

Directions to the Club Meeting Location

Where: South St. Paul Municipal Airport, a.k.a. Fleming Field, located on the southern extremity of South St. Paul, south of I-494, west of Concord Street and East of Highway 52.

if coming from the western Twin Cities going east on 494:

- Exit at the 7th and 5th Avenue exit (Exit No.65)
- Turn right (South) on 7th Ave and go approximately .6 miles to a 4-way Stop sign. This is South Street W. To your left there will be a McDonald's; to your right front there will be a Walgreen's.
- Turn left (East) at the 4-way Stop onto
- South Street W and go approximately .6 miles. Along the way you will encounter three more Stop signs—the third Stop sign (Henry Avenue) will be a "T" intersection. At the "T" intersection on your left will be homes and on your right softball fields.
- Turn right (south) onto Henry Ave. and go approximately .2

miles toward the Fleming Field airport terminal building.
if coming from east Twin Cities on westbound 494:

- Exit at the 7th and 5th Avenue exit (Exit No.65)
- Turn left (South) on 7th Ave and go approximately .6 miles to a 4-way Stop sign. This is South Street W. To your left front there will be a small strip mall; to your right there will be an Amoco station.
- Turn left (East) at the 4-way Stop onto
- South Street W and go approximately .4 miles. Along the way you will encounter two more Stop signs—the third Stop sign (Henry Avenue) will be a "T" intersection. At the "T" intersection on your left will be homes and on your right softball fields.
- Turn right (south) onto Henry Ave. and go approximately .2 miles toward the Fleming Field airport terminal building.

The terminal is on the right with parking available.

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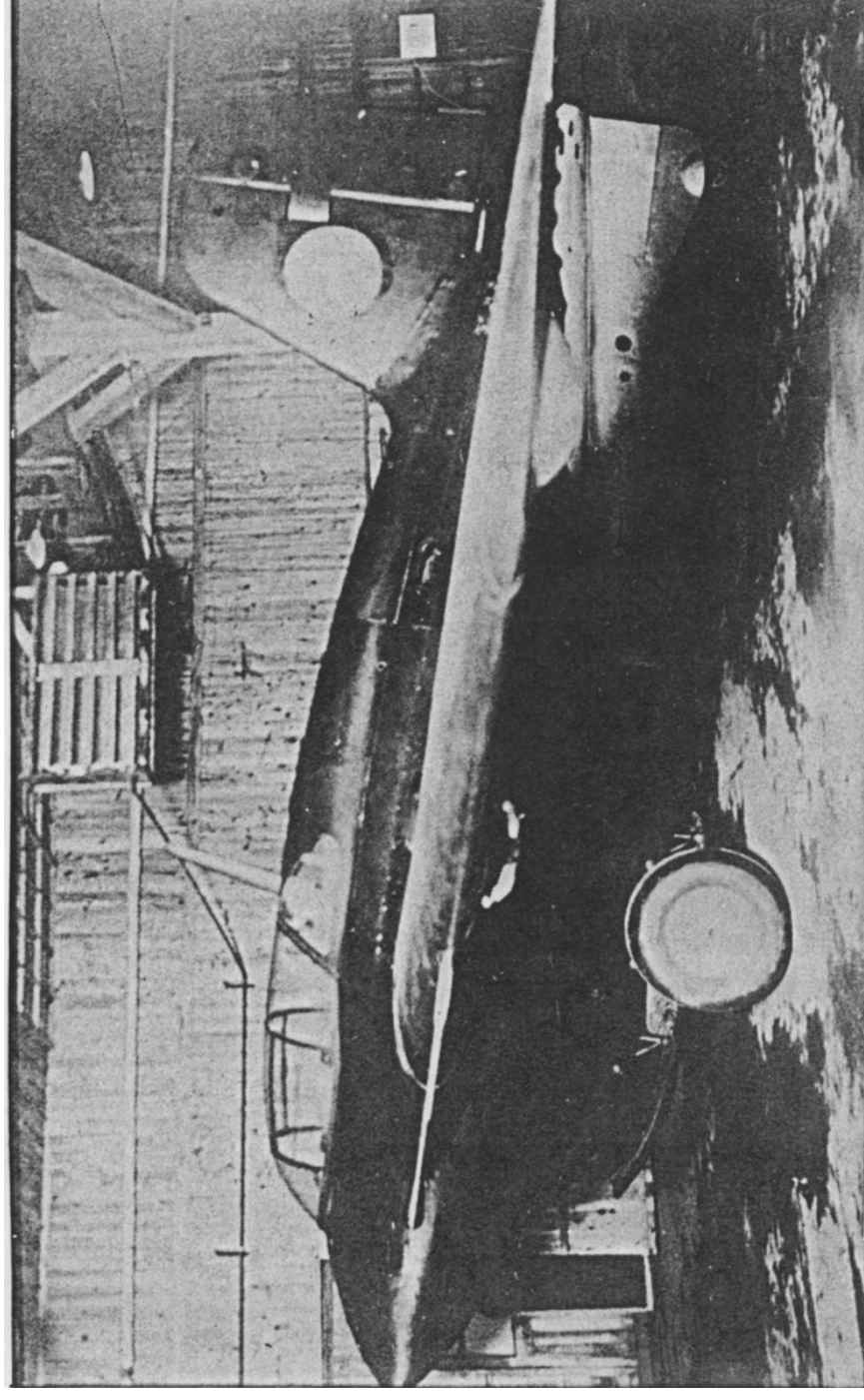
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DRAW DECALS



The Aero Historian

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February 2008



Mitsubishi J8M Shusui
B-29 raids forced production into makeshift factories, such as this one.

The Mitsubishi J8M Shusui by Rick Koehn

In the autumn of 1943 Japanese military and naval attaches were given a demonstration in Germany of the Messerschmitt Me 163B. Japan began to negotiate a manufacturing license agreement for both the Me 163B and the Walter HWK 509A rocket motor.

Arguments raged in Japan between the Army and Navy and various different interest groups as to the viability of Japanese need and use of these weapons. The least of

which was whether their industry could afford to take on another program that was technically beyond anything else they had done before. But the proponents of the program won and Germany agreed to supply complete blueprints and manufacturing data for the rocket motor and Me 163B airframe along with one complete aircraft, two sets of subassemblies and three complete rocket motors, and fuel manufacturing processes, by 1 March 1944. The Japanese were allowed to send a joint service task force to examine the German's manufacturing, assembly, and operating use of the aircraft to

assist its own production. In turn the Japanese would compensate the German government 20m (million) Reichsmark for the rocket alone.

Complete and duplicate sets of technical data on all areas of the project were dispatched to Japan by Cdr Kikkawa aboard the submarine Satsuki and by Cdr Tway aboard the submarine Matsu. The Satsuki was sunk by the Allies but the Matsu docked in Singapore on 14 July, 1944. Cdr Iwaya was immediately flown to Tokyo with his documents.

(Continued on page 4)

Twin City Aero Historian
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Minneapolis, MN 55407

Return address requested

The Aero Historian is published monthly by the Twin City Aero Historians, Inc., a joint chapter of the American Aviation Historical Society and International Plastic Modelers Society/USA, for members and readers as part of their annual dues or fees.

The group is open to aviation enthusiasts from teenagers on up who are interested in aviation modeling, photography, collecting, art and writing. For more information contact Ken Hornby at 651-552-0888

The Twin Cities Aero Historians (TCAH) meet the second Saturday of every month at 1:30pm.

See above for the new meeting locations and directions.

Mail Newsletter material and address changes to the treasurer.

TCAH Officers

President, Bob Maderich

Vice-President, Larry Donovan

Secretary, Bernie Kugel

Treasurer, Steve Jantscher

Historian, Tom Norrbohm

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TCAH This Month

The monthly meeting will be held Saturday February 9, at Fleming Field, South St. Paul, beginning at 1:30 pm. Vendor baiting will begin about 12:30, so come early.

Picture your model here! Send me a photo of your model, and it'll be used to fill these little white spaces at the ends of the columns.

GENERAL MEETING MINUTES – January 2008

Bob Maderich called the meeting to order at 1:30pm. We had some new people show up, Dave Dewitt and Randy Worenger. Welcome. John Roli, Winston, and Axel told us of new products. Steve Jantscher gave his Treasurer's report. We voted on a theme for Nordicon. "Back to the 50's" was voted.

Winston then made a pitch for having an R5 in Rochester in 2009 and asked for support from the members of TCAH.

Bernie Kugel made his current report for Nordicon. He is looking for volunteers to help. Please contact him for more information.

Larry Donovan is looking ideas from the members for upcoming demos and seminars. Please contact Larry if you have anything.

We had "Show and Tell", and then meeting was adjourned.

From the President

by Bob Maderich

Welcome to the February TCAH newsletter.

First off, thanks to everyone who voted last month for our annual awards and for choosing the 2008 Nordicon special theme. I think "Back to the 50's" will be a good theme to build for. Try something different, a jet, an airliner, heck maybe even a car!

I'm hoping to have some more forums in the coming months, be they historical or model related. I really enjoyed the ones we had in 2007. So, if you are interested in doing one, or would like to suggest one, contact Larry Donovan or myself and we'll get on it.

Looking forward to the Rochester show, always a blast, see ya there!

From the Vice President

by Larry Donovan

Firstly, my apologies for missing the January meeting. At the last minute I was "urgently" called to work (the real job; not the fun one at a hobby store). I'll spare you, the reader, from the details; but be forewarned, this does give grist for this writer's mill in a later issue.

I am going to keep this month's column short, covering a few issues I would like to get started ASAP with the club's support:

The Guest Speaker Forum

Please let me know if you are interested in giving a presentation for our meetings. It does not have to be over 20 minutes; we do not expect the smooth delivery of a Presidential candidate on the hustling; and we do promise that this will increase our knowledge of something about modeling, history, or both. Contact me at home, or at the meeting, or email (win1tang2@usfamily.net)

Judges' School

Let's face it. We as a club have been extraordinarily lucky in having great judges at our Nordicon. They work very hard under a very tight deadline and have done a great job each and every time.

And, let's face it, we are burning them out. One of the issues in running for this job (just one heart beat away from our fearless leader!) is that we need to expand our "corps d'judge(s)". If we want this to happen we need a Judge's School to help this process along. Our experienced judges can teach our novices what to look for and how to evaluate models in different categories. After going through this process, potential judges can receive practical experience by being more confident when you are at another groups show and they ask you to judge. We can run a "simulated contest" at a future

(Continued on page 3)

field at Yokoku close to the Natsushima facility to afford the pilot the safety of ditching into the ocean rather than jeopardize a forced landing over land in the event there were problems during take off. By July 5 it was decided the rocket motors were tuned enough to try a flight in two days. The J8M1 weighted 5,401 lbs with 127.5 gals of Ko-liquid and 35 gals of Otsu-liquid. The test pilot, Toyohiko Inuzuka fired the rocket motor at 1655 on July 7, 1945. In 11-second and a run of only 350 yards the Shusui smoothly lifted off, and jettisoned the dolly from about 30 feet. Everyone was excited with the success. After passing through 1,000 feet the engine started shooting out puffs of dark smoke, and quit. Inuzuka leveled off going through 1,500 feet, and began a right turn, gliding back to the field. He jettisoned the Ko-liquid while making a series of turns to line up on the runway, but had lost too much speed. He pulled up into a stall to avert crashing into a house, the right wing dropped hitting the roof and the aircraft cart-wheeled into the open ground just short of the airfield. Both wings were torn off, and the forward fuselage heavily damaged. Inuzuka died from his injuries. It was the only flight of the J8M1.

The rocket engine had quit from fuel starvation. The Ko-liquid tank was only half full and the outlet was

at the base of the tank. In a steep climb the fuel couldn't reach the outlet. Within days rocket motors had exploded at both test centers, leaving only one completed rocket motor. This unit had arrived at Kashiwa airfield, Chiba, and was being installed in the second completed Shusui when hostilities ended.

It had been one year, one month and a day since the plans and data for the Me 163B and HWK 509A rocket motor had been disembarked at Singapore to the end of the war. During this time the military and Mitsubishi had completed four Shusui airframes, six more nearly complete on the assembly line, four production Ro.2 motors had been completed with another two nearly done and parts for 20 more manufactured. It had been an amazing accomplishment.

Production of the Akikusa had been reassigned to Maeda who had completed 50-60 of them. It was being proposed to install water tanks in the Akikusa's to be able to simulate the handling characteristics of a loaded Shusui for pilot training. The Navy was also looking at producing the wooden Akikusa for combat dubbed Shuka (Autumn Fire) and rather than the Ro.2 rocket motor it would use the Tsu.11 ducted jet engine of 441 lbs/thrust. This comprised of a four cylinder 100 hp Hitashi engine

acting as the gas generator in a Campini style jet (Some sources quote 551 lbs/thrust). This unit was the power plant for the Okha-22 suicide weapon.

Other versions under consideration included a J8M2 which eliminated one of the cannons for additional space for fuel. The Army which wasn't pleased with the decision to duplicate the Me 163B as closely as possible only proposed installing different cannon in their aircraft. But as of 1 March, they had launched a major redesign under the designation Ki-202 Shusui-Kai. This was to have been the Army's primary interceptor from 1946 on, after cutting their teeth with the J8M1.

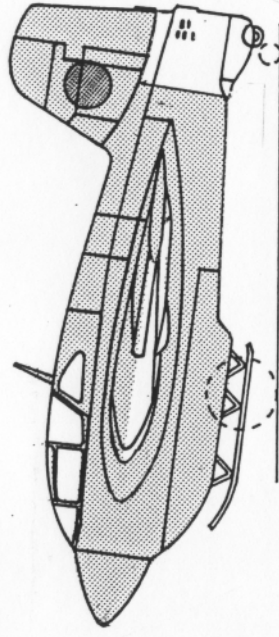
Two Shusui's were transported to the US for evaluations, one for the Navy and one for the Army Air Force, at the end of the war but were never flown. After evaluating theirs, the Navy put it on display at Glenview NAS. Fate of this aircraft is unknown. The Army aircraft was studied at Wright Field and then declared surplus. After touring West Coast cities, it was put in storage in 1947. It was eventually saved from destruction in 1950 by Ed Maloney and is now part of the Air Museum Planes of Fame Museum in Chino, California.

ON THE TABLE JANUARY 2008

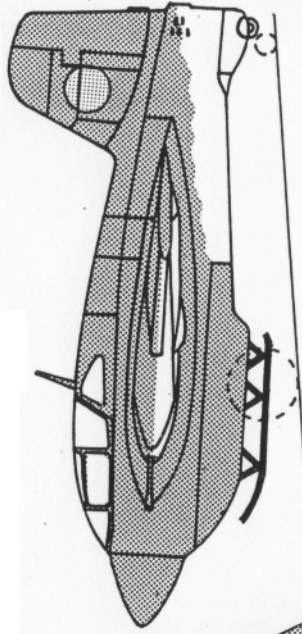
Name	Scale	Manufacturer	Name	Model	Scale	Manufacturer
Bernie Kugel	1/48	Aurora	Steve Hustad	Derelict Bf.109K Diorama	1/72	Finemolds
Bernie Kugel	1/32	21st Century	John Dunphy	Bf.109K WIP	1/32	Hasegawa
Bernie Kugel	1/700	Aoshima	Rick Koehnen	Northrop JB-10	1/72	12 Squared
Bernie Kugel	1/700	Hasegawa	Rick Koehnen	Dayton-Wright RB-1	1/72	12 Squared
Jim Kloek	1/700	Hi-Mold	John Eian	RF-84F	1/48	Heller
Don Stauffer	1/48	Eduard	Steve Erickson	Mig-3 WIP	1/48	Trumpeter
Don Stauffer	1/48	Rareplanes	Hike Mishler	37 Ford 2-door	1/24	Monogram
Mark Jacques	1/35	DML	Kyle Nelson	German soldier	1/16	DML
Tom Norrbohm	1/144	Sweet	Kyle Nelson	Red Army Sherman	1/35	DML
Tom Norrbohm	1/144	Platz	Kyle Nelson	IT-28 Bridge Layer	1/35	ICM
Bob Maderich	1/20	Studio 27/ Tamiya	Sean Brzozowski	Tiger I	1/48	AFV Club
Steve Jantscher	1/35	T-43/76 STZ	Sean Brzozowski	King Tiger	1/48	Tamiya
John Bernier	1/48	F4U-5N				

J8M1 Shusui specifications:

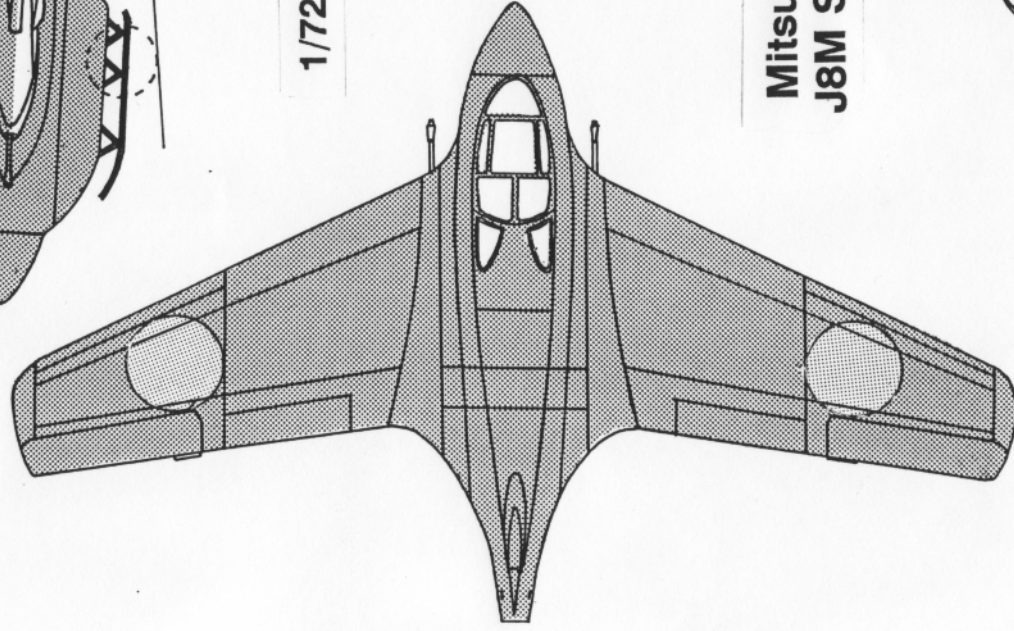
Wing span 31' 2"
 Length 19' 10 1/4"
 Height 8' 10 1/4"
 Weight empty 3,318 lbs
 Weight loaded 8,565 lbs
 Max speed 559 mph
 Climb 19,685' in 2.26 min
 32,810' in 3.5 min
 39,370'
 Ceiling
 Armament 2 - 30mm Type 5 cannon
 Engine 1 - Toku Ro.2 of 3,307 lbs/thrust for 5-5.5 min



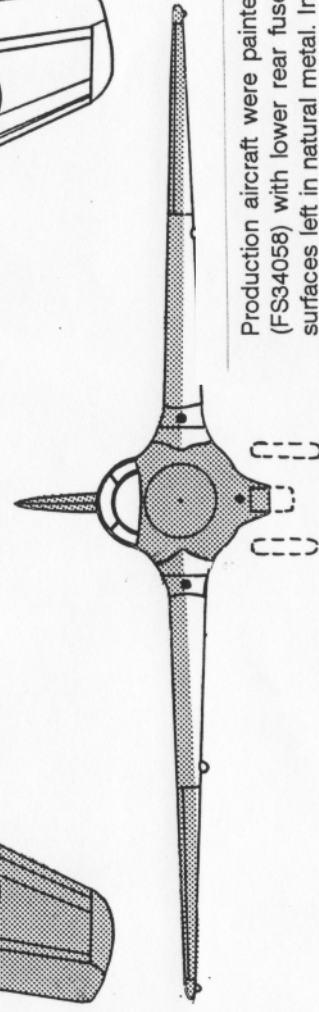
Prototype J8M was painted orange overall with rear fuselage and under surface of wings left natural metal. Plain red Hinomarus placed in six locations.



1/72 Scale



**Mitsubishi
 J8M SHUSUI**



Production aircraft were painted overall Dark Green (FS34058) with lower rear fuselage and lower wing surfaces left in natural metal. Interior should be blue-green. Plain red Hinomarus were placed in four wing and two tail locations.

club meeting; or if the club allows, use an "On the Table" from a regular meeting. If we want to have a judged show for 2009, now is the time to start training. If you are a judge willing to "show us how" or if you are interested in becoming a judge, let me know through the contacts above.

Upcoming Contests for our area:

Feb 2nd Hope it Don't Snow in Rochester, at a new facility, the Kaehler Hotel: contact Ed St. Denis or see the website for the Zumbro Valley Modelers

March 1st "Mad City Modelers 13th Annual Contest" at the Radisson in Madison WI. See the Mad City website or contact Jim Turek at 608-329-7222

March 29 "3rd Annual Model Contest" by the IPMS South Minnesota; contact Dan Bauer at 507-427-2729.

April 12 "14th Annual Plastic Surgeons Contest" West Des Moines IA. See the IPMS Plastic Surgeons website or contact Robert Folder 515-664-4900

May 16th-17th Region 5 Regional Contest hosted by IPMS Fort Crook. The venue is the Mid-America Center in Council Bluffs IA. Contact Scott.hackney@cox.net or contact Scott at 402-598-6114. Having been to the site for Omacon 2007, I can tell you it is a great site. There is a Country Inn and Suites adjacent to the hall, and you are spittin' distance from the casinos if so inclined.

Went a little long (again!) but see you at the February meeting!



Airline Chatter
 by Terry Love

Embraer announced an order from Republic Airlines, the commuter airline, for 11 Embraer 175

airliners. Value of the deal is \$344 million. Republic Airlines is the largest operator in the world of Embraer airliners with 101 currently in their fleet. The Embraer 175 has 76 seats - 12 in first class and 64 in coach. By the end of 2007, Embraer had delivered 712 and had orders for 756 more, for a total of 1,468 Embraer 175s. The Embraer 175 is operated by 43 airlines in over 30 countries.

Maxjet, the two year old, all-business class airline serving trans-Atlantic routes, ceased operations on Christmas day, and filed for bankruptcy protection in the face of high fuel costs, and fierce competition. They operated 4 Boeing 767-200 aircraft.

Air Astana, the airline of the central Asian nation of Kazakhstan, ordered 6 Airbus A-320s and 3 Boeing 787 Dreamliners for a combined price of \$950 million. Air Astana presently has 18 jets.

British Airways ordered 24 Boeing 787 Dreamliners. The order is valued at \$4.4 Billion. British Airways took an option for 18 more.

GOL, the airline of Brazil, ordered 34 Boeing 737-800s completing a purchase option for 121 airliners. This brings GOL fleet to 161 Boeing 737-800s.

Air China is the world's most valuable airline in terms of assets.

China has agreed to relax most of the airline restrictions on commercial aviation (airlines) by letting carriers expand flights and cargo services. In other words, China just de-regulated her airline industry.

Boeing now has 790 orders for their 787 Dreamliner.

United Airlines cancelled more than 1,000 flights around the Christmas holiday due to bad weather. The average airliner holds about 140 passengers. So, that is more than 140,000 passengers that

had their plans disrupted.

Jeju Air, a Korean low-cost carrier, ordered 5 Boeing 737-800s on the last day of 2007. Cost of deal is \$370 million.

Lufthansa will hire 4,300 new employees this year - all in Germany.

Boeing received a record firm orders for 1,413 airliners in 2007. Boeing had orders in 2006 for 1,044 airliners. Third year in a row that orders have been over 1,000.

Boeing delivered 330 Boeing 737s, 83 Boeing 777s, 16 Boeing 747s, and 12 Boeing 767s, for a total of 441 delivered in 2007.

Boeing and Airbus both predicted a very sharp decline in airline orders for 2008. Boeing and Airbus had record orders and deliveries in 2007.

Delta Airlines and some other major airlines (like Northwest Airlines) will merge this year - prediction from me!

Gulf Air ordered 16 Boeing 787 Dreamliners worth \$3.4 Billion. Gulf Air also purchased 8 Airbus A-320s for \$520 million.

Air Pacific, the airline of Fiji, ordered 3 more Boeing 787 Dreamliners. Deal is worth \$580 million.

Airbus delivered a record 453 airliners in 2007. In 2006, Airbus delivered 434, but in 2008, Airbus is planning to deliver 470 airliners. Boeing wins in this category.

Airbus received 1,341 orders in 2007 for a total value of \$157.1 Billion, compared with 790 orders in 2006. Boeing wins in this category.

Northwest Airlines and Delta Airlines have started merger talks. If Delta Airlines ends up merging with United Airlines (unlikely), then Northwest will drop out of the

(Continued on page 4)

<p>(Continued from page 3) merger.</p> <p>Boeing announced the sale of another Boeing 787 Dreamliner to a VIP individual. Boeing has now sold 841 Dreamliners to 55 different customers, including a record-breaking 369 orders in 2007.</p> <p>Northwest Airlines's fleet plans for 2008 consist of parking about 24 Douglas DC-9s, and 3 Boeing 747-200s.</p> <p>United Airlines wild hold merger talks with Continental Airlines if United does not make a deal with Delta Airlines (unlikely).</p> <p>Boeing announced that for the year 2007, the 747 program surpassed the 1,500 order mark sold. The 767 program surpassed the 1,000 orders mark. The 737 reached the 7,000 sold mark. Boeing sold 25 private VIP aircraft, including 8 wide-bodied aircraft. The 777 program also surpassed the 1,000 sold milestone.</p> <p>Air France, who owns KLM, has offered to help speed along a possible Delta Airlines - Northwest Airlines merger. All are members of the Sky Team Alliance.</p> <p>Northwest Airlines's major hang up on the merger could be the deal that they have with MAC-Metropolitan Airports Commission. If NWA moves their headquarters, there is a \$215 million penalty. NWA might be also forced into early repayment of a \$245 million bond which is due by the year 2022. Delta does NOT have any type of a deal with Atlanta's airport commission. Delta says that its headquarters WILL remain in Atlanta under ANY merger conditions that they negotiate. A combination of Delta and either Northwest or United, would be the largest airline merger in history.</p> 	<p>COMPARING DELTA AIRLINES'S POSSIBLE MERGER PARTNERS by Terry Love</p> <p>The following is a look at each potential merger, as well as some pros and cons if either United Airlines or Northwest Airlines merge with Delta Airlines.</p> <p>Combined market share - Delta and United - 29% Delta and NWA - 23%</p> <p>Combined fleet- Delta and United - 900 aircraft Delta and NWA - 811 aircraft</p> <p>Combined revenue - Delta and United - \$37.7 Billion Delta and NWA - \$29.9 Billion</p> <p>Total employees- Delta and United - 98,600 Delta and NWA - 76,000</p> <p>Key markets - <u>Delta and United</u> - Combines two largest US hubs (Atlanta and Chicago) and Delta's trans-Atlantic and east coast networks with United's Asian, midwest and west coast markets. <u>Delta and NWA</u> - Combines NWA's great Asian, and midwest routes with Delta's trans-Atlantic, east coast and eastern presence.</p> <p>Pros - <u>Delta and United</u> - On paper, many industry "experts" say that this is a great match. The carrier would have a truly global reach, and both operate many of the same type of airliners. <u>Delta and NWA</u> - Global reach and more opportunities to cut costs. Delta's CEO Richard Anderson and NWA's CEO Doug Streenland know each other well, which could help smooth top-echelon integration issues. A merger of these two would be more acceptable to the government.</p> <p>Cons - <u>Delta and United</u> - Government could block creation of such a massive airline. United</p>	<p>has several unions, while only pilots are unionized at Delta, so labor integration would be very complicated. Both airlines have hubs in the west - Delta in Salt Lake City and United in Denver. One would have to go. <u>Delta and NWA</u> - NWA is much more unionized than Delta, and that presents a major problem of integration. The fleets do not match as well as the possible United merger. Delta has hubs in Cincinnati and Atlanta and NWA has hubs in Detroit and Memphis. At least two would have to go.</p> <p>Impact on headquarter cities - <u>Delta and United</u> - United is a larger carrier and the better-known brand. That would give United its leverage to keep the surviving name and possibly keeping the headquarters in Chicago. Atlanta will remain the same as far as flight hubs, so there would little effect on air service to the city. <u>Delta and NWA</u> - NWA is smaller than Delta, so it is more likely that Delta would be the surviving brand and the headquarters would move to Atlanta. The Atlanta flight hub would remain the same.</p> <p>What ever happens, it will happen fast. It should be completed this year - 2008.</p>  <p>(Continued from page 1) The argument still continued over whether Japan should devote so much of their resources to developing this radical weapon. The Commanding Officer of the Air Technical Arsenal, Vice Admiral Misao Wada argued that a desperate affliction called for a desperate remedy. With that, the Navy tasked Mitsubishi to develop a Japanese version of the Me 163B under the 19-Shi specification. It was to be designated the J8M1 in Navy use and the Ki-200 by the Army. Its name was to be Shusui (Sword Stroke).</p> <p>The documentation that (Continued on page 5)</p>
<p>(Continued from page 4) reached Japan was not complete and the Army and Navy split in development views. The Navy wanted to stay as close to the German plans as possible while the Army thought that little more time would be wasted totally redesigning the aircraft to attain a desired improvement in endurance, since missing areas would have to be reengineered anyway. The Navy decision finally prevailed.</p> <p>The Mitsubishi Nagoya plant was assigned the task of constructing the J8M1 and from the first full scale meeting on 7 August the military differences were set aside. Cockpit mock-up was 18 days later on 26 Sept. Production called for 155 aircraft before March, 1945, 1,300 by September and 3,600 by March, 1946.</p> <p>Under the leadership of Mijiro Takahashi, the Mitsubishi team had to make a lot of educated guesses in the areas of missing data since there was no time to reengineer everything. As they would finish an area the plant would produce the parts. Three airframes began to take shape, one a structural test article, the others were to be 'heavy gliders' to test the flight characteristics. In Germany Dr. Lippisch had been building tailless aircraft for more than 25 years, this would be the first one for Japan and they wanted hands on experience before trying it with a rocket motor. Two areas that required purposeful deviation from the German aircraft was in the nose, to accommodate the larger Japanese radio suite and the wing roots, to accommodate the larger Japanese cannon. This latter deviation required a lengthened chord at the root by nearly 4" which they then carried out to the wing tip increasing the length of each wing by 4".</p> <p>The Navy Air Technical Arsenal at Yokosuka was assigned to create a full scale wooden glider version which would be designated MXY8 Akikusa (Autumn Grass).</p>	<p>The first one completed was sent to the 312th Naval Air Group Hyakurigahara airfield which was to be the first unit to operate the J8M1.</p> <p>Lt Cdr Inuzuka made the first flight of the MXY8 on 8 December 1944 after being towed into the air behind a K1 OW1. Reports we favorable as were those of the second Akikusa which had been sent to the Army Aeronautical Research Institute at Tachikaw.</p> <p>On December 1, the structural test item was inspected. A week later while being tested it was severally overstressed and distorted during a series of strong earth tremors. On 18 December the Ohe plant which was building the 'heavy gliders' was hit by a B-29 raid. The test article and unfinished 'heavy gliders' were moved into a mountain cave plant at Taura, Yokosuk. Both the Ohe and Nanko plant continued to build a number of pre-series Shusui's. Despite these problems the first 'heavy glider' made its first flight on January, 8, 1945, at Hyakurigahara, towed behind a B6N1 Tenzan.</p> <p>The only flight differences between the 'heavy glider' and the Akikusa were minor trim adjustments at takeoff. It weighted 2,286 lbs for these tests which detected some elevelon vibration in excess of 184 mph. This was resolved by reducing the wing-elevelon gap and the length of the Frise balance. By March the Navy had satisfactorily concluded its testing. The second 'heavy glider' had been sent to the Army who felt there was no need to hurry the program. When it did finally begin in August the aircraft separated from the tow plane prematurely, and crashed in a wooded area.</p> <p>By late December 1944 the first pre-series Shusui was completed and delivered to the Navy with a dummy engine installed. Therein was the problem. While Mitsubishi was able to adapt and modify the</p>	<p>Me 163B data into a completed airframe, the work on the HWK 509A rocket motor had not gone as smoothly. Two divisions of Mitsubishi's industrial base along with the Navy developed the engine known as the Yoku Ro.2 or KR-20. Production of the fuel or T-stoff as the Germans called it, was to be accomplished by the Navy's 1st Fuel Arsenal with the Mitsubishi Kasei and Edogawa Kagaku chemical companies. The Ko-liquid (T-stoff) was 80 percent hydrogen peroxide (H2O2) plus oxyquinoline and pyrophosphate as a stabilizer while Otsu-liquid (C-Stoff) was 30 percent hydrazine hydrate (N2H4) in methanol (CH3HO) and water with a little copper potassium cyanide. Problems were encountered with building a satisfactory turbine pump and just as the problems were solved, B-29's attacked the plant forcing work to move. Many of the materials the Germans used were unable to be duplicated in war torn Japan. Chrome steel was used in place of stainless steel in parts of the pump and this led to explosions of the units. A separate pump design, KR-22, was started but it also exploded and was then abandoned, all effort going back into the KR-20.</p> <p>On 11 April, 1945, more than three months behind schedule, it was decided that if a test bed KR-20 could be run efficiently for 2 minutes it would be installed in the Shusui and flown on 22 April. The unit exploded during the two minute test run. Development was shuttled around to avoid the bombing raids. Both the Navy and Army were running separate tests, trading data in the effort to achieve a 2 minute run. In mid-June the Navy had run a successful 4 minute test and the Army a 3 minute test. It was decided to use the actual bench test motors for the actual flight and one Ro.2 was taken to Natsushima to be installed in the waiting J8M1 airframe.</p> <p>The first completed Shusui was taken to a relatively small coastal (Continued on page 7)</p>
<p>By late December 1944 the first pre-series Shusui was completed and delivered to the Navy with a dummy engine installed. Therein was the problem. While Mitsubishi was able to adapt and modify the</p>	<p>The first one completed was sent to the 312th Naval Air Group Hyakurigahara airfield which was to be the first unit to operate the J8M1.</p> <p>Lt Cdr Inuzuka made the first flight of the MXY8 on 8 December 1944 after being towed into the air behind a K1 OW1. Reports we favorable as were those of the second Akikusa which had been sent to the Army Aeronautical Research Institute at Tachikaw.</p> <p>On December 1, the structural test item was inspected. A week later while being tested it was severally overstressed and distorted during a series of strong earth tremors. On 18 December the Ohe plant which was building the 'heavy gliders' was hit by a B-29 raid. The test article and unfinished 'heavy gliders' were moved into a mountain cave plant at Taura, Yokosuk. Both the Ohe and Nanko plant continued to build a number of pre-series Shusui's. Despite these problems the first 'heavy glider' made its first flight on January, 8, 1945, at Hyakurigahara, towed behind a B6N1 Tenzan.</p> <p>The only flight differences between the 'heavy glider' and the Akikusa were minor trim adjustments at takeoff. It weighted 2,286 lbs for these tests which detected some elevelon vibration in excess of 184 mph. This was resolved by reducing the wing-elevelon gap and the length of the Frise balance. By March the Navy had satisfactorily concluded its testing. The second 'heavy glider' had been sent to the Army who felt there was no need to hurry the program. When it did finally begin in August the aircraft separated from the tow plane prematurely, and crashed in a wooded area.</p> <p>By late December 1944 the first pre-series Shusui was completed and delivered to the Navy with a dummy engine installed. Therein was the problem. While Mitsubishi was able to adapt and modify the</p>	<p>Me 163B data into a completed airframe, the work on the HWK 509A rocket motor had not gone as smoothly. Two divisions of Mitsubishi's industrial base along with the Navy developed the engine known as the Yoku Ro.2 or KR-20. Production of the fuel or T-stoff as the Germans called it, was to be accomplished by the Navy's 1st Fuel Arsenal with the Mitsubishi Kasei and Edogawa Kagaku chemical companies. The Ko-liquid (T-stoff) was 80 percent hydrogen peroxide (H2O2) plus oxyquinoline and pyrophosphate as a stabilizer while Otsu-liquid (C-Stoff) was 30 percent hydrazine hydrate (N2H4) in methanol (CH3HO) and water with a little copper potassium cyanide. Problems were encountered with building a satisfactory turbine pump and just as the problems were solved, B-29's attacked the plant forcing work to move. Many of the materials the Germans used were unable to be duplicated in war torn Japan. Chrome steel was used in place of stainless steel in parts of the pump and this led to explosions of the units. A separate pump design, KR-22, was started but it also exploded and was then abandoned, all effort going back into the KR-20.</p> <p>On 11 April, 1945, more than three months behind schedule, it was decided that if a test bed KR-20 could be run efficiently for 2 minutes it would be installed in the Shusui and flown on 22 April. The unit exploded during the two minute test run. Development was shuttled around to avoid the bombing raids. Both the Navy and Army were running separate tests, trading data in the effort to achieve a 2 minute run. In mid-June the Navy had run a successful 4 minute test and the Army a 3 minute test. It was decided to use the actual bench test motors for the actual flight and one Ro.2 was taken to Natsushima to be installed in the waiting J8M1 airframe.</p> <p>The first completed Shusui was taken to a relatively small coastal (Continued on page 7)</p>