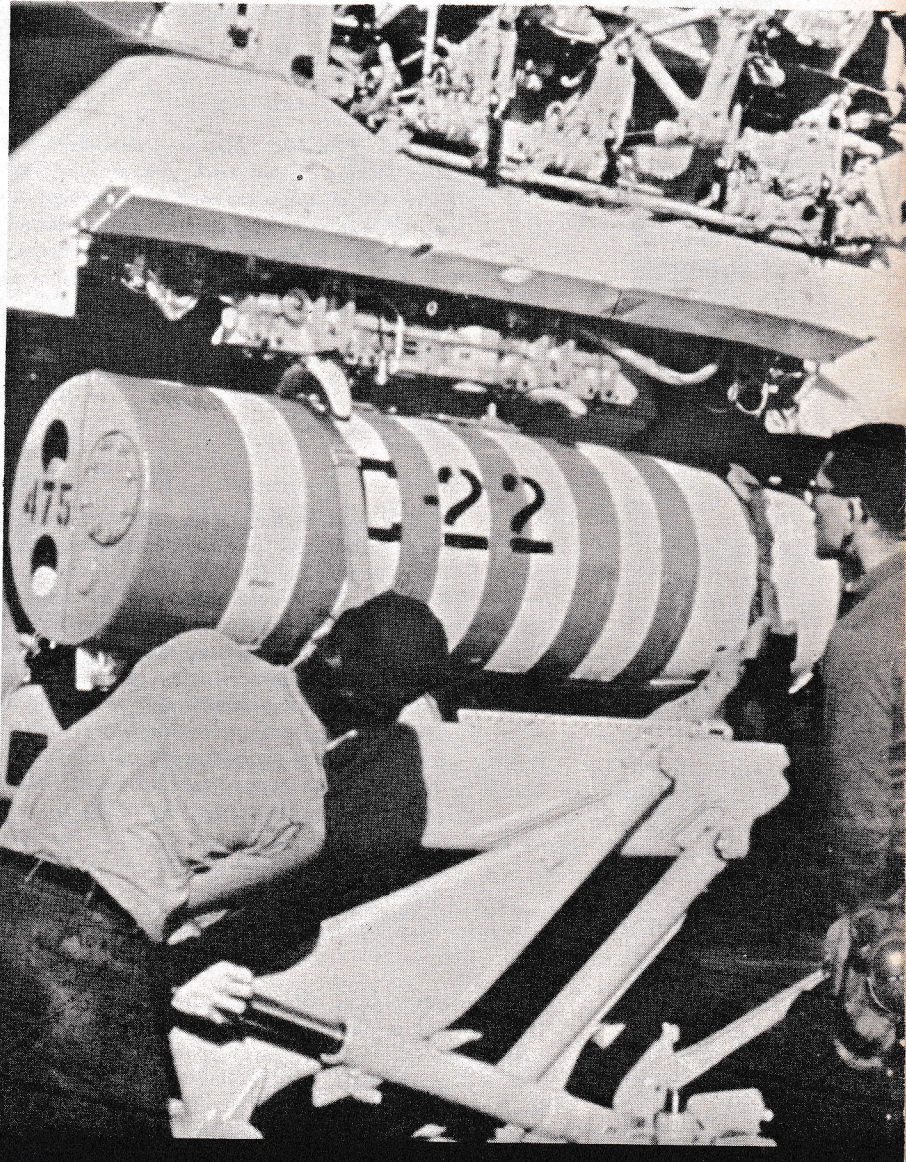


mine and depth-charge

THE TROUBLESHOOTER

- ▶ Jumper Cells In MK 33 Battery
- ▶ Tricky Arming Wire
- ▶ Beware Of Unsafe Air Pressures



AN OFFICIAL NAVORD PUBLICATION

DMPF TRAINING

in this issue . . .

mine and depth - charge

THE TROUBLESHOOTER

Published by the Naval Mine Engineering Facility, Yorktown, Virginia

Roland H. Almonrode, CDR, USN Officer-in-Charge
Haines A. Miller Technical Director
Thomas R. Nevitt Editor
D. Jack LaBar Art Director

REGULAR FEATURES

<i>Rudminde Report</i>	1
<i>Hot Stuff</i>	4
<i>Job Right</i>	9

ARTICLES

<i>Stretching Stocks of Mk 33 Batteries.</i>	2
<i>Playing Safe with Detonators.</i>	3
<i>Tricky Arming Wire in Mk 56 Anchor.</i>	7
<i>Keep that Pressure Down.</i>	8

COVER PHOTO: AOs and minemen load a Mk 36 drill mine on a wing station of an A-6A aircraft on the flight deck of the U.S.S. Forrester during a recent fleet exercise. Members of attack squadron VA 65, and a detachment from MOMAT 0321 with Lt. M. D. Horn in charge, cooperated in this phase of the exercise. Final preparation of the mines was accomplished aboard the Forrester. The mines were assembled by the MOMATs at Charleston.

1 APRIL 1968

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

Troubleshooter is also the official journal of the Rudminde Program a world-wide defect-reporting campaign designed to promote a high level of undersea warfare readiness in US naval depth charges and mines. The Program's basic instrument is NAVORD Form 8500/1 (2-68). Everyone who encounters problems with these weapons should report them via this form direct to the Naval Mine Engineering Facility as prescribed by NAVORDINST 8500.3.

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

Troubleshooter is published quarterly by the Naval Mine Engineering Facility's Publications Division and printed by NPPSO-5ND, in accordance with NAVEXOS P-35. Contributions, questions, address changes, and requests for regular distribution should be addressed to: Editor, The Troubleshooter, Naval Mine Engineering Facility (Code ESP), Yorktown, Virginia, U.S.A. Request copies of back issues from the Naval Supply Depot, 5801 Tabor Ave., Philadelphia. Each transmittal of this document outside the Department of Defense must have prior approval of the Naval Mine Engineering Facility.

THE OFFICIAL JOURNAL OF THE RUDMINDE PROGRAM

RUDMINDE REPORT TO THE FLEET

In Troubleshooter 2-67, and again in 4-67 we printed open letters to MN rates, from Ed Sprecher of the Mine Warfare School, Charleston, S. C. Because of the response he has had, Ed has asked us to go one step further by printing the following rundown on the school's "A" course.

What potential should or does an "A" student possess when he completes the course? To answer this question let me give you a brief rundown on the 20 weeks of instruction the "A" student receives. As you read, note the similarity to the "B" course outlined in Troubleshooter 4-66. Only the intricate circuitry and difficult troubleshooting of the "B" course are missing, with overall mine system analysis, block diagrams of firing mechanisms, etc. taking their place.

The first day of the "A" course is spent on school indoctrination and introduction to mine warfare. Next, two days are spent on Code of Conduct. Then, with administrative requirements thus out of the way, three weeks and one day are spent in what we call Prep: basic electricity, basic electronics, hydraulics, and acoustics. After that there is a half day on explosive handling and safety, 8-1/2 days on accessories, drill components, and instrumentation, and then we get into the mines. We start with seven days in which the Mk 6, 10, and 53 are thoroughly massaged. After that the M9-1, M9-2, and their associated weapons are scrutinized for five days. The Mk 25-0, 39-0, and 49-0 are allocated five days. Combination mines are studied for four days. Acoustic gear (A5 and Mk 19) are pushed for five days. Then for 11 days our mobile child, the Mk 27, is taken to task. This includes gyro testing, afterbody check-out, and complete deck-runs.

That concluded we shift to our big building, with no windows but with outstanding air conditioning, for six days of modular accessories followed by seven days on the Mk 52/55 Mods 1-6. Then we hit logic and boolean algebra for three days in preparation for four days of Mods 7 and up. Next, Mk 56 and 57 assembly, test, leak testing, and balancing are wrung out for a very thorough eleven days. Last but not least are three days devoted to special-purpose gear. That leaves only one more day and it's as full as the rest: it includes the end-of-course exam, and graduation!

As in the "B" course, you'll notice that a good 50 to 60 percent of the "A" time is allocated to lab or practical application. And throughout the course the lab sessions, let me assure you, come as close to actual mine-shop application as our facilities will permit. Another point: safety, good work habits, and ability to follow the OP contribute more than anything else to the grades our "A" students obtain. Proper use and care of test equipment is emphasized. Effective use of Rudminde is continuously stressed. Last but not least, the thoroughness and precision with which the mines are assembled is observed, including such nitty gritty details as lockwashers, flat washers, strain loops, and torque applications.

In summation I cannot tell you that our "A" students, upon graduation, are experienced mine assemblymen.

But I can assure you without reservation that they do possess a basic understanding of our mines. Experience comes with exposure in the Fleet situation, but the man who has had his 20 weeks of "A" school has been thoroughly exposed to every mine in our arsenal, some of which plenty of old timers haven't yet worked on, and that means that these "A's" experience, when it comes, should add up to something really good. It could even be that some old timers could pick up a point or two from our "A" grads if they encourage them to speak up during on-the-job training sessions, etc.

So—I hope this has enlightened you T-Shooter readers on the professional potential of our "A" students. As newcomers to the Navy each is observed daily on all important factors, including military courtesy and bearing. I can assure you they are of the highest caliber by the time they graduate.

LT. H. E. SPRECHER Jr.
U. S. Naval Schools, Mine Warfare
U. S. Naval Station
Charleston, South Carolina 29408

NOTE: Previously we reported the final design conference for the new mine-school building. Ed now reports that everything is moving on schedule, witnessed by the fact that the architectural design work is already past the half-way mark.

ABOUT PUBS DISTRIBUTIONS ... ARE YOU HAPPY?

Recently we came across a readiness inspection report in which someone had griped loud and long about not receiving enough OPs and OP changes. We were concerned until we checked the data and learned that the activity had been receiving precisely what they had asked to receive back in 1965 . . . and that they had requested no change in distributions since that time. So how about you; are you in the same boat?

The distribution system for mine publications has been broadcast in the mine bibliographies for two years, with pleas that all hands investigate their local distribution situation and advise us accordingly. Now we have gone a step further.

Shortly after you read this you will receive your copies of Volume 7 of OP 3504. This is the new pub which is replacing the bibliographies. It will be updated at least twice a year, and perhaps quarterly, and each updating will reveal pubs which have been added or deleted since the last. In it you will find an even more complete explanation of the distribution system and, again, the admonition that it is up to you—the individual activities—to let us know whether you receive too much or not enough. When you receive your 3504 Volume 7, then, read it and act.

How else will we know what you want?

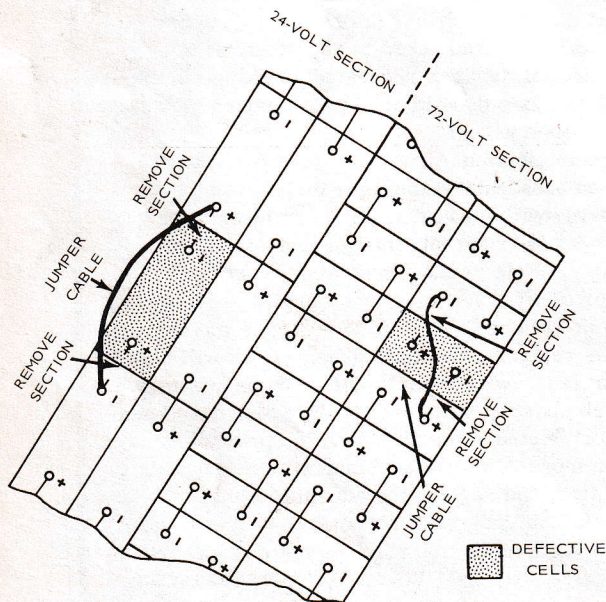
STRETCHING STOCKS OF MK 33 BATTERIES

Although the calcium-lead-cell Battery Mk 33 Mod 1 eventually will be the only battery used in Mk 27 mines, currently there are not enough of them to meet all needs. To take up the slack, some use of the lead-acid-cell Mk 33 Mod 0 battery is authorized. With proper care, using procedures laid down in OP 1516, these lead-acid-cell batteries can be very reliable. The big advantage of the newer battery (33-1) is that after filling and charging it is maintenance-free for 90 days, vs the 14-day maintenance requirement of the 33-0.

In selecting Mod 0 batteries for use select your older ones for exercise shots and those of more recent manufacture for PWRs mines if you do not have enough Mods 1s for this purpose. If you do have enough Mod 1s you should of course reserve them for PWRs and FSMT and use Mod 0s for exercise.

There is no data available for establishing a fixed shelf life for either Mk 33 battery. They should be stored in a dry area that is cool but above freezing. Some deterioration in battery performance due to long-time storage can be expected in either dry or wet charge, but serviceability should be judged only by the ability of the battery to accept a charge.

A Mk 33 Mod 0 battery filled with electrolyte, after an initial charge, should test at least 1.270 specific gravity and show an average cell voltage of 2.38 for a 48-cell total of 114 volts. If the voltage of any cell is below 2.19 volts that cell should be jumped out of the circuit. After charging cell-voltage should average 2.25 volts or more and, the average corrected specific gravity of the electrolyte in the six lowest-voltage cells



Example of Jumped Cells.

Hz ?

Sooner or later minemen will be confronted by the symbol Hz and wonder what it means. It stands for Hertz and one Hertz is equal to one cycle per second. For example, a frequency may be expressed as 60 Hz instead of 60 cps.

This terminology is in recognition of the German physicist Heinrich Hertz whose discoveries in the field of electro-magnetic radiation led to radio. It is being widely adapted so expect to see it used more frequently in the future.

So now you know.

should measure 1.240 or more for the battery to be considered serviceable.

Reject and discard batteries whose average cell voltage is below 2.25—that is, batteries whose total voltage, with no cells jumped, is below 108 volts. Also reject if specific gravity of the electrolyte in the six lowest-voltage cells is below 1.240.

The jumping of cells should be limited to one defective cell in the 72-volt (propulsion) group and two in the 24-volt (control) group. Mk 33 Mod 0 batteries with jumped cells are authorized only for exercise shots. If a battery requires more cells to be jumped than cited here, consider it unserviceable for any use. Make no effort to repair or replace a defective cell.

To jumper a defective cell in a Mk 33 Mod 0 battery cut out a section of the connector that joins its terminals in series with those of adjacent cells, with a hacksaw, then fabricate a jumper cable from an 8-inch length of cable, #4 AWG, 6145-284-1489, and 2 terminal lugs, 5940-155-9704. Next, drill a 1/8 or 3/16-inch pilot hole in the terminals of adjacent live cells, to start pan-head self-tapping screws No. 14-10, 1/2-inch long, 5305-959-4159.

Attach the jumper cable and draw screws tight enough to insure positive contact.

CAUTION ON CABLE HOOK-UP

Questions on the cable hook-up in the Troubleshooter 3-67 article on the installation of supplemental batteries BA-23 prompt this editorial caution.

The only purpose of the illustration of the cable attachment to the A-5 Firing Mechanism on page 3 is to show terminals to which Cables CA-1266 or 1267 are to be connected. It does not represent the cable hook-up for any mine. The route all cables are to take, including CAs 1266 and 1267, is dictated by assembly OP for mine concerned and will vary for each mine.

PLAYING SAFE WITH DETONATORS

Mine assembly activities appear to have gone in many directions in working out safety measures for testing and installing explosive initiators (EEDs) in mines, with precautions against accidental explosions ranging from no protective gear at all at some activities, to elaborate shields and mandatory protective clothing at others. Lack of direction can be blamed to a great extent on lack of guidelines, so let us consider a few.

In common with all rules for safety, emphasis should be placed on precautions to prevent an accidental explosion as well as on protection in the event one occurs. To start with, safety has been designed into EEDs in the form of shorting bars, clips, or twisted leads. Pertinent tests in OPs insure that stray currents in mine circuitry are not present when explosive devices are installed. Test chambers, with shorting circuits built in, protect against an accidental explosion during testing.

An EED work area should be isolated from activities that would distract the operator and certainly from those involving fork lift operation, welding, etc. The area should also be free from radio frequency influences. The detonators and initiators encountered in mine shops are classified as Hero-unsafe ordnance. That is to say, they can be spuriously exploded by RF fields of as little as 0.2 volts/meter in the frequency range of 2-32 megacycles. Such fields are not uncommon in the proximity of powerful radar installations.

With all these precautions taken what remains is the danger of an unintentional explosion due to electrostatic discharge or a sharp physical blow, either of which could take place during preparation for testing, or when installing in an extender. To circumvent these hazards (OD 10773):

► Use a metal work bench and be sure it is grounded. Clear it of all tools and other clutter before you start the job, including shields that would impair dexterity while working. Do wear protective goggles 7G00058; operator and helpers alike.

► Remember that although mine initiators are normally triggered by bridge wires, they can be ignited by being dropped, crushed, or stabbed, or by heat from, say, a nearby soldering iron.

► The work bench should have no integral electrical connections such as an electrical outlet, clamp-on light, bench grinder, radio, etc.

► Operator and metal stool, if used, should also be grounded. For this a grounded metal plate should be provided for the stool to rest on and the operator to stand on. Quarter-inch aluminum is good. The operator should also wear conductive shoes*. Note, however, the warning below:

WARNING When you are grounded to eliminate electrostatic hazard while handling explosive initiators you are more subject to danger from electrical shock. Therefore special grounding gear should not be worn outside the explosive work area.

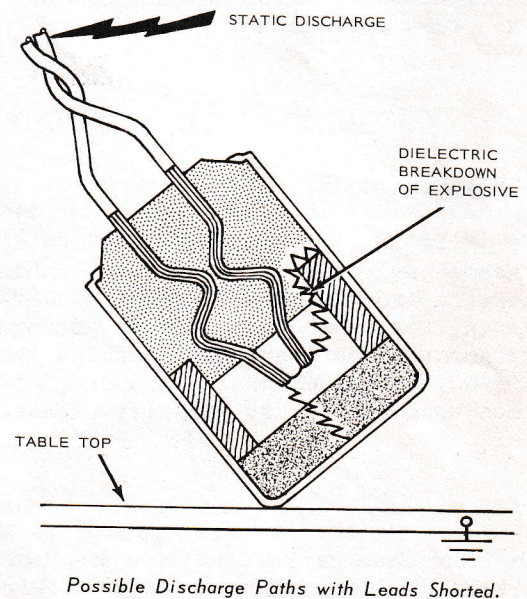
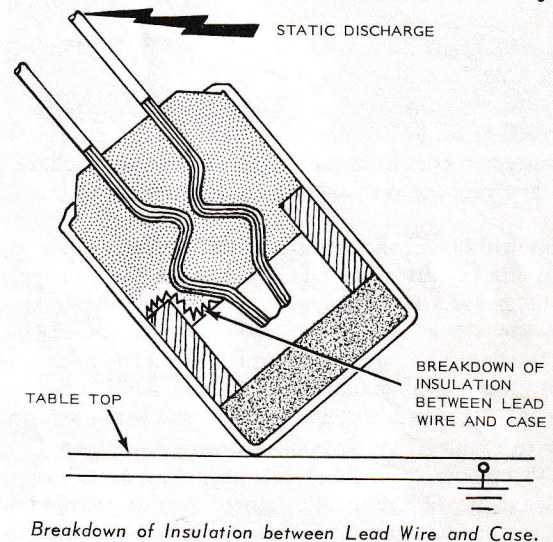
* For supply of conductive shoes see FMSOINST 5101.1A

► Keep stocks of explosive devices a safe distance from work area. They are vulnerable to chain explosions.

Observing these precautions should eliminate all but the most obvious cause of unintentional initiations—CARELESSNESS. Ignorance of the nature of the device being handled contributes to this hazard for sure, but familiarity can create a false sense of security which is just as bad. The answer is to know where the danger lies and be aware of it at all times. This also goes for helpers. Helpers do not and should never include visitors or untrained volunteers.

Perhaps the least understood hazard is electrostatic firing. The generation of a static charge depends on many variables, including humidity, clothing material, motion,

(Continued on Page 8)



by B. Arnaclebutt, MNC



What happens here?

Dear B

Soon after you get this you should be receiving a battery BA-340/U that failed the insulation resistance test. The battery was charged in August 1967, held in temperate storage, then recharged 28 December 1967.

DRB MN2

Dear DRB

Appreciate the chance to dig in to find out first-hand why this battery failed a resistance test, but it's the fact that the battery was held in temperate storage after charging and then recharged that really caught the eye of the old chief.

The BA-340/U comes from the manufacturer uncharged and in this condition has an unlimited shelf life in dry temperate storage. Once charged, however, it should be treated as any other "active" dry cell: that is, placed in refrigerated storage to get the most out of its life span. In any case there is no authority for recharging this battery although the possibility has been studied with so-far inconclusive results.

Notwithstanding, your BA-340/U should not have required recharging in five month's time since its charged shelf life in temperate storage is supposed to be 24 months. Looks like this odd-ball has had odd-ball treatment all around. We'll see what we shall see!

B. Arnaclebutt

Cable repair

Dear B

What about polyvinylchloride (PVC) cables not listed in Troubleshooter Bulletin 148? Is there any reason the same fix for damaged sheaths cannot be applied to PVC cables that are unlisted, or cables that are a part of components such as clocks? Clarify please.

CF

Dear CF

The fix in Troubleshooter Bulletin 148 can be applied to all PVC-sheathed cables whether listed in that bulletin



or not. There are just two conditions of which you must be sure:

- ▶ That the cable is for a fact PVC-sheathed and not a rubber synthetic.
- ▶ That the cable is not to be subjected to water pressure when in use. (Example: CA-198.)

B. Arnaclebutt

Keep it on the level

Dear Barnacles:

Fairly often, excess welding material around the hinge for the band that holds the clock delay in the upper deck of the instrument rack of the Mine Mk 50 interferes with mounting Ship Counter SE 3. We have been grinding off excess metal, to let the counter be secured properly. Anything wrong with that?

EWS

Dear EWS:

Nothing as long as you don't lean so hard on the grinder that you weaken the hinge. When done, if time allows, repaint the area with zinc-chromate primer 7P00150.

B. Arnaclebutt

Parapak life

Dear B

Where are the criteria for reliability of parachute packs? Is there a life limit after removal from their original packaging? When installed on mines? What is the authority on this subject?

WAP MN1

Dear WAP

If there was any more room for them, your questions would add more gray hairs to the old chief's head!

We all know a lot of things can happen to a parapak . . . and nothing can happen to it. It all depends on circumstances . . . whether it is in a rain forest or on a desert . . . whether in its original (manufacturer's) packaging and in dry temperate storage, or in a locally-fabricated moisture barrier in the tropics . . . it's endless!

For practical consideration we know it is safe to consider parapak in their manufacturer's packaging and in dry temperate storage as having indefinite shelf life, yet even these packs should be considered due for re-evaluation of serviceability after ten years. Once out of the original packaging—if not exposed to weather, high humidity, or direct sunlight, parapak can be repackaged per OP 1452, which duplicates specs of original packaging, and still be considered good for ten years.

Installed on a mine, parachute packs can be exposed to weather for the time required to satisfy the requirements of mining missions without sacrifice of reliability.

Installed on a mine that is stowed in a dry magazine a pack should also be good for ten years if effectively enclosed in barrier material, but the effectiveness of barrier protection, as well as evidence of other damage, is checked during the 2-year inspection of the parapak required by MRCs. The indication that all is not well will be rust spots on the housing, or the feel of condensation. If your hand comes away moist, it's trouble. At the same time one should also look for obvious damage such as dents or bent members.

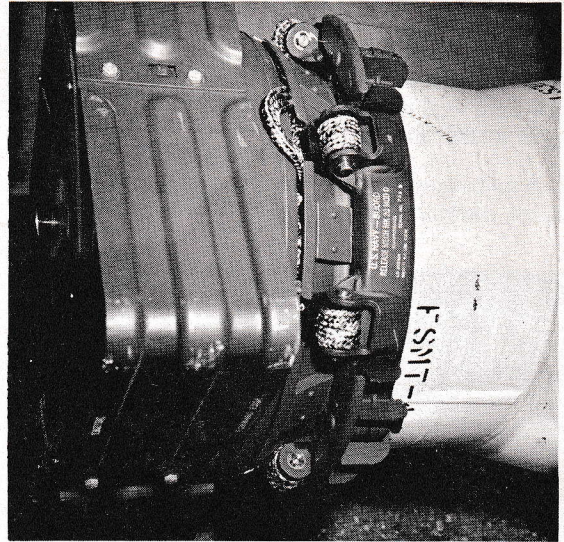
Parachutes capable of being dried out can survive repeated wettings but chutes packed in the metal or plastic parapak housings do not dry out once wet. This does not hurt the chute but at the high altitudes reached during delivery they will freeze and therefore fail to deploy properly.

The one enemy of parachute material, nylon, is exposure to direct sunlight. If exposed longer than four or five weeks the parachute risers may experience deterioration. Keeping them shaded by covers, tarps, dunnage, etc. can be an answer in situations where such prolonged exposure is unavoidable.

Unusual things that cannot be itemized, such as rats, can ruin a parapak. In one location these rodents made a nest in a parapak which did the parachute no good. Other beasties, including insects, cockroaches, and crickets, could do the same thing so keep a sharp eye out for evidence of this sort of damage.

TROUBLESHOOTER 1-68

A QUICK WAY TO SHORTEN PARAPAK LIFE



One of the more obvious things that can happen to a parapak is what happened to this one when an FSMT mine was dropped two feet from a forklift at the flight line. Two things were wrong. First, a forklift was used when a Mk 8 bomb carrier was available. Second, the forklift operator turned a corner too fast.

To paraphrase OP 1452, parapak determined to be of questionable serviceability due to exposure, damage, or nonconformance to other criteria shall be reported to NMEF for disposition. Rudminde it!

B. Amable

No match - new screw

Dear B:

Using your fix, "No match-new hole", to correct the misalignment of the lockscrew and adjusting ring holes in assembling the Mine Mk 53 we ran into a problem. The way you tell it in Troubleshooter 1-65, page 15, the tap for threading the new hole doesn't reach. What our crew did was counterbore the new hole for a 1/2-inch depth. Then everything came out right using a standard 1/4-inch 20-thread tap.

ACF MN2

Dear ACF

Your procedure to accommodate the length of the tap to the depth of the relocated lock-screw hole in the

Anchor Mk 53 is acceptable. For future correction of this misalignment problem however you need not use this procedure at all. Instead obtain a new screw, 5305-010-2577, which is a set screw with a cup point. The point will dig into the adjusting ring regardless of alignment of lock-screw hole with adjusting ring holes. No drilling or tapping of a new hole required.

B. Arnaclett

Junction box trouble

Dear B

The connectors on Junction Box Mk 35 Mod 0 are giving some trouble again. Troubleshooter 4-63 gave a fix on the lock rings that were coming adrift. No complaint about that. But now it's the center guide posts of the connectors that are snapping off in the instrument cables for the 52/55 mines, when they are disconnected. We've put our boxes in Code F awaiting a fix for this one.

JBT

Dear JBT

A fix I haven't got at this time. Just advice. The same advice given for dealing with all push-pull type cable connection: treat with tender loving care, remembering that straight-up steady pull is the only insurance you have against broken posts, pins, cables, or what have you.

You may be interested to know that yours is not our only Rudminde on this broken post problem, and all have one thing in common: they all concern Mk 35 boxes manufactured under the same contract, in which guide posts were made of a phenolic resin, which is susceptible to breakage. In later manufacture the posts are metal, which is to the good, but the bodies of the connectors are still molded phenolic which still means tender loving care.

You can recover those expensive 1800-series cables, by the way, by prying out the broken posts with a pointed tool such as a scribe. If it won't pry drill a 1/8-inch hole, enough to start a screw, and pull it out.

B. Arnaclett



The Mine Division, U.S. Naval Magazine, Guam, M.I., selected swaying palm trees for the background of their group photo. Lt. E. C. Oyer who is the Mines Officer at Guam was not present when the photo was taken but his assistant Lt. J. R. Bruce, then Lt. JG, is. Bruce received his promotion since the picture was taken in January this year. Congratulations! Those in the photo; left to right, are:

First row: TCMC J.W. Powers, MN3 N. Depalma, MNSN A.R. Pote, MN2 J.A. Gore, Lt. Bruce, MN3 J.F. Bannach, MN3 W.B. Smith, MN3 T.E. Blandford, MNC D.E. Wheelock. Second row: MN1 L.G. Bemis, MN2 R. Wyatt, MN2 N.R. Fantasia, MN3 J.J. O'Donnell, MNSN H.W. DeCossas. MN1 R.G. Pinson, MNSN P.S. Hewitt. Third row: MN3 A.G. Paul, MN3 A.B. Hollingsworth, MNSN A. Pasquarella, MN1 E.J. Miller, MN3 H.K. Watson, MN3 D.C. Goodwin, MN3 J.A. Currier, MN3 R.B. Barton.

Mine personnel not present are Lt. Oyer, MN2 C.L. Hartshorn, MN2 B.D. Hamrick, MN3 J.W. Hastings, MN3 J.W. Carson, MN3 G.D. Pliska, MN3 J.B. Christian, MN3 J.C. Good, MNSN C.R. DuBois.

TRICKY ARMING WIRE IN MK 56 ANCHOR

Incorrect installation of the Arming Wire Mk 4 in the anchor of the Mine Mk 56 Mod 0 has been responsible for wire breakage upon release of the mine from the aircraft. The result: our best moored mine confines itself to the bottom with anchor still attached. A dud.

So minemen take care. Other arming-wire installations are the responsibility of AOs but the installation of this one, in the hydrostatic switch in the anchor, is a part of mine assembly. No corrections or adjustments made by AOs at plane side are likely to help. Here are the things to watch out for:

- ▶ Improper routing of arming wire from hydrostatic switch piston to and through the slot in the anchor sleeve.
- ▶ Kinks in the wire.
- ▶ Binding between shield and anchor housing.

Now let's consider how the job should be done. First we'll assume you have your 56 on a dolly, lugs up, with its anchor extending over the end, so the anchor shield can be removed easily. Place the sleeve on the deck.

What you'll find now is that there is not enough room to work the wire through the arming wire hole in the piston and to attach the Fahnestock clips while the clips are on their chain. If you try, the result is apt to be a kinked arming wire. So don't. Instead, cut off one leg of the Mk 4 wire (Mod 1 preferred) about 3/8-inch below its ferrule and bend the remnant back over the ferrule, then pass the other leg through the free hole in the hydrostatic-switch piston. . . the one not occupied by the safety pin. Keep pushing until a generous length comes out the other side of the anchor, then uncouple the retaining chain and remove the Fahnestock clips. Slide the clips 3 inches on to the projecting end of the arming wire. Do not use clips other than those supplied with the hydrostatic switch.

From this point work carefully. Pull the wire back through the piston until the clips bear against the piston. See that the wire is free of kinks and make sure you haven't caught a clip on something it shouldn't be caught on, then route the wire from the piston, under the gas generator tubing, and in front of the grip-arm nut. If the wire is now straight, kinkless, and taut, with 3 inches projecting past the clips, re-connect the clips' chain and remove the safety pin.

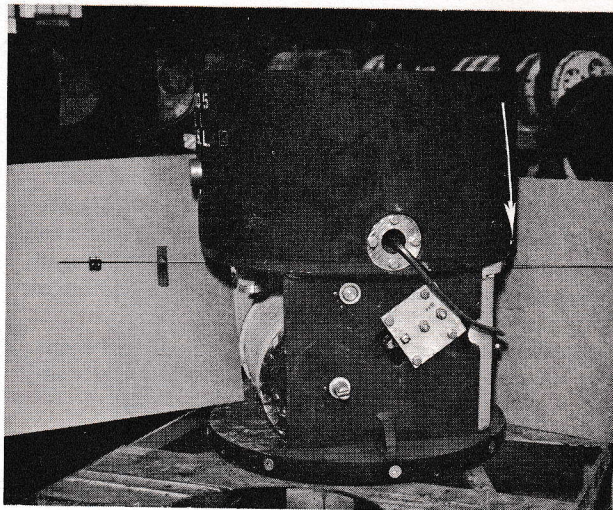
You are now ready to install the shield, which introduces your last chance to foul.

In replacing the shield what you have to watch out for is the standing part of the wire catching between the shield and its mating recess in the anchor case. To insure that this will not happen two men should do the job, one lifting the shield and the other keeping the wire low in its slot: the long, narrow one, not the wider one. Maneuver the shield until the orienting slot (the wide one) fits over the orienting pin. That should do it but you still need to be sure.

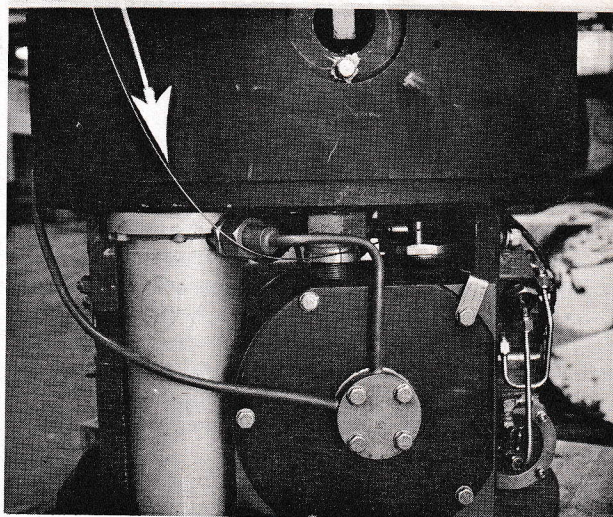
After the shield is secured, then, pull on the standing part of the wire just enough to determine that the only resistance is that provided by the grip of the Fahnestock

clips. Do it gently and pull no more than an inch of wire through the clips in making the test. If all is free, pass the standing part over the end of the mine in a smooth arc, no sharp bends, and tape it to the mine case alongside and parallel to the suspension lugs.

Now, if the wire doesn't get messed up in handling, everything should work like a charm when she drops!



Arming wire ready to pull through . . .



. . . and comes out the otherside. Arrow pointing to approximate location of wire slot on fit-test anchor only.

TYPO CORRECTION

After reading old Chief B. Arnaclebutt's reply under "Tolerant tolerance" on page 7 of the 4-67 issue of the Troubleshooter we hope you didn't order a copy of the OD 3504 cited. It should have read OP 3504.

KEEP THAT PRESSURE DOWN

Compressed air is powerful. Exceeding design pressure when testing any pressure vessel can result in damage to equipment and injury to personnel. If you're lucky the blow-out may only knock your hat off, as it did recently for an operator performing a test of the pressure chamber with the Test Set 250 Mod 0. If he had been unlucky it's not hard to imagine the injury that could have been caused by the blanking plate that flew past his hat and through the roof. The safety latches on the test set's chamber, in case you are wondering, were ruined.

As insurance against such mishaps maximum test pressures, which should not be exceeded under any circumstances, should be stenciled in 1/2-inch characters on all mine shop pressure-test gear, in whatever color will provide greatest contrast to the background color. Stencils should be located where they can be easily seen on the vessel itself, not on its shipping box or associated equipment. The stenciled information can be arranged in one, two, or three lines, as best suited to available area.

Intermediate activities should accomplish the stenciling on equipment they hold even though they are con-

cerned only with Class B component tests which require pressures well below maximums, so depot and surveillance people who may be concerned with the gear later will have no doubts about safe pressures. Depots should make it SOP to stencil equipment when drawn from stock for issue or station use.

Here is a list of the gear and the safe pressures. The fact that pressures may already appear on nomenclature plates should not deter stencilling such as we recommend here.

TEST EQUIPMENT	STENCIL
Test Set Mk 66	MAX TEST PRESSURE 60 PSI
Test Set Mk 250	MAX TEST PRESSURE 500 PSI
Test Pot Mk 3	MAX TEST PRESSURE 100 PSI
Test Pot Mk 4	MAX TEST PRESSURE 100 PSI
Test Pot Mk 5	MAX TEST PRESSURE 200 PSI
Test Pot Mk 6* 10	MAX TEST PRESSURE 20 PSI
Accessory Set Mk 17	MAX TEST PRESSURE 50 PSI

*Accessory Set Mk 10

DO YOU OVERCLASSIFY ?

The number of Rudmines with unnecessary security classification being received at NMEF has been growing. Over classification imposes burdens at both ends of the line, originator and recipient: complicated handling, double envelopes, registration, signatures, etc. It also slows up investigation of the problem or defect reported.

It helps, then, when you can avoid classification. Each Rudminde should be evaluated on its own involvement with security. When a confidential pub is involved it does not mean that all references to it are automatically classified. Out of context much information can be transmitted in the clear. A big help towards resolving the question whether to classify or not is NAVORDINST 5511.9: Naval Mines, Depth Charges, and Associated Equipment; Security Classification, available from NAVSTA, Washington, D.C. 20390. This instruction consists mainly of charts, so be sure to read the introductory matter before you use them.

The NAVORDINST is specific. For broader rules consult OPNAVINST 5510.1, the security manual for ground rules. The final arbiter, of course, is your OIC. Also check with your security clerk on proper procedures.

In any case, we still subscribe to the maxim that states, when in doubt, classify. And we certainly do not mean to imply that you should cut off any facet of the Rudminde stream of communication simply because it involves classified information. All we really ask is that all hands consider, also, another maxim: if it isn't classified don't classify it.

PLAYING SAFE (Continued from Page 3)

and capacitance of the human body, and you cannot be sure what the charge potential is at any given moment.

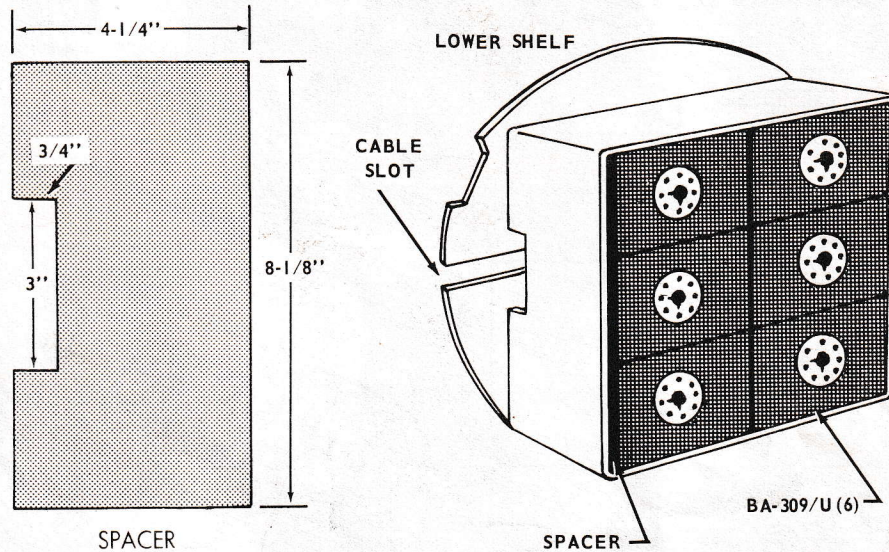
The average capacitance of a person, wearing ordinary shoes and standing on a non-conductive floor, is 200 mmf., and as much as 1500 mmf when sitting on a metal stool. At 30% relative humidity this capacitance may easily acquire a charge of 1300 volts by walking across the floor, and as much as 3700 volts by simply standing up from a sitting position on a stool. This is more than enough stored energy to explode a detonator if allowed to discharge through the leads, and could be strong enough to break down the insulation between bridge wire and case and cause the detonator to fire even when the leads are twisted together.

The safest rule, then, is to recognize that an electrostatic charge can be generated in sufficient strength to fire a detonator and drain it off by grounding.

The sensitivity of EEDs to electrostatic firing is not necessarily the same as the sensitivity to normal capacitor firing. The latter requires the heating of the bridge while electrostatic firing may involve a breakdown of insulation between leads and case. Thus an initiator may fire through its bridge wire when an operator not grounded permits a lead to touch a grounded table top. It may also fire if insulation breaks down when the case touches a grounded table (first illustration). Even shorted leads cannot be counted upon to insure protection against accidental firing. The insulation could break down when the case touches the table top, letting the charge follow paths similar to the second example illustrated.

The best advice, then, is the simplest: handle with care.

Do You do this Job Right?



CABLE SQUEEZE IN MINE MARK 50

Back in Troubleshooter 3-64, on page 12 we told assembly activities how to cut a hole in the cushion between the lower and middle deck of the Mine Mk 50 Mod 0 instrument rack so the six-branch junction pad on Cable CA-817 wouldn't crush Batteries BA-309/U. Then, in Troubleshooter 1-66 Job Right we reinforced the octal plugs on that cable so they could be connected and disconnected repeatedly without damage.

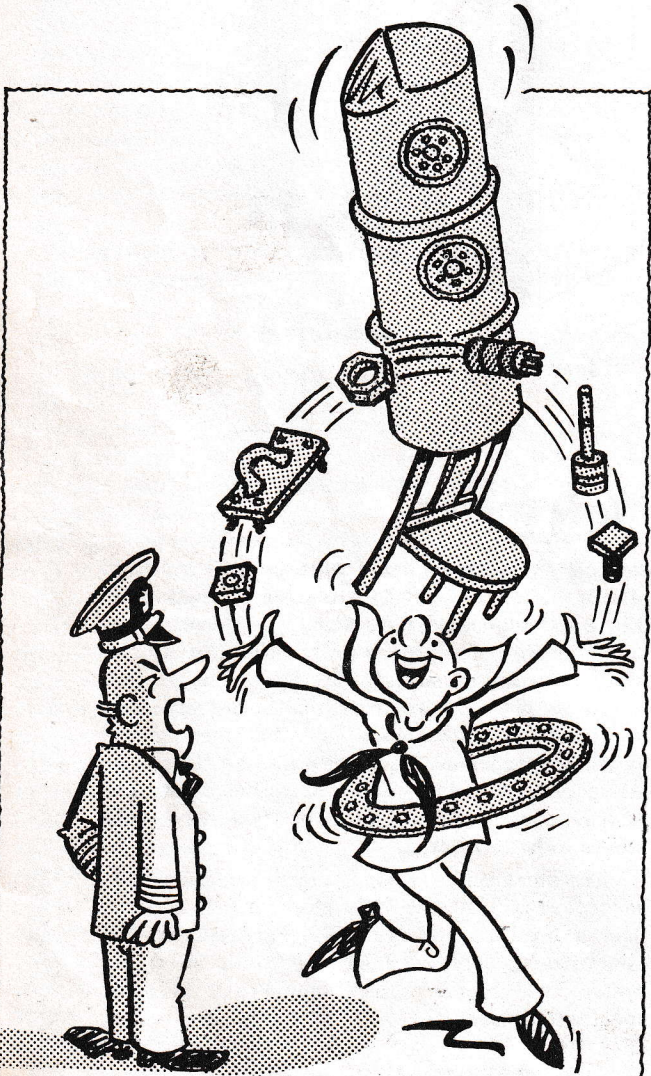
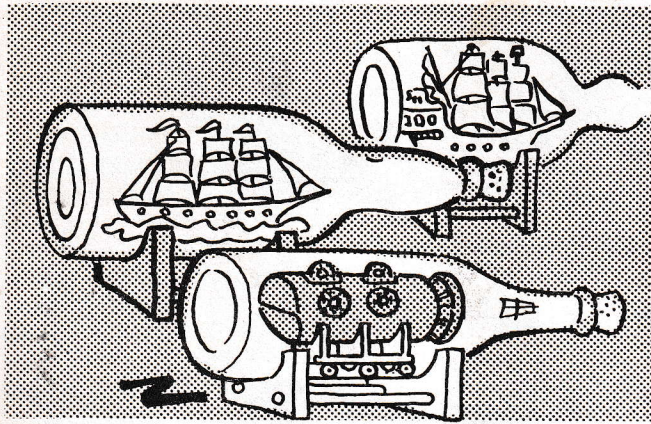
Now it is the Batteries BA-309/U that are pinching Cable Assemblies CA-817, CA-820, and CA-821 where they are led through the cable slot adjacent to the battery rack in the lower deck. This is bad since the other side of the pinch is the mine case bulkhead. The squeeze could eventually cut through insulation causing a short.

By using the locally fabricated spacer described here the squeeze can be taken off the cables and transferred to the spacer. The spacer is made from 1/8-inch tempered hardboard (Masonite) and inserted between batteries and the side of the bat-

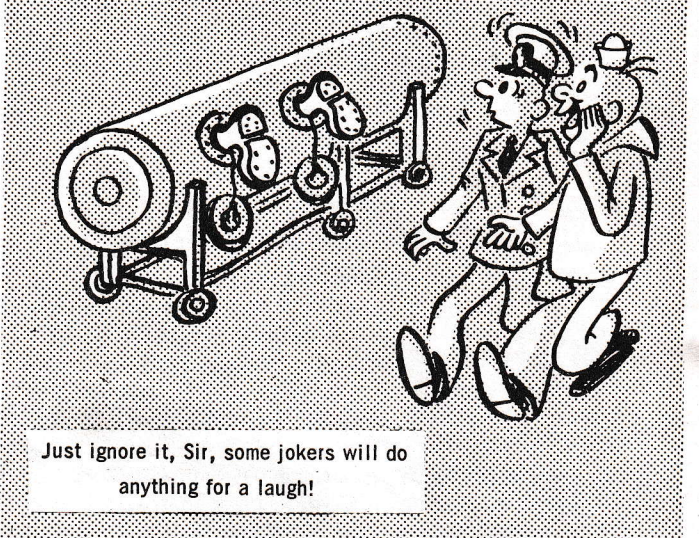
tery case that has a cutout centered on the cable slot in the lower deck of the instrument rack. The 3 by 3/4-inch cutout in the spacer will match the cutout in the battery-case wall, thus providing more room for passage of the cable. The procedure is to place the six Batteries BA-309/U in the lower deck as instructed in OP 1811, then insert as many spacers as required to make a tight pack, all spacers placed between side wall and batteries. At least one such spacer must be used if the problem is to be alleviated.

The stock number for a 4 by 8 foot sheet of hardboard is 5640-275-7459, from which more than a hundred spacers can be cut. Spacers of similar design will eventually appear in the stock system, and a forthcoming revision to OP 1811 will specify their use.

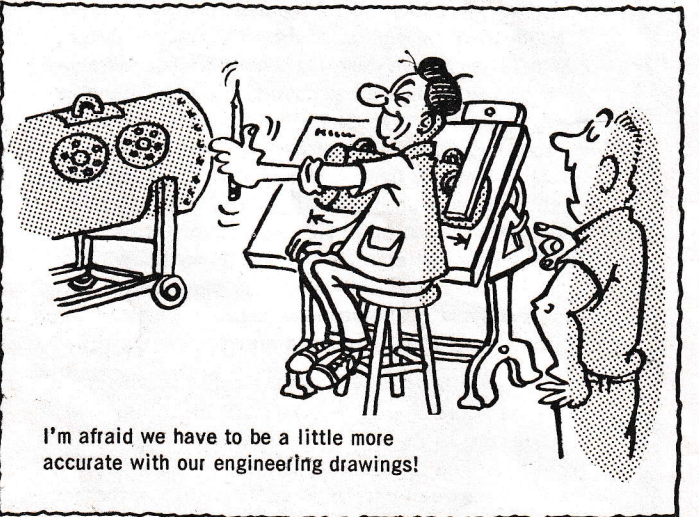
The Editor



Forget it, Dawson, I will not transfer you to Special Services!



Just ignore it, Sir, some jokers will do anything for a laugh!



I'm afraid we have to be a little more accurate with our engineering drawings!

BUT *Real* PROBLEMS ARE NO JOKING MATTER ...
USE RUDMINDE!