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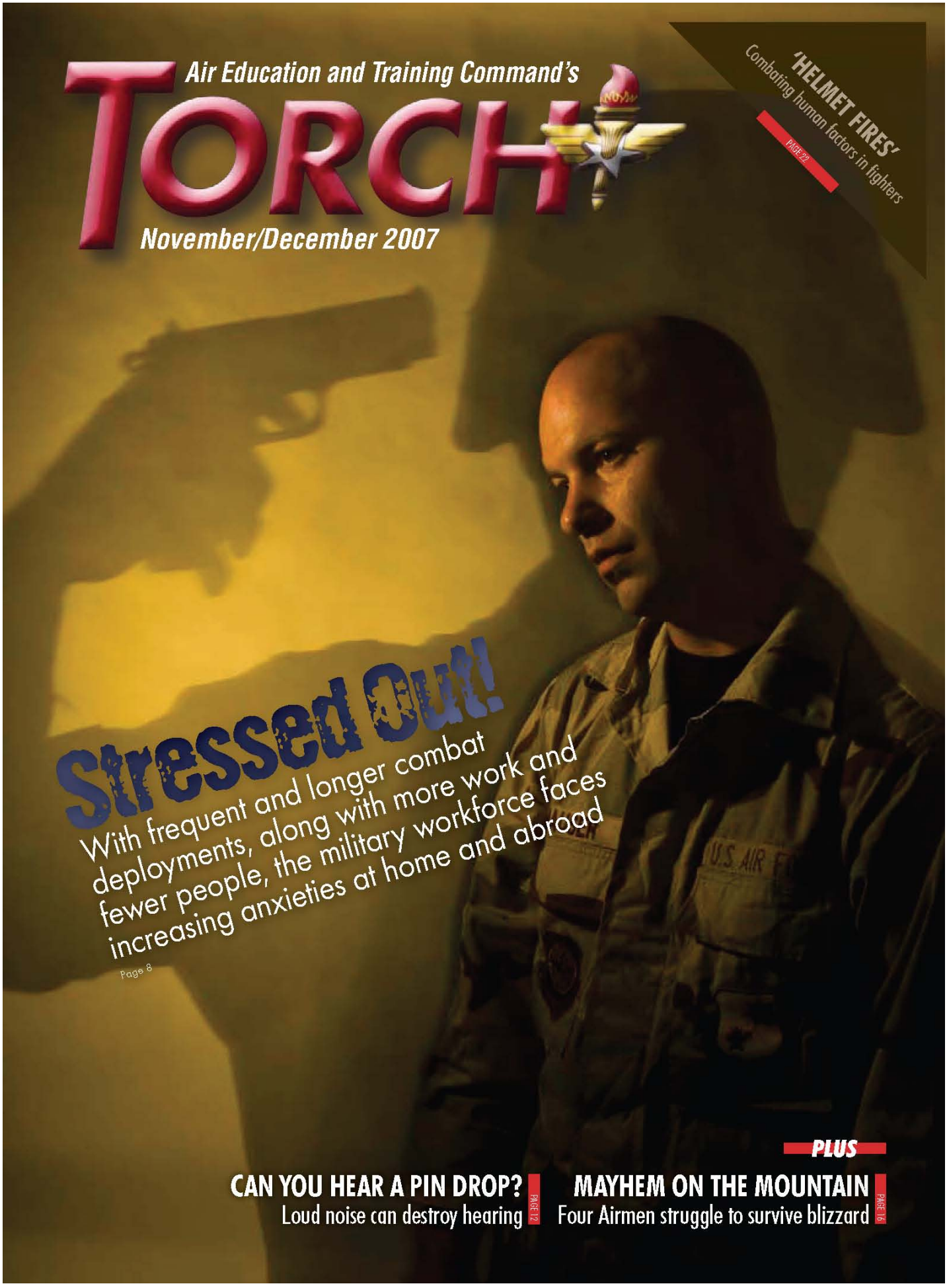

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'HELMET FIRES'

COMBATING HUMAN FACTORS IN FIGHTERS

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In the pursuit of understanding fighter pilots, the study of human factors in aviation has evolved and grown. But, one constant remains: The majority of flight mishaps are still caused by human factors. In other words, jets crash more often than not because the pilot just screwed up or let his guard down.

"Helmet fires" (otherwise known as task saturation, mis-prioritization, situational awareness and channelized attention) can get the best of us, resulting in mishaps. As a matter of fact, task mis-prioritization, situational awareness and risk assessment/decision making are the three most frequently cited causes of Air Force fighter mishaps.

Modern day mishap statistics indicate 70 to 80 percent of aviation mishaps are caused by human factors. Throughout aviation history, even though we have dramatically reduced mishaps overall, the human factor rate has remained fairly constant. For example, a 1943 pilot information file states, "Pilot error is the cause of 70 to 80 percent of all aircraft accidents." Sound familiar?

Solomon was right when he wrote in Ecclesiastes, "What has been will be again, what has been done will be done again; there is nothing new under the sun."

Fighter pilots, specifically single seat pilots, face some of the most challenging flight environments. We have to organize our own resources plus work as a team to accomplish the mission while preparing for such immediate contingencies as weather, threats, in-flight emergencies and alternate missions, to name a few. Most of the time, these unexpected and unanticipated contingencies can only be overcome by skill, experience and/or training.

Nevertheless, skill-based errors (i.e., inadvertent ops, checklist errors, procedural errors, over/under control, inadequate anti-G straining maneuver) overwhelmingly comprise the greatest number of pilot errors as the root cause of most fighter mishaps. Most safety programs don't address how to fix skilled-based errors. The bottom line is the pilot has to fix the problem because the pilot, not the safety system, is most likely the problem.

Putting out helmet fires involves staying ahead of the jet through preparation and anticipation; that is, *preparing* for the worst case and *anticipating* the next event in the chain. Anticipation is forecasting using your best judgment — a byproduct of experience. It's thinking ahead.

Techniques on how to manage helmet fires vary, but there are some proven concepts that have helped me survive almost 3,000 hours in fighters (see "Save Your Jet and Yourself" on the next page). Maybe these concepts and techniques can help you get your act together and help us reduce the skilled-based errors that are destroying our fighter force.

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SAVE YOUR JET AND YOURSELF

PREPARATION

Mission planning: The flight should plan together as a team to produce a smoother mission equipped to overcome contingencies or problems. Simple plans with realistic and focused tactics have a higher chance of succeeding than complex plans with little margin for error or room for contingencies. Flights should be planned to minimize the workload through the use of user-friendly, organized products, such as a communication-card with frequencies listed in sequential order. Even the way a pilot folds a map prior to the flight can reduce in-flight distractions and give the pilot more time to think and react to other situations.

Know the capabilities of your flights: Are you flying with a new wingman? What are the currencies of everyone in your flight? The flight commander should be the key to answering any questions regarding personnel issues, capabilities, currencies and problems. Task saturation demands proficiency in the basics of tactical flying.

Briefing: The "on-time" briefing has the most impact on the flight and should be the melding of mission planning information, tailored to the least experienced pilot, and not an introduction to the plan. A disjointed and rushed briefing (or a briefing that ends right at "step" time) usually equates to a flight filled with multiple "helmet fires." By the way, if you're eating lunch during the flight brief, then you're most likely missing critical bits and pieces of the brief that could prevent a helmet fire.

Preflight: Slip your start, check-in, taxi and takeoff times to accommodate last-minute changes. Disruptions to pacing and habit patterns increase task saturation.

Ground operations: Review your game plan for such things as takeoff emergencies where critical actions must be accomplished with little time for analysis. Thinking through your game plan (otherwise known as "chair flying"), before you really need to set it into motion, can increase your chances of not having a mishap.

Proficiency: When was the last time you accomplished an emergency procedures simulator or cracked open your Dash One? Did you *really* accomplish situation emergency procedures training last month? Know your jet! Remember, you're responsible for your own proficiency and knowledge, and during an emergency is not the time to discover you're not as proficient on things as you need to be.

Personal life: Are you fit to pull high Gs? If you're 3 percent dehydrated, then your G-tolerance is cut in half. You should have a personal fitness program, including proper nutrition (a balance of carbs, proteins and good fats), and you should be getting enough pilot rest to maintain a high degree of alertness and beat fatigue.

ANTICIPATION

Communications: Flights should anticipate radio changes and use clear concise 3-1 communication. This will help prevent missing critical information and avoid task saturation.

Cross-checks: At low altitude, anticipate checking "near rocks" and "far rocks" prior to accomplishing any other tasks and use an effective crosscheck between your heads-up display and round-dials. This can reduce helmet fires in poor weather or at night.

Training rules: If you anticipate a training rule violation about to occur then don't be afraid to "knock-it-off" before a violation or mishap occurs. Believe it or not, training rules violations have been the cause of several mishaps in the past few years.

Weather: Anticipate weather changes so you're not caught without enough fuel to divert. Pressing the fuel for one more pass or engagement can only cause stress on the return to base.

Gut feeling: This actually may be your most reliable anticipation cue in the jet. The human body is able to detect stimuli long before the mind has consciously put it all together. So, trust your gut feelings. If the hair on the back of your neck is standing up, then knock-it-off and check six.

Distractions and fixation: If you're distracted in the cockpit or find yourself fixated on something, then stop, look around and check six.

Always have an out: Always have a back-up option to execute for all aspects of the mission to include such basic actions as formation overshoots, weather aborts from low altitude, or unusual attitudes at night with night-vision goggles. Having an out is key to risk reduction.

Risk assessment: Just ask the question, "Can I live with the consequences of my next action?" It's that simple! You don't need a computer program or chart to make basic risk assessments and decisions.

See and avoid: Midair collision avoidance and controlled flight into terrain are at the top of the list for non-engine related fighter mishaps. Anticipate where you expect to encounter close-calls between both civilian and military aircraft and then force yourself to clear your flight path. If you're terrain masking in mountainous terrain, then you need to have your eyes focused outside the cockpit and not on the radar display.

Night flying: Even with night-vision goggles, processing and recognizing data at night is more difficult than night vision itself. Keep your night tactics very basic to process information more effectively. If you operate with the same mentality as in the day, then the chances of making a mistake are significantly greater.

Know and respect your limits: If you are pressing your limits, back off the intensity of the mission and reassess. You can always flex to an alternate mission that is less demanding, such as basic intercepts or instrument training. If you're the flight lead and notice your wingman is consistently having an issue, then knock-it-off and find out what the problem is before continuing the mission.

Don't let your guard down: The mishap database is full of reports for mishaps that occur on return to base — most of the time because the intensity of the mission dropped significantly and the pilot relaxed and stopped paying attention. It's easy to let your guard down and take a break. But keep the focus; you can relax once you're back on the ground.

— Lt. Col. Edward Linch