M.A.R.C.S. SPARKS

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Come Fly With Us

MARCS meetings are held on the first Thursday of every month at 7:00 P.M. in Room 201B of the Madison Labor Temple, 1602 S. Park St. in Madison. Visitors are always welcome. We think we have a great hobby and we invite you to come and see and consider joining us.

Officers:
Pres: Wayne Lanphear, bgbird@charter.net
Vice Pres: Don Weigt, 608-238-9402
Secty: Burr Fontaine, 233-9063
Treas: Ed McDonald, 608-249-0734

Membership information:
Ed McDonald
Phone 249-0734

Flight Instruction Coordinator:
Dan Dudovick
Phone 273-4339

Mail address for official business, **other than for publication in SPARKS**:
PO Box 8864
Madison, WI 53708

MARCS Web Site: **www.marcswi.org**
Web Master: William Velez
william@velez.org
The MARCS web site contains links to War Birds and Electric Flyers Special Interest Group web sites

Editor: Jerry Buss
1809 Browning Rd
Madison, WI 53704
e mail: jbuss@itis.com Phone: 244-8534
Contribution of articles is encouraged. Deadline for submittal is the 20th of the month.

Minutes of MARCS General Membership Meeting, April 3, 2003

By Burr Fontaine

The meeting was called to order by President Wayne Lanphear at 7:10 p.m. with 44 in attendance.

New Members: **Mark Mikol** is a new member that just moved to Fitchburg from the Chicago area. Mark has two planes: a trainer and a Four Star 60 with a Saito .91 in it. **Chad Price** and son **Noah** joined tonight and both want to learn to fly. **Nicholas Schwandt** joined recently as a junior member. **Ralph Culver** is a former MARCS member and has rejoined tonight.

Treasurer s Report: An updated financial report is available for review during the meeting by anyone interested. Ed McDonald indicated our present membership total is 132 this year compared to 149 at this time last year. This represents a year-to-date income for the club of $700 less this year than last year at this time.

Old Business: After the last snow melted, several tire ruts in a circular pattern were found in the newly seeded part of the field. Thanks go out to **Mike Kimmerly, Bill Kinney,** and **David Raimond** for raking them out.

New Business: **Mike Kimmerly** is looking for a small (6 or so) group of volunteers to put a new roof on the shelter on Saturday, April 5. The regular Annual Field Work Day is scheduled for April 12 at which time new spectator and pit fences will be put up. The money for the fences has been donated by **Schultz Sport and Hobby.** Workers should bring their own tools such as pliers, wire cutters, etc. Brush trimming along the northern, east-west drainage ditch is also scheduled for the day. **Jerry Buss** is organizing food for all at noon.

Dan Dudovick reported on flight instruction plans. The new pilot orientation day is scheduled for the morning (9 a.m.) on Saturday, May 3. New and beginning pilots will have a chance to get some stick time with either their own plane or one that will be provided. Dan expects to have 5 or 6 instructors and 4 or 5 trainer

planes available. This is also a time for experienced pilots who are interested in teaching to get some experience as an instructor on a buddy-box cord with Dan as the student. Four or five new instructors have signed up to help with lessons this year. Dan still needs more instructors and has a goal this year of one student per instructor. Can you help?

The only event scheduled for June is the Big Bird Rally on the 14th. In July, there is the Electric Fly-In on the 5th, the Boy Scout Fun-Fly on the 12th, and the Float Fly and Picnic on the 20th. More details on these at a later meeting.

Raffle: Our thanks to Harley Nelson for the donation of his handmade glass swans as prizes tonight. **Winners: Wayne Lanphear** - Gallon of fuel; **Mike Kimmerly** - " flight pack; **Lindley Wolff** - Cutoff saw**; Dick Brandt** - Voltmeter**; Ed McDonald** - T-shirt; **Joe Imilkowski** - Swans; **Dick Brandt** - Swans; **Scott Schwandt** - Gallon of fuel.

Show & Tell: Show & Tell pictures are on the Club s website, www.marcswi.org. **Tom Lazar** brought a pattern for the center section for a 101" Stuka dive bomber. The nicely detailed pattern will be used to fabricate a fiberglass mold which in turn will be used to mold as many fiberglass center sections as desired. The future wing will consist of a set of foam core wing panels and a fiberglass center section. **Greg Baer** brought the fuselage for his Extra Easy trainer to the meeting for a checkout. Greg was pleased with the ease of the assembly. **Pamorn Wongkit** had a very nice looking, mid-wing, .46 size plane that he designed himself. **Tim Green s** plane is a 9-oz, Big Buzzy electric park flyer which he modified to have a V-tail. Tim has had some 23-minute flights with it at the Dome. **Bill Kinney s** newest plane is a US Aircore Coroplast Colt which he says took 9 hours to build and €NL flies great. **Harley Nelson** continues to show up with the unusual. This time it is PBY-5-A Water Bomber Fire Fighter with a pair of SuperTigre .90 engines. Some of the features include a water pickup probe and an outlet valve that can be remotely operated in flight to fill and empty the drop tank. Harley also made a number of modifications to the foam wings to strengthen them.

The meeting adjourned at approximately 8:45 p.m.

Philosophy 101

I came, I saw, Iran.

Anonymous Iraqi Fighter Pilot

Big Indoor Electric Event

By Dave Rush

Madison Indoor Electric Flyers invite you to our last indoor fly of the season. It's on **Sunday, April 27** at the Urban Links Golf Dome starting at 7:00 AM and running to 9:30. Doors open at 6:45.

The dome is located off Verona Road on Madison's southwest side, on **Highway PD just west of Highway 151.**

Cost is $15 for pilots, spectators free. Please contact me, Dave Rush, at djrush@hotmail.com or at 838-9704.

We will be taking pictures and sending an article to Quiet Flyer Magazine, hopefully for publication. Plans for the day beside open flying may be:

- 1. Pylon racing with different classes;
- 2. Spot Land and penny drop;
- 3. Combat;
- 4. How many planes can we get in the air at once!!! (12 is the most so far - we hope to make it look like a beehive!!)

We are hoping to have a picture with everyone that has flown at the dome at some time. Come on out and check it out, even if just to observe - we will need lots of spotters for the mass launch - hopefully not to help pick up the carnage!!

Field Work Day Report

There was a good turn out for our once a year day of fixing up at the field. The Fencing that **Charlie Schultz** donated to the club was all installed and it looks great. I think it's a big improvement where both appearance and utility are concerned. A word of caution to pilots, however: if you manage to taxi into it don't expect it to be as forgiving as the old plastic stuff was. In addition, some timber cutting and bridge fixing got done. It was finished before noon. I served Sloppy Joes to the crowd and we came within about three servings of coming out even. I misjudged the temperature, however. We should have had hot chocolate instead of cold Coke. Following are the guys who turned out, at least to the extent that they signed the attendance sheet.

Ed McDonald	**Greg Baer**	**Dave Rush**
Harvey Kerns	**Bob Geimer**	**Harley Nelson**
Ozzie Johnson	**Paul Schulte**	**Bill Kinney**
Mike Kimmerly	**Burr Fontaine**	**Merlin Seals**
Romey Bukolt	**Scott Nelson**	**Jerry Buss**
Randy Allhands	**Frank Baker**	**Les Thorp**
Wayne Lanphear	**Tom Lazar**	**Bill Disch**
Dave Jeardeau	**Don Weigt**	**Mike Kelly**

Jeremy Kelly **Mike Pirkl** **Steve Kettle**
Vince Calandrino

New Pilot Orientation Day

New members who have not yet soloed should remember that May 3 is your day to get in some stick time. Come on out to the field about 9:00 AM, get your plane checked out, get yourself checked out on field safety rules and get on a buddy box with an instructor and fly! It's your day, so take advantage of it.

RC Flying on Cable TV

By Romey Bukolt

For those who have Charter digital cable, I discovered that on channel 122 at 10:30 p.m. on Thursdays there's a half hour program featuring RC products presented by Chris Chiannelli (Model Airplane News editor?). The channel is called the "Do It Yourself" channel and has a website www.diynet.com.

Whizzer's War Bird Report

By Craig Lovell

Background: The North American P-51 Mustang started out as a very different airplane from the version that most people think of when they hear the name. It got its start as a design using an Allison V-12 engine and went to war as the A-36 Apache with that engine and dive brakes. Later it was fitted with a Packard built Merlin engine and the high altitude performance and fuel economy permitted it to escort the heavy bombers to the target and back.

First Impressions: The kit I'm reviewing is the Hangar 9 Almost Ready To Fly (ARF) .60 size P-51 Mustang. I haven't assembled many ARFs but of the few I've put together a couple have been Hangar 9. My experiences have been mixed. The 80" Cub was a nice flying plane but the wooden motor mount failed the first time I started the motor. To its credit Horizon Hobbies made good on that. The other H9 ARF was a Das Ugly Stik 40, the covering was similar to shelf paper and didn't stay attached. All of these planes flew well but left me unimpressed in terms of the hardware provided and all the firewall or motor mounts had issues with staying attached.

Upon opening the P-51 box it looked like H9 has done a nice job of packaging to minimize shipping rash. The covering job appears to be beyond my abilities. The thing that struck me right away was how heavy the main wheels are. Those may get replaced depending on where the CG ends up. The cowl and canopy come pre-painted, which is nice.

Manual: The assembly manual gives you a nice list of what is included in the kit and what you'll need to complete the project. The recommended engines range from a 60 two stroke to a 100 four stroke. 5 standard servos are required as well as the recommended retract servo to handle landing gear actuation. Overall the manual is OK. I found several instances where the needed items listed at the beginning and the listing for items used in a step don't match or aren't even referenced as being needed. Several of the pictures in the manual do not match the kit I received. More on that later when we discuss installing the aileron servos and landing gear doors.

Assembly: Before I get too far into my impressions about the assembly of the project I think its fair to point out that I've done a fair amount of research into the experiences others have had in building and flying this plane. Most of the input I got was on RC Universe or some of the Internet news groups. The two most common complaints about the model are that the firewall appears to fail with some frequency and that the cowl paint doesn't hold up to exposure to nitro. My plans to address these issues are to add an epoxy fillet to the rear of the firewall and possibly triangle stock if its not already in place. To address the issues around the paint crazing on the cowl I will use Lustrekote clear to protect it and the decals from the nitro in the fuel.

I also don't have much experience with mechanical retracts. The units in the wings are actuated by a servo. Even when I've used mechanical retracts in the past I've typically actuated them with air cylinders so that will be a new experience. If I'm not convinced they'll handle my "workmanlike" returns to terra firma I'll substitute Spring Air units.

Tail Surfaces: Not too much to talk about concerning the tail surfaces. They are very light and rely on CA hinges. About the most difficult part is the joining of the elevator halves using music wire. The part I found the most disconcerting was that you get epoxy all over one half of the horizontal stabilizer that you need to carefully clean up. The vertical stabilizer doesn't fit particularly well as the fin extension goes forward toward the cockpit.

Wing: Again CA hinges for the control surfaces. Joining the wing is a pretty straight forward process however no amount of fiddling gave me as tight a joint as I would like. In the end I have a very small epoxy filled gap in a couple places. The servos mount onto plates, which are then fastened to ply plates in the wing. Mounting the servo blocks on to the plates is pretty easy. What I did notice is that the cutout in the plate for the servo arm isn't in the same position as shown in the manual. Its biased toward the front of the wing rather than the trailing edge as shown in the manual. If the wing didn't have the big star and bar on the bottom I would just swap them around. In my case this means the push rods are longer than the manual shows and the control horns were a bit tricky to line up properly with the hinge line and minimize binding. The cutouts in the servo mounting plates also do not permit sufficient throw of the surface even with longer servo arms. I would have liked to see the covering on the servo mounting plate wrap around a little on to the back side to make sure the covering won't

MARCS 2003 Calendar of Events

Event	Date	Location
New Pilot Orientation and Training	May 3	Kettle Field
Big Bird Rally	June 14	Kettle Field
Electric Fly In	July 5	Kettle Field
Boy Scout Fun Fly	July 12	Kettle Field
Float Fly and Picnic	July 20	Rilie-Deppe Park, Marshall
1.5 Meter Hand Launch	August 16	Long Island Sod Farm
Kindschi Scale Rally	August 17	Kettle Field
Fall Thermal Soar	September 6	Long Island Sod Farm
Warbirds Over Dane	September 20	Kettle Field

expose bare wood when I re-shrink it all to remove the wrinkles and bubbles.

Retract Set Up: I picked up a Hitec HS 75 low profile retract servo to actuate the main gear retracts. According to the RC Report review of this plane the push rods for the retracts can bind if you don't raise the servo ¼" in the mounting plate that gets installed at the center of the wing. I applied that modification right from the start. Given my limited personal experience with mechanical gear I've done some reading on their set up. Several people have warned against using the receiver battery to power the retract servo.

When mounting the gear doors I ran into a minor issue with the hardware provided. The manual shows pictures for nylon blocks which wrap around the wire and secure the door to the wire. The kit came with pre formed aluminum brackets. I also don't like the way the gear doors don't fit snuggly against the wing.

Fuselage: From my earlier comments you can see that I'm a bit skeptical of ARFs in the firewall area. I always have visions of the motor and the rest of plane deciding to fly separate maneuvers. This plane is no exception in terms of its construction relating to the firewall. In checking it out it looks like it is a single or perhaps two layers of something that looks like 1/8" light ply and simply glued in, I think. My first thought was to back the whole thing up with another piece of ¼" aircraft ply. Having checked out the RC Report review and the Model Airplane News (MAN) review I decided to just put an epoxy fillet on the back side and around the tri-stock backing. I could see no visible glue fillet and on one side the triangle stock doesn't even contact the fuse side. It broke out easily so I just reinstalled it with epoxy and in contact with the fuse side and the firewall.

The work to complete the fuselage includes installing the fuel tank, engine and throttle servo, the elevator and rudder servos go in the tail and the receiver and battery. Installing the throttle push rod is a bit interesting with the motor I'm using since the carburetor is on the rear of the motor just off the centerline. A Sullivan Goldenrod got me past that issue.

Finishing up: To finish things up I needed to re-shrink the covering to remove a number of blisters and tighten it back down. In doing so I found that in many places the overlap between pieces wasn't sufficient to permit some shrinkage during the tightening up. The net result was I ended up with gaps on top of the turtle deck behind the canopy and just behind the wing fillets.

Once I had the covering shrunk down and the gaps patched I installed the decals following the instructions. Things went great until I stopped to allow the decals to dry over night. When I came down the next morning I shocked to see what appeared to be gray bubbles or streaks under the decals. I did not have any air bubbles under the decal when I applied them so I'm at a loss to explain what has happened. After about 4 days of moping I went back down and had a look and the streaking and grayness had disappeared.

The canopy was crazed and scratched in a number of the painted areas. I contact Horizon Hobby twice over a three week period. Despite assurances that the canopy would go out the next day I did not receive one. Later Charlie heard of my problems and worked with Horizon to get me a new one.

The plane ended up very nose heavy. I was looking for an excuse to add an onboard glow driver for the inverted 4 stroke motor and between that and a larger battery I was able to balance at the recommended center of gravity.

Flying: The first flight was made with the engine way too rich. Despite the motor not putting out much power the 51 kept on flying. Once I brought the gear up and fed in a bit of down trim and a touch of left aileron trim things were going pretty well and got even better once my hands stopped shaking having nursed the plane along the raged edge of controlled flight with a shortage of power. The motor leaned out after a bit and things started being fun. The landing was a nonevent unfortunately I'd forgotten to turn on the on board glow and the motor quit after the rollout. The second flight was better and the plane flew very well. The landing went well too despite it being a little more firm than the first although the retracts held up. I relaxed some of the up elevator and the plane did go up on its nose though.

Conclusion: I still have some misgivings about how the retracts will hold up on our field and whether the plane will nose over easily. In the end I always ask myself if I would like to build another. In this case I'm of mixed

emotions and would probably pass. Below you can see the Pros/Cons

Pros:

- Lightweight
- Fairly complete

Cons:

- Firewall not glued well, reinforcing tri stock didn't contact the fuse side
- Canopy was crazed in a number of places.
- Covering trim on aileron doesn't permit the aileron to be centered in the opening and have the yellow stripe line up.
- Assembly manual has some omissions and errors
- Provided wheel collars and wheels are too wide for the axle on the main gear
- Covering isn't sufficiently overlapped to permit re-shrinking. Re-shrinking results in gaps.
- Aileron servo mounting plates were not covered to permit installation as depicted in the manual resulting in longer control rods and limiting control throw.

The Bent Bird

The Tale of the Vertical Tail

By Don Weigt

After nearly a century of flight, almost everyone knows what a typical plane looks like. Make something similar, with decent structure so it's strong and light enough, put on a good engine, balance it right, and it will fly. Many people know that. What far fewer know is why!

The last article dealt with center of gravity (CG), and how the wing and horizontal stabilizer, fore or aft, work together to support the plane, regulate its speed, and control pitch. All these are necessary, but not enough.

Almost every plane has a vertical tail. Often, it's about half the area of the horizontal tail. Early model planes sometimes used a vertical tail that was the same size and shape as half the horizontal tail. But, the shape and size of the vertical tail may be much smaller, or even larger. It depends on a number of things, which we'll get to shortly. The primary function of the vertical tail is to keep the plane aligned with the relative wind: the air flowing past it. Just as the feathers on an arrow, the vertical tail keeps the nose pointed forward and the tail following.

The basic requirement is that its area is sufficient to overcome the side area ahead of the center gravity. In addition, it has to have enough effect to manage the plane despite other effects, such as unbalanced thrust if an engine fails on a multi-engine plane.

Planes like WWII fighters, with big heavy engines, have short noses and longer tail moments. These can have rather small vertical tails. Multi-engine transport planes, with almost equally long noses and tails need larger vertical tails. Planes like the B-36, which had 6 huge pusher engines and a very long nose to balance, need huge vertical tails.

Vertical tails usually produce far less force (lift) than wings and horizontal tails, so their shapes have less effect on flight efficiency. On big planes, the height of the vertical tail may be limited by hangar doors or other non-flying concerns. But, in general, a tall narrow vertical tail is more efficient than a short wide one, just as is true for wings.

If tall narrow vertical tails are more efficient, why do multi-engine planes often have a vertical tail with a big triangular extension (dorsal fin) running forward along the top of their fuselages? Even some light planes have them. Airplanes are seldom designed for beauty: those base extensions aren't there for style. They compensate for the one disadvantage of long narrow vertical tails. Narrow tails stall, just like wings. That wide low extension at the base of the vertical tail makes less lift, but stalls much later. It keeps on working when the rest of the vertical tail stalls.

This is nice when the pilot of a light plane jams in full rudder to lose altitude with a forward slip, or to keep the nose lined up with the runway in a cross wind.

It's really great for multi-engine planes, jet or prop, with their engines far out on the wings. If an outer engine fails, thrust from the engine on the other wing produces a huge yawing load. If the vertical tail had only a narrow tall section, the whole vertical tail might stall and the plane would snap toward the dead engine. That's a formula for a disaster. It probably happened on the first 4 engine Boeing passenger plane built in the '30s. That big dorsal fin helps keep the planes under control, besides sometimes being rather pretty!

The vertical tail and dihedral interact, and that's one thing that limits how big a vertical tail should be. An airplane has to slip a bit for the dihedral to lift the low wing. If the dihedral is small, and the vertical tail is large, the plane may have spiral instability. It will slip into a turn, to either side, and will tighten up until it crashes or the pilot corrects it, after which it may do the same thing to opposite side.

Many years ago I had an .049 powered rudder only plane with crude escapement control. This was on-off: you had straight, full right, or full left, nothing in-between. This plane flew fine until I moved the CG forward and added more decalage (angular difference between wing and horizontal tail.) Suddenly, it was falling out of the sky, diving to the left or right. I was bewildered by it, and gave up on the model after it was badly damaged in one of those spiral dives.

Only much later did I find out why moving the CG could have caused the problem. I'd increased the effectiveness of the vertical tail by moving the CG farther from it. Planes turn about their CGs in the air: they don't have any other reference until they move in response to the control input. So, when the CG went forward, it was just like splicing an extra quarter or half inch of length into the rear of the fuselage, and shortening the nose the same amount.

This plane had only a little dihedral. It must have been just enough for the original CG, and not been enough when I'd changed it. The plane needed the CG restored to its

original position, or more dihedral added. Too bad I didn't know it then!

Look at the old time free flights, or most new ones. They had large amounts of dihedral or polyhedral (multiple dihedral joints.) Their wings produce large corrective forces with small amounts of slip. That's why they work great for rudder only, as long as their rudders are small or have low deflection. Otherwise, they are veeeerrrrry sensitive to rudder deflection. This can be fun, but it also can cause crashes.

Prisoner or War

By Jerry Buss

A few months ago we looked at the interrogation methods of Hanns Scharff and the Luftwaffe in WW II. Whatever else one might say of the Germans and their actions in that war, it must be admitted that they observed the rules of the Geneva Convention in the treatment of UK and American POW's. It was much different to be a POW during the Korean War.

Walker "Bud" Mahurin was a P-47 pilot in the 63rd Fighter Squadron of the 56th Fighter Group, Zemke's Wolf Pack. Most writings credit him with 20.75 kills in the ETO, but in his book, *Honest John,* he maintains that the correct number is an even 21. He was the first American to achieve 10 kills in Europe. In the process of shooting down his last victim, a Do 217, he paid too little attention to the rear gunner and was, himself, shot down. He made contact with the French underground and after several weeks was picked up at night in a farm field by a Westland Lysander, along with two spies, and flown back to England. He carried with him some information from an underground member suggesting a bombing attack on a particularly ripe target and the whole story of this and his escape was widely publicized in the States despite USAAF efforts to suppress it. Consequently, he couldn't rejoin his squadron, since, should he be shot down again, he would be fair game for a firing squad as a spy.

After several months in the states with his wife, to whom he had been married just before going to Europe, he volunteered to join a new fighter group headed for the Pacific. His wife was not pleased. Flying Mustangs in the closing months of the war, he downed one Japanese plane and was among the first occupation troops to reach Japan.

Having had great academic difficulty getting the two years of college at Purdue that he needed to get into pilot training before the war, he felt that with his rank of Lieutenant Colonel his best future lay in the army. Over the next five years he completed his engineering degree and was just beginning his second assignment to the Pentagon when war broke out in Korea. By this time he was a full colonel and the father of two children.

He wanted to get into the action in Korea, but the Air Force was reluctant to send any more older men ranking as high as he off to that war. Further, his four year Pentagon assignment had just begun as Assistant Executive to the Secretary of the Air Force, who did not wish to be inconvenienced in his staffing arrangement. After several failed attempts to get assigned, he and three friends came up with the idea of 90 day tours as "observers" to gain experience in the war situation to enable them to better serve in their current duties. The Secretary bought it and off they went. Again, his wife, Pat, was not pleased.

Arriving at fighter base K-13, just before Christmas, 1951 he found that he was on the property of the 51st Fighter Wing, commanded by an old and good friend, Colonel Francis Gabreski. Gabby made Bud his Assistant Wing Commander. The wing had only recently been converted from F-80's to F-86's and, although there as an "observer," Bud flew combat missions regularly, scoring 3.5 kills to bring his overall total to 25.5.

They patrolled in force almost daily, at least two or three squadrons strong and often two wings strong, up to the Yalu River. There they would watch the MiGs rise off their fields in their Manchurian refuge, near the city of Antung. They would climb to superior altitudes that the Sabres couldn't reach and then come screaming down at them, generally in superior numbers. After that it was a matter of hard dog fighting, but the 51st maintained a kill ratio of 14 to 1.

Conjecture about whether the MiG pilots were Oriental or Russian was a regular topic of conversation until one day a MiG pilot was seen to eject. Following him down, the Sabre pilot victor, Major Boots Blesse, discovered that the man had lost his helmet. He had red hair and a bright red beard. Blesse made several passes at him, taking gun camera pictures as the Russian shook his fist. On another occasion, a MiG pilot bailed out off shore. Air-Sea Rescue was called in in hope of making propaganda capital by capturing a Russian, but while the orbiting Sabres waited some had to go home for want of fuel. Then a large force of MiGs appeared and while some distracted the remaining Sabres, others strafed their own man in the water.

Over time, the principle of "hot pursuit" came into play while 5th Air Force command turned a blind eye to the Defense Department's chagrin. As a result, many MiGs were reported destroyed on the Korean side of the Yalu, but somehow fell in Manchuria. Many feet of edited gun camera film was sent to the 5th's headquarters too. It would never have done to send them Lt. Bill Ginther's film showing a MiG sparkling with hits by .50 cal. rounds just over a concrete runway with rows of MiGs parked on one side. The enemy appeared to accept the invasion of their heretofore sanctuary as a quid pro quo for their Russian "volunteers," so long as the F-86's didn't strafe.

As Mahurin was packing to return to Washington at the end of his 90 day assignment, he received orders to, instead, assume command of the 4th Fighter Wing. It was here that he inherited the call sign, "Honest John," the title of his book and a word play on his straight forward report on his actions as a POW to what proved to be his detriment. Leading the 4th, he experimented with using the Sabre to dive bomb and to make low level ground attacks. These

operations were highly successful and, in addition to the three and a half red stars painted beneath his canopy, he added a bright red locomotive for a destroyed train. Successful though his new tactics were, they were to be his undoing.

On May 13, 1952, Gabreski was about to leave for the States with his tour of duty completed and Mahurin was to take his place in command of the 51st Fighter Wing. On that day, however, after making a successful dive bombing run, Bud violated the cardinal rule of strafers: "Never go back." Seeing a truck running from his target area toward a small village, he went down after it. Gun crews on the ground who had been asleep on his bomb run were waiting and scored several hits. He was now separated from his squadron and in trouble at low level with his tail pipe overheating dangerously. He headed down a river, toward the sea where he intended to bail out. He had forgotten that there were two towns along this river just before the coastline that were hornet's nests of antiaircraft guns and here his plane was hammered some more. Electing to ride the Sabre in to a crash landing, he hit in a rice paddy. The wings sheared off and the engine torque caused the fuselage to roll over several times, finally coming to rest almost on its back at the paddy's edge with the cockpit minus its ground off canopy just out of water. Somehow, he had avoided having his head ground off along with the canopy. Releasing his seat belt he dropped out. He could hardly get to his feet. He was soaking wet, covered with mud and unable to release his parachute harness. Two hands were required and his left arm was broken. Weighed down in the mud of the paddy by his chute and seventy five pounds of escape and survival gear, he could scarcely move and he proved to be easy meat for two Korean civilians who, when they discovered he wasn't "Russki," cornered him until soldiers arrived.

Marched to a nearby village, Bud was held for several hours until two Russian jeeps appeared, one carrying an NK colonel who spoke English. The colonel ordered several of his men to go to the wreck to retrieve the gun sight. MiGs were equipped with a sight that was little better than those used in WW II, whereas the Sabre had a lead computing, radar ranging and radar controlled sight. Despite the fact that the sounds of an air battle could be heard as they set out for a nearby town, the colonel scoffed at Mahurin's suggestion that it might be well to wait until dark lest they be strafed. On the way they met a Russian built truck loaded with about 30 Chinese soldiers. Bud was concerned when the they were stopped and an unfriendly exchange took place between the NKs and Chinese, but eventually the NK colonel was able to calm things.

The following morning, Bud was taken back to the scene of his crash. The carcass of the Sabre had somehow been manhandled up onto dry ground where it lay on its side. A large group of gawking civilians crowded up next to the Sabre's remains. The gun sight was still intact, but several NK mechanics were going over the wreckage, dismantling it piece by piece. The ringleader, who spoke broken English asked how to remove the gun sight. Bud refused to answer and told him not to fool around in the cockpit. After also warning the colonel not to let his men in the cockpit, he was taken back to the village where he had been taken initially the day before and confined to a mud hut. After a couple of hours the chief mechanic came running up, out of breath and angry demanding to know what it was that had blown up in the cockpit. The gun sight had carried a self-destruct charge and one of the NK experts had managed to trigger it. Three men had been injured. Bud explained what had happened and again warned the NK to stay out of the cockpit. The disgruntled mechanic returned to the wreck. About three hours later he again returned in a rage. What had blown up in the cockpit? Bud had no idea, for there were no other self destructs, and asked the man to explain. It soon became apparent that one of the gomers had been fooling around and managed to activate the ejection device. Seat and man had both been ejected out into the crowd of bystanders, killing four and injuring fourteen others.

After hacking the remnants of the gun sight out and tearing out instruments and electrical control panels and circuit boards, the experts came back to the village. One of them proudly held aloft what he had discovered to be the secret of the gun sight. It was a box of silica crystals used to keep moisture out of the system. He demanded to know how the system worked. Bud explained that people were sent to college for four years to figure that out. How was he to tell him in five minutes? He was not asked again. Later a truck arrived and the NKs began throwing the salvaged parts and instruments into it, assuring that if any had been in working order, they now no longer were.

That night Bud was taken by truck to what proved to be an interrogation center about 30 miles north of Pyongyang. There was a hospital set up here in a collection of huts. He was given ether and when he awoke, his arm had been set and was encased in a plaster cast. Before the effects of the ether had worn off interrogation began.

Only after several days did the NK colonel believe that Bud was a colonel. He simply wasn't old enough. It took listening to Armed Forces Radio in Japan and hearing Bud's name mentioned to convince the NK officer to accept the notion. In the meanwhile, he wanted to know about how and where American air forces were distributed in Korea and about their tactics. Bud didn't cooperate.

To be concluded next month.