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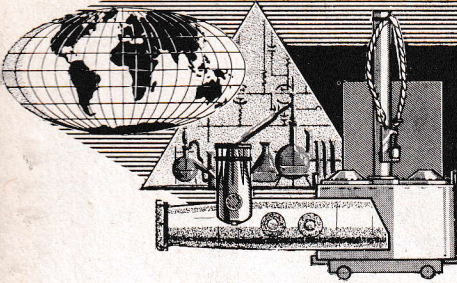
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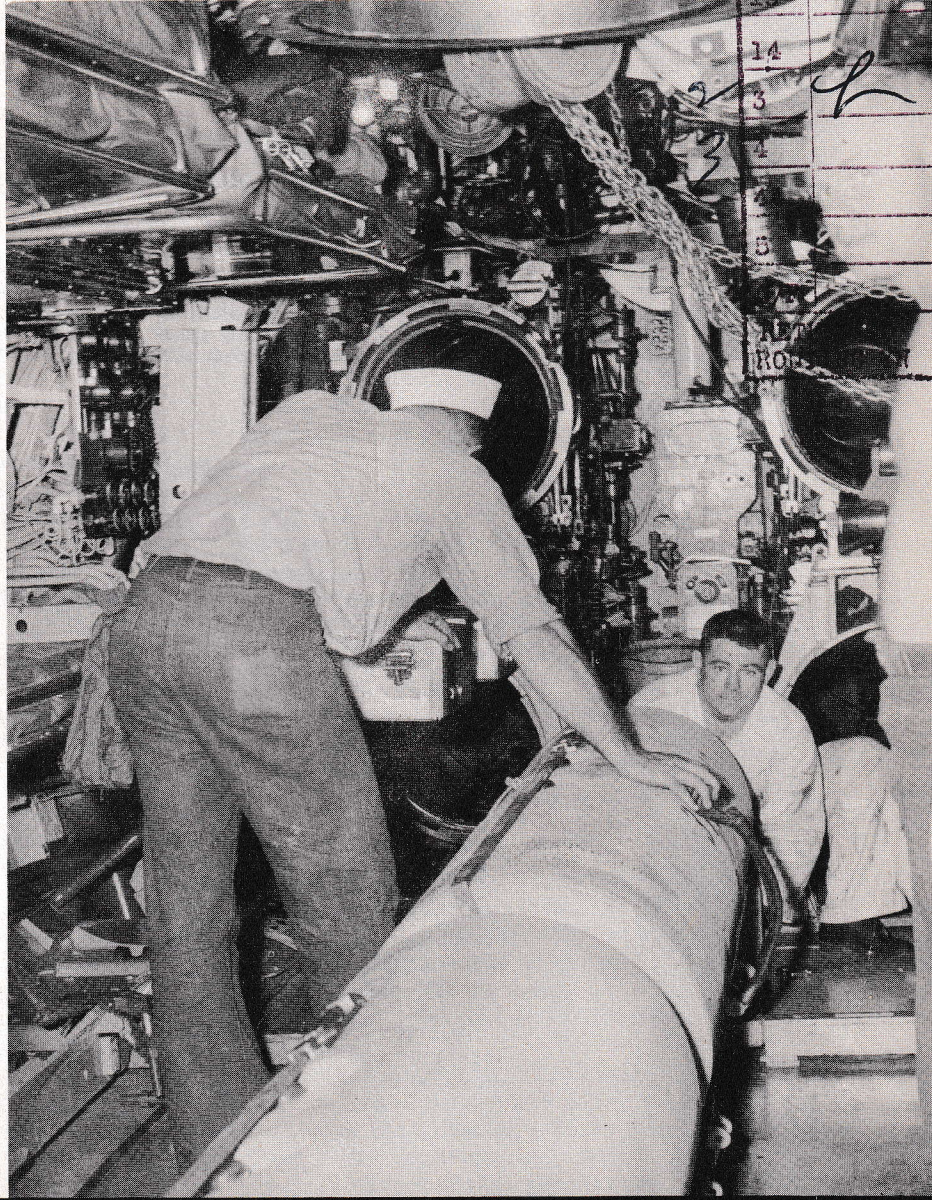


mine and depth - charge

THE TROUBLESHOOTER

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- ▶ Color Coding Explained
- ▶ Hedgehog Practice Made Safe
- ▶ T-Shooter Named "Official"



AN OFFICIAL BUWEP'S PUBLICATION

in this issue . . .

mine and depth charge

THE TROUBLESHOOTER

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

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COVER PHOTO: Torpedomen mount Mk 49 mines on skids aboard the sub STERLET (SS 392) for planting in Fleet Service-Mine Test. FSMT Program provides continuing check of reliability of all types of in-service mines under conditions that closely approximate wartime use.

— 1 JULY 1962 —

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 (e.g., items of general interest such as are reported in *SOUNDINGS*) 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 basic instrument of the program is NAVORD Form 2776. 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 NAVORDINST 8500.7.

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THE OFFICIAL JOURNAL OF THE RUDMINDE PROGRAM

SOUNDINGS

The Changing Scene In Undersea Warfare

CROMWELL CURRENT: The U. S. Navy Weather Research Facility has prepared a research publication, "The Cromwell Current," to acquaint Navy meteorologists with a recent discovery in oceanography: a strong narrow subsurface ocean current discovered in the Pacific Equatorial area within 2° of the Equator. Named for its discoverer, the new current extends in width from 2°N to 2°S, and in length from 140°W to 92°W. At the Equator the easterly flow is first perceptible at a depth of about 20 meters, the maximum speed of 2 to 2.5 knots being at a depth of 100 meters.

There is some evidence that a similar current exists in the Eastern Atlantic Equatorial Zone.

SWELL WAVES AND SEA GARBAGE: The most we know about the ocean floor is on the shelf, or, to quote Harris B. Stewart, Jr., chief oceanographer of the U. S. Coast and Geodetic Survey, "Only two percent of the ocean bottom is adequately charted and this charting has been limited almost exclusively to the . . . continental shelf."

How come? The biggest part of the answer is that a professional oceanographer is a rara avis indeed, a fact not hard to fathom when one learns that, in all the world, there are only about fifty schools of oceanography, most of them not much for size. Graduates from schools of geology and geography aren't plentiful either, but they outnumber oceanographers by some 1000 to 1. Then there's that bugaboo about funding.

Little as we know about the ocean floor, we know even less about what goes on between the floor and the surface. Man may have been charting ocean currents since before Biblical times but three have gone uncharted until the last four years: one in the Atlantic and two in the Pacific.

Then there are those mysterious deep-sea currents that influence the surface currents (see CROMWELL CURRENT above). What we don't know about these will give some oceanographers divers paths to follow for years. Other oceanographers are fascinated by swell waves. For instance, there must be some magnificent measurements involved in a swell wave that has enough wallop to wreck ships standing at anchor off the Northwest African coast after rolling all the way from Newfoundland.

Still another problem, one new to our age, is that of ocean turnover or the movements of sea water upward. The question that hurts: Will deep-sixed atomic garbage stay down?

Tackling questions such as these is the mission of the newly-founded Special Committee on Oceanic Research (SCOR), an offspring of the International Council of

Scientific Unions (ICSU) which also sponsored the International Geophysical Year (IGY). SCOR now hopes to convince 25 participating countries that they should contribute \$60 million for Indian Ocean research and charting.

DAMP DUDS: After a year of searching for clothing to keep boat crews warm and dry during long periods of rescue work, the Coast Guard has settled for Scuba "wet suits" which kept wearers much warmer than did conventional foul weather gear in numerous tests. The need for a wind-breaker over these suits when worn in cold wind for lengthy periods was solved by using coveralls. Color: high-visibility orange.

"Wet" Scuba suits differ from dry suits in that water is permitted to seep in around the neck, wrists and ankle openings. This water forms a thin film that serves as insulation and helps to retain body heat.

Made of neoprene, the suits are buoyant so eliminate the need for wearing a life preserver. The CG is now looking into the merits of equipping its helicopter crews with this type of protective clothing.

FAIR ENOUGH: More than 3500 Navy men and 13 ships were scheduled to participate in the Seattle World's Fair. Among the big ships slated to appear were the heavy cruiser HELENA, the amphibious command ship ESTES, the seaplane tender CURRITUCK, the guided-missile frigate PREBLE, and the submarine BLACKFIN. Destroyers scheduled to take part were the WEDDERBURN, PARSONS, and LYNDE McCORMICK. Minesweepers included CONSTANT, ADVANCE, PLUCK, PIVOT, and ENERGY.

All of the ships are home-based at San Diego, California, except the BLACKFIN and the five minesweepers.

UPSADAISSY: On Armed Forces Day, 15-year-old Richard Brewer was skin diving 50 feet down in a quarry near his home in Toledo, Ohio, when he lost his weight belt. Releasing his air tanks, he surfaced too rapidly. Result: a boy with the bends. The bubbles in his blood stream could be worked out only in a decompression chamber.

Luckily, the Navy Sub CERO was anchored in the Detroit River for Armed Forces Week. The unconscious boy was airlifted to the CERO in a Coast Guard helicopter and placed in the sub's decompression chamber where air pressure was upped to 20 pounds equaling a 50 foot depth, then eased to the equivalent of 40, 30, 20, and then 10 feet.

Richard sat up. He left the CERO under his own power

rocky but unbended. His father's comment: "Thank God for the United States Navy."

QUICK WATSON! Research scientists at the U.S. Naval Ordnance Laboratory at White Oak, Maryland, have developed a new technique for testing explosives. They are filling hypodermic needles with explosives and heating them to determine the relative impact sensitivity of the explosive.

Information obtained from the tests will ultimately insure the reliability of explosives to ignite in a weapon system.

FAST FOILS: The nation's first tank for precise testing of high-speed hydrofoils and other seagoing systems will become operational this fall at the Lockheed Missiles and Space Company at Sunnyvale, California.

Now an underwater missile facility, it is being doubled in size and a system to tow scale models is being installed. Included is a vacuum system permitting pressure changes of the atmosphere in exact proportion to the scale of the model under test.

IRON SEA SHELLS: A cache in a steamer sunk off Fort Fisher (now a North Carolina State Park) has turned out to be a Civil War buffs' dream. While crowds watched from the shore, Army, Navy, and Air-Force divers

recently retrieved a variety of Century-old British rifles, bayonets, cannon shells, and other arms from a hulk in 25 feet of water some 300 yards off shore.

Some believe this may be the British blockade runner **MODERN GREECE**, an ironclad one-stacker that was fired on by two Union vessels, the **CAMBRIDGE** and the **STARS AND STRIPES**, on June 27, 1862, then ran aground off the coast and was sunk by Confederate fire from the fort.

TOSSED SALAD: Miami Beach bathers were bothered recently by sea slops churned up from the ocean bottom. Mostly a mess of kelp and brown vine-like sea plants, the unwelcome weeds were the worst bit of litterbugging Dad Neptune has done along Florida's famous doorstep in some time.

POOL SCHOOL: At the headquarters of the Pacific Missile Range at Point Mugu, California, a pool 50 feet in diameter is being built to accommodate six porpoises which Navy scientists hope can be taught to count, retrieve, tow objects underwater, and perhaps even talk.

The ability of porpoises to respond to training and develop a repertoire of stunts has long delighted spectators at marine zoos. The Navy "school" project is aimed at discovering how porpoises can attain speeds of 40mph and how they communicate with each other. These and other data could be important factors in the development of future torpedoes and submarines.

THIS IS NUMBER THREE of what bids fair to be a regular T-Shooter item. If you've already sent in your group's photo, we'll be publishing it soon. If you haven't, now's the time to do it—while our group backlog is low. This issue's featured group is the Mine Shop Crew at NAVY 3835.

Front row (left to right): C. E. Mace MNCA, J. W. Hermsen MNCA, B. H. Levesque LTJG, T. Bok MN1, J. C. Price MN3.

Middle row: F. Cavaricci MN1, M. T. McGee MNSN, H. P. Hart MN3, W. C. Carter MN2.

Back row: L. L. Long MN2, W. A. Hugus MN3, C. S. Cowell MN2, J. C. Hamilton MN3, D. H. Holt MN3.



RUDMINDE REPORT TO THE FLEET

Stand fast in the faith

Like the proverbial elevator operator, ye ed has had his share of ups and downs as to whether T-Shooter scoop is to be treated as official doctrine or not.

From our readers the affirmatives have always come in loud and clear: "What good is it to tell us how to do the job right if we've got to keep right on doing it wrong for months or maybe a year before somebody makes it official?" BUWEPS readiness inspection reports, in different words, have echoed the very same theme.

And at last it's worked! Starting with this issue, for the first time since Issue 1-61, ye T-Shooter is official again and in the firmest possible way: by special authority delegated by the Chief, BUWEPS, on 19 April 1962. And this time we think it will stick.

Details you can get by reading the masthead copy (the fine print) on the contents page. We can think of plenty of readers who'll be plenty pleased when they do!

Bone up for exams

The next best bit of info we've received lately comes from Wilber Bean, MNC. Reporting that minemen who've learned of his transfer to the Great Lakes Naval Exam Center have written asking him for a list of rating and proficiency exam sources which they can study, he reports—with full endorsement of the center's CO—as follows:

"My references (see box—ed.) are the pubs or lists of pubs used by me in preparing [minemen's] exams. The first two warrant careful study in the parts pertinent to the MN rating and Military Qualifications. The third lists the mine and depth-charge assembly and testing publica-

BEAN'S STUDY GUIDE

- NAVPERS 10052 (Current Revision), Training Publications for Advancement in Rating.
- NAVPERS 18068, Manual of Qualifications for Advancement in Rating.
- BUWEPS Instruction 8500.1B dtd 31 October 1961: Bibliography for U. S. Naval Mines and Depth Charges.
- NAVORD Instruction 8500.7 dtd 10 July 1957 w/change 1 dtd 11 April 1959: Report of Unsatisfactory or Defective Mines, Depth Charges, or Equipment (RUDMINDE), with NAVORD Form 2776 (New 6-57) (Report Symbol BUORD 8500-4).
- OP 4 Volumes 1 and 2, 2d Revision.
- OP 5 Volume 1 2d Revision, Volume 2, Volume 3.
- OD 8485 w/changes 1, 2, 3: New Mine Accessories.
- OP 1516 1st Rev w/chgs 1 and 2: Chaps 1, 2, 3, 12, 16, & 17, Lead-Acid Batteries for Torpedoes.
- OP 1303 1st Revision w/change 1: USN Synchros.
- OPs 1883 and 1893 for controlled mines and relay operation.
- BUORD Manual.

tions (ed. note: T-Shooter 2-61 contains latest revision) but omits the very important ones that complete the list and are referenced in various OPs and NAVPERS training publications.

"As my constant guide for writing the exams I use pages 2-5 through 2-8 of the second manual on the list. The current changes affecting minemen are number 12 for Professional Qualifications, and number 18 for Military Qualifications.

"As a self-study course I recommend writing questions based on the qualifications listed in NAVPERS 18068, constructing each question with a correct answer and three reasonable but incorrect alternatives. Write as many questions as you can for each qualification. When you have assembled fifty or a hundred, try rewriting them to make them more difficult for higher ratings, more simple for lower ratings. Soon you should have assembled a sizeable study notebook from which you can administer tests among yourselves, grade the tests, check the answers, and learn why or where you made errors.

"I hope to present more illustrations in future exams (commencing August 1962) not only so there will be less necessity to recall from the dusty recesses of your memory obscure but important items, but so the questions can become more technical: more electronics and electricity with circuits and circuit tracing; synchro transformers as applied to the Mk 27 mine. For the higher ratings I hope to be able to beef up the administrative areas. I will try as much as possible to match the Qualification-Area Title to the Subject-Matter-Section Title of your profile cards so it will be easier for you to tell in what areas you have any weakness.

"Remember that a qualification that says a third class should know how to use certain types of meters assumes that he also knows the construction and theory of operation of those meters, that he has learned this before taking the third class test and will not forget it by the time he is ready to take the E-9 pro-pay test. A full-wave rectifier power supply operates the same whether it is in a test-set circuit or a radio circuit, a second class should know this when he is ready to advance to first, and even an E-9 shouldn't forget it.

"Also please remember that questions about or corrections of test items should cite the specific question, and your reference if possible, so they can be processed more rapidly. These questions or corrections should be addressed to the Commanding Officer, US Naval Examining Center, Great Lakes, Illinois.

"If you have personal comments on the tests or are writing as an old friend, I can be reached at the same address."

Onward and upward

Thus, men, concludes another T-Shooter first. Our sincere thanks to Brother Bean and his CO, H. H. Greer, Jr., for their interest and help. Let's hope they'll use us this way over and over again.



by B. Arnacbutt MNC

Massa needs a cool cool ground

Dear Buttster,

Only once have I been on the receiving end of a jolt from a test set, but some guys you just can't tell. About grounds, I mean. A kid here got a real wallop yesterday from a hot 95-2 set because he wouldn't listen to me.

Now don't you agree that earth grounds would be a good idea for all sets in all shops?

J. G. MNC

Dear J. G.,

Like they say in matrimonial circles, I DO! So does W. C. Lynch at NAD Charleston, who attributed the same trouble with the same set to damp storage and sticking relays, and that makes three of us whose advice to all hands is to rig an earth ground to the chassis of any and every 110-volt test set before plugging the line cord in. If an external power supply is used, also jumper the set's chassis to the chassis of the power supply.

Newer sets, of course, provide for grounding via 3-conductor line cords. We progress.

B. Arnacbutt

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.

? ygoloremuN

Dear Butts,

That .1-mike capacitor we're supposed to install between Pos (+) and "G" on the TB-8 in Drill 36-1s (electrically it's across the CD-10's switch A)—where in #1?ç\$*8W do we get 'em?

H. P. L., MN-1

Dear H. P.,

Probably you're using the old stock number: N5910-112-7142. The latest is Z1350-829-8739. This one will soon show up in your OD 7306 Vol. 1 (item 305.0) and it will also appear in the next revision to NAVORD List 24036.

B. Arnacbutt

Dish-combobulated

Dear Barnacles:

Assembling some Mk 49 mines we were plagued by those pesky fiber washers breaking at only 12-14 pounds torque. Apparently the answer was steel flat washers that were warped, maybe because they'd been used before and were pressed out of shape. At least when we replaced these dished washers we didn't have any more fiber-washer breakage.

C. U. P. MN1

Dear Cuppy,

So somebody pitched you a bunch of curves! But you seem to have found the answer...it'll happen even when the dishing is so slight you have to look really hard to be sure it's there. Another hint: fiber washers that are wet or damp will fracture consistently, even under flat washers that are absolutely flat.

B. Arnaclebutt

Up from Shouldmanship

Dear Butts:

My "official" copy of OP 1452 (Second Revision) has Section 9 still on page 25 in all its pristine obsolescence. Wasn't this Serial Marker Tag requirement done away with about four years ago? Seems like Clark Starter ought to have told us in his quaint Pub-S-Crawlin' way that Section 9 should be crossed out.

X. X. X. MN1

Dear X,

You're right! That requirement is over, dead, and gone, and has been eliminated from the new (third) revision to OP 1452 which will become official later this year.

As for your 2d Rev., get out your pen, pencil, or finger paints and do as Clark tells you in this issue.

B. Arnaclebutt

Spot or not

Dear B-Arnacle:

Change 1 to OP 2238 page 102 says to insert ahead of "When the mines" the follow-

ing: "5. A yellow spot at least one inch in diameter is painted on the crate next to each caution sign." This seems to indicate that the loading activity will do so. Last paragraph page 102 states that the assembly activity will obliterate all lettering on mine crate and re-letter, but says nothing about putting back the yellow spot. The question is...Should the yellow spot be replaced on the crate by the obliterators or not?

W. C. C. MN1

Dear Bill,

You're right! The loading activity puts a yellow spot before each caution sign. But darned if I can think of any good reason for assemblers to paint 'em out and then stencil 'em back in again. So don't do it. And for more answers on paints, colors, and spots see our feature, this issue.

B. Arnaclebutt

The head bone's connected to the...

Dear Chief:

Have noticed that Mk 66-0 control units come in containers stenciled EXPLOSIVE POWER DEVICE CLASS C. Without any explosive fitting? What's the reference on this?

J. T. M. MNC

Dear Chief,

On these control units the Mk 51-1 thermal battery, connected to the time relay mechanism which is secured to the Control Unit, contains a 101-3 primer which, when detonated, activates the battery. This is the reason for the EPD CLASS C rating and the reference is BUWEPS letter FSPP-6/104:AF of 4 August 1960.

Another reference is BUWEPS letter C-14-HMR:lar of 22 December 1959, which says that Control Units Mk 66 without Explosive Fittings Mk 1-0 may be stored as inert material if kept away from flammable material.

B. Arnaclebutt

Smoke on the water

Dear B. A'butt:

"Drill Gear Again" in T-Shooter 2-60 is a real helpful article—and subsequent T-Shooters have done a lot to keep us up-to-date by publishing info about new FSNs and

such like—but what about those colored signals? Aren't there four of them?

F. X. O. MN1

Dear Frank:

Right! Four colored signals for Drill Mines Mk 25, 36, 52, and 55, but still only two colors: green and red. The difference is in the delay time. These colored signals are provided with fuses that delay their operation for 38 or 72 seconds to allow time for them to surface from approximately 80- or 150-foot depths (OS 7178 and 8414 specs) before emitting smoke and flame. Here's the run-down:

Signal	Delay Time	Smoke Color	Flame Color
Mk 39 Mod 0	72 sec. (150 ft.)	Green-yellow	Green
Mk 40 Mod 0	38 sec. (80 ft.)	Green-yellow	Green
Mk 43 Mod 0	38 sec. (80 ft.)	Red	Red
Mk 44 Mod 0	72 sec. (150 ft.)	Red	Red

B. Annaclebutt

Cases awry

Dear Bar-knuckles:

I notice that OP 1765 says to tighten the search-coil cover fastenings to a torque of only 5 pound-feet, whereas it says to torque the bolts on the firing mechanism to 16 to 20 pound feet. What's the reasoning?

G. I. N. MN1



Dear George,

No reasoning here at all, Mate. Just the result of getting something right cranked in one place and not another. The 5 lb-ft is SOP for shipment and storage and the 16-20 lb-ft is SOP for planting.

Back in T-Shooter 2-59 in the feature on case openings there's a section on "Torque talk" (page 20) that's THE WORD on all watertight openings on all mines. Eventually maybe we'll get it straightened out in all mine OPs!

B. Annaclebutt

Slam bam!

Dear Annaclebutt:

When we pulled the short-time clock from a Mk 25-0 mine the cable caught on the CD mounting plate and knocked it for a loop. Sure wish everyone used that T-Shooter 4-60 idea, on page 16, about the tape to keep that cable in the clear.

R. I. P. MN2

Dear Rip,

But not everyone does. I'm also thinking that you must have been using one of those impact-type extractors to pull the clock. On the T-Shooter page with that tape idea we also showed a gadget for removing those fiber washers that beats impact pulling and lets you get the clock out without such spectacular cable troubles. Right?

B. Annaclebutt

Fair and colder

Dear B-Butt,

OPs 2567, 2805, and 2806 specify storage temps of 21 to 55 degrees for Pressure Detectors Mk 1 Mod 0. Isn't this narrowing things down pretty fine? If cold storage is needed couldn't they be stored right with the batteries?

C.E.I. MN2

Dear C.E.I.,

You bet. Storage at minus 30°F with dry batteries is okay but with two reservations: 1) after removal they should be left in their containers until they reach room temperature; 2) they should not be repeatedly thawed and frozen again.

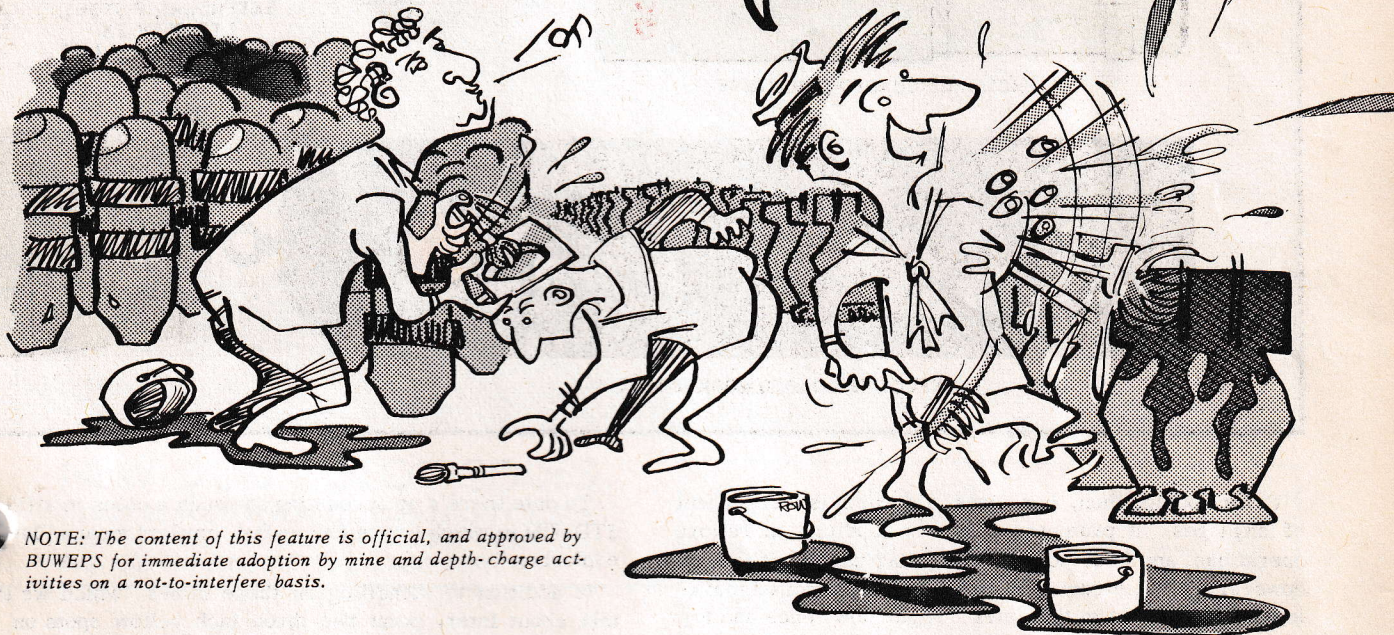
As for the pubs you mention, we're told that NOL is changing 'em right now.

B. Annaclebutt

TROUBLESHOOTER 3-

Let's talk about . . .

COLOR CODING ON DEPTH CHARGES AND MINES



NOTE: The content of this feature is official, and approved by BUWEPS for immediate adoption by mine and depth-charge activities on a not-to-interfere basis.

WE COULD FILL A FILE with the last couple of years' mail asking questions about painting and stenciling mine and depth-charge cases. As a matter of fact, we have. We couldn't do anything else with it until something could be done to resolve the contradictions among the documents that are supposed to tell all.

Meanwhile we've been filling another file with accumulated answers, planning a T-Shooter feature that would tell all.

Noble? Ah yes. But this, friends, is not it. Deciding that half a loaf is better than none we've had to postpone detailed coverage on specific stenciling locations until more kinks can be straightened out, contenting ourselves—and, we hope, you—with some hard and fast info on colors and paints.

But what's our authority?

The standing guide to surface-preparation techniques, primers and undercoaters to use before various paints, and similar dope is NAVORD OSTD 52: Painting of Ordnance Equipment. It's now in its 20th revision and, some say, ready for revision 21. Our color numbers are from Federal Standard 595 which is right up to snuff.

For more specific info on where to put what paint the authority has long been OP 2238. The trouble, recently,

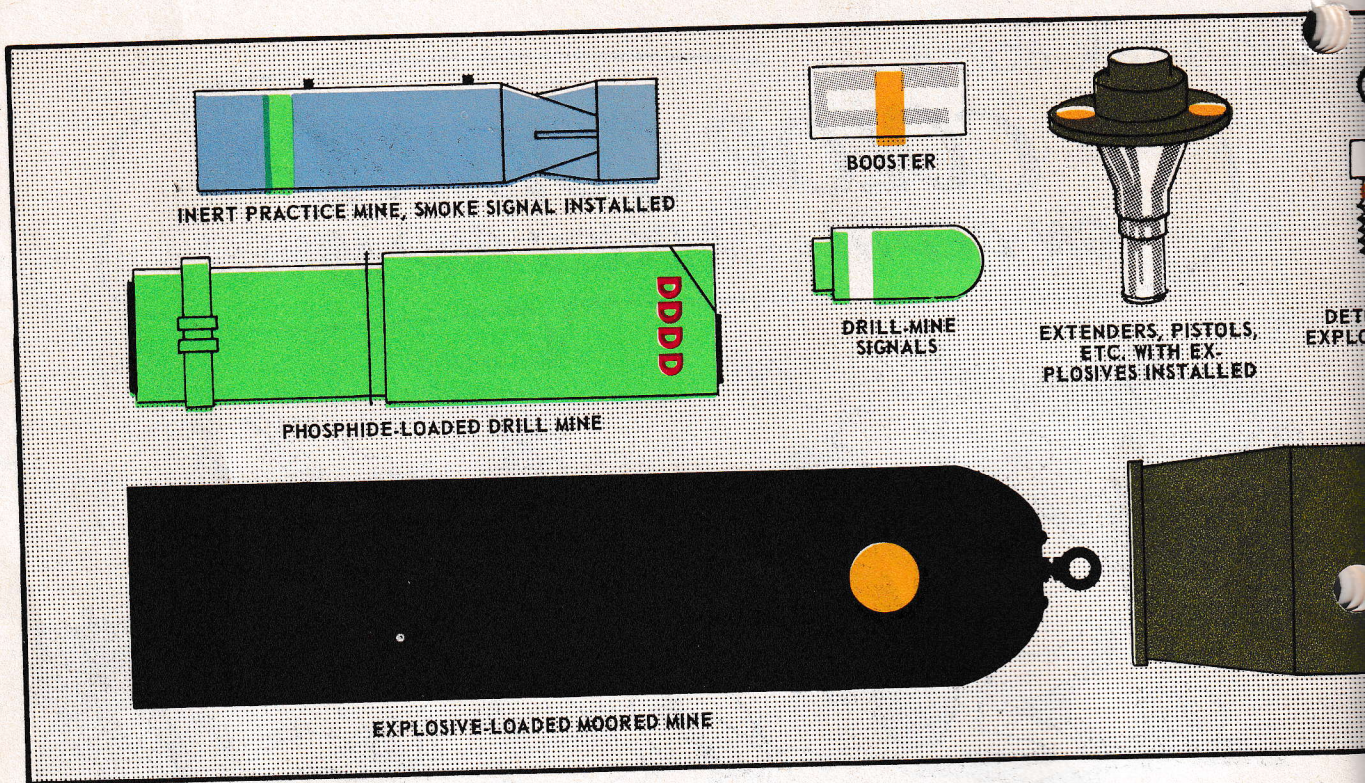
is that this fine book has not kept in step with the latest standards, especially MIL-STD-709, Ammunition Color Coding, which was approved by the Departments of the Army, Navy, and Air Force in June 1960 and sets up a system that has since been generally accepted as standard by a number of foreign countries including our NATO allies.

Now, fortunately, many such contradictions have been erased by Change 1 to OP 2238, just published in June. This change doles out a healthy portion of the oil we've been trying to pour on the water, but it will take yet another change to get 2238 in line with the latest drawings and specs.

The common code is here to stay

Like a good many doctors, the Department of Defense firmly states that the common code is something we are going to have to learn to live with. And the reasons are good:

- ▶ It permits easy identification of most types of ammo by members of all US armed forces and by all participating allies.
- ▶ It provides all with positive designation of the presence, in loaded components and assembled ammunition, of hazardous or explosive materials.
- ▶ It indicates the absence of hazardous or explosive materials in inert weapons or components.



Color coding, then, is a visual aid which is independent of languages. It promotes safety in handling, in rework operations, and in disposal or demilitarization. It is not, however, to be considered a substitute for stenciled markings, but we'll get to that later. Right now, once and for all, there's one color we want to tell our readers to be on the watch for. Yellow. It means danger—high explosive whether used for stenciling, round spots, bands, or as an overall background color. It'll be showing up on your mines and depth charges this way soon!

Paint by the number

So much for why we are here. The one thing you won't find in the authorities we've mentioned are the specs for the paints you should use, so let's get in a clue or two about that.

► Explosive-loaded mines. Paint explosive-loaded bottom mines olive drab, color 34087, MIL-E-10687, and explosive-loaded moored mines (and their anchors and floats) black, color 37038, MIL-P-15930. That's an anti-fouling black, and neither the OD nor black has any coding significance.

Predictably, there are exceptions and in this case they are the new Mines Mks 56 and 57. The word we have now is that all mods of these mines (all new moored types which will soon make the in-service scene) will be painted with primer system #48 of OSTD 52 (a vinyl-plastic base) finished off with Copperpac #9134 Type 1. Pending preparation of a mil spec it's available only from Dolphin Paint & Varnish Co., Toledo, Ohio. The color: a dull (dark-brick) red somewhat like color 20061 on page 5 of Federal [color] Standard 595.

To date there's no accounting for such a color in MIL-STD-709 in which brown (somewhat similar) means "low explosive."

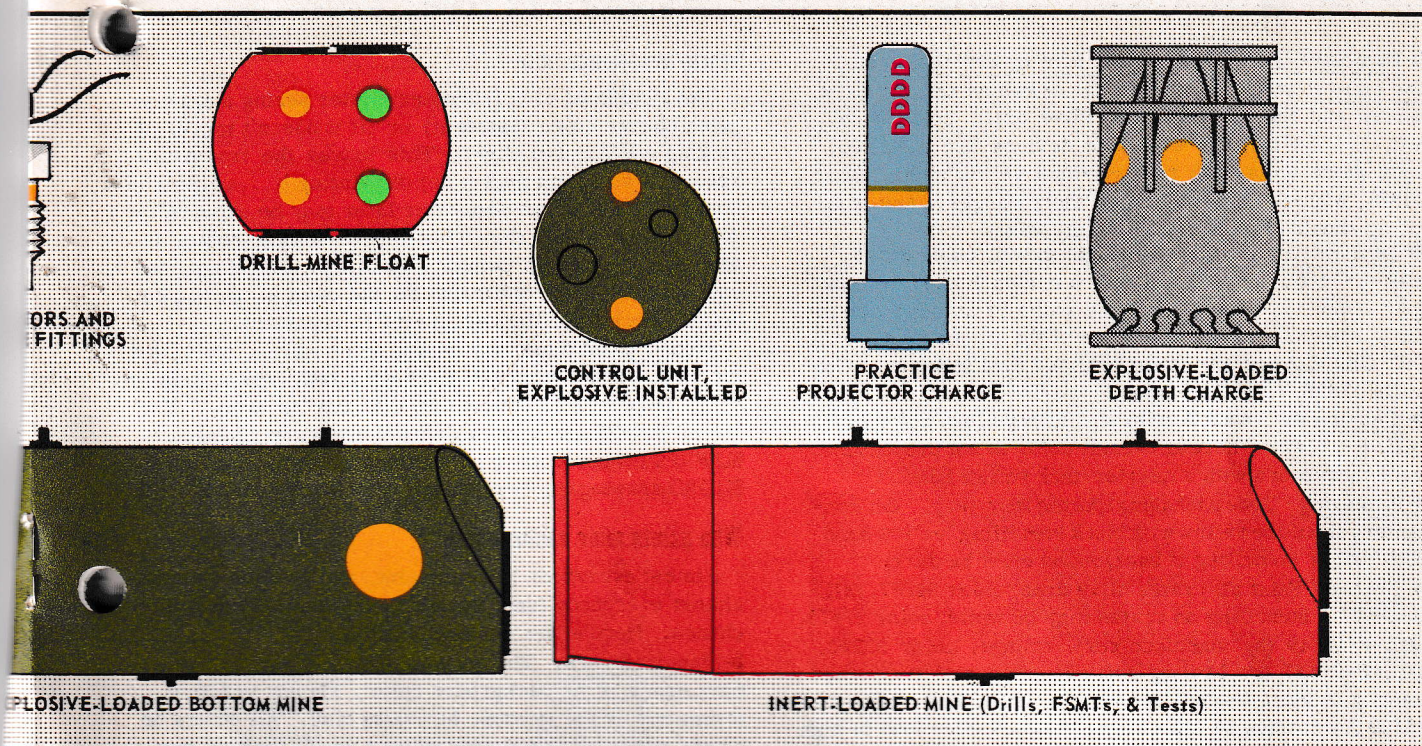
In addition to stenciling on these mines, which we'll talk about later, paint two three-inch yellow spots on each explosive-loaded case: one spot next to the stenciling indicating the type of filler and the other on the case's opposite side. Mark 6 spherical cases should have the two three-inch spots located on an imaginary circle about 4 to 8 inches above their equators (as positioned on their anchors) and approximately 90° on each side of their D4 floats.

The yellow to use for these spots and for stenciling is color 23538, MIL-P-15149. Yellow, remember, means high explosive.

► Recoverable mines (Drill and FSMT). Paint all recoverable inert-loaded mines orange, color 32246, MIL-E-10687. Orange does have a coding significance. It means non-combat. The legends DETONATOR INSTALLED, DRILL, etc. should be stenciled in black, color 27038, MIL-P-15149. (See page 11, col. 2 for more.)

► Non-recoverable drill mine (Mk 50). Paint this mine light green, color 34558, MIL-E-16663 (means smoke) and indicate the phosphide load in white coding, color 27875, MIL-P-15149 (white means pyrotechnics). If dye has been specified, groups of four red Ds approximating the color of the dye should be added 90° apart in a circle twelve inches from the mine's nose.

► Practice mines. Paint blue, color 35231, MIL-E-10687 (means drill, target, or dummy [non-combat]). When a smoke signal is installed add a one-inch light-green band, color 34558, MIL-E-16663 about 8 inches from the nose



NEW DOD COLOR CODES

(NUMBERS ARE FOR SEMI-GLOSS AND FLAT COLORS, RESPECTIVELY. IN WARTIME, ALWAYS PAINT OUT ALL CODING JUST BEFORE LAUNCHING.)

and stencil the name or abbreviation of the smoke in light green parallel to the band, also the color of the smoke (e.g., COLOR: RED). All other stenciling should be black, color 27038, MIL-P-15149.

► **Drill-mine floats.** Paint orange, color 32246, MIL-E-

10687. After installing the explosive fittings and signal add two light-green (smoke) and two yellow (explosive) one-inch spots to each side of the float. After installing on a mine also add yellow and light-green spots to the mine case per page 11, col. 2. For light green use color 34558, MIL-E-16663; for yellow, color 23538, MIL-P-15149.

► **Practice projector charges.** Overall color should be blue, color 35109, MIL-P-8585 (non-recoverable training device), with four red Ds approximating the color of the dye (and indicating the presence thereof) on opposite sides near the nose. When explosives are installed (e.g., impulse cartridges) band the charge with a half-inch strip of yellow self-sticking tape. Any stenciling should be black, color 27038, MIL-P-15149.

► **Explosive fittings.** Code explosive fittings with a quarter-inch-wide circumferential yellow band and stencil any additional data in yellow. The yellow to use is color 23538, MIL-P-15149.

► **Boosters.** Code with a half-inch wide circumferential yellow band and stencil the name or abbreviation of the explosive in yellow. The yellow, again, is color 23538, MIL-P-15149. Additional stenciling should also be yellow.

Yellow	23538	33538	High explosive
Brown	20117	30117	Low explosive
Gray	26231	36231	Chemical (war gas) ¹
Red	21136	31136	See note 2
Light Red	21158	31158	Incendiary
Green	24108	34108	See note 3
Light Green	24558	34558	Smoke
Black	27038	37038	Armor-piercing ⁴
Aluminum	17178	—	Countermeasure
Magenta	27142	—	Nuclear ⁵
Blue	25109	35109	Training/Practice
White	27875	37875	Illumination/Pyrotechnic ⁶
Orange	22246	32246	Noncombat (recoverable)

1. Gray as OA background color indicates chemical gases; change to MIL-STD 709 will delete coding significance when used as background on underwater ordnance.
2. Used as banding on gray background (gas). One band means non-persistent harassing agent, two mean persistent harassing agent.
3. Used as banding on gray background (gas). One band means non-persistent casualty agent, two mean persistent casualty agent, three mean G-series agent.
4. Has no coding significance when used for lettering on any ammunition nor when used as OA background color on underwater ordnance.
5. Other nuclear ammo color coding is classified.
6. No coding significance when used as OA background on missiles and rockets, also can be used for non-code-significant lettering where black would not contrast with background color.

► **Explosive-loaded extenders, arming devices, pistols, and control units.** Wherever the drawings call for paint, bodies and flanges should be olive drab, color 34087, MIL-E-10687. When explosive devices are installed, code these units with two one-inch yellow spots, color 23538, MIL-P-15149, on top of their flanges. Any stenciling should also be yellow, same specs.

► **Drill-mine signals.** Paint light green, color 34558, MIL-E-16663 (smoke), and add a one-inch band of white (pyrotechnic). Also stencil the name or abbreviation of the pyrotechnic agent, the color of the smoke (e.g., COLOR: GREEN) and any other required data in white. Use white 27875, MIL-P-15149.

► **Detonators.** Overall color should be yellow, color 23538, MIL-P-15149. Where an overall color is not practicable, code detonators with a quarter-inch yellow band.

► **Packaging.** Code packaging like the item (e.g., det containers should be yellow with black stenciling, yellow band with yellow stenciling if background must be dark).

► **Crates.** Paint all crates olive drab, color 34087, MIL-E-10687. Stenciling on crates may be white, color 27875, MIL-P-15149 (by manufacturer), orange, color 32246, MIL-E-10687 (by loading and assembly activities when weapon is inert-loaded), or yellow color 23538, MIL-P-15149 (by loading or assembly activities when load is high explosive), or light green, color 34558, MIL-E-16663 (by loading activities when load is phosphide smoke). This applies to all mine crates and all depth-charge crates too.

► **Depth-charge cases.** Here we have an area which is still not completely resolved. MIL-STD-709 now designates gray, BUWEPS' traditional color for depth charges, as the code for chemical gases. But Change 1 to OP 2238, mentioned earlier as having resolved most differences, overlooked this one so that BUWEPS (in effect) still says gray for charges with explosive loads.

Now the NATO equivalent of MIL-STD-709 called STANAG 2321 (it's still in 3rd draft) okays gray as a color having no coding significance when used on underwater ordnance. And that, we've now been assured, will be picked up in the next revision to MIL-STD-709. Gray, then, will have no coding significance on underwater ordnance but will mean chemical gas on other devices.

So here's the word: Paint explosive-loaded depth-charge cases gray, color 26173, MIL-P-16188, with four three-inch yellow spots, color 23538, MIL-P-15149, placed 90° apart near the cases' largest circumference. Stenciled lettering should be the same yellow, at least one inch high.

Paint inert-loaded depth-charge cases orange, color 32246, MIL-E-10687. There's also been some argument from the field about this, namely that orange depth charges would be too conspicuous on combatant ships. Personally, we've never seen an inert-loaded depth charge on any ship. Anywhere. And if we ever do, it'll more than likely be far from combat, and picked up first on a color-blind radar screen. The word, then, is to paint inert charges orange if the occasion should ever arise. Chances are it won't, but that's the final word if ever it does!

For the word on depth-charge crates see the paragraph entitled "crates" above.

Repainters please note

The likelihood of a T-Shooter reader seeing a mine or depth charge move (salute it) or (if it doesn't move) of picking one up, are slight. This leaves the traditional resort (if you can't pick it up) of painting it... and this is something any of us sooner or later may be expected to do. A firm rule to remember when that time comes is this: write down all painted stenciling, markings, and codings before you obliterate the old paint so all can be painted back after the background is repainted.

Always paint them back in the same color, size, and location, except when you know—like from this article or some later official document—that they're wrong. The legend BUORD, of course, should always be changed to BUWEPS except when it is identifying a drawing number. BUORD drawing numbers must still be identified as BUORD.

Who paints mine cases where

Almost everybody likes to paint, and with mine cases almost everybody from manufacturer to MNSN gets his chance. Here's how she breaks down:

► **Manufacturers.** The manufacturer, of course, gets first crack at the background color. On any practice mines now in the system, he paints blue. All others he paints either black (moored mines) or OD (bottom mines). Stenciling applied by him is white in inch-high letters, and die-stamping is in quarter-inch letters or larger. The information he applies is as follows:

STENCILING

Case mark and mod
Case serial number
Manufacturer's initials or symbol
Inspector's initials or stamp
Contract (NOrd) number
The word "empty"
BUWEPS LD number and FSN

DIE STAMPING (ON INSTRUMENT-COVER FLANGE)

Case mark and mod
Case serial number
Manufacturer's initials or symbol
BUWEPS LD number

For cylindrical mines the manufacturer also die-stamps the serial number on the forward section of each case just ahead of the forward suspension lug and in line with the lugs, or forward of the safety-latch pocket.

► **Loading activities.** Loading activities change background colors to orange when inert-loading empty cases, or to light green for the phosphide-loaded Drill Mine Mk 50, at the same time restoring the manufacturer's stenciling in white. When explosive-loading, the background is not changed.

In either case, the loading activity attaches a tag (BUWEPS DWG 1406800) to each case and fills and initials appropriate blanks as work proceeds. These tags, which have blanks for the info listed below, then remain attached to the cases until firing components are installed. This is contrary to OP 2238, which wrongly calls for much of this data to be stenciled on the cases:

COLOR CODING

MINE CASE MK _____ MOD _____
 SERIAL NO. _____
 MFGR. _____ CONT. NO. _____
 CASE INSP B/L _____
 CASE LEAK TEST _____
 CASE GAGED B/L _____
 CASE HOT MELTED _____
 INSP BEFORE CLOSING _____
 FILLING HOLE CLOSED _____
 INSP & GAGED A/L _____
 LOADING DEPOT SYM _____
 MO & YR OF LOADING _____
 LOADING-ORDER NO. _____

Each empty mine case is also die-stamped before loading to indicate the kind or type of filler with which the case is to be filled. The following symbols are used:

HBX. HBX
 HBX-1 HBX-1
 Trinitrotoluene. TNT
 Inert plaster INERT-PL
 Inert sand INERT-S
 Inert concrete INERT-C
 Inert wax INERT-W
 Inert water INERT-WA

After loading, the activity's initials are stenciled on the case, also the load-type symbol and filled-case mark and mod (e.g., CASE, UNDERWATER-MINE, HBX-1, MK—MOD—), the FSN for the case as loaded, filler weight, gross weight (case plus hot melt plus filler), and the loading date, all in black (inert or phosphide filler) or yellow if explosive...also USNAVY BUWEPS, all one-inch high.

Next, the word "empty" and the FSN, stenciled in white by the manufacturer, are painted out using the background color of the case (black, orange, light green, blue, or OD). Then the previously-explained yellow coding spots are painted on explosive-loaded cases and also the caution: EXPLOSIVE MINE—HANDLE WITH CARE, also in yellow letters two inches high and preceded by a two-inch yellow spot, on the opposite side from the loader's 1-inch stenciling.

If inert loaded, the legend INERT-LOADED DRILL MINE should be stenciled in black in two-inch letters (no spot). If phosphide, the legend should read PHOSPHIDE-LOADED DRILL MINE—HANDLE WITH CARE (two-inch black preceded by a two-inch white spot) with dye coding added (per above) if dye is used. Either legend goes on the opposite side from the loader's one-inch stenciling.

► **Mine-assembly activities.** From what we've already said you can see that there'd be little room left for the mine shops to add anything unless they first had a painter's field day. And that's exactly what they do!

First they paint out all stenciling that was painted on the case by the manufacturer—all white. Then, at appropriate times, the assemblers stencil in black (inert or phosphide) or yellow (explosive): 1) mine-assy mark and mod and operational assy number (e.g., UNDERWATER MINE ASSY MK 36 MOD 1 OA 03 [the word "drill," where appropriate, goes between "underwater" and "mine"]); 2) gross weight

(total-pounds) as determined by adding a computed figure to the loader-stenciled gross weight (computed from average of the actual weight of several complete sets of firing components: the new gross is painted in place of the loader's gross); 3) the assembly activity's initials followed by the month and year of assembly; and 4) an indication of satisfactory inspection and test.

For service mines (black, dull red, or OD) the legend DETONATOR NOT INSTALLED is stenciled in one-inch letters near the extender well exactly as has been done in the past, but in yellow. This also applies to orange FSMT mines, but the stenciling is black preceded by a three-inch yellow spot (painted in and out with the word NOT) together with a similar yellow spot on the opposite side of the mine.

When floats containing signals and explosive fittings are installed in drill mines, stencil a three-inch yellow spot above the word DRILL (in loader's legend INERT-LOADED DRILL MINE) and a three-inch light green spot below the word. Other stenciling for drill and special-test mines will be covered in appropriate directives issued in conjunction with such operations. When there is no coding significance all assembler's lettering on such mines should be black.

And mine crates, of course

Everyone who gets a crack at the mines also gets his chance at their crates. Like this:

► **Manufacturers.** Using the previously-specified white paint, in letters one-inch high, the manufacturer stencils: 1) CRATE, UNDERWATER-MINE, MK—MOD—; 2) the LD (list-of-drawings number) for the crate; 3) the INSMAT inspector's initials and stamp; and 4) the legend US NAVY BUWEPS followed by the crate's serial number, followed by its federal stock number.

► **Loading Activities.** Using the paints specified earlier in this article, loaders add the following to the crate stenciling in yellow (explosive mine), orange (inert mine) or light green (phosphide mine): 1) CASE, UNDERWATER-MINE, MK—MOD—; 2) the gross weight; 3) the filler symbol; and 4) caution signs such as EXPLOSIVE MINE—HANDLE WITH CARE (yellow preceded by a one-inch yellow spot) or INERT-LOADED MINE (orange preceded by a 1-inch orange spot) or PHOSPHIDE-LOADED DRILL MINE—HANDLE WITH CARE (light green preceded by a one-inch light-green spot).

► **Assembly activities.** According to OP 2238, assembly activities should paint out all previous crate stenciling and start fresh. This doesn't make sense. They should certainly touch up or replace any of the manufacturer's and loader's stenciling that's in bad shape, and when the firing components are installed in the case they should change the loader's nomenclature (i.e., case, underwater-mine, etc.) to read UNDERWATER MINE ASSY MK—MOD—OA—, at the same time changing the loader's gross weight to include the weight of the installed components as they do on the mine.

Other than that, change is necessary only when the mine is removed from the crate and the crate is to be used for

continued on page 16



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.

The tie that binds

As pointed out by James R. Coffman, MN2 of Navy 555, OD 12067-G does not list all items needed to assemble mines. To get the gear for some recent Mark 25s Jim, like a surprising number of others, reports that the bill of material on page 14 of T-Shooter 2-60 was a life saver. For us, that's always pleasant news.

But then Jim goes on to suggest that the G-book be updated to include all mine materiel. The fact is, Jim, that it never will. The G-book lists only J-cog items, while there's not a mine in the system that doesn't also require some items from G-cog and Z-cog and heavens knows how many others. If you don't understand this—or the reason for it—I suggest you go back and read the only "poor man's" explanation I've ever seen in print—the article on Federal Stock Numbers in T-Shooter 2-60.

So what's to do? Best help for most mines right now will be found in the appropriate General Reqs (ODs) and soon an improved OD system that NMEF is getting the bugs ironed out of right now will, we hope, be of even more help.

Further off but even better is a system made practicable for the first time by the new federal supply system and its non-changeable Federal Stock Numbers. With this it may not be too long before you'll see complete bills of material showing up in your mine-assembly OPs.

Since that has always seemed like the handiest place, let us pray.



Plug and cable stable

When Ronald Johnson MN1 was testing a Mk 39-0 mine he couldn't find jumper plugs for the CD-14 and CD-12 with Test Set Mk 41-1 like it says he should in OP 1736. The drawing for the test set says so too.

Getting a CD-14 plug is easy. There are 8 of them in the basic tool set. But a jumper plug for the CD-12 is so rare that Ronald thinks it should be included with the special tools for Mk 39 mines. Unfortunately this would call for a game of musical chairs that wouldn't end up any handier than having the plug right in the case of the test set you use it with. So don't toss these plugs into your tool kits when you finish with 'em, men. Make sure to put 'em back in that compartment in the Mk 41 test set where fellers can find them when the heat is on.

Don't draw the line

Somehow, Safety-Line Assembly Type X hasn't given up the ghost. It was designed to be used with Float-Release Mechanism Mk 1 Mods 0 and 1 on Mk 6 mines because these mechs were a bit skittish and would sometimes let the float go ahead of time, bringing about the hazard of premature firing of the mine.

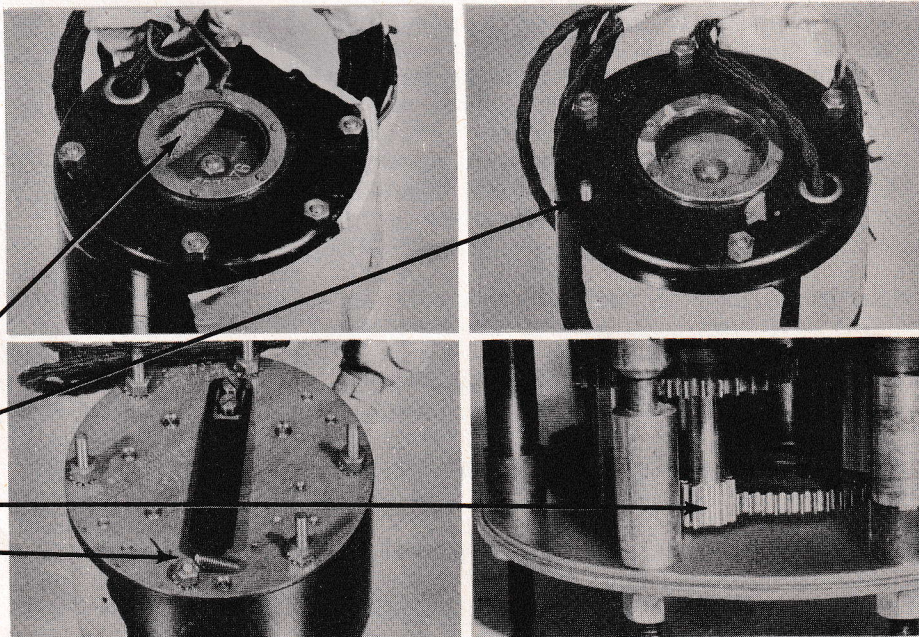
Then an improved float-release mechanism, the Mk 3 Mod 2, obsoleted the Mk 1-0s and 1s. The result: documents that still call for the Type X safety line shouldn't. They're no longer needed.

Watch it, Buster!

Damaged shipments and missing parts bug minemen more than anything else—and I have the Rudmindes to prove it! So I harped on this just last issue. That's tough. 'Cause as long as you men object to getting junk I'm going to keep right on insisting that you deserve better treatment.

My latest photos to the point come from L. M. Sulik MN1 and T. Daniels MN2 at Navy 3867. If this is Code Zero gear we'd all better find somewhere to hide when the war she is come.

GASKET ADRIFT
NUT MISSING
GEAR STRIPPED
STUD BROKEN



Guess who!

Back in T-Shooter 2-61 B-Butt raised the question: "Who's gonna do the dishes?" The "dishes" in this case were recovered mine cases somebody should have cleaned up but hadn't and Butts predicted an Instruction that would clear up the question of just who was responsible for what. So maybe you've read it: BUWEPSINST 8550.8 dated 9 April 1962, which says "Activities conducting post-recovery analysis of FSMT mines will make sure that the used inert-loaded cases are properly prepared for return shipment to the basic stocking point, i.e., outside of cases washed down with fresh water, inside dried, components properly secured, etc. Further, after the detonator has been removed, the word 'NOT' shall be stenciled on these cases between the words 'DETONATOR' and 'INSTALLED.'"

Soon there'll be yellow spots to paint out too, as explained in our feature on color, this issue.

"If Winter Comes..."

Due to a packaging mixup, some of you have been receiving Drill-Mine Signals Mk 25-1 minus their ejection springs. Well, we've asked all issuing activities to make sure from now on that there's a spring shipped with every signal, but that may not solve the whole hex and that's why I'm advising all hands to save any used springs that may be recovered with Mk 15 floats.

You don't have to report them as on-hand items and it's okay to scrap them when you're sure you'll no longer need them. Right now, though, my advice is to retrieve all you can and keep all you get.

millie amps



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.

Attention TMs!

A new revision to OP 747, dated 15 March 1962, has been distributed since our last issue. This new revision, the second, covers the assembly, testing, and use of Depth Charges Mk 6 Mods 0, 1, and 2 (the first revision did not cover mod 2) but contains nothing on Depth Charge Mk 7 Mods 0 and 1 (as did the first revision) which are now obsolete.

There are other changes, too. The earlier revision—especially if yours contained the voluminous changes that had been made over the years—contained a fair amount of info for depots on component repair. The new revision also contains instructions for depots and ammo tenders, but only pertinent to preparation for issue to users. This

reflects present policy on rework and overhaul of depth-charge component stocks: to be performed only when directed by BUWEPS, and to be based on overhaul Specifications (OVSS) prepared by NMEF rather than OP instructions.

The result, of course, is a considerably smaller and simpler book which we hope will make the job of handling the Mk 6 charges simpler too, especially aboard ship. So if the Mk 6 Charge is in your mission and you haven't received copies, request from the Naval Supply Depot, 5801 Tabor Avenue, Philadelphia, Pennsylvania. And now, here's this quarter's batch of pubs errors which (see instructions above) you are positively authorized to write into your OPs and ODs.

► **OD 7303 Vol. 1 3d Rev (Mine Mk 25-1):** In change 1, 16. (c) and (d), cross out green and write in Red.

► **OD 7331 Vol. 1 4th Rev (Mine Mk 36-2):** On Sheet 23 after item 213.0 (CA-718) in the operational assembly columns for drill mines, cross out the numeral 1 that appears under 02A and 03A.

► **OD 7335 2d Rev (Controlled Mine System Mk 1-0):** On sheet 12 change the second number in the USED WITH column (following 201.0, Adapter) to 221.0.

► **OD 7568 2d Rev (Mine Mk 49-0 OA 01-04):** On Sheet 46 cross out item 267.0.

► **OD 7569 (Mine Mk 49-1 OA 01-04):** On Sheet 62 Item 296.0 should be described as Pin, Cotter, split, steel, zinc plated 3/32" x 3/4" lg, not 1/8" x 3/4" lg. The number for this item is MS-24665-283, not 12-Z-5055-14.

► **OD 9168 (Firing Mech Mk 21-0):** On page 18, 6th line from the bottom, cross out V301 and write in V302.

► **OP 902 2d Rev (Mine Mk 18-0):** On page 5, right column, in line 3 under Bleeder Resistor, cross out ± 10 percent and write in ± 20 percent.

On page 11, Section 3.1, Bleeder Resistor Test paragraph 2, line 5, cross out 5040 and 6160, and write in 4480 and 6720.

On page 35, directly after the heading Detonator Installation, insert the following:

Test the resistance of Detonator Mk 46 Mod 1 with Test Set Mk 32 Mod 1 and Test Chamber Mk 4 Mod 1

as directed in OP 1452. Install Detonator Mk 46 Mod 1 as follows:

WARNING

Before installing the detonator make certain that the extender and the clock starter are locked in the safe position with safety pins.

1. Remove the plastic cover from the terminal block on the extender.
2. Connect a voltmeter across DET 1 and DET 2 on the extender terminal block and check for voltage. THERE MUST BE NO VOLTAGE. Reverse the leads and again check for voltage. AGAIN THERE MUST BE NO VOLTAGE.

WARNING

Do not attempt to install a detonator if voltage is present.

3. Disconnect the voltmeter from DET 1 and DET 2. Renumber subsequent paragraphs 1 through 14 as 4 through 17.

Add the two above WARNINGS to page vii in the front of the book.

► **OP 902 Change 1 to 2d Rev of Advance Copy (Mine Mk 18-0):** On page 17, Test Bleeder Resistors, in step 3, cross out 5040 and 6160, and write in 4480 and 6720.

► **OP 956 3d Rev (Mine Mk 25-0):** Cable Assembly CA-920 should be named instead of CA-298 in the following places (CA-920 comes with the preferred Search Coil SC-20-1, CA-298 with alternate SC-20-0): page 9 fig. 3, p. 10 fig. 4, p. 19 line 15 under Search Coil, p. 29 fig. 8 p. 30 fig. 9, p. 37 table 8, p. 48 par 44k, p. 52 paragraph

50 (5 places), p. 54 fig. 18, p. 79 par. 4, p. 80 par. 1c, Item 6 figs. 8 and 9, Item 11-1 par 25a(6) table 8 and figs. 8 and 9, Item 12 par 32j(3), Item 17 figs. 8 and 9, Item 23-1 par. 44k table 8, Item 23-2 figs. 8 and 9, Item 24 figs. 3, 4, 8, and 9, Item 28 pars. 50, 50a, 50b, and 50c, and Item 30 fig. 18.

On page 55, beginning of paragraph 52f, write in: Set the sensitivity switch as directed in the assembly order. This addition should also be made to Item 30 in the back of the book.

► **OP 1452 2d Rev (Mine Accessories):** On page 25, left column, cross out all of Section 9 and its footnote. In figure 16, cross out upper right part of the drawing showing installation of marker. Also, cross out the last four words of the caption to figure 16 on page 23 and on page viii of change 3.

On page 32 cross out the last sentence of paragraph c. On page 33, Change 3, cross out the first two sentences of paragraph d and insert the following in their place: Observe the pressure when the piston is extended far enough so that the distance between the end of the piston and the flange of the clock delay mechanism is not less than 0.057 inch nor more than 0.090 inch. The pressure must be between 2 and 6 pounds per square inch (representing 4.5 and 13.5 feet of sea water, respectively). Then slowly increase the pressure, if required, to complete piston travel; and check the distance between the end of the piston and the clock-delay flange. This distance must not be less than 0.057 inch.

On page 60, at the end of paragraph f, add the following: NOTE: Position all verge-type mechanisms with the verge directly above the crown wheel when performing the test in the horizontal position.

On page 69, column 1, cross out the five lines of the Starting Bar paragraph and insert the following in their place: Starting Bar and E Switch Operation. Place an ohmmeter across the E-Switch leads according to the CD Mod as follows:

<u>CD-12 Mod 0</u>	<u>CD-12 Mod 1</u>	<u>CD-17 Mod 0</u>
<u>1 and 2</u>	<u>B and C</u>	<u>F and G</u>

Using the starting-bar gage as directed in paragraph c under Timing and Gaging Tests, page 58, check for the following: When the 0.090-inch (GO) gage is used the clock should start and the ohmmeter should indicate less than ½ ohm. When the 0.220-inch (NO-GO) gage is used the clock should not start and the ohmmeter should indicate an open circuit.

On page 72, in table 10A, change to read Switch A closes 3 ± 1 minutes before Switch D.

On page 73 Change 3, at the end of paragraph b under Timing Tests, add the following: NOTE: Position the mechanism with the verge directly above the crown wheel when performing the test in the horizontal position.

On page 83 column 2 line 13, change 15 to 35 feet of water to read 20 to 30.

On page 84, table 11 column titled Range Feet (psi)

change the first two lines to read 18 to 32*, not 15 to 35*.

On page 88 of Change 3, in the Description column of table 12, change the core diameter for SC-7 to 0.623; and for SC-20-0 to 0.873.

On page 96, in table 16, change SR-9 Mod 2 to Mod 0.

On page 97 add the following as the beginning of step g: Set the 5pa-25pa switch at the 25pa position.

On page 98 add the following as the beginning of step k: Set the 5pa-25pa switch at the 5pa position.

On page 108 of Change 3, in table 21, in the No-Load column for BA-248/U add 5; in the Load column add 4, 5.

On page 109e of Change 3, right column, line 4, cross out ± 10% and write in ± 20%.

On page 141 of Change 3 in paragraph titled Control Unit Mk 66 Mod 0, change the third line to read 15 days not 3. Also cross out the last sentence of this paragraph.

► **OP 1811 (Mine Mk 50-0):** On page 5, table 3, in the alternate column, cross out Hydrostatic Switch Mk 22 Mod 0. This switch is now obsolete.

On page 7 figure 5, change Primer Mk 114 Mod 2 call-out to read Mk 131 Mod 0. The same correction should be made on page 9 under Explosive Fitting.

On page 35, under Firing-Circuit Safety Tests, re-number steps 3 through 8 as 1 through 6, and arrow steps 1 and 2 as 7 and 8.

SCHOOL, ANYONE

Speaking of boning up for rating and proficiency exams (see page 3) Lieutenant J. L. Toben, Director of the Mines Department of the Mine Warfare School at Charleston, tells us there aren't enough men sufficiently trained in the various phases of submarine or aircraft mine assembly, test, adjustment, preparation, etc. This shortage isn't due to a lack of training facilities. In fact, Lt. Toben says, the School's courses covering these areas are shy on enrollment.

Both the sub-laid mines course (CUM) for minemen or torpedomen, and the air-laid mines course (CAM) for minemen and aviation ordnancemen, are also open to maintenance officers. And there's no better time than right now to start a request for enrollment on its way through the mill. The dates for early 1963 are:

Submarine Mines (CUM) and Submarine-Mines Maintenance Officer (UMMO)

7 Jan 1963 to 23 Feb 1963 7 weeks

15 April 1963 to 31 May 1963 7 weeks

Aircraft Mines (CAM) and Aircraft-Mines Maintenance Officer (AMMO)

11 March 1963 to 10 May 1963 9 weeks

We're happy to cooperate with Lt. Toben in passing along this important information. With his help we'll try to keep our readers posted on other mine-school schedules and opportunities. Look for them!

COLOR CODING (Continued from page 11)

a different kind of mine. Then, of course, the non-white stenciling must be changed in accordance with the instructions pertinent to the new mine it will hold.

Depth-charge case data, too

As with the mines, everyone who handles 'em gets a chance to paint something on depth charges. Like this:

► **Manufacturers.** All manufacturers' markings are applied to metal plates which are welded to the tops (ash-can types) or sides (teardrop types) of the cases, and there she stays. So far these plates seem to have been slightly different in each manufacturing lot and there's nothing standardized that we can state at this time. In the event of any new procurement the drawings will tell all. Overall case painting is gray.

► **Loading activities.** These people both die-stamp and stencil, using letters at least a quarter-inch high for the former and one-inch high for the latter. All stenciling is in yellow for explosive-loaded charges, or—on those Sundays in the middle of the week—black if the loads are inert.

The stamped information, all of which goes on the filling-hole covers just before loading, is: 1) case mark and mod; 2) weight of load followed by the load-type symbol; and 3) the loading activity's initials followed by month and year of loading.

The stenciling, all of which goes on the side of the case after loading, is: 1) CASE, DEPTH-CHARGE, MK—MOD—; 2) US NAVY BUWEPS and the FSN for the loaded case; 3) the filler symbol; 4) gross weight in pounds (case plus filler); 5) the loading-order number; and 6) the loading activity's initials followed by the month and year of loading and the inspection department's stamp.

On the opposite side of the case the loader should stencil EXPLOSIVE-LOADED DEPTH CHARGE—HANDLE WITH CARE in one-inch yellow letters preceded by a one-inch yellow dot or, if inert, the legend INERT-LOADED DEPTH CHARGE, in black. (OP 2238 will be changed to agree.)

► **Issue agents, ammo tenders, and users.** At the time of firing-component installation, whether at depots, aboard ammo tenders, or aboard destroyers, the loader's case mark and mod stenciling should be painted out (use background color—gray or orange) and the mark and mod of the assembled depth charge stenciled in, e.g., DEPTH-CHARGE ASSY MK—MOD—. (Note that charge and case designators may be quite different as, for example, when a Mk 14 Mod 0 charge is assembled in Mk 9 Mod 4 case, etc.) Conversely, destroyer crews must paint this information out and paint the case mark and mod back in (it's die-stamped on the filling-hole covers) when they disassemble the charges for turn-in.

With the Mk 14 charges there are further requirements. The issuing agent installs firing mechanisms and batteries, tests this assembly, and then stencils the fins accordingly (see OP 669, the Mk 14 assembly and use manual, for de-

tails). This stenciling must then be up-dated by gunner or ammo-tender crews per OP 669 whenever the periodic operational tests are repeated or new batteries are installed.

These depth-charge requirements are not clearly explained in OP 2238 but this, too, will be changed. Without such stenciling it would be necessary to disassemble a depth charge and research component use through several OPs to find out the mark and mod of an assembled charge!

... and depth-charge crates?

Depth-charge crates are one item we've never seen. Maybe we're just too young, or maybe too old, or maybe they're reserved for use only with those inert-loaded charges. Anyhow, we've found specs in OP 2238 for stenciling them whether you can find 'em or not, so let's get the requirements in line with the system.

Like this: Make all letters one inch high and use the paints and colors specified for crates in the section of this article headed "Paint by the numbers." This applies of course, only if and when depth-charge crates are used.

First, in white, the loading activity should stencil: 1) CRATE, DEPTH-CHARGE, MK—, MOD—; 2) the LD (list-of-drawings number) for the crate; 3) the legend US NAVY BUWEPS followed by the crate's serial number, if known, followed by its federal stock number.

Next, in yellow (explosive-loaded charges) or orange (inert) the loader adds: CASE, DEPTH-CHARGE, MK—MOD—; 2) the gross weight; 3) the filler symbol; and 4) the legend EXPLOSIVE-LOADED DEPTH CHARGE—HANDLE WITH CARE in yellow preceded by a one-inch yellow spot or, if inert, the legend INERT-LOADED DEPTH CHARGE preceded by a one-inch orange spot.

And that, we think, is all. We can't imagine users keeping charges in crates so for them we have no crate-stenciling scoop.

Don't leave it standing in turps

Except for specifying colors and paints, we've had nothing to say about stenciling on components by overhaul and rework activities. That's because most necessary info along this line is added by tags. Where stenciling is required, the Ordalts or Overhaul Specs (OVSS) that call for it will henceforth contain appropriate directions.

As we stand now, then, NMEF is revising the master drawings for in-service depth charges and mines to specify standardized sizes, locations, and codes for all stenciling and stampings—the really hot items right now and the others as our work priorities allow. This means we'll ultimately be able to piece together a follow-up to this article with gnat's-hair stenciling advice.

Meanwhile you should know that repainting to conform to these new color requirements should only be done on a not-to-interfere basis. As a result you're almost sure to see some straggling FSMT mine cases still painted solid yellow, a condition which we hope won't last too long. And with that we're sure you've had more than enough jazz on paint for one dose.

—Clean up your brush!

Do You do this Job Right?

Hedgehog hedge

Last week we met a man who had been worried ever since reading BUWEPSNOTE 8540 of 29 Jan '62. Bad. A gunner in charge of firing the hedgehog weapon, he was leery about fragmenting nose castings and cartridge chambers every time his crew fired a salvo of Projector Charges Mk 12 Mod 0.

Now, based on recent tests, we think we can truthfully say this worry is no longer with us. Porous nose castings like the BUWEPSNOTE says? Yes. But this turns out to be no cause for concern. The worst troublemaker, we find, is the Impulse Cartridge Mk 33 Mod 0 that everybody's been using in these 12-0 projector charges. Its burning rate is just too darn fast.

There are other troubles, too: leaking dye, weak ground connections, variations in back-up discs, etc. But we feel sure we've corrected them with minor design changes that will show up in new procurement lots of 12-0 charges very soon. Meanwhile—for new and old, old and young—here are some hints that should make using these charges as carefree as the life in the garden of Eden before that snake made the scene:

- ▶ Soon as you can get 'em (and that, too, will be soon) start using Impulse Cartridges Mk 33-1 instead of the 33-0s. (In tests we found the 33-1's slower burning rate gave better range, far fewer misfires (negligible), and did not cause rupture or fragmentation even in charges whose cartridge chambers had already been cracked).
- ▶ Stop removing the back-up discs as some have been doing to get better contact between the cartridges' primers and the spigot firing pins. Your problem has been recognized and these discs are being improved, but firing without them can louse up your weapon's firing pins after very few rounds.
- ▶ Remember that misfires are often caused by troubles with the hedgehog's firing pins (accumulated gunk, weak springs, etc.) also by accumulations of wax and polyester film (from the cup wads of fired charges) that insulate the charges' ground springs. To cure this a field day now and then will surely help, also a little oil for those firing-pin springs.
- ▶ Don't pull those cardboard inserts from the charge

bodies across the ground springs. This, too, can leave wax deposits and result in poor ground-spring contact.

▶ Nevertheless... see that men are not unnecessarily exposed when firing your charges, and keep helmets on those who are exposed. (This would be SOP from your OP on this charge if you had one. Until you do, your OP for the 7.2-inch Projector Charge Mk 10 will answer most questions.)

▶ To take care of any problems we don't know about, continue to report all misfires or other troubles to NMEF via Rudmines (NAVORD Form 2776). If you don't have the forms, a letter will do.

Parapak care

Mine parachute packs are excellently-packaged components. They may be stored indefinitely with no apparent deterioration, thanks to the vapor-barrier material in which they are sealed. No moisture damage. No mildew. No rot. And that's no stuff.

Unfortunately, though, we can't also say "no sweat"... not when a single activity has to report 41 rejects in one fell swoop! Why? The Rudminde attributed it to breakdown of the barrier material, but that's not something that happens when storage conditions are right. Somaybe it's time for a reminder to all activities where parapak are stocked:

- ▶ Store parapak in the manufacturer's wooden shipping containers. If these are no longer available, make new ones. This is the only sure way to keep those all-important barriers unbroken and air-tight.
- ▶ Store parapak indoors where it's dry, with good ventilation. Any unnecessary moisture is bad. Heat is bad, too, so avoid proximity to steam lines etc. Whatever you do, don't leave parapak sitting out in the sun.
- ▶ Never open a parapak moisture barrier until the pack is ready for installation on a mine. Once installed, protect it from rain, dew, and direct sun until the mine is installed in a plane in preparation for planting.

the Editor

We have the world's best weapons—Use 'em right!



COMINPAC 16 09 4 1962 AUG 16
...now shoot us a RUDMINDE!