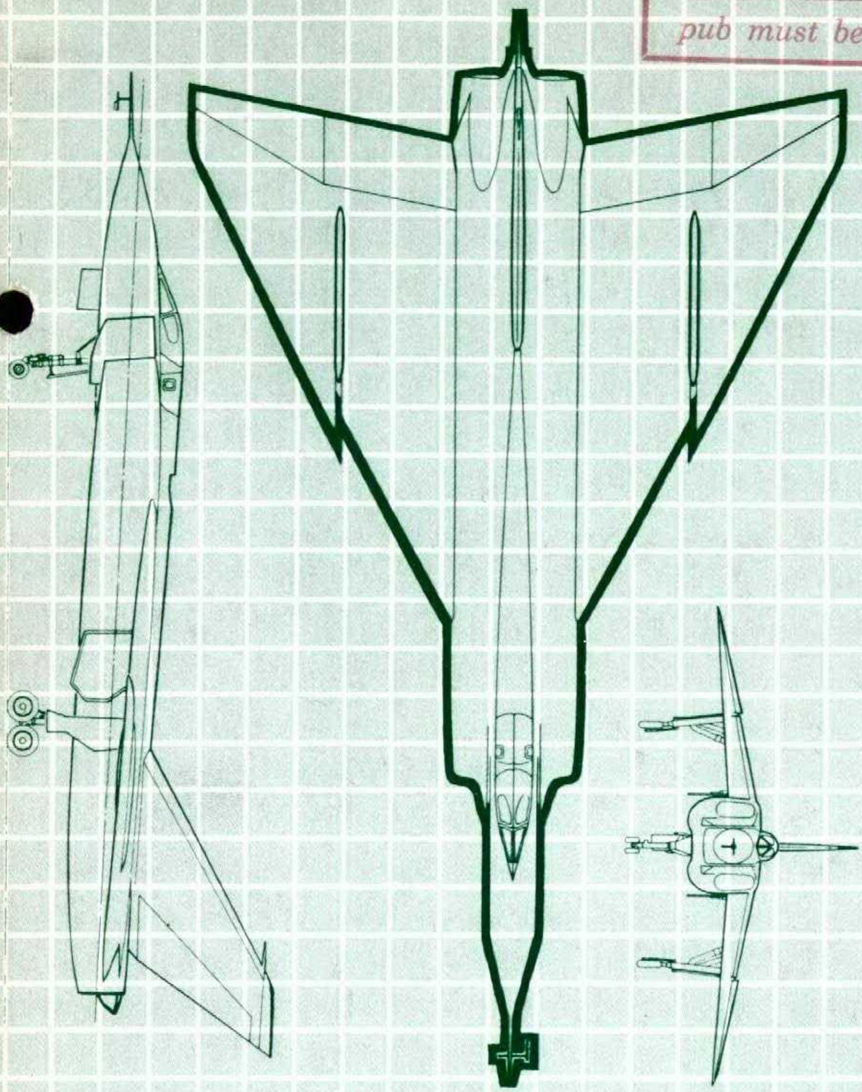

FLIGHT COMMENT

ROYAL CANADIAN AIR FORCE

MARCH • APRIL • 1958

FLIGHT COMMENT

ISSUED BY
DIRECTORATE OF FLIGHT SAFETY
R.C.A.F. HEADQUARTERS • OTTAWA, ONT.

MARCH • APRIL 1958

C O N T E N T S

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OFFICIAL INFORMATION

The printing of this publication has been approved by the Minister, Department of National Defence. Contributions are welcome, as are comments and criticisms. Address all correspondence to the Editor, Flight Comment, Directorate of Flight Safety, RCAF Headquarters, Ottawa, Ontario. The Editor reserves the right to make any changes in the manuscript which he believes will improve the material without altering the intended meaning. Service organizations may reprint articles from Flight Comment without further authorization. Non-service organizations must obtain official permission from RCAF Headquarters before reprinting any of the contents of this publication.

Edmond Cloutier, C.M.G., O.A., D.S.P., Queen's Printer and Controller of Stationery, Ottawa.

S/L G. INGLIS

SGT. J. W. CARR

S/L Inglis was piloting a Canuck on a rocket firing exercise at 25,000 feet when he experienced a violent yawing caused by a malfunctioning yaw damper.

Just as he switched off the yaw damper and auto-pilot, the gyrosyn compass stopped operating, smoke began pouring from behind the flight instrument panel, the API commenced spinning, fuel gauges went unserviceable, and the artificial horizon became sluggish, under-reading in bank with the OFF flag showing intermittently.

The pilot immediately "dumped" pressurization, which cleared the smoke from the cockpit, and cut out the circuit breakers for the compass, auto-pilot and radar. The only flight instruments left functioning were the ASI altimeter, turn-and-bank, and vertical speed indicator. Weather at base was 300 feet, sky obscured, visibility five-eighths of a mile.

S/L Inglis advised GCI of his difficulties and commenced a GCI/GCA approach which was set up with Sgt J. W. Carr, the GCA controller. Although the first "no-compass" GCA was good, the aircraft drifted off centre line on final approach, and the pilot elected to overshoot rather than execute a steep turn at low altitude. On the second GCA approach the pilot and Sgt Carr collaborated closely and effected a successful landing. Technical investigation showed that loss of power in the aircraft was caused by a malfunctioning main inverter.

The standard of flying skill displayed by S/L Inglis, and the ability demonstrated by Sgt Carr in directing the aircraft to a successful landing, were of the highest order. This calibre of cooperation and understanding between pilot and ground controller is well deserving of a "Good Show".

Who's Who?

W/C P. deL. MARKHAM
Directorate of Maintenance Engineering

Do you, as a pilot, ever feel a bit imposed upon by having to carry out a lengthy and complicated preflight check? Have you ever thought, "Why should I do this? It's serviceable, isn't it?"

Do you, as a technician, ever feel a bit insulted by having aircrew check over your aircraft before flight? Have you ever thought, "What's he doing that for? I signed it out, didn't I?"

You do, eh? Well you should be interested in this little reprint from "Air Clues", which is issued by the Assistant Chief of the Air Staff (Training), Air Ministry, London.

Cross Check

"The pilot of a Hunter 4 felt a sudden lurch and loss of power just after takeoff, and promptly returned to the airfield to land again. On looking round the aircraft he saw that a radio access door had stuck in the starboard intake.

"It was found after landing that the locking tabs over the catches on the panel had not been screwed down. The pilot said that he had paid special attention to the fitting and position of the catches before starting, and that they had appeared to be secure.

"The airframe mechanic responsible for the daily servicing inspection was held to blame for the accident, and an order was issued that all pilots on the unit were in future to make a physical check before flight to ensure that the screws were tight."

Wing Commander Spry (an imaginary, but typical officer representing Air Clues opinion) had this to say in reply:

"There are certain checks by the pilot which may be essential before flight, and a pilot with any common sense and a moment or two to spare will naturally have a more careful look around. The prudent will voluntarily check up on ejection seat latches and similar items which affect their prospect of survival, but these checks by the pilot are entirely independent of the normal servicing routine.

"The pilot is entitled to expect that he will find the aircraft in the state indicated by Form 700 (RAF equivalent of our L14), and any fault he discovers on his inspection is no less a sign of failure of the servicing organization than if it had been found out in flight.

"I think we must be realistic and recognize that a pilot has enough to worry him without being involved in responsibility for the mechanical state of his aircraft before he uses it. Warnings are fair enough, but servicing errors will not be eliminated by adding a new item to the pilot's check list every time they are discovered. The test of a good order is whether it can reasonably be expected to be carried out in practice as well as in theory. To provide a busy and occasionally harassed pilot with a long list of checks, most of which lie outside his normal sphere of interest and responsibility, is a practice which has only its administrative convenience to commend it.

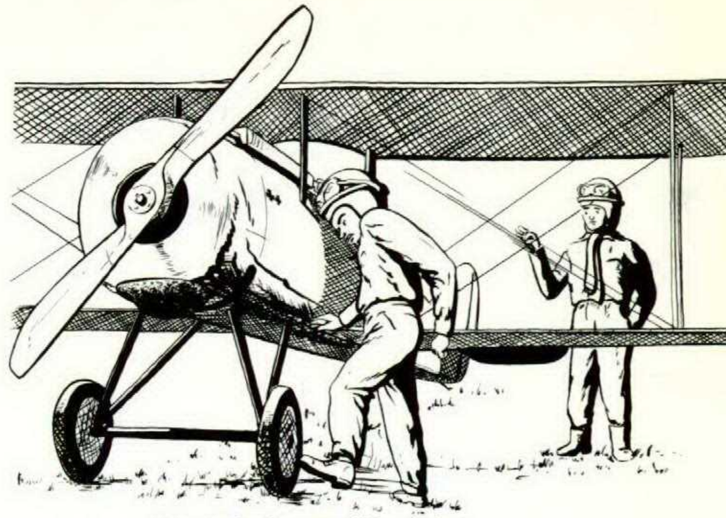
"The danger seems to me to be twofold. In the first place, the pilot's basic checks may be obscured by the extras; and in any case he might be tempted to discriminate under pressure of work between what he regards as essential and what he does not, regardless of his formal obligation. The second and more important danger, however, is the use of the flying order book as a shelter for the technical staff or a substitute for logical organization. The implied transfer of obligation from the technical supervisor to the pilot is not likely to encourage the former to realize his responsibility for irregularities which are revealed in the pilot's preflight check.

"As usual we have to strike a sensible balance. A chap who leaps into the cockpit without at least walking round the aircraft is an utter fool, in my opinion, but I would hate to see him attempting a primary two-star inspection when I wanted him in the air. I would certainly be annoyed with him if he took off with a ladder attached, a blanking plate installed or a panel open; but I can't see myself getting very excited with him for not checking that the nuts and screws were tight enough. In this case I should have addressed some very searching questions to the servicing NCO whose job it was to supervise the guilty airman."

The original external inspection was not intended as a double check on serviceability but rather as an extension of the cockpit check. The inspection included removing the pitot cover, control locks and intake covers, as well as pulling the engine through. It should be noted that these duties do not effect the serviceability of an aircraft but rather its readiness for flight. They are still part of our preflight checks, together with similar precautions which are more specifically associated with modern equipment.

The careful pilot of the old days looked over other things too, for his own satisfaction. He probably checked his tires, his plug leads, the tension of his flying and landing wires, and other odds and ends which had not been quite right on some previous occasion. He may have heard that so and so had a wheel come off because someone left a split pin out; and so he looked at these too. He added or subtracted from his mental checklist to suit his experience with particular aircraft and particular groundcrews. On the whole, though, his aeroplanes were not very complicated or expensive.

The modern external inspection is a combination of the check for readiness and the mental checklist of possible trouble spots. Our aircraft are far more complex and immensely more costly, and a lot more pilots fly them. Consequently it is a good thing to protect the investment in materiel and training by attempting to ensure a standard check which embodies all relevant experience on the aircraft concerned. However, although we now have some serviceability items in our pilot's checks, they are not a substitute for the checks carried out by groundcrew. In all cases they are a duplication, and no responsibility is transferred to the pilot from the engineering staff. The man who signs section 3 or 4 of the L14 has the responsibility for a fully serviceable aircraft. That's his job. The pilot's job is to ensure that the aircraft is ready for the particular mission he has to undertake.



The original external inspection.

So let's not misunderstand the situation. That external inspection is to assure the pilot that everything is on the top line when he takes over from the groundcrew. Once he is committed on the takeoff, it's too late to secure that fastener, to lock that filler cap, to take off that pitot cover, or remove those control locks.

You—the pilot—should realize that no one is infallible. Because mistakes are made every day, you owe a check to your passengers, your crew and yourself. This is good airmanship.

And you—the technician—should appreciate the pilot's point of view. He knows that you are good, but he also knows that you are human. You count your pay on pay-days, don't you?

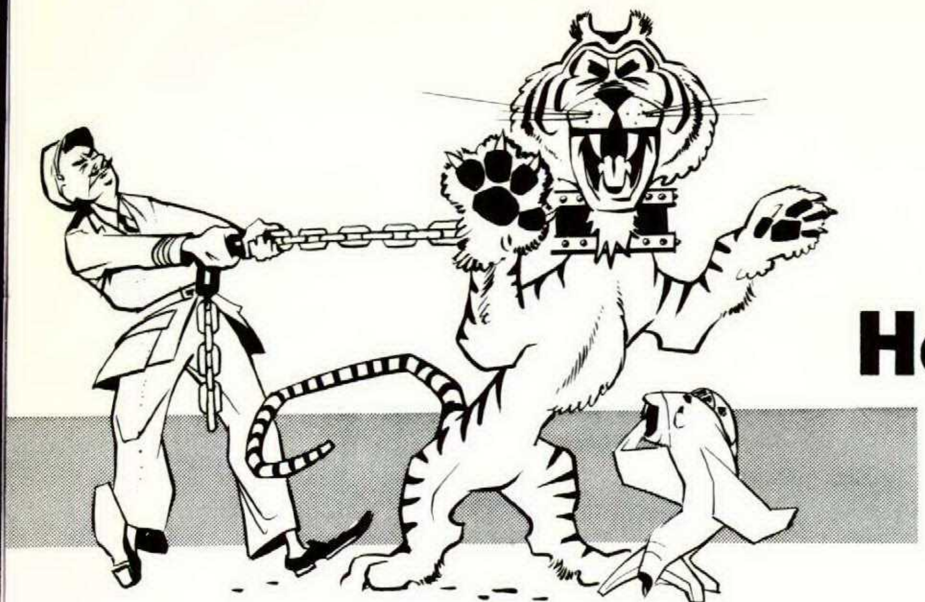
SIMULATED INSTRUMENT FLYING

Prior to takeoff in an Expeditor on a simulated instrument flying exercise, the metal shield was installed. During takeoff, which was handled by the pilot in the right-hand seat, the shield fell from its mounting. Three unsafe conditions were present.

- If an engine had failed, the pilot in control could not have reached the feathering button and flown the aircraft at the same time.
- The pilot in the left-hand seat could not have assisted during any emergency because he was behind the instrument shield.
- The shield could have created a dangerous condition if it had fallen in such a way as to hinder the control column movement or restrict the throttle quadrant levers.

Although realistic instrument simulation is desirable, safe operating procedures must be followed. During simulated instrument flights the instrument flying shield should not be put in place until the aircraft is safely airborne with undercarriage and flaps up and climbing power established.

Operational Hazard Report



Hold That Tiger!

W/C J. D. LINDSAY
Directorate of Air Defence Operations

OK! So you're a Tiger! A real roaring Tiger who has waxed just about everything that can get airborne. Yes—you're hot, real hot. A ball of fire who can wring an aircraft through any manoeuvre that's ever been invented—and a few which as yet haven't. So I ask you: What's with this Tiger stuff? What are you proving?

Now don't get me wrong. I'm not knocking the Tiger Spirit. I'd just like to point out that its use in the RCAF seems to have become very badly misdirected.

"Every man's a Tiger" was a catch phrase born during the Korean fracas. It was meant to instill a keen, aggressive spirit into budding young fighter pilots who suddenly found themselves on the threshold of combat rather ill-prepared or indoctrinated for the real "honest-for-keeps" type of flying. The supervisory staffs—the squadron and flight commanders, and the section leaders—were often as green to "shooting" operations as were the second balloons. As a result, the younger fellow didn't get his baptismal fire by degrees—by learning from the experiences of more seasoned types—but had to face it abruptly and in most cases with grave misgivings.

How to overcome these shortcomings? How do you build up pilot confidence? First you sell them on being aggressive. Then you encourage them to be proud of their aircraft and confident of their ability. Last but not least, you teach them how to fly an aircraft well—right up to its limits. Don't forget that the Korean type of flying was for keeps. There was no time to accomplish all this in a leisurely way. It had to be rushed and it had to be pushed; and like most things done in a hurry, it was overdone.

Overdone. Therein lay the greatest problem. We tried to make Tigers out of lambs—and got more than we bargained for. Today, as a result, the Tiger Spirit has become misconstrued to the point where you are no longer considered a Tiger until you go up and "wax" the squadron commander, pull 6-1/2G in a split-S from five thousand feet, growl daily at the CO—and then repeat the whole performance

THE TEMPO MUST BE MAINTAINED

just for the benefit of young F/O Jones, the latest wet-nose addition to the squadron.

Oh, we're hot all right! Trouble is, the Tiger isn't really flying his aircraft any more—he's just punishing it. And why? The poor aircraft is innocent. It did nothing to deserve this terrible beating, particularly when it's just for "kicks". All the Tiger achieves by pushing an aircraft to its maximum is a stress here, a strain there, the odd popped rivet, and a partially satisfied, over-active ego.

To-day's aircraft are strong and fast. They are built very precisely, to do a very precise job. Because of the precision equipment which goes into them to make them weapons, and the limited tolerances which the manufacturers are allowed in their construction, flying has become a highly skilled profession. This means it must be precise and accurate. Not slap dash. It means knowing your aircraft and your own limitations. It means staying within the bounds of these limitations or, if necessary, flying right to the extreme edge of them. But NEVER!—and I repeat, NEVER!—over them.

Sure, there may well be the odd occasion when the aircraft's limits are exceeded accidentally. But brother! Don't hand me that line that you just had to hang onto your leader and pulled 7Gs when you inadvertently ran through his slipstream! You already know you're on the G limitation; you already know there's a jet wash from the aircraft in front. That's when your act ceases to be "inadvertent" and becomes stupid.

My particular illustration may be rather weak, but I've seen and heard many excuses just as lame. Yes—and given by real Tigers, too! The only difference is that on those occasions it was the engineering officer and the squadron commander who were doing the growling.

OK, so I'm square—a little old, you say. True, a little older. But there's a reason why I'm a Tiger. I believe in the Tiger Spirit and I believe aggressiveness must always be foremost if a pilot and his organization are to enjoy a successful career in the fighting business. As to being "aggressive", a term which any good dictionary defines as "being offensive", I know on which syllable I place the accent for myself. I wonder where your CO would put it when describing you?

Give me a pilot with a good steady character, a reasonable amount of common sense and an easy, natural ability to co-ordinate mind and muscle. Give me a pilot who knows his aircraft—and himself—intimately. Give me a pilot who can temper dash with discretion. Give me all of this in one pilot—and I'll show you a REAL TIGER!

STAY AWAY FROM PINNACLES

Some men set themselves up on little pinnacles, apart from their fellows. Pinnacles do have certain attractions. They rear their craggy heads high above the surrounding terrain. They provide an opportunity to look down on a big chunk of the world, and to enjoy being in an elevated position. They afford refuge from interruptions and annoyances and people who are hard to answer. They permit a sense of aloofness, of importance and, perhaps, of superiority.

If you see a pinnacle on your personal horizon, detour, because pinnacles are not for Supervisors. When you are perched on a pinnacle you are not getting anywhere. But you are on a spot where you can lose your touch, where you can't reach your men and where they can't reach you.

Recently I was with a mechanic when his Supervisor passed by without a glance in our direction. This Supervisor is a man of vast experience and considerable achievement. I commented that it must be interesting to work with him.

"With him?" snorted the mechanic. "He doesn't know I'm alive, much less that I work here."

The disappointment and the hurt of being ignored was evident in his voice. Thinking to ease the pain I asked, "But isn't that better than having him on your neck a dozen times a day?"

The answer was quick and flat and unequivocal. "No! I do my work well and it would be nice if he noticed it. Perhaps he could show me how to do it better. But he isn't interested. He doesn't even know I'm alive."

Personally I think that this mechanic is mistaken. It is probable that his Supervisor knows a great deal about him and about his work. But the two are completely out of touch. There has been no communication down from the Supervisor and none up from the mechanic.

That is the sad thing about pinnacles. Their cold and lonely heights cut you off from your men and from your job. And the knowledge that you isolated yourself doesn't help a bit, unless you want to get down.

So stay close. Stay warm and alive. Stay knowable and reachable and friendly. Stay away from pinnacles.

FSF: Mechanics Bulletin

TOOL RIGHT—SAFE FLIGHT

MAJOR RICHARD A. HARDING

The first half of Tool Right—Safe Flight appeared in the Nov-Dec 1957 issue of Flight Comment. Some readers have described the article as "too basic". Our reply is that we all occasionally need to review fundamentals if we are to overcome two of the commonest faults in human nature: carelessness and complacency.—ED

Use Pliers Sparingly

Pliers are next on the list. They are also on "the list" of many supervisors who hate the very sound of the name. No tool in your box can be more misused or ruin more work than a pair of pliers. In fact, some old-timers won't let a mechanic use a pair under any circumstances.

There are many types of pliers, but the most common are the 6-inch combination slip-joint pliers, usually called "combination" pliers. Combination pliers come in the following sizes: 5, 6, 8 and 10 inches. Some are made with a side cutter arrangement for clipping cotter pins.

Under no circumstances should pliers be used on hardened surfaces to tighten or loosen a nut. If you do use them on such a hardened surface you will dull the teeth and the pliers will lose their grip. There is a wrench made for nearly every job of torquing. Think of a pair of pliers as a HOLDING tool, never as a torquing tool.

Other variations are the diagonal (dike) pliers and the long nose or "duckbill" pliers. Use diagonals for clipping cotters, pulling cotters from castellated nuts, and for spreading split ends of cotter keys after the key has been inserted in the hold.

The long nose pliers, either flat or duckbill, will help you out of many a tough spot where you need a long reach in a tight place. Think of them as an extra long pair of fingers, and use them accordingly. Clean your pliers regularly, and put a drop of oil on the joint pin now and then. Pliers will rust, and rusty pliers are inefficient tools.

Open-End Wrenches

Solid, non-adjustable wrenches with openings in each end are called open-end wrenches. About 10 of these wrenches are commonly found in a tool box. The openings vary from 5/16" to 1 inch in width.

The size of the openings between the jaws determines the size of the wrench. The smallest wrench in the ordinary set has a 5/16-inch opening in one end and a 3/8-inch opening in the other. Because of this combination the wrench would be referred to as a 5/16 x 3/8-inch, open-end wrench. These figures refer to the distance across the flats of the nut and not to the bolt diameter. The wrench openings usually measure from .005 to .015 of an inch larger than the nominal sizes marked on the wrenches so that they will more easily slip on and off bolt heads and nuts.

Length Varies

The smaller the openings in the wrench, the shorter the over-all length. This proportions the lever advantage of the wrench to the size of the bolt or stud. With a given amount of pull on a wrench, a short length will produce less twisting or torque and will reduce the possibility of over-torquing to such an extent that the work is sheared or stripped.

Only nuts use pliers on nuts.

Isaac Newton speaks again.

Push for the knucklebuster.

Good way to wreck a wrench.

Open-end wrenches have the head and openings at an angle to the body. Most are designed to be off-set about 15 degrees, but some wrenches are designed for a 22.5-degree offset. In case you wonder why wrenches are made this way, this design provides for working in close quarters. An elementary trick is that of "flopping" the wrench after every stroke—turning it over so the other face is down and the angle of the head is reversed to fit the next two flats of the hex nut. This makes it much easier to turn off or tighten up.

The 15-degree angle, plus the flopping of the wrench, enable you to turn a nut continuously even when the swing of the nut is limited to 30 degrees. If the head were straight and not on an angle of the body of the wrench, you would require twice as much travel.

Some special types of open-end wrenches have the angle of opening at 75 degrees, and others are set at an angle of 90 degrees. There are also special thin, open-end wrenches which have extra long handles that allow you to work in narrow spaces. Be sure that you never use this type of wrench for any job that requires a lot of torque, because the handles are not designed to withstand heavy leverage.

Here are two simple rules for the use of open-end wrenches:

- Be sure that the wrench fits the nut head.
- When you start to torque a nut, be sure that the wrench seats squarely on the sides of the nut.

Always PULL on a wrench—never push. Pushing a wrench is dangerous. The threads could break loose unexpectedly, and you'd wind up with some hide off your knuckles.

Adjustable Wrenches

Adjustable wrenches are shaped somewhat similar to open-end wrenches but have one adjustable jaw. The angle of the opening to the handle is 22.5 degrees, and the usual set of adjustable wrenches includes 4, 6, 8, 10 and 12-inch sizes. However, these wrenches are also made in standard 15 and 18-inch sizes.

Although adjustable wrenches are especially convenient at times, they are not intended to take the place of standard open-end, box or socket wrenches. Smaller adjustable wrenches are principally designed to be used when you encounter an odd-sized nut or bolt.

Adjustable wrenches are not built for hard service. They just won't take torque! Whenever you have to exert any amount of force on an adjustable wrench, remember these two factors:

- Always place the wrench so that the pulling force is applied to the stationary jaw side.
- After setting the wrench, tighten the knurl so that the wrench fits the work snugly.

Under no circumstances ever hammer the end of an adjustable wrench or use an extension on the handle to get more torque. The result will be a wrecked wrench.

Box Wrenches

The best feature about a box wrench is that it can be used in close quarters. These wrenches are called "box" wrenches because they box or completely surround the nut or bolt head. In place of a hexagonal or six-sided opening, the box wrench has 12 notches arranged in a circle. A 12-point wrench can be used to continually loosen or snug up a nut with a minimum handle travel of only 30 degrees as compared to the 60-degree swing necessary in an open-end wrench. Another advantage of the box wrench is that there is little or no chance of a wrench slipping off the nut or bolt.

Decisions—always decisions.

There is one disadvantage in using box wrenches. Working with them is slower than with other types of wrenches. Each time the nut is backed off the wrench has to be lifted up and refitted to the head of the work. Use the box wrench to break loose tight bolts, or to snug up work after the nut has been seated.

Socket Wrenches

The socket wrench is the big factor in making a mechanic's work easier. The first socket wrenches were formed with an L or T handle as part of the wrench, and each size socket was a separate wrench. Today there is an infinite variety of socket wrenches for every possible use and position.

One thing to keep in mind when using socket wrenches is that they should never be over-stressed. Never use an extension on a socket wrench to increase torque. Always use a socket that's big enough for the job—and by that we mean the drive size. Don't be in a hurry and use a half-inch drive socket when it will take only a minute to get a 3/4" drive that's built for the heavy job.

Spanner Wrenches

There has been much conjecture in certain high places as to the proper use of the word "spanner" as opposed to "spanner wrench". The British call almost any wrench a spanner; but spanner wrenches as we know them are special wrenches for special jobs. They do not come under the classification of tools for the average kit.

There are several types of spanner wrenches. The "hook" spanner is for round nuts which have a series of notches cut in the outer edge. The "U" spanner wrench has two lugs in the face of the wrench to fit notches cut in the face of the nut or screw plug. End spanners resemble a socket wrench but have a series of lugs on the end that fit into corresponding notches in the work. Then there are pin spanners that have a pin in place of a lug. The pin fits into a round hole in the edge of the nut. Face spanners are like "U" spanners except that they have pins instead of lugs attached to the face. Call it "spanner" or call it "spanner wrench", but be sure you have the right tool. Spanners are special tools!

Which Wrench to Use?

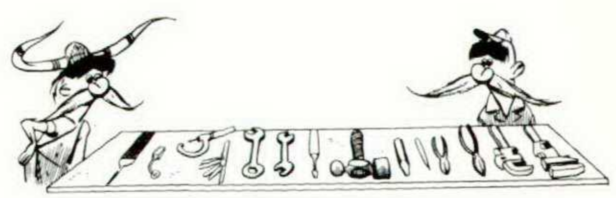
Now that you have been exposed to the various kinds of wrenches ordinarily used by mechanics, you probably are wondering how you are to choose the right wrench. Shall it be an open-end, adjustable, or box? Only experience will teach you this—experience and a little good common horse sense.

However, there are a few simple rules that will help you. The type of job to be done and the location and number of nuts or capscrews to be worked can be the basis of tool selection. When there are a number of nuts of the same size to be loosened, use the proper socket wrench. For instance, if you were pulling the head on an auxiliary power unit, you would first break the stud bolts loose by using a socket on a hinged off-set handle with the handle bent at about 90 degrees for leverage. Then, after the bolts are broken loose, the hinged handle would be brought up to vertical, and the bolts would be finger-twisted off. For installing an oil pan, a speeder wrench would be best. Not much force is required, and the wrench is fast.

For fuel lines, oil lines, hydraulic systems and linkage, open-end wrenches are best because little leverage is required to work them. This is important. On aircraft there are many knurled nuts. These nuts are not designed to be torqued up more than a few pounds. Never use a metal wrench on a knurled nut. You will find leather strap wrenches available in the tool crib. Take a minute extra and get the right tool. Put a metal tool on a knurled nut and you ruin it.

Much of the above may have sounded elementary to you experienced hands. But, day after day, it is the so-called "experienced hand" who is fluffing up the job with the wrong tool or the right tool carelessly used. The one big block seems to be the human brain. Stop and THINK a minute. That fuel line you over-torque may be on the next aircraft to carry YOU or someone you know. Don't try to make an accident statistic all by yourself.

USAF: A. A. & M. Review



The choice is up to you—so are the results you get.

SEAT HOSE DISCONNECT

"At 1845 hours on the 9th of September, I started up the Canuck to go on an AI exercise at 30,000 feet. While taxiing out to the runway for take-off, I noticed exhaust fumes in the cockpit from the aircraft ahead of me, and re-selected the oxygen regulator to 100%. As I was doing a cockpit check, a loose side panel rheostat control knob came off and dropped to the floor. I started groping for it, and I recall that my hands touched the oxygen hose by the bottom left-hand side of the seat.

"Take-off went well and nothing eventful happened on the climb until, just before levelling out at 30,000, I felt a slight dizziness. When the condition persisted, I did an oxygen check—but neglected the blinker. Next I tried to slow down my breathing by inhaling deeply; however it was very difficult to hold my breath for any length of time.

"The cabin altitude at 30,000 feet was approximately 16,000 and I remained at this altitude for about 45 minutes, completing three runs as fighter and three as target. As I was doing my last run I started to feel so bad that I thought it would be best to return to base. At that time I started to vomit, and immediately descended to about 20,000. I felt a little better once I got down to a lower altitude. I still had a headache, but my dizziness had disappeared. Obtaining a clearance I completed GCI/GCA run.

"On the ground I was uncertain as to whether I had suffered from hypoxia or just airsickness, so I decided to have a talk with my flight commander before entering anything in the L14. However, before I had a chance to talk to anyone in the flight room, servicing called down and said that aircraft 593 was unserviceable because of a duff blinker in the front seat.

"I then went out to check the aircraft myself and found that the oxygen hose on the seat was not connected to the floor. The snag crew were informed of this, as was my flight commander."

The unit FSO comments: Whew! Well—that's it. This pilot owes his life to some quirk in his physical makeup that causes him to vomit before passing out from lack of oxygen. Since we don't all come equipped with this handy rig, let's at least see what we can learn from the pilot's story.

Searching for knobs on the cockpit floor will not pull your oxygen hose out of engagement at the bulkhead connector. The ejection seat had been installed just before flight, so the technician simply failed to connect the oxygen hose. Moral: Although this particular airman is not likely to make a second mistake, others might—so read those L14 pink page entries and be prepared.

Obviously this Near Miss was caused by a poor cockpit check. The one recalled by the pilot failed to include the press-to-test or a blinker check. As for the exhaust fumes, clearing them with a disconnected hose and 100% selection must be regarded as sheer coincidence. There just isn't any substitute for a complete preflight check and regular cockpit checks through 10,000, at levelling off, and periodically during flight. Oxygen has got to be watched. So check it.

Cockpit checks we all know about, but the joker in this Near Miss is the failure to recognize symptoms of oxygen lack. Early in his training, the pilot concerned in this incident had suffered from air sickness, and the symptoms he encountered at 30,000 were so much like his earlier sickness that he never seriously suspected anoxia but continued roaring through the night doing collision course intercepts and getting dizzier all the time.

The hazard speaks for itself. The only safe precaution is to treat all unusual symptoms as possible anoxia. Practice the drill. The pilot in this case missed blinker, regulator selector, pressure test, oxygen supply and bailout bottle. When you can run through it all in your sleep, you've got it made.

If you feel you know your anoxia symptoms, read on. This pilot had tried it in a decompression chamber at a pressure altitude of 33,000 feet and showed amazing tolerance. However, the symptoms he encountered at a cockpit pressure altitude of 16,000 feet were so unlike those in the decompression chamber at 33,000 that he could not associate them. We must, then, be prepared for a more insidious onset of symptoms in a pressurized cockpit than we found in the decompression chamber. Recognition of symptoms can be doubly important. If you return safely and unknowingly as this man did, you too might overlook the L14 and set the stage for the next man's Near Miss.

Think about this for a minute: Our friend here made only one mistake—his preflight cockpit check was incomplete.

Finally, the designers deserve a blast. This is the third seat hose disconnect Near Miss we've encountered. Why haven't we got a restrictor valve in the seat hose like the one in the mask hose?

Mayday! Mayday! Mayday!

S/L G. L. SHEAHAN

Electrifying transmissions that light the fuse! When they come in, entire ground systems are alerted. Crash crews stand by, the Rescue Co-ordination Centre notifies Air Sea Rescue, Air Sea Rescue crews begin plotting your track, medical teams are readied, and technical and flying experts are made available for any emergency.

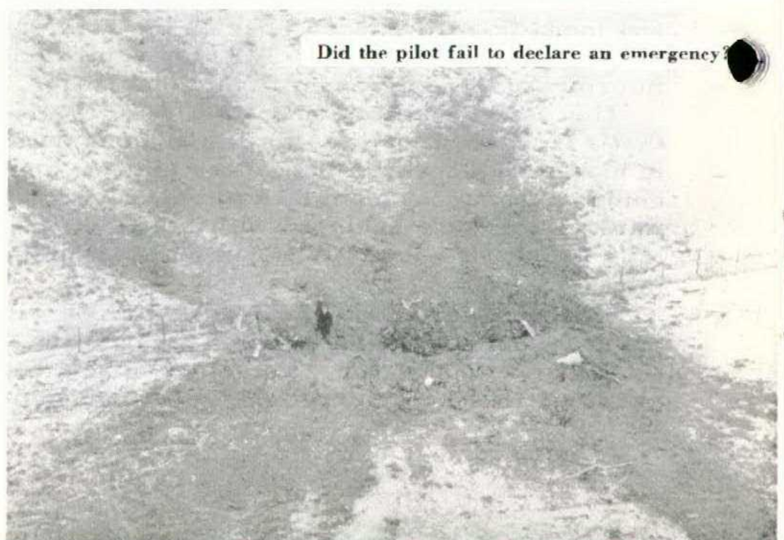
What Mayday throws into high gear is an organization designed to make flying safer, to assist you and your aircraft to return to base in one piece, and—if you have had to eject or force land—to effect a fast rescue. However, should you fail to declare an emergency when it arises, this entire ground force is rendered powerless to help you. It isn't necessary to call Mayday every time trouble crops up, but if something unusual is happening in the aircraft, you should advise the ground and give them a chance to assist you.

There is a story concerning a pilot whose engine began running rough in flight. He assumed it was carburettor icing, so he applied carburettor heat. This seemed to be the answer at first, but then the roughness got worse. An immediate power loss was apparent, and finally a piston broke and the engine failed. After a lengthy search, the crash was located. The aircraft was a writeoff.

On another occasion the engine of a Harvard cut twice momentarily on takeoff. The instructor at the controls assumed that it was mixture trouble. When he adjusted it, the engine stopped cutting out but continued to run rough. Despite this warning the instructor elected to continue the exercise. Returning to the circuit after the exercise, he found it was necessary to overshoot because of heavy traffic. On the go-around, the engine failed. An emergency was declared and a landing made on the airfield. The Harvard's engine was badly damaged.

The circumstances aren't too different in the case of jet aircraft. During takeoff in a T-bird, the pilot noticed a higher-than-normal tailpipe temperature. He reduced power to 90% to prevent overheating and continued the exercise. On his return to base, he was making a GCA and overshoot when he again noted a high tailpipe temperature. By this time it was obvious that something was wrong, so he landed. Taxiing was difficult because any throttle movement caused a sharp rise in tailpipe temperature. When the pilot finally shut down, the engine was damaged beyond repair.

The pilot of another T-bird was doing a climb-out after takeoff when the amber overheat light came on. With a reduction in power the light went out, so the pilot continued his circuit. On initial, he was advised to break off because of traffic. He shortly rejoined the circuit and made an unsuccessful attempt at landing. After a tight circuit he touched down safely on his second try. Once again the T-bird's engine was severely damaged.



Did the pilot fail to declare an emergency?

In both cases involving these jet aircraft, a flameout—or worse—was imminent. If they had remained airborne much longer, the results might have been disastrous.

At no time during or after the occurrence of the initial difficulties cited here was an emergency call transmitted. In all cases, excessive damage was caused to the engines; and in the T-33 accidents, fuselages were badly damaged by overheat.

The cause of the excessive damage must be attributed to poor airmanship. A contributing factor was lack of knowledge of the aircraft. However, in the resulting investigations, neither pilot was censored for neglecting to declare an emergency, and no mention was made of the increased damage caused by the pilots' failure to effect a landing immediately trouble developed.

In the past two years, 22 fatal accidents have occurred in which the cause factor must be classified "obscure". In all cases the aircraft either exploded, dove into the ground or disappeared. Why did the pilots fail to declare an emergency? You can't help but wonder what percentage of these cases could have been avoided if the pilots had recognized in time that all was not normal. Finally, what caused the accidents: lack of knowledge or just poor airmanship?

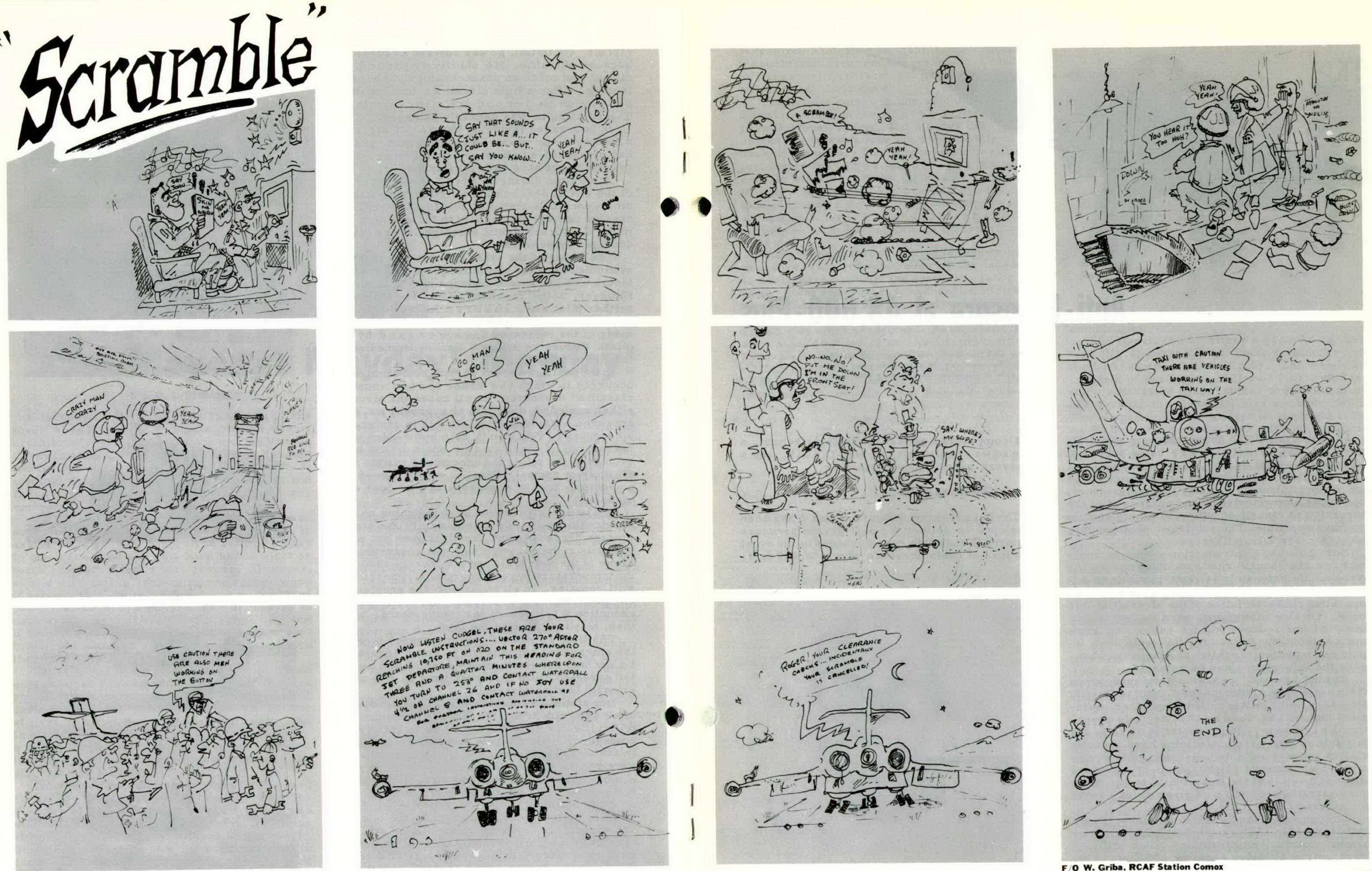
A glowing overheat light indicates an unserviceability in any jet engine. If the temperature decreases and the light goes out when power is reduced, you have not corrected the cause of the overheat; you are merely reducing the temperature by reducing power. The trouble still remains. In all probability the problem is compounding; in a short time, not even a power reduction will reduce the temperature. What then, Mayday! You're too late.

The time to declare an emergency is when the emergency happens. It is good insurance to declare the emergency—even if you aren't too sure—to allow the tower time to give you a priority landing clearance.

Our statistics show that many a pilot remarks after an accident that he did not consider his difficulties serious enough to constitute an emergency. When your aircraft is acting up in the air, every minute of flying time you can save right then will look mighty big on your pension cheque. Aircraft complete with engines are getting more expensive every day.

An emergency is easy to cancel—but if you hesitate to sound one, you might be too late. If you experience anything unusual in the air, advise the tower and land. This is one of the surest ways to preserve engines, aircraft and irreplaceable pilots.

"Scramble"



F/O W. Griba, RCAF Station Comox

Anti-Exposure at 48,000-Plus

We wish to thank the Institute of Aviation Medicine for supplying the information and photographs used in preparing the following article.—ED

Now that the AVRO Arrow has been officially unveiled, many articles are being published about this newest of our air defence weapons. Unfortunately, all of these articles are based on mere conjecture because the performance, operating characteristics and equipment of the aircraft are classified and will likely remain so for some time. The published photographs, however, are a true likeness.

Somehow this introduction seems to imply that you are about to read something new on the Arrow. Unfortunately it isn't possible to release information on either the performance or operating characteristics of the aircraft at this time. On the other hand, we are aware that many of our readers will be curious to know more about the Arrow and its equipment, so it is our intention to publish such articles whenever the information can be released.

For the present, we have a brief rundown on the new flying clothing—the Canadian Partial Pressure Suit, as it is called—and other equipment that will be worn by the Arrow's operational aircrew. Representatives from the Institute of Aviation Medicine have recently visited several units demonstrating this equipment, but many of Flight Comment's readers will not have had the opportunity to see those demonstrations of the proposed "new look" for aircrew.

The purpose of the Canadian partial pressure suit designed by IAM is to protect RCAF aircrew against exposure on operations which will take them to true altitudes above 48,000 feet. This suit comprises a pressure breathing helmet, a pressure waistcoat, an anti-G suit, and a pressure-gravity valve assembly.

Pressure-Breathing Helmet

The helmet shown in figures 1 and 2 has been developed to deliver the high oxygen pressure required to maintain consciousness in the event of a loss of cabin pressure above 48,000 feet.

Fig. 1

It features a latex rubber face-piece containing a double fixed visor and oxygen mask, a bladder system using the face seal principle, and an outer nylon fabric cover.

The helmet comes in one size only, but has a system of nylon laces in the fabric cover to permit proper fitting, and a heavy duty zipper closes the fabric cover down the middle of the back of the neck. The oxygen mask is situated just inside the visor and directs the moist exhaled air away from the visor to prevent fogging. The oxygen valves consist of a standard inhalation valve and a pressure-compensated exhalation valve. A standard set of RCAF earphones and microphone is incorporated in the valve.

When the helmet is connected to oxygen under pressure, the reflected edge of the face seal is compressed against the forehead, face, and chin. At the same time, pressure is distributed around the side of the head between the layers of the bladder, to equalize the pressure on either side of the eardrums. An unpressurized area along the top of the head prevents the head-piece from lifting under pressure.

The leak rate of this helmet is very small at high pressures, and head coverage is sufficient to overcome the acute discomfort experienced by the eyes and ears when breathing pressures in the A13A mask above 30 mm Hg. Although the helmet may look cumbersome and uncomfortable, it takes little time to become accustomed to it, and under high pressure it is surprisingly comfortable.

Pressure Waistcoat and Anti-G Suit

The counter-pressures required to protect the body against the effects of high mask pressures at altitudes above 48,000 feet are

Fig. 2

Fig. 3

Fig. 4

provided by a pressure waistcoat-anti-G suit combination.

The G-suit can be either a standard G4B type (fig.3) currently on issue to aircrew, or the half-type G-suit (fig.5). The waistcoat consists of two layers of G-suit fabric enclosing a rubberized nylon bladder around the front and back of the chest and over each shoulder. The oxygen inlet is located on the right front to fit between the parachute webbing, and this fitting is inserted and locked to the pressure-gravity valve. The waistcoat is supplied in one size only but is provided with adjustable laces to permit proper fitting.

The waistcoat is worn over the G-suit, and there is little restriction to full breathing with the uninflated vest done up. When the suit is inflated above 40 mm Hg, some uncomfortable distension in both arms may be felt because of the restriction placed by the waistcoat on the return of blood from the arms. However, the duration of the restriction is for a short period only and is of little concern.

Pressure-Gravity Valve Assembly

The P-G valve assembly (fig.6) enables the anti-G suit to be used as a partial pressure suit in conjunction with the pressure breathing helmet and vest, in addition to its normal function of affording anti-G protection.

The P-G valve assembly consists of three valves housed in one body. These valves are the air inlet, oxygen inlet, and vent valves. The assembly allows the anti-G suit to be filled with air from the anti-G valve or oxygen from the breathing system, and allows venting from the anti-G valve. The anti-G suit connection has a spring-loaded cap which will hold a residual pressure of approximately 40 mm Hg in the vest and helmet. Thus some protection is given in the event that the connection is accidentally broken. To prevent the P-G valve from being accidentally pulled off the vest, a positive lock

Fig. 5

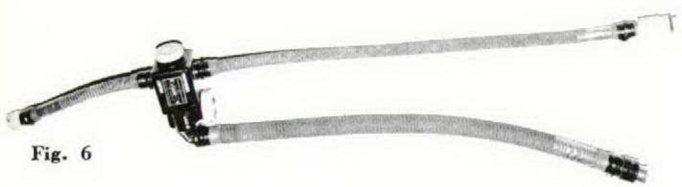


Fig. 6

has been incorporated in the connection.

When an aircraft is pulling G, air is delivered by the anti-G valve through the air inlet valve into the anti-G suit. Immediately after the flow starts and the pressure increases slightly, the vent valve is unseated, allowing the air an alternate passage and hence increasing the flow rate. The vent valve remains open whenever the anti-G suit pressure is greater than the vest-helmet pressure by more than 1-1/2" of H_2O. When G falls off and the anti-G valve delivers less air pressure, the excess pressure in the anti-G suit is vented through the vent valve and through the anti-G valve to atmosphere. When no anti-G protection is required, venting continues until the pressure in the anti-G suit is slightly above the vest-helmet pressure by the closing force of the vent valve (1-1/2" H_2O).

When the oxygen regulator delivers oxygen at a pressure higher than that delivered by the anti-G valve, oxygen flows into the anti-G suit through the oxygen inlet valve. The pressure in the anti-G suit is at all times the same as in the vest and helmet, except when the anti-G valve delivers pressure higher than that delivered by the oxygen regulator.

When the requirement for pressure breathing decreases, the excess pressure in the helmet and vest (over that being delivered by the oxygen regulator) is breathed off and exhaled through the exhalation valve. This decrease in the vest-helmet pressure opens the vent valve in the P-G valve assembly, and the excess oxygen pressure in the anti-G suit is vented through the anti-G valve.

Complete Assembly

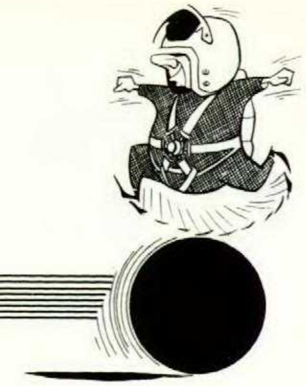
Figures 7 and 8 show a man completely outfitted in the Canadian Partial Pressure Suit. In fig.7 the subject is wearing the standard G and combination flying suit with the pressure vest worn over the top. In fig.8 the subject is wearing the new half-type G-suit and pressure waistcoat. With this assembly, a summer or winter flying suit can be worn over the top if the individual prefers. (Note the use of small bore tubing and positive locks on the bayonet connections.)

This, then, is the Canadian Partial Pressure Suit which will be worn by aircrew flying the Arrow. The suit has been under test at IAM for some time, and both civilian and service test pilots have used it in flight. Adequate protection for the human body at high altitudes will be afforded by this equipment—and we are proud of IAM's accomplishment in developing it for use in the RCAF.

Fig. 7

Fig. 8

HEADS-UP FLYING



DOWN YONDER IN THE CORNFIELD

F/C F.J. Bojsza, a student pilot at PFTS Centralia with only two hours' solo time to his credit, was climbing a Chipmunk after completing a touch-and-go landing. At 200 feet the propeller shaft sheared and the prop flew upward and to the starboard side of the aircraft. F/C Bojsza completed a forced landing check, selected a suitable field and carried out a successful forced landing. Although he had very little time to make a choice, he selected a field of corn rather than a pasture where a number of cattle were grazing. The pilot was unhurt and the aircraft received only minor damage from the corn stalks.

Considering the limited extent of his flying experience, F/C Bojsza exploited his instruction in a most commendable manner.

ENGINE FAILURE AND ICING

F/O B.N. MacGregor of 105 C&R Flight was captain of a Dakota carrying 15 passengers and 1500 pounds of freight and baggage on a night flight from Fort Smith to Namao. While the aircraft was flying at 6000 feet above cloud, a moderate vibration was detected in the port engine and a dark mist was seen coming from the cowl flaps. The engine was feathered and the flight continued on the starboard engine.

Unable to maintain the 6000 feet necessary to stay on top of the cloud, F/O MacGregor elected to descend below the overcast. The reported ceiling enroute was 2000 feet with good visibility under the overcast.

During the descent F/O MacGregor noted that the aircraft was picking up ice, so he increased his rate of descent to 2000 feet per minute to reduce the time spent in the icing levels. By using maximum power settings on the live engine, and smooth flying techniques, he was able to maintain height and make a safe landing at Namao. Investigation there revealed that No.3 cylinder head had separated, causing the starboard engine to fail.

F/O MacGregor displayed excellent airmanship in completing a difficult flight under adverse conditions.

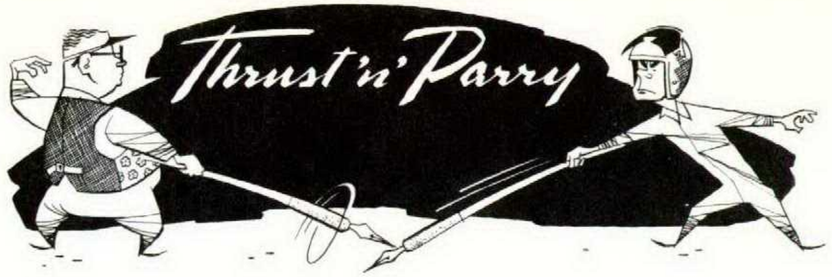
FUEL FLAP

F/O R.A. Button took off in a Sabre on an air-to-air firing exercise. Immediately after takeoff, and at approximately 500 feet, he experienced a complete loss of power. He at once retarded the throttle, selected emergency fuel and the airstart switch, and then advanced the throttle. Luckily the engine responded and the pilot made a successful forced landing on the runway.

The speed with which F/O Button adopted emergency procedures is an example of professional flying at its best. The pilot didn't have to figure things out. He knew exactly what to do.

STUBBLE RUN

F/O E.P. Kelly of 4FTS Penhold was carrying out a formation exercise when the engine of his Harvard started to run rough following a muffled explosion. Since he was still getting some power, the pilot tried to nurse his aircraft back to base. However, the engine began running rougher and cutting out, and oil and smoke obscured forward vision. Confronted with these obstacles the pilot shut down the engine, selected coarse pitch, executed a turn to the right through 135°, and landed in a stubble field. The Harvard sustained very little damage. F/O Kelly is to be commended for his coolness and skill in making a forced landing with a minimum of damage despite obscured vision.



Cover or Cage?

Have just finished reading the article "Cover or Cage" in your Nov-Dec issue and would like to say that #6 FTTU has been training Service fire-fighters, technicians on the flight line, medical personnel, civilian fire-fighters and members of the Ontario Provincial Police on how to get the canopies off crashed jet aircraft, how to safety the catapult seats fitted to these aircraft, and how to undo and remove the injured pilots—all under the circumstances mentioned in your article. To date almost 900 people have taken this short course.

For other Flight Safety Officers interested in the subject, RCAF Training Command has a 16mm movie (Sec 14C/3099 - Emergency Rescue T-33 Jet Aircraft) that is most informative on this subject. Also available are a series of 2" x 2" coloured slides (Sec 14S/S-2-2 Emergency Rescue, T-33 Aircraft; Sec 14S/S-2-3 Emergency Rescue, F-86 Aircraft; and Sec 14S-S-2-4 Emergency Rescue CF-100 Aircraft). These slides explain in detail the correct sequence to be carried out in the event of a crash, so that—yes—even the Education Officer could remove an injured pilot safely.

A. Westwell, FS
6 FTTU, Trenton

Order through the usual channels. — **ED**

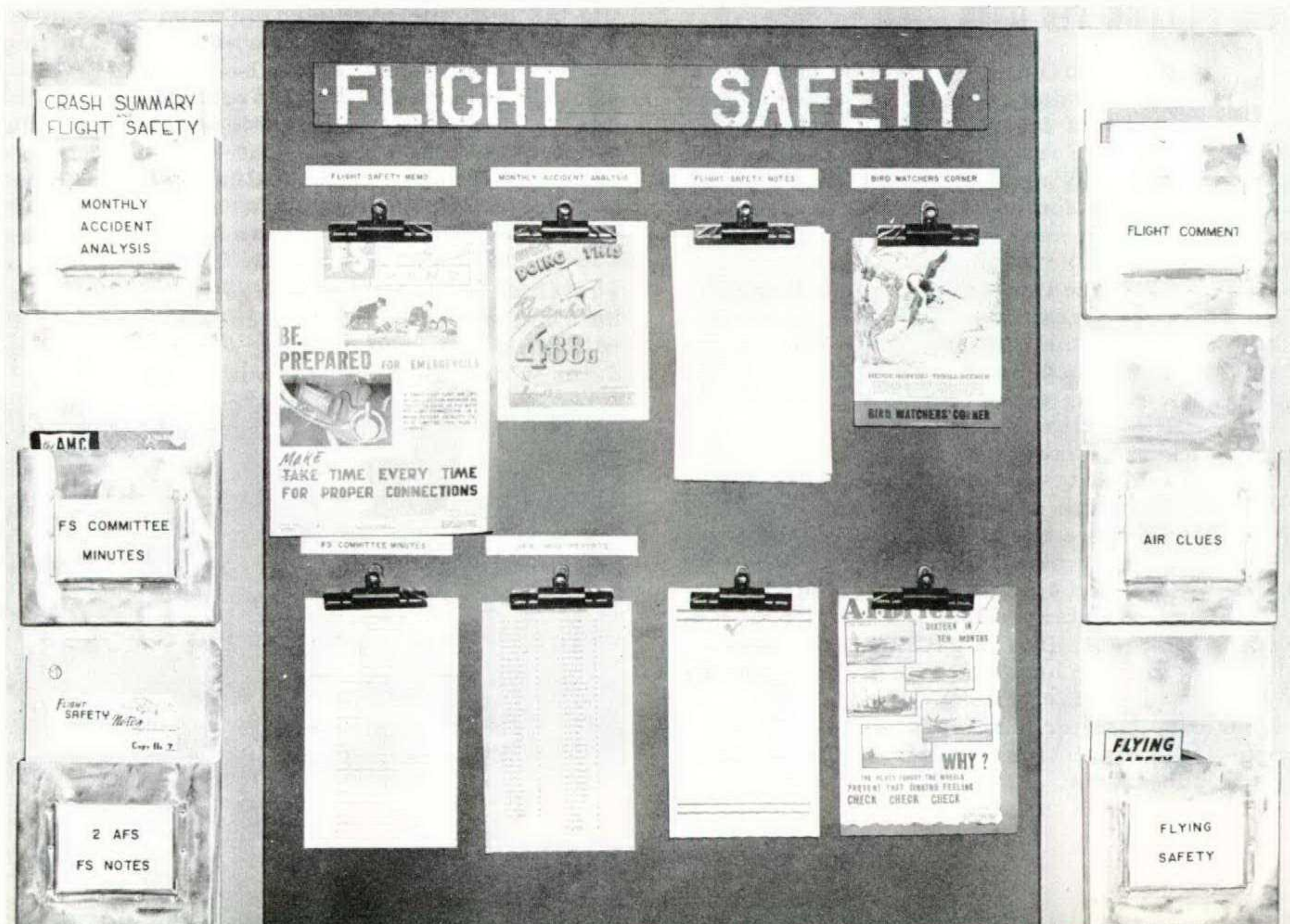
Heads-Up Flying

I heartily concur with your preface to the article on the "Heads-Up Flying" page of the Nov-Dec 1957 issue. It may interest your readers to know that the pilot received an AOC's commendation for his airmanship during this occurrence. The leader of the section was also the recipient of a letter of commendation from the AOC of 1 Air Division for his excellent leadership which contributed to the success of the forced landing. The story is an example of first-class teamwork in the air during an emergency.

I believe that the names of the pilots involved should be made known. Flying the number four position was F/O Larry McKay-Barry and the leader was F/O Harry Stroud. F/O McKay-Barry is presently a member of 434 (F) Squadron, 3 (F) Wing, Zweibrucken F/O Stroud, a former member of the same squadron, has returned to Canada and presently is stationed at the OSU, London, Ontario.

Not to detract in any way from your tribute, but merely to keep the record straight, may I mention that the "26 amps" referred to in the article should have been "26 volts"?

D. D. Weixl, F/L
DFSO, 1 Air Div HQ, RCAF
Metz, France



Rank Confusion

We want to apologize to Cpl. L.A. Woodward for the mix-up in regard to his rank which appeared on the Good Show page of our Jan-Feb 1958 issue. When word of Woodward's promotion came through, we amended the text but overlooked the heading. Definitely a "poor show" on our part. — **ED**

Gen Board

Pictured on **p.18** is one of the Flight Safety bulletin boards constructed at Portage la Prairie. Very neat job, too. We'd be interested in seeing what other units are doing in the field of Flight Safety displays. — **ED**

Congratulations!

Major Rex Riley, familiar to all readers of the USAF's "Flying Safety", has been promoted to the rank of Lieutenant Colonel.

The fictitious Air Force Flying Safety Officer has for ten years been doing a top-notch accident prevention job via articles and posters in Flying Safety. The prototype of more than 1500 Flying Safety Officers serving in the American Air Force, Lieut-Col Riley's contribution to flight safety was officially recognized in the USAF's promotion list for February. — **ED**

SAFETY: Product of Proficiency

Anyone who tries to define "flying safety" in terms of its essential elements soon becomes aware that it is divided into many facets. It is difficult to place them in any order of importance. However, the matter of proficiency and its safety implications should rate high on any pilot's flying list.

An accurate observation, although slightly mixed up in expression, seems to define this subject: "Proficiency is what, if you have enough of, you won't get into trouble as quick as when you think you have plenty until an accident proves you didn't."

Everyone has at least a general concept of the practical meaning of proficiency, so let us turn our attention to the answers to questions intended to provoke serious thinking about one's own individual state of proficiency.

How do we usually rate ourselves as to our skill level of proficiency? First of all, we have an annual proficiency check. What does this proficiency check tell us? Simply this: At that particular time, and usually under ideal conditions, we are capable of operating that particular airplane within the acceptable limits. We can get the machine into the air, perform certain basic manoeuvres, and demonstrate in a rather loose manner some familiarity with the emergency procedures. The final blessing is then given to us by means of a signature on a certificate. You have it made for another year. But, have you, really?

Are you honestly confident that you can cope with combinations of adverse and unforeseen factors your experience tells you exist? It is of little consequence to rationalize that you used to be able to hack anything; nor does it follow that once you have been through some rough encounters you can get through them again. Why is this so? Because your proficiency is not the same, particularly if you are occupying a position that limits you solely to readiness-type flying training.

That annual proficiency check should be more than just an inconvenience to get out of the way. Consider the check instead as a way of determining where your flying is weak and needs strengthening. The word "practice" may be trite but no one can deny that proficiency comes from practice.

On any flight, the person who feels secure is the one who knows that the pilot has flown a certain route often in the recent past and that he is ready for emergencies. The pilot is proficient; he is practised. Practice, then, provides a second clue to our skill level.

Thinking back, when was the last time you practised a particular phase of flight? How much time did you spend doing it? Were you really certain that you could accomplish it safely under the stress of severe critical conditions?

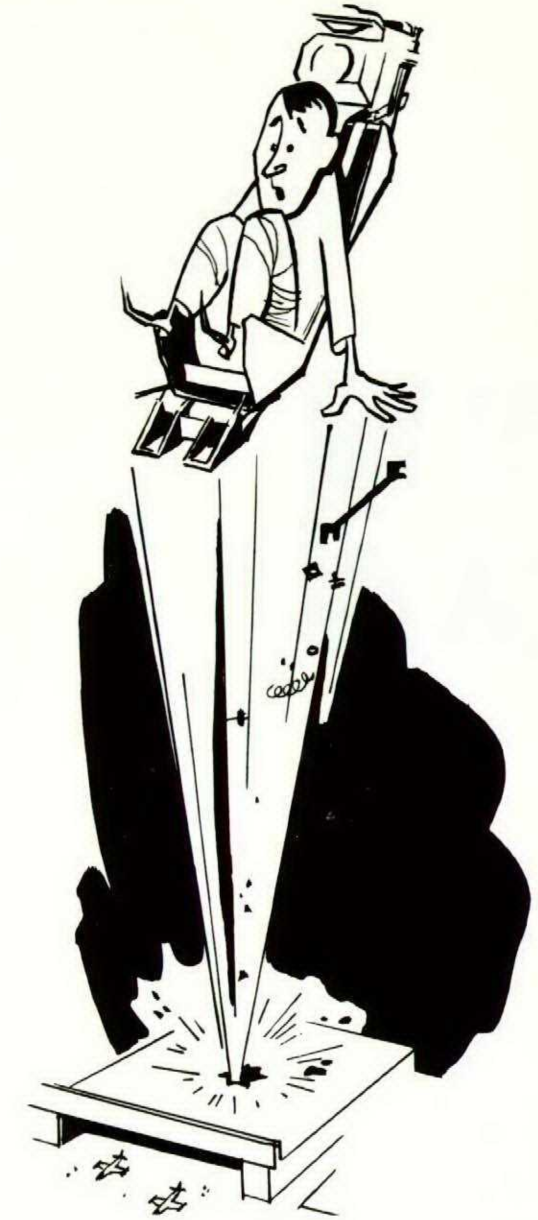
Practice steps up one's proficiency. A baseball player who has a low batting average probably practises more intently than does his team-mate who leads the league in batting. The ball player's proficiency is tested every time he comes to bat, and if he strikes out he gets another chance. No one but you yourself can know your flying average precisely—and if you strike out, there is seldom another chance.

Here are some ways in which we can enhance our proficiency. First of all we can make each hour that we fly count for some type of practice, even if it is simply doing some elementary manoeuvre in a precise professional manner or reacquainting ourselves with the contents of charts and other flying manuals.

Next, as we practise each phase of flying we can be critical of our own abilities; if we are having difficulty or if we are not completely confident that the particular item is mastered, then let's ask for assistance. It's a wise man who knows his limitations. Proficiency is that which you know you have and not what you think you have.

JETTISON SYSTEMS are for AIRCREW

Directorate of Maintenance Engineering



The various jettison systems installed in modern aircraft are ideal for the use of aircrew in emergencies during flight. However, to prevent inadvertent firing of such systems while the aircraft are on the ground, special precautions are necessary. Otherwise, accidental triggering of jettison mechanism by trades personnel working on these aircraft can result in serious injury or death.

It would appear that Canucks are particularly vulnerable in this area. During the past few months, 25 Canucks sitting innocently on the ground had their canopy jettison links blown; five others had their rocket pods jettisoned; and two more fired off a few rockets when they shouldn't have. In all, 32 accidents—every one of them potential killers.

All of the canopy links were blown because of carelessness: Twelve were blown during Special Inspections 5/97 and 5/36; wires were connected to wrong terminals; switches were reinstalled backwards; and screws in the terminals were long enough to contact other terminals. In four other cases the battery was not disconnected before work started on the electrics. Finally, the canopy jettison switch was hit accidentally while windshields were being cleaned, another while an altimeter was being set; and a number of circuit-breakers were pushed by mistake.

Rockets are deadly things; one of them is capable of destroying an enemy aircraft. Obviously they shouldn't be fired off indiscriminately around a station. But it happens. In one case a polarizing plate (the positioning device used to guide a plug home) was installed in reverse. The same thing occurred in an aircraft in which the polarizing plate pins had been broken off and the connector installed in reverse.

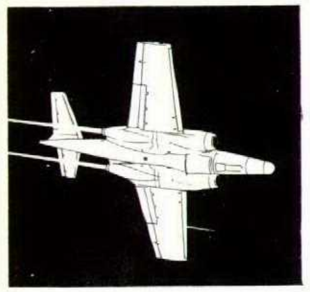
A little investigation showed that 75% of the polarizing pins on the squadron's Canuck aircraft had been broken off by personnel who found that the pins required too much effort when the connectors were put together.

Then there were the four Canucks which had their rocket pods blown off because the jettison air pressure had not been released prior to a current delivery check. Finally, one other Canuck dropped a pod because a mobile repair party doing modification wired the pod jettison circuit to the canopy seal inflation valve.

The only compensation arising from these accidents derives from the fact that in every case the jettison system worked perfectly and did exactly what it was supposed to do.

Those of you who enjoy hunting or target shooting likely take time to ensure that your gun is empty before you clean it. The situation here is no different. For a long life we earnestly recommend that you treat the jettison systems of all aircraft as you would a loaded gun.

ARRIVALS and DEPARTURES



Hey, Jack!

While making a special inspection on a Canuck, the crew took time off for lunch, leaving the aircraft sitting on jacks. After lunch an undercarriage retraction was done, and the aircraft's nose dropped to the hangar floor. Can you guess what happened?

While this crew were at lunch, another crew removed the nose jack adapter to rectify a snag on another aircraft. The jack was left in position, but because the first crew were working on the other side of the aircraft, they did not notice that the jack had been tampered with.

How can an accident like this be avoided? The answer is up to the tradesmen, but it has to be found because the damage incurred here is equivalent to the down payment on a house.

Drive That Bolt!

A Canuck would not break ground when take-off speed was attained, so the captain managed to abort the takeoff successfully. Investigation revealed that the bolt (item 42 of figure 50, EO 05-25F-4 page 218) installed in the lever assembly (item 31) was not through the end fitting of the elevator booster (item 44).

Before this attempted flight, new hydro boosters had been installed; but because of various circumstances—leave, the flu, and others—a number of different crews were involved in the installation. When this occurs, the chances of an oversight are compounded. In this case it happened, and when such a boner is pulled it is not too easy to detect. The improper installation was passed by two NCOs and the ground functional check.

It is significant to note that the elevator movement was normal until air pressure was sufficient to overcome the friction between the booster end fitting and the idler arm. What do you think would have happened if the error had not been detected until the aircraft was airborne?

For Want of a Nail

The elevator trim indicator of a Canuck failed to function properly during a tarmac check. Although several selections were made, the indicator would not respond but stuck at the neutral position. When the aircraft was shut down, a visual check showed the elevator trim tab to be in the tail-heavy position. The trim tab was operating satisfactorily, but the elevator set screw which secures the transmitter control rod to the transmitter shaft was loose, permitting the control rod to rotate without moving the transmitter.

A maintenance error? Yes, it was; but let's investigate a little further and find out how it happened. The set screw (a 3/32" Allen head, EO 05-25F-4 Fig 56 Item 25), had at one time been tightened with a pair of pliers, and the last three threads were stripped. As a result the screw was not bottoming properly. The instrument technician who installed the elevator trim transmitter tightened the set screw using a large Allen wrench that had been tapered to fit the 3/32 head. The manufactured wrench was not ground square but was more or less rounded. Because of the two factors—the stripped thread and the manufactured wrench with the rounded edges—only a limited torque could be applied before the wrench would slip. In this position the screw was in far enough to hold against the shaft temporarily, and it ground-checked OK; but during the test flight it had been loosened by vibration.

Now why was the screw tightened in the first place with a pair of pliers? Why was a manufactured wrench used in the second place? Apparently confused when they discovered that the required wrench was not on the scale of issue, the I-techs must have assumed that it was not available. However, the wrench is a "C" class store (cost, four cents) and, as such, does not require scaling. Stocks were available from the unit supply section or sub-stores on an "as required" basis.

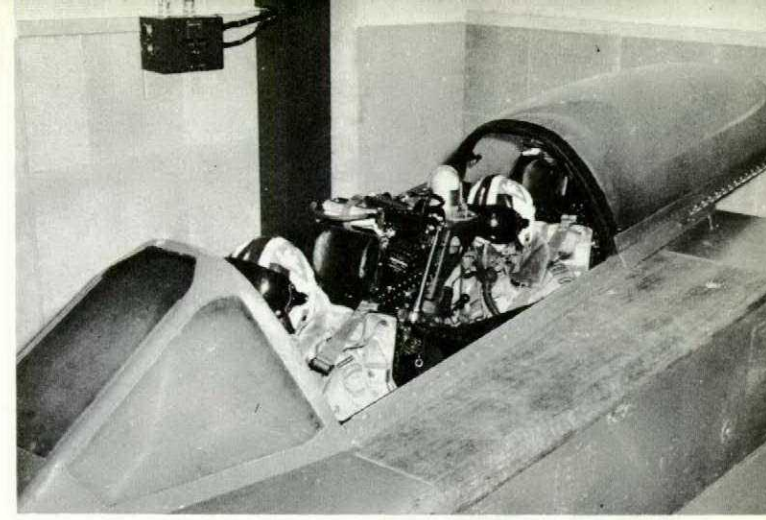
How much effort was made by the I-tech to get the item? What did his supervisor do? A change-of-scale request was submitted unnecessarily when all that was needed to obtain the wrench was a simple request (not even an E42) at sub-stores. Plenty of initiative was used in manufacturing an alternate item, but none to get the proper one. The whole problem is simply one of "for want of a nail"—for want of a simple request by the user.

About Flight Simulators

The pilot was making a practice single-engine GCA letdown in a Canuck when the hydraulic pressure warning light came on. The hydraulic pressure gauge indicated "zero". The controls were operating normally, but a gradual stiffness developed so that the pilot had to deboost the controls. He declared the emergency to GCA and switched to tower frequency to advise that he could manage a wide circuit with a long approach. The aircraft undercarriage and 25 degrees of flap were left in the down position.

During the extended downwind leg the power pack was operated for three seconds; the hydraulic pressure indicated 2200 lbs and then decreased slowly. The flaps were lowered by emergency air bottle during the final approach. Just prior to touchdown the power pack was again operated and hydraulic pressure once more indicated 2200 lbs. After touchdown the brakes tested normal and the aircraft was stopped and cleared off the runway. Throughout the occurrence the captain executed emergency procedures in a manner indicating competence and a good knowledge of his aircraft.

Seven days prior to this incident the pilot had completed an exercise in the Canuck simulator which included a simulated hydraulic failure and flying out of boost. He felt that the instruction and practice he received there had assisted him in overcoming the difficulties encountered during the actual failure in the air.



This is the first evidence to reach DFS on the effectiveness of the Operational Flight and Tactics Trainer as a training aid. We cannot help but wonder whether the aid is being exploited by the aircraft users to any great extent. Since "practice makes perfect" plays as predominant a role in operational flying as does the simulator in flying safety, supervisors are urged to take another look at their own simulator programs with a view to extracting maximum dividends from an invaluable training aid.

[If any other unit or member of aircrew has a story concerning the simulator, we would like to hear it.—ED]

Control Rod Disconnect

A Canuck had taken off and was climbing through 13,000 when the left rudder pedal went to the full forward position. It required considerable force to return it to neutral. The turn-and-bank indicator showed that full rudder was on, and this was confirmed by a following aircraft. The pilot immediately checked the stalling characteristics of the Canuck and then landed successfully.

After the landing roll, the rudder was found to be jammed at approximately the mid-point of travel, and a check revealed that the rudder hydro booster had been driven to the starboard rudder position. The bolt (reference EO 05-25E-4 Fig 49 Page 218 item 12) connecting the control rod was found lying in the bottom of the rear section, and the nut and washer on top of the structure bracket. No split pin was located.

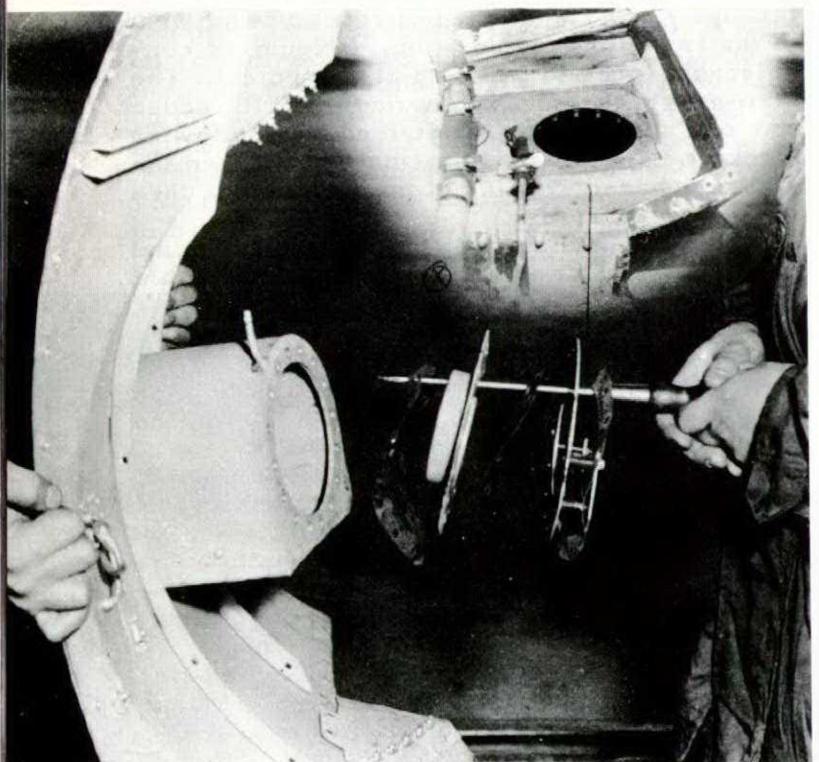
Mod EO 05-25E-5/191 was carried out at the repair depot. The aircraft had an acceptance check at the unit, and subsequently a 75-hour check. Both checks require a visual inspection of boosters, connections and lines. It is impossible to guess when the nut backed off, but a visual inspection should have revealed the absence of the split pin.

While the maintenance error was assessed against the unit (they had two chances to pick up the error), the repair depot also must share the blame. Luckily the Canuck landed safely, but any control malfunction—particularly one induced by a missing split pin—is a hazard to life and limb. When you are working on controls, make one more check—just to be sure.

Groundcrew Briefing?

A fuselage tank change was made on a T-33. Somehow the filler neck assembly was incorrectly installed, an error which resulted in fuel venting. When the aircraft arrived at its parent unit, extensive fuel deposits were found in the plenum chamber. Fuel vapour in the plenum chamber creates an extreme hazard, for in almost every case it causes an explosion.

In this instance the error was caused by a lack of knowledge on the part of the technician who carried out the installation, and a complete unawareness of the danger involved. EO 05-50C-2 does not give the filler neck assembly procedure in detail, nor does it show any photographs of the operation. Consequently, as a result of this incident, the EO is up for review.



Gas or Gravitate?

Much has been said and a great deal has been written about fuel and fuel management, but still we have accidents which are caused by the inability to remain airborne owing to the lack of that "old necessary". Just such a lack was the cause of the following accident.

The Mitchel was on a long range, pilot training exercise. The westbound phase of the flight was made without incident. The eastbound leg proceeded normally until the aircraft was 56 miles west of destination, when the pilot noticed that an abnormal amount of fuel had been consumed. The quantity remaining did not seem to present a critical shortage, but ten miles west of destination the right engine sputtered and fuel crossfeed had to be selected to keep it running.

Disregarding the warning given by the sputtering engine, the pilot decided to do a normal circuit and landing on the runway in use, rather than a straight-in approach to another runway which was out-of-wind. On the final approach, both engines failed owing to fuel starvation. The pilot was then left with no other choice but to crash land short of the runway in a residential section of the city.

Miraculously, neither the pilot nor passengers were seriously injured, and nobody on the ground was hurt. Nevertheless, the local residents were highly indignant about an aircraft using their back yards for a landing area.

Normally, provided that all tanks are full at the commencement of a flight, the Mitchell should have over two hundred gallons of fuel remaining after completing a flight of this duration. Despite a thorough investigation, no reason was found to explain why this aircraft did not have sufficient fuel to complete its flight. The crewman affirmed that the tanks were full at the beginning of the flight, and the pilot declared that he did not mishandle either the engine or fuel controls.

The carburettors were tested and found to be running a little rich, but not enough to make a difference of over two hundred gallons. None of the fuel tanks were venting and no fuel leaks could be found. Hence we appear to have on our hands another of the many mysteries which show up frequently in accident investigations.

Close attention to one's fuel consumption and the amount remaining should be elementary. There is no gas rationing in this country; get yours when you are running short—and stay airborne.

Pattern for DISASTER

It appears incredible!

But the debris in this photograph was found under the floor boards of ONE Dakota aircraft.

Have YOUR Dakotas been checked lately?

EXPERIENCE IS THE CHEAPEST THING YOU CAN BUY IF YOU'RE SMART ENOUGH TO GET IT SECOND-HAND