

Though its methods may be difficult to decipher, the Soviet Air Force has a clear idea about how to ensure that its fighters show up for a war.

READINESS, SOVIET STYLE

BY RICHARD D. WARD

FOR ALL TOO many Western analysts, the Soviet tactical fighter force apparently has become a military riddle wrapped in a strategic mystery locked inside a readiness enigma.

Misreadings of Soviet airpower are widespread. The illusion that the Kremlin has built a ramshackle force of second-rate fighters masks the disquieting reality that Moscow's air arm fits its war plans with great precision.

Western skeptics seeking to make the case against Soviet fighters cite very high overhaul rates as "Exhibit A." This, they conclude, can only mean that the aircraft are of inferior quality.

In fact, close examination reveals such maintenance to be deliberate, the key to a highly unusual war-readiness system. Far from failing to achieve high peacetime fighter durability, the USSR keeps its planes in constant repair to ensure their reliability in wartime. Benefits that flow from this system are many:

- High warplane availability, with some ninety-five percent of front-line, deployed fighters ready for war on Day One.

- Low vulnerability, with forces able to move to and operate from austere, dispersed bases devoid of maintenance facilities.

- Extensive reinforcement powers, with thousands of warplanes in reserve for swift deployment to forward locations.

The system that produces these benefits is complex and alien to Western thought. But an analysis focused on the aviation support system of a Frontal Aviation air regiment illustrates the point that Soviet fighter readiness procedures mesh well with Soviet objectives.

Those objectives are based on elements of surprise. In the Soviet view, this requires the ability to launch or respond to an attack from a "standing start," without mobilization; the ability to protect Soviet forces by dispersing them widely across European bases; and the ability to exploit initial successes of a swift attack by rapidly bringing back-up forces to bear on the main action.

Unusual Maintenance Cycle

The Soviet Union's unusual and much-misunderstood maintenance cycle provides the key to all three

The USSR keeps its planes in constant repair. This system keeps close to ninety-five percent of front-line, deployed fighters ready for war on Day One. The Soviets—and their allies—also take an innovative approach to ground equipment. For example, the ladder being used here by an East German mechanic to work on the vertical stabilizer can also be used by the pilot for cockpit access.



objectives. In fact, the frequent overhaul of Soviet fighters is the basis of the Soviet operational approach to readiness.

In simplest terms, the cycle can be broken down into three distinct segments: operational aircraft deployed at the main base, a complex of large overhaul and repair facilities based in the rear, and a material reserve stockpile of refurbished weapons.

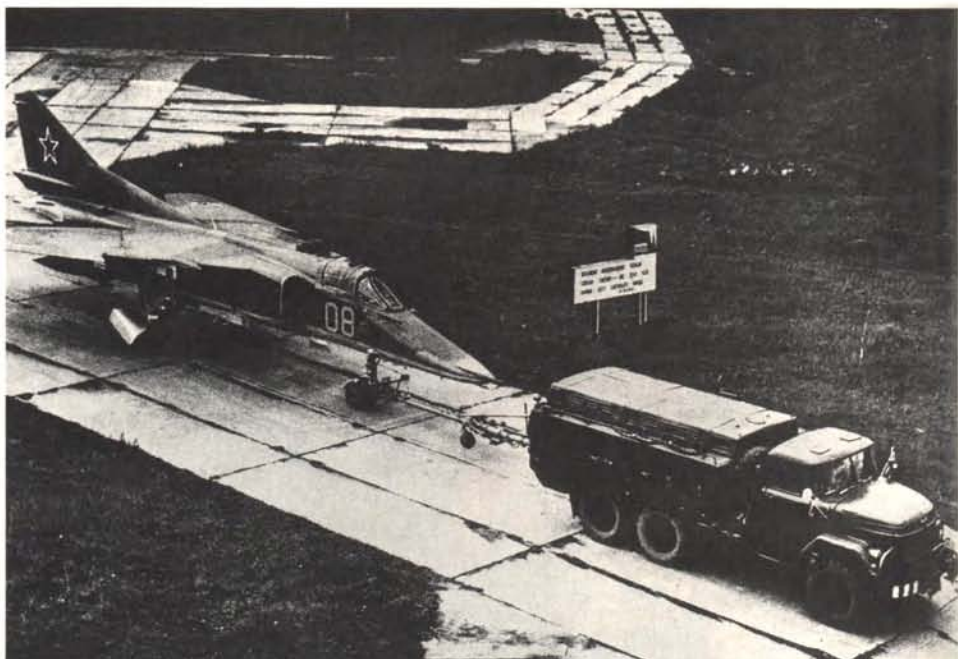
The cycle works this way. When an operational aircraft comes due for an overhaul, it is withdrawn from action and replaced with a new or totally refurbished fighter drawn from the strategic stockpiles. The inactive fighter is then shipped to an overhaul facility for a thorough rehabilitation. Once that is complete, the renovated warplane is itself transferred to the stockpile, available for future deployment as a replacement for some other plane. When that happens, the cycle begins again.

In stark contrast with Western maintenance practice, however, overhaul takes place after an aircraft logs only a few hundred hours of flight time. The figure in the West is usually several thousand hours.

This short cycle for Soviet aircraft, however, stems not from the failure of Soviet components. What needs to be understood is that the Soviet equipment is returned for overhaul at the peak of its reliability. The Soviets have determined how many hours each weapon can be expected to last in war. By subtracting that number from total hours of reliable life in an aircraft, they determine the time at which an overhaul must be performed. This takes place even if the aircraft happens to be working extremely well.

The overall system ensures that aircraft equipment goes to refurbishment immediately when its allowable peacetime flight hours have been accumulated. This overhaul-before-needed philosophy is in keeping with the Soviet dictum that all fighter equipment provided to the regimental commander must be reliable for a specified period.

With so much Soviet maintenance being performed at rear installations, the Soviet military has developed a gargantuan, highly organized, specialized system to carry it out.



The Soviets view the MIG-23 Flogger and its support truck together as the Flogger Weapons System. The truck tows the aircraft and functions as a tool chest and a storehouse for test equipment. This arrangement provides efficient support to the aircraft both on the main operating base and at any dispersed location. Note the concrete slabs used for ramps and taxiways at the bare-base location.

The Soviets maintain a single logistics support organization, known as "Rear Services" or, in Russian, "Tyl." It supports all five of the Soviet military services. Rear Services functions are divided into two principal areas: the Military Central Support System and the Field Logistics Support System.

Each Rear Services support level provides repair installations for Soviet fighter aircraft. However, because of differences in service equipment, each branch has separate engineering support units—troops who actually perform maintenance. In the Soviet Air Force, Aviation Engineering Services (IAS) is responsible for all levels of aircraft maintenance.

At the highest, "national-strategic" level of organization, the Military Central Support System is responsible for material acquisition, through either the civil economy or military procurement agencies. This system is also responsible for maintaining strategic reserve stockpiles. Soviet storage depots stock 13,000,000 metric tons of arms and ammunition and 60,000,000 metric tons of fuel, oil, and lubricants. This is enough reserve war material to support intense offensive operations for up to ninety days.

How "Overhaul Factories" Work

It is at this strategic level of organization that total fighter overhauls are performed. The Soviets maintain entire facilities, known as "overhaul factories," to carry out this task. These factories, located primarily in the Soviet Union, employ more than 100,000 IAS workers, most of them former aircraft maintenance troops.

The principal function of these centralized, air-army-level overhaul factories is to renew airframes and aircraft components. In most cases, overhaul facilities are former production plants with machinery for the same models still in place. In some cases, current production plants are used to overhaul aircraft on lines even as new production models continue to roll from adjacent assembly areas.

The Field Logistics Support System functions below the national level. It is responsible for operational and tactical-level support of the armed forces. One half of the Field Logistics Support System, called the Operational Logistic System, supports fronts, armies, corps, and divisions. Operational reserves—stockpiles of combat-ready weapon systems—are positioned at this level.

Within this system, the IAS operates Air Division repair depots, which perform major maintenance tasks just short of complete overhauls. Most weapons parts needing repairs are crated and sent to rear-echelon depots rather than to facilities at a forward operating base, as would be the case in the West.

The other half of the Field Logistics Support System, the so-called Tactical Logistics System (TLS), supports smaller units such as air regiments and battalions. War reserve stockpiles at this level include expendables such as fuels and lubricants, munitions, food, water, and material goods. These are stored on motor transports or in containers sized for truck and train transport. The TLS directly supports air operations, a task critical to readiness of Frontal Aviation units.

How does this extensive Soviet maintenance activity affect the Kremlin's ability to carry out its wartime objectives? Clear-cut results can be seen in aircraft avail-

viet aircraft are available for combat right away and have the staying power to last for some time.

If strikes originate from the main bases, the aircraft will be launched very rapidly, alternating from both ends of the runway to minimize exposure time and maximize deployment rate. When the sorties start, the expectation is that at least ninety-five percent of the combat aircraft on each air base would be flying.

In peacetime, only a small percentage of Soviet fighters is used for training, the bulk of the training taking place on simulators. The training aircraft never dip below wartime service hours. Unused standby aircraft are maintained in a "run-in" state, keeping Soviet air squadrons at almost full strength on a constant basis.

Efficient Wartime Operation

Reinforcing the inherently high availability of Soviet fighters is another factor: The Soviet Air Forces,

only for a postulated combat life and with sophistication commensurate with the technical qualifications of the maintenance personnel who are operating under the stress of war.

For example: On every Soviet fighter, one can remove the afterburner without having to disconnect fuel and electrical lines—a great advantage when it comes to wartime repairs. Realizing that this is the most frequent maintenance task, the Soviets have simplified it.

Soviet military planners have enhanced operational effectiveness by carefully balancing performance against readiness. Without doubt, readiness is the primary consideration, a fact reflected in the ruggedness of Soviet planes. In the words of one analyst: "The Soviets can 'turn' these aircraft [for combat] while they are being bombed, strafed, gassed, and snowed on in below-zero weather. Their aircraft may not be the best performing, but they're certainly not delicate."

Equally great is the impact that

A Soviet pilot and his crew chief prepare for a mission. The trucks assigned to each aircraft have an off-road capability, and maintenance crews are armed. In the background, several bomb caskets can be seen. The bombs are fuzed and are positioned with the aircraft for rapid upload. The round shape of the casket allows for rolling the bombs when necessary.



—TASS/Sovfoto

ability—the pivotal factor in Soviet planning for "standing-start" air operations in event of war.

Unlike his Western counterpart, a Soviet commander does not have to worry that many of his planes are nearing the end of their reliable combat lives. The replacement cycle, if it does nothing else, ensures that all or virtually all deployed So-

to a degree not seen in the West, design their fighters to be able to operate efficiently in war's harsh environment.

Their very simple designs tend to keep support requirements to a minimum. Soviets believe that weapons must be supportable in the fog of war. In practical terms, this means that aircraft are designed to last

the Soviet maintenance cycle has on the ability of a Frontal Aviation regiment to disperse—yet another of the Soviet Union's wartime requirements.

In peacetime, it is true, the maintenance procedure becomes a complicated task requiring long-distance transport and time-consuming repair cycles. But in wartime,

the much smaller number of base-level maintenance troops and equipment greatly reduces the support "tail" and allows more flexibility in aircraft deployment.

Soviet aircraft appear well suited to combat operations from austere dispersal bases lacking repair facilities. The Soviet view is that an abundant supply of virtually new aircraft will display few of the routine maintenance problems that would occur in equipment that has been ridden hard in peacetime. With little need for repairs, the jets can operate from a wide variety of strips.

The Soviet embrace of dispersal as a major wartime objective has had an impact on USSR base structure. The Soviets have decided that base-level, or intermediate-level, maintenance and its accompanying facilities only complicate the task of building combat readiness. Maintenance is minimized and in most cases eliminated. Most main base repair tasks are of the "remove and replace" type.

The configuration of the Soviet base reflects this. While the American air base is a stand-alone fortress from which to launch multimission air operations, operating in much the same way as an aircraft carrier, the Soviets see their typical base as a combat deployment fire base. In a sense, the Soviets operate their main operating bases as the US Air Force operates its dispersed bases. The USSR air base, in wartime, would serve one function—that of launching combat sorties, not that of a major maintenance facility.

Rear-Echelon Overhauls

The Soviets believe that major repairs and overhauls should be conducted at rear-echelon facilities where skilled labor and precision machinery can be concentrated efficiently. These high-value facilities would be less vulnerable in those locations.

At a main base, virtually all aircraft support equipment is mounted on trucks. Thus, this important equipment can be transported quickly to dispersal sites. Entire tactical aviation units, including flight-line support, medium-level repair shops, inspection and armament vans, and flight operations control vans, can be convoyed to

remote bases without breaking radio silence.

In sum, it appears that Western aircraft could attack all Soviet main operating bases and their limited repair facilities and still have little or no effect on the overall readiness of Soviet fighter regiments.

In addition to the contribution it makes to wartime fighter availability and dispersal operations, the unique Soviet maintenance cycle ensures that military commanders will have sufficient reserve forces to exploit early successes.

The Soviet Union has built a substantial stockpile of reserve weaponry—from aircraft components to entire, battle-ready aircraft—and constantly replenishes it. It is estimated that well over half of all fighters the Soviets produce are stored in material reserves. The constant inflow from the overhaul factories prevents any diminution of the reserves.

War reserves are maintained separately from other weapons, in what the Soviets refer to as "full readiness" for immediate use. In peacetime, replacement of such emergency material reserves takes place when their "shelf lives" have expired. In wartime, these emergency material reserves are used for the specific purposes of equipping high-readiness units and replacing combat losses.

The war reserves would also greatly reduce the need for base maintenance. Malfunctioning aircraft parts would be replaced from war reserve stockpiles, eliminating the need for repair depots. Such a procedure would be especially necessary in the initial period of the conflict, when the Soviet economy would not yet have converted to wartime production to replace forces destroyed in battle.

As might be imagined, the unorthodox Soviet maintenance cycle requires the Soviets to deploy a unique support organization with each of its air regiments. This air base support group, known as the Aviation Technical Battalion (ATB), is a separate and distinct unit that combines several functions.

One ATB subsection, the Independent Air Field Technical Support Group (OBATO), handles the traditional Rear Services functions on base premises. Primarily respon-

sible for upkeep of the airfield, OBATO personnel maintain runways, taxiways, and hardstands. The group uses specialized runway maintenance vehicles, which in wartime would also aid in preparing austere strips. OBATO is responsible for fuel dumps, motor vehicle refueling points, portable pumping stations, and other logistics enterprises.

All the aircraft servicing and maintenance on a base, however, remains the domain of the Air Force engineering service, organized in an ATB subgroup known as the Technical Exploitation Unit (TECh). It has responsibility for the operation, maintenance, and repair of aircraft, helicopters, aircraft engines, weapons, and equipment.

The TECh manages transfer of equipment to overhaul factories for scheduled maintenance; transfer of equipment to repair depots for unscheduled maintenance; and inspection, minor repair, servicing, and arming of aircraft. It is also responsible for replacement and calibration of repairable items.

Mobile Repair Shops

Virtually all of the TECh is mobile. The TECh provides the personnel and equipment to inspect and replace components and conduct repairs using truck-mounted specialty service equipment called mobile repair shops or "PARMS." The units are designed specifically for dispersal operations.

All services can be provided in the field from these portable truck-mounted facilities. Each aircraft is assigned to a specialized support truck. It provides AC and DC power, compressed air, simple inspection equipment, and an auxiliary fuel pump. It also has a communication link with the IAS duty officer.

This truck actually tows the aircraft. In fact, the fighter and its truck together form an aircraft "system." The truck becomes the principal means of wartime dispersal because it can tow an aircraft to a dispersal airstrip and then maintain it at that site.

Armament and external store service are also provided by the TECh. This job is relatively simple because there is little or no assembly of bomb, rocket, or external tanks on a Soviet air base. All stores are deliv-



This Mikoyan test pilot's expression at the Farnborough Air Show last fall reflects the Soviets' determination to have their aircraft operate under any conditions. The MiG-29 in the background has doors that cover the intakes when the landing gear is lowered. This prevents foreign object damage to the engines at austere strips.

ered to the base crated and ready to load.

In all its features, the peacetime Soviet tactical aviation support organization is designed for efficient and rapid transition to war. How would the various components of Soviet readiness come into play in a conflict?

If Soviet leaders choose to conduct operations from the main base, the entire system would function much as it does in peacetime. It is in a dispersal operation, however, that the true strength of the Soviet system would become apparent. Even after a Western attack that disables the main base runways, the Soviets would be able to rebound and keep fighting. All evidence indicates that such an operation might resemble the following scenario.

At the main operating base, the first step is the immediate dispatch of an advance airfield-activation unit to planned dispersal areas. Work begins on preparation of deployment sites for dispersal of aircraft and aircraft-support units that are to follow within hours.

These would prepare at least three dispersed airfields in each dispersal area. Runway clearance,

support-area preparation, and setup of command and control areas and regimental headquarters all would take place swiftly. Activities at the regimental headquarters would include preparation of the central command and control system, an intermediate-level maintenance center, helicopter pads, and garrison areas.

While the advance units are en route to the deployment sites, other support teams at the main operating base load mobile aircraft and airfield service equipment onto trucks. Strict radio silence is maintained during performance of all these tasks.

When the loading is complete, a convoy of the mobile garrison and support units, led by the regimental commander and his staff, leaves through several different exits and proceeds to the initial checkpoint. At this time, even the commander is unaware of his destination. The con-

voy receives directions en route, either from highway control troops or from a series of beacons.

In this convoy, each aircraft-servicing vehicle is towing a high-performance aircraft. Speeds on the highway reach up to twenty kilometers per hour. The remote sites, only a few kilometers from the main base, are reached quickly. Throughout, the regiment succeeds in masking its redeployment to new locations.

At the dispersed base, elements of Soviet remote-site philosophy are apparent—mobile flight operations control towers, camouflaged shelters, mobile pipelines and roadways, and simple power support equipment.

The advance units are finishing the preparation of the airstrip, a highway section about 2,200 meters long and twenty-two meters wide. In the "runway" portion of the airfield, the median strip has been paved over, with an apron at either end, measuring 100 meters long and thirty meters wide. Automatic landing systems and crash barriers are deployed at both ends of the runway.

In less than eight hours after the regimental dispersal began, the unit launches its first combat sorties.

Support depth is minimal, with the fighter unit having access to only the most critical parts, basic repair and inspection equipment, fuel bladders, and ammunition. As the war continues and the stockpiles are depleted, resupply of certain critical materials and cadres for both the ground and air forces are provided by air transport, which use the dispersal bases to stage their operations. The largest aircraft in the world, the An-124 Ruslan transport (whose NATO code name is Condor), can operate from the highway strip and appears frequently.

Such is the style in which the Soviet Union has planned to go to war. While the Kremlin's ways may be mysterious to many in the West, the problems they pose are only too apparent. ■

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