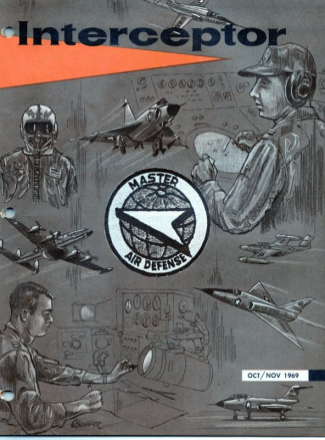


# Interceptor



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# Interceptor

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## spotlight

All power, even the most despotic, rests ultimately on opinion.  
**Hume**

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## OUR COVER

The requirements for award of the MAD skill rating are stringent. The MAD rating encompasses the entire ADC role and the teamwork required to survive a demanding mission.

# memo

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## from the CHIEF OF SAFETY

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### WOULD YOU BELIEVE . . .

That the majority of our accidents these days are precipitated by maintenance error or materiel failure? As a matter of fact, during 1968, maintenance/materiel failure was the starting point for 17 out of 22 jet accidents in ADC and our ANG units where the cause factor was known. Some of them were ridiculously simple, such as UHF failure and A/B eyelids failing to close.

From such simple beginnings, the pilots failed to analyze the situation completely and painted themselves right into the accident corner. During the past three years, statistics show that 78 percent of our accidents were precipitated by maintenance/materiel failure.

The purpose here is not to point out that our aircrews are failing to meet and solve the problems which face them. In general, they have done a magnificent job because in 1968 alone, they successfully handled more than 2,600 precautionary landings and in-flight incidents.

But what is so disheartening is that some drop the ball so completely. For this reason, I estimate that we have experienced six accidents this year that we didn't deserve.

The message is this:

Analyze your problems. If things start going wrong, interrupt the deteriorating chain of events — break off and start over. In preparation for this, know the symptoms of various materiel failures. Reason out beforehand what you would do under these circumstances and follow the prescribed emergency procedures.

Col. H. C. Gibson



Col H. C. Gibson

# HOT LINE



## OUCH!

One of our Safety Officers writes: "The July INTERCEPTOR had an article titled "GCA and You" which told of shortages in manning and as a result poorer GCA service. The corrective action suggested? An excerpt from the second to the last sentence says, "... it is incumbent upon the pilot, the mission supervisor, and the mission planner to be totally aware . . ." Why isn't it incumbent upon those who have the power to correct this manning shortage to do so? Why isn't it incumbent upon higher command to give us a good safe IRAN? Why isn't it incumbent upon these some people to give us a good and sufficient supply of spare parts? Why isn't it incumbent upon higher headquarters to schedule night exercises in such a way that crew rest is followed instead of being thrown out the window? Why isn't it incumbent upon depots to perform quality maintenance so that local maintenance isn't saddled with depot's mistakes or with work that should be done at depot, but is shuffled downstairs? Why isn't it incumbent upon all of us in this chain to take some of the load off the last guy at the bottom of the hill down which everything flows: the pilot? In the end, he is the guy who has to take this whole system of shortages, poor quality, inexperienced personnel, inaction by higher headquarters, and poor planning, and try and make it work."

We can't help but sympathize with the sentiments of our safety man in the field. Contrary to the opinion that all headquarters types are built in a sausage factory, there are many of us who were at one time or another "at the bottom of the hill" and who also felt the sting of frustration. But understanding the problem, and wanting to do something about it, doesn't automatically provide the opportunity. Head Sheds are sat on by Head Sheds ad infinitum. What may appear to be inaction is in all probability impotency. We can always give sympathy because it isn't limited by fiscal reits. And that isn't passing the buck. You can't pass what you don't have. Everyone is concerned over the problem areas mentioned by our Safety Officer, and many more. But the situation is very much like the one in which an op-

timist told a pessimist to smile because things could get worse. So he smiled, and sure enough, things got worse.

**59-555**

**T-33 GEAR UP.** During a low approach, a solo pilot noticed a slight binding when he raised the gear handle. He flew a closed traffic pattern and when he attempted to lower the gear, the handle wouldn't go down. After repeated attempts, the handle suddenly became free to move in any direction, but had no effect on gear position. Using the emergency procedure, he was able to lower the nose gear only and had to land in that configuration.

Investigation revealed that when the landing gear handle became jammed in the "up" position, downward forces exerted by the pilot caused the threaded extension of the selector valve cam shaft to shear, allowing gear handle to rotate freely.

The gear handle was stuck in the up position because the locking pin was bent and became jammed in the locking hole. A positive reason for the bent pin could not be determined, but it is suspected that excessive stresses on the landing gear mechanism over an extended period was the cause.

The main landing gear emergency cylinders failed to operate, probably due to an airlock in the lines which permitted the uplocks to remain engaged, resulting in unsuccessful emergency extension of the main landing gear.

To prevent similar gear handle malfunctions in the future, T-33 pilots are cautioned to adhere to the following recommendations:

1. Insure that the gear handle release button is fully depressed before exerting pressure on the lever.
2. Do not use unnecessarily heavy pressures on the handle while raising or lowering the gear or performing the "jiggle" check.
3. Write up any unusual feel or operation of the landing gear handle or release button.

As for the emergency cylinders not operating, that's something else again.



# a salute

*... in recognition of  
outstanding achievement  
in accident free operation.*

## Over 6 Years

162 Ftr Gp, Tucson

112 Ftr Gp, Greater Pitt

## Over 5 Years

48 FIS, Langley

## Over 4 Years

148 Ftr Gp, Duluth

## Over 3 Years

4603 AB Gp, Stewart

147 Ftr Gp, Ellington

## Over 2 Years

103 Ftr Gp, Bradley

142 Ftr Gp, Portland

4758 DSES, Holloman

169 Ftr Gp, McEntire

75 FIS, Wurtsmith

124 Ftr Gp, Boise

343 Ftr Gp, Duluth

## Over 1 Year

49 FIS, Griffiss

78 Ftr Wg, Hamilton

120 Ftr Gp, Great Falls

158 Ftr Gp, Burlington

27 FIS, Loring

4676 AB Gp, Richards-Gebaur

71 FIS, Malmstrom

319 FIS, Homestead

144 Ftr Gp, Fresno

57 FIS, Keflavik

163 Ftr Gp, Ontario

as of 31 August 1969



# Coolstone Volunteers

by ROGER G. CREWSE / Chief, Analysis Division, Hq ADC

Coolstone was well aware, from sad past experience, that when volunteers are asked for, seldom is a good deal in the offing. His squadron experience had been that good deals never get to the volunteer asking point. Now, assigned at a higher level, the Rock was somewhat less hesitant to volunteer after, of course, he had carefully evaluated the mission. The reason he was now at 47,000 feet over the Pacific, 1500 miles away from the United States in a B-57, was that it had seemed a pretty good idea at the time he had volunteered. He and his fearless navigator were in the process of ferrying a B-57 from Clark back to the depot in the United States.

The reasons that Coolstone had volunteered were: one, he needed to get out of the office for a while — the new boss was pressure, pressure, pressure. Two, he hadn't been to Vietnam yet, and this trip would serve to bring his war stories partially up to date. They were seriously

in need of updating. Three, if you hadn't been there, the Pearl of the Orient still held a romantic fascination, which had carefully been built up over the years by people who had also never been there.

Well, Coolstone had been there, and left. He left his watch and about one thousand pesos. He called his navigator on the intercom.

"Two from One. Have we passed the point of no return yet? And why haven't you got Duck Butt on the radio compass?"

Two cleared his throat gently, and then said, "According to my calculations we're right at the point of no return, and I haven't been able to raise Duck Butt. We should be in range about now, and according to our flight plan, we should make a heading change to the south of about eight degrees, if the winds are right."

"Okay," said the Rock, "I'm turning to zero nine five now. Let me have the radio compass for a moment and I'll see if I can raise them

from up here."

He took control of the radio compass, fiddled with the knobs, but was only able to raise a highly developed static level instead of the signal from the picket boat. He went from antenna to compass and then the loop position, but he could get no signal of any kind.

"I can't tune them in either," said Coolstone, "so I think I'll give them a call. You know, that radio compass wasn't working too well before we got to Hickam. When you go out of sight of land, it quits. They said it checked okay on the ground at Hickam, though.

"Call them," said Two, "maybe they can get a fix on us. I'd like to know about where we're at."

One keyed his radio. "Hello, Duck Butt, from Coolstone One. Duck Butt from Coolstone One. Come in, please."

Nothing.

"Are you getting the side tone?" he asked Two.

"Negative," said Two.

"Okay," said Coolstone, "I think the radios are going out too. You know we had some trouble with it just before we got to Hickam, but they said they checked this radio out okay on the ground, too." He tried to contact Duck Butt once again.

"Duck Butt, from Coolstone One, how do you read? Over."

Nothing.

"I think that radio is out," he told his navigator. "I thought it was awfully quiet up here. Say, are you getting anything on the radio compass now?" he asked as he saw the needle settle down a bit.

"I thought I had something," said Two, "but I don't hear a tone, the static just got quieter, but if that is him, he's about 110 degrees off of the left side."

"What are you talking about?" said Coolstone One. "I show the...y

"degrees starboard on my indicator."

"Right now you show thirty degrees starboard!" said Two.

"Rog, thirty degrees starboard. What have you got?"

"I've got 110 degrees port," said the navigator.

"Hello Duck Butt, hello Duck Butt, this is Coolstone One, Coolstone One, do you read? If you read, come in please."

Nothing.

"Duck Butt from Coolstone One, if you read, I have lost my radio compass and I would like a DF steer, please."

Nothing.

"What does your radio compass read now, Two?"

"About 130 degrees port," said Two. "What's yours?"

"I show about 40 degrees right, now," said One.

"I can't hear a thing on the low end," said Two. "I don't know that I'm getting a signal or not."

"If we are getting a signal," said One, "your indicator is probably right, since time and distance indicated that we should actually be past Duck Butt."

"Roger," said the navigator, very sagely.

"Say," said Coolstone. "Run one of those ten degree time checks. You know the one that gives us the distance from the station."

"Do what?" said Two.

"You know," said One, "time the ten degrees change, and then multiply it with whatever you multiply it with, and then you get time from the station or something."

"Never heard of it," said Two.

"Never heard of it!" screamed the Rock. "You're a navigator, aren't you?"

Negative, negative. I'm an EWO, said Two, "all I've ever had to do is follow the needles. Tell me how to do it and I'll give it a try,

through."

"I can't exactly remember," said Coolstone. "You time the ten degrees and then you multiply it by something, and you either get time or distance. But a navigator would be able to figure that out."

"Never heard of it," said Two, again. "Anyhow, we couldn't trust it if we did know how to make the calculations. I haven't even heard a signal yet and your indicator is different from mine."

"Okay," said the Rock, disgustedly. "I'm going to run a fuel check now and I see we're picking up an undercast ahead. I don't remember anything like that in the forecast."

The Rock checked his tanks, then his totalizer. The hair started to rise slowly on the back of his neck.

"Two thousand pounds short!" he said, out loud. "Impossible!"

"What's that about two thousand pounds short?" said Coolstone Two in the back seat.

One said, "If this totalizer is right, we have two thousand pounds less than we should have at this point. It's going to be close, close, close."

"Hello, Duck Butt," he said. "Coolstone One, Coolstone One, come in please." But there was no answer. Coolstone had to resign himself to the fact that the radio was out, the radio compass was out, and he was about a thousand miles out to sea.

"Okay," he said to Two, "I'm going to start squawking emergency when we're about four hundred miles from the coast. About two hundred miles out we should be able to pick up a TACAN of some kind—if our equipment is working. Give me an ETA for four hundred miles and two hundred miles from the coast."

"Rog," said Two, and immediately went to work.

The fuel situation wasn't improving a bit, and Coolstone sometimes

didn't look at the liquidometer for three or four seconds. He strained his eyes up ahead again to see if the undercast was going to break up. He'd like to know when he passed over the coast at least. Then an unsettling thought crossed his mind. Since they had been over fifteen hundred miles without a fix, he wasn't sure if they would even hit the coast close enough to his destination TACAN to pick it up. Quickly he decided he would accept anything from British Columbia to Mexico, and he methodically checked off the frequency for each of the coastal TACANs.

After about an hour or more, the EWO said, "Well, we're coming up on about four hundred, according to my calculations."

"Rog," said Coolstone, and turned his IFF to emergency.

It was shortly after this that a rather interesting drama began to develop in one of the Direction Centers on the coast. A telephone rang at the controller's desk.

"Hello," said the controller. "This is Red Eye."

"Roger, Red Eye, this is the Center. We have a B-57 enroute from Hawaii with a suspected radio failure. He didn't check in with the ocean station. He'll probably be north of flight plan due to the prevailing winds. Do you have anything out there?"

"No, not yet," said the controller. "I don't see a thing that isn't identified. But we'll keep an eye open."

About thirty minutes later the phone rang again.

"Hey," said the weapons director to the controller, "I think I have an emergency squawk out here about two hundred miles off the coast. He's in our area now, but he's just about on the boundary between us and that other division. It looks like he'll drift into that other division's

area if he keeps on the heading he's using now. What shall we do?"

"Well," said the Red Eye controller, "let's watch him for a little while. Maybe he'll go into 'that other division's' area and they can take the action. I'll call 'that other division.'"

"Roger," said the director.

The controller dialed the phone, waited a moment, then said, "Cataract, this is Red Eye. We have a track that is in the southern portion of our area and out over the water about two hundred miles. We think he's squawking emergency, but it looks like he's going into your area. We've classified him as pending. He might be a B-57 which the FAA center says has lost his radio."

"Reg," said Cataract. "We'll keep an eye open for him."

The weapons director called in. "Hey," he said, "that emergency traffic has finally gone out of our area. He's 'that other division's' problem now." And he chuckled a bit.

"Reg," said Red Eye, "we outlasted them that time."

The phone rang again. It was the Center. "Say," said the Center controller, "we think we're picking up an emergency squawk out there about one hundred and fifty miles. Have you got anything?"

"Reg," said the Red Eye controller, "I think we have got something out there, but we don't know exactly what it is. If it's the B-57 and he just has the radio out, there is probably no emergency. He's in 'that other division's' area now."

"I don't know," said the Center controller, "don't you think you ought to take intercept action? You got anything close by? He might have something else wrong."

"Well, we could put an F-102 on him," said the Red Eye controller. "Maybe we should."

"I think that would be a good idea," said the Center controller.

The Red Eye controller called "that other division's" controller. "Hey, Cataract, how about running that F-102 like you have out there in on that May Day squawk. The Center thinks he might be in trouble."

"Reg," said Cataract, "we'll go ahead and divert the Guard Deuce and put him on that target. Do you have an altitude?"

"Reg," said Red Eye, "the Center said something about forty-nine thousand feet, and he's doing about 3."

Meanwhile, back in the mess — "How far are we out?" Coolstone asked his EWO.

"If my figures are anywhere close, we should be some place between one hundred to two hundred and fifty miles off the coast at this point," said Two.

Coolstone started dialing in TACAN frequencies. He started with ones in Oregon first and began working down the coast. He picked up nothing.

"How far out now?" he asked the EWO.

"We shouldn't be over a hundred — fifty or a hundred and seventy five miles off the coast, right now."

"Reg," said Coolstone, and with a pure guts play, he dialed in his destination TACAN frequency. He was absolutely amazed to see the needle swing around and lock. The DME stopped its inevitable rotation and much again to his surprise, locked in at 195 nautical miles. He checked the signal to be sure that he had an identification. He corrected his course 45 degrees to the north, checked his fuel, short - short - short - but he could see that up ahead, there were some breaks in the undercast. He pulled both throttles back and started an enroute descent with very little power.

About a hundred miles out could see that the weather was broken to scattered.

"Hey," said Two, "Look out on the right wing!"

Coolstone looked, and there was a Deuce. After much arm waving, he was able to make it known to the Deuce pilot that he was without radios and low on fuel, but that if the DME was right, there was no sweat.

"Boy," he said, "how about that! We've been squawking emergency here for about an hour and we get intercepted right after we find ourselves."

The low grade panic level at which he had been operating began to recede, and in its place came a slow burn which, by the time he had landed, had developed into a full-fledged fire. As he was taxiing in, he saw now that the liquidometer had given him back his two thousand pounds that it had taken away. The radio compass was working again, and on an off chance, he even tried the UHF, but it was still out.

After he had parked and then entered base operations, he got a line to the Direction Center. "Look," he said, "didn't you guys see that squawk of mine? When I was out there I was in a world of hurt."

"Yah," said the controller, "we intercepted you, didn't we?"

"Sure you intercepted me," said Coolstone. "After I had found myself, and then I had to put up with that Deuce all the way down to final. How come you didn't get him on me sooner?"

"Ah," said the controller. "We didn't exactly know who you were, but everything worked out okay, didn't it?"

Reluctantly, Coolstone agreed that it worked out okay, but it would be a hot day in December before he volunteered again for anything.



# the BORED convenes

T-BIRD 013: T-33A - 56-1061



MAT. HADBIT:

CAPT. GLASSBELT:

MAT ROBERT McCAW

CAPT. THOMAS BURKE

"Major Hadbit, the sole purpose of this investigation is to determine all factors concerning the accident and in the interest of accident prevention, to preclude recurrence. The investigation will not be used as evidence, or to obtain evidence, for use in disciplinary action, to determine pecuniary liability, or line of duty status, to revoke commission or to support a demotion, to remove from the active list under provisions of AFR 36-2, or for use before a flying evaluation board. Do you understand?"

"Yes, Sir, all except peculiar reliability."

"That's pecuniary liability and it means being fined or required to pay money for damage to the aircraft."

"Well, Sir, I'm not responsible like that. I claim temporary insanity."

"It isn't the purpose here to deter-

mine things of that nature. All we want are the facts to keep it from happening again. Nothing more."

"I think I understand, Sir. May I smoke? Investigations always make me nervous."

"Yes, the lamp is lit. You mean you've been before an accident investigation board before?"

"I didn't say that, Sir. Besides, what would it have to do with this trial?"

"This is not, repeat not, a trial, Major. And I'm not the D. A. Now let's get down to brass tacks. In your own words, please describe for the . . . members of the board the events which preceded the accident and the details of the accident itself."

"That won't be easy because I haven't been the same since. But I'll try, Sir. On the afternoon of 13 November, at 1313 hours, I took off in T-bird 013. My destination was

Ratchet AFB for a refueling stop. I was on my way to Sidewinder AFB when I was directed to stage out of as a target against the 99th Air Division the following night. The back seat was filled by Captain Glassbelt who I didn't know too well because I'm a new head in the squadron myself. Anyway, we landed at Ratchet and stayed the night. Next morning, we took off for Sidewinder and arrived without difficulties. We spent the rest of the day relaxing for the night go.

"Sometime before we went to the briefing, I got to talking to Captain Glassbelt and found that he hadn't flown the front seat in much of anything since graduation from pilot school. Since he did such a good job taking the T-bird off from the back seat at Ratchet, I thought I'd give him a shot at the front seat for the rest of our flights.

"After the mission briefing, we

filed our clearance, with Glitter AFB as alternate. Sidewinder was forecast to be fogged in on our return. We launched, flew the target mission, and sure enough, we had to divert into Glitter. We got to bed late so we slept in the next morning. We took off for Mountain Top AFB that afternoon and arrived about dusk. By the time we got filed for home plate, it was dark.

"To back up a little bit, at Sidewinder during the aircraft preflight, I noticed that the elevator was binding somewhat. I asked Captain Glassbelt to check the pushrods in the plenum chamber while I moved the elevator. We couldn't find the trouble. We decided to press on since the binding wasn't all that bad. It didn't seem to bother Captain Glassbelt's flying any.

"We cranked the engine at Mountain Top after receiving our clearance, and taxied on out. No other discrepancies showed up except the same elevator binding and the heading indicator 180° out of phase in the front cockpit. Mine was OK. Captain Glassbelt took the active and ran it up. At 80% all the gauges were in the green, so he released the brakes and jabbed the power to it. I got involved with changing the radio to departure control frequency and the next thing I know we're airborne with an excessive nose high attitude. The airspeed was 115 knots and I knew we had trouble. So I took control of the aircraft and lowered the nose to pick up some speed. We had drifted off the right side of the runway and when we touched down for the first time, it was among the tulips. I hooked it back in the air and told Glassbelt to suck up the gear to reduce drag. No luck! Old 013 touched down again, harder this time, and went bouncing through the boonies with no grace at all. Just before we came to a

grinding halt, Glassbelt jettisoned the canopy, with his right armrest yet, and a ball of flame whirled past my right ear. I got a little burned, but was able to hotfoot it out of there. Glassbelt made it OK too. The fire department was right on the button and put the blaze out in no time at all. But 013 was really busted up. That's about it, Sir."

"Major Haddit, are you aware that a flight control problem is a grounding item?"

"Yes, Sir."

"Why did you elect not to have maintenance take a look at it?"

"Well, I checked it out to my satisfaction. Even though I couldn't isolate the cause, I felt that it didn't present a big problem. I have a couple thousand hours of T-bird time and sort of know when she's hurting. Besides, the wrenchbenders probably would have grounded the bird to cover themselves."

"Major, I can't help but think that, if they had, it might have saved us all a lot of time and trouble. But nevertheless, you indicated that you first noticed the binding at Sidewinder. It was also a night mission and the weather was forecast to be poor. You still elected to let Captain Glassbelt fly the front seat even though he had never done so before in a T-33?"

"Yes, Sir."

"You say you have a lot of T-33 time. Are you an IP?"

"I thought I was, but now I know that I wasn't."

"Please explain."

"Several weeks back I was told that I was to be put on orders as an IP. I assumed the paperwork had been put through. I guess I misunderstood. No such action had been taken."

"In other words, you were functioning as an IP even though you were not so designated on orders?"

"Yes, Sir."

"Were you aware that Captain Glassbelt was not T-33 qualified?"

"Yes, Sir."

"Were you in any way directed to check Captain Glassbelt out in the airplane?"

"No, Sir."

"Is it usual squadron policy to allow pilots who think they are on orders as an IP to check out anyone they so desire?"

"No, Sir. I . . . ."

"Major Haddit, did you have any difficulty exiting the rear seat with the canopy gone?"

"Excuse me, Doc, but what has that got to do with the line of questioning up to this point? I'd like to hear Major Haddit's full reply to my question."

"Sorry, Sir. I got carried away."

"Major Haddit, please continue."

"What was the question again, Sir?"

"Is it usual squadron policy to let pilots . . . , uh, to check out anyone they so desire if they think they are on IP orders?"

"No, Sir. I'm sure that is not squadron policy. I did that on my own."

"I see. How did you drift off the right side of the runway? The wind was light and variable."

"I don't know. It must have been a ghost wind or something. We just blew over."

"Who raised the flaps?"

"I didn't and Captain Glassbelt said he didn't."

"Were they set for takeoff?"

"Yes, Sir. At 30°. I checked."

"If you didn't raise them and Captain Glassbelt didn't — how come the switch and the flaps were found in the "UP" position? A ghost hand possibly?"

"I can't speak for the ghosts, Sir. I know I didn't raise them."

"Insofar as you can remember, was the engine performing properly

"Was it delivering normal thrust?"  
"Yes, Sir. Insofar as T-33's deliver normal thrust nowadays."

"Did you compute a line speed check?"

"No, Sir, I didn't. I can tell by the seat of the pants whether it's putting out decent thrust or not."

"Did you have a checklist in your possession?"

"Yes, Sir."

"Did you use it?"

"No, Sir. I have it memorized."

"When the investigators examined the cockpit, the throttle was found full forward and the engine switches were all on. Was the engine running after the aircraft came to a stop or did you shut it down?"

"I don't remember. The fireball got my complete attention."

"Doc, you can ask that question now."

"Yes, Sir." "Major, did you have any difficulty exiting the rear seat with the canopy gone?"

"Yes, as a matter of fact. I was wearing the seat chute and it got hung up slightly. I had to yank fairly hard to pull it free. If you don't come straight out with the chute, it hangs up on the lap belt adjustment buckles."

"Very interesting! Were you aware that Captain Glassbelt had used his right arm rest to jettison the canopy?"

"Not until later or I would have been out of that seat before the bird came to a stop."

"Was Captain Glassbelt contemplating ejection?"

"You'll have to ask him. But I'm glad he didn't go through with it, if he was. I'm no super hero."

"Thanks, Doc." "Major Haditt, you stated that you knew Captain Glassbelt was not T-33 qualified. Did you give him a thorough cockpit and ejection seat briefing?"

"Before I put him in the front seat I gave him a quick and dirty briefing on the layout of the switches.

He's flown the ack seat before and knows about the ejection seat and things."

"What I can't understand, Major, is what prompted you to take it upon yourself to check out an unqualified T-33 pilot, without authorization, at night, with a malfunctioning flight control system. Aren't you aware that it's totally against the . . . that it's not according to the book?"

"Yes, Sir. But two things influenced my decision. The first is that I've always felt sorry for these GIBs who seldom get to fly the front seat. Second, I figured I could give Captain Glassbelt a break and yet be able to handle any situation from the three foot trail position. It's not often that I've been right, but this is one time I was wrong."

"What was that last statement that you made?"

"I've been a pilot for a long time. Like other pilots, I've done a lot of things and made a lot of decisions which were not right according to one handbook or another. That's where not being right very often comes in. But judgment is usually evaluated by success and since everything has always turned out OK for me, I never got criticized. This last one blew up in my face and so for all practical purposes, I was wrong."

"What you are saying, then, is that you've been under the impression that rules can be broken as long as everything turns out okay."

"I used to think along those lines, but now I know it catches up with you sooner or later. And yet, it really doesn't matter when you get right down to it. If someone wants to nail you to the wall, they can do it, no matter what you do."

"How did you manage to come up with that conclusion, Major?"

"Well, Sir, everyone will agree, before the fact, that rules and regs

can't cover all possibilities and so pilots are encouraged to use their judgment. Yet after the fact, any number of little known or less cared about rules and regs can be massaged and interpreted to send the pilot up the creek without a paddle. The classic example I'll always remember is the one about the pilot who had an engine blow up and he tried a flareout landing. He hit short and wiped out the gear. For his trouble he got pilot error. Variations of this kind of Old West justice still go on, no matter what anybody says."

"And so you think that because there may be a flaw in the system here and there, you have a perfect right to choose the manner in which you crash an airplane."

"No, Sir. What I meant is that there are times of distress when no guidance is available until such time that you foul up. Then, guidance appears all over the place. It leaves a bitter taste."

"I see. Well, there's enough bitter taste in this accident to leave no doubt where the cause factor lies. The lesson is a grim one. Since there are no more questions for this witness, you are excused."  
"Bring in Glassbelt." ★





# IS SMOKING

## IS IT WORTH THE RISK?

by SSGT DAVID L. JACKSON / HQ ADC (ADMFM-C)

*Ed. Note: The following paper was written by a young NCO while stationed in Southeast Asia, spending what spare time he had studying under the University of Maryland Extension Course. His instructor was so impressed with the research and thoughtfulness expressed in his writing, he suggested it be used by INTERCEPTOR. The Editors agree.*

**P**resented herein is a rather short but hopefully concise attempt to present a vivid picture of the effects smoking has on the health of the individual.

This presentation is to inform those who do smoke to consider what must surely be the consequence of continuing, and to give moral support to those who do not smoke and show them how wise their decision was.

This paper will not have all the answers, and I'm sure many smokers will find fault with some areas covered. However, this was not written solely to convince all that smoking is bad, which I'm sure I cannot do, but to shed some light on smoking

and its possible effects. It is an attempt to show what certain research and studies have found with regards to smoking and its relationship to the individual's health.

I hope it will create enough interest that the smoker, in giving some thought to the evidence presented, will consider seriously the possibility of giving up smoking.

In 1964 the Federal Trade Commission announced that effective January 1, 1965, the tobacco industry would be required to indicate on its pack of cigarettes that smoking could cause death from lung cancer, resulting in the statement: **Caution: Cigarette Smoking May Be Hazardous to Your Health.**

This announcement was predicated on the report made by an advisory committee appointed by the Surgeon General of the Public Health Service. The committee concluded that "cigarette smoking is a health hazard of sufficient importance in the United States to warrant appropriate remedial action."

In order to determine what effect cigarette smoke can have on an individual we must first determine what

chemicals are contained in tobacco, and tobacco smoke. There have been 110 elements and compounds in tobacco and 270 elements in tobacco smoke identified so far, 15 of which have been identified as poisons and can cause cancer. To name a few, there are such compounds as arsenic, carbon monoxide, hydrogen cyanide, hydrocarbons, nicotine, and tar.

Cigarettes first became popular in America in 1880. At that time cigarettes were being smoked by those 15 years of age and older, at an average of 16 cigarettes per year. By 1910, an average of 139 per year, and by 1920, when there was a noticeable increase of lung cancer, the average had jumped to 341 per year. In 1930, when the cigarette consumption rate grew to over 1,500, there were 2,357 deaths from lung cancer reported. By 1963 the rate of consumption had grown to over 4,000 cigarettes with a lung cancer death rate well over 40,000.

No other disease is increasing at the rate we find with lung cancer. The majority of deaths from lung cancer is among men; however,

among women is increasing steadily each year. This increase is quite evident with the increase of smoking among women.

Cancer is one of the oldest diseases known to man, noted as far back as 3,500 years ago by Egyptian physicians. Cancer is a condition in which normal cells have been altered in significant respect. They are larger and more irregular than ordinary cells, and known as cannibal cells. These cannibal cells, instead of growing in an orderly manner, begin to grow wild without control. Cancer cells affix themselves to body tissue and destroy the tissue to the extent that death occurs. These cells are carried through the body in the blood stream causing cancer to appear in other parts of the body.

Lung cancer is by far the most prevalent cause of death from cancer. This disease was very rare in the early 1900s. However, in 1920 there came a noticeable increase in lung cancer, but still no connection with cigarettes. Dr. Alton Ochsner, Professor of Clinical Surgery, School of Medicine, Tulane University, was one of the first to notice any relationship between heavy smoking and lung cancer, and this was not until 1936. Dr. Ochsner was able, in new patients, to correlate type and extent of cancerous damage upon learning of the patient's smoking habit, which surgery later proved.

All factors which can cause or promote cancer are known as carcinogens. Nicotine seems to be the most predominant carcinogen of those identified. It is a colorless liquid alkaloid which turns brown when exposed to the air.

In its pure state nicotine, even a small quantity, can cause vomiting, weakness, rapid but weak pulse, and possibly death. Nicotine in smoke, depending on brand of cigarette, amounts to from .7 milligram to 3.8 milligrams. When cigarette smoke is

held in the mouth for two seconds, 66 to 77 percent of the nicotine is absorbed, and when inhaled, 88 to 90 percent of the nicotine is absorbed.

There are also chemicals known as co-carcinogens. These substances, when tested, have not been found to cause cancer, but when cells are exposed to a carcinogen also, cancer frequently appears. An experiment in this area was conducted by Dr. Peyton Rous of the Rockefeller Institute using rabbits. When the rabbits were infected with a virus type co-carcinogen, large wart-like growths developed. But when the rabbits were exposed also to a carcinogen, cancer soon appeared.

Cigarette smoke contains a powerful co-carcinogen known as phenol. In addition to this substance, there is another substance suspected of being a co-carcinogen. As already stated, a co-carcinogen when linked with a carcinogen will produce cancer. Therefore, it is a reasonable assumption that tobacco smoke, which contains both the carcinogen and the co-carcinogen elements, is a strong candidate for causing cancer.

In another experiment, using small birds, it was discovered that the vapor from a glass rod moistened with nicotine, when held close to the bird's beak, would kill the bird instantly.

Nicotine also has definite physiological effect on the cardiovascular system of experimental animals and of man, as reported by the Surgeon General's 1964 report. Increase in heart rate, systemic arterial pressure, cardiac output and stroke volume, all resulting in an increased myocardial tissue oxygen demand. This tissue oxygen demand is a situation in which the supply of oxygen carrying blood to the tissue cells is decreased.

The lung gives the blood its oxygen supply and also removes carbon

dioxide from the blood. As the blood circulates, carrying nourishment to the tissue, it gives up oxygen and absorbs carbon dioxide.

Studies have also shown that the carbon monoxide absorbed from smoking may cause a decrease in the supply of available oxygen from the blood which is required to meet the increasing demand of the myocardial tissue. This, in itself, is evidence that smoking can contribute to the increase in heart disease.

Because of the vast amount of publicity given to cigarette smoking and its effects, many have turned to smoking pipes and cigars. There is a higher filtering quality to pipes and cigars which is apparent in the brown substance found in the stem of pipes. However, it is still quite apparent that much of this substance can still get through to enter the mouth, allowing for a good chance of it affecting the inner part of the mouth.

An experiment by three American scientists—E. L. Wynder, E. A. Graham, and A. Croxinger—working with mice at Washington University in Saint Louis produced rather interesting results with this substance. They constructed a machine with openings to hold cigarettes and by a sucking action, were able to simulate actual smoking. This substance was collected and painted on the shaved skin of mice. The mice died almost immediately from nicotine poisoning. When the substance was diluted in a solution and then applied, lesions appeared within two weeks on the mice.

In 1959 the American Cancer Society made a study covering a much broader area than cancer. It covered more than a million men and women, collecting more information about each participant than had ever been done before. They were concerned not only with smoking and cancer, but other health problems.

One of the significant findings in their study indicated that lung cancer was closely associated with inhaling cigarette smoke. Early studies have shown that inhaled cigarette smoke paralyzes the short, hairlike cilia, whose function is to prevent irritants from settling in the bronchial tubes.

In an experiment conducted by Doctors E. Caylor Hammond, Oscar Auerbach, and Purdy Stout performing microscopic examinations of lung tissues from 1,000 patients, all of whom had died from different causes, they found that by comparing the cancerous tissue of all lung cancer victims against the noncancerous lung tissue of smokers and nonsmokers, they found that in all of the smokers the cilia had been destroyed — a condition that was not evident in any of the nonsmokers. To quote Dr. Ochsner, "When the cilia don't function properly, the inhaled irritants settle upon the walls of the bronchial tree, accumulate and proceed with their destruction unhampered." Coughing eventually results from these irritated tissues, and one of the first symptoms of respiratory illness is a nagging, dry cough.

The American Cancer Society's study indicated that smokers of pipes and/or cigars rate from all forms of cancer 32 percent above that of nonsmokers; heavy cigarette smokers 156 percent higher than nonsmokers, and 200 percent for lung cancer.

The different areas most susceptible to cancer by types of smokers are: Cancer of the lungs — cigarette smokers. Cancer of the lips — pipe smokers. Cancer of the tongue — cigar smokers.

The following are some possible causes for cancer: (1) Atmospheric pollution from domestic and factory chimneys. (2) Exhaust fumes of road vehicles. (3) Dust from tarred roads and rubber tires. (4) Smoking

of tobacco.

Out of those listed, only one comes nearest to the cause — SMOKING. Fumes, pollution, and road dust are characteristics of an industrialized country. Yet in countries less industrialized than the United States we can find a high rate of lung cancer; on the other hand, in some countries as equally industrialized, there is a significant lag in the rate of lung cancer.

The diesel engine road vehicle was not introduced to any extent into this country until 1930. This was well after the noticeable increase in lung cancer. All evidence continues to point to one definite cause of lung cancer — tobacco and tobacco smoke.

A shocking experience was described by Dr. John B. Sutton of New York who one morning noticed his left arm seemed to be asleep — he thought it was because he had rested on it during the night. "I could not shave, I could not dress, I could not tie my tie. When I regained the use of my hand, I said to my wife that I was going to try an experiment and that it might prove what was wrong with me. I had been smoking cigarettes for thirty years. So I picked out one of my favorite cigarettes and began inhaling it, as I usually did. The tip of my thumb and all of my fingers began to tingle. They became dead and white, and that tingling and dead feeling went up to my elbow and I was right back where I started from, with a perfectly paralyzed hand and arm. I was admitted to the hospital and had a course of anticoagulants administered. Gradually, improvement occurred." Dr. Sutton quit smoking.

Much of the experimental evidence against smoking has been through the use of animals. Therefore, many of the critics of the anti-smoking advocates, which include some doctors and scientists, refuse

to accept anything but actual proof of any relationship between smoking and cancer. Until there is a human volunteer to experiment on under laboratory conditions, conclusive proof will be hard to obtain.

However, research has shown that there is more than just a chance relation between smoking and your health. So much evidence has been gathered about smoking that, were tobacco any other substance such as a questionable drug, it would have been off the market long before now. In "A Cancer Source Book for Nurses," (1963), published by the American Cancer Society, it is stated: "Lung cancer is the chief cause of death from cancer in men. It has increased eightfold in the past 20 years. An impressive mass of evidence has been accumulated to indicate that cigarette smoking is the major causative factor in lung cancer." Research and studies strongly indicate that smoking may also contribute immensely to other forms of cancer. Smoking presents an enormous risk to the individual's health. A risk he cannot afford and cannot possibly win. ★

#### ABOUT THE AUTHOR

Born in Freehold, New Jersey, Sgt Jackson enlisted in the Air Force immediately after graduating from high school. His overseas service includes Korea and SEA. During his military career he has attended off-duty courses at Paul Quinn College, Texas; Duquesne University, Pennsylvania; University of Alaska; and University of Colorado, Colorado Springs Center. While stationed in Vietnam he attended the University of Maryland on the Tan Son Nhut "campus." In addition to his educational courses here at ADC, he also coaches Young American League football.

## ANSWERING QUESTIONS ABOUT LUNG CANCER

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**Q.** *Is there anything specific in cigarette smoke that may cause lung cancer?*

**A.** A number of chemical agents have been found that are capable of causing cancer; and a number of others (known as co-carcinogens) which assist the action of cancer-causing chemicals. Skin cancer has been produced experimentally in animals with chemicals found in cigarette smoke and with gross cigarette tars.

**Q.** *If you smoke cigarettes and don't inhale — are you safe from lung cancer?*

**A.** Safer than if you do inhale. Recent studies show that lung cancer death rates increase with the amount of cigarette smoke inhaled. Most smokers inhale to some degree, even perhaps involuntarily.

**Q.** *Is there a "safe" number of cigarettes one can smoke?*

**A.** Individuals who smoke more than five cigarettes a day show a higher death rate than nonsmokers. The death rate increases with the number of cigarettes smoked.

**Q.** *Do people who do not smoke cigarettes get lung cancer?*

**A.** Yes. The disease is found occasionally among non-smokers. The type of lung cancer which is most common occurs almost exclusively in cigarette smokers.

**Q.** *If you start smoking early and quit in your teen years, will you get lung cancer?*

**A.** Anyone who gives up cigarette smoking decreases the risk of contracting lung cancer. However, once they have started, most cigarette smokers find it difficult to stop — at any age.

**Q.** *What are the symptoms of lung cancer?*

**A.** The symptoms are persistent cough, blood in the sputum, a lingering infection of the lung or pain in the chest; but by the time these appear, the disease has usually progressed too far to be cured.

**Q.** *How is lung cancer detected?*

**A.** Usually by x-ray examination of the chest. But when lung cancer is large enough to be visible by x-ray, it is no longer in its early stages, and is not often curable.

**Q.** *How is lung cancer diagnosed?*

**A.** By x-ray examination and by bronchoscopic examination or surgical exploration of the chest with the removal of a portion of lung tissue, which is examined under a microscope.

**Q.** *What are the chances of being cured of lung cancer?*

**A.** About one in 20. Most cases are incurable at the moment of discovery.

**Q.** *If a person gets a physical checkup every year, but continues to smoke cigarettes, can he still get lung cancer?*

**A.** Yes. A checkup will not prevent lung cancer, but is useful to detect cancer and other diseases in their early stages. However, as stated above lung cancer is difficult to detect early.

**Q.** *How many people die in the U.S. of lung cancer annually?*

**A.** About 43,000.

# MAD AGAIN!

In the May 1966 issue of INTERCEPTOR, an article entitled "How MAD" was published to explain and promote interest in the Master of Air Defense (MAD) skill rating. When the article was published, forty aircrew members and four INDs had attained the MAD skill rating. Since that time thirty-nine more ADC personnel have attained this coveted and distinctive rating.

Some recent changes to ADCR 51-5 should be brought to the attention of aircrew members and INDs. The changes reduce the number of examinations and checks that an individual is subjected to. The program is easier to manage and candidates for the rating can complete the total requirements in less time. In order to understand the program and the changes a quick review is in order.

First, the "Master of Air Defense" rating can be awarded to AEW&C aircrews (pilots and navigators), intercept directors (ground and air environment), and interceptor aircrews (fighter interceptor pilots, and weapon systems operators). These personnel are considered to have a primary

specialty (expert proficiency required) and a secondary specialty (working knowledge required). For example, an F-106 pilot has a primary specialty of F-106 aircraft and weapons system, and a secondary specialty of ground environment.

Second, let's review the examinations/checks a candidate takes. The F-106 pilot in the above example takes a ground environment written examination, a console proficiency check, an aircraft/weapons system written examination, a simulator check, and a tactical evaluation flight check from a numbered Air Force evaluator. When the candidate passes these tests, he has to again take and pass his primary specialty tests from a Headquarters ADC evaluator. (Previously the candidate had to take both primary and secondary specialty examinations from both the numbered AF and Headquarters ADC evaluators.) When these eight hurdles are passed, he is awarded the MAD skill rating.

The command emphasis and recognition given to the MAD program make the expenditure of effort required

to attain this rating well worthwhile. After a candidate completes all the requirements, he is presented the ADC Form 235, "Master of Air Defense Certificate," by the Commander, ADC, at Headquarters, Aerospace Defense Command. The recipient receives a framed "Master of Air Defense" patch, a lapel pin, and an Air Force blue blazer with ADC emblem and a separate device with the words "Master of Air Defense" embroidered on it. In addition, a letter of favorable communication is sent from the Commander of ADC to the numbered Air Force in which the individual is stationed in recognition of the individual's accomplishment. ADCR 51-5 also suggests that the individual be considered for the award of the Air Force Commendation Medal.

This short resume gives the required examinations/checks and awards that comprise the MAD program. When the candidate has passed the examinations/checks successfully, he has the public recognition and awards cited above, but also he has two intangible benefits: one — a superior job



knowledge; two — a working knowledge and appreciation for the duties and problems encountered by the other half of the Aerospace Defense team. This is the real benefit from the MAD program — personnel who are

better trained and more capable of performing their duties in ADC.

That's the program in a nutshell. If you want to go MAD, for once, you not only have headquarters approval, but a guarantee that you

can not lose; for the end result is knowledge, and no one can take that from you.

The following list of names is published in recognition of those who have attained the "Master of Air Defense" rating:

#### **F-89 PILOTS**

Maj. D. H. Fleisland  
Lt Col A. P. MacDonald

#### **F-101 PILOTS**

Maj. W. H. Scott  
Maj. P. L. Harris  
Maj. G. F. Rogge  
Maj. J. A. Alfard  
Maj. A. S. Warinner  
Maj. E. F. Mullins  
Maj. S. D. Chester  
Maj. B. L. Nobles

#### **F-102 PILOTS**

Capt. J. D. Coomes  
Capt. F. T. Faha  
Capt. D. D. Bright  
Capt. G. W. Cristanson  
Maj. O. V. Johnson  
Capt. P. M. Williams  
Capt. L. L. Crawford  
Capt. T. C. Smith  
Capt. K. J. Lamberton  
Capt. E. W. Daisley  
Maj. R. E. Meinert  
Capt. E. H. Armstrong  
Capt. Y. F. Lucas  
Maj. R. E. Ross  
Capt. W. J. Hobbs (ANG)  
Maj. R. D. Goodman (ANG)  
Maj. C. A. Beasley (ANG)  
Capt. W. Tomasi III (ANG)

Capt. L. Leach (ANG)  
Capt. J. Yeager (ANG)  
Maj. D. T. Biggerstaff (ANG)

#### **F-104 PILOTS**

Maj. C. J. Fitton  
Maj. E. M. Bunn  
Maj. K. M. Reed  
Maj. E. M. Kronebusch

#### **F-106 PILOTS**

Maj. E. E. Distrow  
Maj. J. D. Garmley  
Capt. H. B. Pyles  
Maj. A. Leman  
Maj. N. W. Potter  
Maj. H. A. Goodall  
Lt Col R. E. Edge  
Maj. D. C. Schuyler  
Capt. Corlick  
Lt Col J. M. Boughton  
Capt. R. B. Evans

#### **C-121 PILOTS**

Capt. W. M. Adams

#### **C-121 NAVIGATORS**

Capt. M. D. Kenny  
Maj. J. P. Bistro

#### **WEAPON SYSTEM OFFICERS**

Capt. A. B. Winkleman  
Maj. G. E. Coats  
Maj. E. H. Osuchowski

Maj. P. J. Frickleton  
Maj. N. L. Trimmell  
Capt. N. M. Acker  
Capt. L. L. Ellis  
Maj. M. E. Mohr  
Maj. M. L. Johnson  
Maj. B. A. Curtis  
Maj. R. W. Shaleski  
Maj. Leroy Rigaby  
Maj. J. J. Pizzo  
Maj. C. M. Hoosterler

#### **INTERCEPT DIRECTORS**

Capt. W. L. Nietsch  
Capt. N. Lovernick  
CWO E. S. Chappell  
Capt. K. J. Dorsch  
Capt. G. H. LaMontagne  
Capt. D. T. Richards  
Capt. H. B. Stevens  
Capt. A. C. Frost  
Capt. W. E. Westfall  
Capt. G. A. Fisher  
Capt. J. T. McGraw  
1/Lt L. P. Campbell  
Capt. T. A. Hebert  
Capt. J. J. Kelly  
Capt. J. E. Cialer  
1/Lt F. P. Herre  
Capt. D. M. Beschta  
Capt. R. L. Drew  
Capt. T. M. McKenzie  
Capt. J. R. Biddle



# a little EXTRA

**N**ot too long ago a vest was authorized for wear with our flight clothing. Stylish? . . . Not Practical? . . . Yes! The SRU-21/P survival vest may be just that "little extra" that will save your life one day should you be forced into making a nylon touchdown.

When an inflight emergency occurs in a jet aircraft that knowledge, checklists, and plans of egress cannot correct, the aircrew has two choices: one — make a forced landing if a suitable field is available; two — eject. The problems associated with forced landings are well known and will not be reviewed in this article. If we assume that an ejection is our only alternative, what does the aircrew take with him as he leaves the cockpit?

A typical fighter pilot (see illustration) has his pockets filled with all sorts of goodies such as a knife, flares, matches, a computer (small/CPU26A/P), etc., that cause the overloaded appearance. Carrying survival items in certain pockets of the flight clothing is not recommended. As Mr. Robert H. Shannon points out in the article, "USAF Ejection Summary" (March-April 1969), there is a real hazard involved if aircrews carry survival items in G-suits and the lower pockets of flying suits. As statistics are compiled, the injury problem associated with carrying items in the G-suit and lower flight suit pockets is being pinpointed. The problem is more acute as ejection speeds increase. With these facts staring us

in the face, what recourse do we have?

One answer is the SRU-21/P survival vest. The vest is now required on all T-33 flights. *It is highly recommended for all flights and especially in ejection seat equipped aircraft.* This lightweight overgarment has twelve pockets in which to secure survival items. The vest is worn over the jacket and under the LPU and parachute harness. This practically assures retention during an ejection; and since the items are distributed around the upper torso, cockpit interference is negligible.

Individual issue of the SRU-21/P is authorized and highly recommended. An individual vest can be properly fitted and the items in the vest are one man's responsibility.

However, if individual items cannot be accomplished, be sure and have the "Personal Equipment" personnel adjust the vest to fit you properly. If you wear the wrong size vest, it can interfere with ground egress procedures, especially lap belt release. Now, we have a vest, what can we put in it?

These items can be carried in the SRU-21/P:

1. RT-10 radio or equivalent (mandatory in vest)
2. MK-13 flares (two)
- \*3. Penguin flare kit (one)
- \*4. Police whistle (one)
- \*5. Signal mirror (one)
- \*6. Waterproof match container (with waterproof matches)
7. Fire starter (one)
8. Survival kit—individual (one)
9. Insect repellent (one)

NOTE: Asterisked items plus MC-1 knife are ADC mandatory items.

These are proven survival aids, each has its purpose. For example, the radio is excellent for communicating your location and condition to rescue aircraft. However, once the rescue aircraft is close to you, the MK-13 flares can pinpoint your location. (Remember the *poopy end* of the MK-13 flare is for night signalling.) The other items have their specific uses also. Get a refresher from personal equipment personnel if you have any doubt as to proper operation of any item. To have the equipment is not enough, be able to use it to your best advantage.

ADC Regulation 501-7 is emphatic in its requirements. However, a regulation by itself is inadequate; understanding the "why" is an essential element of compliance. So, wear the vest; know the contents, their use, and capabilities. A little extra time and effort, yes . . . but it just may be "a little extra" that save your life.



Display of contents used at Peterson Field, Colorado



SRU-21/P vest (front view)



SRU-21/P vest (back adjustment webbing)

# ZOOM BAG

## scenario

by MR. JOHN GARRETT AND MR. MILTON ALEXANDER

*Anthropology Branch, Human Engineering Division  
Aerospace Medicine Research Laboratory  
Wright-Patterson AFB, Ohio*

*ED. NOTE: Frequently we take for granted the comfort and safety built into the equipment we use in our flying activities. Many long hours of research and testing go into the design of an item before it reaches the field. Full pressure suits are no exception. The Editors extend their thanks to Mr. John Garrett and Mr. Milton Alexander for their background information on the development of two suits for the high altitude mission.*

4756th pressure suit section, received a telephone call from Mr. Milton Alexander, a physical anthropologist at Wright-Patterson. Mr. Alexander was inquiring about the availability of A/P 22S-6 pressure suits to support a research project on the exterior dimensions of pilots while wearing these suits. The need for this information had become pressing since more and more aircraft were being prepared to perform a high altitude mission.

Both Mr. Alexander and M/Sgt Reeves were well aware that a cockpit had to be large enough to accommodate all pressure-suited pilots or someday a tragic accident would result. It was then agreed that the Anthropology Branch could conduct its research project at Tyndall, using the facilities of the Physiological Training Flight. This was to be accomplished on an informal basis and was not to interfere with the normal mission of the PTF. ADC pressure suit experience was offered to assist in the study.

While this instant cooperation, without red tape, amazed the physical anthropologists, it was another typical example of the 4756th's routine. Besides their regular ADC duties this unit serves as pressure suit depot for the operational high altitude mission which involves Aero-

space Defense Command, Military Airlift Command, Air Force Systems Command, and Tactical Air Command. In addition, the unit earned a Meritorious Unit Citation for their cooperation with the RCAF assault on the high altitude record.

Since 1967, numerous shuttle trips have taken place between Wright-Patterson and Tyndall. As a result of this activity has been only comprehensive studies for cockpit layout and design to accommodate the pressure-suited pilot. Two of these studies are now available to the drawing board engineers. One study concentrates on the space required for and the type switches compatible with pilots wearing pressure suits and gloves. The other study presents a full listing of 185 different dimensions on all sizes of the A/P 22S-2 suit. Presently under way is a study to measure pilot arm reach capability in cockpits, not only for the -2 suits but also for the brand new A/P 22S-6.

The tremendous cooperation of the 4756th PTF at Tyndall has enabled the Anthropology Branch of the 6570th Aerospace Medical Research Laboratory to expedite data collection and testing in order to help provide the high flying pilot with the safest, most comfortable, yet functional, full pressure suit.

**F**or those ADC pilots whose mission includes wearing an Air Force full pressure suit, rest assured that neither the orange A/P 22S-2 or the new green A/P 22S-6 was designed and fitted by colored lights and magic mirrors. These pressure suits give pilots the ability to fly safely at high altitudes. Part of the responsibility for their development lies in an almost unique relationship between two diverse Air Force units—an ADC operational group, the 4756th Physiological Training Flight at Tyndall AFB, and an Aerospace Medical Division research branch, the Anthropology Branch of the Aerospace Medical Research Laboratory at Wright-Patterson AFB.

It all began in 1967 when M/Sgt Billy E. Reeves, then chief of the

#### ABOUT THE AUTHORS

*Mr. Garrett and Mr. Alexander are Research Physical Anthropologists in the Human Engineering Division of the 6570th Aerospace Medical Research Laboratory at Wright-Patterson AFB.*

*Both have been extensively involved in the sizing of personal protective equipment and cockpit layout work.*

*A/P 1254 Full Pressure Suit in P-106 cockpit for storage evaluation*



*Pilot in A/P 1254 Full Pressure Suit inflated to 2.0 psi - Symbolic altitude chamber*



**OPERATIONAL  
READINESS  
INSPECTION TEAM  
HQ, ADC**

## **“ONLY SATISFACTORY?”**

You may be wondering if the CI team has a quota on outstanding ratings for munitions services sections, since only one “outstanding” has been given in this area in the past 12 months. Of course, there is no such thing as a quota. However, we can review situations that have led to lesser ratings. By alleviating these problems, your unit will have progressed well toward an “outstanding.”

We are interested in two major areas: certification records and proficiency loadings.

We expect to encounter few problems with certification records, since ADCR 52-3, ADC Munitions Certification Program, has been in effect for a long time. Unfortunately, we constantly find numerous errors in ADC Form 242, Individual Technician Evaluation and Certification Record. Some of these errors have resulted in the reporting of limiting factors or major deficiencies. Three factors caused most of the errors: carelessness in the preparation of the forms, lack of familiarity with the requirements of ADCR 52-3, and failure to clarify questionable areas with higher headquarters. A thorough understanding and application of ADCR 52-3 requirements will aid your bid for an “outstanding.”

A unit cannot expect to attain an outstanding rating, if its load crews are unable to load in a safe and reliable manner in accordance with the applicable technical orders and supporting directives.

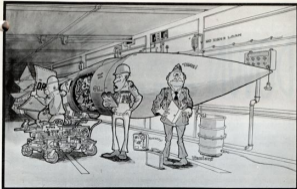
We choose carefully the crews to be observed. For example, we usually look at crews with augmentees. Our observation of the crew during the proficiency evaluation may contrast sharply with that of your standardization team, because more than the mechanical motions of loading are observed. We also inspect the aircraft, equip-

ment and weapons. Thus we evaluate the crews in all areas, including their knowledge and application of rejection criteria.

The most critical items in the application of rejection criteria are the aircraft forward and aft umbilicals. Many crew chiefs appear to be unaware that a “CONTAMINATION” and a “NOTE” exist which give explicit instructions on what action to take when contamination is found in the umbilicals or when the pins are damaged or bent. The question then arises as to just what constitutes contamination or a damaged pin. During our own inspection of these umbilicals, we consider that contamination is any substance — oil, grease, moisture, dirt, paint, or whatever — that may in any way affect the proper routing of voltage through the pins; normal discoloration is permissible. We deem damaged pins to include those that are bent, burnt, buried, worn, or that have any other defect that could damage the umbilical of the weapon.

The inspection of weapon umbilicals has also caused much consternation on our inspections. We expect to see the load crews apply exactly the same stringent criteria to this inspection as is required of the munitions maintenance personnel. Contamination in this instance is the same as previously stated, and also any loose paint or dirt particles large enough to be detected.

Many units apparently believe that the aforementioned areas are the only ones judged for the final rating. However, Annex G of ADC Operations Plan 6-67 lists other interesting endeavors to be evaluated, such as: the training program, facilities and equipment, compliance with directives, and management. Several of



" # 21. DEPRESSURIZE WARHEAD COMPARTMENT AND REMOVE ACCESS DOOR."

" # 22. EXTRACT LAST YEAR'S ORI INSPECTOR . . . . "

tions services sections might have received outstanding ratings if they had not fallen down in these areas.

Management has often detracted from an otherwise outstanding performance. By management, we mean everyone from the squadron commander to the most junior crew chief. It is quite evident when a section lacks effective direction and guidance. Adverse comments are made by the troops; respect for the upper echelons is at the zero mark; and unity is lacking with other sections. You should interest the commander and his staff in your section, and gain their aid in providing aircraft for load training, adequate facilities, and recognition for your people.

Without a well-scheduled and well-documented training program, a section may find itself in difficulty when faced with testing. Our test will challenge the reliability and validity of your training program. The test consists of two parts: one section examines the technical knowledge required for loading; and the other covers the basic supervisory information contained in AFM 66-1, ADCR 53-3, and ADCM 136-1. Most people do well on the former, and poorly on the latter. For example, 80 percent of those tested to date did not know what a COLLEGE KNOWLEDGE message was. It is reasonable to consider a section outstanding when its

supervisors aren't acquainted with basic ADC directives.

Finally, there are the cases where the sections have met only the minimum requirements. They have accomplished their normal day-to-day functions in an adequate manner, as expected. Often, this section is rated only satisfactory, because they did not utilize procedures, policies, or equipment that were superior, ingenious, or which might be helpful to other units.

No one inspector alone can rate a section outstanding. Data are furnished to the inspector by fellow team members, and all factors are evaluated by the inspector and his team chief. The final decision rests with the team chief.

In this "discussion," I have reviewed several items that have caused meritorious services sections to be rated only satisfactory in the past, and that will probably continue to plague them in the future. Do not assume that if you do not have these problems, you will automatically receive an outstanding rating on your next capability inspection, but you will have gone a long way to improve your chances.

THE BEST OF LUCK ON YOUR COMING CH!  
BILL NORRIS, Colonel, USAF  
Team Captain, ADC ORI Team

# DOWN and out

## F-101 INFLIGHT FIRE

The aircrew was briefed for a short (17 minutes) flight to a nearby base for a quick turnaround exercise. Exterior and interior cockpit preflights were accomplished normally except for a momentary inability to secure a green "trimmed for takeoff" light. Activation of the rudder trim switch corrected the situation. The first attempt to start the left engine failed because of lack of ignition. The second attempt was successful and so was the first start attempt on the right engine.

Because of the short flight involved, the pilot climbed to and levelled at 8,000 feet. Cruising airspeed was 480 knots IAS with the left engine at 100% military power and the right engine at 100% afterburner power setting. He was attempting to burn fuel as rapidly as possible in order to get the aircraft on the ground for the quick turnaround.

At approximately 9 minutes after takeoff, the pilot heard a loud thump or small explosion in the aft section of the aircraft. Simultaneously, the right engine steady fire light illuminated and the aircraft went through a series of moderately severe gyrations about all axes. The pilot shut the engine down, declared an emergency, and was given vectors

to the nearest suitable airport. Approximately 2½ minutes later, the fire warning light went out. He pressed to test both bulbs and determined that they were working. He then activated the test circuits and found them operative. At about 10 miles out on final approach, the pilot attempted to lower the landing gear. He felt no indications in the cockpit of the gear doors opening or of gear extension. The green gear down lights were out, the gear warning horn was sounding, and the unsafe gear warning light was on in the gear handle. He recycled the gear handle, but the indications remained the same. Utility hydraulic pressure was normal.

The pilot then attempted to lower the gear with the emergency system. He got a green safe light on the nose gear only. A helicopter flying in the local area was asked to visually check his landing gear configuration. The helicopter reported the nose gear and left main gear down, but the right main gear up and locked. He also reported no indications of fire. The pilot of the emergency aircraft then tried to retract his left main gear while trapping the nose gear down in accordance with checklist procedures. He was unsuccessful. The utility hydraulic pressure now read zero.

The aircrew made their decision to eject rather than land with only two gear extended. They requested and received from approach control vectors to the ocean shoreline. When the pilot visually observed the shoreline passing beneath the aircraft, he told the WSO to eject. He followed 2-3 seconds later. Altitude was 5,000 feet. The aircraft was observed to pitch up and enter a flat spin. It impacted some 500 yards inland from the shoreline.

During an extensive investigation and analysis, it was discovered that the right engine afterburner igniter fuel filter housing failed in flight. There was evidence of oxidation of





low pressure aluminum housing due to fire, both outside and inside the filter, caused by temperatures in the region of 900°F. The high pressure housing showed evidence of being heated to a temperature in excess of 1180°F. Some of this metal had melted and the housing was cracked open with its sides resembling the petals of a flower. The paper filter element and its fine mesh screens covering were missing.

Based on the results of the investigation, the accident board concluded that material failure of the right engine afterburner fuel filter housing caused a fuel leak which subsequently ignited. This caused an engine bay explosion and fire. The engine bay doors were weakened and failed at the hinges with major portions of the doors departing the aircraft. The explosion and fire destroyed the aluminum hydraulic gas-

down lines in the right engine bay. The fire also burned the inboard section of the right flap and destroyed the emergency gear extend air lines in the right wheel well. This made it impossible to lower the right main landing gear and necessitated abandoning the aircraft. The aircrew was considered competent and knowledgeable, and their actions were not considered to be a factor in the accident.



# ✓ POINTS

We would sincerely appreciate your inputs mailed directly to:  
The Editor, INTERCEPTOR, Hq ADC (ADCSA-E), Bn AFB CO 80912

✓ **T-33A EXHAUST GAS TEMPERATURE LIMITATIONS.** Maximum starting temperature: 900 degrees C. Maximum during operations: 715 degrees C. Maximum EGT during altitude acceleration checks: 900 degrees C. During the acceleration check the EGT may exceed 715 degrees without causing damage; however, the temperature should not lie between 715 and 900 degrees for more than 20 seconds.

Minimum EGT: Ambient Air Temperature	Minimum EGT for Takeoff
-10 degrees C	610 degrees C
0 degrees C	610 degrees C
30 degrees C	640 degrees C
40 degrees C	650 degrees C

The EGT varies considerably in various engine and airframe combinations. Consequently, it is imperative that the acceleration check be utilized to determine that adequate thrust is available for take-off. During climb there are no established charts for minimum indications. Reference: T.O. II-33A-8CF-1.

(4600WGMME-Q)

✓ After proficiency flight checks, flight examiners will complete a separate line entry for the examinee in blocks A through E in AFTO Form 781, placing appropriate AFTO 781F code in Block E. Reference: AFM 60-1, para 4-5a. (ADCSA)

✓ The Parker Aircraft Division of Parkers Hannifin has developed a total fuel tank inerting system that thus far in tests appears to be completely effective. Briefly stated, liquid nitrogen is loaded aboard, converted to gaseous nitrogen, and distributed throughout the aircraft's fuel tank system to displace the oxygen in the tanks, thus eliminating the possibility of combustion of any sort occurring within the tanks... and regardless of ignition source! Actual flight testing on an extensive scale is presently being conducted by the USAF in C-135 aircraft. Parker shares credit for this development with Pan American World Airways, Inc., FAA, and the USAF, (Flight Safety Foundation)

✓ AFM 60-1, dated 14 July 1969, changes requirements for refresher courses and flight checks. The BIRTH MONTH is now the key word rather than birth date.

(ADCSA)

At Mach 2, you will travel nearly a mile — 5191 feet — in the time it takes to turn your eyes from distant vision outside the cockpit, look at an instrument, recognize the reading, and look outside again. You will travel 3040 feet in the time it takes to detect and recognize an object outside the cockpit. (ADCSG)

Red X and Red Diagonal symbols entered on the aircraft forms represent an opinion as to the condition of the defects. Therefore no individual will be directed to change the symbol. If someone of higher responsibility, within the maintenance or repair activity, believes that the condition is more serious than represented by the symbol, the individual will change the symbol himself. If any supervisory personnel believe that the condition is less serious than represented by the symbol, the matter will be brought to the attention of the maintenance officer or chief of maintenance, who will determine if the symbol can be changed. (4600WGMME-C)

It might be well to be reminded that 90% of the natural lightning strikes recorded occurred in the  $-10^{\circ}$  to  $+10^{\circ}\text{C}$  temperature range. Of equal importance is the fact that in this same temperature range jet fuels are flammable whereas avgas is over-rich at these temperatures . . . and 10% of the recorded lightning strikes occurred on the wings of the aircraft, the principal fuel storage area for modern jets! (Flight Safety Foundation)

Pilots who maintain currency in jet or turbo-prop aircraft may substitute one weather penetration for 40 minutes of (annual or semi-annual) instrument requirements. Reference: APM 60-1, para 4-12b. (ADCSA)

A drip pan or other suitable apparatus shall be placed under outlet overflow vents of aircraft being serviced with liquid oxygen to prevent contact of the liquid with any oil or grease which may be on the ramp. Drip pan shall be kept clean and not be utilized for any purpose other than liquid oxygen servicing. Reference: T.O. 00-25-172. (4600WGMME-C)

Place the T-33 tip tank jettison switch in auto drop in a safe area and prior to take-off. Also make sure it is "off" before entering the parking area. In a recent incident, the tip tanks jettisoned when the canopy was raised after turning off the runway. The tip tank jettison switch was still in auto drop, and some unusual wiring caused the tip tanks to jettison when the canopy was opened electrically. (ADCSA)

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## BLUE ZOO

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"Mummy knows you don't want to go to the Academy, but Daddy knows best!"

## FIELD REPORTS

**T-33A REVERSE TRIM.** The pilot got little or no effect from the nose up trim applied during flap retraction. When he tried again, the nose went down. He checked further with emergency trim. He suspected the elevator trim was wired backwards, but hesitated to try opposite trim. He landed the aircraft without problems. The nose-up and nose-down wires had been reversed in the elevator trim tab actuator cannon plug during its repair. The trim system worked correctly after the wires were correctly located.

**T-33 LOW LEVEL WARNING LIGHT.** In flight the pilots noted that the tip light came on with the totalizer reading 566 gallons. Two minutes later the fuselage tank low level warning light came on, even though the fuselage quantity indicator was still indicating full (88 gallons). Fuel switches were immediately gangloaded. Low level warning light remained on and emergency was declared. Landing was completed with a computed 5 to 10 gallons fuel remaining in the fuselage tank if the low level light had been correct, the fuselage fuel quantity indicator stuck on full, and fuel transfer to the fuselage tank stopped. Upon touchdown, the low level warning light went off. Visual check of fuselage tank afterward revealed that it was full. Maintenance investigation revealed that there was insufficient pressure of the follower on the cam track to insure low level switch was made with fuselage tank full. Follower arm was bent to increase pressure. No further problems experienced.

**TF-102A AC/DC POWER FAILURE.** The aircraft had an unusual electrical problem when water shorted a Brundy plug on the cockpit floor. The AC and DC power failed initially, then appeared to reset—at least the warning lights went out. The UHF and nose wheel steering were inoperative on the DC side and the main attitude indicator was inoperative on the AC side. The emergency AC generator was supplying power. What happened was the electrical short blew several circuit breakers in the nose wheel well which denied power to certain components. With the shorted plug and wiring replaced, the electrical system checked OK.

**F-102A FUEL LOW LEVEL LIGHTS.** The aircraft was acting as a target at FL 430. After the drops had fed out, the pilot used afterburner during a turn. Both fuel low level lights came on and the #3 tanks read 400 pounds. When he came out of the afterburner the tanks filled. Subsequent use of afterburner caused the same results. The tanks filled again and the lights went out during the return to base. Maintenance personnel changed the #3 tank vent valves.

**F-57A ENGINE FAILURE.** After approximately one hour of flight, #2 engine began a mild vibration. An emergency was declared and precautionary landing was uneventful. After engine shutdown, it was discovered that #2 engine had seized. Engine removed for shipment to depot. Suspect #2 bearing failure.

**F-106A FUEL SYSTEM MALFUNCTION.** The fuel low level lights illuminated while aircraft was on final approach with approximately 2300 pounds total fuel remaining. The boost pumps were turned off on taxi-in and the engine immediately flamed out. Investigation revealed trapped fuel in the transfer tanks caused by a restricted aft fuel tank pressurization filter. The filter was cleaned, re-installed, and checked satisfactorily with the fuel system tester.

**F-101B EVIL SPIRITS.** During cruise at 24,000, 30 minutes after takeoff, the pilot noted that he could not get any engine response on the right engine between 2300 pph and 3500 pph fuel flow. Fuel flow could not be stabilized at any point between these figures. Engine response was normal on either side of this range. Emergency fuel was selected and the engine operated normally through all ranges and a precautionary landing was accomplished. The engine was ground checked through all power ranges and the malfunction could not be duplicated. The fuel control was changed as a precautionary measure.

**TF-102A LIMITED ENGINE THRUST.** The aircraft was on GCA final prior to glide slope when the pilot realized it was taking full mil to hold airspeed. To increase airspeed, he used afterburner briefly. The instructor pilot noted the EPR remained about 1.6 or 1.7 when the pilot came out of afterburner, indicating the cyclids had remained open. They closed very slowly and EPR returned to normal. The same thing occurred during the ground engine run and it was determined the exhaust nozzle control valve was sticking. Replacement of the valve corrected afterburner/cyclid operation.

# THE WAY THE BALL Bounces

## ACCIDENT RATE

1 JAN THRU 31 AUGUST 1969

ADC ANG

Thru August 1969

5.1

\*7.4

MAJOR — ALL AIRCRAFT

## ON TOP OF THE HEAP

MO	ADC	MO	ADC	MO	ANG
64	48 FIS	25	343 Ftr Gp	79	163 Ftr Gp
39	4603 AB Gp	23	49 FIS	77	112 Ftr Gp
31	75 FIS	18	71 FIS	58	148 Ftr Gp
29	4758 DSES	17	78 Ftr Wg	36	147 Ftr Gp

## ACCIDENT FREE

## BOX SCORE

ACCIDENTS FOR Avg	CUM TOTAL	1st AF	4th AF	10th AF	ADWC	4660	ANG

T-33			1				2
F-100							
F-101	1			1			
F/TF-102				1	1		2
F-104							
F-106	2	2	1				
B-57	1	1					
F-84							1 1
EC-121	1						
OTHER CONV							1 1

## CUMULATIVE RATE

1 JAN THRU 31 AUGUST 1969

ADC ANG

JET	6.5	*6.7
CONVENTIONAL	1.6	14.7

BY AIRCRAFT	T-33	1.7	15.8
	F-100	0	
	F-101	8.6	
	F TF-102	5.3	*3.2
	F-104	0	
	F-106	12.2	
	B-57	15.8	
	EC-121	2.9	

MINOR ACCIDENTS THIS PERIOD — 9  
MINOR ACCIDENTS CUMULATIVE — 3

SAFE — MAJOR ACCIDENTS  
PER 100,000 FLYING HOURS

\*Estimated

# the Cold Hard Facts...

The approaching foul weather can POUL up an approach — know your definitions!



## DECISION HEIGHT (DH)

Decision height is a height expressed in feet above mean sea level (MSL) and at the point on a precision approach where the decision to land or execute a missed approach must be made. Precision approach is defined as a PAR or ILS approach with aimpath and glide slope available.



## MINIMUM DESCENT ALTITUDE (MDA)

Minimum descent altitude is a height expressed in feet above mean sea level (MSL). Descent BELOW this altitude is not authorized for nonprecision and circling approaches until the runway environment is in sight, and a safe landing can be made. Nonprecision approaches are defined as an ILS without glide slope, ASR, TACAN, VOR, ADF, or LP approaches.

CENTIMETER  
MEASURED HEIGHT  
OF BASE OF CLOUDS



TOUCHDOWN  
POINT

TWO INSTRUMENTS MEASURE EYE



## RUNWAY VISUAL RANGE (RVR)

Runway visual range is a value, in feet, determined by instruments adjacent to the runway centerline and near the touchdown point. When reported, RVR replaces prevailing visibility for deteriorating field conditions.