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No. 2-67

3 | 4

mine and depth-charge

THE TROUBLESHOOTER

- New Drill Gear
- Mine School News
- Getting FSMT Data

AN OFFICIAL *NAVORD* PUBLICATION

in this issue . . .

THE TROUBLESHOOTER

mine and depth-charge

Published by the Naval Mine Engineering Facility, Yorktown, Virginia

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REGULAR FEATURES

ARTICLES

COVER PHOTO: P3-A airplane is shown here taking on a Mk 55 mine. An assembly team from MOMAT 0322, Charleston working with VP 45, NAS Jacksonville, put the show on the road for FSMT CNAL 5-67. The plant went off without a hitch. In the photo LTJG P. D. Blades, Weapons Officer, supervises while AO2 Smith guides weapon into place. (For MOMAT team pictures see page 9).

1 JULY 1967

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

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

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THE OFFICIAL JOURNAL OF THE *RUDMINDE* PROGRAM

RUDMINDE REPORT TO THE FLEET

FSMT Instrumentation
... some are still not with the program

NOT too long ago engineers were mostly guys with striped overalls and sooty faces who jockeyed railroad locomotives, and instrumentation was a term by which musicians referred to the numbers of trumpets vs violins vs glockenspiels in a band.

Today things are different. Bands consist mostly of guitars, anyone who can scrounge a down payment on one is a musician, and engineers are guys in white shirts and neckties who sit at desks designing ever more raucus amplifiers for the guitars . . . and changing terms like instrumentation to mean the use of mechanical, electric, and electronic gadgets to monitor the functioning of other mechanical, electric, and electronic gadgets.

Thus instrumentation has become the modern-day measure of success or failure in many kinds of tests, including the Fleet Service-Mine Tests with which most Troubleshooter readers sooner or later become involved. And this brings us to our point: namely, that the FSMT instrumentation in current use has demonstrated that it is reasonably rugged and reliable in the mine plants in which it has been used, but a people problem is keeping it from doing the job that it might.

Equipment that works

The instrumentation we're talking about is by now familiar to minemen everywhere: The Mk 17 time-of-fire recorder which marks the exact moment when a test mine is actuated, and the mine-contained Mk 62 transmitter and diver-carried Mk 16 receiver with which planted test mines are located and recovered for analysis. The reasons for having such instrumentation should also be familiar. It costs the Navy plenty to perform a mining mission, test or otherwise. And when it's a test and you don't get the data, the cost is mostly a waste.

Fortunately, though, very few FSMT mines are not recovered these days . . . in all only about 3 percent per year. Satisfactory function, installation, and operation of the transmitters and receivers is therefore nothing like the problem it once was, and that goes for installation of the fire recorders too. In fact it appears now to be no problem at all. It's <u>after</u> the test mines are recovered that the trouble begins . . . the stage where we need not only to have had reliable recorder operation, but also absolutely accurate on-the-scene reading and interpretation of its dials. That presupposes equally correct on-the-scene recorder readouts at one stage or another <u>before</u> the planting operation. We emphasize readouts so much because we now know that recorders which have been properly maintained and installed are 96 percent reliable. Even some of the remaining four percent, accounted in our records as failures, may not have been failures at all. We've simply had to consider them as such because users didn't turn them to NMEF for evaluation.

So there you are: test mines recovered average better than 97 percent: fire recorder reliability of operation 96 percent . . . <u>yet the actuation data lost in fleet service-mine tests continues in excess of 20 percent!</u>

A good time for all

How come? No small part of the reason, we think, is that the individual fleet tests – once conducted in such a way that virtually all operations took place in a single time zone – are now planned in such a way that most involve movements between time zones. Predictably, this has added great importance to the way the "time" blocks are filled out on the fire recorder readout tags, yet some men leave the time-zone block blank . . . some fill in the wrong time zone . . . some fail to note "half" time zones . . . some enter local time but don't designate whether it is daylight-saving time, standard, or what . . . some make recorder re-starts but do not alter the tag's time blocks accordingly. In the face of all this, remember that an overall error of two hours can make a big difference in test conclusions and you can see the problem: No one on earth can analyze such readouts and determine for sure whether a given mine was actuated by the target, or by the sweeper, or somewhere between sweeper and recovery operations!

One solution would be to design a new recorder, but think of the time and money. Another solution, which can work just as well, is to use ZULU time as standard for making <u>all</u> time entries on <u>all</u> readout tags. A new edition of OP 3233 will soon specify doing just this, and will give more details. ZULU, of course, is Greenwich Civil Time – the standard for the entire world – and what a forthcoming revision to OP 3233 will tell you is not to try to convert your local time to ZULU by Guess and by God, but to get your GCT from a known source (e.g., call base communications), and to set your watch or a clock in your shop to it for as long as you are working the mines for a test.

With this, assuming you are making a first reading (e.g., the reading at time of installation), start the recorder and immediately enter the date and starting time on side one of the readout tag: <u>ZULU time from your ZULU-set watch or clock in the "time" block, the letters GCT (for Greenwich Civil Time) in the "zone" block.</u>

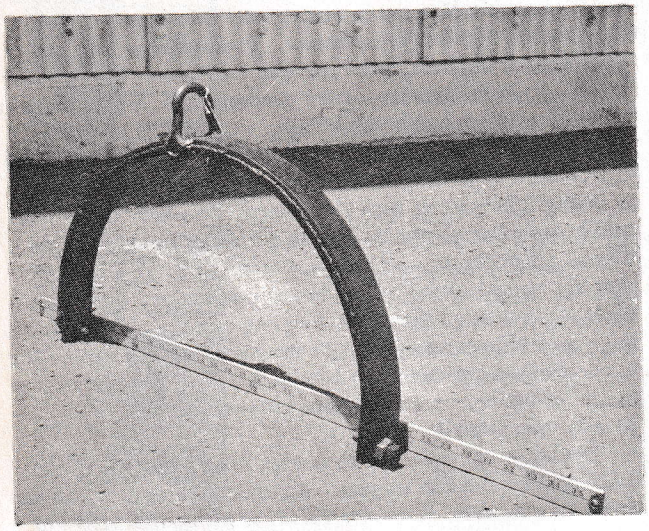
That done, still working on side 1 of the tag, place pencil marks on the facsimile of the recorder's face to mark the <u>exact position</u> of each of the recorder's dial pointers. (Always record tenths (outer) dial first, then the hours, tens, hundreds, and thousands.) At this point just <u>copy</u> the positions of the pointers; do not try to interpret them. Only after they are copied should you go to side 2 of the tag, find the squares designated for the <u>side 1</u> readout, and in them write numbers from the diagram you marked on side 1. This is when you must interpret. To do so note that all dials must always be read to the lowest whole number, just like the tag says. This seems

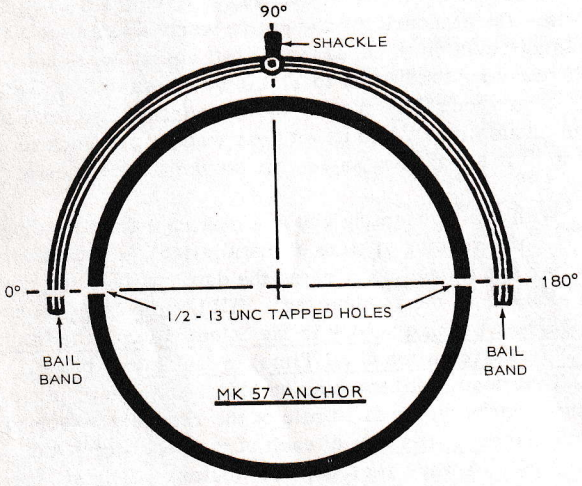
(continued on page 12)

AN ORIGINAL WAY

SWEATING through those OP 2718 procedures for upending the Mine Anchor Mk 57 is a back-breaker that inspired MN3 C. T. Christian III at NAD Oahu to design a device to make the job easier, and to us it looks mighty good.

Christian's quarrel with the standard eye bolt and lifting plate method is that the final step (upending while the hoist is being slacked off) requires two men with three men's muscle. This, he observes, is being done at the same time the anchor is resting on its chine, and that gives the anchor a tendency to roll, making it even harder to control.

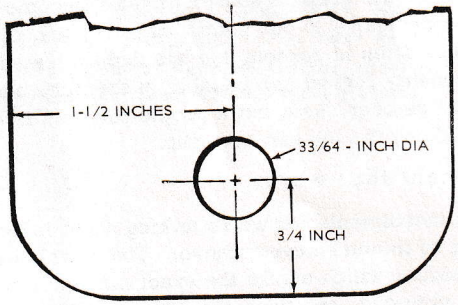


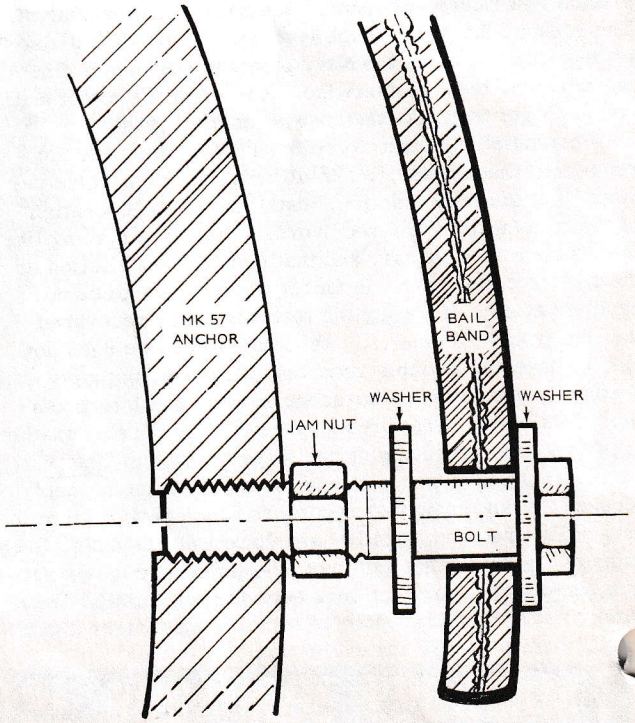


So Christian uses the eye bolt from the outside of the anchor shell, instead of the one inside, to make his first lift. And instead of the prescribed lifting plate he uses a bail band of his own design, pictured here, for the final lift. He constructed the bail by cold bending a strip of quarter-inch mild steel about 3 inches wide and 40 inches long into a semi-circle . . . specifically, a bending radius of 11-1/2 inches, and an arc of 180 degrees. To stiffen this piece a second strip was bent over it and welded to it.

Next step was to drill 33/64-inch holes near the two ends (0 and 180-degree centers) as shown, trimming any excess length and rounding off the sharp corners to save the skin and tempers when the rig is used. At this stage it would also be a good idea to trial fit the bend to the curve of the anchor shell: the object, of course, is to have the two 33/64-inch holes line up with the half-inch tapped holes near the rim of the anchor at its cover-plate end.

Midway between the two drilled holes, at the 90-degree point on the band, a half-inch steel shackle is welded to the band. This can take some blacksmithing, to spread the shackle so it fits snugly over the band. This weld is critical; it must be a good one.





TO UPSET A MARK 57 ANCHOR

Put a flat washer against the heads of two half-inch bolts, place the bolts in the 33/64-inch holes in the ends of the bail, put a second washer on the bolts and run a nut back on the threads of each, and the rig is complete . . . except for one thing:

WARNING Before using the device shown here it must be load-tested and certified for 1200-lb lift per Safety Handbook OP 2165.

In use, the bail works like a dream. Screw the bolts about three quarters of an inch in to the tapped holes in the anchor, and use the nuts already on the bolts as jam nuts. Now, with the anchor on the deck, marriage compartment up, with eye bolt installed on the outside of the anchor and the bail on the same side, follow the steps shown pictorially here and ye Mk 57 anchor will upset as pretty as you please.

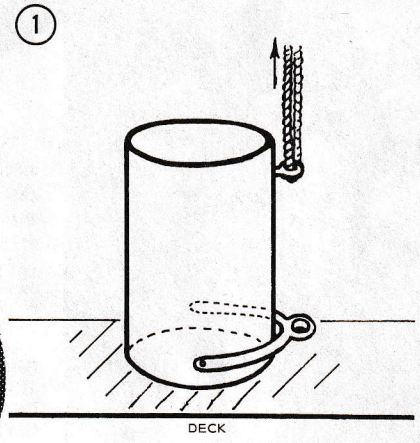
No strain, says Christian.

Shop salvage may yield all the materials required to fashion a bail band but if not this list will fill you in.

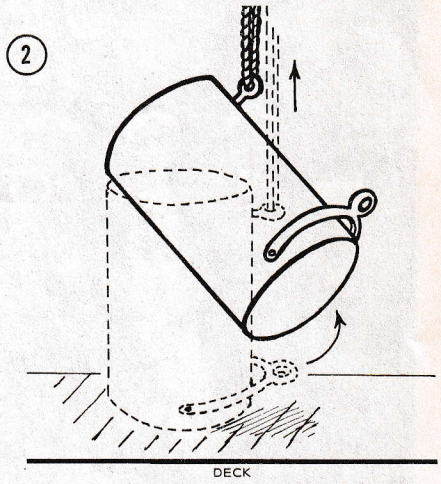
ITEM	USED	FSN
Shackle, 1/2-inch stock	1	4030-791-8532
Bolt, steel, 1/2-13UNC x 2-1/2"	2	5305-685-3193
Nut, steel, 1/2-13 UNC	2	5310-768-0318
Washer, steel, flat (1D.625)	4	5310-187-4129
Steel strip, 1/4" x 30" x 40"	2	Open purchase

HOW TO UPSET MK 57 ANCHOR

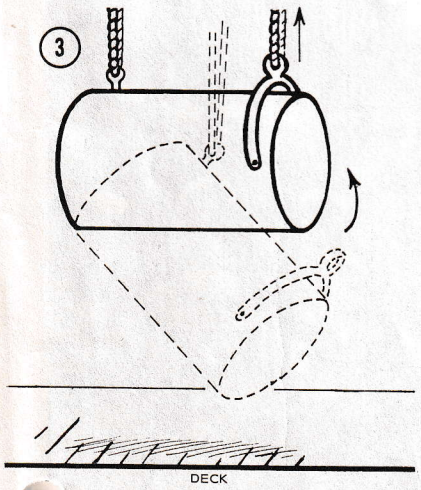
Remember bail band must be certified for 1200-lb lift before use, per OP 2165.



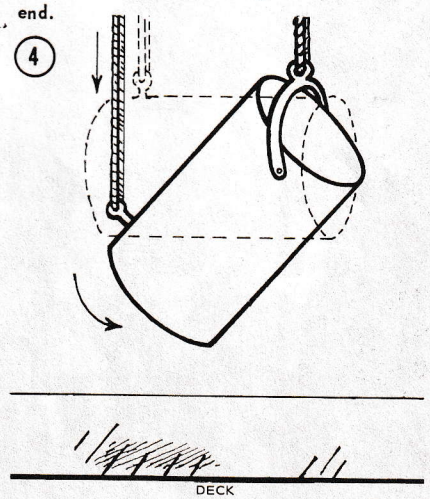
Secure first hoist to eye bolt inserted from outside of anchor at marriage compartment end.



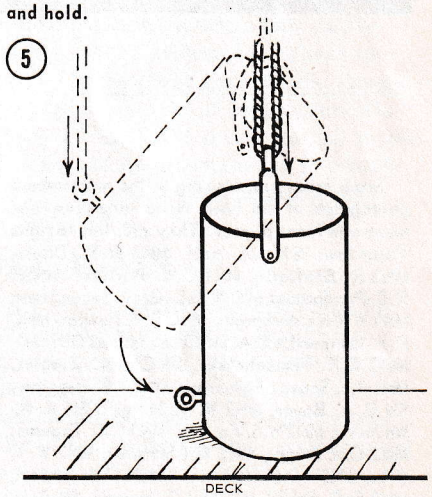
Lift until anchor swings free of deck. Steady by hand, continue lift for another foot or so and hold.



ure second hoist to bail band shackle. Lift until approximately horizontal and hold.



Lower first (eye-bolt) hoist until cable is slack. Hold on second hoist and disengage first hoist.



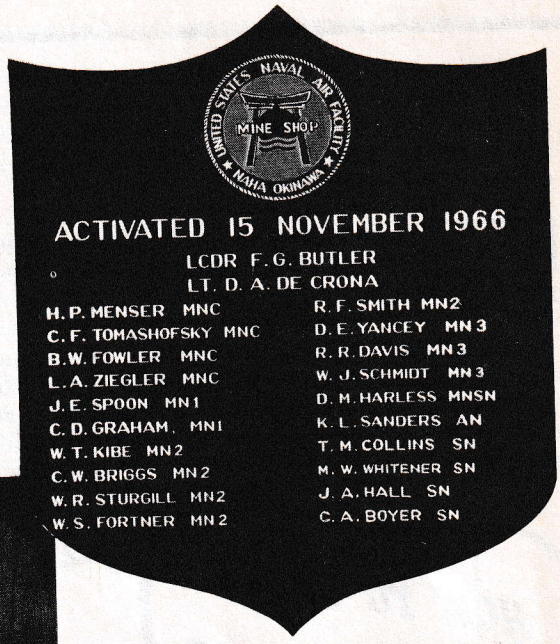
Lower anchor to deck by second hoist. Slack off and disengage second hoist. Remove bail band.

HOUSEWARMING FOR NAHA MINE CREW

COME 15 November 1967 the mine division at NAF Naha will celebrate its first year in a new air-conditioned building that include office, classroom, and bunk room as well as the last word in component testing, assembly, and storage areas. So reports MN2 Richard Bonfiglio who sent these photos of personnel then and now.

Since these photographs were taken these transfers have taken place: MNC Ziegler to USNTC Great Lakes; MN1 Spoon to COMSERVLANT, Norfolk; MN1 Graham to NAS Atsugi; MN2 Fortner to the Navy Swim School, Key West; MN3 Davis and MN3 Yancey to MN "B" School; AN Sanders to Corpus Christi; SN Hall and SN Collins to IUWG-ONE Long Beach and advanced to MN3, SN Whitener to NAVMAG Subic Bay, SN Boyer to CVA-65.

Also Lt. De Crona is on orders to NOF Yokosuka and MNC Menser to the Fleet Reserve. MN3 Higgins and MN3 Bonfiglio have been advanced to MN2, and MNSN Harless has been advanced to MN3. MN3 Schmidt has returned to civilian status.



This lacquerware plaque, in black and gold with the names of charter members inscribed, was designed to commemorate the activation of the new mine shop. It will remain on permanent display in the shop.

Posed with their commissioning plaque are charter members of the new mine shop crew, left to right: Front row: SN J.A. Hall, MN3 R.R. Davis, MNSN D.M. Harless, MN2 R. F. Smith. Second row: MNC B.W. Fowler, MNC H.P. Menser, LCDR F.G. Butler (WEPS Officer), Lt. D.A. De Crona (Mines Officer), MNC C.F. Tomashofsky, MNC L.A. Ziegler. Third row: SN C.A. Boyer, SN M.W. Whitener, MN2 W.R. Sturgill, MN1 C.D. Graham, MN2 W. S. Fortner, MN2 C. W. Briggs, MN 2 W.T. Kibe, MN1 J.E. Spoon, MN3 W.J. Schmidt, SN T.M. Collins. Not present: MN3 D.E. Yancey and AN K.L. Sanders.

Some faces are missing in the most recent photograph of the NAF Naha mine crew and some new faces appear. They are, left to right: Front row: SN J.A. Hall, MN3 R.R. Davis, MN3 R. Bonfiglio, MN1 C.W. Barbee, MNSN R.D. Pendergast, MNSN G.L. Gray. Second row: MN1 W.W. Neiderberger, MNC B.W. Fowler, MNC H.P. Menser, Lt. D.A. De Crona (Mines Officer), MNC C.F. Tomashofsky, MNC L. A. Ziegler, MN1 J.E. Spoon. Third row: MN3 A.R. Higgins, SN G. A. Boyer, MN2 W. R. Sturgill, SN M. W. Whitener, MN2 W.S. Fortner, MN1 C.D. Graham, MN2 C.W. Briggs, MN3 W.J. Schmidt, MN2 W. T. Kibe, MNSN D.M. Harless, MNSN D.W. Anders, MN2 R.F. Smith, MNSN J.P. Hutson, SN T.M. Collins. Not present: MN2 R.F. Parsons, MN3 C.D. Tice, MN3 S.C. Shaneman, MNSN T. A. Lawson.

THE NEW LOOK IN DRILL MINES

SOME air-laid drill mines are going to have a new look, what with the new drill gear shown on the following page, and the fact that its use introduces shifts in center of gravity (CG) that require the use of specially-compensated mine cases to avoid aircraft damage and make these birds fly right.

Drill assemblies of the Mark 25 Mod 0 Mines so configured will be identified as OAs 21D, 22D, 23D, and 24D, and in addition to the new drill gear these OAs will require a modified mine case: Case Mark 25 Mod 3. This case is laminar loaded, a term new to the mine force which means (per OD 28653) a case loaded "with two or more strata of materials with different densities . . . to position the center of gravity of a completely assembled drill mine of fixed weight at a specific dimensional location" . . . with respect to its suspension lugs. Inert laminar loading is accomplished by mixtures of cement and vermiculite, cement and sand, and, for Case Mk 25 Mod 3, lead shot. MM Code for the 25-3 Case is 9C05107.

For Mods 1 and 2 of the Mk 25 drill mine which will use the new drill gear and the laminar-loaded 25-3 case, OAs 21B, 22B, 23B, and 24B have been assigned.

For Mark 36 drill mines the CG has been compensated by the addition of an auxiliary strongback that provides a shift in lug position, rather than by laminar load. Cases so altered are being identified as Case Mk 36 Mod 3, MMC 9C05108. For Drill Mines Mk 36 Mods 1 and 2, OAs using the Mod 3 case and new drill gear are 21B, 22B, 23B, and 24B. For Drill Mine Mk 36 Mod 3 the OAs are 11B and 12B. Case Mk 36 Mod 3 accepts only Suspension Lugs Mk 6 OL00018.

Cases for all mods of Drill 52s, old and new, have also had to have the lug re-positioning strongback treatment. The result is Case Mark 52 Mod 2, 9C05110, and it is specified (so far) for OA 02B of Drill Mine Mk 52 Mods 1 through 6, and OAs 02B, 03B, 04B, and 05B of Drill Mods 7 and 8.

For Drill 55s the solution is again laminar loading. The case so compensated is Case Mark 55 Mod 3, 9C05114, specified (so far) for OA 02B of Drill Mine Mk 55 Mods 1 through 6, and OAs 02B, 03B, and 04B of Drill Mods 7 and 8.

At the time of this writing (15 Aug 67) AIRSYSCOM HQ expected to announce clearance to fly drill OAs using the new drill gear on A-1, A-4, and A-6 airplanes, and that means it won't be long before you'll need to know how to recognize them. The auxiliary strongbacks have a quarter-inch weld bead on all sides – you can't miss 'em. But to tell a laminar-loaded job you've got to check the stenciling. Aside from Mod number, the legend INERT C tells you it's straight concrete and safe only for use with older drill gear (early OAs using Float Mk 15). INERT-LAMINAR is the legend that must be on the Mk 25 or 55 case you select for the new drill OAs using Float Mk 17. Whatever you do, don't get these assemblies crossed: FSMT mines and early drill OAs do not use cases with auxiliary strongbacks or laminar loads. New drill OAs, using the Mk 17 float etc., do require auxiliary strongbacks or laminar loads and are not safe to fly without them.

Speaking of the "etc." that goes with the Mk 17 float, from the few who have already used it we've had so many gripes on the difficulty of parts identification and assembly that we locked head illustrator Roland Rollins in a room and told him to do an illustration that would make it clear. When we finally let him out he was so frustrated he resigned, leaving the illustration on the next page as his last will and testament to ye T-Shooter. We think many, in the coming months, will be thankful he didn't take it with him!

NEW BATTERY SPACERS FOR 36-1, 36-3 MINES

RECURRING reports of crushed batteries BA-249/U in Mods 1 and 3 of the Mark 36 Mine, and interference between CD-14 and case wall thereby induced in the Mod 1, make it necessary to discontinue use of locally-fabricated spacers as described in Troubleshooters 1-63 (p 17) and 1-64 (p 13).

Instead, cushions of half-inch rubber (available in 24 x 120-inch sheets as MIL-R-6130 Type 1 Grade B, 5330-232-2447) should be cemented to the bottom (battery side) of the battery brackets for the Mod 1, or the battery retaining straps in the Mod 3. Use rubber cement MIL-A-1154, FSN 8040-273-8716 (1/2 pint).

For the Mine Mk 36-1 cut two rubber pieces 2-1/4-inches wide by 6 inches long for right and left brackets or, for OAs using an SD-4 instead of a second CD-14, one piece 2-1/4-inches by 6 inches for the bracket that supports the CD-14 mounting plate, and one piece 2-1/4-inches by 2-1/2-inches for the battery retaining strap. For the 36-3 cut two pieces 2-1/4-inches wide by 2-1/2-inches long for right and left retaining straps.

These spacers are best cemented at time of mine assembly so that, before the cement sets, they can be trial fitted to be sure the rubber cushions will bear on the tops of the batteries, in the clear between the ridges formed by the battery case. At time of battery installation torque fastenings to 10-12 pound-inches for all mines.

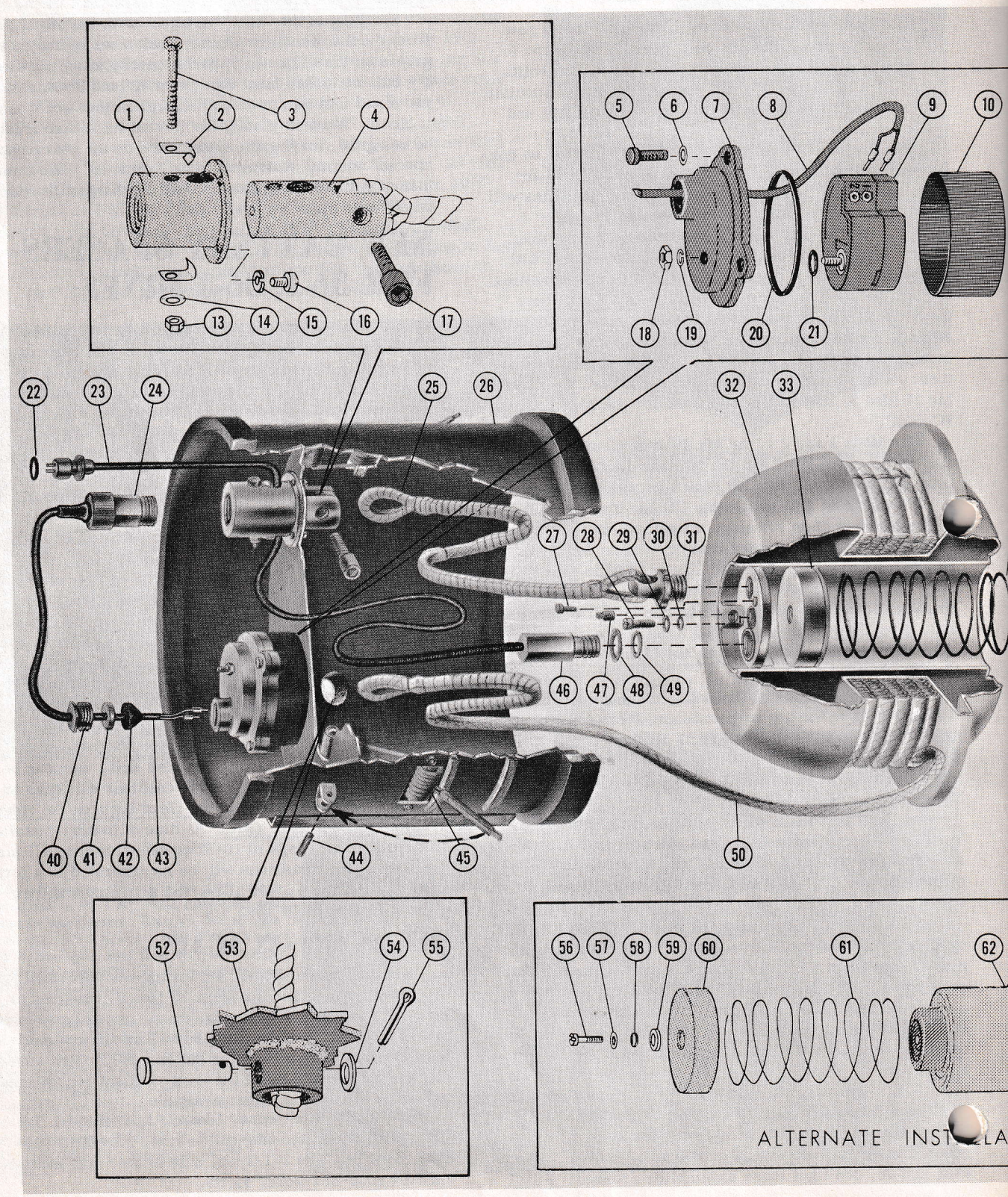
Use of these cushions will be incorporated in a forthcoming Revision 4 to OP 1684, and a forthcoming permanent change to OP 1892 Vol 1.

OFF AGAIN ON AGAIN

Back in Troubleshooter 4-63 a fix was described for the repair of Junction Box Mark 35 Mod 0, designed to keep the connector's lock rings from coming loose under stress of plugging and unplugging. This fix was made mandatory by Troubleshooter Bulletin 093, which stated that the gallon-size kit of the epoxy sealant recommended in Issue 4-63 was no longer available.

Now Sealing Compound, Class I, MIL-S-8516, is again available in the one-gallon size, FSN 8030-823-7953, $14.30. The 2-1/2-oz. size is also still available via FSN 8030-881-2618, $1.85.

FLOAT MK 17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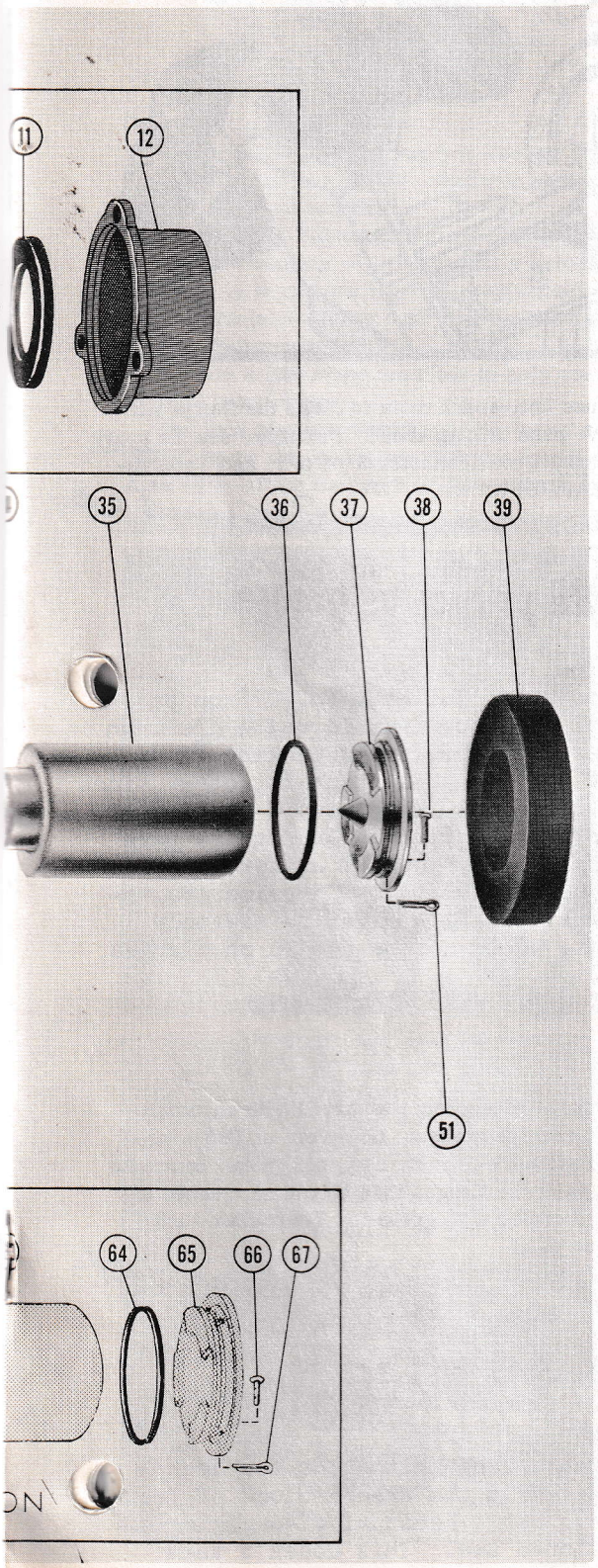
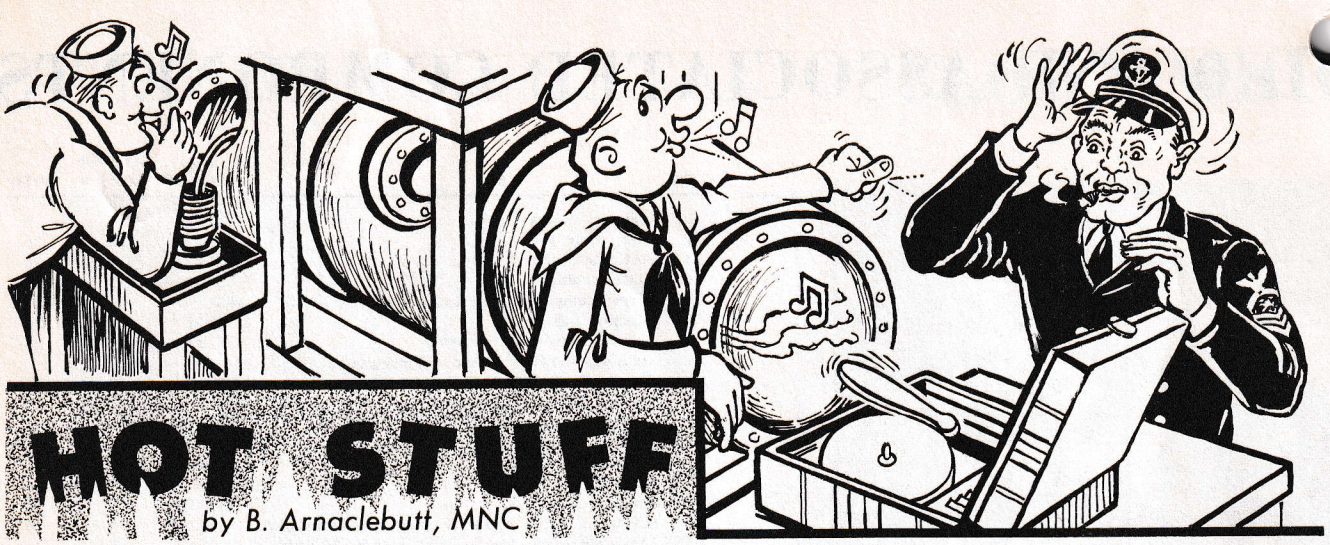
ALTERNATE INST

MOD 0 AND ASSOCIATED COMPONENTS



ITEM	NAME	MM CODE ■	NO. PER MINE *	WITH
1	Housing, cutter	9S17089	1	26
2	Clip, cable	9S18089	2*	26
3	Bolt, shear, hex-hd 1/4 x 2-1/2"	9S19089	1*	26
4	Cutter, cable	9S20089	1*	26
5	Screw, delay-switch cover, soc-hd 1/4-20 x 1"	9S25089	3	26
6	Washer, flat, 1/4"	9S27089	3	26
7	Cover, delay-switch housing	9S26089	1	26
8	Item 43, showing method of connecting	-------	---	---
9	Switch, Delay, Mark 64	9S00201	1	---
10	Sleeve, insulating, delay-switch	9S33089	1	26
11	Cushion, delay-switch	9S39089	1	26
12	Housing, delay-switch	9S40089	1	26
13	Nut, self-locking, 1/4"	9S24089	1*	26
14	Washer, flat, 1/4"	9S38089	1*	26
15	Washer, lock, 1/4"	9S23089	4	26
16	Screw, mounting, cutter-housing, soc-hd 1/4 x 1/2"	9S22089	4	26
17	Screw, mooring-line securing, soc-hd 3/8 x 1-1/2"	9S21089	1*	26
18	Nut, brass, 1/4-20	9S35089	1	9
19	Washer, lock, 3/8"	9S16089	1	9
20	Packing (O-ring), .139 x 4.234"	9S12089	1*	26
21	Packing (O-ring), .070 x .551"	9P00045	1*	9
22	Packing (O-ring), .103 x .424"	9F19061	1*	46
23	Electric cable integral with item 46	9F11049	---	---
24	Explosive Fitting Mark 19	9F09045	1*	---
25	Mooring line, drill-float	9F12069	1	32
26	Shield, drill-float	9S00089	1	---
27	Screw, anti-rotation, soc-hd 1/4-20 x 3/8"	9F17069	1	32
28	Screw, signal-retaining, self-lock 5/16-18 x 7/8"	9S11097	1*	35△
29	Washer, flat, 5/16 x 9/16"	9S14097	1*	35△
30	Packing (O-ring), .070 x .301"	9S13097	1*	35△
31	Eye, mooring, drill-float: integral with item 25	9F20069	---	---
32	Float, Drill, Mark 17	9F00069	1	---
33	Cup, signal-spring	9S15097▲	1*	35▲
34	Spring, signal-ejector	9S12097★	1*	35★
35	Signal, Smoke & Illum, Mark 25 (gray)	9S06097	1*	---
36	Packing (O-ring), .210 x 3.600"	9F13069	1*	32
37	Cap, signal-tube, punch type	9F14069	1*	32
38	Rivet, alum, 1/8 x 1"	9F15069□	4*	32
39	Cushion, drill-float	9S37089	1*	26
40	Plug, gland	9S29089	1	26
41	Washer, gland	9S30089	1	26
42	Packing, gland	9G00017	1*	26
43	Electric cable integral with item 24	9F11045	---	24
44	Pin, roll, .156 x 1"	9S36089	3*	26
45	Spring, float-ejector	9S41089	3	26
46	Explosive Fitting Mark 20	9F09049	1*	---
47	Bolt, self-sealing 3/8-24 UNF	9F19069	1	32
48	Washer, flat, .890 x 1.218"	9F12049	1*	46
49	Packing (O-ring), .139 x .859"	9F13049	1*	46
50	Recovery line, drill-mine	9F11069	1	32
51	Pin, cotter, 1/16 x 1/2"	9S17105	4*	32
52	Pin, clevis, 5/8 x 2.531"	9S31089	1	26
53	Rear view of item 26, showing method of attaching item 50	---	---	---
54	Washer, flat, 5/8"	9S32089	1	26
55	Pin, cotter, 1/8" x 1-1/2"	9S13089	1*	26
56	Same as item 28	9S11105	1*	62
57	Same as item 29	9S14105	1*	62
58	Same as item 30	9S13105	1*	62
59	Washer, nylon	9S20105◎	1	62
60	Same as item 33	9S15105	---	62
61	Same as item 34	9S12105	---	62
62	Signal, Smoke & Illum, Mark 39 (green)	9S06105	1*	---
63	Signal, Smoke & Illum, Mark 44 (red)	9S06109	1*	---
64	Same as item 36	-------	---	---
65	Cap, signal-tube, plain type	9S11105☆	1*	62☆
66	Same as item 38	-------	---	---
67	Same as item 51	9S17105	---	---

* Asterisk (*) after number used per mine indicates item is expendable each drill plant.
■ For complete identification of Material Management Coded items see OP 3504.
▲ Item 33 is multiple coded: 9S15097/105/109 as supplied with items 35/62/63.
★ Item 34 is multiple coded: 9S12097/105/109, as supplied with items 35/62/63.
□ Item 38 is multiple coded: 9F16069 as supplied with item 32, 9S18105/109 as supplied with items 62/63.
◎ Item 59 is multiple coded: 9S20105/109, as supplied with items 62/63.
△ Items 28, 29, 30 also supplied with items 62, 63.
☆ Item 65 multiple coded 9S11105/109 as supplied with items 62/63.



HOT STUFF

by B. Arnaclebutt, MNC

Keep it in the groove

Dear Barnacles:

When a number of explosive-loaded Mk 25-1 mine cases were hauled out of stock recently for overhaul, their flange surfaces exhibited traverse grooves, or scratches, or indentations or pits, in varying degree. About 3 percent were rejected although they had been stocked as Code A.

If it hadn't been for the Troubleshooter 2–59 article on case openings more of the cases would have been put on the reject list by our Quality Assurance people. As it is we are holding the reject cases in Code L (suspended) until we get a reading on these questions: 1) Does a traverse scratch have to extend radially across all phonograph grooves, or across the entire area covered by the gasket and beyond, if there are no grooves, before it is a cause for rejection? 2) Does the same rule hold for pits and indentations? 3) How deep must scratches and pits be before they are objectionable?

RFB TMCS

Dear RFB:

The answers to your first two questions are yes. Like the 2-59 article said, traverse scratches that do not cut across all phonographic grooves; or which, on flanges without grooves, do not cut across the entire surface covered by the gasket width, are acceptable for service use. Further, pits in or between individual grooves, and pits that do not cover as much or more surface than that covered by the gasket itself, are also acceptable, although such pits should be no deeper than phono grooves.

Since men are remembering that case-opening article, most of which is still good even though the 1-59 issue has been cancelled, we'll correct one misstatement. You do not have to use anti-spark tools to clean the flange surfaces we have been talking about. For more see To spark or not to spark, Troubleshooter 3-66 p-5, and Troubleshooter Bulletin 095.

B. Arnaclebutt

Chromate primer vs grease

Dear B. Arnacle

Troubleshooter Bulletin No. 095 on preservation of mine openings is quite clear on newer mines using preformed packing ("O" rings) but what is the intent for other mines using flat gaskets? Many have a coating of chromate primer on flanges and others bare metal flanges. To make all uniform and comply with Bulletin 095, should primer be removed from all flanges prior to assembly since grease would not be needed on flanges so primed?

RJN MN1

Dear RJN

Flange surfaces adequately preserved with chromate primer do not require grease. However, as 095 says, when there is evidence of rust, dirt, old gasket remnants or excessive paint the flanges then should be cleaned to bare metal and coated with grease. Thereafter such flanges need no paint.

B. arnaclebutt

Keep Mk 303 test set safe

Dear B.B.

The latch spring that holds the lock plunger locked in the breech block of Test Set Mark 303 has a habit of disengaging after continued use. This doesn't seem

to be too healthy when it's explosive devices you're testing. With an extra bend or two we can get the latch working again?

LSF MN1

Dear LSF:

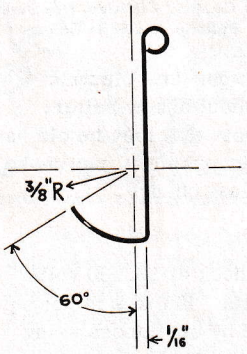
With an extra bend or two you can get the latch working again. And you should. And you shouldn't use a 303 set when it's not working.

But do not be haphazard in your bending. Too severe or frequent bending will permanently deform the spring. Best way is to remove the retaining screw and lockwasher and lift the latch spring out, then reshape the spring with a pair of long-nosed pliers.

Here is a life-sized template to help you bring it back to its original shape.

The lock plunger should operate freely so that when pushed home the spring engages the detent slot easily. Also when lifting the latch to unlock don't overdo it.

When the latch clears the detent the spring-loaded plunger should come out freely. If it doesn't no over-bending of the latch will do it. The plunger is binding because you have not turned the breech block far enough, clockwise – or too far – to bring the plunger into alignment with its bolt hole.



If handled gently that spring latch should operate without a hitch indefinitely.

B. Armadebutt

MOMAT CREW AND ITS MINES

Charleston's MOMAT 0322 assembly team delivered the 24 Mk 55s plane-side at NAS Jacksonville where the Patron 45 crew took over. The smoothness of the operation is a credit to team-work so some kudos should go to members of the MOMAT team pictured here. They are: left to right, standing: MNC M. L. Bryan, MN3 F. A. Tetor, MN1 H. F. Bright, MN3 J. R. Feyrer, and WO1 J. F. McDonough. Kneeling are MN3 F. D. Fann and MN2 S. J. Kelly.

THE FATAL CURRENT

Printed through the courtesy of Fluid Controls Co. Inc., Cliffside, New Jersey, University of California Information Exchange Bulletin, and Safer Oregon.

STRANGE AS IT MAY SEEM, most fatal electric shocks happen to people who should know better. Here are some electro-medical facts that may be old hat to plenty of minemen, but which nevertheless may make you think twice before taking that last chance.

It's the current that kills

Offhand it would seem that a shock of 10,000 volts would be more deadly than 100 volts. But this is not so! Individuals have been electrocuted by appliances using ordinary house currents of 110 volts and by electrical apparatus in industry using as little as 42 volts direct current. The real measure of shock's intensity lies in the amount of current (amperes) forced through the body, and not the voltage. Any electrical device used on a house wiring circuit can, under certain conditions, transmit a fatal current.

While any amount of current over 10 milliamps (0.01 amp) is capable of producing painful to severe shock, currents between 100 and 200 mA (0.1 to 0.2 amp) are lethal.

Currents above 200 milliamps (0.2 amp), while producing severe burns and unconsciousness, do not usually cause death if the victim is given immediate attention. Resuscitation, consisting of artificial respiration, will usually revive the victim.

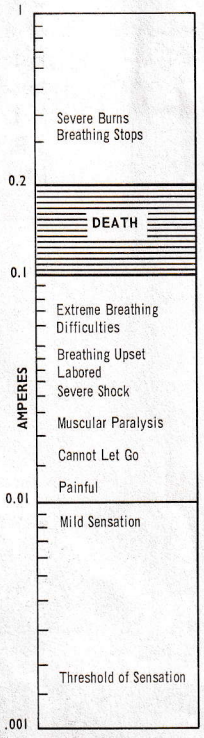
From a practical viewpoint, after a person is knocked out by an electrical shock it is impossible to tell how much current passed through the vital organs of his body. Artificial respiration must be applied immediately if breathing has stopped.

Physiological effects of electric shock

The chart shows the physiological effect of various current densities. Note that voltage is not a consideration. Although it takes a voltage to make the current flow, the amount of shock-current will vary, depending on the body resistance between the points of contact.

As shown in the chart, shock is relatively more severe as the current rises. At values as low as 20 milliamps, breathing becomes labored, finally ceasing completely even at values below 75 milliamps.

As the current approaches 100 milliamps, ventricular fibrillation of the heart occurs–an uncoordinated twitching of the walls of the heart's ventricles.



PHYSIOLOGICAL EFFECTS OF ELECTRIC CURRENTS

Above 200 milliamps, the muscular contractions are so severe that the heart is forcibly clamped during the shock. This clamping protects the heart from going into ventricular fibrillation, and the victim's chances for survival are good.

Danger- low voltage!

It is common knowledge that victims of high-voltage shock usually respond to artificial respiration more readily than the victims of low-voltage shock. The reason may be the merciful clamping of the heart, owing to the high current densities associated with high voltages. However, lest these details be misinterpreted, the only reasonable conclusion that can be drawn is that 75 volts are just as lethal as 750 volts.

The actual resistance of the body varies depending upon the points of contact and the skin condition (moist or dry). Between the ears, for example, the internal resistance (less than skin resistance) is only 100 ohms, while from hand to foot it is closer to 500 ohms. The skin resistance may vary from 1000 ohms for wet skin to over 500,000 ohms for dry skin.

When working around electrical equipment, move slowly. Make sure your feet are firmly placed for good balance. Don't lunge after falling tools. Kill all power, and ground all high-voltage points before touching wiring. Make sure that power cannot be accidentally restored. Do not work on underground equipment.

Don't examine "hot" equipment when mentally or physically fatigued. Keep one hand in pocket when you do investigate "hot" electrical equipment.

Above all, do not touch electrical equipment while standing on metal floors, damp concrete, or other well grounded surfaces. Do not handle electrical equipment while wearing damp clothing (particularly wet shoes) or while skin surfaces are damp.

Do not work alone! Remember the more you know about electrical equipment, the more heedless you're apt to become. Don't take unnecessary risks.

What to do for victims

Cut voltage and/or remove victim from contact as quickly as possible–but without endangering your own safety. Use a length of dry wood, rope, blanket, etc., to pry or pull the victim loose. Don't waste valuable time looking for the power switch. The resistance of the victim's contact decreases with time. The fatal 100 to 200-milliampere level may be reached if action is delayed.

If the victim is unconscious and has stopped breathing, start artificial respiration at once. Do not stop resuscitation until medical authority pronounces the victim beyond help. It may take as long as eight hours to revive the patient. There may be no pulse and a condition similar to rigormortis may be present; however these are the manifestations of shock and are not an indication the victim has succumbed.

MINE SCHOOL NEWS

SPRECHER SPEAKS!

The following rundown on what's new at the mine school is presented in the form in which it was received: an open letter to MN rates everywhere.

HOW MANY OF YOU have heard the statement, "I don't know the first thing about the Mk 52/55 series weapons" or "I haven't even seen a Mk 56/57 mine"? Well this no longer need be the rule. Approximately a year and a half ago BUPERS authorized minemen to attend the MN "B" course not only when going from shore to sea duty, but also when going from sea to shore. Qualifications are clearly spelled out in Troubleshooter 3-65.

This relaxation of the rules allows the individual a much greater selection of school dates to fit into his plans of preparing himself for CPO. It also opens another door for the graduates of calendar year 1959 (or before) to come back and polish up their knowledge bumps on new mines . . . as well as on older weapons which are still a vital part of our arsenal. When stockpiling of the 52/55 Mod 7 is initiated I'm sure there are going to be a lot of senior minemen that will have to say, "I'm sorry Sir (or Seaman Brown!) I don't know anything about computer action, or Boolean Algebra or logic". Well — all I can say is, it's available, so why not take advantage of it? As a fringe benefit, it'll help you help your kids with their modern math homework, too!

Speaking of preparing yourself for CPO, let's consider the often-used practice of asking for a waiver of "B" school in order to qualify for the E-7 examination. Such waivers could very conceivably grind to an abrupt halt, whereupon plenty of minemen would find themselves sitting high and dry when it's time for the next advancement examination.

You say you put in for "B" course, but BUPERS turned you down? Well, if in fact you are eligible and were turned down, drop me a note and give me the dope, (dates, letters, serials, etc.). Don't get me wrong . . . I'm not getting into the personnel business, but I'll certainly see if I can find out why you were refused, like whether the letter didn't reach the right desk or something.

There's also another route: Try again! We now have the capability of processing 40 "B" students a year through NSMW, yet only 16 per year are taking advantage of it.

Remember you have to ask for school, it doesn't come automatically like payday, and that includes you E-7s who ought to think about asking for school to prepare yourself for that long dry spell of E-8 and E-9, for whom the course is no longer available. That doesn't mean we're disowning you E-8s and 9s just because you changed your arm patch to TM; BUPERS (C-148) tells me the path is clear for you to apply for some school housing under the Mines Officer Maintenance Course, which for all practical purposes is MN "B". So if you're interested note it on your preference card, submit it for consideration, and also let me know by personal note or something if this is what you want – I'm no mind reader and it's hard to anticipate your desires.

NSMW is asking for a longer "B" course, so we can better instruct such topics as test-set repair, administration (records, requisitions, etc), mine instrumentation testing and repair, component repair, new Mods for the 52/55s, special-purpose weapons, a more thorough course on Mk 27, drill kits old and new, and troubleshooting. We are purchasing new training aids to assist the student in developing good troubleshooting techniques, and we're making an honest effort to minimize emphasis on Mks and Mods that would bore the old timers.

So you see, we at the school are doing all we can to improve the course and give you, the fleet mineman, what you want and need. Help us, to help you, by attending our courses . . . then offer your professional, constructive criticism which will assist in further improving the course in the future. In short, come and get it!

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

NOTE: In the way of recent news of interest to the mine family Ed went on to express his pride that one of the NSWW instructors, MN1 GOTSHALL, had been selected by the Navy for the Associate Degree Program! Seventy-five men were chosen for this program with GOTSHALL representing the mine force. Ed says he couldn't pass up the chance to point out that the new program also opens up this tremendous avenue of opportunity for the "B" school graduate (a prerequisite for the program), and we of The Troubleshooter join him in a hearty "Congratulations GOTSHALL".

Rudminde Report

(continued from page 1)

to confuse quite a few people. If you are one of them, here's your chance to get it straight:

First, memorize that rule absolutely: always read all dials to the lowest whole number. What this means is that you can't consider a dial to be reading 6 as long as its pointer is somewhere between 5 and 6. The correct reading is 5, not 6, right up to the point where the pointer is directly on the 6 mark. Then the dial reads 6. And it keeps reading 6, no matter how it looks, right up to the point where the pointer is directly on the 7 mark.

Read to lowest whole number

That's what the rule means: always read all dials to the lowest whole number. Don't forget that those tick marks between the even numbers on the small dials represent the odd numbers 1, 3, 5, 7, and 9. The odd numbers are whole numbers too!

So much for indicating the reading at time of installation. When these directions are followed for the fire recorder shown here the readout tag will look like the example we show. Note that the outer (tenths) pointer in this case has not yet reached 9, so is recorded as .8 hours. The hours hand is between 2 and the index mark for 3 so the reading is 2 (lowest whole number). Accordingly, the "tens" dial is recorded as zero (it hasn't reached 1), the "hundreds" dial reads 8 (the figure it has just passed), and the "thousands" dial is recorded as 0 (zero) (its pointer is near 1 but has not reached it yet!).

Post-recovery readout

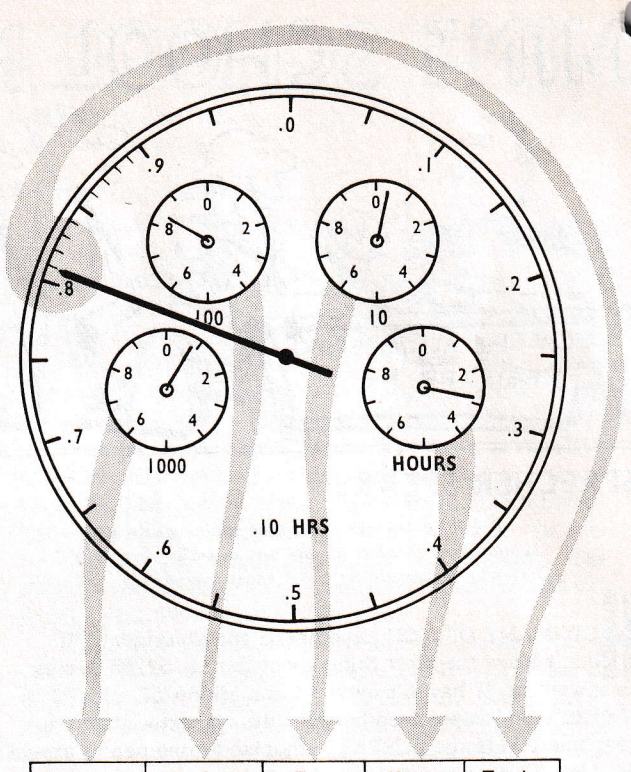
Upon opening a recovered mine for analysis, always determine whether its fire recorder is running before you disconnect the recorder or remove it from the mine case. Check the appropriate blocks (running: yes/no, date, and time) on the readout tag promptly. ZULU time in the "time" block and the letters GCT in the "zone" block, remember?

Whether or not the recorder is running (it should not be if the test mine has been actuated) transcribe its dial readings to the face diagram on side 2 of the readout tag exactly as explained above for side 1. Copy the dials first. Then interpret them and write your readings in the "side 2" squares at the bottom of the tag.

Pencils, not pens

One more plea for help and we're through. Grease pencils eventually make the readout tags an unholy mess. Entries made in pen and ink tend to disappear completely when the tags get wet. The one best tool for use on these tags, then, and the only one you should use, is a plain old lead pencil with a good sharp point.

And that's it. Mark only in lead pencil, use only confirmed Greenwich Civil Time, copy the dials first and interpret them later, read all dials to the lowest whole number, and we think all will be fine. We think that present 20 percent data loss will become a thing of the past.



Thousands	Hundreds	Tens	Hours	Tenths
0	8	0	2	8

ONE ARMING WIRE, ALMOST

OUT OF THE LONG-STANDING guessing game of which arming wires to use with which air-laid mines the two-leg 96-inch Arming Wire Mk 4 Mod 1 has been adopted as the standard wire for all uses. However you can't expect to ignore the older wires until the Mk 4 Mod 1 wires are in sufficient supply to meet demands. Until that time the older wires can and should be used as alternates.

Even when in sufficient supply the use of the Mk 4 Mod 1 wire, one to be supplied for single or double arming as required, will not affect any of the information published in check lists as to what kind of wires to provide with various mines. This applies to Mines Mks 56, 55, 52, 50, 39, 25, and 10-9. Where a double wire is called for the Mk 4 Mod 1 will be used as is, or shortened to suit. Where a single-leg wire is called for, an appropriate number of Mk 4s will be delivered with the mines and the loading crew will trim off the extra leg in the course of loading. This does not apply to the wire which is installed in the Mine Mk 56 anchor by the mine crew during mine assembly and not by the loading crew.

The Arming Wire Mk 5 Mod 0 remains in the system as the one exception to the one-arming-wire-for-all-purposes rule. It is a jointed arming wire which installs between anchor and arming device on submarine-laid Mine Mk 57 Mod 0, for which no other arming wire will do.

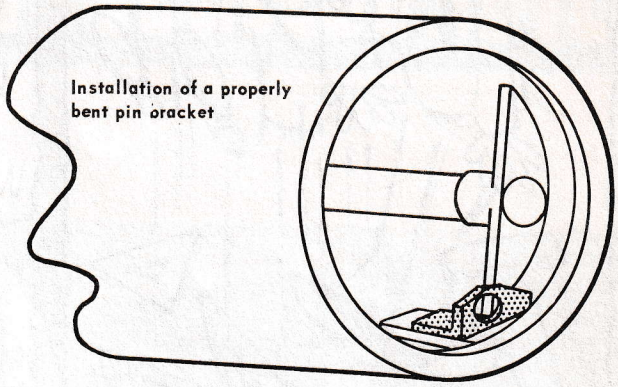
Do You do this Job Right?

BRACKETS OB00092, used in Mine Mark 36 Mod 2 as receptacles for the tail-cover locating pins, are appearing in stocks bent the wrong way. We encountered this once before, back in 1960, at which time we found that only one manufacturer's idea of right had been wrong according to DWG 496411, and that total stock contamination was only 2 or 3 percent. By 1967, then, we thought the problem would surely be dead when along comes a report from MN1 D. G. Duncan that some more "wrongies" had turned up in the stocks at Misawa.

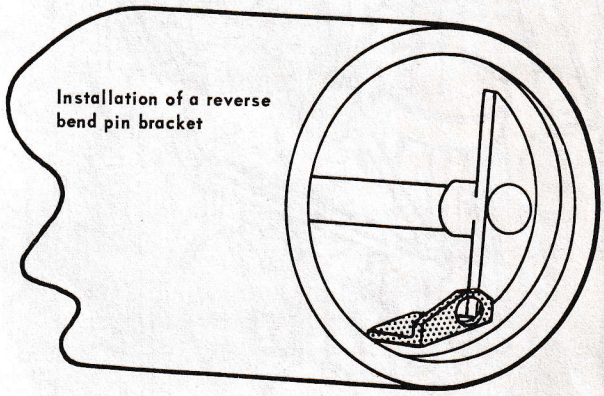
Duncan included the photographs we show here, which all goes to prove there is nothing new under the sun. It may not have been necessary, though, to reject them as Duncan's outfit did, since it is usually possible to install both right and wrong brackets provided you can position them with the large hole nearest the tail flange. To do so the long end of a "wrong" bracket must be positioned next to the after side of the search-coil-tube brace and in some Mk 36 mine cases the bracket mounting pad may be welded further forward than normal, causing interference between the tube brace and the bracket.

Sketches on this page should give you the idea of what we are talking about, and in most cases you'll find that the wrong-bent brackets will do. Try 'em and see.

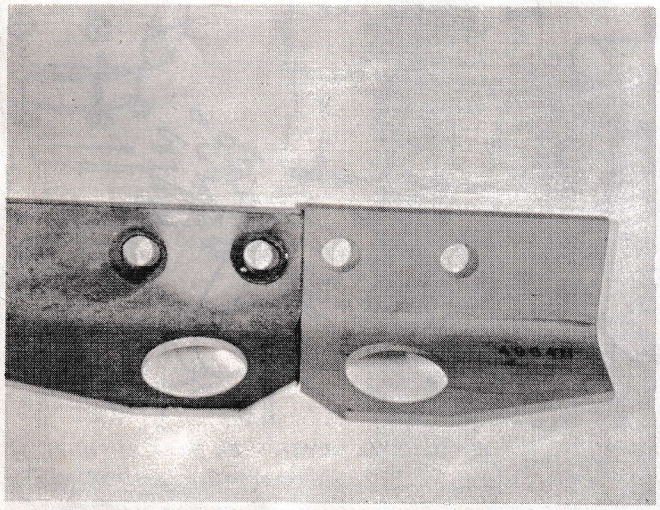
the Editor



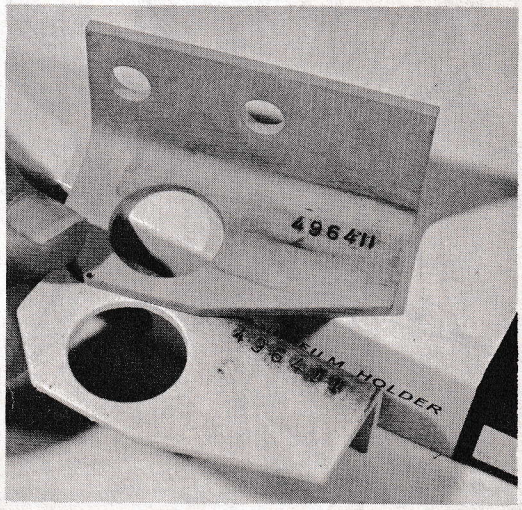
Installation of a properly bent pin bracket



Installation of a reverse bend pin bracket



No matter how you look at them . . .



. . . they're 180° out.