NAVAL AVIATION NEWS

RESTRICTED

Tactical Test
Air Support Jets
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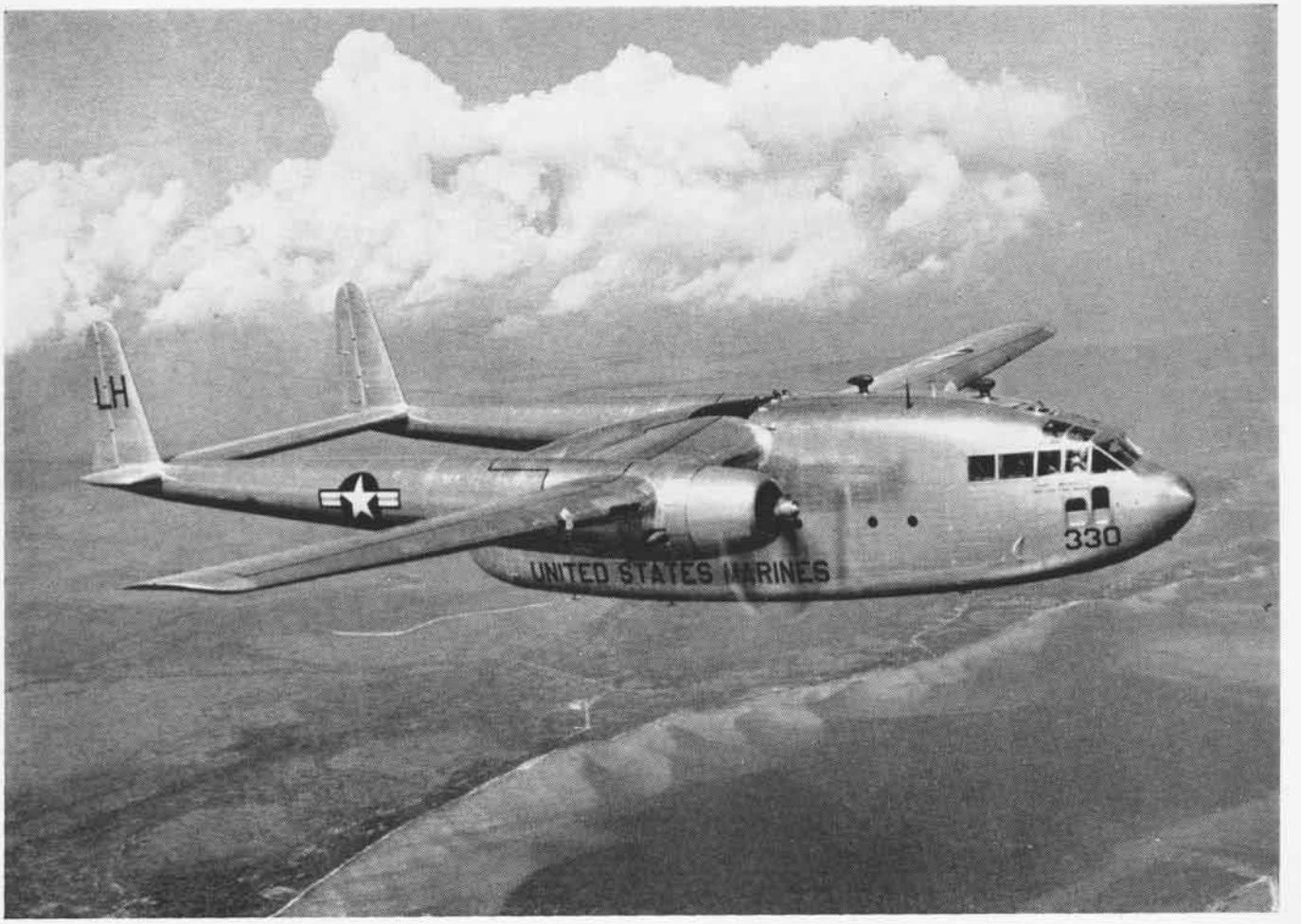
RESTRICTED

HARE AND TORTOISE

Three new models of today's fighting aircraft are shown here, two small and fast and the third slow and roomy. Can you identify these planes? *Answers appear on the last page.*



CAN MY PLANE FIGHT?

HOW DOES my plane stack up against those of other squadrons and any potential enemy? How far can it go? What's its turning radius? How is it on gas?

Whenever any new airplane reaches fleet squadrons these questions are inevitable and natural. To answer them is the job of the Tactical Test Division at the Naval Air Test Center, Patuxent River, Md.

Tack Test is a combination of civilians, enlisted men and officers of wide knowledge and experience. Their job is to make preliminary evaluation on service type planes before delivery to squadrons and continue investigations in conjunction with the fleet after the planes have gone into operational squadrons where new problems arise.

Included in tactical evaluation are aircraft of every type, instruments, aeronautical equipment. Present and anticipated requirements are kept in mind in these trials. Combat types are flown in all kinds of weather and are evaluated with other Navy planes and those of other services by actual comparison in combat maneuvers in the air. It is a proving ground.

LCDR. HILL CHECKS F2H-2 BEFORE HIGH FLIGHT

Skipper of TT is Cdr. W. J. "Gus" Widhelm, C.O. of a carrier dive bombing squadron early in World War II. He was later C.O. of an early night fighter squadron, VF (N)-75.

Major sections of TT are devoted to carrier types, patrol aircraft, all weather flight, fuel consumption, and special devices to aid operations from crew standpoint. Projects are undertaken at the request of the Bureau of Aeronautics and DCNO(Air) for new aircraft and later in liaison with the fleet as the planes go to the operating squadrons. In the resulting reports findings are frank and many a highly touted plane is found wanting in one or more departments.

Instead of the detailed instrumentation used in the testing of experimental models emphasis is placed on realistic operations such as will be found in the fleet. Ways and means are found to improve the efficiency of the plane itself and the method of handling it. It is TT that has made many high altitude photographs of eastern cities and pioneered in extremely high altitude fighter interceptions over Patuxent.

CDR. WIDHELM & EXEC. CDR. FUNK ARE PROUD OF LOOK NO HANDS

L. A. MILETO SHOWS OFF LATEST IN SELF-ERECTING GYRO-HORIZON

Testers Have To Keep In Mind That The Average Pilot Is Not An Aero Engineer

PERHAPS the most difficult task of persons testing new aircraft is trying to keep the common touch.

In testing experimental models the rarefied atmosphere of the engineering profession is appropriate. In tactical testing, however, a plane must be analyzed from the viewpoint that the average man flying it is neither an engineer nor is he a pilot with years of experience behind him.

Every pilot and engineer in Tactical Test must keep the average pilot in mind while working on problems related to operations in the fleet. As a result many of the performance figures forthcoming from TT aren't as sensational as the original "leaks" in the press.

Pilot comfort cannot be overemphasized. Anything done to ease his physical load increases his value as an effective operator of a weapon. The days when Shorty had to use an extra cushion underneath and an extra back pad and still couldn't reach the pedals comfortably are past. Likewise Long John doesn't sit doubled up with his head in the breeze.

When a TT pilot first crawls into the cockpit he takes a good look at the enclosure itself and then goes over the location of every instrument, handle and switch. In many instances serious faults are found because company test pilots haven't operated under service conditions and aren't burdened with navigation gear in pursuing tactical operations. In such cases fixes are tried and recommendations for changes are made to BuAer.

Once the cockpit is taken care of flights are made. Times to climb to various combat altitudes are recorded and the best climbing and descending speeds are determined through trial and error. For carrier aircraft, handling at slow speeds is investigated thoroughly because of the necessarily low speeds used in carrier landing approaches.

Combat radius problems are run. In this phase the exact unvarnished figures are demanded for it is on this information that fleet commanders will base their attack and defense maneuvers.

In this connection fuel consumption figures are found by exhaustive trial. Operating at combat loading the time and distance that jet aircraft can go is limited and every minute and mile must be tabulated. Climate comes into the picture in fuel consumption. In warmer climates climb is much slower and more fuel is used in operation. Level flight must be analyzed in the light of the operation. A fighter on combat air patrol over his force uses less fuel than one on a strike.

Tail end Charlie isn't neglected. It is well known that the man flying wing uses more fuel in keeping in position. An efficient flight leader can reduce this amount to a minimum, but the poorer section leaders must be kept in mind too.

Many flights are made of two or more planes to see what difference in consumption is found. One F9F recently made a long range navigational flight cross country. Its first stop was Dallas, 1280 nautical miles from NAS, Anacostia. Complete records were kept of the flight. Fuel consumption was only one item. A cross section of the route traveled was included in the report, showing true air speeds, altitudes for optimum cruising conditions and altitudes to fly over bad weather.

Reports written for BuAer edification are in engineering language. For the fleet, however, they are couched in language which can be easily understood by every throttle jockey in the squadrons. Reports aren't the opinion of one man. Every pilot differs in his opinion of what constitutes good operating procedure and what is convenient for him. In the cockpit, for instance, Long John disagrees volubly with Shorty. Result is that reports are compromises of a variety of opinions. In relation to tactical requirements there is less compromise. The plane must be able to do a certain job—climb so high, fly so fast, be a good gun platform, have high rate of acceleration and be highly maneuverable. If it doesn't fulfill these requirements because of basic design there isn't much Tack Test can do. Minor items are taken care of within the capabilities of the division.

ONE TYPICAL report of a minor nature which emanated from TT concerned a jet plane which we won't identify for security reasons. The test was of the autopilot installed in the plane. Design of autopilots for high speed, high altitude aircraft is difficult because of the extremes in stresses and temperatures encountered.

The plane was taken up on many flights. It was found that the automatic control system was unstable in its pitch channel. While cruising at 25,000 feet this instability accounted for variations in altitude on the order of 2,000 to 3,000 feet. Because of its high speed a jet plane reacts faster and leaves the norm in greater degree than a slower plane, so this autopilot simply wasn't accurate enough to do the job. Every three minutes the plane would go through a 2-3,000 foot change in altitude.

The pilots also found that in the low temperatures of the rarefied atmosphere the engage-disengage control froze

and wouldn't work. Thus a report was submitted without recommendation, but the result would be obvious—either another autopilot would have to be developed or the bugs removed from the one tested.

In the above test there was assurance that the item tested was operating at its best. Behind this is the TT instrument shop, under a civilian, L. A. Mileto, who is a laboratory mechanic. Mileto has a laboratory which specializes in seeing that all standard instruments in a plane are in top notch working order. In this respect it differs from an activity which takes new planes and gives them their first flights. Mileto's instruments are not special ones to delve into every phase of vibration, engine operation and aerodynamics. He takes the ordinary, run-of-the-mill instruments that come with a production aircraft and tests them in the laboratory and in the air to see that they are accurate enough and will help the plane fulfill its mission.

BELTZ, HAMPTON, ALBERTSON, LIVERMAN, KOLB, RUN INTERCEPTION

WHILE CONDUCTING flights in the F2H it was noticed that extremely high oil temperatures were encountered under some operating conditions. Tack Test got busy immediately and by some minor redesign the trouble was licked, not only for their planes but for those in the fleet too.

One continuing problem which is being investigated is that of jet engine rumble at high altitudes. This phenomenon starts at a medium high altitude when high engine power settings are being used. It is just what it says—a roughness and rumble in the engine (s). If the high settings are continued as altitude is increased a flameout occurs.

Westinghouse engineers have two theories as to what causes the rumble. They have no facilities to prove either one so TT is following through to see if it can find the answer. One theory holds that the rumble comes from compressor blade stall because of the low pressure air and high speeds. The other theory, which is rapidly finding more adherents, holds that it is a combustion problem in which the chamber temperature goes beyond normal limits and the flameout occurs. It is possible that both compressor stall and combustion faults combine to cause the trouble. Only cure found so far is that of throttling back, a distasteful procedure when as much power as possible is needed at altitude.

For four years the Minneapolis-Honeywell Regulator Co., maker of autopilots, has been working on an automatic approach and landing system. It is known that an autopilot can do a better job on approach than a human pilot, and the aim is to extend that to landing. Previously in NANews the "Look No Hands!" R4D in which Minneapolis-Honeywell had installed its automatic approach system was described. Now it has been applied to the F7F night fighter

JOHNSON, VOSS, MITCHELL, LEADING CHIEF, TOW AUTOFLIGHT F7F

all-weather version. It is TT's job to try out this baby under all conditions to see how it will work in Naval operations. The idea is to relieve the pilot of as many operations as possible so he can concentrate on his main task.

As head of the multi-engine section LCdr. W. J. Coley last winter tested a P2V on skis in the below zero cold of the Paul Bunyan country at the airport of Bemidji, northwestern Minnesota. This is believed to be the heaviest plane ever operated on skis.

A long-range task now underway by the multi-engine section takes its planes over a great portion of the north Atlantic ocean. Flight lines are being flown for a magnetometer survey in cooperation with the U. S. Geological Survey. Flights are made between Bermuda and the following points: Argentia, Newfoundland; Halifax, Nova Scotia; Nantucket, R. I.; Cape May, N. J.; Norfolk, Va.; Jacksonville, Fla.; Nassau, Bahamas; San Juan, Puerto Rico.

Principle of the magnetometer is similar to the magnetic detectors used in spotting submerged submarines. In this case, however, it is used to measure earth's magnetic field.

HERE IS NEW, UNUSUAL SHOT OF F2H-2 BANSHEE OF TACTICAL TEST

B. R. CRANNIS, AN, GETS BIG KICK OUT OF CARING FOR HIS BANSHEE

One Pilot In One Cockpit Requires A Good All-In-One Computer Kneepad

SITTING on a hill in back of Tactical Test is a small building surmounted with typical radar antennas.

"Red Hill" is the place where the newest fighters are put through their paces to see what they can do in high altitude interceptions. How high, we can't say, but the Navy is right proud of what it has accomplished along this line. It's one thing to get a plane so high, but another to make it act like a fighter up there.

Almost every day LCdr. John Hutto has his "CIC" gang up on Red Hill giving TT's test pilots the right directions to find somebody else in the region of the black daytime sky. This landbased CIC has a most natural radio call—Red Hill! Keeping the boys on their toes is R. C. Beltz, AEC, who is also supervising the job of building up and improving this newest acquisition of Tack Test.

His crew consists of G. H. Hampton, AT3, C. R. Albertson, AT3, J. D. Liverman, AL1 and J. S. Kolb, AT3.

From this ground control setup will come the knowledge of just how high shipboard CIC's will be able to direct their fighters and what speeds and what maneuverability they will be capable of.

Chief Engineer of Tactical Test is T. W. Davidson. Problems presented to him are many and varied. One of his pet projects at present concerns a method of helping jet pilots help themselves in knowing just how they stand at any given time.

SHEPARD, FALLIS, BABICK, MORROW & PICKRELL TEST ELECTRONICS

LT. EVANS CHECKS OXYGEN SUPPLY WITH NOYES, AD3, BEFORE FLIGHT

Like the passage of time when having a quick drink or two before going home, minutes in jet aircraft can rise up hard and slap the unwary jet pilot down. He must ask himself, "How far can I go?" "How long can I stay in the air?" "How fast can I go?" "How long will it take me to get there?"

In the December 1949 issue of Naval Aviation News there appeared a story on several "computers" developed by squadrons VX-3, VF-51 and BuAer. Now, having talked it over with Tack Test it develops that they weren't computers at all but tabulators. The difference, it seems, lies in the fact that a tabulator has precomputed information written on it and the proper setting of the face of the tabulator reveals the desired information, already worked out.

A computer, on the other hand, is a mathematical device. In making them for use in aircraft they usually assume a circular slide rule form.

DAVIDSON, AFTER much brain cudgeling and hashing it over with members of fleet squadrons, came up with a computer which can do everything but use the relief tube. His reason for seeking a computer over a tabulator is that the latter sometimes presents a false picture. It doesn't allow for wind or extra fuel, for example.

Computers have been developed for the F9F-2 and the F2H-1 and 2. Davidson has traveled widely to operating squadrons where he explained the intricacies of this time saver and instructed in its use. Fleet squadrons now have them and are using them.

This computer is called REST (Range, Endurance, Speed and Time). Once a level flight calibrated airspeed is determined it gives ready reference in one setting on range, endurance, time, fuel and true airspeed corrected for compressibility. It works for any amount fuel aboard by multiplying miles per pound of fuel by pounds remaining and comes up with the answers. It is based on optimum performance as discovered by Tack Test. It takes into consideration wind corrections either from predicted winds or from information by passing check points.

The REST computer is a three disc circular slide rule. The top disc has several windows, each for a different altitude, in which calibrated airspeed values appear for the pressure altitude selected. Speeds which appear cover the range from maximum range to maximum speed points. The log scale on the top disc represents pounds of fuel. On the middle disc the log scale represents miles.

By taking the speed line on the top disc aligned with the log scale, miles per pound is indicated on the log scale of the middle disc. Further examination reveals speed scales

for same altitudes scribed on the outer portion of the bottom disc. An extension of the speed lines to the bottom disc points to the minutes per pound of fuel.

Other alignments reveal true airspeed and air nautical miles.

There are computers for both single engine and twin engine operation in the F2H.

Only incidentally LCdr. John Hill, VF section head, has worked up a sideline in finding a suitable substitute for the old Mark III plotting boards which fitted under the instrument panels.

Jet pilots have to do all their navigating and cruise control on a knee pad. That means that what was described above and the E6B or equivalent navigating plotter and computer must be condensed into knee pad size, almost like trying to fit a size 4B shoe on a woman who has need of size 8 brogans.

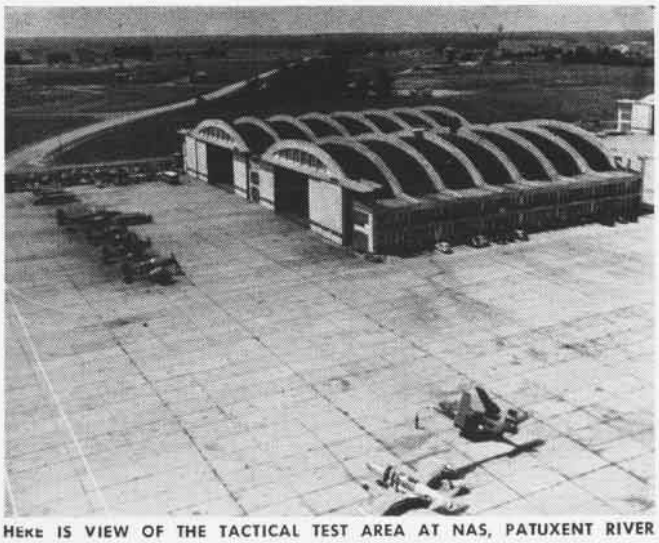
The problem is almost licked. Already one company has submitted an idea they dreamed up. The Sight Light Corp. of Deep River, Conn., has one which might fill the bill. Indirect red lights illuminate it and many layers fold in and out. It's pretty complete but can't compete with a woman's pocketbook. Although there is a tendency to turn up the nose at such gadgets they still are necessary. One item submitted was a pencil which illuminated the area around the lead with red light. But sometimes you can't think of everything, they forgot to illuminate the eraser end of the thing too.

ANYWAY, WHAT is needed is a completely satisfactory kneeboard and accessories which will work at night. All the duties of the pilot, engineer, copilot and navigator of the multiengined plane have been compressed into one person in one seat, and, well, he isn't Superman. His tasks have to be streamlined and the people in Tact Test are the ones to do the job.

One important phase of TT's work is evaluation of the all-weather flight capabilities of aircraft. Head of this section is LCdr. Jack Boyum. Most all-weather flight tests are made on aircraft destined for night fighter roles, although some are day fighter versions.

All the component parts of instrument flight are tried out in any particular aircraft to find just how suitable it is for the task. If instruments are found wanting they are modified to fit the need.

Instrument lighting in its fine points is studied. First of all the flight surgeons recommended some years ago all indirect red lighting, then the Aircraft Instrument Laboratory developed the idea and now in the finished planes TT finds only minor faults in arrangements.



HERE IS VIEW OF THE TACTICAL TEST AREA AT NAS, PATUXENT RIVER

Some work is being done on applying omnirange, ILS and GCA to carrier approaches. "Look No Hands!" comes into the picture also in that it has a sensing unit for angle of attack rather than attitude in respect to the horizon, thus controlling approach speed in closer limits.

Here is one typical report on an aircraft flown by Tactical Test. The plane was flown as a normal fighter and in an overload condition. Here are some comments:

Plane was not steady enough to be good gun platform; found maximum altitude at which 2G turn can be made; checked TAS and actual fuel flow; can't see backward from cockpit because couldn't turn around with buffet helmet on; checked characteristics for night carrier landings; checked oxygen assembly, hose prevents full turning of head; cabin pressurization; visibility in flight through rain was possible through side only; stick forces—pilot fatigues in short time; trim speeds; aileron trim—too easy for instrument flight; combat speeds; freezing of controls at high altitudes; determined compressibility correction in airspeed.

Currently undergoing scrutiny at TT are the F2H-2 McDonnell *Banshee,* the F9F-2 and 3 Grumman *Panther,* the TO-1 Lockheed better known as the Air Force F-80, the F3D Douglas *Skyknight,* the P2V-2 and 4 Lockheed *Neptune* and several others.

Other projects being pushed by Tactical Test are to see what pilots can do in high speed attacks and to see what are the tactical visibility limits of exhaust flames at night.

Tactical Test welcomes inquiries and suggestions from fleet commands and squadrons.

LTJG. HARDIN, CANFIELD, LCDR. HILL, LCDR. HALLEY DISCUSS KNEE PAD

P2V ON SKIS WAS OPERATED AT BEMIDJI, MINNESOTA, LAST WINTER

GRAMPAW PETTIBONE

Standpipe Trouble

Sometimes it takes an accident to bring to light the fact that a pilot has been flying a plane for some time with a misunderstanding of how the fuel system works.

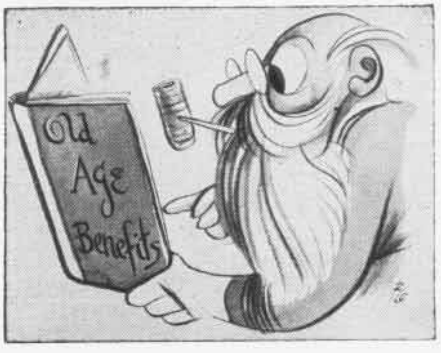
In this case the pilot was a Reserve aviator transitioning from F6F to FG-1D type aircraft. He had completed a written examination on the FG-1D aircraft in which he had given the correct answers in regard to the fuel system. Nevertheless near the end of the transition syllabus in the F-1D, he flew the aircraft with the selector valve on MAIN until all the gasoline above the 50 gallon standpipe level was exhausted. At this time he was making an approach to a landing at NAS NEW ORLEANS. He had wheels and flaps down and was about 100 feet above the surface of Lake Pontchartrain when the engine cut out.

The pilot states that he pulled up his wheels, extended full flaps shifted the gas selector from MAIN to RESERVE and turned on the primer. Then in a moment of confusion, he shifted back to MAIN shortly before hitting the water. He was picked up by the station crash boat about six minutes after the ditching and suffered no injuries.

The *Corsair* was salvaged and examined. The gas selector valve was found on MAIN and approximately 50 gallons of gas was available had the selector been placed on RESERVE. Further questioning of the pilot by an Informal Aviator's Disposition Board revealed that he had always flown the FG-1D with the selector on MAIN and that he was not familiar with the fuel system and other information available in the FG-1D pilot's handbook. He also had ignored the check-off list which plainly states that landings and take-offs will be made with the gas selector on RESERVE.

Grampaw Pettibone says:

Just about everyone else has raised cain with this pilot and he's currently spending a year on probation—so I'd like to direct my remarks to the training officers. When pilots are flying at relatively infrequent intervals, it's a pretty good idea to operate on the basis that someone may not have gotten the word or got it but didn't retain the needed information. Even elementary facts concerning the fuel system should be reviewed during



briefings. You may be boring 95% of your audience, but if you correct a misconception on the part of just one pilot you may save an expensive airplane.

To bring the record up to date, I should mention that F4U-FG Service Change Number 366 issued on 10 April 1950 and effective 1 May 1950 eliminates this standpipe from the *Corsair* fuel system. This change is to be completed not later than the next 120-hour check on the airplanes and those in storage will be modified prior to issue to the service.

Dear Grampaw Pettibone:

After a discussion concerning fuel requirements on a VFR flight plan and consulting ACL's, the question still remains unanswered. "How much fuel reserve is required on a VFR flight?"

I say it is a pilot's responsibility to determine that he has sufficient fuel to reach his destination and effect a safe landing.

LT. ———, USN

Grampaw Pettibone says:

Slow down a minute, bub Your answer cuts the safety margin tight down to zero. Would you say that a pilot had carried out his responsibility if he completed a three hour cross country flight, made a safe landing, and taxied up to the chocks just in time to hear his engine konk-out for want of fuel?

A lot of pilots have done this or come mighty close to it, and I know that it makes for good conversation around the bar, but let's take a look at the other side of the picture. Every month we have two or three fellows who figure their gasoline supply so closely that they DON'T arrive at the other end of the line. Almost invariably the accident is charged to—"Pilot Error, Negligence, and Poor Judgment."

Even on a day when the weather is CAVU all the way, it is wise to allow yourself an extra thirty or forty minutes of flight time when figuring range. You may hit unpredicted head winds, or you may happen to get a plane that burns a lot more gas than the handbook indicates. You may get into the landing circle at your destination only to find that your wheel's won't come down. If this happens you'll need a little time to try various emergency methods of lowering them.

You won't find a hard and fast rule in ACL's or Flight Safety Bulletins which tells you just how much fuel reserve you should have for a VFR flight. The reason for this is simple. One rule just won't fit all conditions and all types of planes. Some jet, for example, burn about half of their total fuel supply in an hour of low level flight even with economical power settings. To require a one hour safety margin for these types would seriously restrict their usefulness.

Helicopters don't burn up their fuel supply nearly so rapidly and have the advantage of being able to land safely on almost any flat space, so they don't require an hour's safety margin over land. So far I don't believe that we've had a single helicopter accident caused by running out of gas.

On cross country flights, particularly over unfamiliar terrain, good judgment demands that you maintain a greater fuel reserve than would be necessary for a flight where you are constantly in sight of your home field. ACL 43-49 specifies that ferry flights shall be planned to arrive at destination with one hour's fuel reserve whenever practicable.

Circumstances may make it expedient for you to shade this rule on other types of VFR flights, but if you do, you'd better be darn sure that you can justify your decision in the event of an accident. Excuses such as "I thought I had enough," or "I had to go around a thunderstorm" or "My radio compass went out" won't keep you from being charged with negligence if you run out of gas.

Props Reversed in the Air

In case any pilots are curious as to the effects of reversing propellor pitch while in the air, the following account of such an occurrence should discourage experimentation:

The P2V-4 was making a second GCA approach on the longest runway at NAS QUONSET POINT with a ceiling of 100 feet and visibility 3/8ths of a mile. The plane was given a late wave-off on this approach due to being above the glide path as it came over the end of the runway.

The co-pilot who was riding in the left seat had been instructed by the pilot who was making the GCA approaches from the other side to take

over and land if they were contact at 100 feet or better. The plane broke through the overcast at an altitude of 75-100 feet slightly past the end of the runway. Speed was approximately 120 knots.

The co-pilot called out, "I've got it," to indicate that he could see the runway and throttled back for a landing. The pilot looked out at this time and saw that the plane was going to touch down well into the second half of the runway. He therefore decided to pull the reverse pitch levers rearward to position them for immediate use after landing. (*Note:* A solenoid lock is supposed to prevent rearward motion of the reversing throttles unless the weight of the airplane has compressed the main landing gear struts.)

However, at this moment the propellors went into flat pitch, nosing the plane down abruptly from an altitude of about 20-25 feet. The co-pilot pulled back on the yoke, but was unable to level the plane. The P2V-4 hit about midway down the runway in a 10 degree nose down attitude. The nose wheel carried away on the initial impact and both main tires were blown as the plane was braked to a stop 700 feet from the end of the runway. The pilot was unable to use reverse pitch during this 2000 foot slide as the props were hitting the runway. Pieces of the propellor blades cut through the fuselage and the initial impact buckled portions of the fuselage and wrinkled the center sections of both wings.

As a result this P2V-4 is a probable strike. (Cost $1,090,246 less the salvage value of undamaged parts.)

Grampaw Pettibone says:

Looks like a little money could have been saved here by taking that wave-off.

They set this plane up on jacks and conducted nearly 100 tests of the reverse pitch operation. It functioned normally in all configurations—gear down, simulated airborne, simulated on the deck, solenoid lock tripped and untripped. No failure of material could be discovered in these ground tests.

I think the commanding officer's statement in regard to this accident is worth quoting:

"It is difficult to reconcile the perfect performance check of the solenoid afterwards with its apparent failure in the air. It is possible that the solenoid latch was manually tripped in spite of the evidence available. Regardless of how the propellors got into reverse pitch a most expensive aircraft suffered severe damage. Fortunately no one was injured. It is therefore urged that this accident be given the widest publicity to forestall any possible curiosity on the part of any pilot as to the effects of using reverse pitch in the air."

Dear Grampaw Pettibone:

I thought you might be interested in the enclosed picture of a Corsair with

a badly chewed tail. The pilot taxiing directly behind this plane was occupied with retracting flaps, opening coolers and adjusting his radio volume. He failed to notice that the plane ahead had stopped to avoid crossing the duty runway where a plane was just taking off.

The impact caused strike damage to the plane in the picture and D damage to the other aircraft.

Grampaw Pettibone says:

That's a downright sad looking fighter plane. If that Corsair could talk, I'll bet it would say something like this:

Oh, once I was happy,
Now look at my rear.
A fine way to end
A Corsair's career!
The Pilots I always
Endeavored to please;
Now look how my poor tail
Waves in the breeze.
They should get the pilot
Who chewed my behind
A seeing eye dog, cause
I'm quite sure he's blind
Oh, my flight days are over
I'm done for they say
FOR MY TAIL HAS BEEN NIBBLED AWAY!

P. S. The same type of accident happens on carriers too. The plane in the picture below isn't landing, as you might think, from its altitude. It has been taxied out of the gear and right into the plane ahead.

One Jerk Too Many

After a flight of about 60 minutes the pilot of an AD-1 discovered dark brown smoke coming from the rear of his plane. The smoke had an acrid odor and began to fill the cockpit. The pilot cut all electric switches including battery and radio, but the smoke increased in intensity. He then throttled back and put the AD-1 in a glide at about 120 knots. Smoke filled the cockpit, making it difficult for the pilot to see. He headed for a straight, level, stretch of beach for an emergency landing, but as he got down low he saw a number of people in this area. With his shoulder straps tight, seat lowered, flaps down, he ditched the plane parallel to the beach.

Investigation of the salvaged plane by O&R engineers showed that the fire had started at the external power receptacle and was caused by a shorting of the terminals when the insulating block broke apart.

As a result of this accident, Commander Fleet Air Quonset Point issued a safety bulletin, a portion of which is quoted below:

"Observation of line operations reveals that after an engine has been started with the assistance of an auxiliary power unit, the APU power plug is usually disconnected from the aircraft by standing clear of the prop wash and tugging on the cable. This tugging causes cracking of the external power receptacle insulating block at the mounting screws.

"Vibration during flight extends the cracks until a rupture occurs and permits the terminals to short together. Since the terminals of the receptacle are connected directly to the battery in most aircraft, they are always 'hot' and there is no way in which the pilot can remove power from the circuit when a short occurs. *RESULT*—An electrical fire, and in one case, the ditching of an aircraft in salt water.

"It is necessary that APU's be disconnected by applying an even pull on the plug in a straight line out from the receptacle; and in the interest of conservation of aircraft and pilots, it is recommended that external power receptacles of all aircraft be periodically inspected for cracks and replaced if necessary. It is further recommended that this bulletin be brought to the attention of all line-crewmen, and that all personnel using APU's be thoroughly indoctrinated in the proper removal of the power plug from the aircraft."

"Oh, once he was happy, but now he's forlorn.
Looks mighty sad since those gold wings were shorn.
He valued the orders, which once read "DUFLY"
But one day forgot — his FUEL SUPPLY!"

LT. TATE GAZES FONDLY ON THE EJECTION SEAT WHICH SAVED HIS LIFE AS BANSHEE FAILED

TATE 2ND PILOT TO 'EJECT'

NAS JACKSONVILLE—Second Navy pilot to use his emergency ejection seat to bail out of a stricken plane was Lt. Hugh J. Tate of VF-171, the same squadron which claims the #1 man to make such a bailout, Lt. J. L. (Pappy) Fruin.

Tate was forced to use his ejection seat from his F2H on a ferrying mission and was within radio range of Jacksonville when his plane developed trouble. Listed as structural failure, it looked like to onlookers on the ground tremendous explosions as the *Banshee* tore itself apart after starting to do snap rolls.

Tate reached up with one hand to pull the curtain over his face to fire the seat. Nothing happened, so he used both hands, and this time the seat went out of the plane. He fell from 2,000 to 5,000 feet before he kicked free from his seat and pulled his chute ripcord. His plane fell on the beach highway, blasting a hole 20′ square and a foot deep in the road. He received only a bruise under his right eye when he tore his oxygen mask from his face sometime during the trip down.

Fruin, Tate's squadron mate, made his ejection at a speed better than 600 mph on August 9, 1949, over North Carolina. Nearly a year later he is still taking treatments at the naval hospital but is expected to start flying again shortly. He suffered a broken leg and other injuries.

Tate broke into the news last summer when he flew a *Banshee* over Washington, D. C., and took photographs from 48,000 of the capital city. One of the pictures appeared in enlarged form on a downtown cafe wall last fall and created quite a furor during the B-36 investigation.

Tate said definitely that he would have lost his life if it had not been for his ejection seat. With his plane doing snap rolls, centrifugal force pinned him against his seat so hard, he was able at first to raise only one hand to grasp the face curtain handles. He suggested that BUAER might study an alternate method of firing a seat out of the plane where the release would be somewhere around the knees.

The third Navy pilot to bail out of a crippled jet plane came five days after Tate's escape on May 24. He was Lt. Alden M. Pierpoint of VF-71. On an instrument flight from Quonset to Jacksonville in his F9F-2, he suffered an engine flameout at 37,000 feet over the Atlantic ocean when he made a sudden increase in power. He tried to restart at 16,000 and 12,000 without success. Finally, breaking out of the overcast at 8,000 feet, he used his ejection seat.

A sidelight of the search for Pierpoint comes from MCAS CHERRY POINT. Lt. L. E. Lovett of VMF-223 went out to look for the missing pilot. While searching he found an old F4U wreck which never had been found, near Sandy Hook, N. C. Later on he found Pierpoint 30 miles away. A Coast Guard helicopter picked him up and took him to Elizabeth City, N. C. His F9F was not found by the searching planes.

Capt. Graybiel Honored

1950 Lister Award Given Medical Man

The Theodore C. Lister Award for 1950 was presented to Capt Ashton Graybiel, Medical Corps, USN, Director of Research, Naval School of Aviation Medicine, NAS PENSACOLA, by the Aero Medical Association at its annual meeting recently for Dr. Graybiel's outstanding scientific contributions to aviation medicine.

Capt. Graybiel, one of the world's leading heart specialists, received the award for his studies in disorientation of pilots and illusions induced by angular acceleration effects; for co-authorship of the book, "Electrocardiography in Practice;" for his achievements as director of the naval school; and for his studies in aviation medicine.

The award commemorates the achievements of Gen. Lister, first surgeon of the aviation section, Signal Corps, U. S. Army, during World War I.

RUNWAY SERVES AS PIG CORRAL AT WHITING

Roundup Time In Florida

Hams-On-Hoof Give Sailors Chase

The day was still and sultry, and the dust raised by churning men and animals hung low over the barren plain.

It mingled with the perspiration and clung to the bodies of the swearing, sweating, lariat swinging punchers.

What is Texas? Was it Arizona?

Guess again.

Scene was the sailor-on-dry-land NAAS WHITING FIELD, Pensacola, Florida. In need of rounding up were two brood sows and 12-50 lb. shoats who were wandering over the duty runway.

After a merry hour-long chase, the score was nine captives and five over the hill and far away.

All nine prisoners were turned over to the Master-at-Arms who banished them from the station as unauthorized.

Close Air Support With Jets

NATIVES in central Bougainville cornered a group of Japs in a cluster of pill boxes and houses in a clearing. Unable to rout them out, they asked a *Corsair* squadron based on nearby Piva airstrip to help.

So the pilots could tell where the Japs were, the natives marked the area with red cloth and smoke. The 10 fighter bombers dropped 18 bombs on the strong point, erasing all but one of the 11 huts.

That is how close air support works. Another version took place in the air over shell-torn Iwo Jima and Okinawa. Marines and Army troops were having tough going against the Japs hidden in caves. By means of ground communications centers, messages asking for aerial help were broadcast to Navy carrier planes orbiting overhead. Told just where on a grid map to drop their bombs, rockets or napalm, the fighters would dive on the targets below and plaster them.

The Navy kept more than 2,000 carrier-based aircraft a few miles off Okinawa during the entire three-month campaign, to protect the ground fighters. It paid for the privilege by taking hits on eight *Essex*-class carriers and one *Independence*-class carrier. The Japs sent hordes of *Kamikazes* against the floating airfields, home of close air support planes. The Japs lost 7,830 planes in that campaign.

Using *Hellcats* and *Corsairs,* the Navy and Marines developed close air support and put it to increasing use in the Carolines, Philippines, Iwo and Okinawa. Close air support remains a potent military weapon today and is a primary mission of Marine Corps aviation, but the tools to do it with have changed.

Fighters of a future war, unless it is fought in the next few years, will all be jets. How are these sleek, lightning-fast jets going to work out on a job where pinpoint rocket, bomb and gunnery work is required?

Only recently have rockets and bombs been hung under the wings of jets. Since the war the main effort has been to lick the bugs in the jet planes themselves. The Air Force, the Navy and the Marines have not had much experience with anything more than cannon in their jets. The Air Force has hung 32 5" HVAR rockets under the wings of a single F-84 jet fighter (*see photo, pg. 11*). Experience with jets in Korea was not good; pilots who flew them said they were too fast and too short-ranged for that job.

The British have had some experience using their jet *Vampires* for close support of ground troops during exercises. But the doctrines and techniques which will be used in the event of another war are still being argued and tried out by military men on both sides of the Atlantic.

JETS MAY PROVE A POTENT CLOSE AIR SUPPORT WEAPON IN ANY FUTURE WAR WITH THEIR SPEED

IT WAS one thing to send a 200-mph *Hellcat* screaming down on a Jap cave to shoot rockets into its mouth; it is another thing to give a 500-mph jet whistling down to try to do the same job. Being so fast that radar has difficulty tracking them, jets will be mighty hard targets for ground antiaircraft to hit. They present smaller targets, going past machine gun AA emplacements at such terrific speeds that they are gone before the gunner can swivel his gun around.

But, by going so fast, doesn't the jet make it pretty tough on its pilot to locate and aim his plane at a ground target in the few seconds he has it in view? That is the price that will have to be paid. However, jets can be slowed down to a few miles above their 105-mph stalling speed, if necessary, by use of speed brakes. The propellered fighters of World War II do not have such brakes.

Being slick and slim, jets accelerate at terrific rates in dives unless brakes are used. But test pilots have found out they can dive straight down in a jet, pop the brakes, and start their pullout at 10,000 feet and still hit their targets. The steeper the dive angle, usually, the more accurate the dive-bombing. *Corsairs* and *Hellcats* could not decelerate their dives on the way down as a jet can with its brakes.

So, we may see the jet fighter of World War III doubling for the old SB2C and the F4U together and doing some pretty accurate close air support work. The British reported that accuracy of rocket fire since 1945 had increased tenfold, thanks to better rocket sights, better firing platforms in the jet plane and to other factors.

Probably the first objection raised against the possibility of using jets for helping ground troops smash enemy pillboxes or strong points is that they are short-ranged compared to propellered fighters. They cannot orbit over a battlefield for hours, waiting for a radio call to come downstairs and sock the enemy. They burn up three times as much fuel at low altitudes as a conventional fighter.

There are two answers to that one, from jet advocates. You can put tip tanks on jets, like the F2H-2, and add several hundred gallons of gasoline to the supply. This will give them longer endurance. Many jets, like the F2H, F3D and F7U, have two engines. They can cruise comfortably on one engine, shutting off the other to save gasoline.

NAVY HAS A POTENT CLOSE SUPPORT WEAPON IN HEAVILY ARMED AD'S

F9F'S SPEED BRAKES ARE PERFORATED AREA ON BELLY AHEAD OF WING

Pilots like the idea, too, of being able to get back to their carrier on one engine should the other be hit by enemy fire or suffer mechanical failure. *Hellcats, Wildcats* and *Corsairs* had only one.

The second answer to the short-range-of-jets argument is that maybe the plane won't have to orbit over a battlefield. Here is why: A propellered airplane has to warm up its reciprocating engine about five minutes on a warm day before it can take off. There is a lot of talk about Arctic operations—it would have to be warmed up 15 minutes or more in frigid zones before it would be ready. The jet requires no warm up at all. The pilot scrambles to the cockpit, starts the engine and taxies right out to the take-off spot. He doesn't need as much gas if he stays on the carrier or ground till ordered to action.

CLOSE AIR support, then, might be operated right from the deck of a carrier offshore. It could be quite a ways offshore, too, because the jet could get to the battlefield mighty fast. Having the carrier far offshore would make it less vulnerable to enemy retaliation attacks. Or close air support may be operated from a rear area airfield, instead of by having planes orbiting overhead, for the same reason.

The kingpin of the aerial show, the Commander Air Support, Control Unit, could be on the carrier or at the airfield. Only one plane might be orbiting over the battlefield to receive the calls for aid from troops below. This air coordinator could radio back to base for half a dozen jets to plaster a strong point. Pilots sitting in the ready planes would immediately start their plane engines and zip off at 500 knots, deliver the rockets where they were needed and zip home to await more requests.

It probably won't be quite as homey as VMF-114 Marines on Peleliu during the past war. Their airstrip was so close to the holed-up Japs in caves that the *Corsairs* did not even bother to retract their landing gear. Those "shortest raids on record" covered 1100 yards, the planes dropping their bombs or napalm and then turning around and landing, all with wheels still down. (*See photo, pg. 11*).

Chance of interception by enemy jet fighters would be small against such a surprise attack. The jets would be in and out before the ground AA or protective fighters knew they were around. It might be necessary to keep a combat air patrol aloft to protect a rear airfield, used for CAS, just as they did our carriers during the war, if jets operated from the land bases.

There are other arguments which favor jets as close air support weapons, besides their speed. Whereas engine changes were needed every 100 hours in earlier days of the jet plane, scientific progress has boosted this to double that endurance and better. The engines are complex but not so much so as a high-powered reciprocating engine like the *Wasp Major*. Advanced base maintenance or overhaul should be easier. The British found that dust, dirt and sand at their African desert fields did little damage when sucked into a jet intake outside of scouring the impeller blades slightly.

Since he is sitting in front of his engines instead of behind a big fan, the pilot has far greater visibility. He can see targets; he can see to take-off and land better. He can attack targets closer to friendly lines because this better visibility makes it easier to see terrain below or ahead. Plenty of our troops were killed in all theaters of the last war by bombers or fighters who undershot their targets or approached parallel to the lines.

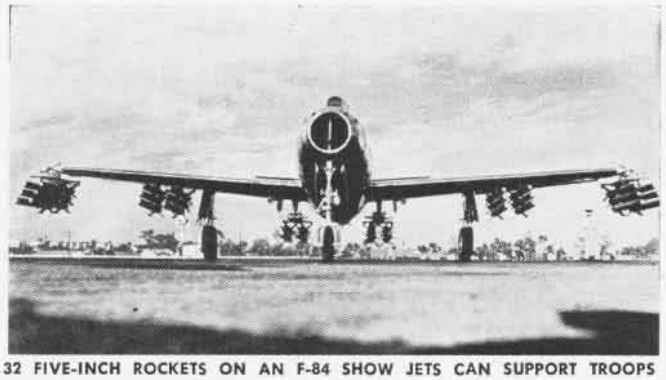
Sitting right in the nose of his plane, he can get more hits on the target. Gunnery competitions with jets in recent months have borne out the contention that jet pilots are hotshots at gunnery. Praise of the jet is high as a stable gun platform because of its smooth flight, positive and responsive controls with light stick forces required to maneuver. It is easy to keep "on target."

Conventional fighter pilots who fly in jets for the first time are struck by the utter absence of engine noise. Used to the terrific roar of the propeller and engine, they find the jet cockpit eerily quiet. This lack, however, helps combat pilot fatigue on long hops and improves his ability to hear radio messages —both important factors in close air support operations.

Because of their ability to reach a target at extreme speed, jets may make it possible for battle commanders to do the support job with fewer planes assigned to CAS. Pilots will get less tired and can fly more missions a day, without having the tedious boredom of sitting upstairs long hours on station. A few jets may be able to cover larger areas, releasing other fighters for attacks on enemy bases.

EVERYTHING is not all sweetness and light when it comes to supplanting propellered fighters with jets for close air support. The change will bring with it plenty of problems. Jets take longer runways because they don't get off the ground in 100 feet, like an F8F. There may not be room on small islands or in hilly terrain like the Americans found in North Africa. Fields may have to

LOW FLYING F-80 JET PEPPERS TARGET AT LAS VEGAS GUNNERY MEET



32 FIVE-INCH ROCKETS ON AN F-84 SHOW JETS CAN SUPPORT TROOPS

be far from battle areas. Planes might use JATO for takeoffs but it is heavy and costly and imposes a supply problem at advanced bases.

They have smaller high-pressure tires which can nest in the jet's thin wings. This puts more concentrated weight on the landing surface and requires smoother fields. Landing at speeds of 100 mph or more, a jet would run into difficulty more readily on a bomb-pocked airstrip. It might not be able to accelerate and clear trees at the end of a runway if it had to take a waveoff at the last minute, because of a jet engine's slowness to accelerate. Jet exhaust blasts are hot; they may burn the asphalt right off an advanced base runways at the takeoff spot.

CRITICS of the jet point out it will not be possible to have several dozen planes orbiting over a carrier deck, waiting their turn to enter the landing pattern. Their fuel would run out too fast. This problem might be solved by sending out smaller numbers of jets at one launch, but making more launches at separated intervals. This would call for a constant stream of planes to come back to refuel in smaller numbers. Gone, apparently, are the days when the whole air group rendezvoused over the carrier waiting for the last man off so they could head for the target.

On land, the problem of supply is definitely a real one for jet operations. Because they burn so much gasoline, jets will require far more tank farms and refueling trucks. They are slower to refuel, too, than propellered fighters, because of their added tankage space. The Navy is working on faster refueling systems for jets. More-numerous engine changes will require greater stockpiles of spares in rear areas and a faster supply chain to the front.

Experience is short as yet on bomb and rocket loads jets will carry, despite the early experiment of putting HVAR's on an F-84. Heavy loads will complicate their already-long takeoff runs and require still longer runways. For close air support missions at battle areas not too distant from a carrier or field it might be possible to leave off the wingtip tanks on such planes as the F2H-2 and stick on a couple of 11.75" *Tiny Tim* rockets instead. Gas requirements will be less on short hops so a full gas load would not have to be taken aboard.

There is little data, also, on what will happen to a jet when hit by shellfire. Some hold it will disintegrate at high speeds, pointing to the time an F2H hit a buzzard at Patuxent River, tore its whole vertical stabilizer off, and wrecked the plane. Although not particularly applicable to close air support, which is low altitude stuff, jets at high altitude will run into lots of trouble with their VHF. Radio at heights catches a lot of talk from extreme distances. And jets work best high up. Communications in CAS work are vital and leave little room for any added impediment.

As a last final thought, ground troop commanders reported that the morale of their men was boosted hundredfold by the sight of friendly planes buzzing around in circles overhead and diving on Jap targets. If jets fly off distant carriers on a minute's call or from far-off landing fields, without any orbiting, that element of cheer to the infantry will be lacking.

RECOGNITION will have to be swift and accurate on the part of friendly ground forces so they will not open fire on friendly jets zipping past on a mission near the front lines. There will be no time to look up a silhouette in a recognition handbook.

The use of jet aircraft for close air support is still pretty much unexplored ground. The Navy and Marines haven't had their jets long enough to have worked out battle tactics to any high degree as yet. But pilots who have flown them both believe they will be superior to propellered planes for the job. Ways are being found to overcome their weak points. Their speed and shooting accuracy put them way out in front of competition at this stage of the game.

MARINE F4U, WHEELS STILL DOWN, DROPS NAPALM ON PELELIU JAPS

BROADSIDE OF ROCKETS FROM CLOSE SUPPORT F4U HIT OKINAWA JAPS

SPIN ROCKETS ON AD

INYOKERN ROCKET TEST CENTER FIRED SPIN-STABILIZED MISSILES FROM STOVEPIPE LAUNCHER

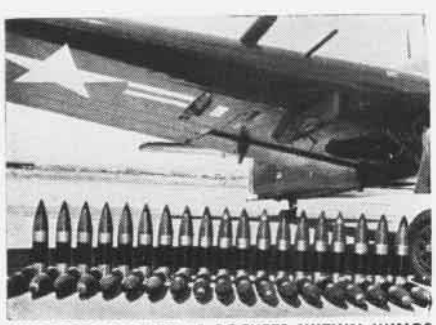
IN ITS continuing experimentation to add firepower to its attack planes, the Navy during the war mounted 75 mm. cannon in the nose of PBJ *Mitchell* bombers.

When the AD *Skyraider* attack plane came on the scene, the Navy tried out a new idea on it—spin-stabilized 5″ aircraft rockets fired machine-gun fashion through a launcher in the plane's wing. Although the Navy is not today using this weapon, details of the experiment make interesting reading.

This largest and most powerful gun ever fired from aircraft was called the Aero X10A. Under design and development at Douglas Aircraft Company's El Segundo plant for the *Skyraider,* the rapid-firing cannon was tried out at NOTS INYOKERN.

Two experimental rocket guns, each firing 19 five-inch spin-stabilized rockets were completely housed within the outboard panels of the plane wing. Exhaust from the rockets was directed downward below the wing by canted escape nozzles. The rocket gun weighed only 160 pounds each as compared to 1500 pounds for a 105 mm. aircraft gun installation another service experimented with during hostilities.

The rockets could be fired at adjusted rates up to three rounds a second per gun. The 38 rounds carried in the wings weighed three quarters of a ton and could be fired in six and a half seconds if desired.



SKYRAIDER CARRIED 38 ROCKETS WITHIN WINGS

Unlike the conventional rocket, the AERO X10A was finless and was stabilized in its trajectory like a gun projectile by spinning. Canted nozzles at the rear of each rocket caused it to rotate in flight as a bullet does from rifling in the gun barrel. More recently, the Navy has developed small 2.75″ rockets with folding fins, the *Mighty Mouse,* which can be fired from "package guns".

Quick Action Saves Plane

Lightning Sets Fire to VR-6 Transport

Quick action by H. C. Nichols, AD2, alert mechanic of Transport Squadron Six, saved a Navy R4D Douglas transport after it had been struck by lightning.

While the plane was at 9,000 feet near Lancaster, Pa., enroute to Westover AFB, Massachusetts, a sudden flash more vivid than those preceding was noticed. At the time the plane was passing through a thunderhead, one of many encountered on the flight.

Immediately after the flash the pilot, LCdr. V. G. Sanborn, noticed a burning odor. It was traced to the propeller deicer pump, located aft of the pilot's seat.

The pump was turned off and Nichols took a CO_2 bottle and stood by until the motor had cooled.

As he turned to station himself in the radioman's seat, he discovered flames shooting up through the floorboards under the seat.

He seized the fire axe, chopped a hole in the flooring and expended the carbon dioxide, extinguishing the fire.

Later examination on the ground showed that the fire had been caused by the lightning bolt which struck the fixed antenna on the belly of the plane.

It melted the lead-in at the insulator, then jumped to the nearest metal conductor which was the supply line for the alcohol de-icer. The force of the bolt fused the de-icer pump and punched holes in the supply line, allowing alcohol to escape and burn. Some hydraulic fluid which leaked was also ignited.

Nichols' coolheaded action averted a serious accident, for ceilings in the vicinity were below 500 feet and a safe immediate landing wasn't possible.

VF-12 Pilot Wins Three 'E's

Scores in Gunnery, Rocketing, Bombing

Lt. (jg) Sherman E. Brent of VF-12 reached a mark seldom attained by Navy pilots when he qualified for his third Navy "E" at NAS JACKSONVILLE.

The veteran pilot, who within three months qualified for the Navy "E" in gunnery, bombing and rocketing, is believed to have set a record for the Jacksonville area and perhaps the entire east coast in achieving ratings of excellence in three phases of aerial gunnery.

THREE 'E' BRENT IN HIS BEARCAT FIGHTER

Scoring his exceptionally high percentage of hits while flying an F8F-1 Bearcat, Brent garnered his first "E" in February of this year and his bombing and rocketing "E's" in May.

During his combat flying in the Pacific during World War II, Brent was attached to VF-3 which listed among other achievements that of being one of the first fighter squadrons to launch attacks on the Japanese homeland.

Grumman Wins Competition

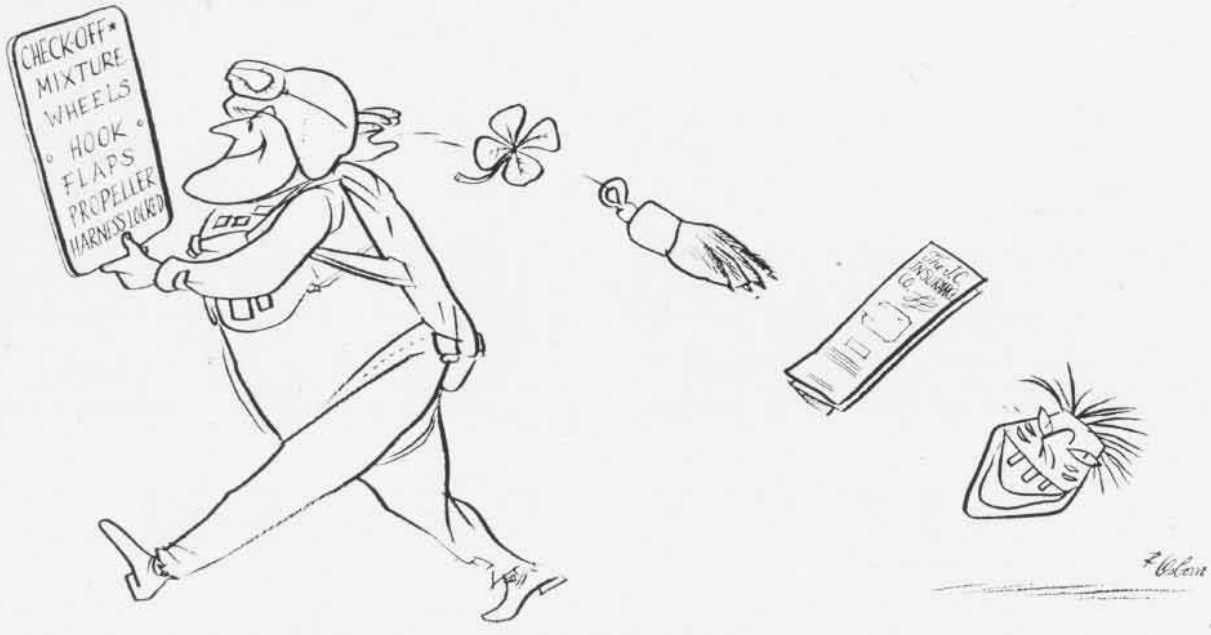
Is Twin-Engined ASW Plane For CVE's

Grumman Aircraft Engineering Corporation has been awarded first place in a competition sponsored by the Navy for a carrier-based antisubmarine plane.

Winning design was a 21,000-lb twin-engined plane powered by R-1820 Wright engines. It is intended for operations from "Jeep" carriers in all kinds of weather. It will carry the latest in ASW equipment.

A contract for two planes is being negotiated.

Runner-up in the competition was the Curtiss-Wright Corp. whose design was also for a twin-engined 21,000-lb plane. The company will be awarded a contract for completion of detail engineering.



Throw Away Those Good Luck Charms Use The Check-Off List

HAVE you ever stopped to think of the various things an average person forgets to do in the course of a few days? One morning he sneezes on the way to work and finds that he has forgotten to put a handkerchief in his pocket. Another day he takes out a cigarette and discovers that he left his lighter at home. Most of us can remember when some member of the family locked the keys inside the car and had to take a cab home for a spare. Annoying as these incidents may be, the fact remains that such errors simply don't prove fatal. As long as you keep two feet on the ground, you can even forget to put your trousers on. You'll be embarrassed and you may even get thrown in the clink if you get on the bus without them, but you won't be killed.

Perhaps this accounts for the fact that the average American home doesn't have a check-off list at the front door. If your life depended on never forgetting anything, you'd want such a list and you'd want it to be correct, complete, and up-to-date.

THEY SURE FLY BETTER WITH BATTENS DOWN

Unfortunately, this is exactly the situation that exists when you get ready to take-off in an airplane. Forgetting just one small item may have a very disastrous result. Even if you survive the ensuing crash, you may have considerable difficulty explaining the accident to an Aviator's Disposition Board.

The cases below are additional reminders of what happens when pilots fail to USE THE CHECK-OFF LIST:

Case #1

Pilot of a TBM-3E left the parking area and taxied to the turn-up area near runway 14 which was in use for night operations. After a satisfactory mag check, he requested clearance for take-off. Take-off was accomplished in a normal manner, and since the pilot intended to practice night touch and go landings he requested permission to remain in the traffic circle.

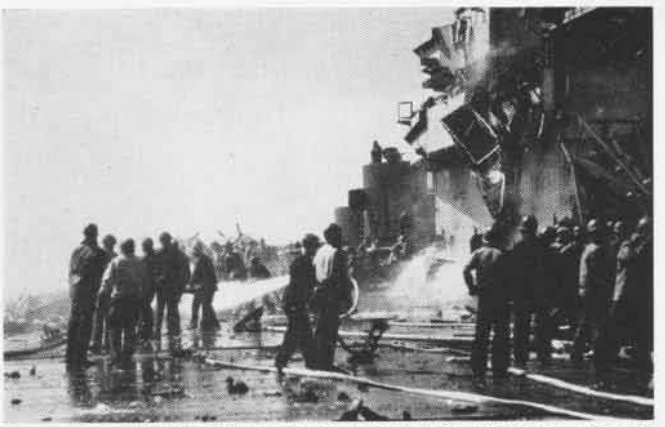
Upon clearance from the tower, he lowered his landing gear on the downwind lag and his flaps on the base leg at a speed of 120 knots. As he approached the runway in use, the control tower operator turned the lights off on runway 14 and turned them on for runway 17. At this moment the pilot discovered that he could not move the stick sufficiently to lift the nose of his plane. Unable to take a wave off, he grabbed his mike and requested that the lights be turned on again on runway 14. The tower complied with this request and the pilot continued in a nose low approach with reduced power after an unsuccessful attempt to raise the nose by adding throttle and moving the tab. The landing gear and propellor of the TBM hit the runway simultaneously.

Fortunately the pilot was not injured and the damage to the plane consisted of a bent prop. *The external elevator control locks had not been removed prior to take-off.*

Cases 2 to 13

These cases are just about as much alike as peas in a pod. All occurred in the same type airplane, and each pilot and co-pilot made the same error. They forgot to check the position of the landing gear switch in SNB's and JRB's before taxiing out for take-off. With the switch in the UP position, most of them ended in an ignominious belly slide as the wheels retracted too soon on the take-off run. A couple of pilots, however, managed to circle the field with the props slightly curled.

LCDR. L. J. CHECK MAKES HIS FIRST LANDING ABOARD USS HANCOCK



500-LB. BOMB ON TBM WHICH CRASHED DECK BROUGHT DEATH AND FIRE

LUCKY SEVEN

☆ THIS IS the twenty-ninth of a series of sketches of squadrons in World War II. It is based on reports filed with Aviation History and Research in DCNO (Air).

WITH Air Group Seven, VF-7 shared the good luck symbol of a horseshoe as a part of its insigne. Add to this the fact that the nickname of CAG-7's skipper happened to be "Lucky," and the omens were favorable.

Commissioned 3 January 1944, the squadron aboard the USS *Hancock* became a part of Admiral Halsey's Third Fleet in October of that year. During their first month, the squadron operated along the Eastern coast of the Nansei Shotoes, Formosa and the Philippines.

In their opening attack on 10 October, 17 VF-7 fighters escorted bombers and torpedo bombers on a strike against Amami-O-Shima. CAG-7 skipper, Cdr. John D. Lamade led the group, flying within 160 miles of the Japanese homeland. Rocket hits were scored on two merchant ships, several luggers and two gunboats. Aircraft installations on Kikai Jima were hit, and a 500-lb. bomb was put down in one of the main hangars at Tokuna Shima airfield.

Three other flights the same day sent six ships down, seriously damaged six others, and knocked out 11 sampans. VF-7 was off to a fine start!

Two days later strikes were launched against Karenko, a town on the eastern coast of Formosa, and Kiirun, off the north coast. In the afternoon, Ens. B. W. Adams and Ens. C. P. Sites broke up a division of four *Zekes*. Initiating the attack, Adams splashed two *Zekes* and Sites, one. The fourth got out in a hurry. Later in the patrol, Adams sent a *Jill* down in flames.

Lucky Seven made Friday the 13th as unlucky for the Japs as possible. At Karenko in 1-2-3 order, seven fighters led by Lamade reduced a chemical plant, a nickel plant and an aluminum plant to flaming ruins.

On the 14th, attacks continued over Matsuyama and Taien airfields on Formosa. In a dogfight with 11 bandits, two divisions led by Lts. Kenah and Bridges shot down four enemy planes.

At 1515, the clanging warning of General Quarters sounded through the ship. Pilots of Fighting 7 manned their planes, hoping to be off the deck before the enemy came in. Just as the engines were turning over, a *Judy* poked its nose out of the clouds, then darted back. Its bomb came screaming down and through the catwalk, port side forward. It exploded harmlessly in the water. This was a *Judy* without a Punch!

The next days were filled with strike schedules successfully undertaken and smartly executed. Aparni and Laoag airfields on northern Luzon were worked over. On the 20th, VF-7 flew sweeps over a wide area in the Visayan Sea.

All this was a part of the preliminary build-up for the Battle for Leyte Gulf. Air Group Seven's participation was initiated on 25 October when two strikes were launched against the Jap force that had sortied the San Bernandino Straits.

MEN ARE PACKING PUNCH FOR HANCOCK F6F

The fighters covered the bombers and torpedo planes during their attacks. Since no airborne opposition developed, it was possible to dispatch some fighter divisions to strafe AA fire just prior to the bombing attacks, and the covering fighters strafed and fired rockets in attacks after the bombing runs.

On the night of 25 October, the Japanese scurried back through the San Bernandino Straits and dispersed. Strikes were launched on the following day to attack stragglers. One of the groups, of which VF-7 fighters were a part, found a Japanese CL and a DD to attack. The fighters strafed both ships to divert and silence AA fire while the planes of Torpedo Seven made the runs and sank the *Agano*-class carrier. The DD was able to avoid the torpedoes launched against it.

STRIKE-PUNCTUATED, sweep-filled days of battle followed. Nichols Field, Clark Field, Cavite Field, and shipping in Manila Bay were targets. In the skies, Lucky Seven did a kind of sky-writing that spelled doom to the Japanese. Below they blasted AA positions, ammunition dumps, hangars, and dispersed aircraft.

Probably one of the most exciting dogfights took place when Lt. H. A. Soli's division at 18,000 feet spotted two *Zekes* and a *Val* at 24,000 feet. One of the *Zekes* made a head-on run at Ens. R. G. Hanecak who was leading the second section. The *Val* made a similar run at the first section. Ens. Hanecak opened up at 2,000 feet range. The *Zeke* finally pulled out about five feet over Ens. Hanecak who split-S'd and followed him down, both of them smoking. When Hanecak tried to pull over to the side of the *Zeke*, he spun three

times, so he cut his gun and pulled out at about 10,000 feet doing 350 knots. Lt. Soli and Ens. P. Holland came into view chasing the *Val*. Both *Val* and *Zeke* hit the sea.

After time out at Ulithi from the 9th to the 14th of November, the *Hancock* was on its way again. On the 18th, VF-7 was striking the Philippines again with Nichols Field as the elected bullseye. In addition to giving the target three solid goings-over, VF-7 downed two *Tojos* and three *Oscars*.

Shipping on Manila Bay and the Cavite Base were targets of the second sweep, and the end of the day found VF-7 forces attacking West Lipa and Batangas airfields. Installations, parked aircraft, scattered shipping received a full measure of bombs and rockets.

On 25 November, strikes were again scheduled for shipping in Manila Bay. Twelve fighters headed by LCdr. L. J. Check escorted bomber and torpedo bombers. Approaching the target, the bombers initiated their dive from 10,000 feet. After that, VF-7 took on a military convoy, and to top it off, the Skipper knocked out a locomotive.

Back on ship, a General Quarters sounded when a *Zeke* bent on a *kamikaze* mission, started a crash dive out of the sun. At 1200 feet, the *Hancock's* AA fire got the *Zeke*, and at about 300 feet, he started to disintegrate. It was another near miss as one of the bombs the *Zeke* carried landed 30 feet outboard of the deck-edge elevator. The *Zeke's* engine glanced off the flight deck by the forward elevator, resulting in a very smoky, but brief, deck fire.

A four-plane division led by Lt. (jg) A. C. Wockomurka, vectored out to pick up more attacking Japs, swiftly accomplished its mission—downed one *Val*, one *Zeke*, one *Frances*.

During the one week of active combat operations in December, VF-7 delivered its daily punches. On the 14th and 15th, the squadron struck heavily at enemy airpower in Luzon. After working over airfields in the area for two days, VF-7 was looking for targets. In addition to the aircraft and installations destroyed, VF-7 demolished 6 locomotives, 16 cars, and damaged more than 30 cars.

On the 16th, on general CAP, Lt. Odom's division, though greatly outnumbered, knocked down four *Zekes* of which Odom was credited with two, Ens. Nygaard with one, and Lt. (jg) Holland with one. LCdr. Check arrived near the end of the dogfight to send a *Betty* spinning down, and Lt. (jg) Barton wrote finis to another *Zeke*.

On 30 December, the squadron went into action again. In the early part of

F6F IS REARMED FOR NEXT STRIKE ON MANILA

January 1945, it supported Army landings at Lingayen Gulf and hit Formosa.

Kashun and Heito airfields were the first targets. Intercepted by a miscellany of Jap planes over Heito, LCdr. Check's flight downed five planes and put three others out of commission.

January 4th was Lucky Seven's unluckiest day, for the skipper went down on a pre-dawn sweep when he collided with his wingman after a dash through the clouds. VF-7 lost a great fighter and a great leader.

On the 6th, VF-7 hit airfields in the Cagayan Valley of northern Luzon. The airfields at Tuguegarao, Cabanatuan, Mabalacat and Bamban were worked over, but the targets were few.

On the night of 9 January, the *Hancock* commenced to operate in the China Sea. On the squadron's first attack on shipping, the fighters escorted VB's and VT's against a convoy outside Camranh Bay. A DE and two gunboats went down while a third was left beached and exploding. Other carrier planes took care of the rest.

Cdr. Lamade led a succeeding strike against another convoy. About 70 planes from various air groups participated in an attack which left few ships afloat, none undamaged. The day ended with a smashing attack on Saigon airfields, appropriately providing a climax.

On 16 January, VF-7's mission was to sweep South China Coast airfields and knock out all aircraft which might prevent strikes planned on the objective of the day—shipping in Hong Kong harbor.

It was too much to expect airborne opposition, but certainly there must be some ground aircraft for VF-7 to liquidate. But Chung Chang—no planes! Macao—no planes! San Chan Island—still no planes! Frustrated, VF-7 worked

HELLCAT PILOT BOARDS HIS PLANE ON HANCOCK

the fields over and returned to base. During the next days, VF-7 escorted strikes on Hong Kong.

The last days of battle operations were a succession of hard-hitting strikes and patrols. On the 21st, tragedy struck when a bomb that had been jammed in the bomb bay of a TBM fell out on the deck of the *Hancock*, exploded and killed 50 men. Of these, three belonged to VF-7.

Strikes on Okinawa on the 22nd marked the end of the tour. The battle-hardened veterans of Fighting Seven, who had lost valiant comrades, were ready to go. On a quiet note, their story ended: "Some of us received honors for actions of which we are all proud. Many of us will not return." And those who did could be proud of VF-7's record.

VF-7 LEFT ALUMINUM PLANT AT KARENK[illegible], FORMOSA, IN FLAMING RUINS ON 13 OCTOBER 1944

'BARS' DON'T SPEAK EASY

Operation of the nose wheel and oleo of Chance Vought's F7U-1 is studied by Capt. A. C. Olney, BAR Dallas, Texas, and his aides

Here a group of Navy inspectors coordinate their work as they make a final assembly inspection at McDonnell Aircraft Corporation

THERE'S no nonsense about Navy's Bureau of Aeronautics Representatives. When BARs say *No,* they mean *No,* not *Maybe.* It is the terrific responsibility of their assignment, rather than innate perversity, which makes the BARs tough, for safe and efficient performance of airplanes is their business. They can't afford to *speak easy.*

The road from contract specification to delivery of an aircraft or one of its parts is guarded by these watchmen for BUAER. The Navy orders what it wants and wants what it orders—not an approximation or a substitute, but the exact aircraft or article described in the contract.

The Field Inspection Service, which consists of the Bureau of Aeronautics General Representatives (BAGRs) and the Bureau of Aeronautics Representatives (BARs) with their assistants, has its offices and branches located throughout the country at strategic points. There are three main districts, each headed by a BAGR with the rank of rear admiral: Eastern District with headquarters in New York City provides the inspection staff for the 4th, 5th and 6th Naval Districts; Central District, Dayton, Ohio, for the 8th and 9th Naval Districts; and Western District, Los Angeles, for the 11th, 12th and 13th Naval Districts. There are nine BARs in Eastern; nine in Central and five in Western.

The BARs generally serve several contractors, but where one contractor has a heavy workload of Navy contracts, the BAR generally orders a Resident Representative (BARR) to the plant. The BARR then handles all Navy contracts of the plant and is, of course, responsible to the BAR.

BARs are often called upon to represent other government agencies. For example, if a plant is assigned a BAR, the administration and inspection of Air Force production contracts are undertaken by the BAR office. At Air Force plants, the Air Force reciprocates this service for Navy.

Difficult as the task of inspection is, it is by no means the only one for which the BAR is responsible. Security is an equally great responsibility. With jet and rocket-propelled aircraft zooming by in every Sunday supplement and attracting every kind of conjecture on the possibilities for their use, it can be no secret that great things are underway, but the *what, why* and *how* must not be revealed.

The secret projects of today are the planes of tomorrow, and so secrecy has a value that must not be underestimated or compromised. The BAR must decide what parts of the contractor's plant are closed to unauthorized visitors, and he must always watch for signals of subversive activity.

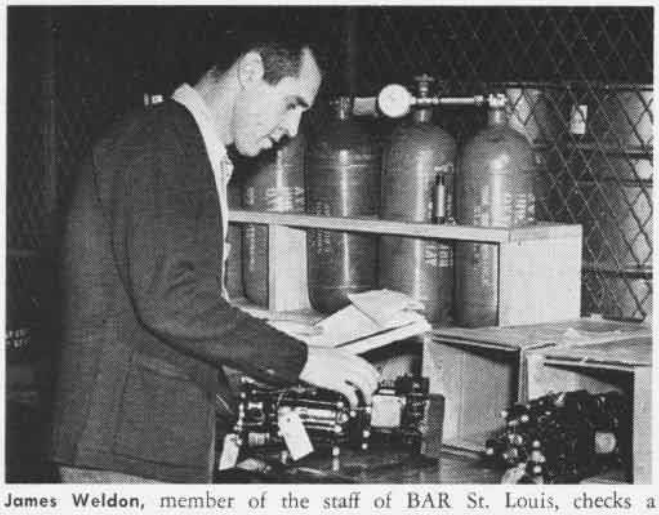
The fact that the Navy has its widespread net of inspection in no way relieves the contractors of their own responsibility in making sure that they are manufacturing materials and components in exact accordance with contract specification. Indeed, so great is the stake of the manufacturers in the proper building of their products that they have their own inspectors too, only more of them than Navy. The ratio of government inspectors to contractors' inspectors is one to 15. It is a useful double check, mutually advantageous.

Nothing can be left to chance, and it can be stated axiomatically that there is no such thing as too much inspection. To make sure that the contract is followed in exact detail, each BAR has a staff of aeronautical engineers, inspectors, and clerical assistants. Where some minor change is recommended by the contractor, it may be approved by the BAR. But any major change must be reported fully to BUAER for confirmation or rejection.

IN EACH BAR organization, the Inspection Division is divided into two sections: Technical and Inspection. When a change is made in the original requirements—and an airplane never gets to completion without scores of them—the Technical Section keeps the Inspection Section fully informed. Technical Section also keeps the Inspection men abreast of RUDM's.

Quality control begins with a review by BAR's Inspection Division of contractor's purchase requisitions. If a Navy inspection is required at the plant of the supplier, the resident inspector takes action. Materials and parts which are Navy-inspected at source receive only limited inspection later, but there is general surveillance until the airplane or finished part is complete.

Obviously, it is impossible for a government inspector to conduct a 100% inspection continuously in every department in the contractor's plant. So this is how it's done! To maintain effective surveillance over the contractor, sampling inspection is conducted by the Navy in receiving inspection, processes and sub-assemblies. At critical points throughout the plant, 100% inspection is conducted. Certain points on



James Weldon, member of the staff of BAR St. Louis, checks a source-inspected GFE starter during routine receiving inspection

Inspector Andrew Jenkins is inspecting a center wing panel assembly of an aircraft at the end of the center section assembly line

all major assemblies and completed aircraft are checked 100% by Navy inspectors. This is true of the careful "look" given flight safety equipment.

All manufacturing processes require rigid surveillance. Heat treatment is one of the most critical of these processes. Highly-stressed parts are designed with certain physical and fatigue-resisting properties based upon a specific heat treatment, so a high percentage of heat-treated parts are carefully checked by Navy.

Major assemblies, sub-assemblies and fabricated parts are inspected at various stages. Before any compartment is finally closed, it is inspected. After the unit has been completed, it is inspected to determine that all operations specified to be performed have been completed and that no undesirable strains have developed owing to improper riveting or welding technique.

FINAL assembly inspection of the completed aircraft is the big event. It is in this final assembly and flight inspection that the highest degree of Navy inspection is performed, and only the most highly-experienced men are used. Here their experience counts heavily.

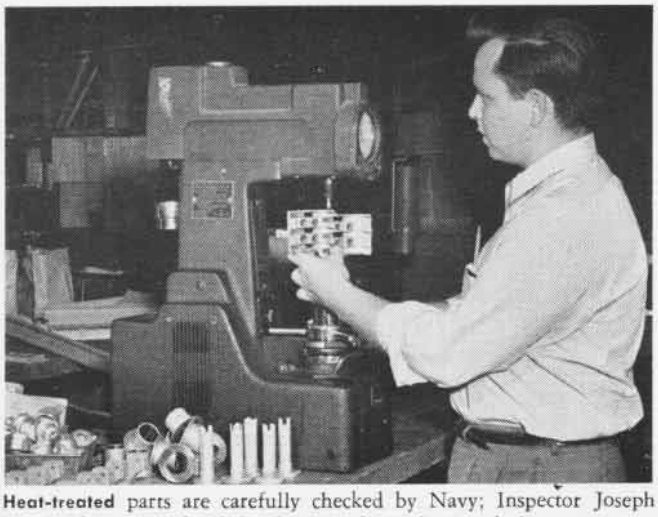
The executive officer of Chance Vought's BAR office, LCdr. Hal Nelson, a man with a historical turn of mind, recently added together the years worked by four civilians in the BAR office and found the total to be 109 years. If the four men, Thomas L. Blakemore, Gustaf Ekman, Lawrence E. McHenry and Fred H. Godeman, had been combined into one man with a talent for longevity, that man would have started his Navy work during the administration of President John Tyler. George E. Badger would have been Secretary of the Navy in those days, and this hypothetical patriarch would have been blissfully unaware of the intricacies of jet aircraft.

Production contracts include a provision for various types of spare parts. These parts get the same degree of inspection throughout the fabricating process. Then, because they will probably not be used for some time, they must be preserved for storage, individually packed and marked prior to shipping Navy inspection follows all these procedures and supervises the actual packing for shipment. After final packing, all shipment markings are checked for correctness in accordance with the Navy Shipment Marking Handbook.

All material which has passed the required tests and has been accepted by the Inspector is stamped with the official anchor stamp. Where possible, important parts, assemblies, component and spare parts carry the anchor stamp as an integral part of the component. Records of inspection stamps are carefully kept.

The Navy has three inspection stamps: the Anchor Stamp (final acceptance), the USN Stamp (provisional acceptance) and the Star Stamp (rejection).

Once the aircraft has been accepted and the final YES is given, the BARs know that it has paid off in safety and flying efficiency not to *speak easy*. With pride the contractor can realize he has now passed the highest tests with colors flying.



Heat-treated parts are carefully checked by Navy; Inspector Joseph Fry is taking a Rockwell hardness reading of a part before acceptance

BAR, Cdr. J. O. Christan, explains some of the unique features of *Banshee* cockpit to Capt. F. H. Brandley, CO of NAS ST. LOUIS

IF YOU WANT to see a really fancy airplane they have it at the Electronics Test Division at the Naval Air Test Center, NAS, Patuxent River, Md.

What it carries is of vital interest to every Navy pilot.

This Douglas R5D is loaded with more radio gear than any ordinary self-respecting plane would carry because its job is research. Its name is the Navy Delta.

The Navy Delta plane was converted to test air navigational systems which will improve the speed and safety of flight in any kind of weather, especially in fleet operations.

One particular piece of airways navigation gear it carries will soon be in every Navy plane.

It is the omnirange or VOR.

In January of 1952 CAA will begin tearing down all low frequency range stations. By the end of that year all Navy planes will be equipped with VHF omnirange receivers. Present plans call for conversion of multiengined tactical and logistic aircraft in fiscal 1951 and other types in fiscal 1952. This means that every Navy pilot will have to acquaint himself with VHF omnirange methods of navigation in the next two years.

Before we discuss what is entailed in this shift let's take a quick look at the Navy Delta which embodies all that's new for airways and fleet air operations.

The plane crew operates under the direction of Cdr. R. E. Laub. LCdr. W. W. Lamar is pilot, Lt. J. A. Montgomery is copilot, A. Cariglino, ADC, plane Capt., K. L. Adkins, ATC, Technician, and I. D. Irby, AEC, electrician.

Navy Delta is actually a flight laboratory. In fact, one section of the plane is fitted out as a lab. Here, in one airplane, for the first time are contained all the various systems of the past and some of the future. Prominent are the omnirange, LORAN, DME (Distance Measuring Equipment) and instrument landing systems. The ILS has been linked electronically with the autopilot to permit very low approaches untouched by human hands.

I. D. IRBY, AEC, USES SPERRY ENGINE ANALYZER

The cockpit instrumentation includes the zero reader, omnirange, ILS, DME, and all the standard indicators for ordinary flight by instruments.

Peculiar to the "front office" is the lack of a bulkhead which permits observers to watch operations with ease. Instead of earphones there are speakers overhead close to the heads of the pilot and copilot.

THIS SPRING a group of newsmen was taken for a demonstration ride. In making the approach, completely automatic, at Richmond, a snowstorm developed in such degree that the runway became visible only 30 feet underneath. Embarassingly, after the group had lunch at Patuxent the weather turned so bad that even the Navy Delta wasn't permitted off the ground. They returned to Washington by bus.

To say what is in the Delta would be correct only for the moment. There is a constant change of equipment. So much for the Navy's flossiest airborne job.

As of June 1 the CAA had installed 294 omniranges. Goal for the end of 1952 is over 400 of them, entirely replacing four course low frequency ranges.

The omnirange sits unimpressively on a 15 foot tower and looks like a squared off high hat. In the future when it is used in conjunction with DME it will look like a miniature railroad water tank with a pole DME antenna sitting on top.

Congestion of the airways today made necessary the demise of the four course ranges.

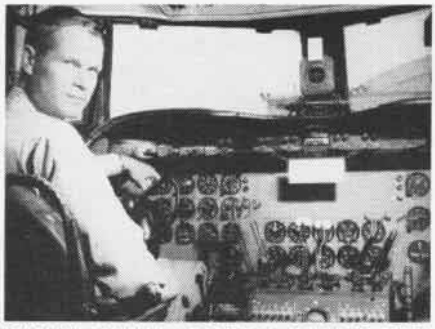
Many Navy pilots who flew big planes during the war are already familiar with the principles involved in DME.

OMNIRANGE FURNISHES a course for every one of the 360 degrees. It operates in the VHF zone of 112 to 118 mc., and is thus relatively free of atmospheric interference. Ordinarily omnirange can be received 30 miles by a plane at 500 feet and 100 miles at 5,000 feet.

An omnirange is tuned in the same as any other station. It is identified by its code signal and it has voice communication ground to air. A bearing selector can be turned to any bearing from 0 to 360 degrees. An indicator with a needle indicates left and right and another tells the pilot whether the bearing is "to" or "from" the station.

Omnirange must not be confused with VHF direction finding. It is better than that.

After tuning in the range the pilot turns the bearing selector to wherever it moves the right-left needle to the center and the "to-from" indicator reads "to". From there on in the pilot flies the needle. In passing over the omnirange station the "to-from" needle will flicker and shift to "from". To make sure he is flying on the course toward the station



LCDR. W. LAMAR AT CONTROLS OF NAVY DELTA

rather than its reciprocal the pilot need only note his magnetic compass heading, or, if that is unreliable, note whether the needle indicator is reversed or not. The reason for this situation is that the "to-from" refers to the direction of the range and not necessarily the direction in which the plane is flying. An omnirange bearing of 090° "to" the station would appear whether the pilot were flying 090° or 270°.

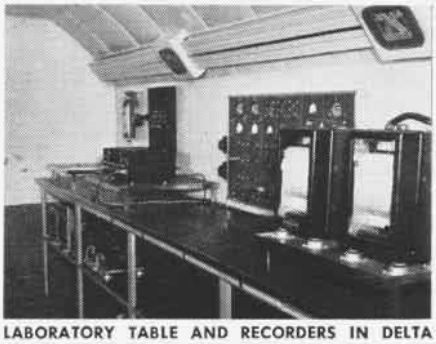
One beauty of this system is that it is already corrected for magnetic variation and wind drift. Wind drift you say? Impossible!

YOU SEE, the plane is placed in bearing from the station. Keeping the needle centered automatically crabs the plane the right amount to keep a constant mag. bearing and fly a straight-line course to the station. This makes figuring wind drift easy. Magnetic variation is corrected in the omnirange itself.

The omnirange receiver works by comparing a steady reference signal with one varying in phase 30 times per second. The angle between the steady signal and the varying one is measurable and where they cancel out is where the bearing indicator makes the needle center.

For the more distant future there will be Distance Measuring Equipment. DME is similar to the wartime Racon. Operating in the 1,000 mc. range, the transponder receives a triggering signal from the plane and then puts out one of its own. The plane DME measures time in milliseconds between its own emitted signal and the one received from the transponder. That gives the distance to the station. Up to 100 planes can use one DME station without interference.

Without DME a plane's position can be fixed by cross bearings from two or more omnirange stations. With VOR and DME located at the same site the



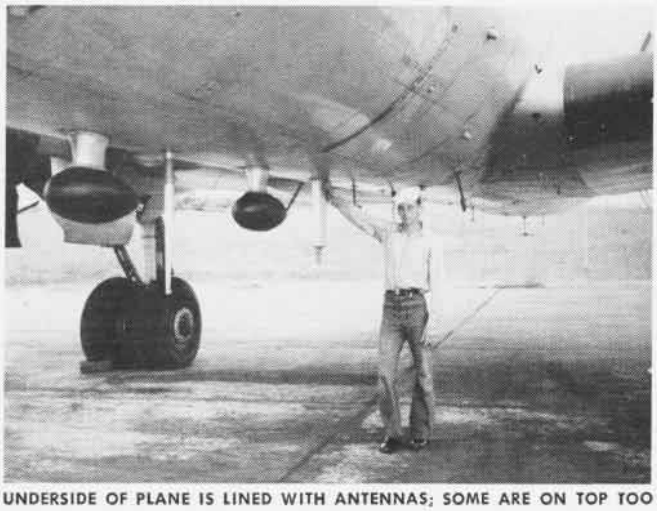
LABORATORY TABLE AND RECORDERS IN DELTA

pilot will have a bearing and distance from that site at all times.

In some installations it is planned to use DME in conjunction with Instrument Landing Systems. With a twin ILS and DME setup the pilot will not only follow the glide path to the runway but he will know also just how far he is from the end of the runway at all times.

Rho-Theta navigation is a system which combines use of information from VOR and DME. To do this on some sort of manual computer and plotter takes time when flying between two points neither of which is the site of VOR-DME.

This job will be taken over by a new electronic device called the Course Line Computer. It will calculate instantly deviations from any preset track.



UNDERSIDE OF PLANE IS LINED WITH ANTENNAS; SOME ARE ON TOP TOO

CDR. R. E. LAUB, ALL-WEATHER HEAD, SEATED AT REMOTE AUTOPILOT

L. M. ODEN RECEIVES DCSA FROM RADM. DAVIS

DCSA Awarded Norfolk Man

At 65 He Invented Spark Plug Machine

Retired once, then back in active service during the war and a successful inventor at 65 is the record of Lewis M. Oden, Sr., of Norfolk.

In recognition of his outstanding work in designing a spark plug gapping machine for the Overhaul and Repair department at NAS NORFOLK, Oden was recently awarded the Distinguished Civilian Service Award by RAdm. R. O. Davis, Commandant, Fifth Naval District.

Tremendous savings were realized from Oden's machine which simplified the method of adjusting electrode clearance on reconditioned spark plugs.

He originally retired in 1936 and returned in 1941. While stationed in the spark plug shop, he perfected the machine and subsequently submitted it as a beneficial suggestion. He received awards totaling $1,500.

In addition the Navy secured a patent for him. The machine may be used by government agencies without cost but every machine sold to private industry brings royalties to the inventor.

Blue Angels Fly at Memphis

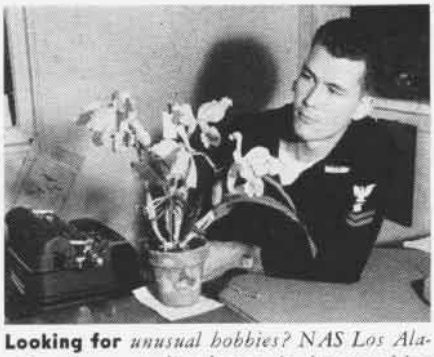
Betty Skelton Also Stars in Air Show

The Navy's famous team of aerial acrobats, the *Blue Angels,* were headliners in the unofficial opening of Memphis' yearly Cotton Carnival extravaganza. In the annual Air Show at NAS MEMPHIS, the *Blue Angels* enhanced their reputation as they put their F9F jet *Panthers* through their paces at better than 600 miles per hour. They made several low level passes before the crowd, zooming almost straight up in climbing demonstrations.

Their most thrilling acts were formation barrel rolls during which each pilot stayed "right in there." A single *Panther* flown by a *Blue Angel* swooped low over the field several times, zooming straight up in a series of slow rolls.

Tiny Betty Skelton, women's international aerobatic titleholder, was also featured in the show. She flew her "little Stinker," a specially built 568 pound biplane, through an intricate and beautifully executed pattern of aerial stunts that had the most seasoned pilots in the viewing ranks staring in open-mouthed admiration.

Also included in the show were parachute jumps by riggers from NAS LAKEHURST, a JATO takeoff by a P2V *Neptune,* and helicopter and fire fighting demonstrations.



Looking for *unusual hobbies? NAS Los Alamitos has an enlisted man in its recruiting office who has one. Charles E. Atkinson, PN2, built himself a small greenhouse and raises orchids for the fun of growing them.*

Marines Score Air Drops

R4Q Planes Work on Operation

VMR-252, CHERRY POINT—The Marines' new R4Q cargo aircraft got their first real test in *Operation Crossover,* supporting the "Allies" in the maneuvers.

On "Dog Day," four R4Q's transported 19,400 pounds of para-cargo over the drop area and, utilizing the new mono-rail dropping mechanism, disposed of all cargo within 10 seconds from their "on target" time. They scored 75% effectiveness in the drop. Again the same day, two more *Queens* dropped a total of 10,400 pounds of air cargo in the same time, scoring approximately 90% effectiveness.

On "D plus 1," one R4Q disposed of 8,000 pounds of water cans to friendly troops, and this time scored 100% effectiveness in the drop. Based on the record in this operation, Marines anticipate that with more practice on the part of pilots and loading crews, utilizing any opportunities available for future supply drops, the R4Q will be a handy and necessary airborne support weapon.

RADM. GREER AND CDR. DAVIS, VP-22 SKIPPER

VP-22 Wins Safety Trophy

Fleet Award goes to Privateer Outfit

At an impressive ceremony held recently at NAS BARBER'S POINT, RAdm. Marshall R. Greer, Commander Fleet Air Hawaii, presented Patrol Squadron 22 with the Commander Air Force Pacific Fleet Safety Award.

In competition with all patrol squadrons in the Pacific, VP-22 received the safety trophy on the basis of its outstanding record—1,732 flying hours without a mishap. Flying the famous *Privateer* aircraft, the squadron completed an intensified training program within the competitive period.

VP-22 was recently in the headlines for its part in the rescue of the ill-fated USS *Elder* which burned at sea. The survivors were pinpointed in a search of over half a million miles by the fliers of VP-22 10.8 flight hours after the search began.

BuAer Exhibit Goes North

New England States to See Aviation

The traveling Bureau of Aeronautics mobile exhibit which has been selling naval aviation over the nation will spend the summer in New England.

After spending June and July in New York, Connecticut, Massachusetts and New Hampshire, it will open its August itinerary on 5 August at Berlin, N. H. Other dates on the calendar are: Barre, Vt., Aug. 8-9; Glen Falls, N. Y., Aug. 11-13; Utica, N. Y., Aug. 15-16; Watertown, N. Y., Aug. 18-20; Oswego, N. Y., Aug. 22-23; Niagara Falls, Aug. 25-27; Jamestown, N. Y., Aug. 29; Pittsburgh, Pa., Aug. 31-Sept. 4; Johnstown, Pa., Sept. 6-7; Altoona, Pa., Sept. 9-10; Harrisburg, Sept. 12-13; Allentown, Pa., Sept. 15-17; Lancaster, Pa., Sept. 19-20; York, Pa., Sept. 22-24; Washington, D. C., Sept. 25.

The mobile exhibit consists of half a dozen huge truck trailers containing aeronautic exhibits, radar, cutaway jet engines and planes and other equipment to stimulate recruiting and Navy publicity. On its winter tour, the exhibit visited 31 cities, travelled 4,550 miles and had 183,575 visitors checked through its doors to view the exhibit.

Taxi signalman *with British-type bats directs pilot of* VR-24 *toward takeoff position at Royal Air Force Station near London; squadron serves Navy in Europe and Mediterranean area.*

While RAF *sergeant looks on, Moriority and Puckett of* VR-24 *finish packing a parachute.*

VR-24, LONDON—Would you like to tour Europe and Africa? Would you like to get in some instrument time? Then join this transport squadron which operates from Hendon Royal Air Force Station in the Eastern Atlantic and Mediterranean areas.

Flying weather from September to May is so rugged, 87% of the flights are on instruments. The rest of the year it is good—only 62% instruments.

Pilots see more foreign countries in a week than the average tourist could see in years. Mail, cargo and passenger flights take them to Stockholm, Oslo, Copenhagen, Bremen, Frankfurt, Amsterdam, Brussels, Paris, Madrid, Athens, Lisbon, Algiers, Nice, Naples, Malta, Cairo and Istanbul.

Since its December 1946 commissioning VR-24 has flown 3¼ million miles, some 16 million passenger miles, and 2¼ million cargo ton miles over Europe.

Two RAF *aircraftsmen get lathe tips from a Navy chief, James Combs, at* VR-24 *hangar.*

Cdr. J. E. Johnson, *skipper of* VR-24, *and Group Captain T. J. Arbuthnot, CO of Hendon station, return salutes from sentries.*

Rugged flying *weather over continent helps make* VR-24 *pilots Lt. John Dick, AP Ivan Edwards, Lt. Newton P. Byrd map conscious.*

One of *VR-2's more interesting passengers recently was Lt. (jg) Gordon C. McNeilly, Navy doctor who went aboard the Marshall Mars with his family. They will spend the next 18 months on Tinian island treating leprosy patients, following a month spent in training at Molakai, Hawaii, leprosarium.*

* * *

Reserve Squadrons Set Mark

North Woods Air Puts Pep In Pilots

When four reserve squadrons attached to NAS MINNEAPOLIS went to Bemidji, Minn. over a recent weekend they established a record for a two-day syllabus.

Squadrons VF-815, VF-816, VA-811 and VA-819 flew past the 900-hour mark 10 and 11 June.

Sixty of the *Corsairs* averaged more than six hours per day/plane utilization time and five and one half hours per day/pilot time, it was reported by Lt. (jg) A. E. Solberg, flight officer in charge.

Six hundred seventy six rockets and 876 miniature bombs were expended without an accident, and only two planes were downed for maintenance.

Bemidji is in the Paul Bunyan north woods country 220 air miles northwest of the Twin Cities.

* * *

Second *regular Navy Wave to graduate from parachute rigger school at Lakehurst weighs the gear she will use for her graduation jump. Roberta Jean Clevenger, PRAN, used a chute she packed herself for final jump.*

P-1 AUTOMATIC PILOT SYSTEM

THE NEW instruments and devices constantly being added to naval aircraft have imposed a multitude of tasks upon the pilots. But when another device—the P-1 automatic pilot—is installed, the job of maintaining the proper heading, pitch and bank attitude with trim adjustable, and properly executed turns is taken off the shoulders of the human pilot. Thus the P-1 autopilot, which is as adaptable to a P2V *Neptune* as it is to an AD *Skyraider,* has become the standby of naval as well as commercial pilots.

This newest of autopilot systems uses electrical sensory and motivating forces, making the maintenance of the P-1 strictly an electronic problem. The maintenance of a system which controls the actual flight characteristics of aircraft must be performed by responsible and well trained personnel.

For these reasons the Fleet Airborne Electronics Training Unit, Pacific (FAIRBETUPac) stationed at the Naval Air Station, San Diego, California, has established a course of maintenance instruction on the P-1 autopilot system for aviation electricians of the Pacific Fleet Air Force.

Objective of this training is to develop within the student the know-how to properly maintain and trouble shoot the P-1 equipment. All instruction in theory and practical work, test equipment, troubles and mockup design has been carefully concentrated into a three-weeks course.

The first phase of the course consists of training in the directional signal system, P-3 lightweight gyro flux gate compass system. This compass system is sometimes installed in aircraft without the P-1 autopilot, so this instruction is available separately to personnel of squadrons using only the compass.

The second phase provides instruction on the complete P-1 system mockup. The mockup is constructed on a ball bearing mounted platform with a model aircraft hung between two gimbal rings, permitting rotation about the three axis. All indicators and controls are mounted on the model with the control surfaces being actuated by the servos.

The functional operation is presented first, so the students may fully realize the importance of the system. "But how does it operate?" The answer to this oft repeated query is presented in four steps: *(1)* Establishing references, horizontal, vertical and directional, *(2)* developing a signal, *(3)* sensing the signal, and *(4)* developing the control forces.

Full use is made of the operating mockup and students are permitted to study the various indicators and other components in a discussion group. Students learn to pick off all the various operating circuits in straight line drawing form from the master wiring diagram of the P-1 system.

The students, by use of standardized job plans, perform regular preflight ground checks of the system.

When the students meet the "trouble box," they face the final and acid test of their knowledge. A "trouble box" contains several switches which are used to place typical circuit faults into the system. Here the students are required to perform trouble shooting in three steps: *(1)* Ground check, determine and state improper operation, *(2)* determine the faulty part of the system from the nature of the trouble, and *(3)* using proper test equipment, localize and isolate trouble.

A P2V type aircraft will be available to FAIRBETUPac's P-1 autopilot students in the near future. Then students will learn the complete flight test procedure during actual flight.

In addition to the above formal course, a local pilot checkout on the autopilot has been set up for FAIRBETUPac duty pilots and student officers who fly the P2V-type plane. This short course will consist of functional operation of the system, ground test procedure, and flight test procedure.

* * *

GCA BOX SCORE

Actual GCA landings set a new record for the Navy during May. A total of 875 planes were brought in when GCA was required—or else.

May approaches	12,041
May instrument	875
Total approaches	361,103
Total instrument	15,153

Here's a *Navy Cadet who has an Air Force Captain as an instructor! Exchange pilot Capt. F. J. Gshwandtner shows NavCad Roberts maneuver at Corry Field, Pensacola*

Reserves Score on All Fronts

NAS NEW ORLEANS—During May a surprise group strike was launched by pilots of VF-822 and VC-822. Plans were drawn up by WS-82 ACIO and CIC teams.

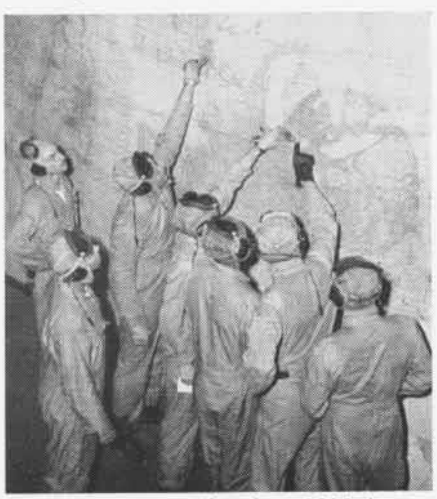
The complete problem was conducted under simulated battle conditions with briefing on all phases. The ACIO's presented their briefings with the aid of photographs and mockups of the general area with all the names of cities changed to those of a potential enemy. Fighter opposition and the various hazards of combat flying were brought out. Weather conditions, their advantages and disadvantages were covered by the aerologist.

The flight took off as planned and proceeded to the target area. After the strike, a post-strike interrogation of the pilots was held and all information evaluated by the ACIO's.

NAS OLATHE—A combined air attack problem was launched at Fort Leonard Wood Air Force Base. Olathe planes made up the attacking forces and NAS ST. LOUIS was the defending station. Wing Staff-88 ACI officers drew up the complete operation plans which included photographing of the terrain and other preparations that required more than three months to complete.

NARTU MEMPHIS—During its two-weeks cruise, VR-791 operated a daily round trip schedule alternating between NAS CORPUS CHRISTI and NAS PATUXENT RIVER. A total of 8,788 ton miles were flown and in addition local and cross-country training flights were conducted.

NARTU ANACOSTIA—Reservists in VP-661 conducted ASW exercises off Atlantic City on a recent weekend. Hourly Posit reports were received through the help of NAS ANACOSTIA.



Organized Reserve pilots from NAS AKRON plot course for a cross-country flight

VF-822 Reservists at NAS NEW ORLEANS line up during a training drill sporting new T-shirts colored to match those worn by flight deck personnel aboard carriers

NAS OAKLAND — Organized Naval and Marine Corps Reserve pilots have racked up an Oakland record by averaging 100.45 hours of syllabus flying during the first eleven months of fiscal 1950. Last year's average for the same period was 59.6 hours per pilot.

NARTU LAKEHURST—During May, ZP-911 reported aboard from NAS SQUANTUM for its annual cruise. Pilots averaged 27 hours during the cruise despite the fact that 50% of their flying days were lost to weather.

NAS BIRMINGHAM — Poor weather on drill day failed to slow down syllabus flying for VF-681. Seven pilots filed IFR in F6F's from Birmingham to Campbellton, Georgia, and return. A stack on Birmingham's approach control and instrument approach to the field with a 1100′ ceiling, completed the operation for a 4.0 drill.

NAS OAKLAND—VMF-141 has completed a series of missions with nearby Marine ground units. With VMF-141 providing air support for ground personnel, amphibious assaults were conducted and beach-heads were established.

Teamed for Defense

NAS GROSSE ILE—Lt. John Ratcliffe, Royal Canadian Navy, and Lt. Edward Fallen, Royal Canadian Navy Reserve, were aboard with CNO clearance to make a survey of procedures and training methods in the administration of the Organized Reserve program that would be applicable to the proposed Canadian Naval Air Reserve program.

NARTU NORFOLK—Fleet units still use the NARTU ground school facilities on weekdays with VC-62 as the current "lease-lenders". Also on the list were the Canadians who were down to learn about TBM's and were temporarily with Fleet FASRON-3 They were greatly impressed with the Reserve's cutaway engines and panels.

NAS OLATHE—This station was the staging point for the annual Marine air lift in which 550 officers from the Fort Leavenworth Command and the General Staff School were transported in 27 R5D *Skymaster* planes to San Diego to observe the amphibious operation known as "Demon III".

NAS MINNEAPOLIS—At 0030 the GCA Unit was alerted for an Air Force C-47 which requested GCA when twenty miles from Wold-Chamberlain Field. The reported weather was visibility 1/8 mile, heavy fog, ceiling obscured. The aircraft made an excellent approach and was landed to touchdown at 0050.

Local AF personnel now are able to take classroom training with Navy O-2 personnel, provided that no additional workload is imposed on the instructor.

NAS LOS ALAMITOS—During May, a group of 20 Air Force Reservists from the 452nd Bomber Wing's Communications Squardon visited the station to attend a GCA movie and watch the GCA unit operations.

On Armed Forces Day, 16 fighter pilots of VF-776, led by their skipper,

Cdr. Sauer awards General Excellence Trophy to Cdr. Turinetto, CO of Volunteer Aviation Unit 11-12, Santa Monica, as Cdr. Kerschner and LCdr. Beckstrom look on

Lt. D. A. Raymond, flew fighter cover over 12 AF Reserve B-26's in an aerial parade over Long Beach and the harbor.

NAS GROSSE ILE—A fly-over of Naval Reserve, Marine Reserve, Air Force and National Guard planes brought Armed Forces Day to the attention of more than 2,000,000 people in the lower Michigan area. These flights passed over 12 cities and numerous large communities. The largest flight was over Detroit, where 136 aircraft flew a parade formation.

NAS OLATHE—As a prelude to the 2472nd Air Force Reserve Training Center move from Fairfax Field to this station, Navy fighter planes provided cover on 21 May for the first of many p ojected missions between the two Reserve units.

The mission was a simulated air evacuation of AF personnel from a fictitious base in Des Moines to Olathe.

NAS MINNEAPOLIS—Instrument approaches were made by the GCA unit on three Air Force aircraft carrying the Secretary of Defense, the Undersecretary of the Air Force, Minnesota Senator Thye and Representative Hagen.

Volunteers On the March

ELEVENTH NAVAL DISTRICT — In competition with fifteen other Naval Reserve aviation units in the Eleventh Naval District, VAU-11-12, Santa Monica, won the coveted honor of being named the "Outstanding Volunteer Aviation Unit of 1949".

The score of 94.97%, compiled by this VAU was the highest score ever made by any aviation unit in 11 ND.

NAS LOS ALAMITOS—Fourteen officers of the Volunteer Reserve from all over the country came aboard for a two-weeks refresher course in aircraft maintenance. The original syllabus was increased to 105 hours to include field trips to Northrop Aeronautical Institute, Douglas Aircraft Company, Aluminum Corporation of America, Goodyear Aviation, Dupont and various other aviation procurement sources.

NAS GLENVIEW—Eighteen Reservists in VAU-1, Moline, were aboard for two-weeks duty during May. Fighter pilots were checked out in the F8F *Bearcats*, while multi-engine pilots flew the SNB and R4D.

Make Theirs 'Navy'

NAS NIAGARA FALLS—The Douglas family of Niagara Falls is Naval-Air-Reserve-minded. Leon A. Douglas MEB2, a World War I vet, his son, Lt. (jg) Charles R. Douglas and his daughter-in-law, WAVE Catherine Douglas SR, a hospital corps striker, are all members of Wing Staff 85. In civilian life, the elder Douglas is a locomotive engineer; his son, a medical student; and Mrs. Charles R., a research librarian for a chemicals manufacturer.

NARTU NORFOLK—Following in their father's footsteps, Mervin and Melvin Fiel, 17 year old twins, recently signed up with the Naval Air Reserve. The boys' father Andres Fiel retired from the Navy submarine service at the end of World War II.

NAS LOS ALAMITOS—Among the seaman recruit Waves now taking 'boot training' are a mother and daughter combination; another Wave 'boot' was recruited by her father, a yeoman in VC-774.

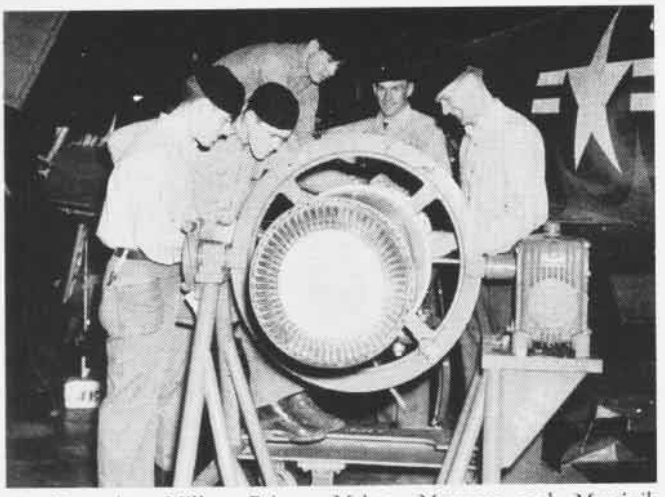
NAS OAKLAND—Nominated for "the pilot who travelled the longest distance to drill" is Lt. Louis E. Rossi of VF-878. On one weekend he covered 2600 miles via car, commercial air and his own plane to get to Oakland "because he liked to fly jets."

Lt. Rossi of Hardin, Montana, has been in the Organized Reserve since its post-war inception and has logged 4400 hours, civilian and Navy. A crop-duster in civilian life, Lt. Rossi has missed drill only once.

NAS DENVER—Among the Organized Reserve officers who have chalked up perfect drill attendance records are

PIO Riester congratulates Navy veteran Andres Riel whose twin sons, Mervin and Melvin, just joined the Naval Air Reserve

'Welcome aboard' says Lt. L. Wilson to new weekend warrior L. A. Douglas as son Charles and d-in-law Catherine stand by



Air Reservists Miller, Prince, Maher, Matarese and Marcinik check engine of one of the 8 jet *Phantoms* at NAS WILLOW GROVE

NARTU Jax PIO Coghlan with H. Moore, J. Beaty, B. Thompson, S. Long, P. Harrell, and M. Marshall who graced Jax float

several who have to travel approximately 1000 miles to get to the station and back each month. They come from Albuquerque and Los Alamos, New Mexico; Scotts Bluff and Crawford, Nebraska; Tribune and Goodland, Kansas; Laramie, Cheyenne, Rock Springs, Pine Bluff and Glen Rock, Wyoming.

Men Who Do Things

NAS ST. LOUIS—W. G. Berg AM-1 of VF-922 and B. H. Huene AMH-1 of VF-923 designed and constructed a universal wing repair dolly under the supervision of R. L. Jones AMC of the metal shop. The dolly accommodates all of the smaller type wings of both VF and VA type aircraft in any position from vertical to horizontal and simplifies the job of the metalsmith working on the wing panel.

NAS MINNEAPOLIS—As an aid toward training personnel in the fundamentals of hydraulics, Donald Fransen AM1 and Dwight Henson AD1 have designed and constructed a powered and activated basic hydraulic panel.

In the line of ingenuity, C. H. Abelson ADC has figured out an idea that permits the instant lowering and righting of a nosed up or nosed over aircraft in order to remove it from the runway. The idea makes use of an adaptor which is universal for all aircraft and is used on the standard large Sterling crane.

Still another idea has been suggested by H. J. Brunner AM2. This involves using a hypodermic needle for the application of the new liquid to cracks in plexiglas to repair or reinforce them.

NAS GROSSE ILE—J. M. Herman AMC has constructed a double-sided training panel showing a complete set of metal patterns on one side and a complete set of hand tools used in metalsmithing on the other. All items are mounted so they can be quickly removed for close examination.

NAS MINNEAPOLIS — When the Navy was called upon in the middle of the night to fly six vials of influenza Anti-H Typo-B Serum to Rapid City, South Dakota, to be administered to a three month old baby critically ill with influenzal meningitis, LCdr. Robert L. Feiten and Lt. (jg) Thomas O. Milton got it to the hospital within four hours.

Up the Ladder

NAS MIAMI—Two former stationkeepers, James W. Kirk AA and Herbert J. Recker AA, are now enrolled in the NavCad program at Pensacola.

NAS MINNEAPOLIS—Eleven candidates were successful in passing the competitive examinations for appointment to the Naval Academy and as of 1 June 13 ROC candidates had already received orders for summer training.

NAS OAKLAND—From boot to Ensign in seven years is the record of A. J. Schaffer, former RM1 of the technical training department, who has just been given a commission in the Naval Reserve. During the war Schaffer served aboard the *Maury* and saw action at Midway, Santa Cruz, Guadalcanal, Tassafaranga, Kula Gulf and Villa Gulf.

At NAS NEW ORLEANS, L. Armstrong gets chief's rate from FASRON-821 CO Trapolin

Three men of VC-872, Don Walsh AA, Guy McElroy AA and Harold Phillips AA, passed their entrance examinations for Annapolis. Walsh and Phillips were accepted under the Naval Reserve quota and McElroy has a senatorial appointment.

NAS NEW ORLEANS—Another Organized Reservist has made chief. His name is L. A. Armstrong ADECA.

Station Round-Up

NAS LOS ALAMITOS—This station played host to 317 Boy Scouts and their fathers on a "Fathers and Sons" overnight encampment, which was the largest gathering of this kind held here.

NAS GROSSE ILE—At a pistol match in Tampa sponsored by the National Rifle Association, aircraft ordnanceman J. C. Forman of Grosse Ile and his mates on an all-Navy team set a new world mark in the .22 cal team event.

NAS LOS ALAMITOS—All seven members of the Long Beach City College volleyball team, one of the strongest in the State, joined the O-2 program while they were aboard to play their matches.

NARTU ANACOSTIA—VF-662 now numbers 12 Calvin Coolidge High School students among its members.

NAS NEW ORLEANS—On drill weekends, plane handlers now sport new T-shirts colored to correspond to those worn by flight deck personnel on carriers.

NAS WILLOW GROVE—Although jets are now an old story at this station, pilots are still eager to fly them and maintenance personnel like to work on them.

NARTU JACKSONVILLE—PIO's certainly had to work hard to make Armed Forces Day a success, but now and then they had a few compensations. Take Lt. (jg) Frank Coghlan, for example. It was his arduous task to line up local beauties for the NARTU float (an F8F *Bearcat*) in the parade. And he even got his picture taken with them.

Heroism After P2V Crash

C. L. BRILL, SN, THANKS PAUL POLLAKIS, AN, FOR SAVING HIS LIFE

ON 1 JUNE THE CRASH OF THIS NEPTUNE TOOK A TOLL OF NINE LIVES

THE tragic crash of a P2V-2 *Neptune* at NAS QUONSET POINT early in June, which brought death to nine members of the 11-man crew, was a scene of heroism.

Albert P. Metrolis, ADC, a chief pilot attached to NAS Operations, saw the doomed plane coming in for an approach. Upon the attempted landing, it bounced from the strip and rolled over on its port side. The port wing snapped off the fuselage.

"I started running toward the crash as it burst into flames," Metrolis said. "The operations officer, Cdr. Fowler, passed me in a car, followed by the duty trucks of the Operations Crash and Rescue Section."

Three seamen from VP-7, Jay E. Alverson, James J. Heimann, and Charles L. Brill, on duty with the Line Crew, were standing by in a jeep. The three men raced to the scene of the crash and were among the first to get to the burning plane.

"When we got to the plane," Alverson stated, "Heimann ran to the co-pilot's side, and I went to the pilot's side of the ship. Charlie Brill grabbed a foam hose. We all stopped to see if we could hear any voices inside, and when we didn't, we looked around for the easiest place to get into the plane."

Seaman Brill, manning the foam hose, stood in a large puddle of the foam midway between the nose and broken tail sections of the blazing *Neptune*. He turned suddenly and found himself surrounded by fire from the gasoline which was leaking from torn tanks into the foam puddle.

He dropped the hose, finding himself alone, and started to run out of the suds. He tripped and fell, breaking the foamy blanket, and the gasoline-drenched dungarees he wore started burning.

He ran to dry land, but the wind increased the intensity of the flames which covered him from head to foot. Then something hit him, and he found himself again in the pinkish blanket of suds.

The "something" that hit Brill was Paul Dixon Pollakis, AN, of the Operations Crash Crew. Pollakis' timely tackle knocked the burning Brill into the suds.

"I saw someone surrounded by flames in the foam," Pollakis said. "He started to run but due to the slippery sand beneath the foam, the guy fell down. He was trying to get to his feet, but kept falling on his hands and knees. Then he regained his feet and ran out of the puddle, his clothing all aflame. I ran at him and tackled him around the waist, and both flopped in the foamite.

"I had a raincoat and tried to smother the fire on him by keeping him under me, and it worked."

That quick thinking saved Brill's life.

While this was going on, Alverson, Heimann and Metrolis joined in the effort to free the pilot and the co-pilot from the smashed-in cockpit.

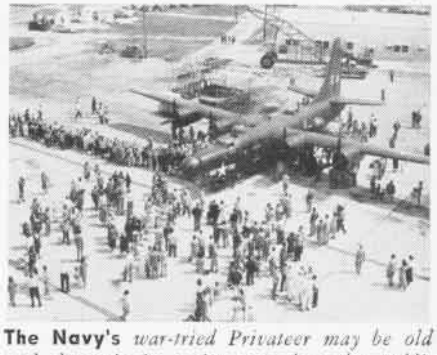
"I saw someone's head and shoulders hanging face down near the escape hatch, so I started to dig with my hands," Heimann said. "I then saw some guy with a shovel, so I grabbed it and with some other men started to dig. Then the guy in the plane (Co-Pilot Harold A. Hamberg) mumbled something about his shoulder straps holding him, so a corpsman (P. B. Merriam, HM3/C) and Cdr. W. W. Brehm (Assistant Operations Officer) cut the straps and we pulled him out."

Cdr. G. E. Frauenheim, skipper of VP-3 and pilot of the *Neptune,* was pulled out in the same way. Both pilots and Brill went to sick bay.

The Operations Crash and Rescue Crew, aided by the NAS Fire Department, and scores of volunteers, joined in keeping the blaze under control. The fire fighters were in constant danger of being caught in the blast of flames had the gasoline tanks exploded.

The starboard wing, wrapped in fire, was pulled away from the fuselage by a crew who cut holes in the wing and then hitched a cable to a cleat track. It was towed to a spot where it could cause no damage. This followed a suggestion from LCdr. D. C. Carmichael, Exec of VP-8.

Typical of all-out efforts by civilians and sailors in combatting the blaze were Otto Kruger, a civilian, and John R. Fleming, AD3 of NAS Operations. These two men stood directly beside the blazing airplane, directing their foam hose into it. They stood their ground, oblivious to danger even when ordered to withdraw, in the hope of extinguishing the fire and saving the victims trapped in the wreck. But it was no use. When reached, the crew had perished. It is believed they died in the initial crash.



The Navy's *war-tried Privateer may be old and decrepit in a jet age, but the public still likes to look at them. VP-23 at Miami put one on display, and the public was interested enough to stand in line. The Blue Angels put on an exhibition to help secure attention for recruiting of NavCads.*

P&W MARKS 25th BIRTHDAY

THIS is initially the story of one man, one company, and one institution, and how they worked together.

Twenty-five years ago a lanky engineer came to Hartford determined to build radial air-cooled engines. Once he found the financial backing, he organized his company.

The Navy's part was Admiral Moffett's expressed view that if such an engine as this man proposed to build succeeded, Navy wanted to use it.

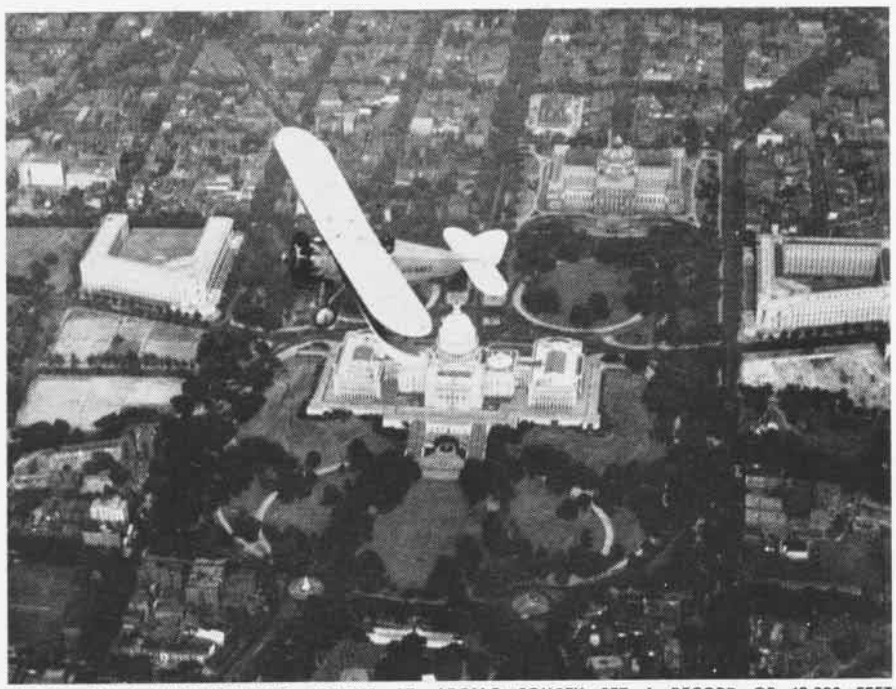
The leading participants had stepped on the stage—Frederick B. Rentschler, Pratt & Whitney Aircraft and the U. S. Navy.

Five men whom Rentschler chose to work with him were George J. Mead, A. V. D. Willgoos, D. L. Brown, John Borrup and Charles Marks. They started to work on 3 August 1925, ambitiously setting as their goal a 400-horsepower air-cooled engine which was to weigh no more than 650 pounds, a project enthusiastically seconded by Chance Vought who knew he could use it. That was the beginning of the Wasp.

This engine had an ingeniously designed forged crankcase, which reduced the weight of the engine, and a two-piece crankshaft with a solid master rod. This arrangement made possible 1900 rpm which was 250 more than its nearest competitor and, of course, increased its power.

On 5 May 1926, the Wasp took to the air in the Wright *Apache* flown by Lt. C. C. Champion Jr., BUAER test pilot. The Navy was delighted with its success.

That summer Cdr. Eugene E. Wilson, then head of the engine section of the Bureau of Aeronautics, wrote in *Aviation* magazine: "The Wasp incorporates some of the finest engineering yet seen in aircraft engines, plus workmanship for which Pratt & Whitney is known. There seems no doubt now that this new engine is, even at this early point of development, considerably advanced over any other air-cooled engine of its class that we know of. . . ."



IN 1930 IN A WASP-POWERED APACHE, LT. APOLLO SOUCEK SET A RECORD OF 43,000 FEET

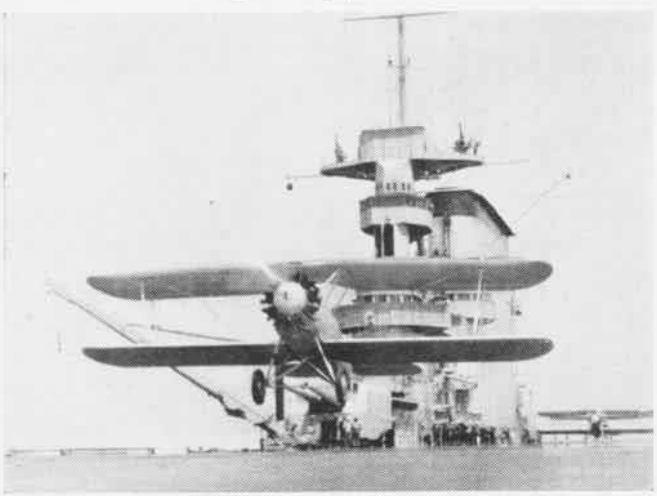
In October 1926, the Navy ordered 200 Wasps, and by the end of 1927 Navy had its engines, and P&W had chalked up a record of production of which any firm might well be proud.

The Navy's need for an even more powerful air-cooled engine for carrier-based bombers and torpedo planes had caused P&W to begin development of the Hornet even before the first experimental Wasp had been completed. When the Hornet passed its test on 25 March 1927 with a rating of 525 hp and a weight of only 750 pounds, P&W had accomplished the feat of designing, building and qualifying two of the most advanced power plants of that time in less than two years.

The success of the Wasp in the O2U, F6C4 and F2B and of the Hornet in the T4M convinced the Navy that the air-cooled engines were here to stay. Navy ordered 102 Hornet-powered T4M torpedo planes, and in 1927 announced it would build all its aircraft around air-cooled engines.

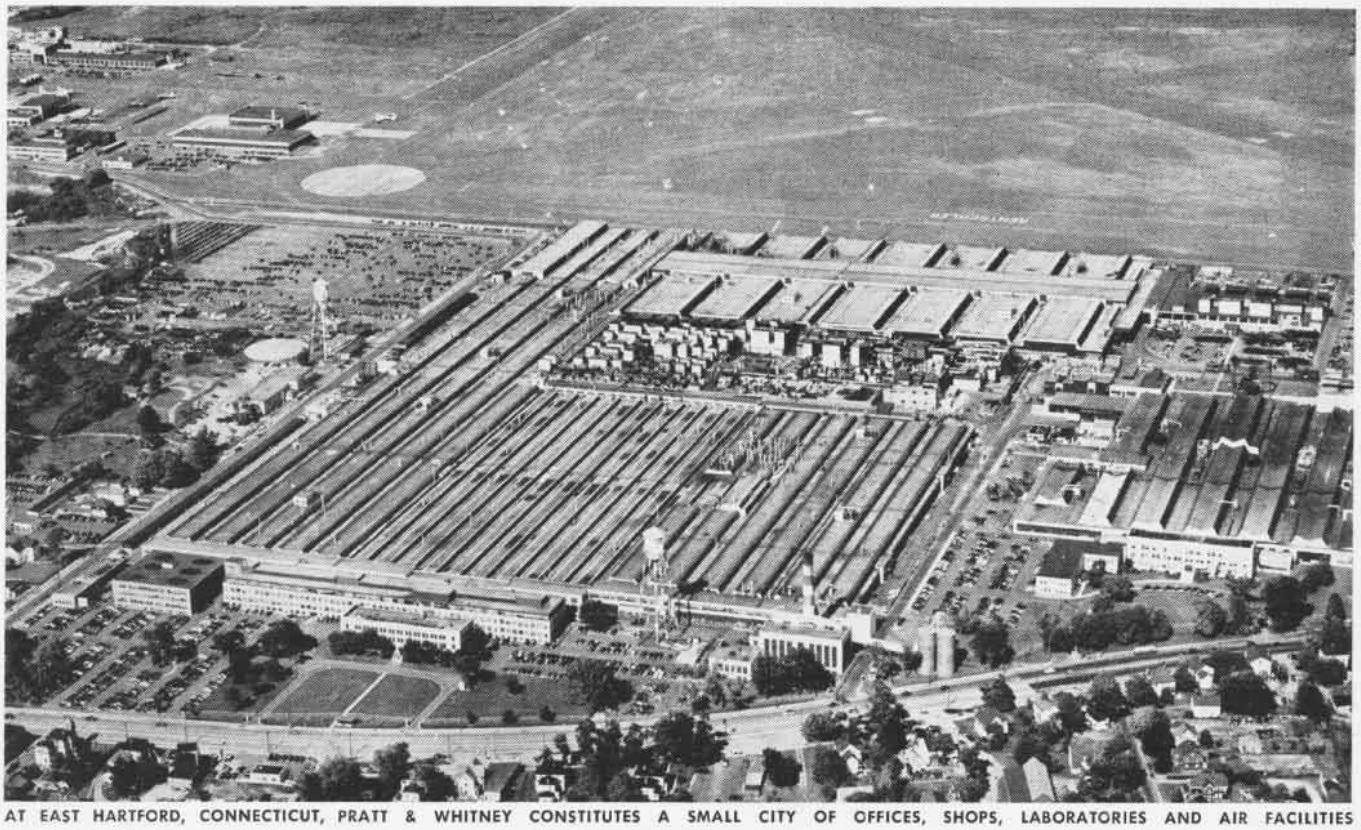
IN 1928, the Naval Aircraft Factory fitted two Hornets on the PN-12, and 60 days later it had made five world records.

The demand for faster planes meant



LT. FORREST SHERMAN FLEW THE FIRST CORSAIR OFF THE OLD 'SARA'

IN 1926, LT. C. C. CHAMPION, JR., TESTED FIRST WASP FOR THE NAVY



AT EAST HARTFORD, CONNECTICUT, PRATT & WHITNEY CONSTITUTES A SMALL CITY OF OFFICES, SHOPS, LABORATORIES AND AIR FACILITIES

the development of engines with more horsepower, greater capacity and longer service life. Through the years, P&W made larger engines, designed them with two rows of cylinders, installed superchargers, developed silver-lead-indium bearings, improved lubrication, and incorporated water injection. During World War II, one of P&W's great achievements was the 28-cylinder 4360 Wasp Major with its four rows of cylinders yielding 3500 horsepower.

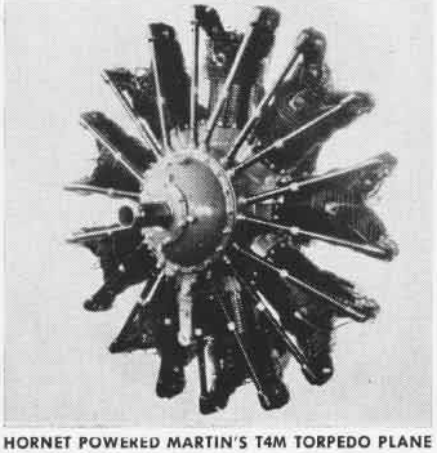
A forerunner of the R-4360 was the R-1830 Twin Wasp at which P&W was hard at work in 1935. This was a 14-cylinder, double row engine rated at 800 bhp—the highest takeoff rating at the time—designed for such aircraft as the JF-1, P3Y-1, and the TBD-1. During World War II, the R-1830 was used in the *Catalina,* the *Coronado,* the *Liberator,* the *Privateer* and the *Wildcat;* and the R-2800 Double Wasp, developed from the R-1830, powered the war-proved *Hellcats* and *Corsairs,* as well as the *Venturas* and *Harpoons.* The Grumman *Tigercat,* also powered by the Double Wasp, arrived at Okinawa just as the war ended.

THOUSANDS of Army and Navy pilots were flying behind the Wasps, and the thousands of men and women in many parts of the country cutting, grinding, buffing, polishing and inspecting the 14,000 parts in each engine knew their jobs were essential. The challenge of war had caused a tremendous expansion, so that in Connecticut, Massachusetts, Michigan and Missouri, P&W Aircraft had its forces at work.

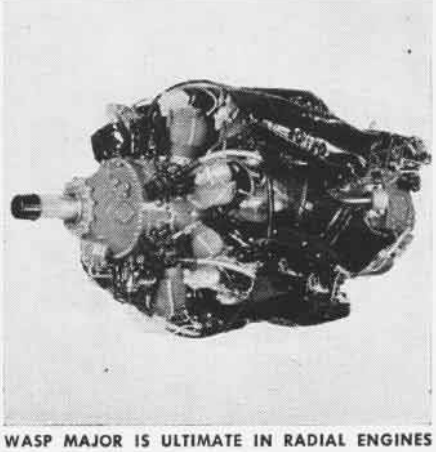
In all, Pratt & Whitney and its licensees produced 363,619 engines in World War II, fifty percent of all the horsepower required of the combined American Air Forces.

The R-4360 Wasp Major was the largest engine to be developed to the point where it was accepted for military use before the end of World War II. In the summer of 1940, P&W had become interested in developing a multi-row radial engine, and a few months later the engineering department had the green light to start on this program. Successful flight tests were completed in May 1942, and the first engine was delivered to the Navy two weeks later. By January 1945, the Wasp Major with its 3500 hp rating was unequalled any-

THE ORIGINAL WASP, RATED AT 400 HORSEPOWER

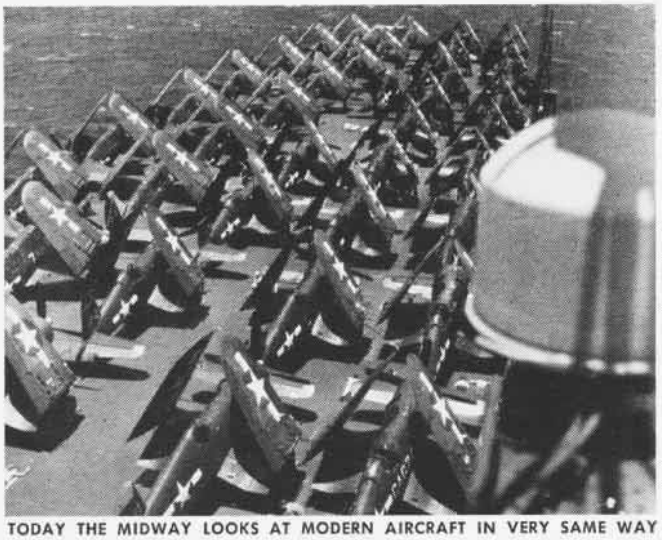


HORNET POWERED MARTIN'S T4M TORPEDO PLANE



WASP MAJOR IS ULTIMATE IN RADIAL ENGINES

'SARA' WAS PROUD OF HER AIRCRAFT, ALL POWERED BY P&W ENGINES



TODAY THE MIDWAY LOOKS AT MODERN AIRCRAFT IN VERY SAME WAY

where. The Navy uses it in the R-60 *Constellation*, the P4M-1 *Mercator* and the AM-1 *Mauler;* and the Air Force's B-36 is powered with the same engine.

But the demand for even greater speeds than reciprocating engines could provide pointed the way to the development of gas turbines. During the war, P&W had had to devote all of its effort to the building of reciprocating engines, but with the end of hostilities, it intended to develop a gas turbine as notable as its wartime engines.

A significant milestone in P&W's postwar course was Navy's decision to bring the Rolls-Royce Nene to this country. Its rating of 5000 pounds static thrust was attained with a total engine weight of 1700 pounds, a weight/power ratio that Navy was interested in for use in its new fighter, the Grumman *Panther.*

WHEN Navy asked P&W to undertake this project, P&W seized the opportunity. The problem of doing the engineering required to bring the Nene into quantity production was a challenge, particularly since the Navy contract specified that the first American built Nene must roll off the East Hartford assembly line in November 1948—just 17 months from the time the first Nene blueprints has been obtained.

Despite the obstacles — translating British blueprints into American technical language and redesigning the accessory case and drive system—P&W had the J-42 running in March 1948. Just seven months later, the J-42 had completed its 150-hour qualification test at a rating of 5000 pounds thrust dry and 5750 pounds thrust using water injection—the highest power rating of any turbojet in production in this country at that time.

The Navy had brought forces into play that produced the very fruitful collaboration between Rolls-Royce and Pratt & Whitney. The pooling of the engineering talent and research facilities of these two great companies yielded a turbojet engine rated at 6250 pounds static thrust, known in England as the Tay and in the United States as the J-48.

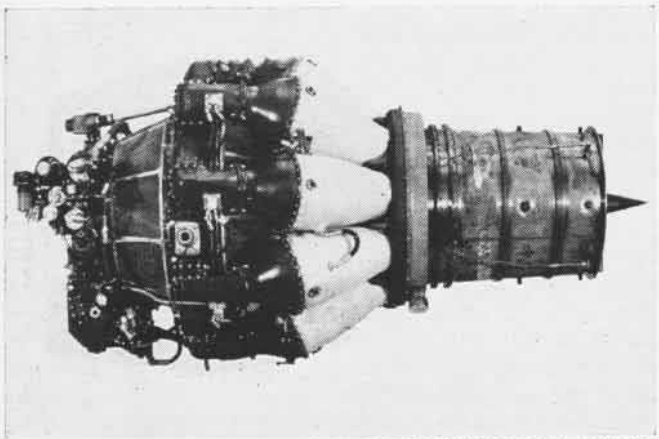
In the fall of 1949, the P&W Turbo-Wasp was flying in a later version of the *Panther,* the F9F-5, as an eventual replacement for the J-42. It provided a 30% increase in power without any substantial increase in dimensions.

At the time of its public debut in February 1950, the J-48 Turbo Wasp was the most powerful jet engine fiying in either the United States or England. Shooting for still higher power, P&W added water injection and an afterburner of its own design to send J-48 soaring far above its basic thrust for the short periods of operation so vital in combat.

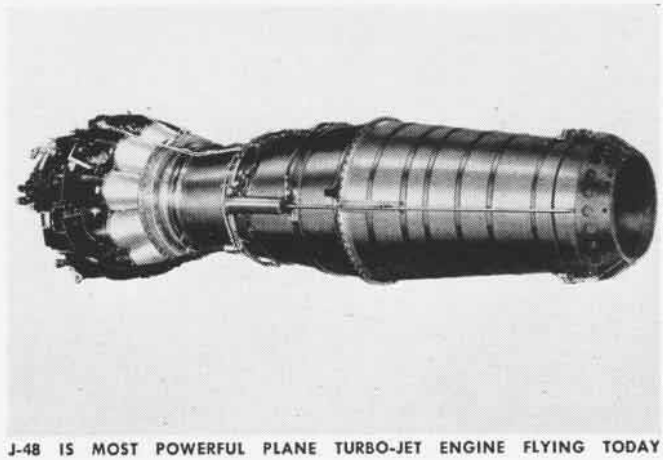
THE decision of Frederick B. Rentschler to form a company 25 years ago was a tremendously important one. His dream of the future of aviation was intensely realistic—the engine's the heart of the airplane.

It takes time to develop new designs, time to perfect them, time to produce them. The five men Rentschler gathered about him in 1925 became hundreds and then thousands until, in the war years at East Hartford alone, there were 40,000 men and women at work. It was on the basis of the experience of the early years that skilled engineers and craftsmen met the war crisis admirably.

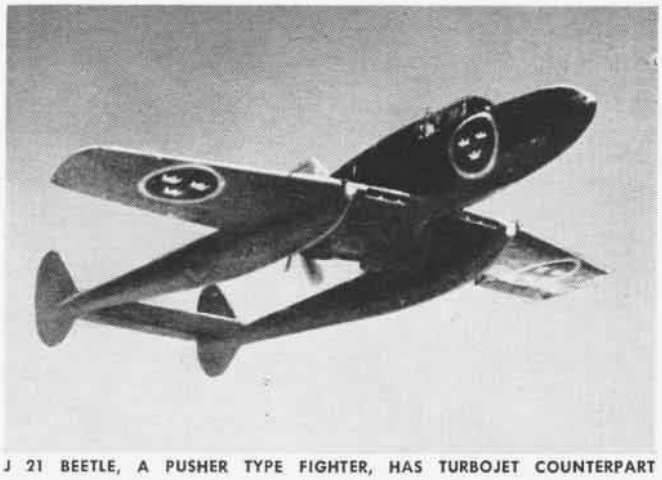
With the J-42 and J-48, the Navy and P&W are entering a new engine era.



THE J-42 POWERED THE EARLY MODEL OF THE CARRIER-BASED PANTHER



J-48 IS MOST POWERFUL PLANE TURBO-JET ENGINE FLYING TODAY



J 21 BEETLE, A PUSHER TYPE FIGHTER, HAS TURBOJET COUNTERPART

USING SWEDISH P&W ENGINES, B 18A HAS TOP SPEED OF 296 KNOTS

SWEDISH AIR FORCE

THE FACT that Sweden has not fought in a war of aggression for the past 135 years probably has some bearing on her policy of armed neutrality. This policy was reaffirmed when Sweden decided to take no part in the North Atlantic Pact.

To defend her long standing neutrality, the Swedish Riksdag has set aside the equivalent of $200,000,000 yearly. The Royal Swedish Air Force figures prominently in this budget. Since 1926, the R.S.A.F. has constituted an autonomous branch of defense, side by side with the army and navy.

The R.S.A.F., exceeded in strength only by the aeronautical organizations of the United States, Britain, and the Soviet Union, is composed mostly of fighters. The peace time organization is comprised of four air groups *(flygeskadar)* which include ten day fighter flotillas *(flygflottiljer)*, one night fighter flotilla, four attack flotillas and approximately two reconnaissance flotillas. An air flotilla (attack and fighter) is composed of approximately 40 to 60 aircraft; a reconnaissance flotilla, of approximately 60 aircraft.

Flying personnel of the R.S.A.F. consist of officers and pilots who are on active duty for short periods. The basic Air Force training lasts for one year and takes place at a flying school located at Ljungbyhed in southern Sweden.

The commander in chief of the Swedish armed forces is General Jung. LGen, Nordenskiold, commander in chief of the Air Force, is assisted by the Air Staff and Air Board. The tasks of the Air Staff are of an operative, organizing and instructive nature, whereas the Air Board deals with technical, economic and legal matters.

The principal aircraft manufacturing company in Sweden is the Svenska Aeroplan Aktiebolaget which is usually abbreviated to "Saab." Founded in 1937 for the manufacture of airframes and aircraft engines, the company has factories at Linkoping and Trollhattan.

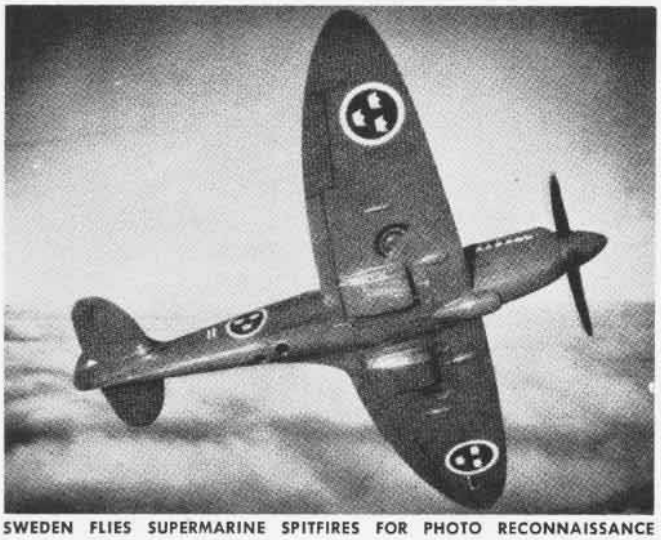
Foreign aircraft are included in the equipment of several Royal Swedish Air Force units. These are given, in common with Swedish types and those built under license in Sweden, a designation which indicates the service duty to which they are to be put.

Type Symbol		*Purpose*
B	Bombplan	Bomber aircraft
A	Anfollplan	Attack aircraft
T	Torpedflygplan	Torpedo bomber aircraft
J	Jakplan	Fighter aircraft
S	Spaningsplan	Reconnaissance aircraft
TP	Transportplan	Transport or ambulance
SK	Skolplan	Training aircraft
G	Glidflygplan	Glider
SC	Segelflygplan	Sailplane

The manufacturer's designation given to projects and new designs is altered on acceptance for service use; for example, the new jet fighter design, the SAAB-1001, was designated J 29. Occasionally the manufacturer will assign a general name, such as "Scandia" for the SAAB-90 transport or "Safir" *(Sapphire)* for the SAAB-91.

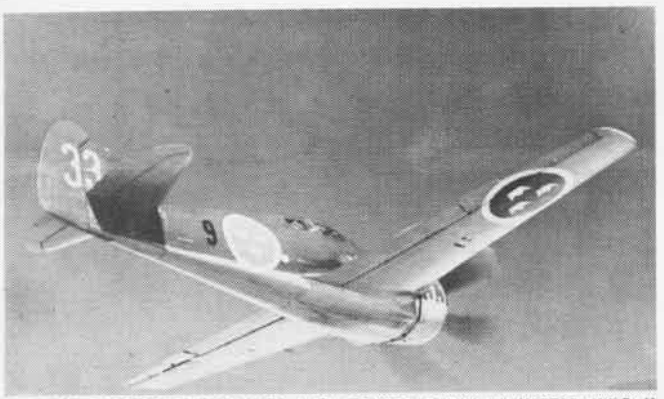
B 18—The Royal Swedish Air Force has no heavy bombers, but is equipped with a standard light bomber, the B 18. There are two model designs of this three-seat, twin-engined light bomber, each of which is 43.9 feet long and has a wing span of 55.7 feet. The 18A is equipped with two 1,200 hp Pratt & Whitney Twin Wasp SC3-G radials which provide a maximum speed of 265 knots; the 18B, is powered by two 1,475 hp Daimler-Benz 605B in-line engines which give a maximum speed of 290 knots. A peculiarity of the design is the position of the cockpit canopy which has been placed to one side of the center line of the fuselage to improve the visibility of the pilot. Armament is light compared with modern standards and consists of one fixed forward firing machine gun and two flexible guns.

J 21—The J 21 *Beetle*, the main reciprocating engine-type



SWEDEN FLIES SUPERMARINE SPITFIRES FOR PHOTO RECONNAISSANCE

fighter used by the R.S.A.F., is a single-seat, twin-boom, pusher-type aircraft. It suggests our P-38 *Lightning* in general appearance except for the position of the engine. The pusher propeller driven by a 1,475 hp Swedish-made Daimler-Benz 605-B in-line engine located aft of the pilot, gives a maximum speed of around 350 knots. The J 21 is slightly smaller than the P-38, the *Beetle* having a 40-foot span as compared with the *Lightning's* 52 feet. The armament consists of five fixed forward firing guns, one 13 mm. gun in each boom and two 13 mm. guns and one 20 mm. cannon in the nacelle. The *Beetle* was the first Swedish aircraft to be fitted with a tricycle landing gear. Because the design of this aircraft had the inherent disadvantage of making it nearly impossible for the pilot to escape with safety in an emergency, Saab fitted the J 21 with an ejector seat which has proved its worth on several occasions when pilots were safely ejected.



SWEDISH ENGINEERS DESIGNED J 22 FIGHTER EARLY IN WORLD WAR II

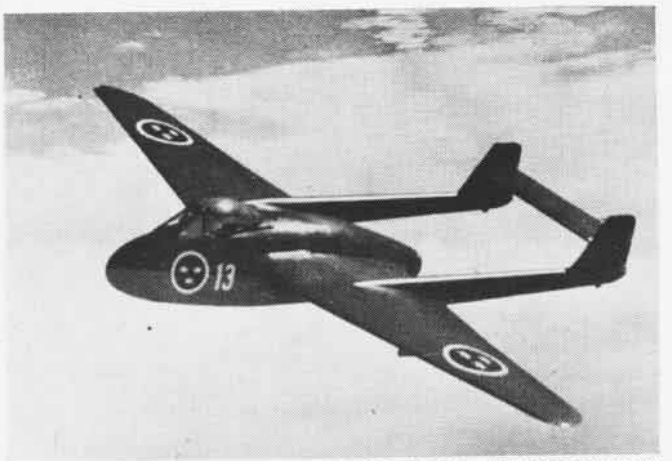
J 21R—A modified version of the J 21, the J 21R, uses a British Goblin II jet engine. It was the first jet-propelled aircraft to be produced in Sweden for the R.S.A.F. Its initial flight the latter part of 1947 indicated that no major modifications were necessary, but the horizontal stabilizer was raised to clear the jet stream. The J 21R resembles the British de Havilland *Vampire* (Swedish J 28) which is also used by the R.S.A.F., but performance figures are not quite comparable to those of the *Vampire,* because the J 21R is a slightly heavier plane and aerodynamically a compromise. Maximum speed at sea level is estimated to be 435 knots.

J 22—This design, an attempt to obtain the maximum performance from an engine of low power, was supervised by a Swedish engineer who had spent some time at the Vultee plant in California. The J 22, equipped with a 1,200 hp Pratt & Whitney Twin Wasp SC3-G engine, was constructed under license by the Svenska Flygmotorbolaget, Trollhäten. Construction was based on a welded steel tube skeleton with a birch veneer plywood skin. First flown in 1943, it has an estimated maximum speed of 300 knots. Two 13.2 mm. guns are mounted in each wing.

The results of a test flight made in conjunction with an F-51 *Mustang* (J 26) indicated weaknesses as well as advantages. The J 22 has an extremely high rate of climb at low altitudes; however, the F-51 is faster in level flight. It would appear that in actual combat the J 22 would be extremely vulnerable because of its plywood and tubular steel construction.

J 26 and J 28—At the end of World War II, Sweden procured a number of North American F-51 Mustangs from the U.S.A.F. and designated them J 26.

The J 28 is actually the British *Vampire 1* procured for Sweden for its jet fighter units. Another version, the J 28B, bears a dual British designation, *Vampire 5* for the R.A.F. and *Vampire* FB-50 for export. Delivery to Sweden of



J 28 IS BRITISH VAMPIRE PROCURED FOR R.S.A.F. JET FIGHTER UNITS

FB-50's equipped with British-made Goblin III units, began in May 1949. Future *Vampires* will be equipped with Swedish-built Goblin III units.

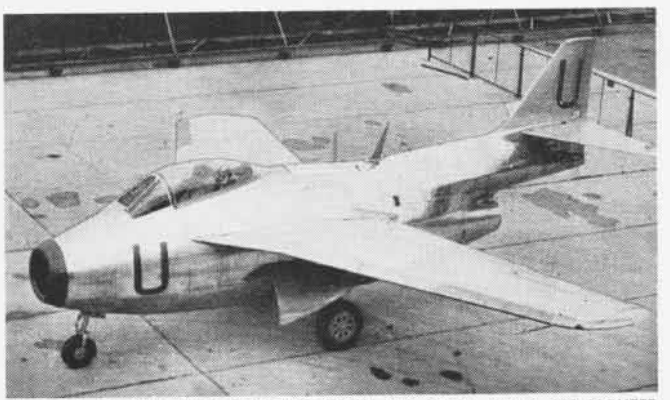
J 29—A-Thousand-and-One-Nights was the name given by the factory workers to the SAAB-1001 jet fighter; later it was designated the J 29 by the R.S.A.F. and nicknamed the "Barrel." It is considered the first expressly designed Swedish jet fighter. As part of the comprehensive research and test program of the J 29, flying tests were made with a half-scale wing of the same characteristics fitted to an experimental SAAB 201, *Safir* light-cabin monoplane. The first of the three prototypes flew in September 1948.

A squat barrel-like fuselage houses a British de Havilland Ghost jet engine of 5,500 pounds static thrust, which gives the aircraft a maximum speed of more than 550 knots at sea level. Arrangements have been made for the British Ghost engine to be manufactured under license in Sweden. The air intake for the single-jet engine is located in the nose of a 33.5-foot fuselage. As in the case of the F9F *Panther,* YAK-15 and MIG-9 the exhaust is out the ventral side of the fuselage forward of the rudder extremity.

Thin sweptback wings with a span of 36 feet, 45° at root and 28° near the wing tips, are attached just above the midline of the fuselage. Four 20 mm. fixed forward firing guns are located around the underside of the jet.

J 30, S 31 and Tp 47—The de Havilland *Mosquito* 19, designated J 30 by the R.S.A.F., is equipped with radar. To accelerate the training of the radar operators, radar equipped B 3 twin-engine bombers (Junkers 85K built under license) have been modified for use as flying classrooms.

Another acquisition from Britain, the *Spitfire* 19, as the S 31, is intended for use as a photo-reconnaissance fighter. Completing the line-up the R.S.A.F. operate a number of PBY *Catalina* which carry the Swedish designation TP 47. The ubiquitous "Cat" is used for air/sea rescue work.



THE J 29 'BARREL WAS DESIGNED FROM THE START AS A JET FIGHTER

When the Navy closed down at Midway, VR-2 brought back the last Navy dependents to be sent home, 86 children and wives. Here LCdr. R. C. Hunt holds a lei-decked boy as his passengers await the arrival of officials from the Naval Air Station at Alameda. Most important "man" aboard the plane was Lance Fuller one month old, nine-pound boy, who was the last baby born on the island. Midway is nearly deserted.

Navy Folds Up Air Group

Midway Returns from Tour to Europe

USS MIDWAY—When this carrier returned to Norfolk after its Mediterranean tour of duty its air group, CAG-4 flew to Jacksonville for decommissioning.

VF-41, VF-42 and VF-43, plus VF-45, make up the air group, which was headed by Cdr. R. H. Burns. It originally was Air Group 75 and was stationed at Chincoteague, later moving to Norfolk as CBG-3.

The air group used chessmen as its insignia, with the Group Commander being King, the attack squadrons flying *Skyraiders* being the Knights and the fighter squadrons in *Corsairs* represented as Pawns. On its last cruise, the group combined with the *Midway* ship's company to establish a record of 3,660 carrier landings without a landing accident.

Israeli Studies Navy Flying

Flying Loader Checks Flight Training

NAS PENSACOLA—Navy methods of flight training were shown to Col. Daniel L. Shimshoni, head of Israeli's Air Training Command, who visited this station the first of June.

A graduate of Princeton, Col. Shimshoni reported students in his country speak a number of languages, which creates problems in instruction and flight standardization.

Israeli uses Stearman *Yellow Perils* for primary training, then switches to SNJ's for basic, as the Navy used to do during the war. Col. Shimshoni said the nation is considering adopting the Navy's present method of starting pilots out in SNJ's. Israeli's air forces use F-51's and British *Spitfires* as combat planes.

2,000 Landings on Carrier

British Pilot Claims a World Record

Claimant of a world's record for carrier landings is British LCdr. J. S. Bailey, who made his 2,000th landing on an English flattop on 24 May. Bailey made most of his landings on aircraft carriers during the war. His 2,000th was aboard the *Illustrious* while piloting a *Seafire* fighter.

Believe it *or not, the scene above is on a naval air station. The last of May NAS Los Alamitos was host to 317 fathers and sons at a Boy Scout encampment, climaxed by a huge bonfire and Indian ceremony. The boys slept in pup tents; the fathers, in barracks. Forty boys were given a hop in an R4D and all were given a chance to sample Navy chow.*

VC-10 Adopts New Mascot

Saves Goose From Chopping Block

According to a popular song hit, the wild goose gets restless in the spring and takes off into the deep blue for green pastures in the far North.

Composite Squadron 61, based at NAAS MIRAMAR, San Diego, does the same thing. Every spring since 1947, the Navy's only Fleet photographic reconnaissance squadron, has been migrating north from sunny California to conduct photo mapping operations in the Alaskan wilderness not to return until the snow begins to fly.

So it is only natural that VC-61 should adopt a goose for a squadron mascot. Although Cdr. William H. Davison searched far and wide in southern California for an authentic specimen such as a Canadian "Honker" or a Brant, he could only find the unstuffed variety in the San Diego live poultry market.

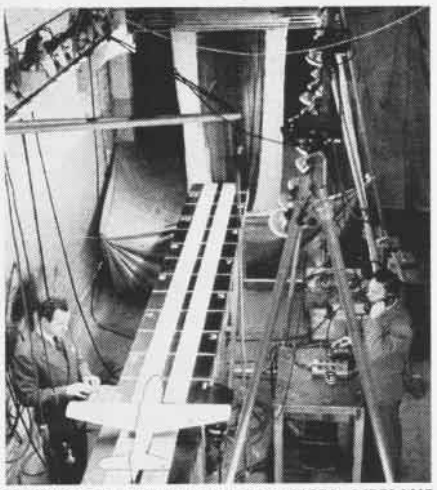
AIRMAN L. B. NICHOLS HOLDS VC-10'S 'VIP'

Which is why VC-61's mascot is a domestic Touloose goose.

Issued a custom-made parachute and survival gear, "Vip," the goose, is all set to ride in a big Navy four-engine photographic plane during the forthcoming operations.

According to Cdr. Davison, "Vip" should be happy in her new duty as a naval air mascot. Prior to her rescue she was scheduled for a San Diego chopping block enroute to someone's 1950 Thanksgiving dinner. She can now look forward to a secure career in naval aviation, providing, of course, that budget cuts don't put VC-61, itself, on the chopping block.

• MCAS CHERRY POINT—While making field carrier landings in his Corsair, MSgt. W. G. Langley lost a landing gear in colliding with a truck. In regaining altitude, he lost oil pressure and bailed out, but his harness caught on the plane. He finally struggled free at 800 ft. and landed in the Neuse river wet but otherwise uninjured.



CHEESECLOTH BARRIER AT TOP STOPS AIRPLANE

Model Tests Catapulting Data

To find out how a projected Navy plane will behave during catapulting from a carrier, Douglas Aircraft Company's El Segundo plant has developed a unique testing method employing model planes.

A reduced catapult deck equipped with a driving shuttle simulating an actual carrier installation has been developed. The models made of balsa wood and paper are carefully weighted with lead to give dynamically similar characteristics of the full scale aircraft.

The models simulate the range of conditions found in actual service. Motion of the models as they are catapulted down the "deck" is obtained with a high-speed motion picture camera taking 700 frames a second.

This camera photographs through a hole in the roof located directly over the catapult deck, giving a bird's eye view of the action. One of the most difficult problems in developing this test program was recovering the model at the end of the catapult run without damage.

This was accomplished by installing a stopping barrier at the end of the run consisting of 15 sheets of cheese cloth hung vertically and spaced about 6" apart.

San Diego O&R Stops Fungus

Fungicidal treatment of electronics equipment is being undertaken by the O&R Department at NAS SAN DIEGO. Although the process is not new, its further use in overhaul activities will effect savings.

New equipment from factories has been treated by drying and coating with fungicidal lacquer in accordance with JAN-T-152. Old equipment undergoing overhaul was cleaned and similarly treated when signs of fungus were present.

When radio equipment is to be used under hot and humid conditions the fungicidal treatment is of utmost importance to lengthen the life of electronics equipment. An attempt is being made to so treat all parts going through overhaul, even though this takes more time. It is believed this procedure will lessen future costs.

Ordinary cleaning and spraying facilities are adequate for the job. The only problem involved has been to provide an oven capable of processing the necessary volume of equipment. At San Diego the load is approximately 1,000 items a week. As each item should be in the oven about three hours at a temperature between 120° to 140° F., it would take too much time to place the items on a fixed table and keep time on all of them. Likewise, a conveyor system would be too expensive.

Answer is to have several ovens into which loaded carts can be rolled for the required time. Afterward the carts are rolled to the paint booth, and the fungicidal lacquer spray is applied. In the booth, a four-foot diameter turntable provides an easy method of handling the pieces to be sprayed and also gives them a few minutes to dry. Then the pieces go back to the reassembly line where any spots which were missed are touched up.

Carts are of three-shelf design. To aid disassembly and masking, a list of items is furnished, and Air Force training film MA4939 is shown.

Seattle Bomber Hits a Sub

NAS SEATTLE—An unnamed marksman from the Reserve training unit here probably wins the 1950 prize for bombing marksmanship.

Flying in a PBY, he dropped a tiny practice bomb squarely on the slender periscope of the submerged submarine *Greenfish* in a recent ASW practice. The eight-pound bomb contained a small explosive charge which shattered the periscope lens.

Designs Beach Gear Wheel

NAS, CORPUS CHRISTI—Man-handling PBM tail beaching gear weighing upwards of 400 pounds is a back breaking task. It practically has to be bulldozed up and down the ramp.

In order to move the tail gear to its desired position, one end must be picked up and the gear pushed along on its two end wheels.

A solution to this problem was thought up by L. J. Sandusky, ADC, who reasoned that if a small metal wheel were welded to the underside of the end to be lifted, the beaching gear could be moved along merely by pushing.

Sandusky is attached to Advanced Training Unit 10 at Corpus. His idea has been incorporated in gear used at this activity with satisfactory results.

The idea has not only cut down on the wear and tear of the beaching crew but also saved money spent on repair of gear damaged in operations.

L. J. SANDUSKY, ADC, WITH HIS BEACH GEAR

UPHOLSTERY SECURED WITH RETAINING STRIPS

Four JRM-1's Reupholstered

Like any housewife facing the problem of spring redecoration, officials at NAS ALAMEDA picked up overhaul specifications on four *Mars* flying boats with some hesitation. Orders called for reupholstering all compartments previously upholstered, plus revision of head installations and putting in additional upholstery.

The old upholstery, fastened with panels and buttons, had buckled and gapped, and some of the buttons had rusted. Wood broadcloth on the flight deck of the compartments required repeated dry cleaning, particularly during heavy maintenance check periods.

To renew the existing installation would be costly and unless a perfect alignment of panels was achieved, the finished product would be too loose and baggy or too tight. Each panel would have to be fitted individually, sewn and then fibreglass backed before installation.

But there was a more efficient solution, and this was put into practice. All old panels were removed from the big aircraft with only the fibreglass backing on them. Metal build-up was installed to provide retainer mountings in corners and around obstructions; then the fibreglass was cemented directly to the hull outer skin and structure. Cloth-backed vinyl leatherette was fireproofed by spraying with Flamort compound and installed over plastic retaining strips.

In the case of panels where periodic checks and inspection were necessary, zippers were installed. Upholstery panels were then added, using plastic retaining strips and blind metal edge strips secured with screws and cup finish washers.

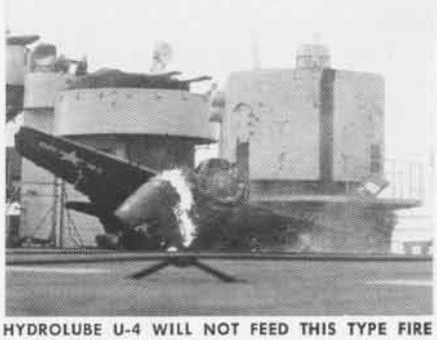
It is anticipated that the installation will stand up well under normal usage. The present upholstery has now been in service for over nine months. It provides ease of maintenance and cleaning, removal and replacement, but above all, it presents an exceptionally fine appearance.

● NAS OLATHE—Chief Gash of the electric shop has completed what this activity considers to be one of the best generator test benches to be found outside of an overhaul station. All kinds of generators, alternators, regulators and reverse current relays may be tested. Diagrams are available.

Fireproof Hydraulic Fluid

THE fighter plane came in, struck a barrier and burst into flames on the carrier deck. Asbestos-clad figures rushed to the aid of the pilot and managed to get him out before the flames engulfed him. The fluid in the hydraulic system of the plane fed the fire and totally destroyed the aircraft.

Because that happened often enough in the World War II—and sometimes the fire occurred in flight and the pilot and crew were lost—the need for a non-inflammable fluid was foreseen and research accelerated. If it could be found, the hazards of aircraft fire could be substantially reduced; at least, the hydraulic fluid the aircraft carried would not accelerate its destruction. Out of BUAER's program of research and development came non-inflammable fluids,



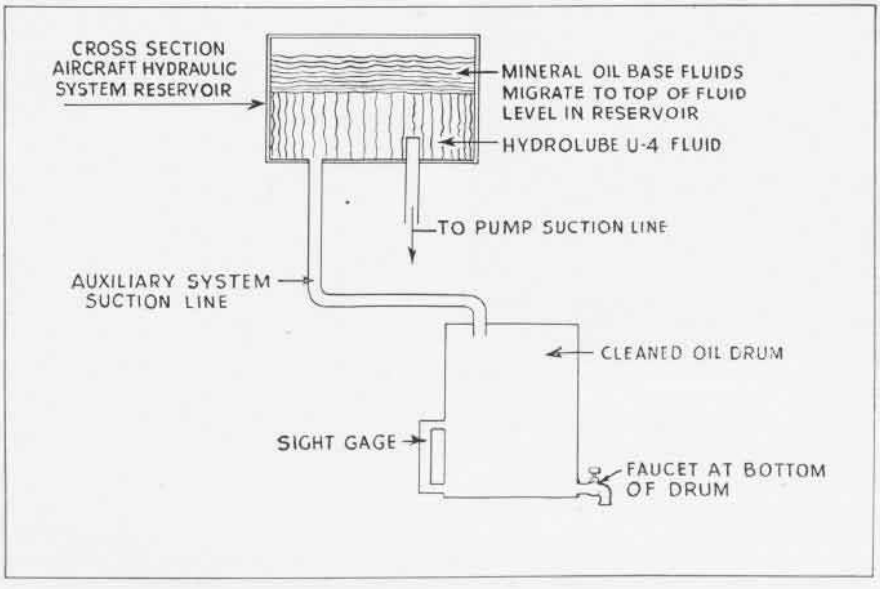
HYDROLUBE U-4 WILL NOT FEED THIS TYPE FIRE

called *Hydrolubes* because of their water base.

When fires in systems containing mineral oil base fluids were analyzed, it was clear that the fires were caused primarily by external leakage of the system under high pressures. The resulting vaporization and carburetion of fluid produced a highly flammable mixture that was readily ignited by a hot exhaust manifold, an electric spark or any other source of heat. Furthermore, minor fires caused by other aircraft systems adjacent to hydraulic installations, which would otherwise be readily extinguishable, became all too often major fires. In addition, if a bullet ruptured hydraulic installations containing mineral oil base fluid, a real fire *might* follow.

The hydrolube non-inflammable fluids are basically mixtures of water and ethylene glycol with additive materials which improve lubrication, low temperature operability and the viscosity index as well as prevent corrosion. The non-inflammable fluid now being produced by the Carbide and Carbon Chemicals Corporation is made from commercially available materials and is designated Hydrolube U-4.

Hydrolube U-4 fluid (BuAer Specification 51F22 AER) was developed to be used in systems currently using mineral oil base fluid AN-0-366; that is, an hydraulic system which operates satisfactorily when filled with mineral oil base fluid will operate satisfactorily when filled with Hydrolube U-4 fluid without changing the material or packings contained in the system. This does not mean, however, that the two fluids can be freely mixed in the same system at the same time.



Since so many questions have been addressed to BUAER regarding Hydrolube U-4, these same questions are probably in the minds of many pilots, engineers and maintenance men. Here are the questions—and the answers.

Q. How can one determine which type of fluid to use when filling an aircraft hydraulic system?

A. The hydraulic system reservoir will bear an instruction plate indicating by specification number and color the type of fluid required.

Q. Can Hydrolube U-4 fluid be mixed with mineral oil base fluids in an aircraft hydraulic system?

A. Hydrolube and mineral oil based fluids should *not* be mixed in a hydraulic system. However, in the event of an emergency, the following practices may be followed when the main hydraulic hydrolube system reservoir requires filling and no Hydrolube U-4 is available:

1. If the additional fluid required to fill the reservoir is in excess of one-half gallon, drain the aircraft hydrolube system of all Hydrolube U-4 fluid. It should be refilled with mineral oil base fluid AN-0-366 as an interim measure, the change being noted by a suitable log book entry and the attachment of a warning tag to the reservoir filler cap. Upon availability of hydrolube fluids, the mineral oil base fluid should be drained from the system as completely as practical and refilled with Hydrolube U-4 fluid, this change also being indicated by a suitable log book entry and removal of the warning tag. Residual quantities of the mineral oil base fluid will migrate to the fluid reservoir where they can be removed by draining the reservoir completely.

2. If the additional fluid required to maintain the reservoir or hydraulic hydrolube system at its full capacity is one-half gallon or less and no hydrolube fluid is available mineral oil base fluid may be added as an emergency interim fix. A suitable log book entry should be made, and a warning tag attached to the reservoir cap indicating the quantity of mineral oil base fluid added. In no instance should the total fluid added exceed the one-half gallon limitation. Upon the availability of hydrolube fluid, the reservoir should be drained, a log book entry made and the warning tag removed. No immediate flushing of the system is necessary after removal of the added mineral oil base fluid from the reservoir. Removal of small percentages of mineral oil base fluid, whenever it is known to be in the system, can be accomplished as shown in the diagram. Under no circumstances should water or ethylene glycol or Prestone or any mixture of these be used as a substitute in aircraft hydrolube hydraulic systems.

Q. What effect has Hydrolube U-4 fluid on metals normally used in the aircraft hydraulic systems?

A. Results of laboratory and flight tests reveal that copper, steels and aluminum alloys normally used in aircraft hydraulic systems are not adversely affected by Hydrolube U-4 fluid and give no indication of corrosion. There are a few exceptions, however. Cadmium plating and zinc plating, normally used as a protective coating on steels, are attacked, the Hydrolube U-4 fluid forming a soapy, jelly-like substance. In one

instance the depositing of this soap-like jelly in a dead-end passage if the pump feathering mechanism caused malfunction of the hydraulic system. By replacing two cadmium plated steel components with stainless steel parts the difficulty was overcome.

Serious corrosion of 50-50 solder, lead, bronze and magnesium make it impossible to use these materials in conjunction with Hydrolube U-4.

Q. Is Hydrolube U-4 fluid injurious to personnel?

A. Hydrolube U-4 fluid will not destroy or irritate human skin tissues by chemical action. It is generally known that some people are allergic to engine oil, others to aluminum, and still others to almost any material used in the aircraft. Similarly, there are probably some people who are allergic to Hydrolube U-4 fluid, but essentially, *it does not contain any injurious chemicals.* To remove Hydrolube U-4 fluid from the skin or clothing, simply use soap and water.

Q. Does Hydrolube U-4 fluid have any toxic effects on personnel?

A. No. Hydrolube U-4 fluid is composed basically of water and ethylene glycol, and since the vapors of neither of these are toxic, the fluid may be used safely indoors in test equipment or in servicing aircraft.

Q. What color is Hydrolube U-4 fluid?

A. Hydrolube U-4 fluid is distinguished from other aircraft hydraulic fluids by its amber color, something like the color of stale beer.

Q. Should Hydrolube U-4 fluid be used as a means of lubricating O ring packings during the assembly of hydraulic system components?

A. Yes.

Q. When hydraulic components preserved with fluid conforming to Specification AN-O-7 or AN-O-366 are to be used with Hydrolube U-4, what steps should be taken?

A. The components must be drained and flushed with U-4 fluid before installation in aircraft.

If the component is bench tested it can be done on a test stand filled with AN-O-366, AN-O-7 or Hydrolube U-4.

Components removed from aircraft hydrolube hydraulic systems shall be preserved in accordance with ASO Preservation Packaging and Packing Technical Supply Bulletin No. 11, dated 17 October 1946, in order to prevent corrosion.

Q. What effect has Hywrolube U-4 fluid on aircraft hydraulic system filter elements?

A. Laboratory and flight tests have indicated that any filter element that uses a cement containing protein compounds will not hold up in hydrolube fluid. Filter elements assembled with a phenolic cement have been satisfactorily tested with no evidence of deterioration. Satisfactory elements, manufactured by Skinner Purifier, Inc. and Purolator Company, can be identified by the letter "H" stamped above or below the manufacturer's part number. Either of the above manufacturers' elements bearing the "H" stamp are considered satisfactory for use in mineral oil base fluid or hydrolube U-4 fluid.

Q. Are non-inflammable fluids ever intended for use in landing gear shock struts?

A. Laboratory drop tests on shock struts indicate the Hydrolube U-4 fluid under pressure has a tendency to hold air in suspension for a relatively long time. Therefore, Hydrolube U-4 fluid would not provide satisfactory damping after initial contact during a hard landing. For this reason, Hydrolube U-4 fluid cannot be used as a replacement fluid in shock struts.

Q. Does Hydrolube U-4 have any effect on paint, lacquer or enamel?

A. Yes, Hydrolube U-4 has a softening effect on paint and lacquer. However, at room temperatures the fluid would have to remain in contact with the painted surface some time before the paint was removed.

If hot fluid from the hydraulic system of a plane were to leak on painted surfaces, the softening rate would be increased. To avoid any possible effect on painted surfaces, spillage of Hydrolube U-4 should be wiped up as soon as possible. Enamel is not affected to the same degree.

Q. What is the electrical conductivity of Hydrolube U-4?

A. Hydrolube U-4 has high electrical conductivity, but this problem is not a major consideration in the selection of an hydraulic fluid. The same precautions that one takes against water near electrical equipment should be followed when one is handling Hydrolube U-4 fluid.

Q. What effect has Hydrolube U-4 fluid on rubber components?

A. Hydrolube fluids have no noticeable effect on the rubber used in aircraft hydraulic systems. Hydrolube U-4 causes significantly less deterioration of the various rubbers than did the mineral oil base fluid. In some instances, however, flight tests have disclosed failures of accumulator bladder and diaphragm, but these failures have been experienced in certain aircraft only and not in others, and have been attributed to the higher operating temperatures of the aircraft systems involved.

Q. Is Hydrolube U-4 fluid to be used exclusively in all naval aircraft hydraulic systems?

A. No. Hydrolube U-4 fluid is currently used in Models F9F and P2V-3W-4 aircraft

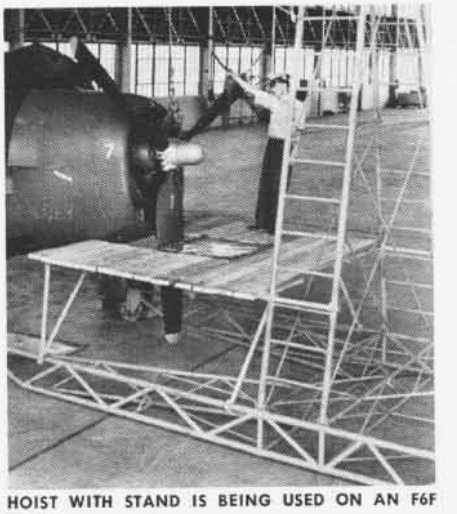
Q. Is Hydrolube U-4 fluid truly non-inflammable?

A. Yes. In one aircraft using Hydrolube U-4 fluid, the engine section was severed from the fuselage when the aircraft struck the ground. The aircraft then burst into flames, the main system hydraulic tank and all lines connected to it were damaged allowing all the fluid to escape. The fluid appeared to be unchanged despite the heat of the burning aircraft.

In another aircraft, under similar conditions, the main system hydraulic fluid supply stand pipe on the tank was broken allowing all the fluid above the stand pipe to escape. The tank held its emergency reserve fluid. The fluid appeared to be unchanged despite the heat of the burning aircraft. No gum deposits, signs of burning or evidence of solidification could be found.

Q. What are the operating temperatures for Hydrolube U-4 Fluid?

A. Hydrolube U-4 fluid is satisfactory for operation from −40°F to 160°F.



HOIST WITH STAND IS BEING USED ON AN F6F

Work Platform for Steel Hoist

On the basis of an idea submitted by S. N. Mack, ADC, one of the structural mechanics at U. S. Naval Proving Ground, Dahlgren, Va., has designed and built a work platform for use with the portable engine hoist crane (R89-11-660200). The cost of this addition is approximately $27 for material.

The platform is 36 inches above the top of the leg truss and extends eight feet out from the boom mast. The platform is solid planked for five feet, and the rest is broken. The entire platform can be removed or set up by two men in 15 minutes. It can be boxed with the rest of the hoist for shipment.

The stand facilitates the removal of propellers and engines from fighter and attack type aircraft.

VP-1 Tests 1065 Engine Oil

During its recent tour in the Alaskan-Aleutian area, VP-1 conducted preliminary tests of specifications AN-0-8 lubricating oil, grade 1065, in the R3350-26W and WA engines installed in the P2V-3 aircraft. The oil was used in a total of ten engines. The remaining engines were lubricated with grade 1100 oil.

Owing to the variable weather and operating conditions, the results obtained are necessarily qualified estimates. Best estimates on minimum temperatures at which satisfactory undiluted cold starts can be made are:

Grade 1065 oil	10° F.
Grade 1100 oil	25° F.

Starting performance with undiluted grade 1065 oil at 10°F. was satisfactory, but considered marginal owing to low cranking speeds and slow oil pressure rise. Undiluted grade 1100 oil was found to be unsatisfactory at 10°F. because of these factors and congealed external oil lines.

There was no difference in maintenance requirements due to the use of 1065 oil, except for a slight adjustment of engine oil pressures. Oil consumption remained under one gallon per hour per engine. Depending upon the results of test engine inspection during overhaul, grade 1065 oil is considered to be excellent for use in all cold weather operations. Dilution and/or pre-heat should be used whenever predicted minimum temperatures are below 10° Fahrenheit.

SERVICE Test
INTERIM REPORT DIGEST

This digest covers the 15 June Interim Report of Service Test, NATC PATUXENT, and does not necessarily reflect BUAER policy.

HRP-1 (118 Hours)

A 120-hour check was performed on the aircraft during this period. The aircraft was transferred to the USMC at Quantico on 12 June 1950 and returned to Service Test on 16 June 1950.

Oil Pump Transmission. While the aircraft was hovering, the forward oil pump warning light commenced to flicker. The oil pressure was approximately five lbs. below normal, and the oil temperature was 10° above normal. Postflight investigation revealed that the pump rotor shaft top bearing was excessively worn, and the bottom bearing scored. This is a new type pump which had operated a total of 17.5 hours since installation.

During flight at 1000 feet altitude, the aft transmission oil temperature rose from normal to 60° C., and the oil pressure dropped from normal to 23-28 lbs. psi, dependent upon rotor RPM. Post-flight investigation revealed that the pump shaft was loose in the pump bearings. A previous failure of the forward rotor oil pump was reported.

Recommendation: Manufacturer should investigate and take corrective action.

F2H-1 (415 Hours)

Status. Test is completed, and the final report is being prepared. The J-34-WE-22 engines were in the airplane during the latter part of the test were operated as follows: one for 356 hours, the other for 264 hours.

Spark Plug. A 200-hour "B" inspection disclosed that pieces of the ceramic insulator were missing in one spark plug. Inspection of the turbine assembly revealed that pieces of the insulator were imbedded in two turbine blades. This failure is considered to be an isolated case. *Recommendation:* Remove the turbine and inspect the blades if the ceramic insulator in a spark plug is found to be chipped.

Under Investigation: (a) failure of ARN-6 shock mounts and (b) failure of combustion chamber liner.

F9F-2 (497 Hours)

The airplane was flown to Grumman Aircraft Engineering Corporation on 22 May for installation of modified fuel cells that are to be tested.

F2H-2 (105 Hours)

The project has been delayed because of a turbine blade failure which necessitated an engine change and a failure of the nose landing gear assembly during the first arrested landing made on the field carrier platform.

The following discrepancies have been reported to the Board of Inspection and Survey:

Light Assembly. The altitude low limit indicator light is too bright for night flight operations. *Recommendation:* Provide a dimmer for the altitude low limit indicator light.

Turbine Rotor Assembly. During a major inspection of J34-WE-34 engine after 70.1 hours of operation, it was discovered that the tips of the first stage turbine blades were curled on the trailing edge. It is believed that this failure was caused by high temperatures that resulted from unsatisfactory ground starts and flame-outs at high altitudes.

Oil Pressure Transmitter. The oil pressure transmitter for the starboard engine failed during flight and was replaced. After 5.3 hours, the replacement transmitter failed. Investigation of the first transmitter revealed that the teeth to the left of zero center on the sector gear had failed. Inspection of the second transmitter revealed that the pin connecting the link to the bourdon tube had failed.

Generator Brushes. The port generator failed after 72.3 test hours because the brushes were excessively worn. The generator was replaced. After 21.6 hours of operation, inspection revealed that the brushes on the replacement generator had worn to within 3/16" of the shunt rivets. *Recommendation:* Provide generator brushes which satisfactorily meet the requirements of specification AN-G-1a dated September 1947.

Nose Landing Gear Strut. The nose landing gear failed during the first arrested landing made by this airplane on the field landing platform. The shock strut had been properly serviced prior to flight. The approach to the landing was normal, and the "cut" was given while the airplane was about eight feet in the air at about 100 knots IAS. A nose-high, free-flight engagement was made with the No. 2 wire. The main landing gear contacted the ground, and then the aircraft rocked forward, and the nose gear contacted the ground and failed.

Investigation revealed that the nose landing gear shock strut had bottomed and failed. The forces transmitted to the aircraft caused many other assemblies to fail. *Recommendation:* Investigate and determine the cause for this failure.

Turbine Rotor Blade. While operating the J-34-WE-34 engine at an altitude of 40,000 feet, the pilot felt a severe vibration and noticed a rapid rise in turbine outlet temperature and a decrease in RPM. The engine was immediately shut down and allowed to windmill until the turbine outlet temperature decreased to 200° C. (a period of about five minutes). Inspection revealed that one first stage turbine blade had failed in the first root serration. This turbine had been operated 21 hours since new and had a total of 3.5 hours at military power. *Recommendation:* Provide satisfactory turbine blades.

UF-1 (192 Hours)

Discrepancies. Inspection disclosed that the electrical conduit elbow attached to the port alternate air door actuator was torn away from the actuator and several wires inside the conduit were severed. The electrical conduits and wires connecting the actuators and the junction boxes in both engine nacelles are approximately 3" too short. The base plate of the port actuator was secured to a mating plate between the elbows and the actuator with only two screws although provision had been made in the plates for four screws. *Recommendations:* (1) Increase the length of the conduit and wiring between the junction box and the elbow leading into the alternate air door actuator motor. (2) Manufacturer inspect assembly of parts more thoroughly.

Exhaust Stack. The exhaust stack attached to No. 7 cylinder of the starboard engine failed.

De-Icing Boot. During installation of the de-icer boots, it was noted that a port wing slot de-icer boot was incorrectly labeled "Starboard wing slot." During flight with de-icer boots not in operation, the top of the starboard inboard wing de-icer boot balloons. This boot appears to be too large and, therefore, is too loose on the wing. *Recommendations:* (1) Label de-icer boots correctly. (2) Investigate and correct that cause for the ballooning condition.

Walkways. Walkway areas are not clearly outlined as required by Specification SD-24-E, pars. 221 and 369. A non-skid walkway is not provided on the top of the fuselage to prevent personnel from slipping when the surfaces are wet. *Recommendations:* (1) Provide a non-skid walkway on the top of the fuselage from the after entrance door to the flight deck emergency escape hatches. (2) Outline the limits of all walkway areas.

P2V-4 (167 Hours)

Pipe Assembly. The front exhaust pipe assemblies on cylinders No. 2 and No. 14 of the port engine failed. Similar failures of front exhaust pipe assemblies installed on a P2V-3 aircraft were reported by Service Test RUDM's 22-49 and 6-50. *Recommendation:* Provide satisfactory front exhaust pipe assemblies.

R3350-26WA Engine. The engine operated erratically. Inspection of the ignition system disclosed that the magneto was timed to fire the spark plugs at 13° B.T.C. instead of at the correct position, 28° B.T.C. *Recommendation:* Time engines correctly prior to delivery of aircraft.

Engine Shield Assembly. Four flame shield assemblies failed. P2V Aircraft Service Change 164 had not been incorporated in this airplane. Tests under Project PTR MA-362 on a P2V-3 airplane on which Change 164 is installed indicate that the change does not completely eliminate this type of failure. *Recommendation:* Provide satisfactory flame

shields.

Flange Connecting Clamp. A flange connecting clamp and a snubber clamp failed. The flange connecting clamp was installed at the junction of the exhaust system and the front cylinder exhaust pipe of No. 16 cylinder on No. 2 engine. The snubber clamp was employed on the slip joint connection of the weld assembly located at cylinders 16 and 17 on the No. 1 engine.

RCM Stub Antenna. The RCM stub antenna which is mounted on the left hand side of the fuselage failed.

Engine Cowl Flap Assembly. Five cowl flap assemblies have failed during this test. Satisfactory cowl flaps will have to be provided.

Escape Hatch Curtains. The overhead curtains in the pilot's compartment are unsatisfactory for the following reasons:

1. Because of the large number of snap fasteners, the curtains cannot be quickly rigged or stowed. It is believed that a window shade roll type curtain, installed at the after end of the window would be a more satisfactory installation.

2. The curtains are made of black material and, when rigged, absorb heat from the sun and dissipate it in the pilot's compartment. Reflective top surfaces are needed.

Propellers. During a ground test of propeller featuring and reversing with engines running, the propellers sometimes continued from the feathered position into reverse pitch when the feathering switch was held out. Attempts to unreverse the propellers by operating the throttle controls were not always successful. Unreversing could be accomplished if the feathering switch was depressed long enough to permit the propeller to enter the governing range.

The propellers were removed and completely disassembled. Inspection revealed that they had been assembled with the low pitch stops set at 14°. The basic pitch had been established at 10°. The reversing control plate had been set with the 10° graduation aligned with the 10° graduation on the segmental gear. This setting of the reversing control plate permitted the blade switch brush to contact a grounded portion of the plate when the piston was only 1° from the low pitch stops. This setting is insufficient to insure unreversing or to prevent entering reverse pitch if the feathering switch is held out.

The third sentence of paragraph 4-163 of Handbook AN-03-22CC-36, revised 1 June 1949, is in error. It should read: "After this has been checked, measure the blade angle at which the electrical ground is *established* when coming out of the reversing position and *broken* when coming out of the feathering position." The last line of paragraph 3-20 is also in error. The word "insulated" should be changed to "un-insulated."

Recommendations: (1) Inspect all propellers on P2V-4 aircraft for correct setting of the reversing control plate. (2) Correct the Handbook.

AF-2W (62 Hours); AF-2S (233 Hours)

Ring Cowl Panels. During the acceptance checks of both the AF-2S and the AF-2W, it was found that the junction of exhaust stacks No. 14 and No. 16 had chafed against the ring cowl panels rear support ring. *Recommendation:* Provide adequate clearance between the exhaust stacks and the ring cowl panels rear support ring.

Fuel Pump. During the acceptance checks of both the AF-2S and AF-2W, it was discovered that the changes which had been directed by BUAER had not been incorporated. The TF-161 gasket in the Thompson TF-3800-1 fuel pumps installed in the airplane was not replaced with a TF-3561 gasket; and the filister head screws were not replaced with AN-74A-20 hexhead bolts. *Recommendation:* Contractor incorporate safety of flight changes before delivery of aircraft.

"O" Ring Seal. Investigation of a leak at the outlet fitting of the auxiliary hydraulic system filter disclosed that the "O" ring had failed.

Hydraulic Tube. The hydraulic tube, which extends from station 116 to station 138 failed, and all hydraulic fluid was lost. It is believed that misalignment and vibration were the causes for the failure. *Recommendation:* Insure that hydraulic tubes are installed properly and have adequate support.

Protected Air Valve Actuator. The protected air valve actuator failed to operate. Investigation revealed that the radio noise filter (Lear Filter Model 943A) attached to the actuator was burned out. Because spacers had not been inserted in the mounting fitting on the drive end of the actuator, the actuator vibrated excessively and caused the capacitators in the radio noise filter to break loose. The broken electrical leads grounded against the cover of the box. *Recommendation:* Provide a satisfactory protected air valve actuator installation.

Mixture Control Lever. The pilot's left leg contacts the mixture control knob. On three flights, the lever was inadvertently moved from "rich" to "normal" position by movement of the pilot's leg, and on two flights, the control was moved to a position halfway between "normal" and "idle cut off." In its present location, the control knob adversely affects safety of flight and is uncomfortable to the pilot.

Investigation indicates that the mixture control lever might be straightened and the knob placed on top of the quadrant, if the propeller control lever were bent outboard approximately 17° and the throttle lever lengthened approximately two inches and bent outboard approximately 17 degrees. This change in the throttle would also increase pilot comfort by allowing the pilot to rest his forearm on the left console.

Tail Wheel. A section of the outer layer of rubber separated from the tail wheel. The layer of rubber had not been properly vulcanized.

Flap Actuating Cylinder. Upon investigating a hydraulic leak at the fitting on the upside of the flap actuating cylinder, it was found that the fitting was loosed.

Wing Tank Float Switch. Gasoline could not be drawn from the right wing tank by the transfer pump. The contact points in the right wing tank float switch were not properly aligned and would not close. *Recommendation:* Institute more rigid inspections and checks on fuel system components.

Manifold Pressure Gage. The manifold pressure gage would not indicate pressure accurately. During take-off with full throttle and 2800 RPM, the gage indicated approximately 33" Hg.; with closed throttle and full high pitch propeller setting, the gage indicated 30" Hg.

Microphone Wires. The pilot's microphone wires, which are routed from the throttle ever under the friction control bolt, chafe against the control bolt and are subjected to tension when the throttle is moved to the forward position. *Recommendation:* Route wires so that they do not chafe against the friction control bolt.

Canopy Hydraulic Control. The canopy hydraulic bypass valve opens in flight and allows the canopy to travel rearward. The valve is opened when the slipsteam actuates the external lever which is installed flush with the fuselage skin and attached to the internal hydraulic bypass valve lever. *Recommendation:* Install an overcenter linkage or a positive lock on the canopy hydraulic bypass valve control.

PF Amplifier Tube. The AN/ARC-1A VHF transmitter receiver operated intermittently. Investigation revealed that an RF amplifier tube No. 6AK5 had failed.

Dynamotor Socket. Upon investigation of feed-back noise in the ICS system, the socket for the dynamotor was found to be broken.

Hydraulic Pump Filter. When the main engine hydraulic pump filter was removed during a routine check, particles of rubber were found in it. The source of these particles is unknown; however, several hydraulic seal failures have occurred, and it is presumed that the particles found in the filter came from the failed seals.

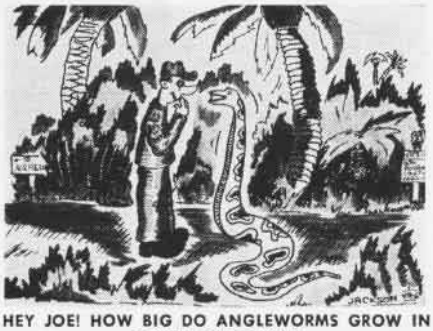
Flow Regulator. Upon investigation of a leak at the hydraulic flow regulator, the "O" ring seals were found to have failed. Two failures have occurred on each aircraft.

Auxiliary Fuel Pump. The auxiliary fuel pump failed. Investigation revealed that the shaft in the reduction gear assembly had seized and cracked. *Recommendation:* Return the reduction gear assembly to the contractor for investigation.

High Voltage Transformer. The APS/31 radar failed. Investigation revealed that the secondary winding of the high-voltage transformer, T802, was shorted internally.

● VMF-115, EDENTON—Lt. R. H. Bahner claims a new rocket record for this squadron. Making only his second rocket hop during 1949, Bahner scored eight bullseyes on eight runs. He dived from 8,000 feet and fired at 1,800 feet.

● VMF-122 CHERRY POINT—An F2H-2 Banshee was flown here in June by Col. J. A. Dunning, C.O. of the Air Force's 20th Fighter Group at Shaw Air Firce Base.



HEY JOE! HOW BIG DO ANGLEWORMS GROW IN SOUTH CAROLINA?

AVIATION ORDNANCE

HOW TO CHECK YOUR GUNSIGHT

As the word gets around that spectacular gunnery scores can be achieved with the Mk 6 Aircraft Fire Control Systems by those individuals who have mastered the requisite techniques, some concern has been expressed by field activities over the accuracy of the lead computation of this system. In particular, the adequacy of test procedures has been questioned inasmuch as a series of home-made systems for checking the operation of the sight unit have been developed.

Some of these systems have semi-official sanction in various publications. They include timing various degrees of turn or taking the time required to achieve the various lead angles in flight. While the concern of the field activities can be appreciated, the Bureau of Ordnance does not consider the exsisting test procedures inadequate. If a sight unit can satisfactorily meet existing checks, full reliance can be placed on its lead computing properties.

The *Sight Unit Mk 8* incorporated in this system yields a lead angle in air-to-air gunnery that is dependent upon the angular velocity of the target aircraft relative to the boresight datum line of the fighter, and upon the time of flight of the bullet from the fighter to the target. If these two quantities are accurately determined as outlined below, the lead angle generated is correct and a hitting solution is obtained.

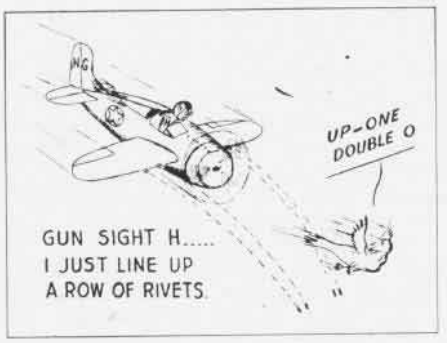
a. Angular Velocity. This quantity is created when the sight is rotated in space with the gyro running. The gyro attempts to maintain its position in space, but is constrained to return to the effective magnetic center by the eddy currents induced in the dome. A lag of the gyro-axis behind the BSDL (lead angle) results, the magnitude of which is dependent upon the rate of turn of the aircraft and the strength of the magnetic field. The field strength is a function of the current in the range coils.

b. Bullet Time of Flight. This quantity is a function of the range to the target and is introduced into the range coils by means of the throttle grip and gunsight controller or by a signal from a ranging radar. It is this range current that determines the strength of the magnetic field mentioned above.

Four Checks. If it were practicable to furnish turntables to squadrons, a quantitative analysis could be made of a system's lead computation by applying a rate of turn and a range input. However, since this is impracticable, the following four checks, if satisfactorily met, should assure the pilot that the system is operating properly:

a. Ample freedom of movement of the gyro is determined by the gyro friction check, using Test Unit Mk. 19 Mod. O set to "Gunsight Mk. 23 Mod. 1" position (p. 37, OP 1216).

b. Gyro-pip alinement check (p. 32, OP 1216).



c. Voltage regulator check (p. 42, OD 6332).

d. In-flight check. The flight check is a quick method to determine proper operation and should be made subsequent to satisfactory checks outlined by *a, b,* and *c* above. The pilot in flight should enter a turn and maintain an approximately constant rate of turn. While in the turn, the pilot should rotate the ranging throttle grip from maximum range (caged position) to minimum range. The gyro-pip should momentarily increase the lead angle and then, as the ranging throttle is moved to minimum range, decrease the lead angle.

Electrical Check. If doubt still exists or erratic movement of the gyro-pip is noticed, an electrical check (pp. 51 and 52, OD 6332) of the sight-unit circuits can be made in the following manner:

a. Remove the sight-unit cable plug from its receptacle.

b. Check the range coils by measuring the resistance between sockets 1 and 10 of the sight-unit cable plug. The resistance should be between 15.6 and 18 ohms.

c. Check the elevation coils by measuring the resistance between sockets 2 and 3. The resistance should be between 1.6 and 2.1 ohms.

d. Check the range resistor by measuring the resistance between sockets 3 and 6. The resistance should vary between 0 and 73.2 ohms ±2 ohms as the range setting is varied between minimum and maximum. (This control is part of the gun circuits only).

e. Check the temperature-compensating circuit by rotating the ranging throttle grip to minimum range position and measuring the resistance between sockets 3 and 5. The resistance should not be less than 8 ohms nor more than 1,750 ohms, depending upon the temperature inside the sight unit. (This circuit is part of the gun circuit only.) At 75° F. the resistance is about 58 ohms.

Gun Circuits. If circuits of the sight unit check satisfactorily, check the gun circuits as follows with sight-unit plug still disconnected:

a. Remove the + 22-volt lead from the regulator to the control box.

b. Set the selector switch to *gyro* or *fixed and gyro* and the fire-control selector switch to *guns.*

c. Using voltmeter check for leaks and shorts by checking all pins to pin 1 and all pins, including pin 1, to ground. All readings should be zero.

d. Measure the resistance between the pins of the sight unit cable connector (connector from the relay box). The following are the correct values:

Between pins	*Approximate resistance in ohms*
3 and 4	34.
2 and 4	34.
5 and 6	35.
5 and 10	2 (20 mm.)
5 and 10	0 (50 cal.)
Throttle grip turned for minimum range	
3 and 6	1,000 (50 cal.)
3 and 6	Infinite (20 mm.)
Throttle grip turned for maximum range	
3 and 6	0.

e. If the resistance between pins 3 and 6 is not zero when the throttle grip is in the maximum range position, the caging switch (S-102-E) in the controller may not be functioning or contacts 2 and 3 on Relay K-104-B in the relay box may be dirty. To check the caging switch, remove connector AN3106-14S-S from the controller and short terminals B and C. If the resistance now drops to zero, the caging switch is faulty. If any other of the above tests are not passed satisfactorily, the relay box should be replaced.

If the units pass the above tests and the sight still does not function properly, the interconnecting wiring should be examined for opens and shorts, with special attention directed to the connections in the connector plug assemblies or terminal lug connections.

Since most of the tests are made at the connector plugs and receptacles, care should be exercised in connecting the test leads of the meter to the pin sockets. Do not force the prongs of the test leads into the pin sockets. If the prongs are larger than the sockets, obtain spare connector pins and insert them in the pin sockets being tested.

Ordnance Pamphlet 1688 to be issued in the near future should be consulted for detailed instructions.

BUORD *Comment:* If the sight unit does not meet the above requirements, take it out of the airplane and turn it in to supply. Use the spare that you are allowed on your allowance list. Calibration of Sight Unit Mk 8 on a Gyro Turntable is possible but is ordinarily beyond the capacity of equipment available to the squadron. The Aviation Ordnance Supply System contains ample spares to replace every questionable sight unit. Central facilities exist for the rapid and economical repair of defective sights.

If you are having trouble with the operation of any part of this sight system or any other Aviation Ordnance Equipment, sit down and report it to the Bureau of Ordnance by RUDAOE. Griping about the operation of your equipment may be a good alibi, but it won't get you any more hits.

● NAS CORPUS CHRISTIE—Two colorful floats, a Marine color guard, Marine rifle platoon, four Navy plantoons and a Wave marching platoon were furnished by this station for the "Buccaneer Days" celebration of Corpus Christi before large crowds.

SUPPLY NEWS
FROM ASO AND SUPPLY DIVISION BUAER

New Trend in Preservation

When a mech or storekeeper has to break out material that is effectively preserved and packaged, he sometimes feels that a plot is afoot to make his already difficult job still more difficult. Before the development of efficient preservation techniques, great quantities of material "rusted in peace." The past few years has proved conclusively that proper methods of preservation increase the efficiency of the supply system and save money, material and manpower.

In the preservation and packaging of aeronautical materials, many items are preserved with grease-like compounds, sometimes referred to as contact preservatives. These contact preservatives set up and form a hard, paint-like protective surface. Others are known as "soft film" types because they form a soft grease-like surface. When heated, many of these compounds have about the same consistency as some of the heavier oils and are commonly referred to as slushing compounds.

In general, the hard film type compounds have given greater protection over longer periods of time. One reason for this is that the hard film types are not easily disturbed by contact with wrapping or other protective materials. A serious disadvantage is that hard film type compounds are more difficult to remove. Removal usually involves the expenditure of considerable manpower and money before the parts can be used.

While the soft film types do not give the positive protection afforded by hard film preservatives, they have the distinct advantage of being easily removed. With the need for greater economies in all "make ready" operations, there has been a decided trend toward the use of soft film preservatives and inhibiting oils. These oils are soluble in common cleaning solvents and do not require the additional expenditure of manual or mechanical effort to facilitate removal. This trend has been most apparent in circumstances requiring disassembly of the item. Precision instrument bearings are good examples of the type of material.

In preparing these bearings for indefinite storage, both the bearing manufacturers and the services originally favored the use of heavy-bodied slushing compounds with inhibitors. However, service complaints received by the bearing manufacturers gradually altered this point of view. Investigations revealed that when slushing compounds were used, it was necessary for overhaul shops to disassemble the bearings in order to obtain the degree of cleanliness required. On the basis of service reports, bearing manufacturers claimed that overhaul activities were not equipped to reassemble the bearings to their original precision state. This, of course, resulted in poor performance of the instrument.

It soon became apparent that the real solution was to be found by developing protective oils which are either the same or can be blended with the lubricants in which the bearings normally operate. The bearing industry has made great strides in the development of these oils, but it still faces a challenge created by problems of dissimilar metals and varying humidity conditions at the time of application.

It is recognized that the objective established for instrument bearings cannot be applied generally to the problem of protecting all aeronautical materials. Current emphasis is being placed upon the development of soft film preservatives and inhibiting oils which can either remain as an operating lubricant or be removed speedily and economically.

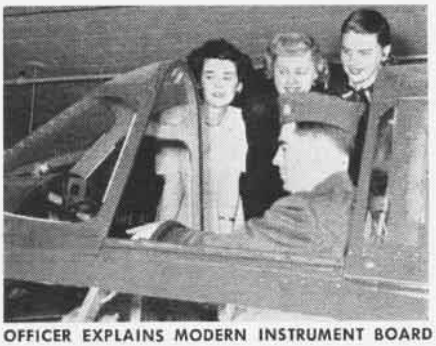
Armed Forces Day Program

Even though rain threatened, more than 12,000 people visited the Aviation Supply Office "Open House" on the first Armed Forces Day in Philadelphia. A four-hour program climaxed with the extemporaneous remarks of Naval hero, Fleet Admiral William F. Halsey, Jr., held the interest of the crowd. Rear Admiral S. E. McCarty, the Aviation Supply Officer, acted as host.

The Armed Forces Day program was off to a flying start as components of the National Guard, Naval Reserve and Naval Air Squadrons from the Willow Grove air stations, zoomed overhead. Blimps from NAS LAKEHURST cruised above the Depot, conducting air-to-ground communication exercises which were broadcast over the public address system. The versatility and maneuverability of the HO3S helicopter in rescue operations were displayed when a crew member climbed to safety by means of a rope trailing from the hovering plane.

Before the beginning of the formal program, the Philadelphia Police and Firemen band saluted the Armed Forces by playing various military airs while the ASO-NASD civilian glee club sang.

Representative William J. Green Jr. stressed the importance of unification in the defense plan of the nation. "Being 'Teamed for Defense,' " said the Congressman, "makes it possible to keep the defense machinery well greased and permits a faster shifting into high gear if the need should ever arise."


OFFICER EXPLAINS MODERN INSTRUMENT BOARD

Admiral Halsey, after acknowledging an ovation, stressed the important role ASO played in World War II. He complimented the personnel of the activity for their efficient work which made war material "available when it was needed and where it was needed."

In the 10,000-square foot ASO Aeronautical Training Room were featured the latest in jet engines, ordnance, aviation materials and samples of USMC and USAF equipment and material. A demonstration of GCA between the Training Room and aircraft flying above the Depot was held. The public was invited to "operate" many of the mechanical displays.

The efficiency of mechanized handling of materials as compared with manual handling was demonstrated.

Movies of the Navy's latest jet aircraft and the Bikini bomb test were shown continuously in the museum projection room.

In order to stimulate the interest of the youths in the Philadelphia area, contests were held in which more than 300 students participated. A poster and essay contest which featured the theme "Teamed for Defense," drew the largest number of entries.

In the evening a 30-minute television program spotlighting the theme of the day was presented by a local television station, WCAU-TV. Cdr. O. W. Stafford represented the Navy; Major E. L. Hemingway, the Marine Corps; Lt. Col. C. W. Cyr, the Army; and Capt. J. W. Russell, the Air Force. These four discussed unification in an open forum. A 20-minute film featuring the progress made in the development of weapons ended the program.

• VP-4—This squadron flew 1,280 hours more in the first five months of this year as compared with the corresponding period last year, a rise of 76 percent. VP-4 averaged 592.2 hours per month over this period as compared with 336.2 hours per month in the same period in 1949. A new squadron record was set in May with 808 hours flown.

LETTERS

SIRS:

In a letter to the editor in the June 1950 NANEWS, VR-2 claims they have ten lieutenants with a combined total of 49,797 hours.

In checking the log books of our ten top lieutenants, the total is 49,665.9, but in taking the time of our ten top pilots lieutenants or below, these pilots have a combined total of 50,979.3. This includes eight lieutenants, one lieutenant (junior grade) and one ADC(AP).

In checking over logs of some of the pilots with lesser time, we have our second team of ten pilots lieutenants or below, who have a combined total of 40,586.7 hours, which is higher than the claim of the 10 men of Airship Squadron One at NAF WEEKSVILLE—36,850 hours—published in March 1950 NANEWS.

Here is a list of the 1st and 2nd teams to back up our claim:

1st Team		*2nd Team*	
W. D. Roll	5519.6	M. P. Darnold	4698.6
C. I. Nettleton	5497.3	R. H. Ebersole	4683.9
H. E. Smith	5176.3	W. R. Bloom	4446.7
C. H. Cox	5116.3	W. G. Coulter	4263.7
A. A. Nelson	5092.4	B. C. Horton	4129.9
G. C. Schoulda	5054.9	C. H. Paske	3971.9
W. F. Hartman	5022.3	B. B. Smith	3903.5
G. P. Spinella	4902.5	S. E. Sloan	3599.3
J. T. Douglas	4875.0	C. F. Blecha	3483.8
J. Pedigo	4722.7	W. E. Deeds	3405.4
Totals	50979.3	Totals	40586.7

It is my contention that United States Naval School, All Weather Flight, can claim title as champions until dethroned by some other unit. These totals include flight time through 31 May 1950.

B. F. MCLEON
CAPTAIN, USN

NAS CORPUS CHRISTI

! Any contenders? Write in your claim.

SIRS:

The men of VU-7 stationed at NAAS MIRAMAR, Calif., are mighty proud of their softball team, the *Invaders*. And justly might they be proud of their team which successfully walked off with the District pre-season softball trophy.

They embarrassed the District team 9-0, slipped by NAS SAN DIEGO 2-0, had a pitcher's duel with FAETUPac 8-7, and narrowly escaped the wrath of Submarine Flotilla One in an overtime thriller 1-0. Members of the team toss a lot of credit to Ace Valenzuela who pitched for the All-Navy championship team in 1949. By winning the 11th ND tournament, the *Invaders* took over the defending championship spot from FAETUPac who had enjoyed that position for two years.

Team members in the picture are: back row, Snyder, Surles, Baker, McClain, Brokaw, Valenzuela. Center row, Gwinn, Henderson, Pressley, Frausto. Front row, Pina, Boatman, Coon.

COMMANDING OFFICER

SIRS:

With reference to your "Power Canopy Murder Case" article in the May issue of NANEWS, the following is a supplement to it:

"On a cross-country flight, I had secured an AD-3N prior to ROVNITE at a west Texas field when I had occasion to re-enter the cockpit. When I went to close the canopy, there was no hydraulic pressure. Standing on the port side, I reached into the cockpit with my right hand, turned on the battery switch, and held the auxiliary hydraulic pump switch closed to charge the system—*without first checking position of enclosure control.* With the enclosure control in CLOSE position, the canopy immediately closed against my shoulder. Fortunately, the leverage of my right shoulder and right hand was sufficient to oppose the closing pressure until a nearby assistant could release the pressure by moving the control."

It is noted that the spring-loaded control handle on the AD-3W which returns to neutral (upon release of manual pressure against the control handle) from the close position prevents inadvertant closing of the canopy under such conditions as described above.

P. S. HARWARD,
Lt. (jg), USN

NAS PATUXENT RIVER

SIRS:

The picture of the "tired little Marine mechanic" pictured in NANEWS (May 1950) and the recognition given to the men like him . . . was warmly received by several members of MAG-25(P) who recognized the Marine "whose name nobody knows." He is R. W. Greenwood, now residing at 139 North K Street Needles, Ariz. He left the Marine Corps after the war as a Master Sergeant and is now an employee of the Santa Fe Railroad.

At the time this picture was taken, Greenwood was a member of VMO-251 (later VMF-251) and was one of many fine Marine mechanics who so capably kept the planes flying at Guadalcanal in 1942-43.

HARRY F. SCHWETHELM
MAJOR, USMC, VMF-152

MCAS EL TORO

CONTENTS

● THE COVER

Shown loading JATO bottles on the side of a P2V at NAS Guantanamo are three members of VP-8. During Caribex and Portrex exercises in March, the squadron was busy qualifying PPC's and more-experienced second pilots in JATO takeoffs, 13 being made in one morning alone. In the picture are D. Razon, AOAN; J. H. Long, AOAN; R. R. Logan, AOC. Photographer G. R. Musal, AFAN, VP-8.

● RECOGNITION QUIZ

Top, left—New swept-wing version of the F-84 Thunderjet, called the YF-96A because of extensive design and engineering changes.

Top, right—Grumman F9F2 Panther with wingtip tanks. Note long nose, wings fairing into fuselage aft.

Lower—Fairchild R4Q-1 Packet, now doing transport service with the Marine Corps.

● THE STAFF

LCdr. Arthur L. Schoeni
Editor

Izetta Winter Robb
Associate Editor

LCdr. Larry L. Booda
Associate Editor

Lt. Rosalie W. Martin
Associate Editor

LCdr. Andrew W. Bright
Associate Editor

James M. Springer
Art Director

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SQUADRON INSIGNIA

A PIRATE, favorite motif on many squadron, insignia, features VF-24's new design. The scimitar stands for eagerness and readiness for battle; the eye-patch, the close scrapes weathered. VF-113's bumblebee signifies its fighters planes; the stinger, their 20 mm. cannon. VP-8 flies P2V Neptunes, so its insigne rightfully has the old gent astride the world, armed with 20 mm. cannon, rocket, spyglass and bomb, each indicating a squadron mission in antisubmarine warfare. The lightning streak is for the P2V's speed. FASRon 8's giraffes with crossed necks are unique.

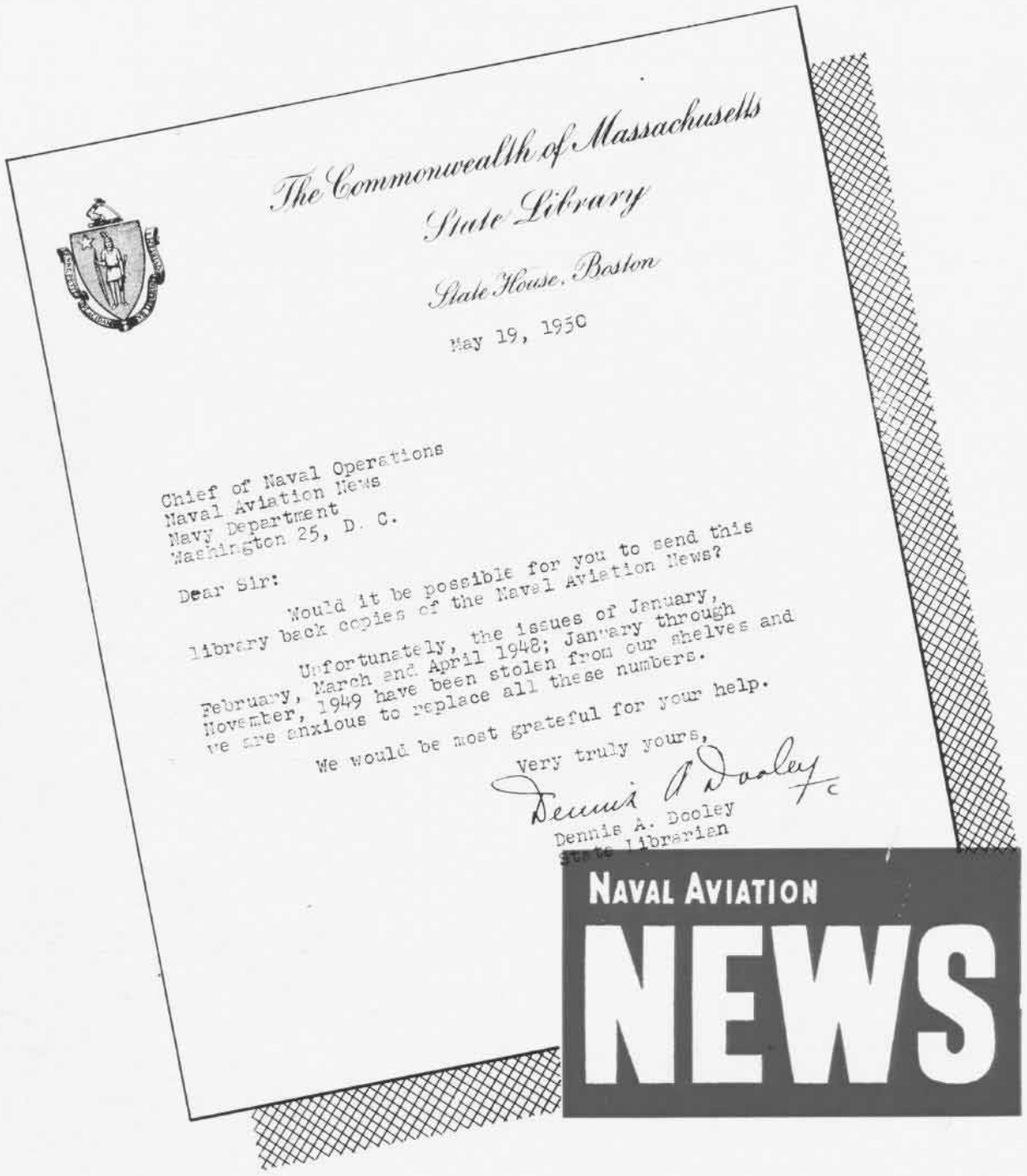
VF-24

VF-113

VP-8

FASRon-8

WARNING!



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