Homage to the Hustler: Reflections on Flying the Convair B-58

By Tony Fairbairn

There is still a mystique about the Hustler that astounds me. Back when we were flying it, if we landed at another USAF base, folks would want to come out and see it, feel it, touch it and talk with us about it. “Just sitting parked on the tarmac it looked as though it was going supersonic.” These tributes from ex-Hustler crewmen are typical of the admiration in which the B-58 was, and still is, held. With its stunningly futuristic good looks and Mach 2 performance it is hard to believe that 40 years have elapsed since the type flew into retirement after a relatively brief career (1960–70) with the 43rd and 305th Bomb Wings of the USAF’s Strategic Air Command (SAC).

It had a crew of three – pilot, navigator/bombardier (nav/bomb) and defensive systems operator (DSO), seated in novel tandem ejection capsules. I invited one of each (from different crews) to give me their impressions of life with the world’s first supersonic bomber.

Darrell Schmidt – Pilot

Schmidt joined the USAF in 1951 via the Aviation Cadet Program, gaining his wings and 2nd Lieutenant bars in 1955. Training on the Piper Cub, North American T-6 Texan, T-28 Trojan and Lockheed T-33, his first productive assignment was instructing on T-33s. He then moved on successively to the B-47 Stratojet and B-52H Stratofortress as aircraft commander, instructor and evaluator. He takes up his story:

“In 1966 I received orders to go to Little Rock AFB, Ark., for an evaluation for entry to training in the B-58 Hustler. The evaluation consisted primarily of proving I could fit into the ejection capsule, followed by an oral evaluation plus a review of my previous training records to ensure I was sufficiently competent to command the single-pilot Mach 2 aircraft, with the emphasis on flight in instrument conditions.

“Part of the ‘lead-in’ training included time at Perrin AFB, Tex., for instrument training in the T-33. This also embraced getting used to a ‘stick’ again rather than the control wheel of the B-47 and B-52. Then I trained in the Convair F-102 Delta Dagger, a delta-winged fighter, which provided more ‘stick’ time plus familiarization with delta wing
I first trained in the TF-102 with side-by-side seating with an instructor in the right-hand seat, and then soloed in the single-seat version.

"After Perrin I went to Carswell AFB, Tex., for instruction on the nuclear weapons of the B-58, then back to Little Rock to begin training in the Hustler. This included ground school for flight systems, integrated simulator training, and actual flight training in the TB-58, the training version of the Hustler that replaced the bombing equipment and the navigator with a pilot instructor position equipped with dual flight controls behind and slightly raised above the normal pilot position.

"I had a love affair with the B-58; you would take off at about 200 kts, come out of afterburners at 350 kts and climb at 425 kts until reaching Mach 0.90, at which time you’d climb to altitude holding that speed. I was surprised to find the cockpit was rather primitive after having flown the then brand new B-52H with advanced flight guidance and autoflight systems. The B-58 cockpit was similar in some respects to the T-33 except for instruments for four engines. It had some automatic flight control readouts, but except for takeoff and landing, the autoflight system required little if any pilot input. It had no flight director guidance and only one navigation radio with one tuner for either TACAN for navigation or Instrument Landing System (ILS) for instrument approaches.

"Because the Hustler was a true delta-wing aircraft it had no horizontal stabilizer or elevator controls. The wing trailing edge featured ‘elevons’ (combined elevators and ailerons) that produced both roll and pitch. If, for example, you wanted to roll to the right while raising the nose, the left elevon would go up a little while the right elevon went up even more. It was basically a blending of the pitch and roll inputs to produce the required flight attitude.

"Like all delta wing aircraft, the Hustler had no flaps – these would have produced a nose down pitching motion.

Special care was therefore essential for takeoff and landing. It was necessary to allow the aircraft to rotate nose high without scraping the tail on the runway, which is why the B-58 had such long landing gear struts. Rapid changes of pitch on landing were to be avoided. Raising the nose too quickly would result in the aircraft sinking too rapidly. The opposite was true if the pilot allowed the aircraft to bounce on landing and then attempted to put the nose down quickly to reduce the height of the bounce. If he shoved the stick forward the elevons would go down, which immediately increased lift (like flaps). Then, when he neutralized the pitch input, the elevons would go back to neutral and the aircraft would sink rapidly. This was called ‘elevon coupling.’

"I was already aware of the Hustler’s flight characteristics from manuals and from other pilots, but I had not personally experienced them until my checkout ride in the TB-58 with an instructor to clear me to solo in the single-pilot B-58. Everything went fine until the landing stage. I bounced the landing, pushed the nose down causing it to rise further, then plopped back on the runway; I began ‘bunny hopping’ down the runway. I shoved the throttles forward and went around for another landing that was fine. I thought I’d ‘screwed the pooch!’ In the debriefing the instructor said: ‘That’s the first time you ever got elevon coupling wasn’t it?’ I sadly nodded my head.
He went on: ‘Did you learn anything?’ I replied: ‘I learned to move the controls slowly for landing and if it bounced a little, just accept it or take the aircraft around for another landing.’ He concluded: ‘Good, you learned a fine lesson; you’re cleared to fly the single-pilot model now.’

“During the TB-58 training the navigator spent his time on the ground simulating navigation and bombing procedures. Our first crew flight in the B-58 was the first time our navigator actually got airborne. One mission, which is a typical example of our operations, included a Mach 2 simulated bomb release on the St Louis Nike missile site from the northwest. When we were inbound, headed southeast at around 30,000 feet the DSO read out the ‘Acceleration’ checklist which included turning the engine spike switches to ‘Automatic’ so the supersonic shock wave would stay out of the engine intakes. We also ensured that our prevailing center of gravity (CG) was within limits for both subsonic and supersonic flight. This was necessary because the shock wave moved the center of lift aft. Then I’d move the CG shift knob to ‘Manual’ and set our required CG for supersonic flight.

“At the acceleration point I moved the throttles to the forward stop for ‘Military Power’ (100%) then lifted them over the stop to afterburner and observed that all four engines did actually go into afterburner. Then I pushed the throttles full forward in the afterburner range and got ready to climb at 600 knots indicated airspeed. The Mach 1 indicator light came on and, while climbing with the vertical speed indicator pegged and holding 600 knots, the indicated Mach number slowly increased towards Mach 2. Approaching 50,000 feet I pushed the nose down to level off while reducing the throttles in the afterburner range to prevent the aircraft exceeding Mach 2.

“Everything looked OK so I engaged the autopilot and the autothrottles and moved the flight steering switch to ‘2nd Station,’ which allowed my navigator to steer the aircraft to the target. We made our calls to the Nike site and gave them our crew information and the specific ground target we would be scored on. On the ground a computer tracked our position and airspeed as we flew at 1,200 mph towards the target. That day we also had a jetstream of over 100 knots on our tail which produced a ground speed of over 1,300 mph. We turned on a radio tone on the communication channel at 20 seconds to go to simulated bomb release. At the instant the radar bombing computers determined it was time to release the weapon it cut that tone and the ground computers scored where they figured the bomb would have hit had we really released one.

“But about 30 miles from the target, just as I was beginning to relax, the aircraft snapped rapidly into a 60 degree bank to the right. I said ‘What the…?’ – and it then banked rapidly 60 degrees to the left. I punched off the autopilot and asked my navigator what had happened. He replied: ‘Oh, the crosshairs moved off to the right a little causing the right turn, so I moved them back to the target, which caused that left turn.’ I said: ‘You sack of crap – tell me when you do that!’ The B-58 computer knew that at Mach 2 almost any correction of heading demanded 60 degrees of bank.

“So I was now flying the aircraft manually and holding 60 degrees of bank to center up the bomb aiming instrument. At 20 seconds to go to bomb release we turned on the radio tone and I was still centering the target. At the bomb release point the tone automatically cut out, I was on target heading rolling wings level. ‘Score that one bomb plot!’ I was thinking. We were at the end of our supersonic corridor so I brought the throttles out of afterburner to ‘Military Power.’ I was hanging forward in the harness while descending and decelerating out of Mach 2 flight. The navigator gave St Louis Nike our post release information for computer scoring and we waited with bated breath for our score. Even though it was a simulated nuclear weapon release, the site still had to score the bomb’s position from the target within certain reliability standards. If not, we would have to show up at the ‘Bad Bomb Board’ the next day while supervisors attempted to fix the blame on the crew…or the equipment…or whatever. After what seemed forever we finally received our ‘score.’ It was called a ‘Type 2C Abort.’ None of us had heard anything like that before so our navigator looked it up in his manual. That particular score indicated that the aircraft maneuvers and speed exceeded the capability of the ground computer to make a determination. The small print said that if our cross hairs were on the target at bomb release, we got credit for a reliable bomb run. Yea!!

“One other very slick feature on the Hustler was the
The autotrim system which, in simplistic terms, enabled the pilot to maintain a constant pitch attitude. This was invaluable during air refuelling during which fuel taken from the tanker caused the Hustler’s CG to change. To prevent the autotrim system causing the pilot to lose his ‘touch’ and ‘feel’ during takeoff and landing the autoflight system was placed in ‘Takeoff’ and ‘Landing’ modes. This provided 20 degrees of elevon and cut out the autotrim feature.

“(...) I flew the Hustler with the 43rd Bomb Wing at Little Rock AFB until we delivered most of them to the aircraft graveyard at Tucson, Ariz., in late 1969. I was then assigned to Vietnam where I flew the C-7A Caribous, but that’s another story.”

“BJ” Brown – Nav/Bomb

Like Darrell Schmidt, BJ Brown joined the USAF (in 1952) through the Aviation Cadet Program, working his way to the Hustler via B-36s and B-47s in SAC. Selected for the B-58 program in August 1962 he describes subsequent events.

“There were five crews in our class going through the Combat Crew Training School (CCTS) and we seemed to hit it off from the ‘get-go.’ While I was doing ground school our pilot and DSO were flying sorties in the TB-58, but finally, on December 7, 1962, we got our first trip together – our solo flight. There is nothing quite like your first flight in a new aircraft. The sights, smells and noises are awesome. Just performing your checklists for the first time together as a crew demands your full attention and keeps your mind sharp. The pilot gets the engines running, the chocks are pulled and we are taxing to the runway. It’s time to go. In SAC, if your takeoff time is 09:05 then at 09:05: the brakes are released and you are on your way.

“We had talked about our takeoff procedures during flight planning. I would tell the pilot when we had one minute to go before takeoff. He would get clearance and we would taxi into position onto the runway and hold. Then at 09:04 I would tell him ‘30 seconds till takeoff.’ He would start to bring up power and I would tell him ‘15 seconds to takeoff.’ He would then set full power, check his instruments while I counted down the seconds. Then the engines would be increased to full afterburner. I continued to count down the seconds: ‘5, 4, 3, 2, 1, Hack.’ At ‘Hack’ the brakes were released and we’d begin our takeoff roll. Around 25 seconds later we would be at 190 knots and the pilot would rotate the nose up to takeoff position. Then we would lift off and climb out at 425 knots.

“This, our first sortie, lasted approximately five hours and went quite nicely. The navigation leg received a nice score, the refuelling was on time, briefed fuel was offloaded from the KC-135 tanker, the bomb runs were scored OK and the pilot made an excellent landing. Our instructors were very happy with the results of our first and subsequent six flights. Following that we graduated with the rest of our classmates.

“(...) After completing training at Carswell AFB we were transferred to the 305th Bomb Wing at Bunker Hill AFB, Indiana. On arrival we checked into our squadron and were given the crew number NR-82. We were at the bottom of the crew status totem pole and it was our job to fly our way back up the ladder. In April 1963 we completed our supervised training, were upgraded to R-82 and began standing alert. Our B-58 was preflighted, refuelled and loaded with five nuclear weapons, so she was ready to go to war at a moment’s notice – and so were we. We normally flew two or three training missions per month and our flights were intermingled with simulator missions, flight planning alert tours and other training.

“My five years on a B-58 crew were the highlight of my USAF career. Flying in the B-58 was a real hoot and my

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Hustler 61-2059, named Greased Lightning, which took the Tokyo-London record in October 1963. (Photo from the AAHS collection, AAHS-1402)
job as navigator/bombardier was made easy by the fact that
the B-58 had the first Stellar-Inertial Doppler navigation and
bombing system. Navigation in the B-47 was tough – we had
to do celestial navigation using the stars at night and the sun
during the day. Simulated bomb runs were radar-tracked and
scored by units on the ground. We called a perfect bomb run
a ‘shack.’ I had one ‘shack’ in the B-47 but a lot of ‘shacks’
in the B-58 – the bomb/nav system was that good. The B-58
had an astrotracker that locked onto celestial bodies but was
only used to feed true heading into the inertial system. Doppler
was used to input drift and groundspeed into the system, while
the radar was used to randomly update aircraft position into
the system. In the B-47 I was strapped onto a parachute, with
cold air blowing on my feet and hot air blowing on my head. I
had a writing table off to my right side. In the B-58 I sat in a
slightly reclining seat with a nice ‘pull-out’ table in front of me
that I could work on in air conditioned comfort. I was strapped
into an ejection capsule – not onto a heavy parachute. It was
heaven.

“Our crew progressed through the crew numbering system
and within 13 months of making ‘R(eady)’ status we were
upgraded to ‘S(elect)’ – and received promotion in rank. With
‘Select’ status came additional responsibilities and we were
moved to the Combat Crew Training Squadron at Grissom AFB
(as Bunker Hill was renamed – after astronaut Gus Grissom)
where we began training new crews at this, the second B-58
base. Training guys to fly as a navigator/bombardier in the
B-58 was a lot of fun.

“It’s worth mentioning that the B-58 got a reputation early
on as a dangerous airplane. Many accidents were attributable to
crew error and didn’t need to have happened. Good aircrews,
good training and good maintenance made the B-58 a damn
good weapon system! It certainly turned heads but we pooh-
poohed the adulation. Still, if we were flying and we saw
lightning in the distance we would smile, turn and fly towards
it. We thought it was the flash from cameras going off!!”

Ray Wagener – DSO

After WWII service as a Radar Counter Measures specialist
on B-29 Superfortresses in the Pacific, Wagener was recalled
to active duty in 1951 and assigned to an RB-36 unit as an
Electronics Counter Measures (ECM) crewmember. Then
followed RB-47s, and it was later, while undergoing B-52
conversion training that he successfully applied to join the B-58
Test Force at Carswell AFB in the spring of 1959. “Looking
back,” he says, “I feel that this was one of the luckiest moves
of my tour in the USAF.”

“Early in the program, flight training for B-58 DSOs was
haphazard to say the least. We attended some classes at the
Convair plant, a few classes in the Test Force, read manuals
and learned everything we could from engineers and crew members
who were flying. At this point it was not easy for DSOs to
get time in the air but after another DSO was grounded for
medical reasons I took his place and found myself on the flying
schedule. And I loved it.

“At this point the Test Force was under the control of Air
Research and Development Command (though I was in SAC)
and I was fortunate enough to fly with many of their crews.
One particular test mission stands out in my memory. The pilot
was Col. David M Jones (who flew one of the B-25 Mitchells
off the USS Hornet on the 1942 Doolittle Tokyo raid) and the
route was from Wyoming to Texas. The mission was flown
on the deck at 600 knots indicated. One thing we reported was, at
that speed, if something (a small aircraft, etc.) appears in front
of you, there is not enough time to turn. All you can do is pick
up one wing.”

Ray has no doubt that the highlights of his time on B-58s
with the 43rd Bomb Wing were the record-breaking flights
on which he was a crew member. The first of these was on

Bottom view of the B-58 showing the delta planform, engines and pod. (USAF photo from NARA collection, AAHS-P008003)
January 12, 1961, when Hustler 59-2442, nicknamed Untouchable, set six world speed records round a 1,000 km closed circuit at Edwards AFB. He recalls what happened: “Henry J. ‘Dutch’ Deutschendorf Jr. (singer John Denver’s father) was the pilot, William Polhemus the nav/bomb, and most bets were that this flight could not be completed. The ballast required for the speed records was fuel carried in two tanks in the pod. The judges monitoring the flight had removed the fuses for the fuel pumps in the tanks, turned them around and placed them backwards in the panel. If we used this fuel we MIGHT get two speed records but no more. The fuel was available for use in an emergency. We were at Mach 2, above 55,000 ft and about three minutes from the finish line when Dutch said: ‘The fuel pump lights in the forward and aft tanks are blinking on!’ I got out of my seat, sat on the floor, used my left hand to activate my intercom and said, ‘If you need the fuel in the pod, I have the fuses in my hand.’ Dutch wanted to know what I was doing and Polhemus replied, ‘that crazy bastard is sitting on the floor in the aisle.’ That was the only way I could reach the fuse panel. About two minutes out Dutch reported that the reserve tank was feeding. This tank was designed to feed the engines only when all the other tanks were dry. I felt the power go to ‘idle,’ saw the fuel flow drop to almost zero and we glided across the finish line at about 41,000 ft. Dutch landed the aircraft in that condition and I never did feel the power come back up. While taxiing in I got back in my seat. After engine shut-down we sat there with our canopies closed just laughing and talking. It was over.” The crew were each awarded the Distinguished Flying Cross for their achievement.

Later that year, on May 26, Ray was the DSO of Hustler 59-2451, The Firefly, that broke the New York to Paris speed record, en route to the Paris Air Show, and he remembers it well: “Bill Payne had replaced Dutch as pilot. Prior to our early morning takeoff from Carswell, the area had been deluged with rain. After takeoff and reaching altitude our UHF radios ceased to operate, though we did have our standby guard channel UHF
and HF radios. I let our Wing Control Room know of our problems but said we intended to continue with the mission, and then turned the radio off. We successfully refuelled on the Washington D.C.–New York City leg using our emergency guard channel radio. Leaving NYC we accelerated to Mach 2, and a short time later the UHF radios started working again. We concluded that the early morning rain had frozen as we climbed out from Carswell and somehow caused our UHF to quit. While accelerating after the third air refuelling we had difficulty in finding an altitude cold enough to avoid exceeding the ram air temperature limitation. We kept searching for a cooled altitude to obtain the highest ground speed. Able to relax after crossing the French coastline, we decelerated after passing Paris and hoped they enjoyed the sonic boom. After landing the ground crew tried to put our nose gear on the same spot where Charles Lindbergh had parked in 1927, but because of the large crowd trying to get close to us we had to shut down the engines promptly.” The Firefly had covered the 3,626 miles at an average speed of approximately 1,089 mph and for this achievement the crew was awarded the prestigious Harmon and Mackay Trophies, presented to them by President Kennedy at the White House, an occasion that Ray describes as “…a great experience.”

Conclusion
During his time in the Air Force Reserve, Brig. Gen. James Stewart, USAF (the film star) spent some duty time at Carswell where he flew in a Hustler. The TB-58 was piloted by Maj. John Irvin who pulled out all the stops to give Stewart a memorable ride and earn his Mach 2 pin.

After the trip Stewart commented: “She was a lot more than a hot rod made for setting records, she was a lethal weapon of war – and an outstandingly handsome aircraft.” Darrell, ‘BJ’ and Ray wouldn’t disagree with that.

About the Author
The son of an RAF pilot, Tony Fairbairn spent 30 years in the RAF as a Supply Officer which took him to Cyprus, Gibraltar, and the Middle East, in addition to assignments in the U.K. The biggest disappointment of his Air Force career was the last-minute cancellation of an exchange assignment with the USAF at HQ Aerospace Defense Command, Colorado Springs, when ADC was subsumed by Tactical Air Command. On leaving the military he spent 10 years working for defense contractors at the RAF’s C-130 base in England. With a life-long interest in aviation history, journalism and photography, he has written two books on military airfield histories and contributed to many of the U.K. aviation magazines. His current major research project is de Havilland Mosquito operations by the USAAF’s 25th and 492nd BGs and 416th NFS in WWII. He and his wife live in Wiltshire, England.

Famous film star and airman Brig. Gen. James Stewart in the cockpit of a Hustler. He gained his Mach 2 pin in a B-58 flight from Carswell AFB, Texas. (BJ Brown)

Head-on shot that illustrates the “spindly” gear design that allowed the gear to be retracted into the minimal space available yet still provide adequate ground clearance when extended. (Photo from the NARA collection, AAHS-P008004)

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Surviving Hustlers
# NAMED HUSTLERS*

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*Source: Convair B-58 Hustler by Jay Miller, Aerofax 1997. (Not necessarily exhaustive)
MEMBERSHIP APPLICATION

Please enroll me as a member of the AAHS for the period specified. Enclosed is my check (money order, bank draft or credit card information) for annual dues as checked below. I understand that I will receive all issues of the Journal published to date during this calendar year (regardless of the date of joining), plus those issues of the Newsletter published after the date of joining. I also understand that renewal is due at the end of the calendar year in which membership will expire. (Valid through 2011)

<table>
<thead>
<tr>
<th>Country</th>
<th>1 year</th>
<th>2 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S.</td>
<td>$39.95</td>
<td>$78.90</td>
</tr>
<tr>
<td>Mexico and Canada</td>
<td>$48.00</td>
<td>$96.00</td>
</tr>
<tr>
<td>Other countries</td>
<td>$69.00</td>
<td>$137.00</td>
</tr>
<tr>
<td>Student*</td>
<td>$19.95</td>
<td>(Electroni c Journals and FLIGHTLINES only)</td>
</tr>
</tbody>
</table>

*Must provide proof of enrollment in a school, college or university.

Make checks, money orders, bank drafts, and credit cards to AAHS in U.S. funds

Enclosed is my check/money order for $____________________

_______________________________________________________
NAME
_______________________________________________________
STREET
_______________________________________________________
CITY
_______________________________________________________
STATE/COUNTRY Zip/Postal Code

This is a:  ☐ New Membership  ☐ Renewal Membership

Charge to  ☐ VISA  ☐ MasterCard

Account # __________________________________________ Exp. Date ______________

SIGNATURE

Member Survey

Area(s) of Interest:

☐ Early Aviation  ☐ WWI  ☐ Golden Age  ☐ WW2  ☐ Jet Age
☐ Personalities  ☐ Commercial  ☐ USAF  ☐ Navy  ☐ Marines
☐ General Aviation  ☐ Experimental/Research
☐ Other _____________________________________________________________________

Survey; responses will help us with future plans:
I would prefer receiving:

Notifications via  ☐ post  ☐ email  ☐ Web site
Newsletters via  ☐ post  ☐ email  ☐ Web site
Journals via  ☐ post  ☐ email  ☐ Web site

Email address:______________________________________________________________

Mail to:  AAHS
P.O Box 3023
Huntington Beach, CA  92605-3023
Phone: (714) 549-4818

Web :7/DEC/2010