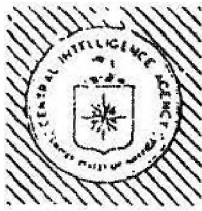


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DIRECTORATE OF
OPERATIONS

Domestic Collection Division Foreign Intelligence Information Report

COUNTRY	USSR	DCD REPORT NO.	OO-8-321/33474-76
SUBJECT	Combating Fatigue in Crewmembers/	DATE DISTR.	10 November 1976
	Aeroflot Work Cycles/Use of Drugs/	NO. PAGES	4
	Biological Effects of Aircraft Noise/	REFERENCES	
	Radiation Research/UFO Phenomena/		
	Prototype Pilot Biological Psychomotor		
	Testing Equipment/Celestial Navigation/		
	Night Vision Testing		

DATE OF INFO

THIS IS UNEVALUATED INFORMATION

SOURCE

SUMMARY: Aeroflot officials are actively involved in aerospace medical research. They are concerned with the medical aspects of physical conditioning which impinge upon crewmember performance and have perfected several devices which test pilot biological functioning and motor response ability. Dr Inal Georgiyevich Akoyev, a noted radiation biologist explained cosmic ray particles (phosphenes) which are causing Aeroflot pilots to "see" flashes of light during night flying. Dr [fnu] Akutin, cyberneticist at the Civil Aviation Institute of Leningrad showed [] prototype pilot biological psychomotor testing equipment which measures blood pressure, pulse rate, cardiovascular function and motor ability. The equipment is automatic and testing is completed in approximately three minutes.

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1. The Soviets deal with crewmember fatigue in several ways. First, they emphasize and promote physical conditioning. If a crewmember is physically fit, he will be less prone to fatigue and will recover sooner after tiring flights. Aeroflot provides exercise facilities at all major airports, and these facilities are supervised by a well known athlete. The second thing they do is to thoroughly test each crewmember prior to flight to insure his physical fitness and mental alertness. At the present time, these tests are conducted by a medical team headed by a doctor, usually a woman. A crewmember is not allowed to fly if he fails the examination. These tests are now being automated and will take only 1-3 minutes when the prototype equipment becomes operational. Finally, there is a third approach Aeroflot is using--a prophylactorium. Each major airport has one, a 3 to 4 story building set off from the main airport buildings, but easily accessible by foot. These facilities are well landscaped and are designed to provide total rest and relaxation for transient crewmembers. They have a large kitchen

6. Dr Akoyev asked for [redacted] personal opinion of the UFO phenomenon. He was told that 99 percent of these occurrences were traceable to either natural or man-made phenomena such as celestial movement, aircraft or artificial satellites, and that the other one percent cannot be explained--possibly an hallucination. Akoyev then asked, "Do you think it is possible...could there be something coming from outer space?"
7. Dr [redacted] Akutin, a cyberneticist at the Civil Aviation Institute of Leningrad, has developed several prototypes of pilot testing equipment. The equipment is planned to replace most of the current duties of medical personnel who examine pilots prior to flight. The automatic devices will be installed in all airport flight operations facilities. Akutin and his associates demonstrated [redacted] a set of instruments which automatically measure a pilot's blood pressure and pulse rate, record his cardiovascular functioning with an electrocardiogram, and test his motor reaction process.
8. The device is activated by inserting a small metallic plate into the testing machine. The plate, one of which is carried by each crewmember, contains a biological baseline on that particular individual. His normal blood pressure, pulse rate, electrocardiogram, and motor ability are coded into the metal plate. This plate is updated annually, or more often if required. After the plate is inserted into the machine, the pilot places the middle finger of each hand into two little holes and rests his wrists on two small metal plates on a table. Small, automatic pneumatic cups close around the fingers and inflate. The machine then measures the blood pressure and pulse rate by comparing the two fingers, computing a mean, and then comparing the result with the encoded information on the pilot's plate. The systolic and diastolic blood pressure and pulse rate are then displayed on the face of the machine in an electronic digital form. At the same time the machine automatically administers an electrocardiogram "across the heart" and displays this on a cathode-ray tube. If any of these values are outside the normal standard for that particular individual, a light illuminates and further examination is required by a medical doctor. If no light illuminates, the pilot is passed.
9. The pilot then faces a panel of red and green colored lights. On the panel are green and red colored buttons. The lights begin to illuminate in a random fashion, with the pilot being required to press the corresponding color button immediately to extinguish the colored light. This test continues for approximately 20-30 seconds, during which the lights flash in a random sequence. At the end of the testing period, the machine scores the pilot's performance and digitally displays his score in the number of correct and wrong responses. If he scores as high or higher than his standard, he is passed; if his score is lower, a light illuminates and further examination is required by a medical doctor. There are three separate programs which are randomly selected, making it impossible to memorize the sequence of the lights.
10. Finally, the pilot is seated before a miniature cockpit with a control stick and an attitude indicator. The control stick must be moved to keep the attitude indicator (artificial horizon) straight and level. The indicator pitches up and down and from side to side and very closely duplicates actual instrument flying conditions. The control stick also closely approximates necessary pilot skills. At the end of this test, the score is again displayed and, depending upon his standard, a pilot passes or fails. The entire sequence of testing, from taking blood pressure to the control stick evaluation, takes approximately three minutes. If a pilot passes all phases, his personal profile plate along with a certificate card is returned to him. He must present the certificate card to the flight dispatcher before he is allowed to board the aircraft.

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