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BACKFIRE BOMBERS IN CHINA



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## BACKFIRE BOMBERS IN CHINA

Numerically, the armed forces in China have consistently been the largest in the world; however, the quality of its military equipment has not matched the size of its personnel strength. With the Four Modernizations and with the adoption of the open-door policy and economic reform, the Chinese Communists actively imported advanced science and technology from the West in order to improve its formerly backward military equipment. Although there has been some gains after many years' efforts, yet the 1989 bloody suppression at Tiananmen Square nearly halted this short-cut modernization route. One after the other, Western countries suspended or prohibited this military exchange; thus, the Chinese Communists were unable to seek cooperations with other countries.

After the Chinese Communists terminated the many years' long hostile posture with the former Soviet Union, relations between the two sides became more and more active. Although initial exchanges were limited to economy and import/export trade, yet the Chinese Communists gradually turned to the former Soviet Union for trade in order to secure examples of advanced science and technology in the military arena. In addition, most weapon systems in Communist China originated in the former Soviet Union; therefore, naturally the imported Soviet weapons are suitable for

use in China. After the collapse of the former Soviet Union, the political and economic situation in the independent republics of the new Commonwealth are poor; however, these republics still maintain vast advanced military heavy industries even in the face of extreme shortage of civilian consumer goods. Therefore, one after the other these nations are selling military resources left over from the former Soviet Union to acquire urgently needed foreign exchange.

In this setting, naturally the Chinese Communists are actively importing military equipment from the independent republics of the new Commonwealth. At very low bargain prices, various models of these weapons are being acquired by China. Currently, these weapons are purchased in two ways: purchase of ready stock, and licensing for production. Among the firm orders are included the following: purchase of 72 Su-27 fighters and licensing of MiG-31 fighter co-production. Additionally, other projects are rumored to include the following: purchases of 400 T-72 tanks, co-production of Yak-141 supersonic vertical takeoff and landing (VSTOL) fighters, and purchase of the advanced SA-12 antiair missile system. Still more projects are rumored to be in the works, including purchase of the Kuznetsov class aircraft carrier now being built in Ukraine. Although these rumors have not been confirmed as facts since the developing situation is still a foglike uncertainty, yet it can be ascertained that military hardware transactions between Communist China and the Commonwealth of Independent States will greatly increase in the future.

After Chinese Defense Minister Qin Jiwei visited Moscow in August 1992, the tempo of military hardware transactions stepped up rapidly. Various sub rosa stories are abounding. Even some recent news accounts stated that Russia will sell to China a batch of Il-76 transports and Backfire bombers. If these news stories are confirmed, the long-unbalanced gap in military strength between both sides of the Taiwan Strait will become even more lopsided, in widening further the gap in air force strength

between Communist China and the Republic of China. The Il-76 is a Russian-built heavy jet transport comparable to the C-141 made in the United States. Currently, 450 of these Russian-built transports are deployed in the independent nations of the new Commonwealth; 85 dual-use military/civilian models of transports were exported to several countries, based on a report. Although this report does not have a direct impact on Taiwan; however, if Communist China also purchases the derived models of the Mainstay aerial prewarning and control plane (AEW&C) and aerial tanker, this will effectively strengthen the antiair capability and air combat radius of China's air force. However, with respect to Taiwan's air defense, the Backfire bombers pose a new nightmare, coming on the heels of the Su-27 fighters. Some years ago, the Backfire bombers became a matter of dispute during United States-USSR negotiation on arms limitation. The Backfire bomber has high attack capability with high speeds, long range, and high penetrating capability at low altitude, carrying air-to-ship missiles with ranges in the hundreds of kilometers. These powerful attack capabilities will impose much heavier burdens on Taiwan's air defense. If Communist China successfully purchases the Backfire bombers, the Republic of China's air force will not only require high-performance fighter planes such as the F-16 C/D and Phantom 2000-5, but it should also purchase various high-performance radar, reconnaissance systems, early-warning systems and air defense missile systems, among other add-ons. Only in this way, can the threat from Communist China against Taiwan be overcome.

For the time being, we can neglect the truth or falsity of these news items, from the circulating sub rosa stories about exports of Backfire bombers to various countries, and upon grasping the deteriorating economic situations in Russia and the frenzied activities in exports of military products, this warning just cannot be overlooked. Actually, on the international scene, there have been stories about Iran preparing to purchase more than 12 Backfire bombers; moreover, several other Asian and

Mideast countries expressed interest in buying the bomber. In addition, the Backfire bombers publicly participated in the Moscow Aviation Exhibition, and the 1991 Cherbourg Aviation Fair in France. It looks like that Russia has decided to place the Backfire bombers on a formally approved list for export.

In this article, the Backfire bomber is briefly introduced ; and the bomber's most recent developments and current deployment status are reported.

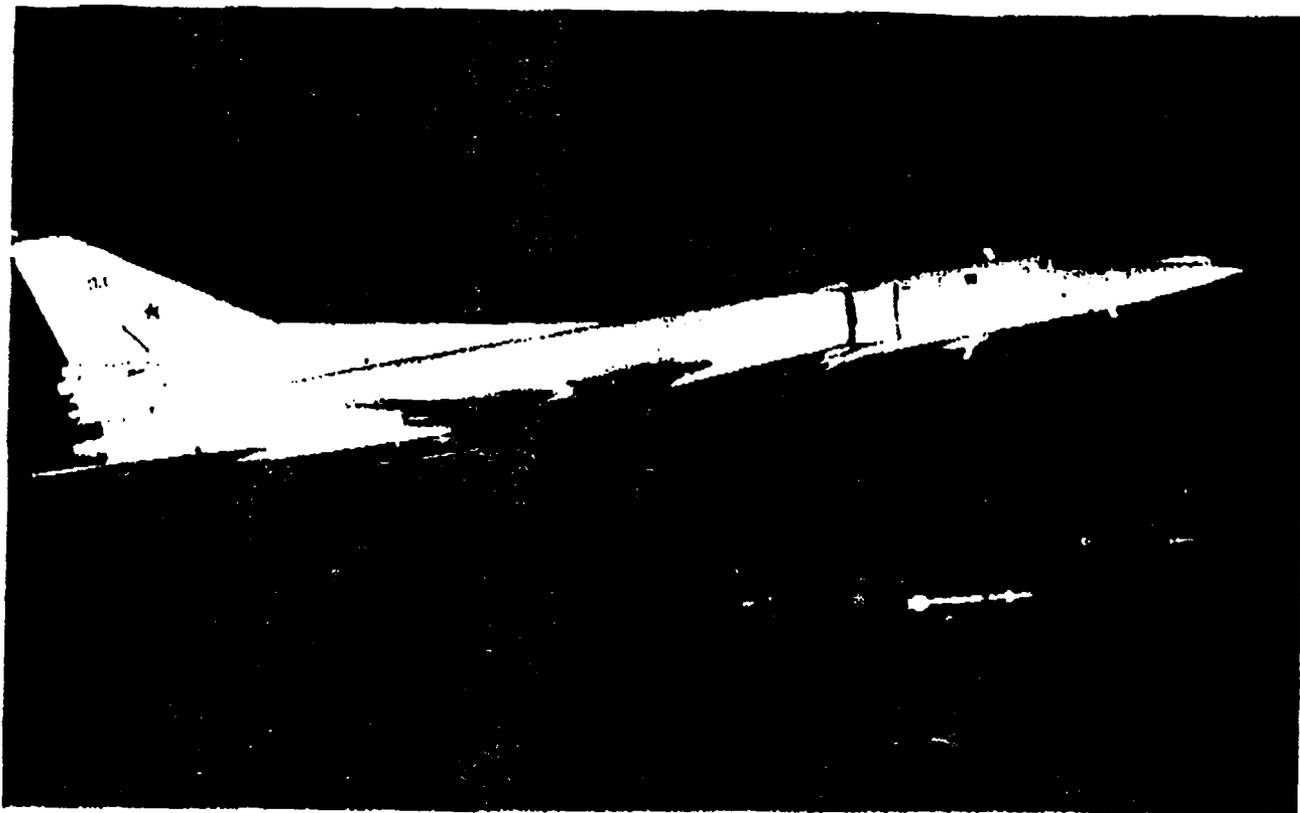


Tu-22 M3 craft as exhibited in the 1992 Cherbourg Aviation Fair in France; due to its dismal economic situation, Russia has decided to place the plane on its export list.

#### Development of Backfire Bombers

Before talking about the Backfire bombers, we should mention first the Tu-22 Blinder jet bomber, which is a replacement of

Badger bombers after many years' deployment (Please refer to Quanqiu Fangwei (Global Defense), No. 95, page 96). The Blinder bomber was a model that was developed subsequently, in the early sixties; however, limitations of its engine led to its inadequate cruise range making it unable to satisfy its design requirements. Therefore, after deployment in 1962, only about 250 Blinder bombers were built before production was halted. Moreover, the air force of the former Soviet Union decided to develop the later newer models.



During the Cold War era, scenes of flights by Soviet Backfire Bomber shadowed by F-16 fighters from NATO countries were routine. Along with changes in the international situation, will similar scenes reappear over the Taiwan Strait? In the photograph, the Backfire Bomber is Tu-22 M2.

In the fall of 1969, for the first time NATO was aware that a new model variable-wing medium bomber was being developed in

the Soviet Union. In July 1970, an American reconnaissance satellite photographed the first prototype plane of the new bomber at Kazan Aircraft Plant in Soviet Central Asia. The photograph was interpreted to mean that the prototype bomber was a twin-engine bomber developed by the Tupolev Design Bureau. In 1971, at least two prototype craft were built to carry out a series of secret flight tests. In 1973, another 12 of this craft as pre-production model were built for development tests, weapon tests and system evaluation, among other areas. In 1975, the long-range air force regiment in which these new bombers were deployed was formally in operation. Subsequently, large numbers of this bomber model were deployed in the air arm of the former Soviet navy.

For the designation of this new model bomber, NATO routinely used as its initial the English letter B, calling it the Backfire bomber. The numbering of aircraft models in Jane's All the World Aircraft has it listed as Tu-26. However, this is the Tu-22M in publicly announced data of the former Soviet Union, and the current Commonwealth of Independent States. In this article, Tu-22M is used to indicate the Backfire bomber.

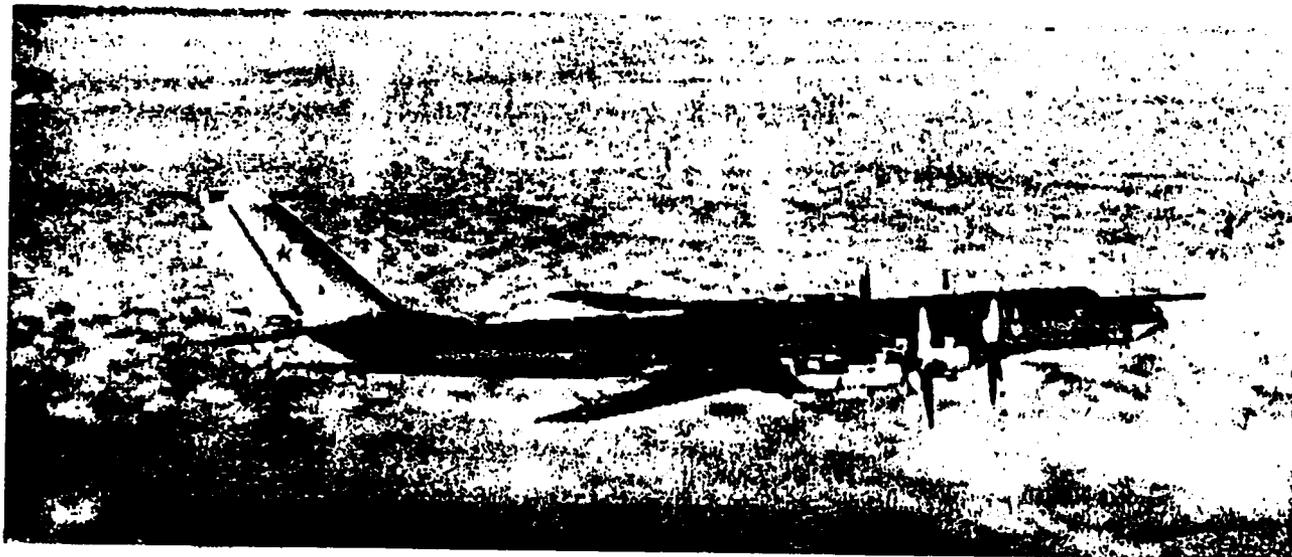
There are mainly three types of the Backfire bombers. The Tu-22-M1 Backfire Model A is a pre-production model, with a production run number of only 12. Tu-22-M2 Backfire Model B was the production model plane during the initial period; production of this model continued from 1975 to approximately the mid-eighties. The Tu-22-M3 Backfire Model C is the most recent improved model; beginning in the mid-eighties, large numbers of model C bombers were deployed in the navy and air force of the former Soviet Union. For details about the Backfire models A and B, as well as the fuselage design, please refer to Global Defense, No. 36, p. 27; no detailed discussion will be included in this article. Only the development of the newest model (Backfire model C) is covered in this article.

### Improvements in Tu-22-M3

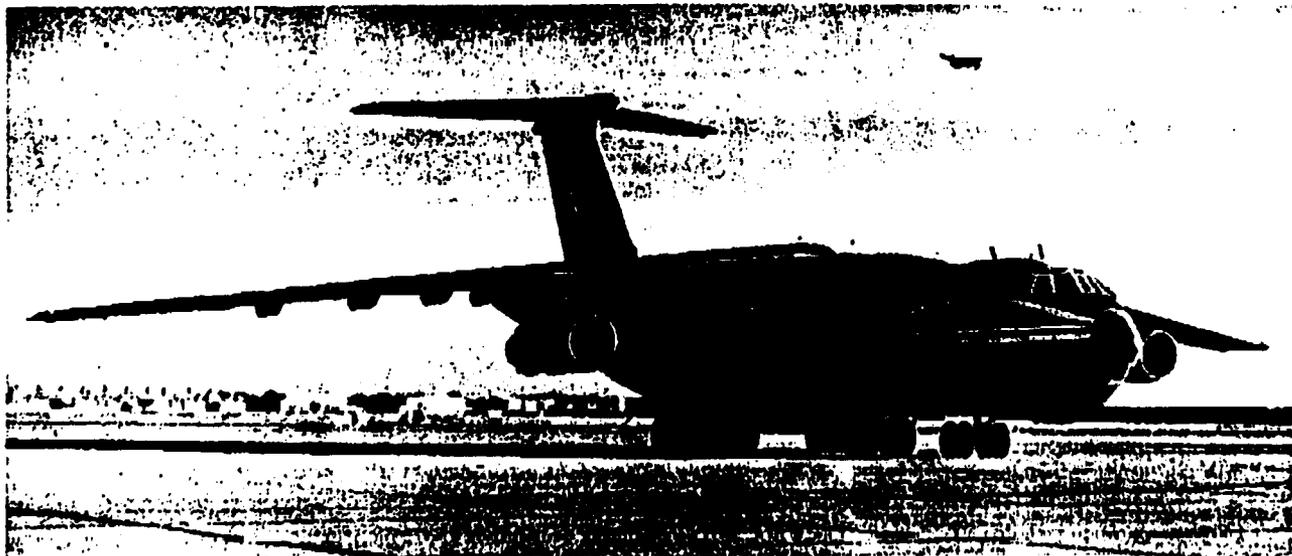
The Tu-22-M3 is the most recent improved version of the Backfire series bombers. After these bombers were made part of the Black Sea Fleet in 1985, large numbers of Tu-22-M3 were deployed. There are marked differences between the Tu-22-N2 and the Tu-22-M3. On the exterior of the new model, the plane nose shape was changed; the engine air inlet of Tu-22-M3 was redesigned; and the root of empennage was slightly improved. As for the equipment installed inside the bomber, higher-thrust engines are installed along with improved radar, avionics and electronic countermeasure devices (ECM). Therefore, whether referring to cruise range, speed, armament-carrying capacity, and air defense penetrating capability, the Tu-22-M3 is a considerable improvement over the Tu-22-M2.

Originally, the nose of Tu-22-M2 was a typical conic structure; at the upper side of the fuselage nose, there is an aerial refueling probe tube; however, at the fuselage nose of the Tu-22-M3 there is no aerial refueling probe tube. In terms of structural shape, the conic structure bends upward in a relatively large radius of arc. A small pod-shaped cockpit is installed at the top of nose cone; it is still not clear currently what role this small cockpit plays. The engine air inlet for the Tu-22-M3 is completely new in design; the air inlet is an unusual-looking wedge-shaped structure resembling that on the MiG-25/31. Originally, the shape of the air inlet resembled that on the MiG-23. The upper side wall of the air inlet is bent downward in order to suppress the radar signature from becoming larger due to the increase in the inlet cross section. Some structural modifications were also made at the empennage near the engine exhaust pipe for better aerodynamic performance. A 23-centimeter GSh-23 aircraft cannon is installed at the stabilizer, located above the engine exhaust pipe; the cannon of the vertical longitudinal row-type duplex design to shoot enemy aircraft (in the tailward direction of the bomber) with remote control from radar guidance. A large drum-shaped radar dome is

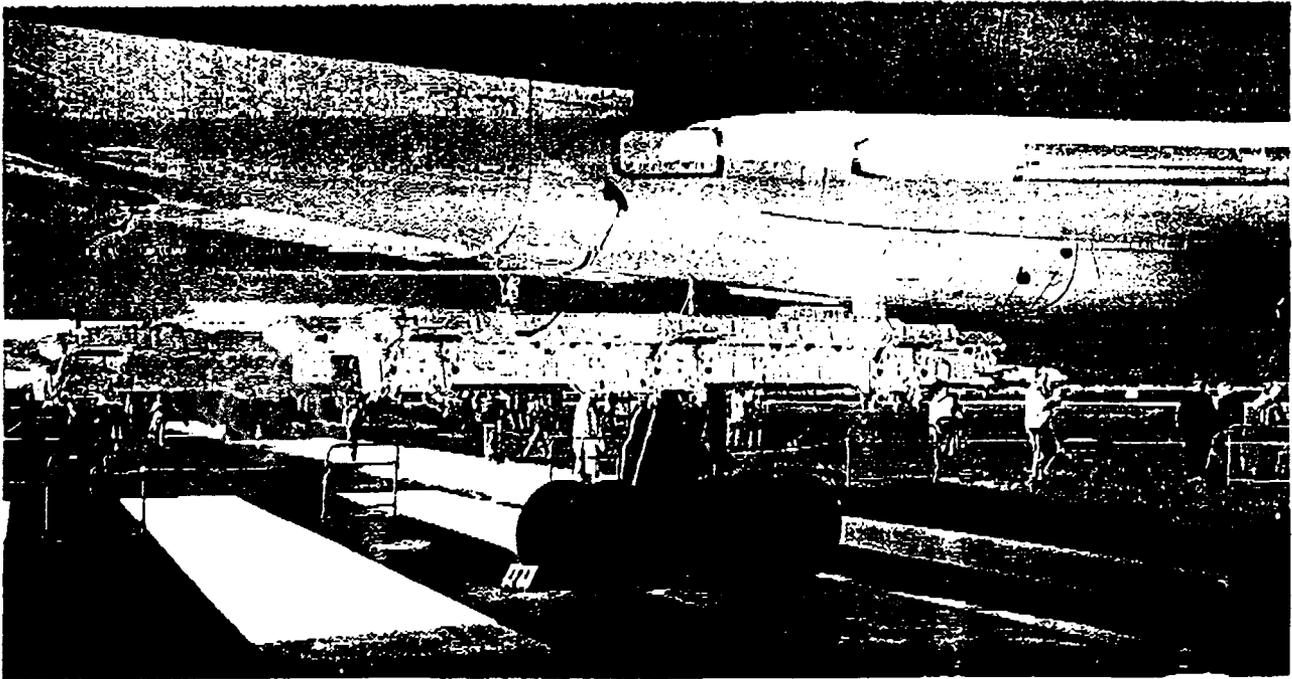
installed above the aircraft gun; from educated guesswork, a Bee Hind rear warning/fire control radar is inside the radar dome for the rearward warning and fire control of the aircraft cannon at the bomber's tail. This kind of radar included routinely as electronic equipment of bombers for the former Soviet Union. An improved system may be part of the Tu-22-M3.



Model Il-76 heavy-duty transports had the longest production run in the former Soviet Union. Currently the biggest export order is from Iraq, for more than 30 of this transport craft.



Model Tu-95 Bear bomber is an old companion craft to the Backfire bomber. Both bombers constituted the main long-range bomber force in navy and air force of the former Soviet Union.



Beneath the air inlet of the Tu-22-M3 is an exterior multiple-layer pylon, which can carry cluster bombs or conventional bombs.

#### Specifications of the Tu-22-M3

Number of crew members:	4
Overall length:	46.2 meters
Wing span:	26.4 to 34.3 meters
Height:	11.6 meters
Maximum takeoff weight:	124 tons
Power plant system:	two NK-132 turbojet engines each with thrust of 155 to 222 kilonewtons
Thrust to weight ratio:	0.4
Maximum speed (high/low altitude):	2200/1020 km/hr
Practical ceiling:	13,300 meters
Maximum bomb carrying capacity:	24 tons
Practical bomb carrying capacity:	6 tons
Practical cruise range:	6800 km with 6 tons of bomb payload
Radar cross section:	20 to 25 square meters
Defensive armament:	duplex 23 cm aircraft cannons
Defensive fire control radar:	Bee Hind



One duplex 23 cm aircraft cannon is installed above the engine exhaust pipe of the Tu-22-M3. This was routine equipment for bombers of the former Soviet Union.

In the power plant system, it is generally accepted that model NK-144 engines are installed in Tu-22-M2 and model Tu-144 Charger supersonic transports; the NK-144 engines were developed at the Kuznetsov Engine Design Bureau. The maximum net thrust of NK-144 is about 127.5 kilonewtons; after starting of the afterburner, the net thrust can be upped to 196.1 kilo-newtons. However, NK-321 engines (also installed on Tu-160 Blackjack

bomber) are installed on Tu-22-M3; the NK-321 engine was also developed at the Kuznetsov Engine Design Bureau with a post-combustion thrust of 245 kilonewtons. This thrust is about 20 percent increase over that of the NK-144. Since the more effective new propulsion system is used, the cruise range of Tu-22-M3 is increased by 30 percent, as far as 6800 kilometers for the maximum range. The practical bomb payload is doubled from 3 tons for Tu-22-M2 to 6 tons for Tu-22-M3. The thrust to weight ratio is increased from 0.33 to 0.4; and the maximum speed is increased from 1.65 to 2.05 in Mach number.

The Tu-22-M3 is installed with the improved avionics system; the greatest improvement among them is a new attack radar installed to replace the old Down Beat radar, which was installed on Tu-22-M2. Detailed data of the new radar have not yet been announced; however, it is believed that the new radar is the first practical aerial radar system with electronic scan antenna. Because of the installation of the new model radar, the Tu-22-M3 has better low-altitude penetrating capability. In addition, together with the better-performing new computer system, the TU-22-M3's overall performance (such as radar-guided bombing and navigation guidance system) are markedly upgraded. In the avionics system of Tu-22-M3, upgrading of the electronic countermeasure technology is particularly stressed. Even though in some aspect that the TU-22-M3 radar signature is nearly 25 percent more than the old Tu-22-M2, however, since the Tu-22-M3 is equipped with new electronic countermeasure devices, the overall effectiveness of electronic warfare is still more than double than that of the Tu-22-M2.

#### Armament Equipped

In the armament payload of the Backfire bomber, generally one Kh-22N (AS-4 Kitchen) missile is installed (in semi-concealed fashion) over the bomb bay along the center line beneath the fuselage for the old Tu-22-M2 bomber. In short-range combat, one Kh-22 missile each is installed at the pylon beneath both wings.

On the Tu-22-M3, there is a brand new modular bomb bay, which has three structural shapes for optional use. For the regular bomb bay arrangement, one Kh-22 or -28N missile is hung in semi-concealed fashion. With the remodeled traditional bomb pylons, the conventional gravity type bombs can be hung on the pylons. With the new rotary type missile launcher, six Kh-15P (AS-16 Kickback type) exterior anti-radiation missiles can be the payload.

Since larger-thrust engines are installed on the Tu-22-M3, more castable multilayer pylons can be mounted. When executing a typical strategic mission, the pylons on both wings can be used to hang one Kh-22 missile under each wing, in addition to six Kh-15P anti-radiation missiles in the bomb bay along the center line of the fuselage. In another arrangement three Kh-22 missiles are hung at three above-mentioned pylons, or as many as ten Kh-15P anti-radiation missiles are hung. When traditional bombs are used, multilayer pylons can be attached beneath the engine air inlet. With these pylons, as many as twelve 500-kg bombs can be hung. Twelve thousand kilograms of traditional bombs can be placed in the bomb bay beneath the center line of fuselage.

On the armament system that is installed on the Tu-22-M3, the Kh-2/Kh-22N are air-to-ground, and air-to-ship missiles, which began to be deployed in 1961. These missiles were placed on the Tu-22 Blinder and the Tu-95 Bear bombers (please refer to Global Defense, No. 77, p. 64, and No. 78, p. 72). The missiles are 11.3 meters in length and weigh about 6 tons. These missiles are installed on the surface of the delta wing, or the cross-shaped tail wing; this installed unit resembles a small aircraft. The missiles use liquid-fuel rocket engine and are equipped with 1000 kg of high explosive bombs, or a nuclear warhead of 350 kT of TNT equivalence. By using a terminal automatic pilot and automatic radar guidance, the maximum speed of the missile is 4.0 Mach, and the maximum range is between 300 and 460 kilometers; these missiles have a high attack capacity against ground and ship targets. Mainly used for assistance in penetrating enemy

air defenses in strategic mission, the Kh-15P is an anti-radiation missile comparable to the U.S. SRAM missile; the Kh-15P is used in particular to destroy enemy air defense radar equipment, with a maximum range of about 200 kilometers. Another optional weapon is the 1.5-ton UPAB-1500 bomb. Its detailed specifications are still unclear at present; however, from the Russian letter U, the designation means a guided type bomb. From recent reports in the United States, new induction type missiles are being developed (in the Commonwealth of Independent States) to coordinate with the advanced ECM and electronic counter-countermeasure (ECCM) equipment as an advanced air defense penetration system.

In the past, there were different Western reports on the Backfire bomber's cruise range; however, all sources agree that the range is upwards of 5000 kilometers. As reported in a recent Western news dispatch, and revealed by a serviceman who had served on a Backfire bomber airbase in the former Soviet Union, the maximum combat air radius is 5450 kilometers without aerial refueling. In other words, the cruise range of Backfire is upwards of 10,000 kilometers. Furthermore, aerial refueling boom nozzles are generally stored in Backfire bombers airbases; these boom nozzles can be installed in less than an hour, if necessary. If coordinated with full-equipped aerial refuelers and RKV-500 (AS 15 Kent) missiles, Backfire attack capability will be greatly increased to a great extent, thus becoming an intercontinental bomber. From the new structural shape, there is no aerial refueling boom nozzle at the plane nose of the Tu-22-M3; currently, there is no convincing evidence to verify whether or not such equipment exists. If there actually is no aerial refueling equipment, the bomber appears not to have the functions of an intercontinental bomber, except for a no-return one-way mission.

#### Recent Status of Deployment

Backfire bombers can be used for long-range bombing mission

and sea combat for nuclear attack, traditional attack and anti-ship missions. Its outstanding low-altitude penetrating capability enables the Backfire to have better survival capability than early bombers of the former Soviet Union. Since formal deployment in 1975, Backfires have been deployed in air force, and naval heavy bomber fleets. Each aviation regiment includes about more than 18 of the bombers. Up to 1991, it was estimated that about 370 Backfire bombers were deployed; 210 of the bombers served in nine flight regiments of the air force, while 160 more were deployed in eight flight regiments of the navy. The Pacific Fleet air squadrons were the earliest ones among naval units to have Backfire bombers deployed. Beginning in 1980, Tu-22-M2 bombers were deployed. The naval model Backfire bombers concentrated their deployment on the Kola Peninsula in recent years. In the North Fleet, the first flight regiment of Backfire bombers began to be deployed in 1988/1989. The second flight regiment began to serve late in 1992. It was understood that in general Backfire bombers are deployed on the European continent; only about one-third of Backfires are deployed in the Far East. After deployment in squadrons of the North Fleet in 1988/1989, currently a total of about 160 Tu-22-M3 bombers are presently deployed in four major fleets of the Commonwealth of Independent States.

As 1991 data revealed, the current deployment situations of Backfire bomber fleets are as follows: about 40 percent are deployed in Russia; 26 percent are deployed in Ukraine; 15 percent, in Belorus; and 19 percent, in Estonia. At present, the defense ministers of the Commonwealth of Independent States have concurred that these bombers are to be placed under a new unified command, or returned to Russia for its exclusive control. At present, there is serious social disorder in the Commonwealth of Independent States. This social situation also affects military units. In some troop units, there is even a lack of regular paydays for soldiers and officers. From reports, owing to a spare parts shortage, only about 30 to 40 percent of Backfire

bomber fleets are operable, with a total of about 100 bombers. A shortage of engines is especially serious in the spare part shortages. This is because aircraft engine life was consistently low, with a relatively high engine wearout rate.



If Tu-22-M3 bombers are bought for the Communist China air force and navy, the total bombing capability is not lower than an aircraft carrier to be purchased. With the Backfire's long-range bombing capability, an effective blockade of Taiwan's maritime lifeline can be imposed.

#### Backfire Bombers for Communist China?

Since the conclusion of cold war between the United States and Soviet Union and disintegration of the former Soviet Union, a series of moves by Communist China have quite clearly exposed its regional power ambitions. For examples, recently China actively participated on the international scene in dispatching its Liberation Army to take part in the United Nation's peace-keeping operations in Cambodia. It deliberately postured in the UN Security Council as the representative spokesman role for nations under Western domination. Recently, in a series of territory announcements, all the disputed Diaoyutai Islands and the Nansha Islands were stated to be Chinese territory; it harks back to the

attitude of reappearing as a regional power as the old Imperial China. Furthermore, China purchased large quantities of advanced weapons from the Commonwealth of Independent States. All these moves cause uneasiness among many Asian countries. In particular, the purchase of large quantities of weapons can stimulate a general arms race in Asia.



China has acquired Su-27 fighter planes. Although some observers consider such purchase activity is aimed mainly at consolidating its southern territory, still there have been news dispatches that an unknown number of Su-27s are deployed at Jianqiao Air Base near Hangzhou.

Faced with the foregoing situations and ailing economic health of republics of the Commonwealth of Independent States, in the future the Communist China may very likely purchase Backfire bombers. Given the Backfire's long-range combat capability, it is broad enough to include all of Japan and even the Nansha Islands within its bombing radius; Taiwan is even more inside the bombing radius. By coordination with the Su-27 fighters bought

by China, its attack capability is even greater, posing an even larger threat to Taiwan.

In the past, the monitoring of Communist China by the Republic of China air force in Taiwan covered air fields within a distance of 250 nautical miles from Taiwan. However, the developments described in this article will break this posture because Chinese Backfire bombers can successfully attack Taiwan even by taking off from North China airfields. Thus, Taiwan's depth of air defense disappears. Besides, a blockade of Taiwan has always been a useful weapon in Communist China's attack on Taiwan. From the past prominence of Backfire bombers in squadrons of the former Soviet Union navy, the long-range bombing capability will greatly intensify China's sea blockade capability. Given coordination with aerial prewarning and control aircraft, aerial tankers, as well as large numbers of surface warships and submarines, the consequences are quite serious.

#### Conclusions

Some time ago, news media of government and commercial influence in Taiwan were glad upon hearing of successful purchase of military goods, such as Bush government's agreeing to selling F-16 A/B fighters, new Sidewinder missiles, Sparrow air-to-air missiles, and SH-2F anti-submarine helicopters, among others. There seems an attitude of gradually accepting the demand posture of defense (by Republic of China in Taiwan) as recognized by the United States. Thus, it led from a delay in purchase of French Mirage 2000-5 fighters to the possible cancellation of this purchase. On the other hand, however, Communist China on the other side of the Taiwan Strait is steadily increasing its purchases of attack weaponry: from long-range fighter planes and bombers up to an aircraft carrier. This is an overpowering posture. Therefore, the Republic of China should not limit itself in the traditional defense conception. We should really purchase weapon equipment we need.

Notwithstanding the real contents of military hardware purchases during the gradually rising tempo of the arms race at both sides of the Taiwan Strait, the author realizes that lowering of the combative posture of both sides is the most important goal, at present. The contest between spear and shield will eventually cause harm to people at both sides. Instead of spending large sums of money to purchase advanced weapons that kill people, it is more practical to use the money for upgrading living conditions. We wish that the political leaders of both sides contemplate these pros and cons.

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