on so thick it fills the phonographic grooves or tapped threads you just got through cleaning out. And this raises a somewhat voluble question . . .

NAVORD INST 8500.10 is your authority for applying the paint. Drafted by our own NMEF engineers but intended only for major depots handling empty cases, it says you can do it "by spray, brush, roller, or dipping."

Now you and we know that in the field spray's okay, while a brush is the one to use in a rush. But use a roller in an extender well? H - - -! And if they think you can touch up a well-opening by dipping, then brother they're slipping.

Either that or the size of your muscles and paint-locker would make copy for Ripley's "Believe It Or Not"!

### Pick a finger

Naturally some mine and depth-charge cases are in a lot better shape than others.

Maybe with fairly new ones you don't have to do everything we've told you to do so far, yet most will last longer and make more reliable weapons if you do. In any case we're now going to assume your case is Ready for Freddy with its gasket surfaces "hospital clean," and move on from cleanup to buttoning up.

From this point on every step is one that anyone who prides himself in being a real mechanic will do. And that goes for the first step — sticking your finger in grease.

Which finger you use is entirely up to you. The Muslims, for example, have rules about what they'll touch with which hand, and if you have similar task assignments by fingers, we of ye T-SHOOTER wouldn't want to interfere with your rights. But on the question of what kind of grease your finger goes into, we're going to be more specific . . .

If the fastenings are bronze or steel, use a regular bearing grease like MIL-G-16908; wipe a thin coat on the threads of all capscrews or studs, and if your gasket's an O-Ring put a very thin coat on that too. The reason for coating the threads? Without it, your torque-wrench pointer will lie.

Now on some openings the fastenings are aluminum — Mines Mk 10 and mysterious Weapon A (the 12".75 rocket) for example. On the threads of these you need Anti-Seize Compound FSN 1350-605-7651 in place of the grease, not only so your torque will be somewhere near right, but because the aluminum parts will practically weld themselves together under torque if you don't.

Note this well, especially you Joes who've been Rudminding firing mechanisms in 12".75 rockets because you've literally been wrenching off the ends of your wrenches trying to get 'em back out . . . your answer lies here.

### Place the gasket

If you've got electrical components to be hooked up inside the well — like in the clock and extender wells of most mines — put the gasket in place *first*. Don't wait 'til after the wiring's complete like some OPs used to say, unless you plan to cut up the wiring or the gasket in order to get it on later.

Of course we're assuming that by now you wouldn't even think of using no-good gaskets, but if there's still any doubt, re-read the section above headed *Ring-type vs full-type*.

A couple more hints may set you

*continued on page 20*



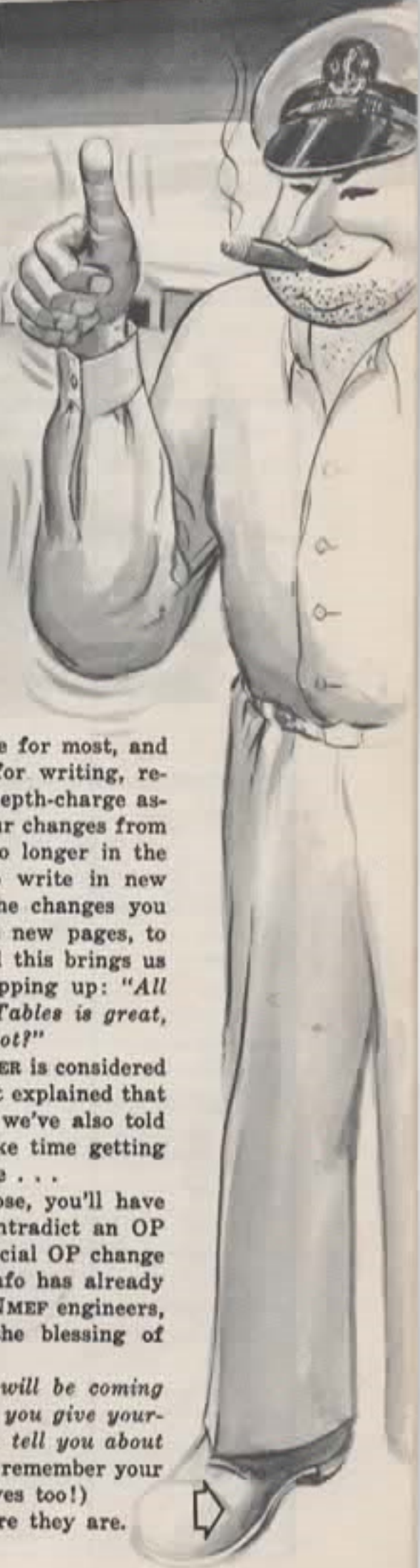
Farnsworth, I told you the cable on that last one was too #%&\$¢ long!



# PUB-S-CRAWLIN'

with

Clark Starter, MN2



**I**N ANSWER to no small number of reader requests, I'm going to try hard to give you a list of recent ORDALTS, NOTICES, and INSTRUCTIONS in the next issue, and periodically to bring the list up to date. That's a promise.

A lot of you have also been asking questions about OP changes, so now let's see what can be done in the way of some answers.

To begin with, your OP is the final authority on how to test and assemble depth-charges and mines. Sure, in some places you use SOPs in place of the OPs. But the SOPs are supposed to be based on the OPs, and should never contradict them on such matters as correct wiring connections, test limits, torque requirements, etc. This means that whoever is responsible for any assembly SOPs in the corner where you are must make it his business to see that they always reflect the latest changes to those OPs. So much for that.

Then there's the deathless question about why it takes so long for you to get OPs and changes to OPs. In the case of the former, much of the answer is printing.

You may not be aware of it, but those crisp new books that keep showing up in the downtown bookstores have often aged two years or more since the author's manuscript was bought by the publisher. Printing is a slow, meticulous business, far beyond the imaginings of anyone who hasn't spent part of his lifetime up to his ears in it. And the U. S. Government Printing Office, which handles your OPs, is by far the largest and busiest print shop anywhere in the world.

But neither BUORD nor NMEF is prone to say that it's out of our control, and therewith forget it. Procedures for handling BUORD pubs have in fact had a thorough review just this year, with the expected result that four to five months will be chopped from the production time for new OPs!

Now NMEF has become responsible for most, and will ultimately become responsible for writing, revising, and up-dating all mine and depth-charge assembly OPs. This means most of your changes from now on will be coming from us — no longer in the form of instructions telling you to write in new scoop with pen and ink. Instead, the changes you get will be in the form of complete new pages, to be inserted in place of the old. And this brings us to one more question that keeps popping up: "All that scoop in the T-SHOOTER Pubs Tables is great, but are we authorized to use it or not?"

The word, men, is that ye T-SHOOTER is considered official (see page 3). Now we've just explained that OPs are your firm, final word, and we've also told how printed changes to OPs can take time getting out. From that the answer is simple . . .

If you've read T-SHOOTER real close, you'll have noticed that we never knowingly contradict an OP without mentioning that the next official OP change will correct. That means that the info has already been approved as an OP change by NMEF engineers, and has been printed here with the blessing of BUORD.

In short, knowing that a change will be coming along, you'll be right on the stick if you give yourself a head start by doing things we tell you about in the way we tell you is best. (Just remember your chiefs and COs have their prerogatives too!)

And now, speaking of tables — here they are.



## PUBLICATIONS ERRORS REPORTED THROUGH RUDMINDE

PUBLICATION	USED WITH	REPORTED DISCREPANCY	REMARKS
NAVORD LIST 22501 Rev. E	"Mine Test Sets, Tools and Equipment"	Lists batteries BA-28 and BA-42 which are used in obsolete multimeter.	Should list BA-30 and BA-261/0 for Multi-meter AN-PSM/4A; next change will correct.
OD 6678 4th Rev.	All mines	Lists mines for interim use which have been approved for service use.	Will be corrected in the 5th Revision, now in preparation at NOL.
OD 7302, Vol. 1, 3d Rev.	Mine Mk 25-0	Item 625 lists one CS/EX gasket per mine; item 663 also lists one CS/EX gasket.	Forthcoming change will delete item 663; item 625 will list two CS/EX gaskets.
OD 7303, Vol. 1, 2d Rev.	Mine Mk 25-1	Item 620 lists one CS/EX gasket per mine; item 654 also lists one CS/EX gasket.	Next change deletes item 654; item 620 will include two CS/EX gaskets.
OD 7306, Vol. 1, 4th Rev. and Vol. 2, No Revision	Mine Mk 36-1	1. Item 206 is designated as a left-hand battery bracket; item 207 as a right-hand one. 2. Cable Assembly CA-528 is not listed for assembly 14. 3. Does not list rubber grommet for sensitrol can cover.	1. See "Ambidextrous Me" in MILLIE'S BRIEFS, this issue. 2. Next change will include CA-528 for assembly 14. 3. Grommet 12-Z-12002-514 (FSN Z5325-292-3837) fits sensitrol can cover DWG 415907; next change will list it.
OD 9169 No Revision	Firing Mechanism Mk 22-0	Figure 11 shows 1.35-volt battery in pressure-sensing circuit with polarity reversed.	It does. NOL has cog of this OD; has been asked to change polarity in figure 10—also to change figure 11 to agree with DWG 1358410 (schematic).
OD 9350 1st Rev.	Mine Mk 53-0	Shows Swagers (12-Z-7000-5004) on page 4c, but not in components list.	They're listed under Firing Mechanism Mk 24-0, item 205.0, as sub-item 16: "Terminal, Cable, 12-Z-7000-5004". New OSO stock number is Z4030-643-6410.
OD 12067-G No Revision	All Mines	1. Page 266, item 4 lists spacer block for use in Mine Mk 36-2. 2. Page 359, item 16, and page 514, item 16, list sequence number for Accessory Set Mk 5-0 as G-0907500.	1. It's used in Mine Mk 25-1, not 36-2. 2. Should be G-09070500. These errors will be corrected in 1st Revision, now in preparation at BUORD.
OP 948 1st Rev.	Mine Mk 10-3, 7, 9	1. Page 54, par. 32m reads "5-ohm, 25-watt". 2. Page 52, par. 29 does not call for lockwashers on TD 16 mounting screws. 3. Page 57, par. 36 does not call for lockwashers on clock-delay mounting studs.	1. Should be "5-ohm, 0.5-watt". 2. Use washers, spring-lock, bronze, #6. 3. Use washers, lock, external tooth, zinc plated steel, #8. Forthcoming change corrects these omissions.



## Errors reported through Rudminde, continued

PUBLICATION	USED WITH	REPORTED DISCREPANCY	REMARKS
OP 956 3d Rev.	Mine Mk 25-0	1. Can't secure CA-275 and Circuit Break as instructed on page 42, par. 39e. 2. Spacer installation instructions (par. 37, page 40) don't agree with fig. 13.	1. See "A Reaming That Helps" in HOT STUFF this issue. 2. See "Silly Boy" in MILLIE'S BRIEFS, this issue.
OP 1391 1st Rev.	All Mines	Page 26, fig. 29 is titled "Mine Mk 26 Mod 0 and 1"	The mine in figure 29 is a Mk 27; this will be corrected in 2d Revision now in the mill at NOL.
OP 1684 2d Rev.	Mine Mk 36-1	Page 12, par. 45 mentions a percussive-type primer in this mine.	It's actually an Electrical Primer Mk 114 Mod 2. NOL's advance copy to the 3d Rev. does not make this error.
OP 1765 2d Rev.	Mine Mk 25-2	1. Table 2 does not list flight gear for assemblies 04, 05, and 06. 2. Page 54, par. 51b states "the A-6 mechanism should not cycle and no firing should be indicated..." 3. Page 31, par. 18 disagrees with OP 1452, page 118, on how to set CD-14 when used with SD-4.	1. Use Parapak Mk 13-2 and Release Mechanism Mk 7-3 with these assemblies. 2. Statement is correct but applies only to Firing Mechanism A-6 Mod 3. See remarks on the A-6 in the "Defects Table," this issue. 3. See "Zilch is the Word" in HOT STUFF, this issue.
OP 1892 1st Rev.	Mine Mk 36-3	1. Figure 26 identifies delay switch as Mk 52-0. 2. Pages 28-29, par. 31e, hookup of Test Set Mk 3-2 for operational test is incorrect.	1. That's Control Unit Mk 66-0, uses Mechanical Delay Switch Mk 25-0. 2. Connect set's lead 3 to terminal 2, lead 5 to terminal 5, lead 4 to terminal 10. Next pub change will put 'em this way.
OP 2282 Prelim.	Mine Mk 52-1	Page 5, par. 3 states "maximum dissolving time of soluble washer is 15 minutes."	Probably should say 25 minutes; NOL will pick this up before the OP goes into final print.
OP 2283 Prelim.	Mine Mk 52-2	Page 13, par. 5 says, "for depths less than five feet."	Should say 18 feet or more. This will be corrected in final printing. (To tell you more here would classify this issue.)
OPNAV INST 08550.3	Coding Instructions for All Mines	Table 5 does not list Mine Mk 36-3.	Your instruction is out of date. Use OPNAV INST 08550.3A (Mine Code ALFA).
ORDALT 4089	Release Pistol Mk 2-1	Par. 9.3 says to stamp body "DWG 4168552".	BUORD ltr Malb-2-JCG:dd A10-1/1 of 27 May 1959 tells holders of ORDALT 4089 to stamp body "DWG 1468552". This is the word.
OS 5877	Test Set Mk 1-1	Various polarity errors in par. F-3.	Right! Use MIL-T-21174, which supersedes OS 5877 and corrects all its reported errors.



Millie Amps'

# BRIEFS



Gee

... you fellows sure overwhelmed me with all your swell replies! Old B-Butt, who'd said I couldn't write any more columns unless you fellows went for my kind of treatment, has since been meek like a lamb. 'Course he didn't come right out and say my column was good, but he sure has been breathing down my neck for new copy. So here's some more of my stuff. Not for him, though, men. Just for YOU!

## Ambidextrous Me!

MN1 R. D. HAMMOND at NWS/Y worked himself into a tizzy a short time back trying to tell the left side of a mine from the right. OD 7306 started him off. He claims that item 206.0 lists the Battery Bracket DWG 416558 as "left" when it should be "right" and he's right!

Apparently the men who've been doing the engineering drawings and writing OPs and ODs haven't always been too sure on this point. Even our

own hard-headed B-Butt has gone for years unaware that good ol' CHARLEY PAINE up in BUORD nailed this one to the floor once and for all when he wrote BUORD letter Re7a-CEP:rhv serial 66685, back in November 1953. What he said was that when the words "right" or "left" are part of an item's official nomenclature, they should indicate that the item is used on the right or left side of the mine as viewed from its tail section, looking forward.

Now — who says we girls can't tell our rights from our lefts?

## Brasses To Brasses

Knowing full well the incompatibility of brass and aluminum — especially when immersed in salt water — JOHN D. PETTY at NAD/Hawthorne got somewhat shook when he read page 37 of OP 1452 where it told him to remove the brass machine screws that secure clock-starter caps to their flanges, and to install aluminum screws in their place.

Like John says, Clock Starters Mk 1 Mods 0, 10, and 11 have brass



flanges, and those brass screws should be left in them right where they are. It's only Mods 3, 4, 5, and 9 of the CS-1 that have aluminum flanges. On these the brass screws should definitely be replaced by aluminum if you can find any. And what if you can't?

Then replace with zinc-plated steel screws GS 5305-290-2779.

### Silly Boy!

In the Pubs Table of T-SHOOTER 1-59 (page 20) our Ed. thought he'd settled once and for all a conundrum put by BILL SEGESSER, Navy 3002, and MAURICE HARMON, Navy 214, about whether in OP 956 3d Rev. it's the text on page 40, the text on page 42, or the illustration on page 43, that's right in telling which way you should turn the pad on the M-11's after spacer (DWG 416702).

The text in par. 37h says to install with this spacer's pad *aft*; this is right. The illustration (fig. 13) shows the spacer's pad turned *aft* toward plate DWG 416557, so this is right too.

Yet the letters keep coming in, insisting that par. 37b contradicts figure 13. It doesn't. Par. 37b refers to the Pad DWG 416742 shown in figure 12 on page 41.

Then there's the MN3 (I won't mention his name here) who asked what our authority was.

On pads, Dads, the authority is ME!



### Shake It But Don't Break It

J. E. JENKINS at NWS/Yorktown reported some mounting sleeves on M-5 firing mechs that were out-of-round just enough that they wouldn't slide into the Mk 10 mine cases without some encouragement applied at the outer end with a hammer.

Now that in itself sounded like pretty harsh treatment for such thin aluminum sheet, though I'll admit Brother Jenkins' hardware may have been in pretty foul shape. But later one of our NMEF observers told me he'd watched some men at another installation who weren't just tapping. "Sweetheart," he said, "they were clobbering!"

Just for kicks, then, I decided to watch a couple of the huskies in our own shop install some M-5s.

One of them was quick to point out that the mechanisms' mounting springs almost always distort the roundness of those sleeves a little. But he also showed me how some judicious wiggling combined with some gentle pressure on the high spots will make it slide in okay; how with him helping a little, even I was able to do it with no sweat.

Take it from me, men . . . there's a technique that works!

### Itchy On The Switchie?

We know perfectly good Circuit Breaks Mk 1-0 and 2-1 have been rejected, and not only at MDAU 0304 where H. W. DZIUSZYNSKI has found a likely reason.

He points to the balancing procedure on page 35 of OP 681, where step a says to throw Test Set Mk 96's GALV/CLK switch to GALV. Apparently all you brutes make out with this step okay, but then some of you get itchy fingers and promptly return the switch to its central position before you go on with the next steps.

That's wrong.

What you *should* do is leave that switch on "galvanometer" (GALV) until you get to the Timing Check. Otherwise the CBs you balance won't work right in the mines, and you'll be rejecting some CBs that would.



### Vive La Différence!

Not only is BUORD the mineman's final authority on how to tell left from right (see my brief called Ambidextrous Me), now — God bless 'em — they've also set us straight on the mating of female and male!

Specifically I'm referring to a Rudminde sent in by Mr. L. B. LUCAS of the Bureau's Material Division. He says that when you need an adapter so as to turn a standard  $\frac{3}{8}$ -inch-female-drive crowfoot with your standard  $\frac{1}{2}$ -inch-male-drive torque wrenches, you'll look pretty silly to the rest of the boys if you try to use Adapter 41-A-29, naively recommended on page 35 of OP 1797. I know for sure this could never work out since it requires mating male to male and female to female!

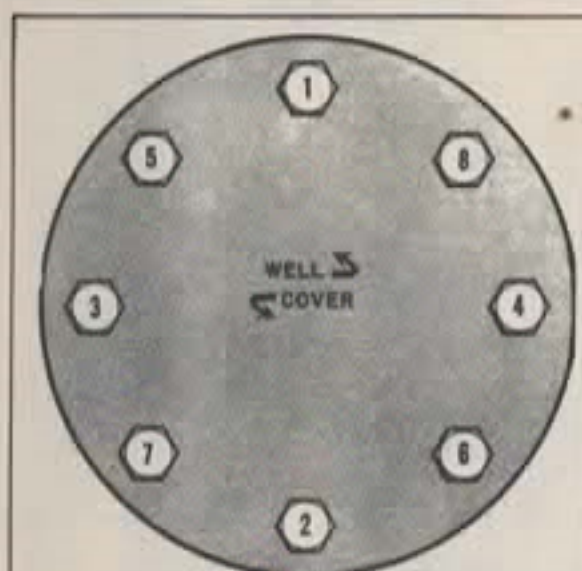
So here's a hot number for you-all to write down in your little black books: Adapter GM 5120-240-8702. It provides a  $\frac{1}{2}$ -inch-female socket for the  $\frac{1}{2}$ -inch drive-end of the torque wrench, and a  $\frac{3}{8}$ -inch drive-end to fit the crowfoot's  $\frac{3}{8}$ -inch-female socket.

— Isn't that nice?

*Millie Angel*



CASE OPENINGS continued from page 14



This is "diametrically opposite" tightening sequence for watertight seals. First set each fastening up slightly, then — tightening each a half-turn at a time — work from one to another in order shown here. Repeat half-turns in this order until each nut or capscrew is torqued to prescribed number of pound-feet.

straight here: 1) Forget the old practice of using rubber cement to tack gaskets in place. On vertical mating surfaces like in tail-plate installations, marry the parts starting at the bottom, turning the fastenings in a few threads by hand, and working up both sides to the top; 2) Seat all O-Rings right down in their grooves. Press 'em home with your fingers instead of waiting for the assembly process to force them in place.

### Don't forget fiber washers

Clock-starters and extenders (except Extender Mk 6-2) have to be electrically insulated from mine cases, and this is made possible by fiber washers that fit into counterbored grooves in the components' flanges, and that must be protected by flat washers placed on top of them before the lockwashers go on.

Now you should never assemble a weapon that needs them without them, but where you put 'em depends on whether you've installed detonators and are buttoning up the weapons for planting, or are assembling without detonators for shipment or storage. If it's the latter, the fiber washers should go in one of those little cloth

bags, tied to the component's electrical cable inside the well. If you're preparing for plant, install 'em on the flanges just like your OP says.

The reason, of course, is that fiber washers can only be used on the fastenings under pressure once.

There's also another word of advice to remember here: Don't install clock starters or extenders that haven't been counterbored. Again, the exception is Extender Mk 6 Mod 2. See page 22 of OP 1452 if you're unsure about this.

### Torque talk

Whether it's the bottom of an electric toaster or a water-tight opening, there's only one right way to tighten it down and that's by following a diametrically-opposite sequence like in the illustration on this page. *Work around the circle in regular numerical sequence, and when you finish you'll always find less torque on the first few fastenings than you gave when you tightened.*

Of course you don't have to measure torque on your toaster, but it's plenty important on these weapons and you'll never get it right if you don't have clean threads with a little grease on 'em just like we said. This is also the time to make sure each component's flange is as clean as the flange of the well.

Then there's the question of how much torque. On this, depth-charge OPs specify nothing while mine OPs specify almost anything. So, once and for all, here's the word:

When you're assembling for shipment or storage, torque the fastenings to 5 lb-ft. That goes for all fastenings on all wells, tubes, and covers of all depth-charges and mines, except those filling hole covers. Like we said at the outset, *leave these cotton-pickers alone.*

When closing for service-use with detonators or drill-mine explosive fittings installed the story is different. At this time and *only* at this time, up the torque to 16-20 lb-ft, again using the diametrically-opposite tightening sequence. This, too, goes for all fastenings on all openings of all depth-charges and mines, except for filling-hole covers and fittings such as glands, horns, release pistols, etc.

Ideally this final torquing shouldn't

be done earlier than about 24 hours before planting. If it's done considerably earlier than that, the torque may become relaxed because of a phenomenon called "cold-flow," to which rubber and neoprene gaskets are subject.

Cold-flow relaxes the torque, but you'll be wrong if you try to correct it. Every time that you do, cold-flow will relax it again and you'll end up with gaskets torn or distorted to such an extent that the openings will leak.

That's why we say 5 lb-ft for shipment or storage and 16-20 lb-ft about 24 hours before use. If you *must* apply 16-20 lb-ft somewhat earlier and then find cold-flow has relaxed it, torque the fastenings back to 16-20 lb-ft once, *but only once*. Your latest authority on torquing by the way, is NAVORD INST. 8550.24.

### Get hep to barriers

Moisture barriers should be installed on all openings of assembled weapons destined for storage or shipment, right after the 5 lb-ft torque is applied.

For now we've got to restrict them to mines, but not for long. TMC BILL GRAHAM of the USS GEARING has come through with some slick ideas for barriers on depth-charges. We're evaluating them now, and the next T-SHOOTER will probably pass them along for fleet-wide use.

It's NAVORD INST. 8550.18 that'll put you in the moisture-barrier biz on your mines. The only point on which it's not quite clear is that you should install them on *all* clock wells, extender wells, tail-plates with microphones, etc., just like we show here. Aside from that you'll find it includes accurate instructions, standard-stock numbers for all needed materials, and plenty of very fine pix.

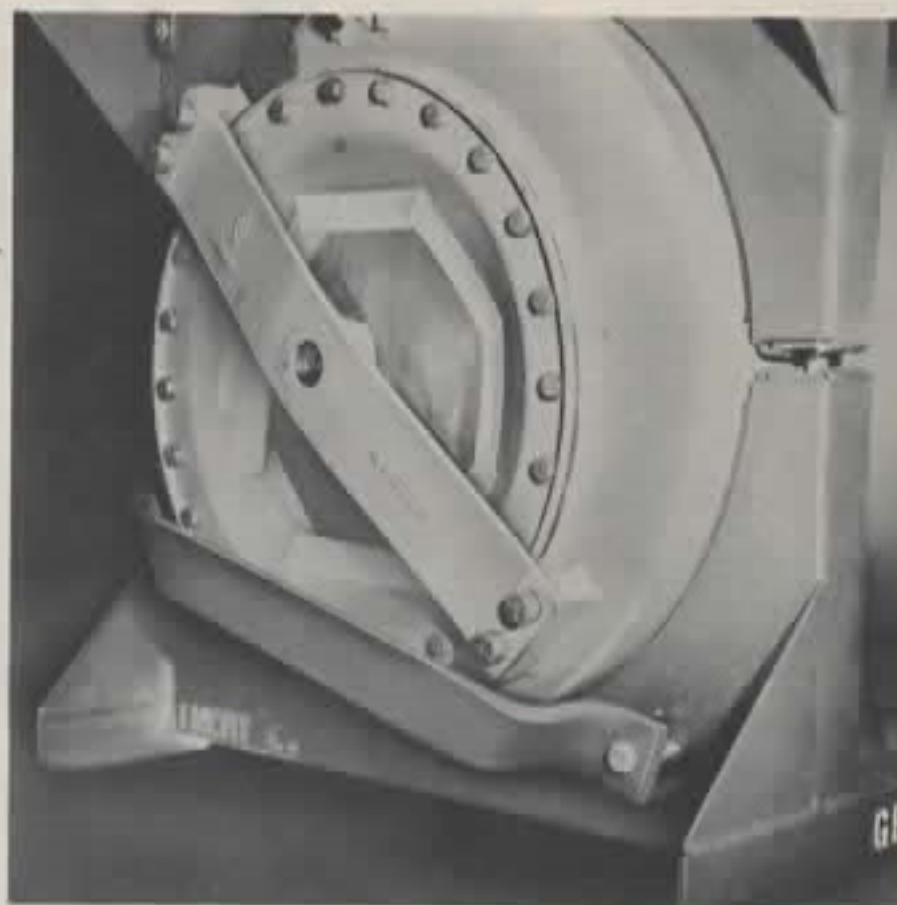
### Gung ho

And away we go . . . leaving you with more than enough *do-how* to make the engineers' *know-how* worthwhile. Treat those openings like we say here and you'll be surprised how much misery our world-wide statistics tell us you'll be saving for Uncle. Besides, you'll have the feeling that comes from a job done right.

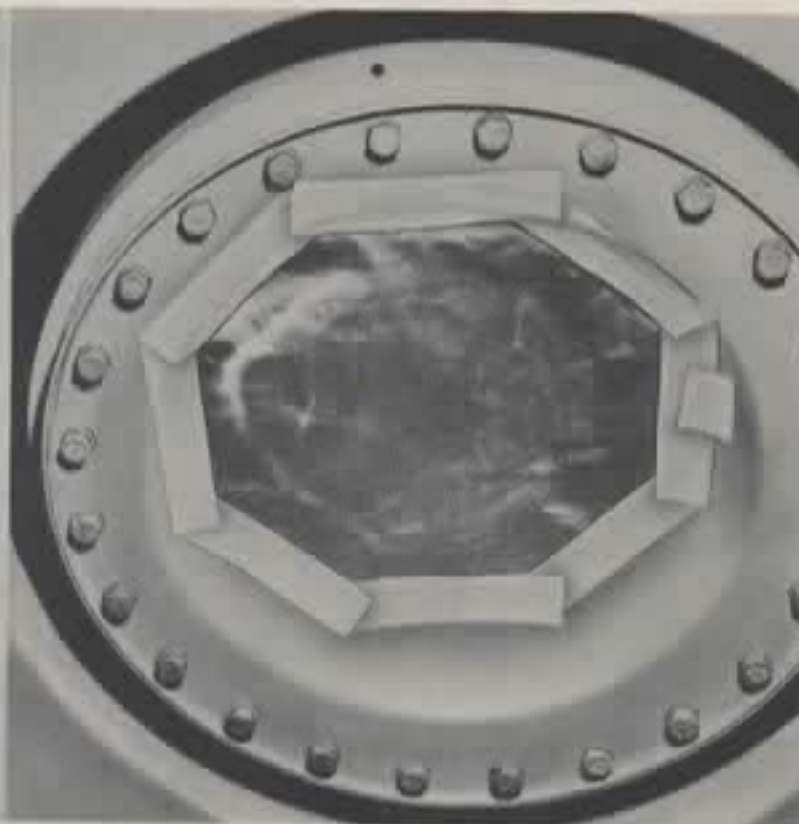
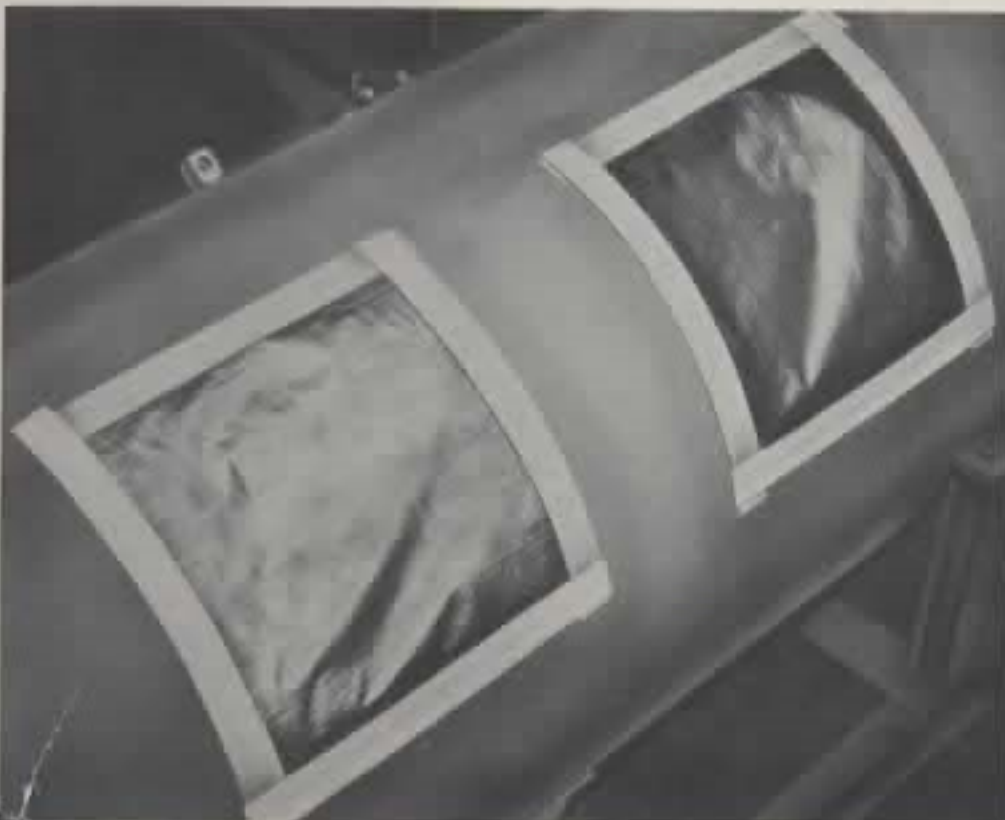
In the long run, there's nothing in the world that can replace that.



This is how moisture barrier is installed to protect Microphone MI-4 in tailplate of Mine Mk 49-1, made of 9½-inch square patch with corners cut off 2¼ inches from points. Barrier material is MIL-B-131 (GF8135-282-0565), 600-ft. by 3-ft. roll makes 2200 barriers, protects all openings for about 25 cents per mine.



Install moisture barriers over Microphone MI-4 in Mines Mk 25-1 like this. Patch is a 13-inch square with corners trimmed 3¼ inches from points. Masking tape (60-yd. roll) is GF7510-266-6712, enough for 120 barriers.



Moisture barriers here are installed on clock well, extender well, and tailplate of Mine Mk 36-2. After installation always coat all barriers with plastic spray GF8030-266-687. 281-2345



# DON'T WORK IN THE DARK



*To get some light on the problem,  
fill out a **RUDMINDE** and send  
it to **NMEF**!*