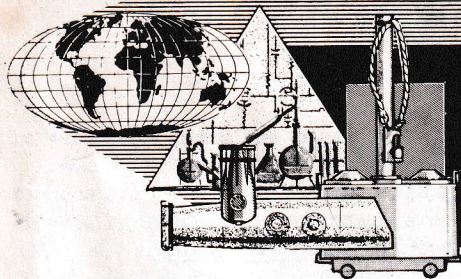


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No. 4-64

*mine and depth - charge*



# THE TROUBLESHOOTER

*Please return 3241 WJOC*

► Bibliography No. 4

► FSMTF Report

► BA-1322/U  
Installation



**AN OFFICIAL BUWEP'S PUBLICATION**

THE OFFICIAL JOURNAL OF THE RUMMIDE PROGRAM

*in this issue . . .*

*mine and depth charge*  
**THE TROUBLESHOOTER**  
Published by the Naval Mine Engineering Facility, Yorktown, Virginia.  
Frederick F. Jewett, CDR., USN... Officer-in-Charge  
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Thomas R. Nevitt..... Editor  
Roland R. Rollins..... Art Director

**REGULAR FEATURES**

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**COVER PHOTO:** What happens when a parachute separates and an air-laid mine falls free is demonstrated by William G. Phillippi, MN1 at Drill Mine Preparation Facility, COMINPAC Headquarters, U. S. Naval Station, Long Beach. Photo, taken in conjunction with post recovery analysis of FSMT CNAP 2-65, is of a Mark 52 Mod 1.

**1 JANUARY 1965**

The Troubleshooter, an official BUWEPS 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 NAVWEPS 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 BUWEPSINST 8500.8.

**ALLEN M. SHINN**  
*Rear Admiral U.S. Navy*  
*Chief, Bureau of Naval Weapons*

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

**THE OFFICIAL JOURNAL OF THE RUDMINDE PROGRAM**

# RUDMINDE REPORT TO THE FLEET

## What's Been Reported?

## What's Being Done?

### In which we jump the gun

About the time this T-Shooter reaches your shop chances are there'll also be a new and unheralded OP showing up in the corner where you are: NAVWEPS OP 3379 Vol 1 - Maintenance Guide for Depth Charges and Mines. In it at least some of our readers will find themselves running headlong into some terms of which they have not previously heard.

Take PMS, for example. For those who don't know, that stands for planned maintenance system - something which CNO has decreed will henceforth be applied to all Navy fighting gear (OPNAVINST 4700.16). Actually PMS is not entirely new. In large measure it harks back to a system called PRISM which a gifted enlisted fire-control technician named Satterwhite worked out and put into effect aboard the USS DES MOINES, which back about 1959 was his "home." More recent influences have been some definitely clever Royal (British) Navy maintenance ideas.

### A hitch?

It would appear, then, that PMS - after some five years of refinement - should exhibit relatively few bugs. And indeed the bugs do seem to have become few when PMS is applied to fixed installations like gun mounts or radar systems, as is now widely being done. The hitch, if there is to be one, will stem from the fact that - until NMEF's work on OP 3379 - the system had never before been applied to expendable ordnance. For once, then, the mine business is scoring a first!

PMS is predicated on the use of MRCs (maintenance requirement cards). All forthcoming mine MRCs will be released via Vol 2 to OP 3379. This is a decided de-

viation from the accepted method of stocking, cataloging, and distributing MRCs. It is, however, only one example of the countless alterations we at NMEF have had to introduce surreptitiously into MRCs and PMS in order to complete what so far as we know is the first and only attempt to fit expendable ordnance into a plan which had been rigidly tailored only to the maintenance of fixed, non-expendable gear.

In all of this our goal has not been to introduce a system that would be perfect from the outset, but one which can gradually be revised into a tool with which mine crews can effectively provide a more dependable, more predictable weapon readiness. To achieve this goal we will need the comments and ideas of the many "Satterwhites" for whom a mine shop in 1965 is home.

### Test-set maintenance too

One of the longest-awaited, most talked-about, and certainly most-needed "programs" in the mine business has been a system to provide mine shops - especially advance bases - with a means of confirming the calibration of their test sets . . . together with a network of established channels for timely repair or replacement of test sets which do not measure up.

Few of our readers will therefore fail to rejoice when they learn that, in conjunction with PMS, OP 3379 Vol 1 also outlines and establishes such a system. By mid-summer reasonable supplies of the necessary manuals and equipment are expected to be in the hands of the activities which need them most urgently, whereupon the business of local test-set qualification will at long last have become not a dream, not a promise, but a fact!

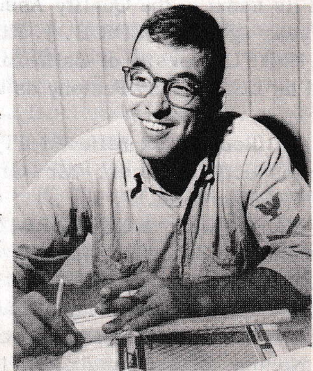
### WANTED: Jobless MNs!

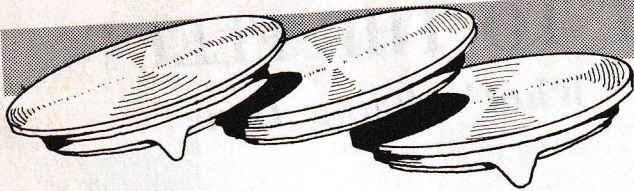
Don't get us wrong. We're not implying that the Navy's overrun with minemen who have nothing to do. But suppose you're about to get out . . . what will you do with your mine experience then?

One thing you might consider is a position as a civilian on the technical staff here at NMEF. Several former MNs and TMs now with us have learned how valuable their Navy experience can be. If you'd like to learn too, why not mail your vital statistics to the O-in-C, NMEF, right now!

MINEMAN GARRY T. BARGER is the Rudminde troubleshooter for Drill Mine Preparation Facility, a unit of COMINPAC, Long Beach, Calif. Assigned to the Training Section he logs all records, notices, instructions, and other material before distribution, and reports all discrepancies found in drill mines and drill-mine publications. The only naval facility of its kind on the West Coast, DRILLMINPREP-FAC assembles and tests more than a thousand drill mines a year! Following exercises, the Facility disassembles each recovered mine and, after tests, stores reusable parts for further drill use.

A native of North Carolina, Mineman Gary entered the Navy in February 1961. He was graduated from the Naval Mine Warfare School in the top half of his class in October 1961, and was assigned to NAD, Oahu, Hawaii, where he was advanced to mineman third in June 1962. Gary came to Long Beach in June 1964.





## PUT ON THE RIGHT CAP

**R**ECENTLY a group of four Signals Mark 39-0 installed in Floats Mark 15 Mod 1 (Mod 0s are obsolete) were test fired in the Pacific by EOD personnel. The floats were anchored in 36 feet of water and fired electrically. Result: all failed. Three failed completely to ignite, while the fourth fizzed a small puff of smoke and went out.

With 100% failure, all 39-0s in the lot from which these signals had been taken were consigned to Code H and reported to NMEF by Rudminde. Also, an analysis was requested of the Quality Evaluation Laboratory at NAD/Oahu, who tested eight 39-0 samples and found:

- ▶ No leakage at 80 psi (equivalent to water depth of 175 feet).
- ▶ All signals fired and functioned properly.
- ▶ Adequate smoke and flame were emitted.

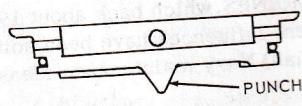
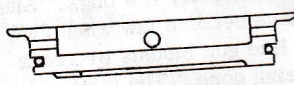
These tests ruled out signal malfunction and pointed to an external influence as the cause. An inquiry brought back the answer: punch-type caps had been used on the floats' signal tubes for those EOD tests.

Punch caps and plain caps are not functionally interchangeable. The punch-type caps are for use only with standard gray-smoke Signals Mark 25, while all red- and green-smoke signals (Marks 39-0, 40-0, 43-0, and

44-0) use the plain cap. This is true whether these signals are used in the Mark 15 Mod 1 float, or in the newer Mark 17 Mod 0 float.

So how had those EOD boys been misled? We've found it to be a matter of misleading documentation resulting in a situation whereby one type of cap (punch) is supplied with the floats, the other type (plain) is supplied with the signals, and nothing clearly tells what must be used with what.

The answers, temporarily, are to be found in the table we've put together here. To back it up, changes to the several affected LDs, ODs, OPs, etc. — already in process — will erase all further doubts as to which caps and signals are compatible with which.

TYPE CAP	SIGNALS	FLOATS
PUNCH: DWG 1276168*  1350-512-7335	MARK 25	MARK 15 MOD 1 MARK 17 MOD 0
PLAIN: DWG 1635685*  1350-969-1086	MARK 39 MARK 40 MARK 43 MARK 44	

\* Caps are identified by drawing number. All marked with drawing numbers other than these cited here are for obsolete Mk 15-0 floats and are also obsolete.

## AULD LANG SYNE ECHO

**A**T least one group photo in the Auld Lang Syne collection printed in our 3-64 issue caught the eye of the old timers. J. C. Jeffcoat, who has now changed his rate to AE2, reported in from Bermuda — Naval Support Unit, Kindley AFB, asking where his old shopmates in the Quality Control Department at NWS, Yorktown, are. Thanks to W. L. Johnson, MNCA, here is the poop.

In addition to changes in personnel the department changed its name to the Quality Assurance Department about a year ago and LCDR E. J. Kirshke, now at U. S. NROTC Unit, University of California, Berkeley, was relieved by LCDR J. F. Pentony as department head, not OIC.

LT R. J. (Bob) Trask relieved LTJG R. F. (Red) Greene as Mine Inspection Officer. Mr. Greene is at Naval Magazine, Subic Point, P. I.

Chief Mahony went to USS CURRITUCK, AV7, and is now stationed at Yokosuka, Japan.

Nunn, MN1 and Carter, MN2 are stationed at Drill Mine Prep Facility, Long Beach, California.

The crew now at the Department consists of Johnson, MNCA; Nelson, MN1; Stancik, MN1; and Wiggins, MN3.

## PRY AS YOU TRY

**A**RE you constantly assembling and disassembling Mk 52/55 mines in the corner where you are? If so, there's reportedly some chance of the wear and tear ultimately taking its toll on the contact pins and phenolic connectors on CAs 948, 952, 1832, etc. To prevent, pry carefully with a screwdriver, at the same time pulling straight by hand, when you disconnect.

According to the technicians reporting from one shop where T-Shooter is read, this helps.

## RELAX LUG MK13 TORQUE

**I**N WE AIM TO PLEASE (T-Shooter 2-64, page 6) change the torques for the Mark 13-0 suspension lug screws as follows: Screw MS 35457-50 from 35 ± 5 lb-ft to 25 to 28 lb-ft; Screw DWG 2290321-1 from 25 ± 5 lb-ft to 15 to 18 lb-ft.

TROUBLESHOOTER 4-6

# HOT STUFF

by B. Arnaclebutt, MNC



And 'round she goes

Dear Chief,

Received Gyros Mark 30 Mod 2 with a Balance Weight DWG 351831-15 and Spacer DWG 427006-11 attached, yet both were directed to be removed by OD 10575 which converted Gyro Mk 30 Mod 0 to Gyro Mk 30 Mod 1. Is it possible these items were put back when Gyro Mk 30 Mod 1 was changed to the Mod 2?

KRF, MN1

Dear KRF,

Somebody must have slipped up on the conversion from Gyro Mod 0 to Mod 1. And the Mod 2, of course,

is an altered Mod 1, the difference being that the Mod 1 contains a Gyro and Gimbal Assembly DWG 427009 while the Mod 2 contains Assembly DWG 694317.

The Mod 2 gyro, then, should be maintained and tested in accordance with instructions for the Mod 1 as they now stand in OD 10573, which means this OD will have to be changed to include a description etc., of the Mod 2. This we will try to do soon, now that you've made us aware of the need.

In use, however, the two assemblies are interchangeable and are available under the same FSN: 1355-399-8276.

*B. Arnaclebutt*

## Counterbore tool coming up

Dear B. B.,

Any idea how we can get that Counterbore Tool 4T LD 497012, which is item 34, on BUWEPSINST 08011.15? Everytime we order, nothing happens.

SOL

Dear SOL,

If I hadn't noticed your letterhead I would have thought you were out at Navy 3923. Out there they wrote to BUWEPS, whereupon they were told that the tool was not available and should be fabricated locally in accordance with Troubleshooter 4-60 on page 16.

This reply was right in that the tool is not available. But the tool described in T-Shooter is not a counterbore, but a tool for digging out fiber washers from around clock- and extender-well studs. So what's to do?

First, we doubt many a clock starter or extender can still be found whose flange holes have not already been counterbored to accept the tiny shoulders on fiber washers. Depots were long ago supposed to have fixed

most stocks, any new procurements will be counterbored in the course of manufacture, and therefore there seems no reason now to put that counterbore tool in the supply system.

We do, however, have drawings at NMEF for local fabrication in case a major depot or overhaul activity should ever have the need. In any case the counterboring as we see it is a function to be performed before issue, not by activities in the field.

*B. Amadebutt*

## In like Flynn

Dear Hot Stuff,

In the electrical hook-up of Drill Mine 49 Mod 0 the routing of CA-23 in fig. 36 of OP 1807 Vol 2 works fine in connecting the CD-12 to TB-19. But when you substitute a CD-8 for the CD-12, per OA 03A, the 8's CA-16 just can't reach by going through the same TB-19 grommet hole. By running the CA-16 over the top of the TB-19, though, ignoring the lower left hand grommet hole, it reaches. We can't see any objection to this practice.

JNA, MN1

Dear JNA,

Neither can I, since that's the only way I know to install that CA-16. But one caution: Be sure to lead your CA-16 over and around the TB-19-1 so it doesn't interfere with the other connections, and so you lead it up to the CD-MECH terminals from the same end as the grommet hole.

This way its six conductors line up neatly with the block's terminals.

*B. Amadebutt*

## A round file?

Dear B. Butt,

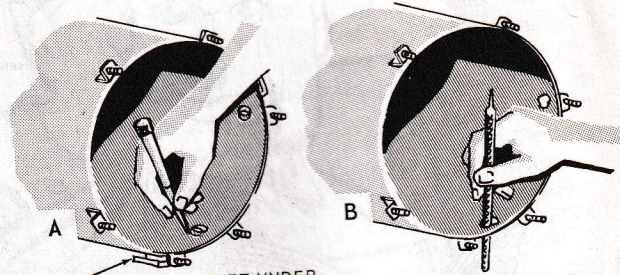
In assembling Drill 36-1s the two holes in the side of the can for the SR-6 repeatedly (3 out of 5) fail to line up with the holes in the cradle bracket welded in the mine case. We enlarged the holes with a rat-tail rather than reject, but we thought you should know.

SFT, MN2

Dear SFT,

Glad you did. Your solution is OK as long as you don't ream so much that the attachment is weakened. If this

mis-match continues to happen with such regularity, though, it would probably be a good idea to trial-fit the cans by slipping their tabs over the six studs on the M-9's compartment cover for a look-see before securing. If the holes line up, go ahead like in par 27 on page 26 of



CRADLE BRACKET UNDER

A - With SR-6 can fitted over studs of Firing Mech Compartment Cover mark offset to indicate where holes should be opened to match securing holes in cradle bracket. B - Remove from mine case and open holes with rat-tail file as marked.

OP 1684. If not, mark with scribe or crayon just where to file.

This will keep hole enlargement to a minimum, and save wear and tear on filer and file.

*B. Amadebutt*

## Too big for its seat

Dear Chief:

The 5/16-inch steel washer 43-W-7921-50 called out for use in the Signal Mark 25 Mod 1 has an outside diameter too big for its seat in the signal's tube. Something should be done.

AST, MN2

Dear AST,

Something has. Stock No. 5310-167-0820 has been assigned to Washer, flat, round, steel, cad-plate, which fits that seat neat! If installing these signals in Mark 15 floats is a big part of your job, probably you should order yourself a gross or so. Until you do you'll probably have to use a file when the washers that come with your gear won't fit.

*B. Amadebutt*

## Use those shorties

Dear Barnacles:

The CA-94s in our stock all measure 26 inches while DWG 1274701 REV C calls for a

cable 31 inches long. These shorter cables are long enough to do their job on the Mine Mark 27 Mod 2, OA 02, so OK to use?

JOC

Dear JOC,

Sure. Longer ones (newer procurement) are easier to use, but no better.

*B. Arnacle*

### Stars first, nuts last

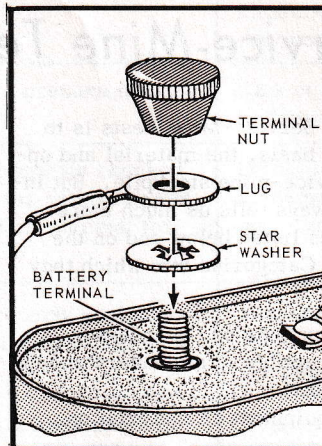
Dear B. Arnacle:

Believe you should call attention to the habit of placing star washers on top of a battery-cable lug when hooking up. With this setup any shock, vibration, or other movement tends to loosen the terminal nuts, whereas with the star washers under the cable's lugs the entire assembly is locked together and stays that way.

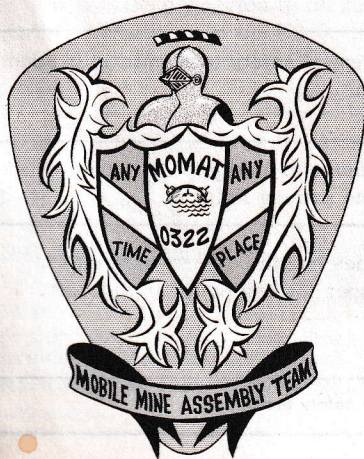
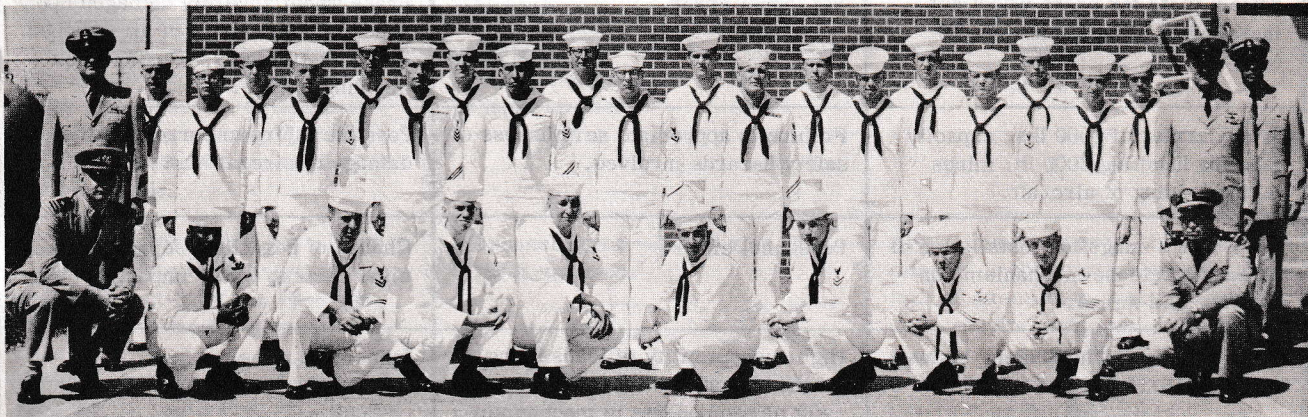
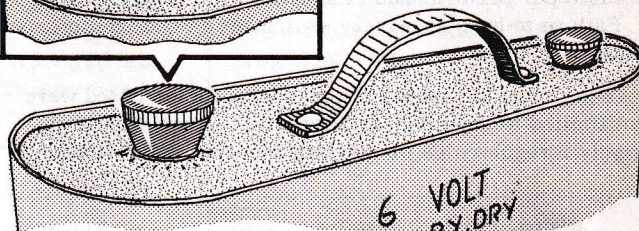
PSW, MN2

Dear PSW,

Brother Gotshall of MOMAT 0302 also called this slip to our attention, noting that instructions in mine pubs vary on the placement of starwashers, or else neglect to mention it altogether. Until they do, accept the location of the starwasher between lug and battery terminal shown here as the one right way to connect cables to batteries.



*B. Arnacle*



◀ Pictured at the left is the official approved unit insignia of this team. It is the winning design selected by popular vote of the unit from a field of fifteen entries. It was designed by Mineman L. D. Moir whom you will find in the first row of the group photo.

▲ Above is a group photo of the original outfitting crew of MOMAT 0322 stationed at U. S. Naval Station, Charleston, S.C. Front row (kneeling), left to right, they are: LT H.E. Sprecher, OIC; E. Gillespie, MN2; P.W. Adams, MN2; L.D. Moir, MNSN; R.D. Laven, MN3; H.C. Spangler, Jr., SA; J.J. Nerino, MN2; M.E. Gambrell, MN2; W.J. Little, MN2; and ENS P.W. Hanks, Asst. OIC. Back row (standing): E.E. Sackfield, MNCS; A.T. Bellamy, Jr., MN2; R.A. Bates, MNSA; R.N. Shinabarger, MN3; R.W. Campbell, MN3; J.C. Harlan, MNSN; M.E. Snow, MN1; W.F. Hester, Jr., MNSN; W. Dove, MN2; D.P. Allgor, MN3; R. Collins, MN3; T.F. Sonderen, MNSN; R.W. Gray, Jr., MN2; J.G. Blyth, SA; A.J. Hume, MNSN; J.T. Allen, MNSN; H.R. Maddocks, MN3; M.L. Bryan, MN1; G.F. Cronin, MNSN; D.R. Coyle, MNSN; R.T. Craig, MNCS; A.R. Stewart, MNC. Not present for photo: W.G. Bean, MNCS; S.T. Carvajal, MN2; R.W. Volgmuth, MNSN; P.R. Owens, MNSN; and T.R. McAnally, SA.

# DISCREPANCY REPORT

## Fleet Service-Mine Tests — July '63 thru June '64

THE stated purpose of Fleet Service-Mine Tests is to determine, on a continuing basis, the material and operational reliability of the service-mine stockpile. But information they yield almost always tells us much more.

Thus the FSMT discrepancies listed below and on the pages that follow tell a story. Categories into which they fall appear to be these:

- ▶ Neglect in following OP instructions or Op orders.
- ▶ Instructions lacking, or susceptible to misunderstanding.
- ▶ Improper performance of tasks.
- ▶ Failure to have necessary equipment or material on hand.

In any case the causes of the discrepancies listed were not limited to the using-activity level. Some stem from supply irregularities or stocking failures, all of which

NMEF is working hard to correct. In others, correction can only be effected in the field.

Either way we think this report is worth studying. We all know that mine failures are caused by something being wrong with material or personnel error of one kind or another, and even that defective material is, to a large degree, the result of personnel errors somewhere along the line. Some of us have even seen mines go ahead and work with such mistakes built in, but none of us would agree that that's the way to win wars.

Errors can be caught at the drawing board, in the course of procurement, in the supply lines, and during assembly and final prep. And when all's said and done it's the mine representing the fewest errors which is most likely to work.

— Right?

DISCREPANCY	CAUSE	RESULT
Bottom plate for brake wheel not installed on Mine Anchor Mk 10 Mod 5.	Personnel error.	Brake wheel severely damaged upon shock of water entry of air dropped Mine Mk 10 Mod 9, causing mine mooring failure.
Bomb carrier of 1600 lbs. capacity used for handling 2000 lb. mines during loading of aircraft.	Failure to appreciate seriousness of safety hazards involved.	Possible injury to personnel or damage to aircraft and weapon.
Re-use of E-rings for installation of parachute release mechanisms on aircraft-laid mines.	Personnel error.	Chance of parachute separation from mine prior to water impact.
Battery leads pinched during installation of TB-19 in Mine Mk 49 Mod 0.	High susceptibility of leads being pinched because of physical arrangement of components in mechanism compartment during mine assembly.	Inoperable mine.
Arming wire safety locks not properly installed.	Personnel error.	Potential safety lock failure and dud mine. <sup>1</sup>
Arming wire safety locks improperly packaged.	Failure of stocking activity to comply with current packaging instructions	Damage to safety locks; could cause mine arming failure. <sup>1</sup>
Two mine shipments sent to wrong final preparation destinations.	Apparent haste of assembly activity in meeting scheduled delivery date because component shortages delayed mine assembly.	Mines had to be re-numbered for proper loading order in aircraft.

<sup>1</sup> - Note that current aircraft loading instructions call for use of safety collars instead of arming-wire safety locks.



**DISCREPANCY REPORT**

DISCREPANCY	CAUSE	RESULT
Battery for Mk 62 transmitter crushed during installation of instrument rack.	Personnel error.	Additional time and effort required to replace damaged battery. In some situations, replacement batteries may not be immediately available.
E-ring Applicators were not on hand for installation of mine flight gear.	Unit not equipped to prepare mines for planting.	Risk of flight gear failure increased by improper installation.
On/off switch screw missing from Mk 62 transmitters (pingers) upon arrival at the using activity.	Transmitters not properly checked at issuing activity for completeness during preparation of material for shipment.	Difficulty encountered locating replacement screws because of their odd size.
OP instructions for the assembly of parachute release mechanisms were found to be inadequate.	Instructions not properly evaluated prior to printing and distribution of OPs.	Personnel bewildered, and time wasted during preparation of mines for planting.
Arming solenoids were by-passed in hook-up of mine arming wires to aircraft.	BUWEPSINST 8551.2 authorized the use of keeper wire in FSMTS and drill mine plants and referenced T-Shooter 4-63 for proper installation procedures which were not followed.	Evaluation of the mine delivery system prevented.
Mines Mk 39 received at the final preparation activity with the screw holes for attaching the fairings filled with paint.	Failure of the assembly activity to comply with OP instructions for case preparation.	Extra work and time required to ready the mines for planting.
Mine Mk 36 Mod 1 (OA 22) - Lead T of CA-527 connected to terminal T of the SD section of the TB-8 vice the blank terminal between the CD and SD section.	Personnel error - CD-10 vice CD-12 hook-up used.	CD-12 B switch shorted.
Mine Mk 36 Mod 1 (OA 22) - Lead A of CA-527 connected to terminal A of the SD section of the TB-8 vice terminal A of the CD section.	Personnel error - CD-10 vice CD-12 hook-up used.	Although mine operability was not affected in this particular instance, lack of attention to assembly details often results in dud mines or wasted time correcting defects.
Mine Mk 36 Mod 1 (OA 22) - Lead S of CA-527 was connected to terminal S of the SD section of the TB-8 vice P terminal adjacent to the CD section.	Personnel error - CD-10 vice CD-12 hook-up used.	CD-12 C switch by-passed.
Three Mines Mk 27 Mod 3 - connector plug P-24 not connected to receptacle J-24.	Personnel error. <i>USS GILMORE AS16</i>	Complete failure of mines (vehicle and mine).
Small hole through case of Mine Mk 27 detected during post recovery mine analysis.	Burn through while welding pinger mounting ring to mine case.	Sea water leaked into mechanism compartment, causing mine actuation failure.
Arming wire broken off in clock starter during planting of an aircraft-laid mine.	Incorrect installation of arming wire.	Broken wire prevented operation of the short-time clock, causing a dud mine.

## DISCREPANCY REPORT

DISCREPANCY	CAUSE	RESULT
Excessive paint on mine case tail cover flanges.	Personnel error.	Poor seal of water-tight openings.
Untested mine components included with shipment of FSMT mines to final preparation activities.	Failure of issue activity to comply with instructions contained in mine finishing order.	Additional workload imposed upon final preparation unit. Possible that lack of test equipment and/or sufficient time may preclude proper testing of components.
Air dryers not installed in mine assemblies.	Personnel error.	Excessive moisture in mine cases, causing rust, corrosion, low insulation resistance, and reduced mine life expectancy.
OP test requirements omitted from FSMT check-off sheet.	Improperly prepared check-off sheet.	Tests which are necessary for determining the condition of the unit not performed.
No restrictions imposed on number of personnel allowed within close proximity of detonator installation operations.	Personnel error.	Violation of safety precautions. Unnecessary risk of injury to personnel.
Manual operational check of hand-wound clock delay and clock starter assembly not performed during preparation of mines for planting.	OP instructions not followed. Failure to use check-off sheets.	Important check points missed which could result in a faulty sub-assembly not being detected.
Lock washers not used under the nuts which secure the clock starter to the clock delay mechanism.	OP instructions not followed.	Possible loosening of clock delay and clock starter assembly, resulting in failure of the clock delay to start and an unarmed mine.
Incorrect requisitioning of Sterilizer Devices SD-4 Mod 1.	Misunderstanding of unit of issue. Item issued in kits of 10 and as individual sterilizers.	One hundred ninety (190) sterilizers were received instead of 19 units required.
Supply agency substituted flat washers with an outside diameter of 5/8-inch for 13/16-inch washers.	Washers of the size ordered apparently were not in stock.	Use of undersize flat washers during installation of clock starters and extender mechanisms caused the insulating washers to split upon application of the required 16-20 foot-pounds torque.
Zinc chromate primer removed from tail flanges during preparation of cases for mine assembly.	OP instructions for case preparation are not up-to-date on this procedure. Conflict between BUORD spdltr Ma7b-JOG:np of Jan 1958 and NAVORDINST 8500.10 of 9 July 1959.	Rusty and pitted gasket flange surfaces.
Calibration stickers were not present on mine test sets.	Failure to comply with BUWEPS INST 4355.5A.	Questionable test results.
Test set not grounded.	Personnel error.	Safety hazard. Operator could have received an electrical shock.

DISCREPANCY REPORT

DISCREPANCY	CAUSE	RESULT
Improper performance of mine operational test.	Personnel error.	Good change of inoperable mine being delivered for planting.
Assembly record sheets omitted from mines.	OP instructions not followed.	Provision for furnishing essential assembly information to personnel who subsequently check the mines negated.
Mine operational settings improperly made.	Personnel error.	Likelihood of mine actuating against target reduced.
MOMAT did not have proper equipment for handling mines at the final preparation site.	Personnel error.	Equipment improvised which made handling and movement of mines dangerous.
Spare mine components not included with mine shipment to final preparation activity.	Failure to comply with mine finishing order.	Logistics problem generated at a critical time in the operation when final pre-plant checks on the mines reveal faulty components.
Mine batteries with no remaining effective life stockpiled at the assembly activity.	Failure to maintain adequate stock control.	Mine readiness seriously impaired.
Conflict between the text and an illustration in OP 2129 on attaching the plummet cord.	Inadequate proofing of the publication prior to printing.	Unnecessary waste of manpower, confusion, and uncertainty as to the correct method.
Water entry holes in mooring safety devices plugged with paint which was detected during final preparation for planting.	Poor inspection procedure at the assembly activity.	Improper operation of the mine mooring system.
Clock Delay CD-14 Sterilizer switch jammed open.	Switch improperly cocked.	Break in detonator circuit - dud mine.
Search coil tube cover incorrectly installed.	Dirty and corroded threads presumably caused an indication of the required closure torque before it was actually attained.	Water leaked into the mine mechanism compartment and short circuited the firing battery - dud mine.
End of search coil core bent.	Rough handling.	Component useless for mine assembly.
Detonator installed in a mine with an ARMED clock delay mechanism.	Extreme case of carelessness. Complete disregard of safety precautions.	Detonator exploded when the mine was moved. Had this been an explosive-loaded mine, the results could have been disastrous.
Assembled mines stored in the open under a hot sun for five days prior to planting. <i>USS GILMORE</i>	Failure of personnel to comply with BUWEPSINST 8550.5, re: "Installation of batteries in mines for Fleet Service-Mine Tests."	Reduced life expectancy of mines after planting because of deteriorated batteries.
Cushions for mine components omitted from mines during assembly.	Cushions not in stock or personnel error.	Excessive effort and time required at the final preparation activity in procuring the cushions.

## DISCREPANCY REPORT

DISCREPANCY	CAUSE	RESULT
Voltage check not made at bleeder resistor terminals after connecting Cable Assembly CA-94 during preparation of Mine Mk 27 for planting.	Personnel error.	No indication of the back-up sterilization feature of the mine functioning or condition of the mine batteries.
Test performed on mine vehicle which was not prescribed by the OP.	Instructions in mine finishing order not adhered to.	Possible rejection of serviceable material.
Test plug assembly for use with Cable Assembly CA-137 to perform the alternate operational test on Mine Mk 27 was not available at the assembly activity.	Cost of simple test plug (approximately \$18) was considered too high, and jumpers were used as substitutes.	Inconvenience, non-use of prescribed equipment, and employment of substitute methods not aligned with OP instructions resulting in the possibility of error.
Handhole cover loose on afterbody section of Mine Mk 27.	Personnel error.	Water leakage into the afterbody, short circuits, additional weight, unbalanced mine, and failure of the vehicle to run its set course and distance.
AC-1 mechanisms tested for assembly of Mines Mk 18. This item no longer required for assembly of this mine.	Failure of cognizant publication agency to promulgate change to OP.	Wasted time and effort testing components not needed for mine assembly. <sup>2</sup>
Soluble washers were installed in Mines Mk 6 the day before planting while the minelayer was enroute to the mine field.	Instructions in OP 1853 (Vol. 1) First Revision do not thoroughly cover all considerations regarding the proper use and installation of soluble washers.	Possibility of chain countermining and safety hazard to the minelaying vessel.
Silicone lubricating compound not used between pinger diaphragm and case of FSMT mine.	Lubricating compound unavailable or personnel error.	Reduction in acoustic coupling between pinger diaphragm and mine case, and possible failure to locate mine for recovery because of weak signal.
Cavities in the nose section of inert-loaded mine cases.	Inadequate documentation of case loading procedures. (NMEF has corrected the deficiency.)	Cases of aircraft-laid mines damaged by shock of water impact.
Proper pinger (Transmitter, Sonar, Mk 62 Mod 0) battery clamps for Mine Mk 27 not shipped to the mine assembly activity.	Item not properly identified during preparation of mine instrumentation hardware for shipment.	Wasteful expenditure of manhours required to fabricate units locally.
Metal chippings from pinger mounting ring weld spatter not removed from mine mechanism compartments.	Personnel error.	Chance of metal particles lodging between electrical connections during mine handling and planting and causing short circuits.
Mine fire recorder switching device cutter not installed in mine.	Inadequate checks at the assembly activity.	Mine fire recorder served no purpose. Test data lost.

<sup>2</sup> - See Troubleshooter 3-63, page 13.

how to make:

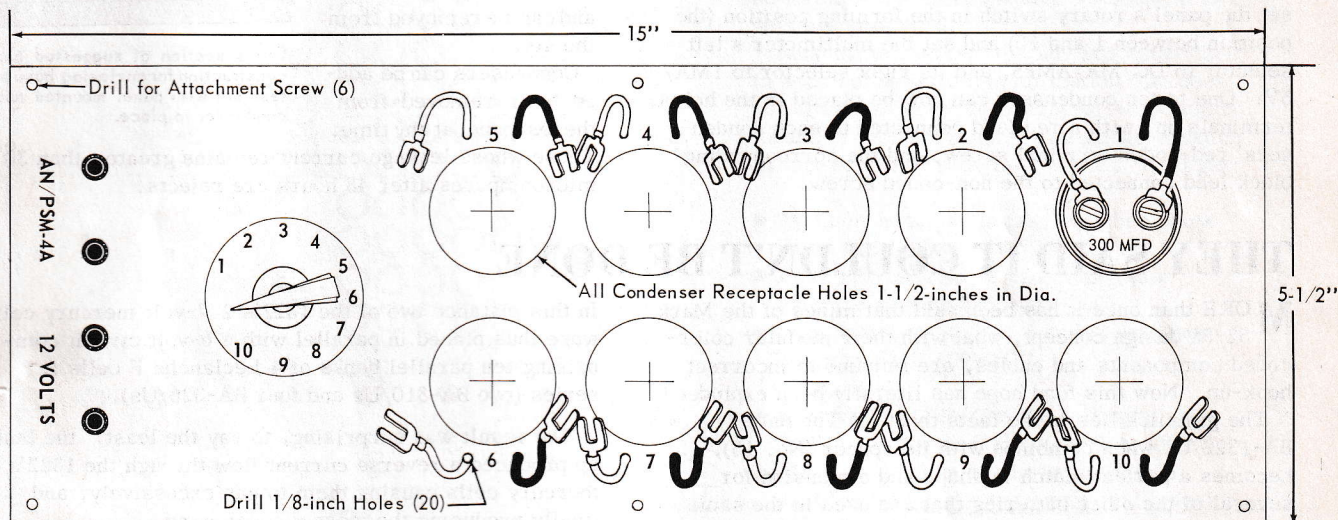
# TEST PANEL FOR 300-MIKE CONDENSERS

THE procedure laid down on page 28 of OP 1844 Rev 1 leaves the detection of inadequately formed 300-mfd electrolytic condensers used in Firing Mechanisms A-6/A-8 until such time as those mech's are tested. So says Mineman A. Hinman at Navy 66. So do you draw an A-6 or A-8 from stock just to test condensers, he asks? Hinman has a point. There's a test set for the 125-mike firing condensers, he says, so why not for the 300s?

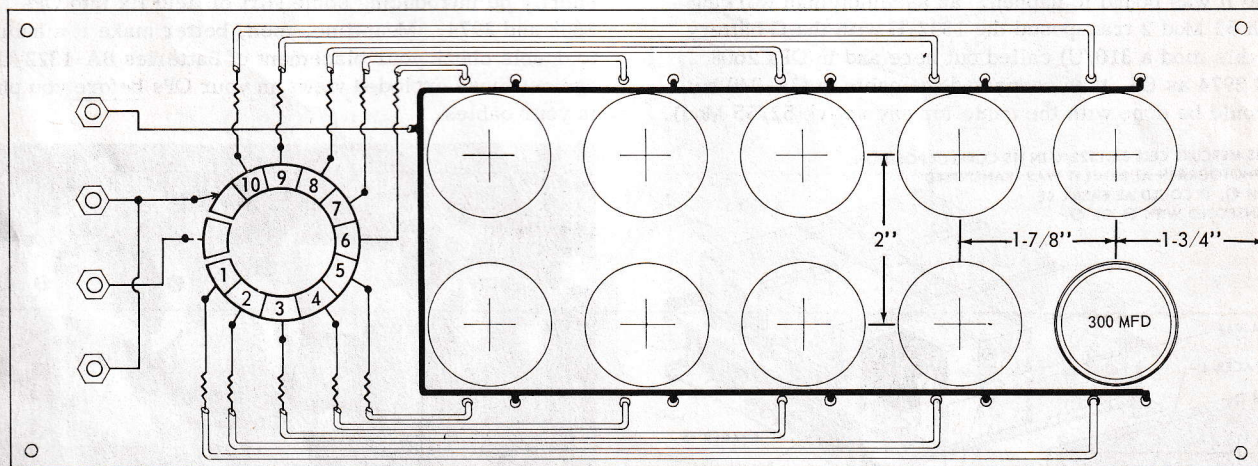
Volume 1 of OP 2567 Part 1 will soon contain a solution

to Hinman's problem, giving a testing circuit as well as a forming circuit for the 300-mfd condensers in a new Chapter 3 (A-6/A-8 mechs) now in preparation for early release via OP change. With this change, Troubleshooter Bulletin 005, which now specifies the use of OP 1844 Rev 1 in the testing of Firing Mechs A-6 and A-8 (vs OP 2567), will be cancelled.

Meantime, for the handy man around the shop, the test panel shown here is easy to make and does the job fine.



Layout for top of bench-engineered panel for forming and testing 300-mike condensers. Cut 5-1/2" x 15" piece from Bakelite or similar material and drill as indicated. Binding posts identified for attachment of batteries and multimeter. Condenser shown in No. 1 position.



Underside of panel shows wiring in place. Short leads are carried through 1/8" holes in panel and spade lugs attached. Conductors, lashed together, will be rigid enough to stay in place without fastening.

LEGEND: POSITIVE  NEGATIVE 

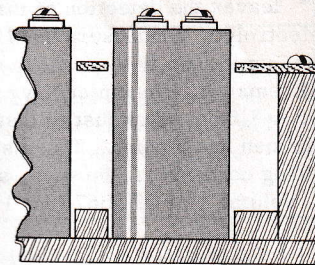
It is not intended as a tool for maintaining stocks of condensers in ready condition. That should be obvious. Its sole purpose is to test or form the condensers before you install them in A-6s or A-8s. After they've been installed you test them in the mechs, when you test the mechs, exactly as has always been done.

To make the panel you will need:

- ▶ Ten 10,000-ohm 1/2-watt resistors.
- ▶ One 11-position 2-circuit wafer switch.
- ▶ Two Batteries BA-249/U (for DC current source).
- ▶ A multimeter (AN/PSM-4A).
- ▶ 15 feet of hook-up wire (black - 4 ft., red - 11 ft.)
- ▶ 20 spade lugs.

To use this panel for forming condensers, connect the multimeter and the two BA-249/Us (in series) to their respective terminals on the panel, as shown here. Then set the panel's rotary switch in the forming position (the position between 1 and 10) and set the multimeter's left selector to DC/MA/AMPS, and its right selector to 1MA/5V. One to ten condensers can now be placed in the holes, terminals up, with a red lead connected to each condensers' red-coded terminal screw, and the corresponding black lead connected to the non-coded screw.

To determine when your condensers are formed you can turn the set's rotary switch through positions 1 to 10, in turn, thus checking condensers 1 to 10 in turn. At each position, however, you should wait about 30 seconds after turning to the desired position, then throw the multimeter's right-hand selector to 100MA/2.5V and read the meter, then return the selector to 1MA/5V. This will protect the meter. Such checks should be made after 30 minutes, 24 hours, and 48 hours forming time. Whenever a condenser's leakage current reads less than 30 microamperes at less than 90°F, it is formed and can be removed from the set.



Cross section of suggested box construction for enclosing base of test set with panel mounted and condenser in place.

Condensers can be added to or removed from the test panel at any time. Those whose leakage current remains greater than 30 microamperes after 48 hours are rejects.

## THEY SAID IT COULDN'T BE DONE

**M**ORE than once it has been said that mines of the Mark 52/55 design concept, what with their modular color-coded components and cables, are immune to incorrect hook-up. Now this fond hope has literally been exploded!

The gimmick lies in the facts that: 1) The Battery BA-1322/U, when combined with its spacer (No. 15), becomes a perfect match in shape and dimension for several of the other batteries that are used in the same battery bank (BA-310/U, BA-324/U, and BA-327/U); and 2) the cable receptacles of all of these battery types are identical in configuration, location, and orientation.

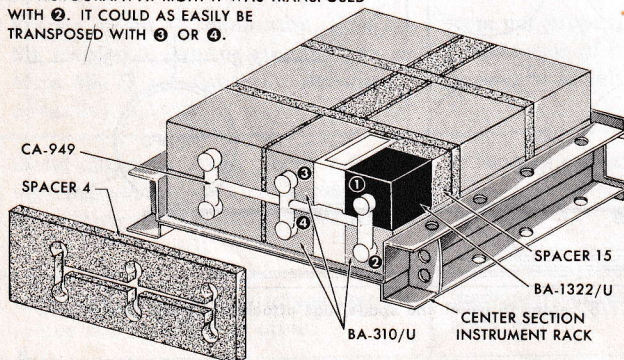
So it was bound to happen: an assemblyman working on a 52 Mod 2 transposed the 1322/U with the C battery (in this mod a 310/U) called out here and in OPs 2608 and 2974 as C3, then connected the cable (a CA-949 but it could be done with the cable for any active 52/55 Mod).

In this instance two of the 1322's 2.7-volt mercury cells were thus placed in parallel with a 6-volt circuit comprising ten parallel banks of 4 Leclanche F cells in series (two BA-310/Us and four BA-326/Us).

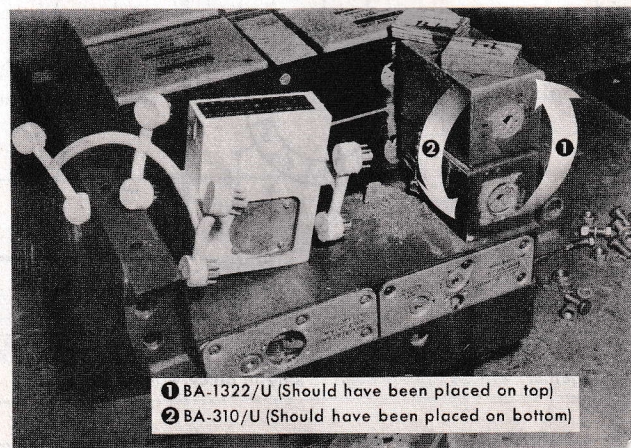
The result was surprising, to say the least: the lash-up produced a reverse current flow through the 1322's mercury cells causing them to gas excessively, and finally producing the mess you see here.

Once more, then, it turns out that the best laid plans of mice and men can go awry. In all probability we'll shortly be introducing some sort of field fix into OPs 2608 and 2974. Meantime, men, better make it a habit to double check your placement of Batteries BA-1322/U against those exploded views in your OPs before you plug in your cables.

① IS MERCURY CELL BA-1322/U IN ITS CORRECT POSITION. IN PHOTOGRAPH AT RIGHT IT WAS TRANSPOSED WITH ②. IT COULD AS EASILY BE TRANSPOSED WITH ③ OR ④.

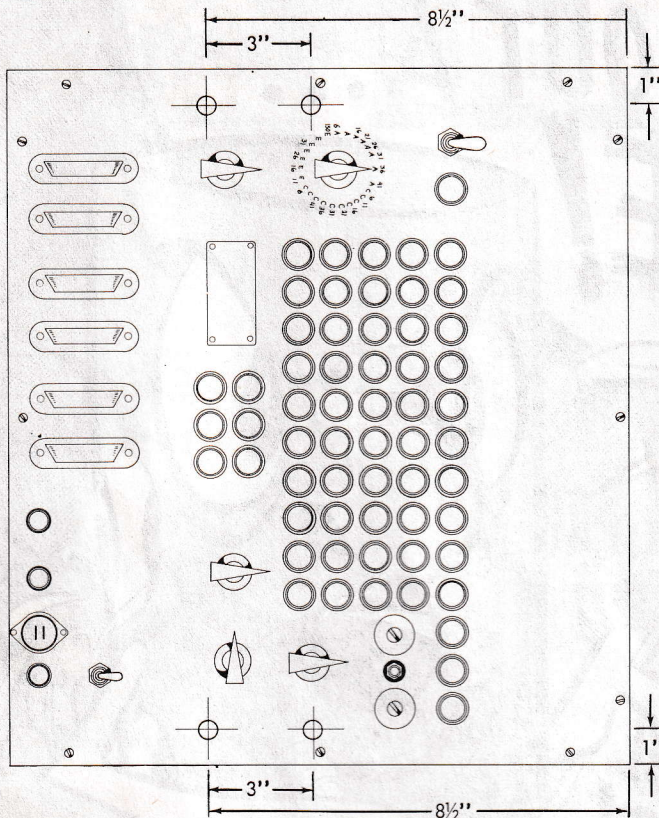


BATTERY ASSEMBLY, MK 52/55 MOD 2



① BA-1322/U (Should have been placed on top)  
② BA-310/U (Should have been placed on bottom)

# Do You do this Job Right?



FACE PLATE OF TEST SET MARK 269 MOD 0  
(Handle location the same for Mod 1)

## LIFT FOR TEST SET MK 269

Anybody who has tried to lift a test-set chassis out of its case without benefit of handles will understand why users have been protesting the omission of handles from the front panel of Test Set Mark 269 Mods 0 and 1. And we have agreed, with the result that new stocks will have handles when and if new sets are procured.

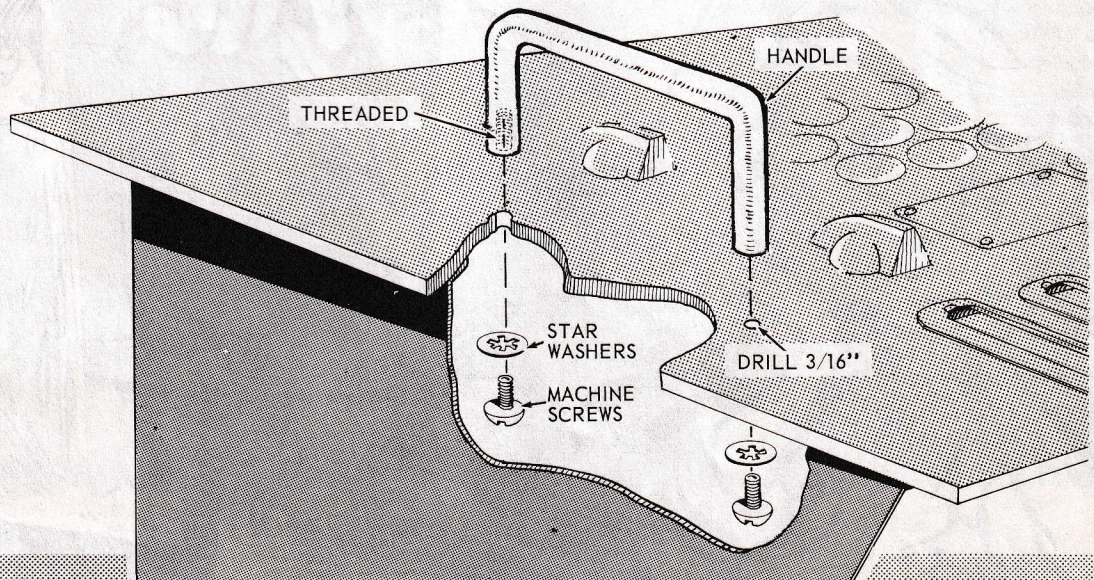
Meanwhile users of the 269 are authorized to accomplish a field modification that does not alter its operating characteristics, which means it does not require a mod change, which means no ordalt required. To fix, first get:

- ▶ Two bow handles, brass, polished black oxide finish, 5340-582-7158.
- ▶ Four 1/2-inch No. 8 cadmium-plate machine screws 5305-043-6695.
- ▶ Four inside-tooth No. 8 cadmium-plate washers 5310-559-0070.

### To install:

- ▶ Remove chassis from the test-set case (it'll be easier next time, with handles!).
- ▶ Mark off centers as shown, and drill 3/16" holes; Make sure your drill doesn't tear up any wiring.

*The Editor*



NOW ITS MY TURN  
TO MAKE OUT A...  
**RUDMINDE!**

