

## The Growth of China's Air Defenses: Responding to Covert Overflights, 1949–1974

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**One constant kept Chinese air force leadership focused: intrusions into PRC airspace by US and ROC reconnaissance aircraft gathering information on China's growing military and nuclear and missile programs.**  
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*Protection of the Chinese state, deterrence of possible aggression against it, and, failing that, the ability to successfully defend against an attacking force have been Peking's highest priorities since the regime came to power.<sup>1</sup>*

The People's Liberation Army Air Force (PLAAF) was an extremely modest force when it was established in 1949, the year the People's Republic of China (PRC) was officially proclaimed. It had few pilots; its aircraft were US and Japanese leftovers from World War II; and most of its early instructors were Japanese pilots who had been prisoners of war and Chinese Nationalists left behind when Chiang Kai-shek fled mainland China and relocated his Republic of China (ROC) government and his Nationalist Party (Kuomintang [KMT]) to Taiwan.

In the years that followed, new PLAAF pilots were selected from young PLA recruits. They were often poorly educated, but they were tough, bright, and determined. During the Korean War (1950–53), they were trained to fly jets by Russian

instructors and were given MiG fighters that could match the US aircraft of the day. With the onset of the Sino-Soviet split in 1958, Soviet support was lost and China was driven to design and manufacture its own aircraft, a vast undertaking beset by technical and political problems.

Political and economic turmoil attending the Great Leap Forward (1958–60), the Cultural Revolution (1966–71), and challenges to Mao Zedong's leadership all affected the development of the PLAAF and modernization of the Chinese military in general. However, one constant kept air force leadership focused: intrusions into PRC airspace by US and ROC reconnaissance aircraft gathering information on China's growing military and nuclear and missile programs. The flights, which did not end until 1974, were recurring reminders of China's vulnerability and spurred PLAAF efforts to counter the threat. The air defenses that emerged contributed to the end of the incursions and became the foundation of the sophisticated air defense system that protects the PRC today.

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<sup>1</sup> National Intelligence Estimate, "PRC Defense Policy and Armed Forces." NIE 13-76, 11 November 1976, 7. See [http://www.foia.cia.gov/docs/DOC\\_0001097855/DOC\\_0001097855.pdf](http://www.foia.cia.gov/docs/DOC_0001097855/DOC_0001097855.pdf).

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### *The Early Years—Through the Eyes of Chinese Veterans*

The PLAAF's earliest days are well described in the recollections of two first-generation PLAAF pilots who rose to senior positions, Han Decai and Yang Guoxiang.<sup>2</sup> Han was an ace and a national hero during the Korean War. He rose to become a lieutenant general and vice commander of the Nanjing Air Command, which faced Taiwan and was one of the PLAAF's most important posts. His background reflects the backgrounds of many other members of the PRC's first generation of military pilots. Han was born in 1933 in coastal Anhui Province in a poverty-stricken village, Fengyang. Han described his childhood:

*We have an old folk song that says ‘We came from Fengyang and that’s a very good place. But ever since we had the Emperor Chu, we starve nine years in every ten.’.... I lived there for 15 years, and in those 15 years I had one year of education. I worked on a farm as a laborer. I was also a beggar. In my 16th year, in February 1949, the Communists came and liberated the town, and I joined the People’s Liberation Army. Then, in June 1950, Chair-*

*man Mao said that we need a strong air force to protect our country, and many PLA soldiers volunteered to become pilots. I was one of them.*

Han was initially sent to an air force preparatory school to catch up on his education, but his academic training was cut short when, in December 1950, he was assigned to the air academy to begin pilot training.

*When Chairman Mao declared that China would join the Korean War, the Chinese air force did not have one operational unit that could put into the air.... We had a single month to learn the theory of flight.... We had three months to learn to fly.... When I joined a combat unit in July I had a total of 60 hours flying time.*

Yang Guoxiang had also been a PLA soldier, the political instructor of a horse and mule transportation team when he was accepted into air force training. He recalled:

*I was serving in the military command in Yunnan and was one of a thousand who signed up to join the air force. Candidates had to be military officers with combat experi-*

*ence and at least a primary school education, but good physical condition was the most important thing. I was one of only six candidates chosen, and after we were sent to Kunming for health checks, I was the only one remaining.<sup>3</sup>*

About his days at the PLAAF aviation school at Mudanjiang in China's far northeast corner, Yang said,

*At first the PLAAF had only aircraft that it had captured from the KMT [Kuomintang-Chinese Nationalist Party] or the Japanese.... Most of our instructors were former Japanese prisoners of war.... We also had former KMT members who had been captured by the PLA and had joined us. Our aircraft were Japanese and American types that remained from the war, like the [Fairchild] PT-17 and the Japanese Type 99.*

Yang, who trained as a ground attack pilot, would later become the chief pilot of the supersonic Qiang-5 (Q-5) project, China's first indigenously produced military aircraft, and would eventually fly it to drop the country's first H-bomb. During the 1978–79 Sino-Vietnamese border conflict, he commanded a Q-5 division.

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<sup>2</sup> Unless otherwise noted, the recollections quoted in this article are all from the author's interviews with Han Decai in Dalian, Shandong Province, November 2001, and in Shanghai, 2011 and with Yang Guoxiang in Kunming, Yunnan Province, in 2009 and 2010. Extended versions of these interviews have appeared in the Smithsonian's *Air and Space* magazine: A&S Interview with Han Decai, "I Was There: Bring Down the Spyplane" in May 2012 and "A&S Interview with Yang Guoxiang," January 2010.

<sup>3</sup> Xiaoming Zhang wrote, "According to the CMC's [CCP's Central Military Commission] requirements, all candidates must be party and youth league members known to be politically reliable, be platoon or company officers with combat experience, be elementary school graduates, be physically fit, and be between eighteen and twenty-four. From a Communist perspective, peasant and worker origins and infantry experience were essential for instilling the qualities of bravery, adaptability, and toughness required of an airman." See *Red Wings over the Yalu: China, The Soviet Union, and the Air War in Korea* (Texas A & M University Press, 2002), 13.

***The Korean War and its Aftermath***

Once in combat units, students transitioned to the MiG-15 with the help of Soviet instructors, who gave them a few hours in the Yak-17—a first generation straight-wing turbo jet—before putting them into the MiGs. After 30 hours in the MiG, they were sent to an advanced airfield at the front. According to Han,

*There we got to understand more about the Americans. We learned that they were among the top pilots in the world, and that the North American F-86 Sabre was probably the best fighter in the world. We started to understand what we were up against. [I took comfort in Chairman Mao's words] The American is a paper tiger. If you face him with courage, he can be conquered.*

Han explained that once in combat, Chinese pilots were independent of Russian control. In the early days, Russian pilots were always in the air when the Chinese were, but in their own formations, serving as cover flights behind the Chinese. Later in the war, Russian and Chinese flights were assigned to separate operational areas.

Reflecting on his experiences in the war, Han said he believed that a Chinese fighter pilot's success in combat depended on how quickly he recognized his disadvantages and dealt with them. Chinese pilots had a low level of flight experience, and the aircraft they flew were outperformed by the enemy.

*We knew that if we used ordinary tactics, we would fail. We had to take advantage of the situation, and take advantage of any mistakes the Americans made. I shot down a total of five aircraft, and in each case but one, I took advantage of a mistake the pilot made and used it against him.*

After the armistice in 1953, the PLAAF faced a whole new set of problems. It had a large inventory of aircraft, but, according to Yang, “many of the aircraft the Soviets had given [to the Chinese] were abandoned because of the short life [remaining on] their engines.” The PLAAF had to find ways to meet future requirements. Given the deteriorating relationship with the Soviets, the Chinese started to think about developing their own aircraft.

The PLAAF's concerns were realized in 1958 with the break in Sino-Soviet relations. The Soviet air force stopped providing support and withdrew its experts from China. According to Yang,

*Soviet Premier Nikita Khrushchev said that without Soviet help, the Chinese air force would become a Chinese ground force in three months. We had great problems. We were short of aircraft and fuel. Most of our airplanes stayed on the tarmac for lack of fuel and spare parts. The lack of fuel meant that Chinese pilots could fly only about 40 hours a year. The recruitment of new pilots was suspended for several years. There were pilot train-*

*ees who graduated from flight school without ever touching an airplane.*

Han, promoted to deputy squadron commander after the armistice, was dealing with another set of problems, including the incursions of aircraft flying from Taiwan. In 1954, he had been sent to Dalian, in northeast China, where Russian instructors taught him how to fly at night and in challenging weather. These skills would be needed when he transferred to Wuxi airbase in Jiangsu Province, east China, in 1956. Han said,

*The weather there was more complicated...but by 1956, we were competent in night flying and all-weather flying. The night incursions of aircraft from Taiwan were going on at this time.*

The incursions, also described in memoirs of pilots who committed them, were CIA covert air operations carried out with the ROC government based in Taiwan. The earliest missions were flown by US pilots working for Civil Air Transport (CAT), an airline that served Nationalist China, and that in time would become Air America.<sup>4</sup> Political considerations dictated that the United States train Nationalist Chinese pilots to fly these covert missions in World War II-era aircraft, including B-17s and B-25s.

By 1954, the CIA was readying an airplane built for the purpose, the P2V-7U. The plane was a version of the P2V Neptune maritime patrol aircraft that was heavily modified by Lockheed's famous Skunk Works. Another, more serious problem for

<sup>4</sup> For documents related to the origins of Air America and its relationship to CAT, see [www.foia.cia.gov/AirAmerica](http://www.foia.cia.gov/AirAmerica), especially <http://www.foia.cia.gov/AirAmerica/C05261065.pdf>.

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*In March 1959, pilots from Taiwan were sent to the United States for flight training in the U-2.*

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the PLAAF was the high-flying Lockheed U-2, also a Skunk Works product, which American pilots had begun to fly across mainland China in August 1957.

### *Defeating the U-2*

As a deputy squadron commander in the Nanjing Military Region, Han was involved in readying the PLAAF's countermeasures: "We got the MiG-17s without radar. We also received a radar-equipped MiG-17, the PF model, from the Soviet Union, which was used to attack the low-altitude intruders from Taiwan." China was developing its own aircraft at his time, the Model 56, which was based on the MiG-17. Han's squadron was equipped with the MiG-17s; the unit's "main target" would be the U-2.

American-piloted U-2s flew across mainland China until Gary Powers was shot down over the USSR in May 1960. Dino A. Brugioni, a senior officer of the CIA's National Photographic Interpretation Center (NPIC) wrote:

*As part of Operation Soft Touch,<sup>5</sup>...U-2 missions were authorized to fly over the PRC to reach Russian targets. Communist China became a prime target when*

*it became known that the Russians were aiding the Chinese in the development of both missile and nuclear capabilities.<sup>6</sup>*

*At the time, it was clear that the aerial and satellite photography would have to provide the bulk of intelligence on Chinese nuclear and missile targets because so little information was available from other sources. In some respects China represented a more challenging intelligence problem than the Soviet Union because we had so little collateral information on what was happening there.<sup>7</sup>*

In March 1959, pilots from Taiwan were sent to the United States for flight training in the U-2, and on 6 May 1960, President Eisenhower approved the sale of U-2s to the ROC.<sup>8</sup>

The Soviet downing of the Powers U-2 appeared to be a devastating blow to the program, and the CIA did close secret overseas bases, but Lockheed continued to sell the aircraft to the US Air Force and other customers. Ben Rich, who participated in the U-2 design and became head of the Skunk Works, wrote:

*Also through the CIA, we completed a deal with the Chinese nationalist government on Taiwan, selling them several U-2s for \$6 million, along with the services of our ground crews and technicians.<sup>9</sup>*

According to Rich, with CIA assistance, a US-ROC joint squadron of U-2s was established in Taiwan, and Chinese Nationalist pilots started flying over the mainland in 1962 and continued to do so until 1974.<sup>10</sup> But there would also be CIA flights over China, in particular to distant nuclear test sites that Nationalist-flown U-2s could not reach. These, Rich wrote, would be approached by CIA U-2s flown from "dirt landing strips" in India and Pakistan.<sup>11</sup>

### *Countering the Flights*

Han described what it was like to fly the MiG-17 against the U-2:

*The U-2s conducted their reconnaissance missions in the daytime. We did our best to attack them, but the problem was the extreme altitude at which the U-2 flew: we could not reach them. The MiG-17 that I was flying at the time had a maximum altitude of 16,000 meters, but the U-2s were flying above*

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<sup>5</sup> U-2 flights over the Urals and Siberia were approved by President Eisenhower in May 1957. See Dino A. Brugioni, *Eyes in the Sky: Eisenhower, the CIA and Cold War Aerial Espionage* (Naval Institute Press, 2010), 227.

<sup>6</sup> *Ibid.*, 305.

<sup>7</sup> *Ibid.*, 306.

<sup>8</sup> *Ibid.*, 306, 307.

<sup>9</sup> Ben Rich and Leo Janos, *Skunk Works: A Personal Memoir of My Years at Lockheed* (Little, Brown and Company, 1994), 180.

<sup>10</sup> H. Mike Hua, *Lost Black Cats: Story of Two Captured Chinese U-2 Pilots* (AuthorHouse, 2005), viii. Hua is a retired ROC Air Force general and former U-2 pilot.

<sup>11</sup> Rich, *Skunk Works*, 182.

20,000 meters. They usually entered the mainland from the northeast of Shanghai.

*There was not much we could do against the U-2. Chasing a U-2 made for a pretty dull flight. Every time a U-2 reconnaissance flight was detected in our sector, we sent up two aircraft to track it. We could go up to our maximum altitude of 15,600 meters, but still not see the U-2, which were flying above 20,000 meters. All we could do was to try to reach the U-2 with a zoom climb.... In the end, there was nothing we could do with our aircraft against the U-2. We had to leave the job to our surface-to-air missiles.<sup>12</sup>*

### Encountering the SA-2

On 9 September 1962, a U-2 flown by ROC Lt. Col. Cheng Huai was brought down by an SA-2 over Nanchang in Jiangxi Province, some 400 kilometers from the coast. Cheng was killed. On 3 November 1963, a U-2 piloted by Major Yeh "Robin" Changti was brought down near the end of his nine-hour mission, with China's southern coastline in sight. Major Yeh was severely wounded, but he survived. He recalled that a high-pitched signal from his System 12 radar had warned him that mis-

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sile guidance radar had locked on to his aircraft. He evaded one SA-2 missile, but a second tore the right wing from his U-2.<sup>13</sup>

In Washington, DC, at NPIC, where film from the U-2 cameras was interpreted, Brugioni was concerned by what the U-2 film showed:

*We began to spot SA-2 missile sites near Chinese strategic targets and cities. We were asked to search proposed [Nationalist] flight tracks for possible SA-2 deployments. We had no trouble identifying them, but the Chinese began playing a shell game, moving the SA-2 sites about, and even camouflaging them...the branch chief responsible for the searches came to me and demanded to be removed from the operation because the danger of a SA-2 site being moved between missions was great and he did not want to be blamed if a Chinese U-2 was downed.<sup>14</sup>*

Brugioni added that NPIC's director, Arthur C. Lundahl, reported to CIA officers that NPIC could "no longer be 100-percent sure" of the

locations of PRC SA-2 sites on any given date.<sup>15</sup>

The SA-2 was an early generation missile, with very limited range. To hit the U-2 at its operational altitude, the missile had to be launched from almost directly underneath the U-2's flight path.<sup>16</sup> The PRC did not have many of the missiles, only four operational battalions, according to estimates at the time, and there was no prospect of resupply from the USSR.<sup>17</sup> Han Decai explained PLAAF missile tactics under the circumstances.

*The way we did this was just like guerrilla warfare. Our missile launchers were fixed on military trucks and could be moved around. We had some sense of where the priority targets of interest to the U-2s were, and that's where we located our launchers. We generally fired at the U-2 when it was within a range of 15 kilometers, and we used certain tactics to bring the U-2 into that range. For example, when a U-2 was detected in an area where a missile launcher was located, we cut off all the radars in that area so the U-2 would not be alerted to their presence. The*

<sup>12</sup> According to Mike Hua, "The MiGs always followed the U-2 over the mainland, and hopefully some malfunction happened that would force the U-2 to descend to the MiG's combat zone. The pilot of the U-2 could easily spot an enemy fighter the size of a tiny pinpoint at the tip of a long white contrail over the background of the earth's surface." *Lost Black Cats*, 5.

<sup>13</sup> *Ibid.*, 2.

<sup>14</sup> Brugioni, *Eyes in the Sky*, 312.

<sup>15</sup> *Ibid.*

<sup>16</sup> The SA-2 Guideline was the first effective Soviet surface-to-air missile. It had an effective range of about 20 miles and a maximum slant range of 27 miles. This was the missile used to shoot down the U-2 flown by Gary Powers. See US Air Force Fact Sheet: SA-2 Surface-to-Air Missile, available online from the National Museum of the US Air Force at <http://www.nationalmuseum.af.mil/factsheets/factsheet.asp?id=334>.

<sup>17</sup> Hua, *Lost Black Cats*, 6.

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*U-2 was not very maneuverable. When it started getting within range, we would suddenly turn on the radars, and it was too late for the U-2 to react.*

Ben Rich recorded the Skunk Works reaction to the shoot-downs.

*Back in Burbank, we did what we could to help cut down the U-2 losses. We developed improved electronic countermeasures (ECM) calculated to confuse Chinese radar operators working their SA-2 ground-to-air missile systems. On radar screens the U-2 would present a false display so that the missile would be launched in the wrong piece of sky.<sup>18</sup>*

Cutting-edge technology it may have been, but it was not effective against the Chinese tactic of keeping radars turned off until it was too late for U-2s to get out of the way of oncoming missiles.

Brugioni later observed that by 1966, the Black Cat Squadron was experiencing losses from SA-2s throughout China and that it had become very dangerous to fly the U-2 over the mainland. But the emergence of a new factor in the overhead reconnaissance equation—satellite systems that could scan vast areas as they passed over—had

become operational in the early 1960s. These systems had developed rapidly, and by 1966, according to Brugioni, “Imagery obtained from KH-4 and KH-7 satellites eliminated the need for the dangerous missions flown by the Black Cat Squadron.”<sup>19</sup>

The last U-2 overflight of mainland China took place in 1968, but Taiwan's U-2s continued to fly missions along the PRC's periphery until 1974. In that time, according to Mike Hua, “The U-2s of the Black Cat Squadron penetrated the Bamboo Curtain one hundred and two times, with five aircraft shot down, three pilots killed, and two captured by the enemy.”<sup>20</sup>

The Black Cat U-2s had done their job well. The photography they brought back enabled US intelligence to monitor the development of China's nuclear capability, from the construction of the gaseous diffusion plant at Lanzhou in northwest China to the discovery of the nuclear test site at Lop Nor in far western China. This knowledge was deemed critical at the time and could not have been acquired in any other way.

The termination of the U-2 flights was at least partially a result of the PLAAF's tenacity. The Soviet experience had shown how difficult it was to reach the U-2, even with the state-of-the-art SA-2. The Chinese had devised ways to use their few

missiles and launchers most effectively. Guerrilla warfare tactics had defeated sophisticated electronic countermeasures. But success against the U-2 underscored the need to strengthen China's air defense system across a wide spectrum, from the stratospheric heights of the U-2 down to the space just above the trees.

### ***Dealing With the Low-Level Intruders***

Other, less capable aircraft had been intruding into China's airspace. After 1949 the United States provided a variety of planes to the ROC, including P-38s, F-51s (modernized WW II era Mustangs), T-33s, RF-84s, RE-86s, and a reconnaissance version of the British-designed B-57 bomber, the RB-57D. These, Brugioni noted, flew missions along the coast and inland, targeting airfields, naval bases, and ports in search of buildups that could threaten Taiwan. The missions also produced order of battle information on Communist Chinese forces.<sup>21</sup>

Improvements in PLAAF intercept capability eventually had a negative effect, however. On 18 February 1958 a high-altitude RB-57A flown by a ROC pilot was brought down over Shandong. The PRC announcement of the shoot-down did not identify the means. In November 1958, the ROC received two improved, “high-altitude design” RB-57Ds. Missions were flown successfully until 7 October 1959, when an RB-57D was shot down near Beijing, apparently by an

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<sup>18</sup> Rich, *Skunk Works*, 181.

<sup>19</sup> Brugioni, *Eyes in the Sky*, 312.

<sup>20</sup> Hua, *Lost Black Cats*, ix.

<sup>21</sup> Brugioni, *Eyes in the Sky*, 77.

SA-2 missile. The RB-57D collection program was cancelled that same month.

Swept-wing RF-84Fs started flying regular missions in late 1956. For a year and a half they operated almost with impunity. In good weather, they flew two missions a day. On 14 May 1957, an RF-84F got an in-flight photo of a pursuing PLAAF fighter. One observer claimed that the “picture probably recorded the first MiG-17 flying in the air for the free world.”<sup>22</sup> It was a glimpse of things to come. On 17 June 1958, MiG-15s caught two RF-84Fs and shot one down.

The fighter-based photo reconnaissance aircraft were short-ranged but fast, ideal for quick dashes across the Chinese countryside. They were difficult to intercept and elements of luck were involved in any PLAAF success. Han Decai described one shoot-down, in 1962, of an RF-101 Voodoo on a low-level mission near Guangzhou in southeast China.

*It was an air-to-air kill, and it was a miracle that a MiG-17 could bring down an F-101. The F-101 was supersonic; the MiG-17 was subsonic. The aircraft that shot down the Voodoo was actually a Model 56, the Chinese version of the MiG-17. The MiG-17 was coming in from the side as the Voodoo approached. The MiG pilot aimed well to the front of the F-101 and let the enemy fly into the cannon shells. Later, when we had the MiG-19,*

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*The fighter-based photo reconnaissance aircraft were short-ranged but fast, ideal for quick dashes across the Chinese countryside.*

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*shooting down an F-101 would not have been such a big deal.*

The PLAAF found one aircraft type in particular difficult to deal with, the P2V-7U, a specialized version of the Navy’s P2V Neptune patrol plane. The aircraft grew out of early CIA requirements for a platform that could handle a range of covert operations. The standard P2V, in service since 1947, had two powerful piston engines. The latest model P2V-7 also carried two small jet engines that could be used briefly in a pinch. The P2V had excellent low-level performance, long range, and could carry a large payload.

Like the U-2, the aircraft was a product of Lockheed’s Skunk Works. Included in the modifications was an enlarged hatch, a “Joe hole,” under the fuselage to drop agents; a modified weapons bay to facilitate supply drops to agents or rebels and to house a programmable device that dispensed propaganda leaflets. Camera systems were installed, as were SIGINT and ELINT collection equipment and the best of ECM devices, including a radar warning receiver and a jammer to foil intercepting fighters.<sup>23</sup> According to a memoir, the aircraft carried no defensive armament and depended for defense entirely on jamming, chaff dispensing, low altitude flying, and evasive action.<sup>24</sup> The upgraded P2Vs replaced three

B-17s and three B-26s, which ROC pilots used for overflights that often lasted 10 hours or more. The first P2V mission was flown in January 1958.

US intelligence was most interested in the signals and electronic intelligence the P2V could collect. The ROC had other priorities: collecting photo and electronic intelligence, showering propaganda leaflets over selected areas of China, and dropping and supplying agent teams. While the U-2 flights were essentially unknown to the Chinese people, the P2Vs were conspicuous and more of a political problem for the PLAAF. The pressure to stop them presumably was high.

In 1961, Han Decai was transferred to Nanjing to fly the radar-equipped MiG-17PF against the low-level P2V intruders. Squadrons in Nanjing, Shanghai, and Xuzhou were kept on alert and ordered into action when a P2V entered their sector. Because the P2Vs flew low and could elude the radars, their known movements were coordinated from sector to sector.

The PLAAF used ground-controlled intercept (GCI) techniques learned from the Soviets, Han explained.

*Our MiGs were directed into position by the GCI controller using ground radars. To avoid detection by the P2V,*

<sup>22</sup> Yung Pang Tsai, *Through the Eyes of the Night Owl: The Opposite Side of the Taiwan Strait During the Mid 20th Century* (AuthorHouse, 2009).

<sup>23</sup> Chris Pocock with Clarence Fu, *The Black Bats: CIA Spy Flights Over China from Taiwan 1951–1969* (Schiffer Military History, 2010), 32.

<sup>24</sup> Pocock, quoting a “CIA briefing document” in *The Black Bats*, 39.

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Over the years, the difficulty of dealing with the intruders and the evolution of the tactics the PLAAF used against them, led to a systematic way of dealing with the problem.

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*the MiG pilot would not turn on his radar until he was in position right behind the intruder. But that tactic was not effective. It really did not work very well. In fact, the P2Vs we did bring down did not come about because of radar, but because we saw them. I can also remember an instance where a PLAAF pilot brought down a B-17 because he just happened to see the exhaust flame.*

The MiG-17's airborne radar was not reliable, and had other faults, Han explained.

*The range was short: the radar could only be used at about 1,000 meters. And because the intruders flew so low—sometimes as low as 50 meters—there was a lot of ground clutter and it was very difficult to track them. The radar in our MiGs was effective only if we were below the altitude of the enemy aircraft, looking up at him. If we were above him, even just slightly, and put our aircraft's nose down, the radar would pick up ground clutter, and we could not make out the target. To make the radar effective, we had to modify it, to eliminate the lower part of the scan, and use only the upper part.*

*The intruder could also elude the ground controller. When we turned on our airborne radar, the P2V would detect*

*it, and immediately dive away. Then he would drop metal foil, and that would disrupt the ground control radar and cause the controller to lose him.*

The PLAAF experimented with tactics and equipment. The World War II era Tupolev Tu-2 light bomber was used as a night fighter but not very successfully. Then, remarkably, the Tupolev Tu-4 was pressed into service to pursue and attack the P2V. The Tu-4 was a large, four-engine aircraft, the Russian copy of the American WW II B-29 bomber. Its virtue was that it could stay in the air a long time and bring many guns to bear on any target it caught. But, as Han remembered, "The Tu-4 was just too big and too slow, and it was accident prone. At least one of them flew into the ground."

Then Russian Ilyushin IL-28 jet bombers were used as illuminators, an effort Han described as pretty hopeless:

*A searchlight was mounted on the IL-28. The idea was that the IL-28 would try to fly above and ahead of the P2V, and then turn on the searchlight to light up the P2Vs fuselage so the chasing MiG pilot could see it. Again, this was not very successful.*

*In practice, this was very difficult to do. It was all a matter of coordination. There were three people involved: the pilot of the IL-28, the pilot*

*of the MiG interceptor, and the GCI controller. The controller and both pilots first had to find the target. Then the IL-28 pilot had to get above and ahead of the target and light it up as the MiG was trying to get into position to fire.*

*The controller on the ground had to follow the P2V and simultaneously move the IL-28 and the MiG into position on an airplane they couldn't see. When the IL-28's searchlight was turned on and illuminated the P2V's fuselage, the MiG already had to be in position to fire. This required exceptionally close coordination and was very difficult to do.*

### ***The Beginnings of China's Air Defense System***

Over the years, the difficulty of dealing with the intruders and the evolution of the tactics the PLAAF used against them, led to a systematic way of dealing with the problem. As Han Decai explained:

*We wracked our brains to come up with ideas to defeat the P2V missions. For example, we tried to set up ambushes in remote areas. We knew that the P2V would always fly at low altitude. Over time, we became very familiar with the kind of routes they needed to fly. We would concentrate our anti-aircraft artillery in the areas we believed they were likely to fly over, and position the guns in such a way that when*

*the P2V entered the area, our artillery could fire at it from different directions.*

*There were searchlights on the ground as well as radar, but the radars were the most important. They were set up in a chain that allowed us to track the intruders over their entire route.*

*We had intelligence collection that gave us advance warning of an intruder flight. We could intercept signals intelligence that provided indications of an intruder flight, long before that flight took off. From the preparations that we knew were being made on the ground in Taiwan, we could do some calculations and determine when the aircraft would take off and also get some idea of its planned route.*

*Our radars could pick up an incoming intruder only at very short range, about 100 kilometers out at sea. Even with a radar station on top of mountain, we still had difficulty tracking incoming aircraft. The P2Vs stayed down very low as they came in, and were hard to pick up. And with the P2Vs being that low, our radar would pick up strong reflections from the waves. In that clutter the P2V was difficult to track.*

*There were many difficulties that we had to overcome. Over time, in overcoming*

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**“What Taiwan achieved was probably negligible. Their intrusion flights affected relatively small areas of China.”**

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*these difficulties, we established an integrated air defense system. We could track the enemy at low altitude and at high altitude. We incorporated our surface-to-air missiles into our air defense system. Then it became really dangerous for Taiwan intruder aircraft to fly over mainland China. Eventually, it was no longer feasible for the Taiwan Air Force to fly intruder missions into mainland China.*

*The mission against the Taiwanese intruders lasted a long time—until we came to a kind of tacit agreement with Taiwan that turned into a truce. The Taiwan government did not send recon airplanes over the mainland, and we did not bomb the islands near Taiwan. I flew these missions from 1961 to 1968. In 1968, I started to fly the MiG-19, which was also used to go after the intruders.<sup>25</sup>*

### **What The Low-Level Intruders Accomplished**

The P2V-7Us proved very effective at the black work they were chosen to do: dropping and supplying agents, dropping propaganda leaflets, and collecting electronic intelligence while eluding the PLAAF's pursuing MiG-17s. With years of experience dealing with this prob-

lem, Han Decai gave his evaluation of what these missions might have accomplished:

*What Taiwan achieved was probably negligible. Their intrusion flights affected relatively small areas of China. In the end, all the propaganda leaflets they dropped gained them nothing. Virtually all the agents they dropped were quickly captured by our local forces. Taiwan may have gained intelligence from these reconnaissance efforts, but as time went on, the value of that was probably offset by US concern about the growing strength of the PLAAF and the increased effectiveness of China's air defenses—all of which were fostered by Taiwan's intruder flights.*

The ROC's aircrews displayed incredible courage in carrying out their low-level penetration missions, but the value of the program in retrospect is questionable. Ten of the aircraft engaged in low-level penetration missions from Taiwan—including all five of the CIA-provided P2V-7Us—were lost over the Chinese mainland, three in air-to-air engagements.

Taiwan suspended its penetration flights over the mainland in 1964, although flights along China's coast were made through 1966, when this joint program with the United States was terminated. Of the hundreds of agents and special operations troops

<sup>25</sup> In his interview, Han pointed out that the Nationalists would continue to launch balloons carrying propaganda leaflets over the mainland. Shooting down the balloons, he said, was easy, however.

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*What the penetration flights did accomplish was to motivate the PRC leadership to more quickly build an air force and to create an effective air defense system.*

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that were dropped, apparently none survived; the propaganda drops were largely ignored by mainland residents. Electronic and other technical intelligence collection gave the United States a good picture of the PRC's growing military strength and its rapidly developing nuclear program, although much of the intelligence on the latter came from the high-flying U-2s.

### ***An Unintended Effect***

What the penetration flights did accomplish was to motivate the PRC leadership to more quickly build an air force and to create an effective air defense system. The difficulty of defending against incoming flights that ranged from ground level to the stratosphere and which employed state-of-the-art technical countermeasures was a challenge that could only be met by development of a

versatile, sophisticated air defense system in which coordination among many parts had to be close and effective and increasingly difficult to defeat.

There is no question that in their time, the mainland U-2 flights were necessary and productive for the United States. However, the PLAAF had to defeat them, and in the process, gained early experience in the use of surface-to-air missiles against specialized high-flying targets. The P2V flights were another matter: they were more difficult to defeat. They required the PLAAF to employ a greater variety of assets and to use them inventively. And it may have been even more imperative to stop the P2V; the P2V's capability to drop agents and commando teams, and dispense propaganda material added a political component to the

P2V flights that the other intruders did not have.

In seeking the intelligence it needed to assure its own security and that of an ally, the United States spurred a potential opponent to create an integrated, multilayered defense capability, with an air force that today ranks as one of the toughest to defeat. In the words of a RAND corporation study:

*Even today, the emerging capabilities of the PLAAF are such that, combined with the geographic and other advantages China would enjoy in the most likely conflict scenario—a war over Taiwan—the USAF could find itself challenged in its ability to achieve air dominance over its adversary, a prospect that the USAF has not had to seriously consider for nearly two decades.<sup>26</sup>*

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<sup>26</sup> Roger Cliff, John Fei, Jeff Hagen, Elizabeth Hague, Eric Heginbotham, and John Stillion, *Shaking the Heavens and Splitting the Earth: Chinese Air Force Employment Concepts in the 21st Century* (The RAND Corporation, 2010). This publication is available online at [http://www.rand.org/content/dam/rand/pubs/monographs/2011/RAND\\_MG915.pdf](http://www.rand.org/content/dam/rand/pubs/monographs/2011/RAND_MG915.pdf).