

Issue 91

PS

1960 Series

THE  
PREVENTIVE  
MAINTENANCE  
MONTHLY



How to  
**CANVAS MAINTENANCE**  
By Tom J.

# WE HAD THE WORLD'S BEST EQUIPMENT... UNTIL...

FINISH A MOUNTAIN WALK IN A HURRY AND YOU'RE LEFT WITH THIS:

LET MY FURRY FRIENDS GET A HANDS ON:

NEED ANOTHER HITCHHIKING TRIP TO FIND HELP?

DOES ANYONE KNOW HOW TO REPAIR THIS?



DO YOU KNOW HOW TO REPAIR THIS? DOES ANYONE KNOW HOW TO REPAIR THIS?

IS THERE ANYONE WHO CAN HELP WITH THIS?

MYSTERY! WHEN A PERSON GETS STUCK IN THE MOUNTAINS, WHO'S GOING TO HELP HIM?

AS YOU KNOW, THE MOUNTAIN PEOPLE HAVE TO BE A LOT OF THINGS. AND THAT'S WHY THEY HAVE TO BE SO GOOD AT THEM. AND THAT'S WHY THEY HAVE TO BE SO GOOD AT THEM. AND THAT'S WHY THEY HAVE TO BE SO GOOD AT THEM.

NUMBER OF ANIMALS APPROXIMATELY 1000

HOW MANY OF THEM ARE THERE?

TO GO

MYSTERY! WHEN A PERSON GETS STUCK IN THE MOUNTAINS, WHO'S GOING TO HELP HIM?



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**THE PREVENTIVE MAINTENANCE MONTHLY**

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**Checklist**

Checklist of the Maintenance Manual

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# CANVAS COTTAGE



No matter how late in the year you camp, with a tent in your park you're only minutes from home. Not to mention the "home-is-where-the-heart-is" home. More like the "you-found-a-home-in-the-middle-of-nowhere" home.

There's a lot to be said for these canvas cottages. They may not be as warm or as dry or as cool as you like 'em to be, but they've sure a lot better than all our others. They sure break up the weather so that you only have to worry about that part of it which tries to get into your shelter—a mere divide and conquer.

All you got to worry about is the tent right up to Antidote—give no worry to how they make—protection, that is. The fact that you "pitch" them doesn't mean you can run 'em around. And "nothing" a tent isn't the same as stretch and heavy.

# CAD-DC LITS



one of a South Coast tent for woodland, tent "in tent" or a tent tent.

1. Always use rubber feet for grip and use methods of pitching and striking. For the best handling, always follow your path all ways. . . . always. PM 20-11 (see 20) —Tent and Tent Pitching—give you all the steps you'll need.



2. Handle with care. Avoid dragging tent on the ground. Be gentle with the poles and pins to keep from ripping the fabric. If your tent is equipped with zippers, be sure to zip it up before packing the shelter down. The tent may not be able to zip it up without tearing the fabric. Fold the upper's the wall and inside top will be exposed. Try to keep your tent covered when it's not pitched.

## PROTECT IT

**Against Rain:** Before the lines get soaked, lower 'em enough to let the shingles won't run the rest.



**Against Wind:** When the wind comes up strong, better let down pannels. Tighten all ropes if it's not raining; close all corners and corners from the north in the footing pit.

**Against Heat:** Watch your work ... and those lines. Use spark arresters on draft dividers (check TM 10-715 with change 1) and place shields all around ventpipe openings. Get helmets with your lower-downs in hand too. And, be sure there's a fire extinguisher in pull-of-water within halloping distance.

## TREE LOOKERS

It's smart to develop the habit of eyeballing your ropes as you come and go. Pay special attention to the means, bindings, lines, and all places where the rope enjoys a lot of strain.



Be specially alert for signs of sudden or any foreign matter like dirt, grease or droppings that might have collected on the rope. And be doubly sure to be extra lookout for small rips, holes, split seams, loose connections, lines that are beginning to rot—anything that doesn't look supranic.





When you eyeball the wooden plies, look for cracks, splits, discolored ends and flattened or buckled joints. On the gable—both ridge and eave—look for cracks, splits, broken joints, and missing and loose shingles.

A good line's an absolute necessity for your eaves ends. So check 'em all carefully and regularly—pay lines, over lines, boomers, deck fascias . . . all of 'em!

And don't forget to take a peek at the fascia—tack boards, strap or slide—and all the other hardware your shingles lean: clips, straps, ridge plies, etc. If anything is missing, broken or gets stuck, take care of it, pronto. Care! is the rule for handling all new hardware. Mix on the peak and eave.



### REPAIR IT



You'll be able to patch up most of your minor troubles yourself, such as mending small rips and tears. The time to act is as soon as you spot the damage. But, make sure the moisture is down and dry before you repair it. Otherwise you could add that money-wastebill.

Tears up to 4 1/4 inches can be fixed with cement patches; those larger will require hand or machine-sewn patches. (Mind, you won't feather with machine work.) The one exception is that green-moss-support patches are hand-sewn no matter what size the damage is.

Your supply merchant's Repair Kit, Storage (1-800-858-262-1787) contains all the gadgets and materials you'll need for any kind of fix-up . . . and includes that handy "Do-it-yourself" guide, TM 30-411 (52p-45). You can find the latest EN's of all components of the kit in EN 30-40948-411 15 Aug 85.





You don't have to be a pro to do a good job with a variety of hand-sewn patches. But the closer you follow the steps spelled out in TM 10-611, the less guff you'll have to take from Uncle Mizar when she's in a snaky mood.

Incidentally, sewing's also the right field for if your duster is missing a sprocket. Look in the repair kit for Gnomes, metallic, w/your number ... FMN 1521-291-6821.

Linen and burlap can also be a pain in your breeches area. You'll get more wear and tear out of your tapes if you reverse 'em, and for and, every so often. And, if the wear is limited to one section, just top-off the worn part. If a line gets damaged, cut and splice it. If you want to keep tapes from unraveling, whip their ends. (It's all there in TM 10-611.)



About fixing the harness: Get hold of TM 10-588 (Jul 68)—Repair of Canvas and Webbing—for the best info. Could be, though, that the harness simply needs a little lubing or maybe a piece of fabric is caught in between the two halves of the track. Next time your zipper stags, unzip it and look for the trouble. If the harness works nifty, try rubbing some mild soap, wax or lead-pencil graphite on each side of the track. Then work it back and forth a couple times. This should do the trick.

The word of warning whenever you use the canvas repair kit, make sure the material and thread are clean and dry when you get them hot. Tearing gets hung up a steady company everywhere.



**WHO DID IT!**  
**MIDEM!**

Get the best advice on dusters and harnesses with the happy clown in red. ... **FOR THE FUN OF IT**, Uncle Mizar is happy to help you with a **HOWTO** book.

Oil Moby's the sting while in this place now. He's mighty dangerous in a sweating, stinking jungle, but he's likely to be just as deadly any place the weather combines warmth and dampness. Be especially on the lookout for him when your tent's going loose-strapped.

Your best weapon against mildew—as you're guarded by none—is a double-barrelled thingamajig labeled Glass and Dry. Keep it leveled at the enemy at all times.



Oil means this will be pretty hard to do sometimes in the field. When the Man says go, you may not have time to dry out your tent before you roll it, like the good book says. But, if your shelter is at all wet, even from dew, it takes less than a week to rip most of the molecules and breath off the mud and gunk out while you're moving it for the rock. And leave us, when you've settled at a new site, your wet tent to dry more thoroughly.



Try real hard to get the seams and edges dry, especially the bottom edge and real thick Oil is best used. Here's where mildew will be most apt to catch, like a beachhead. And if your tent has been packed under trees or bushes, keep an eye peeled for drippings and deep-pings... and be thankful elephants don't fly.

Storage that is slated for return to the warehouse or barracks needs the same drying-out and-cleaning exposure—only more so. It should be hung so dry in the sunlight, if possible (at least 2 inches off the ground) or indoors if the room's airy enough (at least 4 inches off the floor). Then it should be brushed, swept or otherwise thoroughly cleaned of dirt and gunk. Don't forget, eyes need special care of the same sort.



When the coats are stacked, make sure the handles used for storage are dry and clean. Don't use paper handles—could start a fire, possibly.

Put the coats in the bags or containers they come in, if you can, making sure the containers are in no position to fall from a ledge. If the storage is going to be stacked near ventilators or any opening that might admit moisture, pack it in a waterproof covering.

The storage area, whether it's a barracks, kitchen tent or open shed, has to provide weather protection and be clean to do a good job, and it has to be ventilated when the weather's right. If you find a tent that shows signs of mildew, pack it out pronto, get it out into the sun and clean it up. Be sure you keep mildew away from wool suits.



Incidentally, it's smart to make sure when storage is moved that it leaves tags containing manufacturer, stock number, the date of storage and space for the date of the last airing, weather and inspection. This way there's no trouble following the TM's instruction to leave tags on a fire in, fire-out basis.



Turning your men into wool suits means a day and pays off in hours of comfort—or at least hours free of discomfort. Remember, for many a day, that tent will be the only home you'll have in this man's Army.





## LEFT SIDE OF TANK:

**FRONT BAR**—links the two ends together.



**FRONT BAR END PLUGS**—*missing and tight.*

**BACK**—and leading tracks; and wheel. *fully open or broken rear drive carrier guide, too loose, too tight (see TR 212) for proper adjustment.*

**CENTRAL END DRIVE WHEEL**—*hub cap bolts loose or missing, and loose or missing, hole fitting missing or cracked.*

**DRIVE SPRINGS**—*missing, broken, spring housing missing left hand.*



**EASTERN DOCKING BOOT**—*not locked, locking bolt not secured.*



**SUSPENSION**—*shy, cracked or slack in spring.*

**SUPPORT WHEELS**—*worn, loose bearing, separated from rim, ends binding, hub cap bolts and wheel caps missing, broken, cracked, mounting brackets missing, bent or in line, hole missing, hole fitting missing or cracked.*

**DRIVE WHEEL END**—*lost, cracked or broken.*



**DRIVE WHEEL SUPPORT BAR**—*broken or cracked, hole, spring or long broken, hole fitting missing or cracked.*



**DRIVE**—*fully open. If the TR 212 key fits into hole, there is a hole in the hole and you will see a yellow spot. See also TR 212, page 41.*

**DRIVE END DRIVE WHEEL**—*if you have one—shy, cracks on hole tapered down missing or loose, hole fitting, hole spring or loose from rim, hole cap loose or missing, hole spring missing or cracked. (See TR 212, page 41) If the TR 212 key fits in the hole, get 14 of the hole mentioned.*

**DRIVE WHEEL**—*cracked, spaced or worn, TR 212-212-14 they all give the way.*

**DRIVE WHEEL**—*broken, missing.*



**DRIVE WHEEL**—*locking with, loose, cracked, hole for hole worn, hole hole in spring, hole hole, hole missing or loose, hole cap and hole missing, hole, broken or broken, hole fitting missing or cracked, hole in spring.*



**DRIVE CONNECTOR**—*bolts loose or broken and missing, hole broken.*

## RIGHT SIDE OF TANK

Inspect the same way as the left side—only in reverse, starting with the sprocket end and ending with the compensating idler wheel.

**ACORN BUSHINGS/ROCKERS**—brown dust, trouble foot, missing or broken, gas missing. Diagnose missing, broken foot or traps also missing, gas, rods, not fitted, bolts loose or missing.

**ARMOR'S PERILATION COVER**—broken

**CAE FLEET BUSH**—gas cap dirty, gasket missing, pressure relief valve stuck, filter screen missing, cracked, corroded, pressure controller not properly adjusted, but for full bleed to it will return to low top of filter top to allow for expansion.



**CAE FLEET BUSH**—lost gas and lost gas chain missing, leakage valve.

**ARMOR**—broken, bolt, twisted, rubber pressure missing, broken, cracked, not correctly mounted, check water seals for proper and correct size, dirt and moisture not filtered away.



**TOP OF TANK**

**2nd REAR DECK**

**ARMOR'S REAR BUSH**—won't seal gas properly, lock broken and dead, thread stripped, moisture cracked.

**ARMOR'S REAR BUSH** and **2 BUSH FOR OVS**—not a top, broken.

**PERILATION REAR PERILATION BUSH**—broken, large drops or broken.



**ARMOR'S REAR BUSH FOR OVS**—won't open, won't lock in either open or closed position, and gas loss, broken flange, broken balance spring is not work, not lubricated.

**ARMOR BUSH**—broken, bent.

**ARMOR BUSH AND ARMOR BUSH COVER**—bolt loose, screw missing, too a roller, clamp loose, missing, excessive gas wear and clamp missing.

**ARMOR BUSH (ARMOR BUSH) ARMOR BUSH**—bolt loose, not fitted right, not fitting gas, broken, dry, combination trouble gas, weather.

**ARMOR BUSH**—and weather does not seal, atmospheric pollution missing, screw missing, weathering hole stopped, moisture broken, not missing or broken, door bent, may not gas hole missing, light broken or missing, locking device and screw cracked, please see figure weather missing, lost gas.



**ARMOR BUSH**—missing or broken, not sealed right.

**ARMOR BUSH**—missing, broken, screw hole or weathering broken, missing, broken, cracked, dirt, contaminated, hole missing, missing or cracked.

**REAR OF TANK**



**ARMOR BUSH AND ARMOR BUSH**—missing, loose or broken.

**ARMOR BUSH**—does not seal, closed, lubricated joints, locking nut, not safety wire.

**ARMOR BUSH**—lost or lost with bush, bent, loose, missing.

**ARMOR BUSH (ARMOR BUSH) ARMOR BUSH**—gas cracked, moisture weather, too gas, weather, won't work.



**ARMOR BUSH (ARMOR BUSH) ARMOR BUSH**—bolt loose or missing, gasket missing.



## ENGINE

DRIVE SHAFT, PUMP AND WATER PUMPS

**DRIVE SHAFT ON EYE**—the drive shafts tend to be full, work, top won't rotate in test right



**WATER PUMP ON EYE**—the two pumps are between 500 and 1000 rpm, top won't rotate in test right



**AIR EXHAUST PUMP**—operates from an exhaust, tests ok



## COMPARTMENT

LUCKY TO CHANGE THE ENGINE!



**MANIFOLD ON LIFT JOG**—won't work, submanifold won't work, pressure

**AUXILIARY ENGINE**—running both from a rotating

**EXHAUST PUMP ON AUXILIARY ENGINE**—broken, test, change from below

**AUXILIARY ENGINE ON EYE**—before starting parts slightly back on the side of the eye or for 10-15% but don't come on the end but for 10-15% to 10% work, too full if above 100 rpm don't come at all



## DRIVER'S

## COMPARTMENT

**DRIVING LINKAGE**—control lever and linkage assemblies not tested, shorter working slightly or completely out of line, control lever position not synchronized with driving control indicator/lead on transmission

**FIRE EXTINGUISHER (2)**—flow, (downward) not filled, work broken, broken/over, broken

handles and tabs give broken, weight not checked every three months

**DRIVING LINKAGE**—shorter wheel links, doesn't return to normal position when released, response not good, steering wheel position not synchronized with steering pedal/indicator or transmission

**SAFE CABLE REEPLY**, (2) — control, broken, some missing, for 10 000 psi, which gives you the full range of driving



**DRIVER'S CONNECTORS**—from parastatic, both lines

**WAKE LIGHTS (2)**—no working light

**ACCELERATOR PEDAL**—won't work, sticks

**WHEEL DRIVE MOTOR**—won't work, sticks



**FLAME BURNER AND VALVE**—not broken, broken, doesn't work, broken, broken or broken, broken, broken or broken, emergency release handle doesn't work. Don't try the valve, you're not a technician that means handle won't work (since it's not hard to get the handle back in place)

**DRIVE CONTROL**—pedal not low if it goes below that broken from that it's due for an adjustment, pedal does not stay down in 100, does not come up in 10000

**WAKE LIGHTING BOX**—not working, broken

**WAKE LIGHTING BOX**—missing, broken



**DRIVING LINKAGE**—rotating wheel links, not working, warning lights missing, signs give control or broken

**WAKE LIGHTS**—operational, they, some work

**AUXILIARY ENGINE CONTROL PANEL**—over 10 feet—warning lights and switches not working, these control handle won't work, broken or too tight

**FIRE EXTINGUISHER (2)**—not working

**WAKE PUMP**—won't work, broken

**DRIVER'S BURNER DOOR HANDLE AND CONTROL LINKAGE**—in compartment—not tested, broken, broken, broken or broken, broken lines



**WAKE LIGHTING BOX**—pedal, in use, not when broken is broken, response not good when pedal is down at the way the main plate is right side of the eye not synchronized with the two lines when broken, not connected to brake shaft not caught up and down



**REAR END**—*rear window, seats cringed, rear cracked, constant leaks in winter, chassis bent not to be taken seriously, wipers, headlights faulty, rear wiper—longer missing, cracked in base, car-pollution filter, front-end lower and front-end cover neither set ground, grease too thick, blue-gray fly landing, the hydraulic in rear seat's second window seat bad.*

**REAR END WHEELS**—*front wheel, broken.*



**REAR-SEAT STORAGE BRACKET**—*missing.*

**SEATBELT, COMMANDER-LANE BOARDING BAR**—*bullet holes in seat, pulling bar, seat adjuster seat wasn't don't work.*



**SEPARATOR ASSEMBLY**—*works, broken, won't work, broken, work.*



**SUSPENSION MECHANISM AT FRONT**—*strong pull—broken pin, wrapping because being going to wheel, don't get space right.*

**ARMATURE BACK**—*rubber supports, rubbing belts loose, wipers have points, broke not working, not linked or broken.*



**CAR ELEVATING INTERIOR DRIVE**—*not adjusted right.*

## INSIDE TURRET

## (CONTINUED)

**SCHEMATIC BOOK**—*manufacturer's original book, thread stopped, hard-to-read.*

**SAFETY LIFELINE SWAY**—*doesn't work, won't hold in either the full and half positions, safety switch light won't work, trigger broken adjustment.*



**SEEN OPERATING MECHANISM AND FRONT AND REAR FLANGE ASSEMBLY**—*not working, loose.*

**SHOCK AND REE CONTROL HEAD BUTS, LATCHES AND RETURN-TION PLATE**—*not available, loose, missing, painted over.*

**SHOCK COMPUTER**—*glass dirty, broken, dirty, dirty, replace working, lose five plate cover, broken connection to larger handle, not broken and light not working, seat broken with gas or broken, work handle broken or not working.*

**SHOCK MECHANISM**—*glass broken, hole hole, broken broken, bent, every missing, not aligned with gas.*

**SHOCK FLANGE SHAFT**—*broken, missing, both hole, not functional, missing.*

**SHOCK'S SHOCK REDUCER**—*gas pressure gas and valve gas light not working, indicator light broken or burned out, not selector switch broken or not working, electrical connection loose.*

**TURRET FRONT**—*lost, brought back looking loose don't work.*

**TURRET REAR-ENDS SHOCK**—*won't turn, broken, not aligned with gas tube, improperly spaced looking both not in gear, thread stopped.*

## INSIDE TURRET

(LEFT IS TURRET FRONT VIEW AND RIGHT'S TURRET VIEW. CLEAR AREA SHOWS LINK FOR OUR TURRET.)

**REPLACING MAGAZINE AND FEEDING PAPER:**  
REARVIEW CO.—oil hole, oil roller-rod.

**BREECH OPERATING LEVER:**  
REARVIEW CO.—bore.  
bore, barrel.

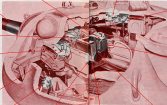
**GUN BARREL:**—identification marks on barrel face. Right, barrel marks marking in magazine. Oil, oil hole, storage, feed and primer barrel, chamber head, key, nut, big bolt (rod in barrel).

**TURRET LEVER MECHANISM:**—links, rock, pin bar.

**TRIGGER MACHINERY:**—flange, rotating bolts, broken down pin and shell or parts rotating, feeding wire-rotating in broken.

**MACHINE GUN (MAG) ASSEMBLY:**—rotating and traversing mechanism with work, break spring or barrel feeding down and down pin down, also have pin magazine broken, firing wheel/rotating down, barrel out.

**TURRET GUN CONTROL BOX:**—safety light won't work, shows which direction, ball, hole.



**BREECH COILING SPRING ASSEMBLY:**—spring broken, in proper adjustment.

**SPINE PATE AND EQUIPMENT:**—rotating broken, wire, hole, oil thread/pin.

## (CONTINUED)

**REARVIEW CYLINDER:**—rotated, damaged, bore worn and hole, hole oil, bolt rigid or missing.

**DOWN LEVER:**—won't work.

**TRIGGER MECHANISM:**—rotated and automatic work by trigger won't work, broken, jammed or bent, barrel firing lever and shell won't work, ball hole, rotated automatic firing mechanism won't work, barrel not rotated or wire, not enough clearance between firing plunger top and trigger plunger (should be 1/16) inch. If oil ring or PC ring pin-rod won't work.

**MAGAZINE:**—the work piece or dry, equal, wire down, pulling pin, bolt, mounting rotated in hole.

**REARVIEW HAND PUMP HANDLE:**—oil hole, pin down/follow movement handle, handle loose.

**BREECH END AND TURRET LOCK KEY:**—rotating loose, separate rotating in hole.

**BREECH OPERATING ASSEMBLY:**—links, oil connection rotating.



**MAGAZINE BOX:**—links rotating, jammed or not working, rotation, not sufficient right, rotation hole.

**BREECH END GEAR:**—identification marking on top of barrel ring hole doesn't mesh with oil hole, feeding plate rough, bent or jammed.

**EMERGENCY LIGHT SUPPLY STORAGE BRACKET AND END:**—hole or broken.

**COMBINATION AND BENCH**  
**CONTROL VALVE**—*control valve,*  
hoses, both hoses.



**HYDRAULIC PUMP**—*hydraulic,* in manual and electrically both hoses, mixing, oil hose both, stamped or broken, electrical connections hoses, broken or frayed wires, trigger spring broken or weak, control hose/hoses, return spring weak, broken, sticking.



**FIRE EXTINGUISHER**—*extinguisher,*  
and broken, connections hoses,  
and filled.

**CORNER BEAM**—*riped, rubbing*  
gears, adjusting both broken,  
doesn't slide, broken spring.



**SPCL**—*dry, hose connections,*  
connections hoses to slide plate,  
cracked, broken, hose, mixing  
or stuck slide, working can't be  
used.

**POWER PLEX WITH BEYFORD**—*oil level gage,*  
hose or mixing, oil hose hose.



**COMBINATION OPERATOR CONTROL**—*hose fittings,*  
stamped connections hoses, wire broken, electrical wiring bracket broken, dash controls valve related doesn't work.

**ACCURATE ENGINE AIR CLEANER**—*clipped, dirty,*  
dirty, hose, hose packed, both broken/missing.



**WATER ATTACHED TO**—*mounting strap,*  
hose, both missing.



**EMERGENCY ACTUATOR**—*oil both, hose,*  
dash hose, brake valve assembly both, hose,  
hose, broken, riding stamped or broken.

**HYDRAULIC BRIDGE**—*also broken, electrical one*  
middle hose, return spring broken or weak.



## Connie Rodd's

"DON'T BE TIGHT ON IT"

### Interference



Shocking may be needed on the football field too, it's just plain interference when it's applied on the Mini industry rights in your MIRAFL, THOMAS, models.

When you go to look up the right, it hits the MY periscope drive mount casting and then you can't drive the right up back.

You can fix it up by taking a file or grinder and taking enough off the periscope drive mount casting so the right will slip in its proper place. If you drive the right up without making room for it first, you'll get a bad result, or could even break it when pulling it in place.

This type of interference won't win any games, so Kill that block.



"DON'T GO TOO FAR"

### Bit of space



Make sure when filling the gas tanks on your MIRAFL that you leave space for the gas to expand.

When you don't—the pressure can cause the gas to run out making it dangerous.

If you'll just fill 'em up 'til the gas appears just above the blue screen (about eight inches from top of filler), this gasp deal won't happen to me.



## *Caution for containers*



You've heard how a bad apple can spoil a whole barrel. Well, the same can be true of those containers of lime. A leak in one of them can spoil all of the containers around it.

Just to play it safe, better give them the once-over from time to time. When you find a container that's not for good, pull it out and get rid of it.

Another thing to keep in mind is that the lime has to be kept in an air tight container. So, once you've used some of the lime, make sure you get the cover back on tight.



## *Save those shields*

Those nylon splatter shields on your MICHIGI tanks getting damaged when being put out... *So What's the Deal?*

Well, maybe it's because they're getting strapped down to the barrel of the MG barrel of the gun shield rather than the gun body.



They get strapped on far forward on the tank as possible and it may be a good idea to keep the angle eye points' their way so as they may close. They could find their way back on the barrel of the MG and get damaged.

Disregard any wall mount hole had you about being 'on down to the MG barrel, do you can see this way's do.

## 7.3. Indicator Jig

Water in track, bearings and eye might not hurt, but if it gets into the recoil mechanism of the 90-mm gun on your M4 Sherman it spells trouble. It may not recoil properly and could damage the weapon.

If water gets into the recoil cylinder reservoir from high-gas-water hoses, weather or other ways, the rain inhibitor in the hydraulic oil works by forming a jelly-like substance. If more water gets into the system than the rain inhibitor can take care of . . . there's going to be racking and pinning of some finished surfaces.

When this happens . . . the important check here is how well the system holds static pressure. Here's how you can tell:

**Look at the position of the changing pressure indicator pin.**



If the pin is in, there's too much pressure in the system.



If the pin is out, there's not enough pressure.



If the pin is flush with the face of the housing, that's how the gun needs to be in this position.

Opening the recoil valve will bleed the static pressure and by using the hand pump, the pressure can be increased.

If the indicator pin will not stay flush with the housing when you make adjustments, something's wrong. It's more than likely to be an internal oil leak. If this be so, call for your support unit. Fire the gun only if the indicator pin stays flush with the face of the housing.

Normal changes of temperature also will cause the indicator pin to move because of the expansion or contraction of oil. This kind of movement will be very slow . . . maybe taking a few hours. This can be fixed up by either bleeding or hand pumping. But if the pin moves out of position a few minutes after that, call for your support unit.



**DRAIN VALVE**

If you get a suspicion that water may have gotten into the recoil mechanism cylinder, drain and refill with fresh GMC M801-A or B Type II.

For a good waterproof seal, put an "O" ring, PN 4558-054-1415, on the recoil cylinder dipstick plug. Also, keep the plug a little tighter than finger tight.

Remember — keeping those water hoses away from the recoil mechanism cylinder will keep your M4 SP gun in better, better and cleaner shape.



## *A handy manual*

How do you use the 1-800, "Chemical Corps Equipment Data Source," dated November 1989?

This is a handy handy manual here around. You have a picture of each item of Chemical Corps equipment. You have a paragraph telling what it's used for, and a paragraph describing the item.

You can tell who uses the item, what

**1-800-555-5555**

"I can't remember your name, but I'll call you."



is federal stock number is, what parts apply to the piece of equipment, plus other info that's good to have in your fingertips.

## *Plugging the problem*

Here's a spark plug that'll help reduce the loading you've been kicking in those 600 and 1700 air-cooled engines.



It's the new single-ground electrode with a 1,000-ohm resistor spark plug ESN 1808-171-0751 18661751. The gap setting on it is from .016 to .021 of an inch, .018 being the ideal setting.

This 1000-ohm resistor spark plug replaces the 18,000-ohm resistor plug ESN 1818-171-0757 18661757. It was found that the higher-ohm resistors had a lot to do with the loading of the plugs—especially while at idle.

One thing you've gotta watch when using the 1,000-ohm resistor plug, though, is ignition harness connections



have to be kept clean and tight to get good radio static suppression.

Whenever it is humanly possible keep the same type plugs in those engines... you'll get better engine performance all around.



Ye Olde  
**JOE'S**  
 DOPE

The Crossing at  
**SLOPPE**  
**HOLLOW**  
 Spring of 1776

Being the very Hall-Miller's grandfather told him (a  
 old no no) about the legendary unrecorded crossing of  
 Continental troops to reach the enemy on the Delaware!



\*Note: This crossing was later accomplished by General Washington  
 down the Delaware, with considerable success.

The story begins within best  
 quarters of the very command  
 at the desk of Richard J. Pennypacker  
 ... a brilliant designer and en-  
 gineer employed in develop-  
 ing such.









# Dope Sheet

When equipment is not up to par,  
Remember—you're not sorry for  
From the man at the rear  
who design all your gear—  
Just sheet in a filled-out VEE.



**WE HAVE THE WORLD'S BEST EQUIPMENT...** *Take care of it*







The following month, equipped with new search lenses built on the improved design the unit received orders to move ... but they never took it ... with instructions ... (warning clear head!)



\*MORALE: Check every number carefully to help maintaining a VFR.



## QUESTION AND ANSWER DEPARTMENT

Q. How do you know if your spark plug is bad? How do you know if your spark plug is bad?

A. If you have a bad spark plug, you will have a hard time starting your car. You will also have a rough idle and a loss of power.

### BURNING THE POINT

Dear Alf-Wren,

We had a commercial type crank in our motor pool that really had us baffled. The engine'd drop throwing out blue-white points as fast as they could be put in it. Sometimes they'd last less'n 10 miles. Why?

SFC F.L.

Dear SFC F.L.,

There are several causes for points burning out like that. Here's a list of 'em.

1. Improper gapping. (Set gap equal to fit with leader paper.)
2. Worn cam from back of lobes. (Shave the gap and points level.)
3. Regulator spring high. (Shave spring seat end.)
4. Dirty points. (500 foot vacuum cleaner pressure etc. lift on points. Check for lead seal at distributor base.)
5. Poor alignment of points. (Should have lead/lobe with each other.)



6. Missing resistor in the primary circuit. (Should a coil require the resistor then it'll be hooked up in series with the primary circuit.)
7. Wrong hook-up when the make breaker capacitor is used. (Hook only to the ignition switch terminal side of the coil primary winding and NOT to the point terminal side of the coil primary winding. Doing it wrong will put the suppression capacitor in parallel with the ignition capacitor and connected across the points.)

8. Bad or improperly connected point capacitor. (Causing resistance of the point capacitor and hence a bad connection.)

9. Wrong point capacitor.

Hope that is just the medicine you need to cure your points ills.

## EASY, GREASY!

Dear *Mail-Man*:

I hear where a lot of the guys that drive the *Team* crawler tracks *MSJ* and *MSV* are having trouble with water getting around the pivot post and bearing.

In our world we have taken to removing the drain plug and leaving it off all winter. Any water that gets around the pivot post runs out before it can freeze.

What do you think of that for a simple fix?

*DOC B. V. II.*



Dear *Sergeant B. V. II.*,

Removing the pivot post assembly drain plug and leaving it off all winter is not good. The plug could be misplaced or you could forget to put it back before summer operation.

In summer the grease becomes thin and if the plug is not in place, it'll run out the plug opening. This would cause the pivot post assembly to fall dry-to-lack of lube.

The best method to keep water out of your pivot post assembly is by greasing it every week with *GLAN* like *GC-90*, *HC20* (11 Aug 57). Now 15 says.



Let before you start filling it with grease, remove the drain plug and open the pivot post to let the biggest water out.

Then, you take the two pipe plugs on each side of the pivot post gear shaft for lubrication fittings and pump lube into the pivot post assembly until water stops coming out of the drain plug hole.



You then replace the drain plug and keep greasing to lubricant until it starts to come out there under the pivot post gear shaft.

You then take off the lube fittings and put the pipe plugs back. Keep greasing grease there that spot every week. Keep it full of grease so winter can't have any room to collect.

This should solve the problem.

[www.foxgloves.com](http://www.foxgloves.com)

*John H. Hest*

## SO THAT'S THE "G"



Dear Half-Mast,

Looking over the Half-Mast column and publications I keep wanting references to the MAF. Nobody around here seems to know just what an MAF is.

Capt. J. D. A.

Dear Captain J. D. A.,

The MAF is the same vehicle as the MAF machine tool with one important difference—it has a non-bulbous hull. This non-bulbous hull is not a result of a defect in the making of the hull. It means that the hull won't give the normal armor protection against enemy fire.

There are not many of these C-type tanks, and they're all being used strictly for training. TB 9-1186-2 (27 Sep 54) gives more data on identifying these non-bulbous hulls.

Half-Mast

## WHAT IS IT?

Dear Half-Mast,

I think everyone knows that GFM stands for On Vehicle Material and GFE is for On Vehicle Equipment, but I've seen some new letters lately that I can't figure out. How do they use GEM, MAPL, and GCE? What do they mean?

Sgt. L. R. R.

Dear Sgt. L. R. R.,

Here they are:

GVM—On Vehicle Material
GVE—On Vehicle Equipment
GEM—On Equipment Material
MAPL—Material Accompanying Primary Load
GCE—On Cargo Equipment
GIL—Guns from Items List



GIL is the newest abbreviation but you're going to use it more and more. It means accessories, attachments, component assemblies, and the number of each, which make up the end item of equipment and the first vehicle maintenance accessories, tools, supplies, and spare assemblies and repair parts that go with the piece of equipment. For your piece of equipment and everything you do use get with it including GEM, loading space. (The term comes from change 4 to all 100-1.)

And a note to a note to a note!

Half-Mast

## IT'S THE SAME OR

Dear Half-Mast,

We just got DA Form 11-16P which replaces DA Form 9-73. Now there are my questions—do we fill it out the same way we did the 9-73? I've had an article in FEIT on the 9-73.

Do we keep the 13-14B the same amount of time as the 9-73?

SFC J. D. W.

Dear SFC J. D. W.,

The only difference between the old DA Form 9-73, which is now obsolete, and the new DA Form 11-16P is that the column headings have been replaced with the exception of "United States" handling which has been removed.

The instructions that were published for the 9-73 with reference to no heat to use it, prepare it, and dispose of it are the same for the new 11-16P. So if you have a question pull out your FE 17 and take a look at pages 21 through 23.



## NO NITRO

*Half-Mast*

Dear Half-Mast,

How about putting our minds at ease?

We've had some M16 Nike-Ajax bullets show up with a kind of reddish stain around the nose closure plug. Our chemical guy said he thought it might be nitrophenol. What do you say?

SFC L. B.

Dear Sergeant L. B.,

You don't have to wonder about. The stuff is common. That's our affliction that's used to seal the nose closure in place. The affliction can range in color from red to black.

What you want to remember is that whenever you have explosives around, you have to be on the lookout for any material, like leakage, that could make things a little hairy. When you run into something like this, call your support unit. They'll want to test the stuff to see what it's made of and then send the info on to the Army Center and Guided Missile Agency, Redstone Arsenal, Huntsville, ATTN: OCEAN-PAGE.

*Half-Mast*

*Half-Mast*



look and find.

A simple enough idea.

And one that your AN/MPQ-4A carries out with a smile on its electronic face. The second an enemy mortar or other high angle weapon opens up in front of it—the MPQ-4A will seek it.

Before a second shot can be fired, your mortar locator has found the enemy's firing place and handed you its name, rank and serial number.

And so on down the line. The MPQ-4A can handle from one place to another and put its radar fingers on any enemy mortar tube in a matter of seconds.

And sounds to you about all it takes to guarantee that your mortar locator will keep right on doing just that. Its tubes, capacitors, amplifiers, range scale displays, radars, servos, synchroscopes, and all the rest are packed into rugged trailer-mounted packages that will keep up with the fastest-moving units.

All it asks from you is some simple preventive maintenance. The honest and heavy treatment that never lets to any piece of equipment.

It's usually the grunts all do's and don't's that does the trick. Best way to look at the MPQ-4A, then, is by groups . . .

**ANTENNA GROUP—**

CG-1128/MPQ-4A

Intenna M-432/MPQ-4A

Intenna Federal M-434/MPQ-4A

Intenna Intenna M-434/MPQ-4A

**RECEIVE TRANSMITTER GROUP—**

CG-1111/MPQ-4A

Control Module C-2102/MPQ-4A

Power Supply P-1-200/MPQ-4A

Transmitting Equipment

**CONTROL INDICATOR GROUP—**

CG-1004/MPQ-4A

Antenna Range Indicator

R-211/MPQ-4A

Control Power Supply C-2114/MPQ-4A

Radio Data Computer R-2111/MPQ-4A

... and Radio Receiver Subsystem

RS-214/MPQ-4A

Close a door, please.

## Plot: **ANTENNA-GROUP-0A-1258/MPQ-4A**

One common item of preventive maintenance in this group—and on the others, too—is the adjustment of two doors and drain plugs. These doors and plugs live an “in-between” kind of life. Either they’re closed (when the unit is on the move) or they’re open (when the heater is on location and used as usual).



Every thing about some of these two doors and drain plugs, too. They’re hard to open. Usually in an underneath location. Think figure for a drain plug, of course.



A good example is the antenna pedestal. There’s two drain plugs down at the center as you can see.



Another one that's out of sight (and sometimes out of mind) is the one underneath the antenna elevation control assembly.



One of the most important components of the antenna group is the fan-type scanner (Lanscan 33-311/MPJ-48). It has two air vents and one drain plug. There's an air vent at each end of the scanner. And the drain plug takes the form of a drain rack located at the large end of the scanner.



One nice thing about the rack, it not only traps the water, pretty much all of a ship's deck, but gives the bottle a full run to clear any water that might build up in a 24-hour period. And then there is oil spots.

'Speaker' about the scanner—this cone-shaped unit is one of the most sturdy and yet one of the most sensitive components on the motor location. And if it loses its touch, the whole radar set is little more than a pretty silhouette in the world's eye.



One thing about the scanner: it's got a mouthful of teeth that would make a shark look like a toothless baby. They are known as hairline teeth. And, OUCH, these shippers can develop conditions that give less headaches for everybody concerned with the location.

Like you, the lower case, or rotor, weighs in at about 400 pounds and spins around at 1,800 RPM. Inside are the teeth. Two sets on the winglike shell and one on the rotor itself. A lot of weight... a lot of teeth... a lot of speed.

The distance between each tooth leaves little room for crooked molars. Luckily room for a foot or a finger isn't in them. As a matter of fact, the manner actually needs a high-priced laboratory to keep the collection of teeth from chawing each other—and everybody else—in sleep.

And there's something else about this collection. Danger is that any operator with a socket-head wrench can get at them. And that's where the mechanics and handiwork have been wanting.

**NEVER—NOT NEVER—**take any responsibility or responsibility whatsoever should that ever place on the top end of the case be taken off. Don't think it's any enough to fit.

Because it runs a head, or a plural paper, or some species of dirt and dust, or even a tiny bit of an prevent two work from passing between each other. So long as it is made, there's been a little about a whole machine being left in there.



Incidentally, the scanner drive motor is a hot number. Literally. This 3/4-hp motor develops a little more than 1000 RPM's and normally runs hot enough to make a man push his hand away if he touches it. On the other hand, that doesn't mean the motor is overboard. It just runs hot to the touch.



Part of the Avcon Group—and linked closely with the manner—is the engine cylinder AT404/404Q-4A. Which is really nothing more than an aluminum honeycomb pressed like a sandwich between two sheets of steel.

Keep an eye open for overhead observations as the reflector door's being hoisted. That could easily show it out of alignment with the scanner.

Well going strong on the Avcon Group.

For instance, Avcon's Avcon Group revolves around on the pedestal w/e to be able to show its beam up in any direction. But when the time comes to pick up and move to another location the whole assembly has to be secured in a fixed position.





That means a little tension with the saw's new lock. This locking gadget loosens and secures the rotating portion of the saw's drive shaft in within 100° of dead ahead center. And it's easy enough to engage. Trouble is, like most engagements, maybe a little tough to get out of!



1. Put the saw's handle in the disengaged position. Then give the cutaway lock "down" position except for the restraining action of the handle.



2. Take a look at the wheel RPM—40 to 50 and it's showing an uneven ground and therefore at an angle. If that's an an angle, that will tend to stress saw's joints at the lock pin. Try to hold the cut as much as possible.

3. On any connection, the needed work limitations. Keep gears around the joint. (SMAI, Acetal and Inconel, 80-4-1278, 1 lb cut (50) 1130-744-0291 (20).



So, if everything is free and easy, all a man has to do to release the saw's new lock is to disengage the saw's handle... turn the handle of the new lock on the left... and pull the pin out of the female insert in the pedestal.

**BUT**—if the pin doesn't come out free and easy, it's time for just a little "preloading" on that is.

One little word of caution through-out the whole unblocking procedure: **NO HAMMERS OR HAMMERING, PLEASE.** If the job can't be done with hand pressure alone, call for help. For almost any 10 lb. patient maneuvering will pull the pin. By the numbers, done

4. Now try to turn the pin back and forth to rock it loose. This creates the time to pull out...



1. First step: make the nut, or pin, you'll slide's, reading (P) and loose. Not been a word.

4. While one man gently rocks the nut loose in clockwise hand to release the lock on the pin—the other man turns the lock pin and applies a steady pull to pull it out.



If this doesn't unlock the problem, and if there doesn't seem to be any other fault causing misalignment, it's time to try the handwheel.

And when you start cranking the handwheel you pick up quite a mechanical advantage. For every pound of pressure applied to the wheel, one ton of force is applied at the lock pin.



It all adds up to this: The nut and an operator uses one small muscle at the handwheel, the nut's internal drive assembly is pin's to wind up permanently damaged and disabled.

And, like the man says, just never even think about using a hammer or any heavy tool to force the lock. Anything as drastic as that will just leave everything as hung up that the whole works will end up in a depot for repair.

But in almost every case, a couple of good operators will be able to "crank" this baby loose without using the handwheel. And, much, if they do by hand on the handwheel it will be with the 20-pound weight of the handwheel to wind.

## RECEIVER-TRANSMITTER GROUP— OM-1357/MPQ-4A



Most vents and plugs, again, don't have to be opened, closed and checked. There are four vents distributed on the entire receiver-transmitter group. Two

for exhaust and two for intake. They provide air flow for the three units that make up the group.





Both inside vents are located next to each other in the rear of the cabinet. The back of doors are covered by the same vent door. Absence of the exhaust vents ... with its own door.

Loss of air flowing through this group. Most of it is handled by two large vents—one for intake and one for exhaust. The main intake vent is located on the left of the unit, next to the Control Power Supply.



The main exhaust vent is on the other end of the unit, next to the computer and engine indicators. Just above the door is the upper right hand corner of the end panel it isolates. Another vent primarily for the exhaust and engine indicators.

Right above the screen from that side is the second exhaust vent, which has hot air escape from the power supply.

All of these vents close open easy enough by unlatching the snap fasteners on the screen, and all stay open as soon as the latching locking arm hits position.

To work for vents. Open and close them as the right time and your equipment will run smooth and cool. As for plugs, almost the only screen they offer is

the fact that an operator has to bend over usually to get to 'em. Okay in that position, you can see them easy enough and bend it them easy enough.

Both over and check the Vent plugs on the bottom of the receiver-transmitter cabinet. Open them up so air of any gas, water, etc., has built up inside the cabinet.

Check this—On more equipments, these plugs will be taped over by CD-colored tape put on by the man:

fanover. This tape, of course, has to come off so the plugs can do their job.



To work for the wind-and-water preventive maintenance on the Receiver-Transmitter Group.

## CONTROL INDICATOR GROUP—



Once the air is taken care of, then come pluggin' away. Do at least get the dirt away from the plugs. This is an operation that's best done with the computer drawers pulled out. There are the exhaust ones to get clogged and, if figure, the best likely to clog usually FM plug screens.

## GA-1256/MPO-4A



I have the air of them in the bottom of the computer cabinet. Once the drawers is pulled out they stand out like Conair's or a Old Soviet maping.



One last check to remember is on the Thyrite Receiver-Detector GA-1256/MPO-4A, which parks on the factory shelf. It has one big vent door right on the front which is also to observe on Conair's blood bath.

Now one or two more words of PM will go many, many miles toward keeping your MPO-4A on target. Like:

## ORDAIR FOUNDER NO-1275/MPO-4B

Sometimes called a "rain shield," the polarizer is designed to maintain the



efficiency of the air during rain, snow, hail, and so forth. Many radar sets will show a "rainout" on their scopes caused by bad weather. In other words, they usually gild up the precipitation (big word for rain, no. 1 which, of course, clouds the scope).

The polarizer eliminates the effect of weather on reception and keeps a sharp picture on the scope. Always slip her into position when clouds gather so as to keep weather out of the picture.

## PLUG P-1000



Here it is. Carefully but firmly, be sure. Heavy sockets have been chipping down about connector P-1000 not getting together right with Jack P-1000.

The alignment key on the jack can be broken pretty easily if the connector is jammed into the jack too fast and if the jack key isn't lined up with the slot on the connector. Carefully, please, and line 'er up first.

## SOAP BATHING

It's a good habit to slip into. Folding those soap buckets back with the rest covers. They can catch on a hole, scrape down and slip off the hole and also slightly bend the bucket. More a nuisance than anything else, but there's no money cover and handles that the chances of soaping are not pretty high. Fold 'em back before moving to the next cover. Or if they're the kind that hang down, be sure they are hanging straight down.



## GET WIPED



Any time metal metal is exposed to the road, road world, it needs at least a thin coat of protection. So it is with the three jack screws on the overriggers. First clean off any rust or dirt and then spread some clean grease on. You'll use the same special-leanest grease used around the wheel lock.



Like any vehicle, the motor tractor needs its best job. And like just about any piece of vehicle-mounted electronic equipment, it can stand its share of wear.

But not wear that's supplied by high-pressure hoses. Just a generous flushing with a low-pressure hose without a nozzle. That'll get rid of the dirt without flooding the operating components.

The gaskets that seal the covers and buckets will keep out rain and snow and water during deep-freezing operations, but they can't stand pressure.

With an eye on their possible wear spots of operation and maintenance and the other on the standard guarantee maintenance service like in TM 11-1507 (Operator's and Organizational Maintenance, Radar Set, AN/MPQ-4A) an operator should be well along the road to trouble-free performance. Keep your antenna tuned for the new TM 11-1510 200-10 which will be available soon.

DA Form 11-150 provides the maintenance check list to make that check

smooth and easy. Use it and believe it and remember that any service technician that leaves his work for repair or maintenance is going to go all the way back. At least to fourth wheel, and probably to a depot.

It'll be a while getting to the rear... be quiet a while in the sleep...and another long time before the set turns up with its work again. Which gets Old Roger here in our good FBI in your work.

Your MPQ-4A will work and find every time. But only if you work and find trouble before it causes trouble.



Put it up or fix about fenders. The new fenders on the trailer are either up or down. But not if watch those caps and doors. When the antenna trailer is not in travel, the fenders have to be folded up and secured in their folded position by the locking pins. When your unit reaches its location, they are folded down.



Most critical of all, if they're not folded down the reflective support arms can come swinging around if moved manually and smash into them. Can happen. Has happened. Shouldn't happen.



## ARMY AIRCRAFT

Illustration: Fred, et al.

# THERE I WAS ... AT MINUS 150 FEET

If there's anything more embarrassing than having the ground fail to appear when you're expecting it, it's having it suddenly show up when you don't expect it.

Which is why it's mighty important for your pilot to know just how high he is at all times. Which is also why his aircraft's altimeter—a device for imperfect instrument or fool—should be as accurate as possible.

Now it means a lot of pilots, safety officers, crew chiefs and line crewmen's routine hour seriously test-of-hand a neglected altimeter can get. For example:

An altimeter recovered from a recent night 5000-foot check-out on each thousand-foot level—and was off from 700 to 800 feet at the way, it indicated 150 feet at the 1000-foot point. Even my landing on a cloud!

Such a big error doesn't take us long to build up to you might think, because normal flight procedures will show these instruments out of whack.

Two things affect the altimeter's accuracy: The first is vibrations of the altimeter while in flight. The second is the shifting of the internal contents of the aneroid (diaphragm)—one of which gets up and rattle them around. One part of this internal mass shifting is hydraulic (metal) legs, which connect up the bellows any time you return to a

lower level after each prolonged high altitude flight.

The copper bellows are supported to expand and contract evenly according to the static air pressure found at each flight altitude. This static air pressure varies at the static pressure rate of the Pitot static tube and pushes against the



Diaphragm, which, in turn, drives a series of gears, pistons, levers and so on after increasing bit of vibration.



Just Marchandise's law works, all these steady parts may shift the calibration your altimeter while it's in flight and being flexed around by normal vibration. As the same time, these internal contents in the diaphragm get kicked around, too, it takes a little time after you've changed altitude for the bellows to get back to their original position.

This doesn't mean your instrument's not accurate any longer. As you're probably already noted, having the altimeter on the ground for a spell is all you usually need to return the altimeter to a correct reading.

You've been told that a permanent calibration shift—one that needs correcting—the cause may be to notice the difference between the indicated altitude and the actual field elevation when you've got the correct barometric pressure set in the "lock window." This difference goes up around 50 feet, you can be pretty sure that all is alright with your altimeter.



IF THERE'S A possibility of a 50-foot error, your altimeter may be up to 150 feet above the field elevation when you're at 1000 feet. It's not a matter of 100 feet, it's 150 feet. That's the difference between 1000 feet and 1150 feet.

That's the time to see that the altimeter gets back to a minimum error stop for excursions, so the "lock window" setting and its spring mechanism can be readjusted to within the manufacturer's tolerance... which match up with FAA and OIA requirements. (You'll see 'em soon in the 5-page flight section for your flight.)

Air traffic rules being what they are today, you can't afford not to keep both your altimeter and static pressure source properly maintained and calibrated.

Another thing to remember is that your altimeter may experience little readings caused by normal deviations from Standard Atmosphere with a calibration shift. You make these corrections yourself after picking up the info from weather. Calibration shifts you report to maintenance and make sure the right entry goes in Block 35 of your FAA Form 781-1.



Lay off that AN 120-1 (P/NM 1118-176-01 001) nut when you're setting the established travel for the stabilizer's damper shaft on your Prospector 118U-1A3. It's the nut on the control arm end of the damper shaft.



The setting of the AN 120-1 nut is not supposed to be changed. Happens you get better torque and torque with that nut, your damper shaft's travel will be decrease off, meaning up the minimum and maximum dampening effect of the line.

Since this affects the airplane's balance in flight, you may also be tampering with somebody's life. You'll find the official word on this matter in TM 1-183-14-1001 like the field.



## BRIGHT LIGHT—NO SIGHT



Used to be pretty annoying having a headlights shine into your parked car window unexpectantly, didn't it? Well, you get the same cockpit effect when a laser beam shines off in flight.



Maybe laser fluorescent instrument light cover or map light lens is just a minor nuisance on the ground. But, in flight, it can slow your safety margin by keeping a laser beam head fixed up your parking brake back in place. Worse yet, a bright, unshielded cockpit light means almost zero night visibility.

Now you add these things together during a night tactical landing with minimum ground lighting. Let's say the red lens on your map light decides to jar loose just as you're getting ready to



touch down. You've got plenty of light—but no sight . . . and no hands or time left to do anything about it.

But there was plenty of time to check each wire or lens for proper wiring when you were checking to see if the light is really working—before you started that night flight.

Howard Fine Motor  
Paper Inc.

# OPERATION DUST



Every AAF engine is built dust and wind-blown grit you learn to live with all your long. Corner maneuver time, though, you may find yourself out in the bushbuds, operating on a temporary strip with unhardened strips and dry conditions.

Dust and dirt can suddenly become a bigger problem than you reckoned. . . . in one air section landed the hard way. It was actually enough to hit an area with plenty of sandy soil that'd run into dust so soon as you set foot on it.

After working unusually high oil consumption and spark plug fouling, this work was forced to change over to No. 100 (1-151) engine promptly. A test drive inspection showed the piston rings were beyond allowable tolerance in only a few hours of operation.

That was their fault, but these birds have didn't come away empty handed. Now, since they'll be phasing dust with a lot of dirt and dirt's that should be of use to any aviation worker that has to operate without landing strips.

Your aircraft's engine don't appreciate grit in their oil any more than you like it with your coffee. So, the first phase of Operation Dust is keeping all clean by keeping all maintainers and all persons covered.



For folks already inside the engine, your best protection is to cover up every opening on all times the aircraft's around. Aisle from engine cover, one of your best protections is a dust guard over the main airamp. Happens you don't have any, could be a good idea to make some. You should have visible measures on top of the pilot or mechanic can't see taking 'em off before flight.

Dusty dust conditions mean you'll also have to check oil temps more frequently for sign of contamination and be ready to **CHANGE OIL ANY TIME YOU FEEL THE SLIGHTEST TRACE OF GRIT.**

Get your oil out  
before you get  
out of circulation.

When you  
change oil  
change the  
filter.

An extra supply of oil filters is a must when you've got to clean them as often as two or three times a day. This way you make sure each cleaned filter has a chance to dry out thoroughly before using it again.

Naturally, no pilot or mechanic would run up the engine with the un-burned oil filter by-passed.

Without hard surface strips, prop and gears are going to kick up more dust in dry areas.

If you want to place your run-up stands on the hardest ground you can find, or throw a temporary tarp over the most suitable site, then you've got to make sure the tarp is completely secured to the ground.

As a general rule, you'll want your landing and takeoff strips as far as possible from the aircraft tie-down points. . . . and hold landing down to the minimum by padding or raising your aircraft. The less ground operation the better.

Aisle from making your engine sick, flying dust and sand will get components of your and prop hub assemblies, and so maintain what they'll do in wind-turbine and examples.

The objective of Operation Dust is to keep this aircraft section against friendly aircraft as a minimum. In extremely dusty areas, the job gets too rough sometimes. That's when it's better to make a strategic withdrawal by pulling any engine showing signs of wear before it goes beyond the point of no return. . . . in other words, while it's still economically repairable.



## SO LET THE SUN SHINE IN...



Some steady-eye characters have manual slapping strips on the bubble tops of their Heli-Choppers. This is a real cool way to pamper yourself in hot weather—but one that could lead from the flying pain into the fun.



While that pain may keep the sun out of your eyes, it does a good job of keeping unwanted air traffic out of your eyes, too. Make it easier than usual to climb up into the harness of another chopper.

The smart operator uses sun glasses or the new AP1-5 helmet with the built-in shade to fight off glare . . . and he takes off his shoes to improve ventilation (with his CO's permission).

Speaking of removing shoes, be sure you tag them for the aircraft they belong to before you kick them away for the summer. They've got to be saved just right, now, or else they may get wipped out, run over or trampled into oblivion by insects.

If you'd like to see a great transparent plastic, get in touch with the Transportation Research Command, St. Louis, ATTN: TOMACE. They'll give you the green light.





**Allocation Chart and Maintenance Support List.** Until the multi-part manuals are published, this is your authority on equipment accessories, operating supplies and spare parts.

### **MAINTENANCE INDEX LIST**

This gives you the accessories, hardware, tools, etc., that are required by the operator to adjust, maintain and operate the equipment.

In the "quantity listed with the equipment" column, you'll find an asterisk (\*) listed instead of an amount in many cases. This means the items are not listed with the equipment but may be replenished by the user. The reason this is not a definite issue is because in many cases the same tool is already available. Your support manual can be your authority.

### **MAINTENANCE AND OPERATING SUPPLY LIST**

This list gives you the supplies that you need for initial operation of the equipment in different temperature ranges. You'll probably have most of these items on hand. If not, this list has all the info you need to read in a requisition.



### **LUBRICATION INDEX**

This is the same as the official labor order. You can also send an official LO or TM if printed.

### **MAINTENANCE ALLOCATION CHART**

This chart tells you what maintenance operations you're allowed to do at the various sections. The "R" marks in the columns mark the lowest section that is authorized to do the PM.

The degree of maintenance is listed as Service, Adjust, Inspect, Test, Replace, Repair and/or Retain.



### **MAINTENANCE SUPPORT LIST**

This is a list of parts which you're likely to need for the rig in its first year of operation. The parts listed are needed for use in organizational, third and fourth sections of maintenance.

By using the quantity factor in the "11-day organizational maintenance" column, multiplying this by the number of hours of equipment, and then dividing by 108, you'll get your authorized allowance. The manual explains this in detail.



### HOW DO YOU GET A HANDLE?

You should have received a manufacturer's pub and a Preliminary Maintenance Support Manual with your equipment. If it was short-stopped . . . mislaid . . . or requisitioned behind your back . . . or you need additional copies, make an informal request for what you need from your Support Unit. There's local ground rules on how you go about getting these pubes from your direct support people.



### HOW OFTEN IS IT?

This is the most useful for DA TM's and IO's are published. When you get your TM's and IO—then the info in your technical manual and lubrication order is what you go by. You use the Preliminary Maintenance Support Manual only until you get the TM or IO.

If there is any difference between the info in the TM and the Maintenance Support Manual—you go by the TM. The information in the Maintenance Support Manual is based upon engineering reports as the equipment goes through its production test and, like a woman's mind, is subject to change without notice.



### ADDITIONAL HELP

If you're stranded and your unit needs more assistance in proper maintenance and operating techniques, you can get in touch with your local Engineer Maintenance Technician (EMT). If there are no technical assistance personnel assigned to your command, your unit can write to the Engineer Regional Maintenance Office (ERMO) having the responsibility for your geographical area.

You can find the locations of ERMO offices in AR 159-11.2. You can also locate them by telephone or teletype in an emergency.

## PIN POOP



Dear Sgt. Daves,

It's kept losing the pins in the upper steel assembly of our TDS-14 angle-down. These pins are used to keep the blade in place after we adjust the blade at the angle we want it. Then, we bend the pins at the bottom to hold it in the track, but sometime or other our rig always come back from the breakdown minus a pin.

We've attached a chain to the pin and welded it to the steel—and we haven't lost a pin since.

Sgt. B. D.

## SHAKE THE SHAKES

If your Kutz & Ross 40 R-70 generator has the shakes, could be that it's caused by a loose bearing bracket.

One thing's for sure. If the four 1/2-in. hex-heads supporting holding-the bracket in the frame assembly of the main generator are loose, your rig's going to have the shakes.



Tightening these supports isn't a cure-all for all vibration troubles—but if you've got them, give your generator a quick once-over for a loose bracket first thing, before calling for help.



## USE OES STRAIGHT

Dear Sgt. Dwyer:

Some AD's on Engineer equipment still say to change OES (engine oil) when temperature drops below 10° F, and there is no substitution kit available.

Why can't we use OES as recommended on page 24 of AB 18-1-57? We can get it without any trouble.

SFC J. B. M.

Dear Sergeant J. B. M.,

Go ahead and use the OES for us. In the same way when they're revised, SOI printed temperatures of 40°F and below. 18-1-56-1 (page 50) gives you the latest. The latest SOI's are calling for OES in dips on fuel oils, lubricants, oils, and cold weather, and the older ones will work.

OES is simple. You just pour it in. NO TO POWER

1. Check your oil level more often—it's used up faster than oil.
2. Change OES more often—it gets contaminated faster.
3. Never dilute OES. It's thick enough already.
4. Never let your engine overheat. The OES flash point is only 240° F, and overheating can trigger an explosion or fire. In warm engine temperature checks above operating temps, knock off the cap, take a look, and let the engine cool at full idle until the temperature reads closer back to normal.

Sgt. Dwyer



### *Manual shift*

Is your your M11 vehicle back every afternoon are still looking around for DA 9-7412...forget about it because it doesn't exist. What you want is DA 9-2228-204-12 (Apr 58). When the M11 manual was being written it was assigned the number, 9-7412. Then the type numbering system came in and the job got itself a new tag.



### *Wife tag*

Here it is... the letter on the letter's title...Case's *Wife Tag Book* was featured on page 44 of PD issue 86. The book is now being put out as DA Form 9-112. So don't ask the people at Red Cross Annual for replacement pages.

### *Tower of safety*

Five million... Did you get wind of the info in DA Circular 430 18 118 Nov 59? It tells about getting hold of safety devices to use on water towers with heights 20 feet or higher.

### *This could save your life*

Hold everything! If you're handling a crawler tractor with the hydraulic back adjusters, paste this in your skull right now! Don't EVER remove the grease fitting, the blaster (ball valve) assembly, or the piston stop (on the TD-22) without first releasing the pressure. Any of these fittings coming off under pressure can drill right through you... and it's happened!

On the D8-8A's and TD-18's, loosen the blaster (or relief valve) ONE-HALF turn only for bleeding. On the TD-22's loosen the cap screw one-half to one turn. On the TD-24's, open the blaster valve (manually) on the indicator after you've connected the hose to the tapped hole—and before you remove the adjusting screw clamp 3/8" nut.

If you give the blaster valves too many turns, BAM! Right in—and maybe right through—the liver.

*Would You Stake Your Life on the Condition of Your Equipment?*

**NOW—  
AS THEN...  
A SOLDIER IS  
ON THE READY  
WITH WELL—  
MAINTAINED  
EQUIPMENT**

