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“We must learn from Germany”: gliders and model airplanes as tools for Japan’s mass mobilization

Abstract: This article explores the prominent role of Germany in the emergence of Japan’s glider and model-aircraft boom. It examines how the invitation of German specialists to Japan in 1935 started a “glider fever” that enabled the Japanese military to forge close bonds with the press and an air-minded public. In the following years Nazi Germany also provided the organizational blueprint for comprehensive aviation education that mobilized all aviation activities of Japanese youth in the service of national defense. Japanese anxieties about the expansion of foreign air power thus were successfully channeled into a wave of popular enthusiasm and participation that became instrumental for Japan’s military buildup and mobilization.

Keywords: German-Japanese relations, aviation education, military mobilization

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1 Introduction

By the early 1940s Japan had become a “nation of flyers.” More than ten million schoolchildren were engaged in building model airplanes and tens of thousands of high school students actively practiced glider flying. At the same time, activities that had started as playful or adventurous pursuits became serious efforts for national defense. A new taxonomy emerged: every sailplane became a “national defense glider,” and a Japanese schoolboy with his model airplane

was no longer a boy with a toy but a “wild eagle” aiming toward the “decisive battle in the sky.”

Such state-sponsored air-mindedness was a transnational phenomenon, rooted in a new ideology that emerged after World War I. Strategists and military planners concluded that any future war would be a total war requiring the mobilization and control of a country’s entire population and resources. Any distinction between military combatants and civilian populations would become meaningless, and the struggles on the home front would be as decisive as those on the front lines.¹

The new doctrine profoundly transformed military and civil aviation. The individualistic World War I fighter ace became an icon of a bygone era. Aviation now had to become a mass movement that could count on the public’s enthusiasm, participation, and support. New slogans emerged. In the 1920s the Soviet Communist Party launched nationwide campaigns to turn “peasants into pilots”; Mussolini envisioned a Fascist aviation culture and already in 1923 famously insisted that “everyone must want to fly”; and in the 1930s German aviation minister Göring repeatedly pronounced that “the German people must become a nation of flyers.”²

This paper examines the rise of Japan’s popular air-mindedness in the wake of the country’s alignment with Germany. Using new archival evidence, my project suggests a fresh view on the development of German-Japanese relations after the conclusion of the 1936 Anti-Comintern Pact. It calls into question the widely held assumption about German-Japanese cooperation as a story of conflicting interests, distrust, and false hopes that rendered the alliance ineffective and limited its strategic and economic consequences.³ I will argue that the Nazi government’s total control of all German aviation activities had a profound impact on Japanese aviation policies.⁴ Nazi Germany provided the organiza-

¹ As Garon (1997: 8–15) has shown, Japan’s highly effective “social management” even blurred the distinction between wartime and peacetime mobilization.

² For the relationship between fascism and aviation, see Wohl (2005: 49–108). I take the phrase “peasants into pilots” from Palmer (2000).

³ Among the numerous studies that emphasize the lack of Axis cooperation, see, e.g., Sommer (1962), Meskill and Menzel (1966), Martin (1995), Tajima (2009), and Dobson (2007). Krebs (2006) gives a detailed account of Japan’s failure to adopt the Fascist model. For an analysis of the Japanese Army’s role in the cooperation with Germany, see Iklé (1956).

⁴ Several recent studies provide evidence for substantial German influence in a wide variety of fields. Kudō’s (1998) nuanced account of interwar business ties between Japan and Germany emphasizes the role of private enterprise. Nakamichi (2008) examines the visit of Hitler Youth representatives to Japan and its strong influence on Japanese youth education. In a similar vein Tano (2010) analyzes the National Socialist leisure organization *Kraft durch Freude* and

tional and ideological blueprint for tying glider flying exclusively to the purpose of national defense and triggered the start of a model-airplane movement as a means of national aviation education. Gliders and model aircraft thus became effective tools for providing the Japanese military with a much-needed pool of young pilots who had the knowledge, skills, and spiritual readiness to fight Japan's air wars.

Studying Japan's emerging glider movement also offers an opportunity to reexamine the mechanisms of technology transfer from Germany to Japan. Previous studies have greatly increased our knowledge about the transfer of cutting-edge technology during the interwar and wartime years.⁵ In contrast, this article focuses on the transmission of a "low-tech" design wherein the Japanese eagerly adopted German know-how about the skillful arrangement of fabric, wire, and wood and built several thousand gliders based on German blueprints. In addition, the successful nationwide diffusion of glider technology reveals the central role of an underlying ideology of "air-mindedness" that Japan could readily import from Germany as well.⁶

2 The emergence of a glider movement

German enthusiasm for gliders emerged in direct response to the 1919 Versailles settlement. When the German delegates signed the Treaty of Versailles, they accepted substantial losses of territory and heavy reparations payments. Part five of the treaty moreover required the destruction or surrender of all German military aircraft, banned the production of aircraft, and prohibited all military flying. Gliders, unpowered aircraft used by amateur pilots, were not included in the Versailles restrictions. Thus, facing the bleak prospect of the demise of German aviation, many Germans saw glider flying as the only opportunity to keep alive the nation's air-mindedness, its *Fluggedanke*.⁷

In the 1920s the Rhön, a region of rolling hills in central Germany, developed into a Mecca for gliding enthusiasts. German glider pilots set a series of

its impact on the Japanese recreation movement. Mimura (2011) examines the influence of Nazi ideology on Japanese policies for establishing a "technocratic new order."

⁵ Pauer (1994, 2009) provides valuable insight into the role of engineers and the transfer of aero-engine technology. Grunden (2005) has examined the technological assistance Japan received from Germany in the design of jet fighters and of rocket-propelled interceptors.

⁶ In a different context Wittner (2008) has emphasized the role of ideology and symbolism in technological choice.

⁷ For an account of the emergence of German "air-mindedness," see Fritzsche (1992).

flight records with a new flight technique known as ridge soaring, which used upward airstreams at a hill's windward side. Further research led to the discovery of thermals, rising masses of warm air that could be used by circling gliders to gain altitude. Henceforth, soaring was no longer limited to mountain ridges; and by skillfully using thermals, glider pilots could set out for long-distance flights of several hundred kilometers.

German glider activity in the 1920s and 1930s had important implications: it led to significant progress in aeronautical science and technology, stimulated military aviation, and promoted a nationalistic air-mindedness. Ironically, these were precisely the fields the Allies had wanted to crack down on with their ban on German aviation. As we will see, they were also the areas where German influence on the development of Japanese glider flying was deepest.

Japan, as part of the transnational world, shared in the development of glider aviation (Satō and Kimura 1999: 1–15). In 1930 the Nippon Guraidā Kurabu ('Nippon Glider Club') built a simple, open-cockpit glider based on the design of the German *Zögling* ('pupil') airplane. In May 1930 Kataoka Bunzaburō took off with the group's glider at the Tokorozawa airfield and established a new Japanese record with a five-second flight that covered a distance of 80 meters (Kawakami 1998: 264). In 1932 German-trained meteorologist Fujiwara Sakuhei founded the Kirigamine Guraidā Kenkyūkai ('Kirigamine Glider Research Society'). The association was named after the location of its airfield at Kirigamine, a mountain range in the Nagano prefecture about 150 kilometers northwest of Tokyo. The region offered ideal conditions for glider flying and would soon be called the "Japanese Rhön" (Brütting 1942: 190). Within a year, more than 400 flights had taken place at the Kirigamine airstrip, which grew to be one of the centers of Japan's glider activities.

Kyushu Imperial University at Fukuoka became another hotbed of Japan's emerging glider movement. Together with fifty students, Professor Satō Hiroshi founded the Kyūshū Teikoku Daigaku Kōkūkai ('Kyushu Imperial University Flight Group') in 1932. The group's successful glider design shows a strong German influence: a reproduction of a German glider, the *Kyūtei 1*, was used in the group's initial training sessions. Moreover, the much more sophisticated *Kyūtei 7* was a close copy of the hugely successful German sailplane *Grunau Baby*. In early September 1935 the glider pilot Shizuru Tadao surprised the Japanese glider community with a spectacular new Japanese record, flying in a *Kyūtei 7* for more than three hours (Satō and Kimura 1999: 26).

By the first half of the 1930s, then, glider flight in Japan had made considerable progress in several isolated locations, but the nationwide spread of Japan's "glider fever" can be better understood in the context of international developments.

3 Japanese responses to Soviet aerial armament

In the early 1930s Japanese anxiety over Russian airpower dramatically increased.⁸ After the Japanese took over Manchuria in 1931 and 1932, they became aware that their new puppet state of Manchukuo was encircled by 30 Soviet air bases from which a Russian air force that was hugely superior in numbers could be quickly deployed. The development of a new type of Russian long-range bomber that could take off from Vladivostok and drop its bomb load over Japanese cities significantly added to the worries of Japan's military planners (Bōeichō Bōeikenshūjo Senshishitsu 1976: 387–394). This new situation prompted Japanese officials to carefully follow the development of Soviet aviation. Their attention was not only drawn to the rapid progress in Russian aircraft technology and production numbers but also to the widespread emergence of a Soviet aviation ideology that could mobilize the public for a rapid air-force expansion.

Japanese diplomats, engineers, and military officers were aware of how the Soviets used gliders for training and for mobilizing public support. In May 1935 the Japanese ambassador to the Soviet Union Ōta Tamekichi reported an emerging “glider fever” (*guraidā netsu*) that had already spread as far as Sakhalin, the Russian island whose southern tip is less than 50 kilometers away from Japanese territory. He emphasized that all over the Soviet Union the Russian Aeronautical Defense Society was using gliders for the instruction of several thousand pilots and for the “diffusion of an aviation ideology among ordinary people” (Ōta 1935). The ambassador's report home received close attention from officials at the army and navy, the Communications Ministry, and the General Staff Office.

The developments in Russia influenced the Japanese Army's air-defense strategy. The Army Ministry decided to significantly expand aerial armament and homeland air defense; however, the sudden need for more pilots and aircraft mechanics presented a problem as the training of these specialists would take several years. Thus in 1933 the army began to extend its outreach toward Japanese youth. Young men between fifteen and nineteen were to be recruited and trained as “the army's young military aviators” (*rikugun shōnen hikōhei*) (Bōeichō Bōeikenshūjo Senshishitsu 1976: 394). The campaign was extremely successful, resulting in 11,000 applications in less than three weeks (*Asahi Shinbun* 1933a). However, the army's flight school could accept only 170 (*Asahi*

⁸ In a wider context Samuels (1994) has examined how Japanese “technonationalism” was driven by constant anxiety (*fuan*) about the nation's security.

Shinbun 1933b). The army then decided to involve civilian organizations in training in order to develop a sufficiently large number of young pilots. As a first step, army officials turned toward the country's major newspapers.

By the early 1930s the Japanese military could safely count on the cooperation of the press. With the start of the war with China, state control of the press had tightened.⁹ However the press was far from being only a malleable tool. As Louise Young has shown, with the outbreak of the Manchurian conflict all major newspapers shrewdly participated in the “news war” in their struggle to increase circulation (Young 1998: 57–68). As a result the Japanese press enthusiastically praised the successes of Japan's military and urged readers to support “our young Japanese soldiers in the cold of Manchuria” (*Chūgai Shōgyō Shinpō* 1932). Several newspapers even launched a highly effective donation campaign for new airplanes that enabled the Japanese Army to substantially reinforce its air power.

The press also played an important role in forging a close link between Japan's air-minded youth and the military. In the early 1920s most major Japanese papers had already established their own “aircraft divisions” for advertising and news coverage (*Asahi Shinbun* 1979: 252). When army officials turned to the *Asahi* newspaper for its cooperation in establishing a new glider association, they found an enthusiastic ally with significant aeronautical expertise. The joint *Asahi*–Army enterprise resulted in the 1935 creation of a glider section of the Nihon Gakusei Kōkū Renmei (‘Japan Students Aviation League’), or Gakuren for short. With explicit reference to Germany the army used the Gakuren to build a “reserve flying corps.” For the army, Gakuren's glider flying was an inexpensive way to provide early basic flight training and to identify talented future army pilots. The army even provided the Gakuren with military flight instructors who could then appoint selected university students as “army pilot candidates” or even as “army aviation commissioned officer candidates” (Nihon Gakusei Kōkū Renmei 1980: 140).

To place the glider movement on an even stronger foundation, the army procured the cooperation of two more major newspapers. When the Army Aviation Headquarters started negotiations with *Osaka Mainichi* and its affiliated company *Tokyo Nichinichi Shinbun*, the army's delegate declared the training of future army pilots to be a matter of “national defense.” He also referred to the exemplary, well-organized aviation education in Germany that Japan should emulate (Matsushita 1966: 362–363). In an obvious effort to catch up

⁹ For government–press relations, see, e.g., Kasza (1988). For an account of pressures by right-wing parties and reservist associations on newspaper companies that allegedly did not provide “sufficient support for Japan's military activities,” see *Asahi Shinbun* (1979: 356–358).

with their competitor, *Asahi*, these two papers complied with the military's request and founded the Nippon Hansō Renmei ('Nippon Glider Federation') in May 1935.

The army did not intend to leave glider flying entirely to civil organizations. In the summer of 1935 the Army's Flight School at Tokorozawa, 30 kilometers northwest of Tokyo, established a glider research section. Major Kondō Kanetoshi was the driving force behind this move (Kawakami 1998: 130–131). He succeeded in convincing the head of the flight school, Tokugawa Yoshitoshi, that gliders could play a central role in the spread of an "aviation ideology" (*kōkū shisō*). Tokugawa, a descendant of the shogun family, was the renowned pilot of Japan's first engine-powered flight. He was held in high regard by the Japanese public and military. His support for the new idea of "military gliders" carried enough weight to dismiss the sharp criticism by some of the army's upper- and mid-level aviation officers who considered glider flying to be "playing and dancing" (*yūgi*) and therefore not an appropriate activity for the army "in a time of crisis after the Manchurian Incident" (Bōeichō Bōeikenshūjo Sen-shishitsu 1975: 278).

4 Wolf Hirth, the "father of Japanese gliders"

One of the new glider research section's first decisions was to invite a German glider specialist to Japan. This turn toward Germany reflected Japanese awareness of German world leadership in gliding. Significantly, it happened at a time when Japanese-German relations were about to enter a new stage as the two countries started preparations for the Anti-Comintern Pact in summer 1935. Japanese military diplomats in Berlin conducted the negotiations.¹⁰ Having witnessed the official announcement of the new German air force in March 1935, they were in close contact with the upper ranks of the *Luftwaffe*. Therefore, when Major Kondō began his search for a German glider expert to be invited to Japan, he could easily turn to his army colleagues in Germany (Kawakami 1998: 129–131).

In June 1935 the Japanese Army Ministry asked the Berlin-based army attaché Ōshima Hiroshi to invite two German glider pilots to come to Japan together with their airplanes. Ōshima immediately started negotiations with the German Ministry of Aviation whereupon he received the answer that such a "gliding

¹⁰ The Japanese military attaché Ōshima led the negotiations, completely leaving out the Foreign Office; see Iklé (1956: 30).

expedition" (*Segelflugexpedition*) could be arranged for the following year. The attaché, however, insisted on the urgency of the matter; he emphasized how Japanese-German relations would greatly benefit from the project and offered that the Japanese Army would not only cover the entire equipment cost but also pay each glider pilot a handsome salary of 2,400 yen for a two-month stay in Japan. The German Aviation Minister then agreed to dispatch two glider instructors together with three aircraft as soon as September 1935, a proposal that the Japanese government accepted "with great joy." As a next step, the ministry appointed the well-known glider pilot Wolf Hirth as leader of the expedition. It even managed to cover all travel expenses with a secret fund that was handed out via the Advertising Council of German Industry, which was controlled by the Propaganda Ministry (Reichsluftfahrtministerium 1935: 45–155).

There was, however, one more obstacle to overcome before the Japanese Army could summon a German aviation specialist. Because Japan had joined the Allied Powers in World War I, the country was bound by the Treaty of Versailles not to employ any Germans for military training or instruction. Yet Japan could readily draw on its already-existing tradition of evading the treaty regulations. Throughout the 1920s nearly all the major German aircraft makers had sent their specialists to Japan to help build up a military aviation industry, a clear treaty violation that was backed by both governments.¹¹ To keep up appearances, therefore, the army conveniently let the newspaper companies *Tokyo Nichinichi Shinbun* and *Mainichi Shinbun* invite Hirth, calling him an instructor for civil aviation.

Hirth himself was well aware that he had to avoid the spread of any "rumors about German-Japanese military arrangements" (Reichsluftfahrtministerium 1935: 150). In his 1938 autobiography he gave only a vague account of the origins of his invitation to Japan. There he reported that in 1935 he had received a phone call from Ernst Udet, a former World War I fighter ace and then a colonel in the newly founded Luftwaffe. Udet informed Hirth that "influential persons in Japan had asked for the dispatch of a distinguished pilot" (Hirth 1938: 129). Habuto Fumio, the then head of *Mainichi's* aircraft section, was more straightforward. Much later, in a 1962 interview, he admitted that *Mainichi* had helped to evade the Versailles treaty regulations but also emphasized that "all the money came from the army." The interviewer asked in conclusion, "So was *Mainichi* used by the army?" Habuto's impish answer, "No, we [*Mainichi*] used the army," is yet more evidence of how the press could cleverly exploit an army-sponsored event for its own purposes (Kōri 2000a: 80).

¹¹ I am exploring this topic in great detail in my forthcoming dissertation on the role of Germany in the buildup of Japan's aviation industry.

The choice of Wolf Hirth was a good one. With his steel-rimmed glasses and boyish smile he did not fit the stereotype of a daredevil airman, yet he was already a pilot of considerable talent and international experience. In 1931 Hirth was the first glider pilot to be awarded the German Silver C badge for his aeronautical accomplishments.¹² Before his visit to Japan he had already gained international fame for his sustained glider flights over New York and for his participation with a glider of his own design in an expedition to South America.

With all diplomatic and financial questions settled, Hirth together with the pilot Karl Baur and the assistant Hans Stolz left Berlin for the long train ride across the Soviet Union on 17 September 1935. The group's official contract, signed with the Nippon Glider Federation, was to spend two months training eight Japanese pilots and several students to become glider instructors. Hirth brought with him one "school glider" (*Schulgleiter*) for basic flight training, one glider suitable for acrobatic performances, and one "gull-winged," high-performance sailplane. A single-engined Klemm 25 for towing the gliders was shipped to Japan as well. The four aircraft were purchased by the Japanese Army, which in turn "loaned" them to the *Mainichi* newspaper, which then assigned them to the Nippon Glider Federation (Kawakami 1998: 138). Soon after the group's arrival in Tokyo on October 2, an intense program of lectures, flight training, and flight demonstrations began.

Two of Hirth's numerous presentations (see Figure 1) were especially inspiring to his military audience. In a lecture held in German and translated by an employee of the German embassy, Hirth emphasized the important role of German student flight groups associated with technical universities (*technische Hochschulen*). He pointed out that many of these groups were receiving state funding for their research into the design and construction of gliders as well as test flights. In return these groups provided the newly created German Luftwaffe with a large pool of highly qualified young engineers who had considerable practical experience in building and flying glider aircraft (*Asahi Shinbun* 1935a).

In another lecture given exclusively to Japanese Army officers, Hirth was franker still about new military uses of gliders. He envisioned gliders that would drop bombs and then safely return to their home bases as well as large-scale transport gliders that could be used for silently flying troops behind enemy lines at night. For Hirth, therefore, future efforts in the development of gliders were to be directed away from achieving ever-longer flight times, as had

¹² The Silver C badge was a prize awarded to glider pilots who carried out a glider flight of more than five hours that covered more than 50 kilometers and had an altitude gain of 1,000 meters.



Figure 1: Wolf Hirth explaining vertical air currents at a lecture held for the Nippon Hansō Renmei ('Nippon Glider Federation') in Tokyo in October 1935. The photograph conveys the official character of these events, with the flags in the background symbolizing the close relations between the two countries. Courtesy of Deutsches Segelfluggmuseum mit Modellflug.

previously been the case. Instead, he stressed the importance of long-distance flights toward specific destinations. According to commentators Hirth profoundly impressed his audience, among them top-level officers of the Japanese Army who eagerly welcomed Hirth's vision (Kawakami 1998: 143).

Nearly one week of Hirth's stay was devoted to glider training for army officers at the Ueda airfield, about 30 kilometers south of the city of Nagano.



Figure 2: Hirth getting ready for an acrobatic performance in his Gö 1 glider. The large number of high-ranking military personnel patiently waiting in the background gives evidence of the high importance the army attached to Hirth's demonstrations and of the raised expectations faced by the visitor from Germany. Courtesy of Deutsches Segelflugmuseum mit Modellflug.

Major Kondō led the small group of about a dozen handpicked army officers. By letting the Japanese officers use the German airplanes, Hirth was able to teach them the skills of glider towing, ridge soaring, and the advanced technique of thermal flight. The trainees' ambition, discipline, and rapid progress earned the praise of their teacher (Brütting 1942: 189).

While Hirth's lectures and training targeted only a selected audience, his public flight shows impressed the masses (see Figure 2). His first performance on October 26 received an exhilarated press report under the headline "Vertical loops with a glider: Just as you would expect from the king of glider pilots":

Hirth embarks his Göttingen-1 glider. Without any sound he flies into the blue sky. Suddenly, at an altitude of less than 100 meters he flies a loop. The audience, who had been thinking that only a motor-powered aircraft could do this, gapes in amazement. Then effortlessly, as if the glider was his own body, Hirth makes a perfect landing. ... The air is filled with admiring voices: "Marvelous!" (*Asahi Shinbun* 1935b)

One week later thousands of spectators made the trip to the Haneda airfield fifteen kilometers south of Tokyo to witness the flying skills of the “King of Glider Pilots” (*hansōō*). Once more Hirth impressed his audience with his glider acrobatics, especially his vertical loops performed at a low altitude, an extremely risky flight maneuver that left no margin for error. After his impressive flight demonstration Hirth was surrounded by an excited crowd that he feared would damage his aircraft (Italiaander 1941: 207).

Hirth’s activities commanded widespread admiration even among the highest echelons of the government. On 12 December 1935, three days before Hirth’s return to Germany, Prime Minister Okada Keisuke awarded the German glider pilot the Order of the Sacred Treasure (*Zuihōshō*). The exchange of official notes that preceded this event shows the high aspirations that Hirth’s activities had stirred in the military (Okada 1935). Both the Army Ministry and the Foreign Minister praised Hirth for training Japanese pilots in “all aspects of flight techniques” and for providing new perspectives on the military use of gliders. Prime Minister Okada expressed approval of Hirth’s transfer of know-how about the design and production of gliders. Within a mere two months, Hirth had “conveyed all his skills, opened new fields, and established a foundation for progress.” The Japanese press joined the laudations. An enthusiastic *Mainichi* journalist ended up revealing that secret agreement: “Hirth went back to Germany with the honor of having accomplished every [aspect of his] mission that was assigned to him by ... the Army Aviation Headquarters” (Kōri 2000b: 156).

5 The spread of “glider fever” and the creation of a second air force

While it took the Japanese Army several years to consider and put into practice Hirth’s proposals, Hirth’s impact on the Japanese public was much more immediate and widespread.¹³ According to an exchange of notes between German diplomats, Hirth had become the “most popular German in Japan” (Reichsluftfahrtministerium 1935: 163). Soon after Hirth’s return, flight demonstrations,

¹³ While Japan’s tactical use of military gliders is outside the scope of this paper, it should be mentioned that only in October 1943 was Japan’s first glider transport squadron set up under the advice of Major Furubayashi, who had been trained eight years earlier by Wolf Hirth (Bōeichō Bōeikenshūjo Senshishitsu 1976: 270–271). Furthermore, by the end of May 1945 the Imperial Japanese Navy used gliders to train around 1,500 reserve students for suicide missions (Nihon Kaigun Kōkūshi Hensan Iinkai 1969: 270–271).

competitions, and lectures were being held all over the country and a “glider fever” (*guraidā netsu*) gripped the nation (Satō 1999: 39). From May to June 1936 the Nippon Glider Federation and the two newspapers *Osaka Mainichi* and *Tokyo Nichinichi* organized two “around-Japan” (*Nihon isshū*) flights. Towed by a motor aircraft, Shizuru Tadao, who was already known to the public as a record-breaking glider pilot, went on a 3,000-kilometer flight from Tokyo via Sendai, Aomori, Niigata, and Kanazawa to Osaka and then completed a 1,500-kilometer Osaka–Hiroshima–Fukuoka–Kumamoto–Beppu–Shikoku–Osaka circuit (Satō and Kimura 1999: 38). These tours effectively promoted the idea of glider flying, particularly as Shizuru performed stunning acrobatics with his glider in numerous places. To further advance the idea of glider flying, the two newspapers organized Japan's first lecture course on gliders in August of the same year. Members of 23 glider organizations participated in the program (Kōri 2000b: 157). One month later Japan's first National Glider Competition at Kirigamine attracted more than 100 pilots. *Asahi Shinbun* acted as the event's main sponsor with the support of the Communications Ministry and the Imperial Aeronautic Association.

All these activities showed clear results. By 1937 Japan could take pride in its 67 glider organizations and 120 sailplanes. In the years 1937 and 1938 glider enthusiasm spread to the Japanese territories of Manchuria, Korea, and Taiwan (Kōri 2000b: 158).

After the conclusion of the 1936 Anti-Comintern Pact when German-Japanese relations became even closer, Japanese studies of Nazi Germany and its organizations intensified.¹⁴ As a result German influence on Japan regarding how to gain public support for the buildup of national air power became even stronger.

The National Socialists' successful promotion of their version of air-mindedness (*Fluggedanke*) impressed Japanese officials, and the number of Japanese “inspection teams” to Germany increased. One important visit was that of a group of six high-ranking Japanese military officers who investigated all aspects of German aviation. The group submitted its classified “Report of the Aviation Inspection Team” upon its return in spring 1937. It is an important document because it drew the army's attention to the education of an air-minded German youth. The Japanese group was impressed with how the German government and military not only promoted the physical education of its youth with regard to the country's aviation but also aroused young people's interest in aviation from early childhood on (Ōshima and Sugawara 1937: 44).

With this information at hand, the Army Aviation Headquarters decided to follow the German model very closely. As a first step they aimed to foster and

¹⁴ For more details, see Kudō et al. (2009).

unify aviation enthusiasm among Japanese youth and put it into the service of national defense. As we will see, gliding, which had started as a pure amateur sport carried out by aviation enthusiasts, came under the tight control of the government and the military.

In early 1937 the Army Aviation Headquarters went ahead with its project to establish a “second air force” (*daini kūgun*) of “young people defending the skies of our fatherland” (*Asahi Shinbun* 1937a). For this the headquarters ensured the cooperation of the Communications Ministry and also joined forces with the Imperial Aeronautic Association and the All Japan Youth League. The four institutions founded the Dai Nippon Seinen Kōkūdan (‘Greater Japan Youth Air Corps’). The Japanese slogan “young people defending the skies of our fatherland” left no doubt about the military orientation of the new Youth Air Corps; neither did the date of its official establishment – 10 March 1937, the 32nd Army Commemoration Day.¹⁵

In an important move, the founders of the Youth Air Corps persuaded the 75-year-old General Inoue Ikutarō to become the association’s leader. Inoue, who was also the president of the Imperial Military Reservists’ Association, was well known as the “Father of Army Aviation” for his merit in the early buildup of the Japanese Army Air Force. His inaugural speech highlighted the strong military motives behind the Youth Air Corps’s promotion of glider flying among young Japanese. After expressing his worries about the rapid spread of “aviation ideology” among Soviet youth, Inoue turned directly to his main concern. The general emphasized that “the progress of [Japanese] military aviation for frontline operations is vital. However, a *second frontline* that carries out the tasks at the home front is also extremely important” (*Asahi Shinbun* 1937b). Inoue expressed his belief that the Greater Japan Youth Air Corps would provide the best facilities for flight training and would fulfill his wish that in the future all young Japanese men would be able to fly aircraft or gliders so that they could defend their country in a case of emergency.

The Communications Ministry, in charge of Japan’s civil aviation since 1923, further tightened control over nonmilitary flying by making a move similar to the Nazi government’s 1937 enforced conformity (*Gleichschaltung*) in all German aviation activities.¹⁶ In September 1940 the ministry announced the “unification” of all Japanese civil aviation organizations. The Japan Students Aviation

¹⁵ Until 1945 Japan held the Army Commemoration Day each year to celebrate the victory of the Imperial Japanese Army against the Russian Manchurian Army at the Battle of Mukden in 1905.

¹⁶ Okumura Kiwao, an influential bureaucrat at the Communications Ministry, admired Nazi Germany for its state-sponsored mass organizations. See Mimura (2011: 214).

League, the Japan Glider Federation, and the Greater Japan Youth Air Corps were “voluntarily” dissolved and put under the umbrella of the Dai Nippon Hikō Kyōkai (‘Greater Japan Aeronautic Association’). The new association was in charge of promoting and disseminating “aviation ideology” through radio and print media and by organizing flight shows all over Japan. The Greater Japan Aeronautic Association was also responsible for the glider training of Japanese youth and for the nationwide establishment of glider groups (Satō and Kimura 1999: 75).

Under the sway of the Greater Japan Aeronautic Association, glider flying in Japan underwent another transformation. Gliding was no longer considered a sport but an activity solely devoted to national defense. Even the designation of the aircraft changed, with every sailplane becoming a “national defense glider” (*kokubōshoku guraidā*). With the militarization of glider activities the army increasingly offered advanced glider training at its own airfields. At various training camps young pilots received instruction in advanced acrobatics and were even taught the basics of instrument flight that enabled them to fly in clouds or bad weather conditions (Makino 2007: 9). Gliders had become an effective means for sharpening the flight skills of future military pilots.

6 Following the German model: glider flying comes to Japan's schools

In the late 1930s the Japanese glider movement had entered a new stage when yet another powerful government agency lent its strong support. In February 1938 the Education Ministry informed all local governors about its plan to encourage glider training (*guraidā ikusei*) at secondary schools. As a first step glider courses for schoolteachers were to be held all over Japan. The ministry then decided that students should not only receive flight training but should also learn how to build their own basic gliders. Therefore the Education Ministry, together with the Imperial Aeronautic Association, in August 1938 sponsored the first month-long course on glider building for teachers from technical colleges and secondary schools.

The Education Ministry's efforts to take glider flying to the schools were influenced most decisively by Germany. The ministry had sent Professor Satō Hiroshi to the Technische Universität Berlin to study aircraft design for two years. After his return in 1939, Satō submitted a detailed report about Ger-

many's emerging glider and model airplane movement.¹⁷ Satō had witnessed how the German Air Sports Association (*Deutscher Luftsportverband*) had been dissolved and replaced by the National Socialist Flyers Corps (*Nationalsozialistisches Fliegerkorps*, or NSFK). The Reich Air Ministry's total control and management of Germany's aviation sport impressed Satō. For him it became clear that the main purpose of the NSFK was to promote Germany's model airplane and glider movement in order to build up "Germany's second air force." In his outline of German aviation education, Satō explained the systematic approach of the National Socialists to prepare the German youth for future air battles.

At eleven years, German students are making simple paper planes, at fifteen years they are building model airplanes based on their own original design. ... By then they have considerable knowledge of the steering system, structure, and instruments of real aircraft. At sixteen they begin to build and fly gliders for which their knowledge and experience gained from model airplanes is very useful. Outstanding students will attend the National Glider Building School and the National Glider Flight School. (Kōno 1939: 180–208)

This organizational blueprint was important because it lent itself to being copied by the officials of the Japanese education system. The NSFK's curriculum also demonstrated how to indoctrinate young people with a nationalistic air-mindedness from a very early age.

The German model had considerable impact on the Japanese education system. In February 1939 the Education Ministry set up a committee to draft a unified national curriculum for glider training. In the curriculum the ministry's rhetoric strikingly resembles both the tone and content of similar declarations by the NSFK (Kehrberg 1942).

The purpose of glider training is to develop a spirit of undivided cooperation among students, to train their minds and bodies, and to improve their physical condition. [The training also should] cultivate an aviation ideology and aim to put scientific knowledge into practical use. Students [should learn to] respect rules, gladly obey orders, respect the common interest, and willingly take responsibility. Acquiring these good habits will also be useful for their daily lives. Furthermore, glider instruction lets students understand the essentials of national defense. They will learn especially the importance of aviation [for national defense], and realize the value of their glider training (*kakkū kuren*) to Japan's security (Nihon Kōkū Kyōkai 1975: 838–839).

This short passage reveals clear parallels to Nazi education: physical exercise, paramilitary training, and the rearing of patriotic subjects who are ready and willing to fight for their country.

¹⁷ Satō's account appears in a four-volume report about the US and European aviation industry that was published by the Japanese aircraft manufacturer Kawanishi (Kōno 1939). I located this uncatalogued source in the archive of Mitsubishi's Komaki Minami Factory.



Figure 3: Low tech, high aims: A *Monbushōgata Puraimarī* glider shortly before takeoff. In the background the launching crew is preparing to stretch the two bungee cords that will catapult the glider into the air. The photo gives a sense of the rudimentary technology as well as the teamwork involved. Courtesy of Vintage Sailplane Historical Association, Fukuoka.

At the same time, the Education Ministry launched a highly successful campaign. The ministry distributed the new curriculum to each local government in August. The glider pilots Matsushita Benji and Kojima Yasuo were put in charge of glider training at all Japanese schools. By March 1939 approximately 150 secondary schools and technical colleges had glider groups; by the end of the year this number had nearly tripled, with groups at more than 400 schools. Three years later, 700 of the 2000 secondary schools for young men practiced glider training (Satō and Kimura 1999: 105).

To further unify flight training at schools, the Education Ministry even designated a standard glider type. In April 1940, with the help of a “glider design committee,” the ministry opted for a simple, open-cockpit glider type modeled on the German Grunau 9. The aircraft was assigned the rather unimaginative name *Monbushōgata Puraimarī* (‘Education Ministry-type Primary’) (see Figure 3).¹⁸ Under the ministry’s supervision the Fukuda Light Aeroplane Works produced this glider in large numbers, using a design that Wolf Hirth had brought to Japan.

18 The designation “Primary” refers to a single-seat, lightweight glider with an open cockpit.

7 Model airplanes: from toys to a pillar of national strength

During the early 1940s the perception of model airplanes underwent a remarkable transformation. What was formerly regarded as a mere children's toy became a cornerstone of Japan's aviation education. In 1939 the Education Ministry decided for safety reasons not to allow glider flying for those under 16 (*Chūgai Shōgyō Shinpō* 1939). At the same time, the ministry conceived of using model airplanes to inculcate in all schoolchildren the importance of aviation for national defense. By building and flying model airplanes the children would also learn to cooperate and to carefully carry out precision work. Furthermore, they would use domestic materials and thus respect valuable resources. Frequent competitions, the ministry asserted, would not only improve the students' skills but also encourage their fighting spirit and build group discipline.

The visit of a German specialist greatly encouraged the adoption of a "German-style model-aircraft education" as a starting point for a well-defined three-stage career that began with making model airplanes, continued with glider flying, and culminated in becoming a military aviator. In May 1941 the Greater Japan Aeronautic Association, together with the newspapers *Tokyo Nichinichi* and *Osaka Mainichi*, invited Gustav Bengsch, leader of Germany's NSFK model-airplane section to Japan. Bengsch gave lectures on how to build and fly model airplanes and how to use them for teaching in the classroom. He also had brought a number of German model airplanes with him that he displayed at public flight demonstrations in several major Japanese cities (Shimada 1987: 170).

Nagaoka Masao, an instructor for elementary school teachers, attended one of Bengsch's lectures. His comment – "I learned about the spirit of the German model airplanes movement and how it became the foundation of present-day Germany's strong air power" – shows how Bengsch's talks could persuade someone like Nagaoka of the model-airplane movement's significance to national strength (Nagaoka 1941).

Most importantly, the Bengsch mission gave the Greater Japan Aeronautic Association and the Communications Ministry a clear idea of how to organize model-airplane activities in Japan even more closely along the lines of the German NSFK. Shortly after Bengsch's visit the Dai Nippon Kōkū Seishōnentai ('Greater Japan Junior Flight Corps') was established to promote model-airplane education among young people all over Japan. By the following year, competitions were held in 49 different locations with 300,000 model airplanes participating.

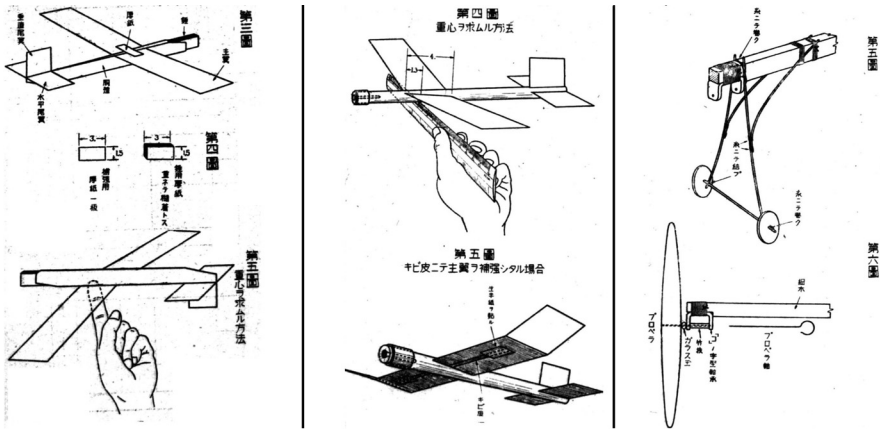


Figure 4: Diagrams of aircraft models for the first, second, and fourth grades as they appear in the 1942 Curriculum for Model Aircraft Education at National Elementary Schools. The detailed illustrations show the semiprofessional, engineer-like approach to model-aircraft building at Japanese schools. Source: Education Ministry (1942: 13, 18, 36). Courtesy of National Diet Library.

In 1942 the Education Ministry set up a syllabus closely following that of the German National Socialist Flyers Corps. The ministry published the model-airplane curriculum as a reference book for teachers. The handbook provided for each age group detailed plans and specific building instructions for a large variety of model airplanes (see Figure 4). Model-airplane building became a compulsory subject in all Japanese schools. As in Germany, rather than being taught as part of science classes it was incorporated into art education (Bengsch et al. 1942: 32). Schoolchildren started by building paper airplanes. As a next step they constructed gliders from bamboo before turning to models with rubber-band motors. At the advanced stages, students were encouraged to make their own designs or to copy German models.

Several influential bureaucrats, scientists, and aviation specialists expressed their high regard for the new model-aircraft movement. They contributed articles to a special edition of *Asahi's* aviation journal *Kōkū Asahi* that was devoted to model aircraft. One essay was written by Sekiguchi Takakatsu, an official of the Education Ministry who emphasized that model aircraft helped to bring up “good Japanese children” (*yoi Nihon no kodomo ni sodateru*) (Sekiguchi 1941: 66–67). Professor Yamamoto Mineo, a member of the Aeronautic Institute of Tokyo Imperial University, expressed a more technical view. For him Japan needed to follow the German scientific approach toward model-aircraft

building so that schoolchildren could become familiar with the basics of aerodynamics and aeronautics (Yamamoto 1941: 72–73).

Satō Hiroshi wrote in the same journal about his experiences in Germany, where he was impressed with how German children were using scientific instruments and synoptic weather charts for their experiments with model aircraft. He also noticed how the organization of children's group work was based on a division of labor that introduced the students to the basics of efficient industrial production. Furthermore, the German prohibition against using imported materials made the schoolchildren aware of the optimum use of domestic resources. For Satō the German systematic approach was a national undertaking that was clearly directed toward a national goal (Satō 1941: 81–82).

The journal also demonstrates how the Japanese model-aircraft movement was backed up by wartime propaganda that denounced the materialism and individualism of the Western democracies. The Japanese labeled their method as “German-style model-aircraft education,” by which they meant a state-guided campaign using public organizations and financed by the national budget. This practice was in a clear contrast to the “US-style model aviation” that required membership in the independent Academy of Model Aeronautics, financed entirely by individual membership fees (Ōmura 2010). A Japanese observer did not fail to comment that in his view the American model-aircraft movement was largely driven by purely personal ambitions and the prospect of winning cash prizes at competitions. His account finished with the sobering statement: “I was not impressed” (Mishima 1941: 83–85).

8 The Pacific War begins: “toward the decisive battle in the sky”

Support for the Japanese glider movement took on an entirely new dimension in the year the Pacific War began. In its 1941 New Year's edition *Asahi* announced the launch of its new “one glider for every secondary school” campaign (*Asahi Shinbun* 1941a). According to the article it was important for a powerful national defense state to “turn the eyes of the young people towards the sky.” Lamenting the poor condition of glider training at secondary schools, *Asahi* appealed to the generosity of parents, wealthy benefactors, and glider manufacturers to donate the funds necessary to provide each school with a glider. To begin the drive, *Asahi* would contribute 200 gliders.

Asahi's campaign found widespread support. The paper happily announced the cooperation of the Greater Japan Aeronautic Association and the backing

of the upper echelons of the Japanese military and government. Army Minister Tōjō declared that “*Asahi*’s campaign is timely and suitable,” and Navy Minister Oikawa stated that “the campaign has value as a national policy.” Communications Minister Murata proclaimed that “I will not be sparing with my support,” and Education Minister Hashida even pledged “without fail: one school, one aircraft” (*Asahi Shinbun* 1941b).

In an unprecedented move the *Asahi* newspaper financed the production of a huge number of gliders. On 14 May 1942, *Asahi* proudly presented its *Komadori* (‘Robin’) glider to the public. Following the Army Aviation Headquarters’ recommendations, *Asahi* had decided to copy the German Zögling glider. Like the Education Ministry’s glider, the Komadori was a simple airplane that could be easily disassembled, transported, and stored. According to the newspaper it could be assembled in less than three minutes.¹⁹

After Japan’s heavy losses in the 1942 Battle of Midway gliders gained importance, becoming an increasingly valuable tool to meet the growing demand for qualified pilots and to compensate for the acute shortage of training aircraft and aviation fuel. Throughout 1943 and 1944 *Asahi*’s campaign was kept alive with news about donations from the broadcasting corporation NHK, department store owners, Kabuki performers, and bereaved families who offered their condolence gifts. *Asahi* even collected money from its own staff in order to stoke the campaign. The company also gained the support of the Greater Japan Women’s Association (Dai Nippon Fujinkai), which pledged not only to provide “outstanding soldiers for [the country’s] aircraft and ships” but also contributed massive funds to the campaign (*Asahi Shinbun* 1943b). In its edition of 28 September 1943, the newspaper could report that the 1.6 million members of the association’s Tokyo branch had raised 630,173 yen for gliders to be used at the country’s schools (*Asahi Shinbun* 1943c).

Asahi’s Komadori together with the Education Ministry’s Monbushō-type gliders deserve a special place in Japan’s aviation history. By the end of the war, about 5,000 of these primary gliders had been manufactured in Japan. Among all wartime aircraft types, only Mitsubishi’s Zero fighter and Nakajima’s Ki-43 were produced in larger numbers.

The Greater Japan Women’s Association also became involved in the model-aircraft movement. The association encouraged Japanese mothers to attend lectures on model-airplane building in order to be able to give advice to their children on building and repair. Using the expression “wild eagle” (*arawashi*), a term usually assigned to Japan’s courageous flight crews in war

¹⁹ Peter F. Selinger, an expert on the history of gliders, has brought to my attention that this claim seems unrealistic.

songs, newspaper articles praised these “wild eagles’ mothers” (*arawashi no haha*) for raising future pilots for the army and navy (*Asahi Shinbun* 1943a). In October 1943 when the “Day of the Model Airplane” was held in Tokyo, more than 900 students accompanied by their mothers participated in a huge model-airplane contest. The event was sponsored by the Greater Japan Women’s Association under the motto “Mothers and children are building model airplanes together – toward the decisive battle in the sky.” Navy and army officers attended the event and expressed their admiration for the “future wild eagles and their mothers” (*Yomiuri Shinbun* 1943).

The rapidly growing model-airplane movement became a central part of Japan’s national mobilization. Ironically a severe shortage of building materials resulted from more than ten million students constructing model airplanes. In 1941 the Education Ministry had to step in to oversee the supply of paper, metal wire, rubber, and wood. This was a difficult task, especially with the 1938 National Mobilization Law already prohibiting the use of these materials for toys. As the fostering of aviation enthusiasm among Japan’s youth had become such a high national priority, however, the Education Ministry was able to successfully negotiate with the Ministry of Commerce and Industry and the Aviation Headquarters for the nationwide allocation of materials for model airplane building (Sekiguchi 1941: 66–67).

By late 1944, with the beginning of the Allied air raids on Japan, the model-airplane boom had come to a halt. But soon after the war ended, the Japanese model-airplane movement received some rather ambivalent kind of late recognition when in November 1945 the Supreme Command for Allied Powers (SCAP) banned all kinds of aircraft, specifically including model airplanes as well (SCAP 1945). While SCAP’s prohibition was primarily aiming at aircraft models for wind-tunnel research, Japanese officials completely prohibited the use of model aircraft at schools and many former activists resorted to a “don’t build, don’t sell, don’t fly” policy (*Nihon Kōkū Kyōkai* 1992: 471). Notably, adults discouraged children from playing with aircraft toys (Ōmura 2010). Model aircraft were no longer a means for bringing up “good Japanese children” but rather an unwelcome reminder of Japan’s militaristic past.

9 Concluding remarks

Japan’s glider and model-aircraft movement emerged as yet another manifestation of Germany’s profound influence on Japan. In the early 1940s even the most casual observer could not fail to notice the air-minded Japanese youth

るあけだれこは道く行へ空が君諸年少青

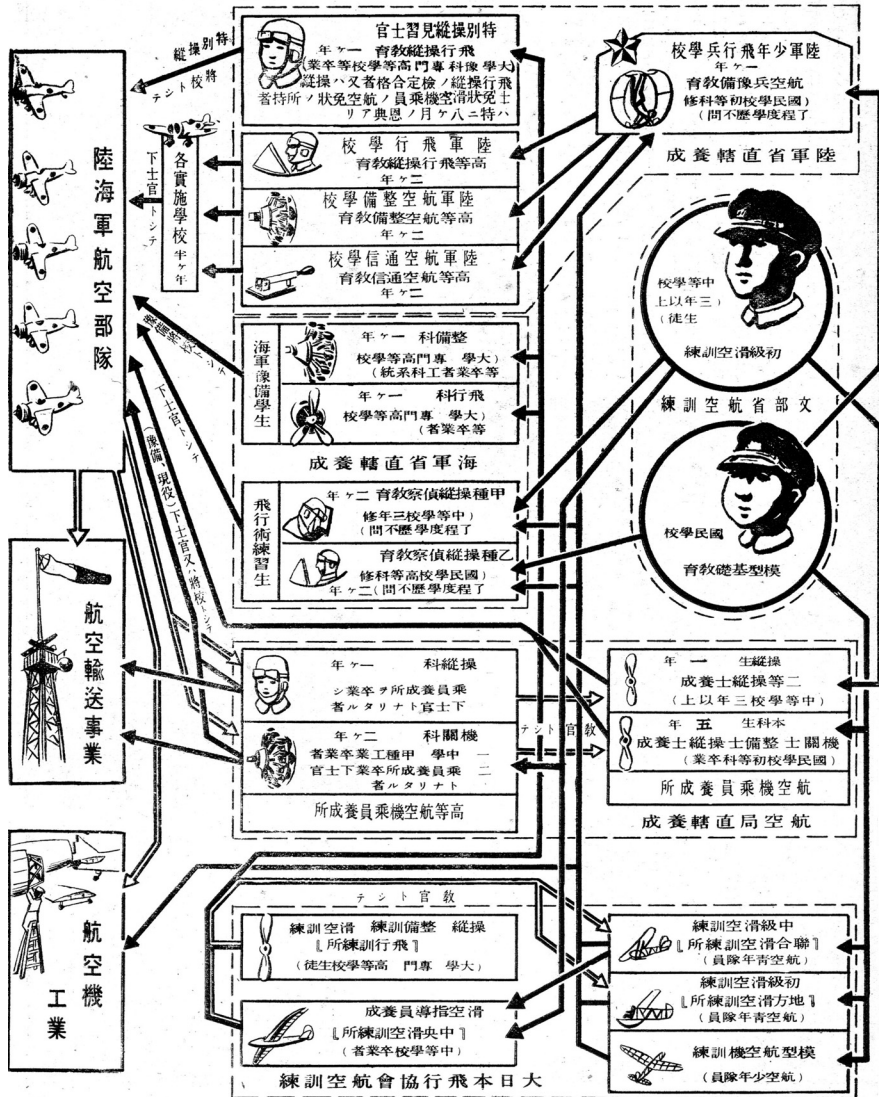


Figure 5: “For young people like you there are so many ways towards the sky.” A diagram published by the Cabinet Intelligence Bureau of Japan explains to students in elementary and secondary schools a large variety of aviation careers. It also illustrates the role of model aircraft and gliders in the training of future military pilots. Source: *Shashinshūhō*. 15 September 1943. Courtesy of Nara Prefectural Library.

sector that used every schoolyard as a test site for model airplanes and practiced glider flying at countless small airfields throughout the country. Indeed, gliders and model aircraft represented remarkably efficient vehicles of mass mobilization. These simple devices transformed unprecedented numbers of Japanese from passive spectators to active participants in the national project of creating a “second air force” of young people devoted to the defense of the fatherland (see Figure 5).

On a more abstract level such a widespread diffusion of aviation activities allows us to reevaluate the mechanisms of technology transfer. The choice of technology by the Japanese was not based exclusively on the lure of advanced machinery. The Japanese opted for German designs for low-tech gliders because these could be easily produced in huge numbers from locally available materials. Furthermore, Japan’s glider and model-aircraft movement reveals the crucial role of ideological and organizational patterns in the successful adoption of an imported technology. In the global context of total war, and air defense, Japanese officials and media strove to create mass support for aviation. The vaguely defined but powerful concepts of “air-mindedness” and “aviation ideology” prepared the ground for the import of aviation technology. Visits and reports from Germany further provided Japanese officials with a clear concept for a systematic and comprehensive aviation education. As a result, the Japanese state effectively used gliders and model aircraft to recruit the entire population of young Japanese males for the project of a nationalistic air-mindedness and military buildup.

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