

Seattle Chapter News



Seattle Chapter
IPMS-USA

May, 1997

Eject, Eject, Eject!

Modern Ejection Seats

Last summer on our way to the '96 Convention in Virginia Beach, Andrew Birkbeck and I had a brief opportunity to wander through the National Air & Space Museum's restoration facility at Silver Hill, Maryland. During our walking tour, as usual for Silver Hill, you just about get over seeing one fantastic sight, restoration project or historical flight object when you see something of even greater importance. We had just spent some time watching and talking with one of the staff members who was working on the restoration of the Museum's recently acquired Hurricane (his current task was just taking shape: Duplicating a type of a rivet used in the original construction during WW II and the correct shade of primer used inside the fuselage.)

As I was trying to fully absorb that detail and the painstaking restoration work, we saw a small group dedicated to restoring NASM's SE-5 WW I aircraft. As we were looking on, they were about to embark on restoring the pilot's seat.

It was fascinating, watching with the original remnants and their work to duplicate and fabricate a new seat. The seat was just that a plain seat constructed of thin wood strips (about 4-5 inches wide) woven into a rough chair shape and held together with small brass rivet like fasteners. As interesting as that was my mind was again going back over the project I worked on for about 2 years—that of restoring a modern ejection seat. The changes over the last 75-80 years in airplane seats is an amazing study in technology. It is but one instance of how

the evolution of modern aircraft has come such a distance, most of it during our recent life time.

For some strange reason, in some of my earlier modeling work, I became interested in the concept, construction and operation of modern ejection seats. Why? Well, in large part, because as the interiors and canopy pieces became larger and of better quality. One can easily see the pilots seat and while the individual instruments and other features of the interior may be only approximated for the most part (with my apologies to John Alcorn, John Frazier and Jim Schubert, who all seem intent on having operating instruments and cockpit features). So where do I begin and how many straps are there in the seat, what does the seat look like (shape and contour) and how

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Terry D. Moore

One thing I enjoy about the models that show up at our monthly meetings is that some of them are unfinished. There is nothing like seeing a model in raw plastic, putty or primer to show how much work may actually be involved in a certain project. A completely finished model may hide a super detailed interior or items that had to be scratch built, whereas the unfinished model may show what many hours of work have accomplished. For example, Jim Schubert's Japanese submarine was considerably reworked, including scratch building most deck details and the "Glen" floatplane. I watched its progress over the course of several meetings until it was finished. Had I not seen it in its project state, I may not have admired the finished product as much as I do. Another example is Dan Rowbottom's scratchbuilt Fort Casey/Flagler/Worden dioramas. The disappearing guns are miniature jewels and the amount of work he has done on them just won't be as noticeable when they are painted and on the diorama. So if you are currently working on a 1/5th scale Jagpanther or 1/24th C-5A and you have just finished detailing the gun barrel or fuselage, bring it in and show it off.

What a time to be a model builder! Not a week seems to go by when there isn't a new kit on the shelf at the local hobby emporium. And I'm not talking about the umpteenth release of an F-14. A few years ago, I would not have thought it possible to build a 1/48th scale "Betty" bomber or a U.S. cage mast battleship. Too many models - not enough time. Isn't it terrific! What brought this to mind was the other night I was looking at one of our old Seattle Chapter Quarterlies, a publication produced by our club in the late '60's/early '70's. and from which some of the more timeless articles may appear on these pages. Back then, I had more hair on top of my head and I could see my toes without bending over. There were models of only 5 modern Soviet jets (MiG 15, 17,

19, 21, IL 28 end they were all bad), the Airfix B-26 was state of the art and Tamiya kits could only be ordered by mail. The first F-14 kit was released by Monogram, which had just been absorbed by Mattel, and many thought it was the end of the line for them. I myself speculated that the only way to build a Curtiss-Wright CW-21 would be to convert it from the Monogram B-52! Ewww. Most tank kits were motorized. There were no aftermarket products except for a few decal sheets by ABT and Pat Stein. Photoetched & resin castings were years away so it was masking tape for seat belts and balsa wood to make that radome. *Scale Modeler* was THE model magazine, and for a while, some thought the oil embargo of '73-74 would put an end to ANY plastic models.

It would appear that we survived the "dark ages" quite well. See you at the May meeting!

Terry

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How can I get my stuff into print?

I recognize that some of you are a bit uneasy about how you can get your material (reviews, comments, research notes or other submissions) into the Chapter Newsletter. Please don't be concerned. Don't let the mechanics throw you nor that your submission may not be quite as professional as you'd like to see it in final form. We need the input and the Newsletter will never be better than the support of the Chapter provides for. How can you help and get your submission into the editor for use in the Seattle Chapter Newsletter?

The answer is simple. First, it will be helpful if you can type or prepare your submission and insure the spelling and wording is as you want to see printed. As you are aware, our interests contain many references, words, names, places and items which are outside the normal spelling and grammar rules used on most computers. These one-of-a-kind words may be known to the editor, but if not, he must rely on the accuracy of what you've submitted, except where an error is apparent (and even the ed. can see it).

How to get to the Newsletter? Best is to bring it to a meeting and give it to the editor. It's easy to send the text via e-mail (hence the e-mail address above this note). Most art work (as you can see in this issue) is easy to scan into the computer and put into the Newsletter. The editor relies upon several programs: MS Word, Aldus SuperPaint, Photoshop and PageMaker. Please call me at 232-7784 if you have any procedural or technical questions. *Thanks -Bob*

(Continued from page 1)

can I approximate the appearance of the actual ejection seat? Each of the questions, as is the case with many other aspects of scale modeling, can drive you to drink in serious quantities and force you look for answers to questions you want or need to answer.

This brings me to the issue at hand, the modern ejection seat. From my few resources, it is easy to see there are numerous types of ejection seats and even more individual sub-types or marks. However there are some basic common features, or at least it seems that way to me, and I hoped someone might like to share in what information I have (or think I know). I am approaching this from a reasonably narrow viewpoint and will try to cover these questions in at least some basic form:

- (a) Basic ejection seat theory and function
- (b) Typical ejection seat construction (straps, major parts, etc.)
- (c) Modeling and color suggestions
- (d) A summary of known types used in modern military aircraft (with drawings)

Since most of my first-hand knowledge is of modern US Navy aircraft, you will quickly notice these notes and equipment described tends to reflect those aircraft. I will happily include more information for other aircraft as those of you who have additional tech manuals and resources will share them with me (and the Chapter) and will continue to build on that information.

With those caveats in mind then, here goes. I hope this will bring some new or enhanced perspective to your modeling. Enjoy.

Introduction and Early History

As many of you have read, initially it was considered very "un-manly" to even consider wearing a parachute in an airplane. Several countries made a concerted effort to warn their pilots not to even think about anything other than their assigned mission—to think about getting out of the airplane was out of the question. In this country pilot safety was always of some concern, following the first fatality in a military aircraft accident. Through most of WW II it was considered an even

bet that should something happen to the aircraft you could use your parachute. Most aircrew members wore them all of the time, usually sitting on the chute that doubled as a seat cushion and merely jumped from the airplane, time and altitude permitting. With the arrival of modern, jet and other types of high performance aircraft, the pilots sought more of an advantage in getting away from the aircraft, often when the pilot was incapacitated or unconscious and the plane crippled. Both the British and American aerospace worked toward enhancing pilot survivability leading to what we have known as the modern ejection seat and its related equipment. Most of the modern seats are known simply as "0-0" (zero-zero) seats, meaning that they are fully capable of ejection of the aircrewmembers from "0" feet altitude and without any forward airspeed (as opposed to earlier seats which required a predetermined altitude and speed for safe deployment of the seat and its parachute). As an added note, since I began these notes, Bill Johnson was kind enough to lend me a copy of a book published by the Martin-Baker company in England, in which they very clearly illustrate their early efforts to design and build ejection seats. From all that I have seen, the Martin-Baker company is clearly one of, if not the world's leader in these efforts over the last 45+ years.

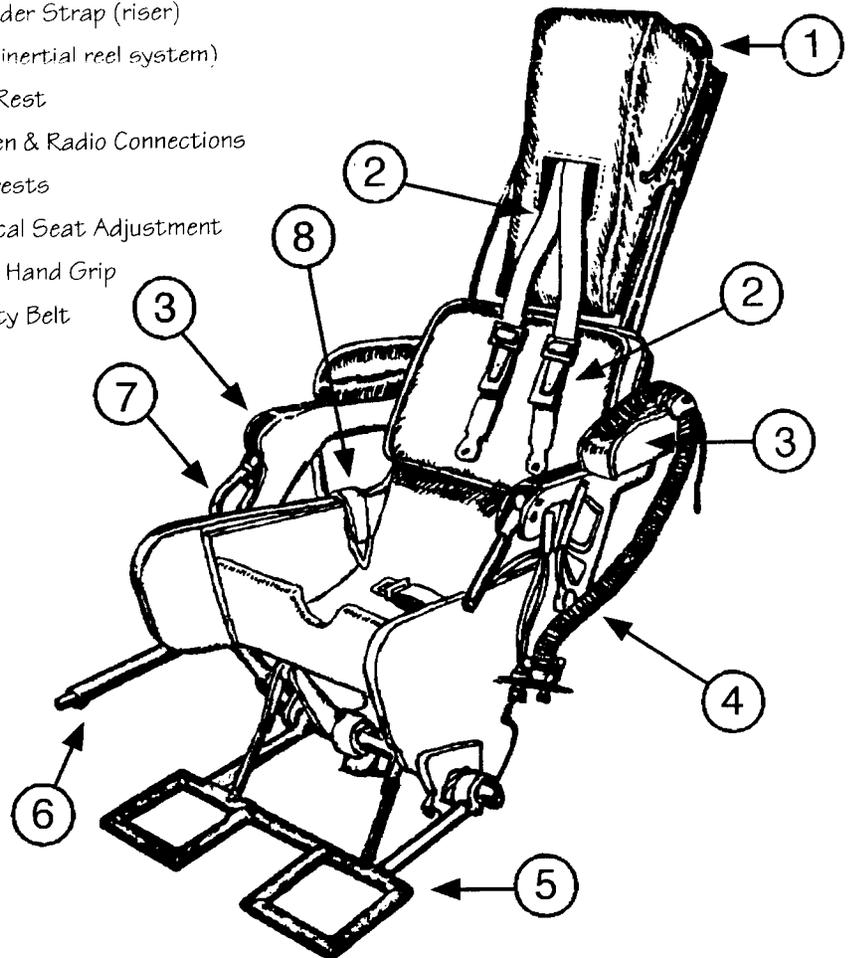
Basic Ejection Seat Design and Features:

It appears to me that the greatest interest in modern ejection seats was the direct result of the Navy's interest in their carrier based pilots. For the most part, the other services felt the need was largely one of getting the pilot or crew member out of an

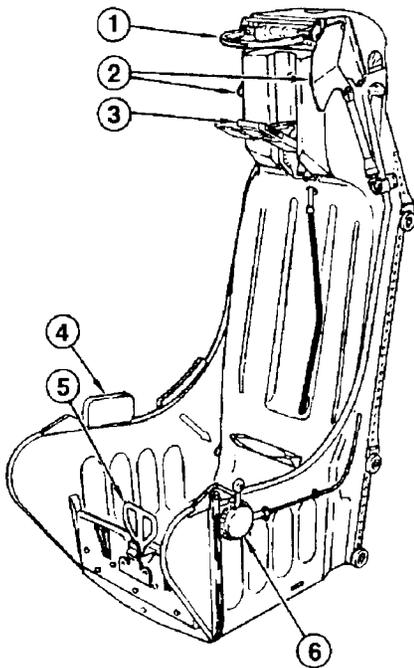
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Early U.S. Ejection Seat

1. Initiating Cable
2. Shoulder Strap (riser)
(with inertial reel system)
3. Arm Rest
4. Oxygen & Radio Connections
5. Footrests
6. Vertical Seat Adjustment
7. Right Hand Grip
8. Safety Belt

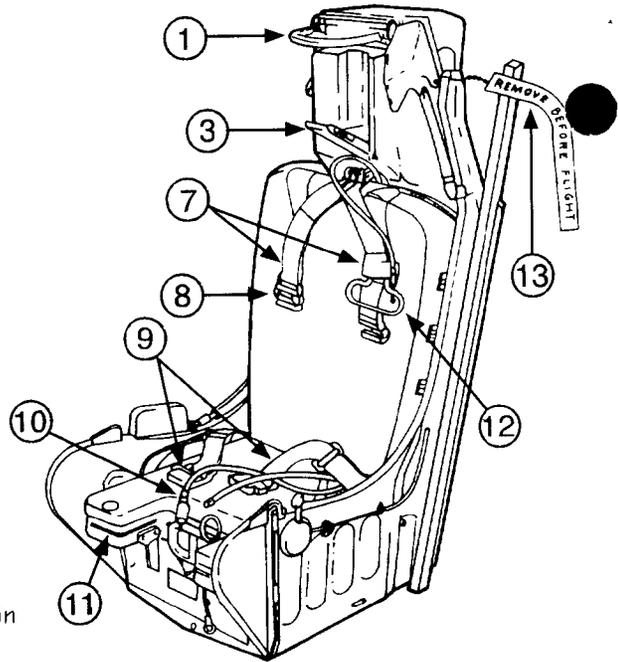


Martin B-57 Ejection Seat (about 1955)



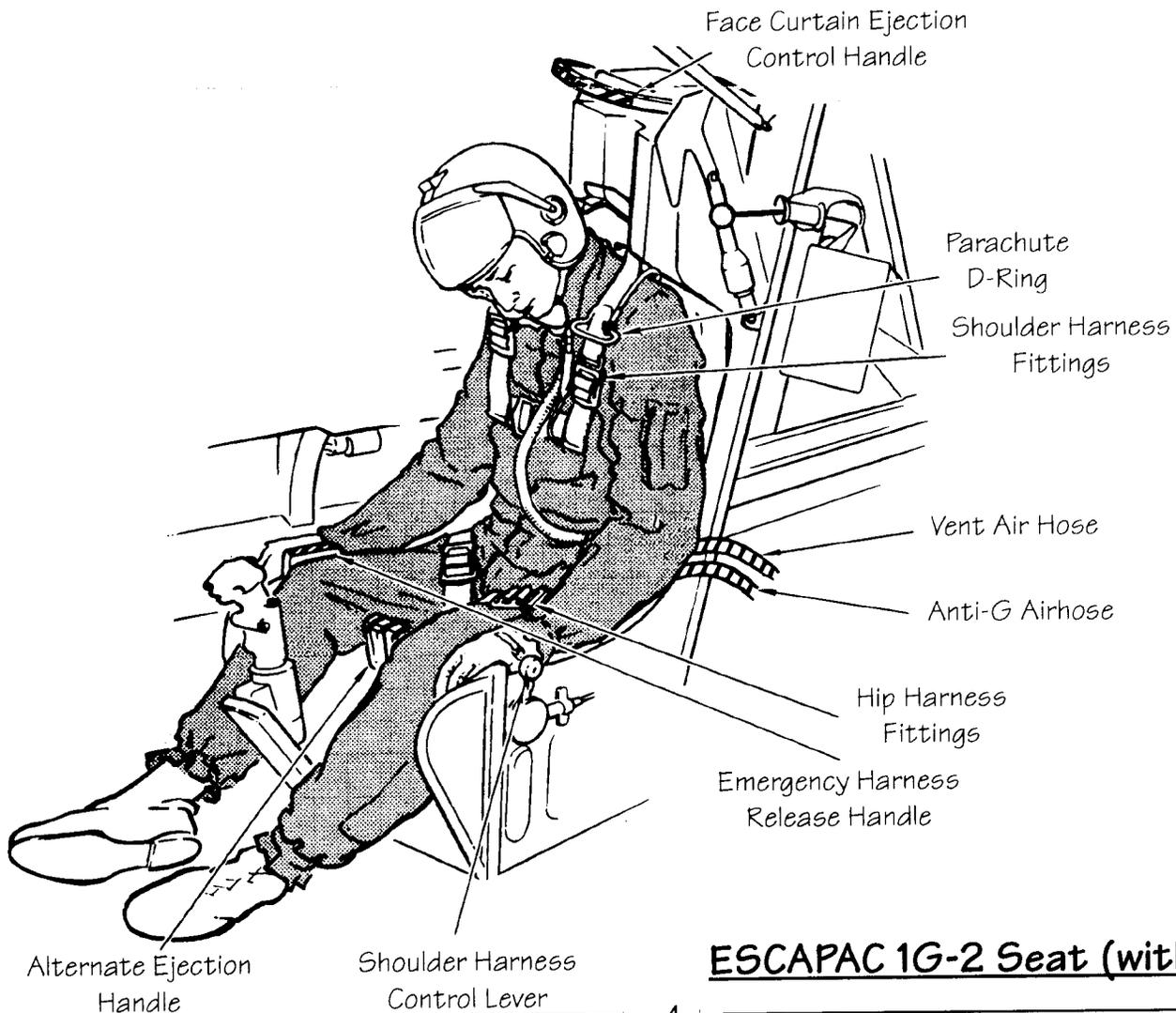
Key Seat Features

1. Face Curtain Ejection Handle
2. Canopy Breaker
3. Ejection Controls Safety Handle
4. Emergency Release Handle
5. Lower Ejection Handle
6. Shoulder Harness Lock Lever
7. Shoulder Harness Straps
8. Koch Fittings
9. Lap Belts/Harness Straps
10. Personal Services Connector
11. Survival Kit (RSSK-8)
12. Parachute Rip Cord Handle
13. "Remove Before Flight" Safety Pin

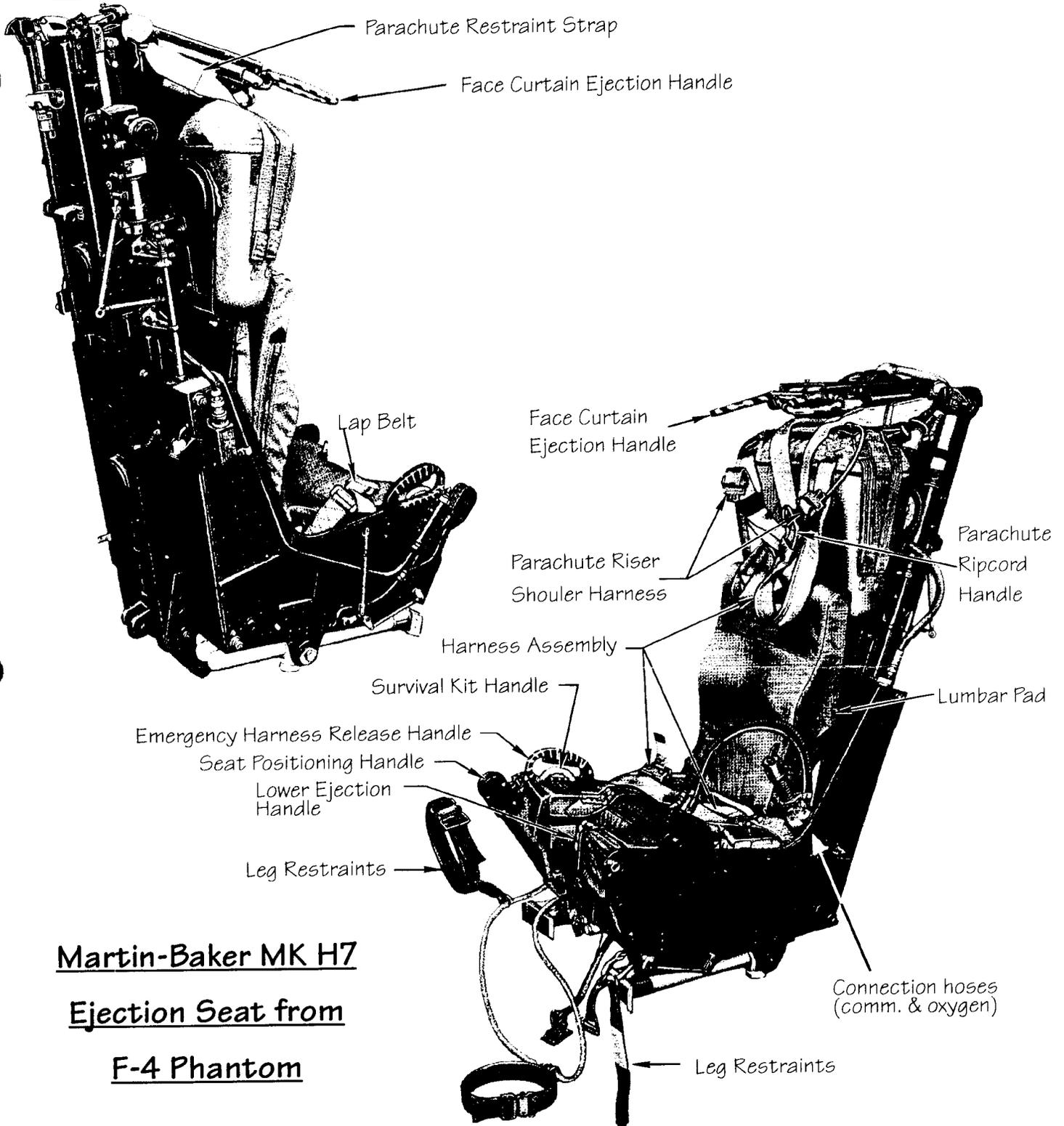


ESCAPAC 1G-2 Seat (empty)

ESCAPAC 1G-2 Seat (equipped)



ESCAPAC 1G-2 Seat (with pilot)



Martin-Baker MK H7
Ejection Seat from
F-4 Phantom

(Continued from page 3)

aircraft that was at least at altitude. The Navy was confronted by their need to insure the survival of a pilot who was often sitting still or best in the early throws of preflight and may be only a few feet above the deck surface.

The ejection seat is quite an engineering feat in itself. It is usually a

light weight, yet very strong material, able to withstand the high g-load of the rocket's ejection (from the aircraft), contains the parachute for the crewman, the survival kit (usually in a rigid seat kit, containing the material I mentioned in an earlier article), a separate booster rocket to "right" the seat, some type of stabilizing equipment, separate oxygen supplies for

the crewman (though some of the newer seats like the Martin-Baker SJU series actually contain their own self-contained oxygen generation systems) and the pilot's attachments for the seat, the parachute, survival kit, and communications connectors. These modern seats are really marvels of aerospace engineering. Large

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scale models of such a seat would be a very interesting modeling subject in itself. The seat is usually mounted onto or into to the aircraft using a "rail" type of system and often attached to the back of the bulkhead itself, rather than the floor of the aircraft (which appears to be the way most model kits depict them). One should also note that there are still a few "pod" types of ejection systems in operation, such as in the EF-111 and B-1 aircraft, where the entire area around the aircrew is ejected from the aircraft and leaves with the aircrew inside for it's ascent. For the most part however, the basic ejection seats are similar to those described in this article.

Another facet of this story is that until the U.S. started using the Martin-Baker and ESCAPAC style of seats (about the early 60's), most of the early ejection seats were largely "in house" products of the aircraft companies themselves. When one bought a B-52, an F-106 or an F-11, one acquired whatever type of seat the manufacturer provided. These were usually the very basic types of seats. A look at the basic B-57 seat (see page 3) built by the Martin Company in 1955 illustrates this point well I believe.

Ejection Seat Parts and Features:

- High strength, lightweight seat structure of monocoque-type aluminum sheet construction
 - An integral ground safety device for ejection controls (this allows for the seat to be "safed" whenever the aircraft is not in service)
 - A two-stage rocket catapult (allowing for both the actual "ejection" of the seat and pilot from the aircraft and the "righting" of the seat)
 - Flip-up or fixed canopy breakers to allow safe ejection through the canopy (hence the height restrictions on some pilots today)
 - Two ejection controls: a face curtain ejection handle and a lower ejection handle located on the forward or side edge of the seat bucket
 - An MA-2 integrated torso harness which provides positive torso restraint during the flight, crash, and parachute opening loads
 - A rigid seat survival kit contains the emergency oxygen supply and survival equipment. Two hooks on the front of the

survival cause the survival kit to rotate straight forward out of the seat during pilot/seat separation. A survival kit release handle is located on the right side of the seat which will release the life raft and survival equipment (attached by a 25-foot lanyard)

- An actuator cable is attached to radio beacon in the survival kit so that automatic actuation of the beacon occurs upon seat separation from the aircraft.
- A seat stabilization consisting of two braking devices attached to the bottom of the seat
- Pilot's services (anti-g, exposure suit ventilation, and oxygen/communication) which plug into the aft portion of the left console. These lines pull free at their disconnects upon ejection.

Modern ejection seats are highly developed technological wonders! One could imagine what would happen if a modern techno-thriller author like Tom Clancy were to learn about these seats and include this type of knowledge into a book of his fiction!

These parts are the major components only. Believe me, I am skimming the surface. When you look into the individual seats, one will quickly find many added subsystems and functional parts. In the case of the ESCAPAC 1G-2 seat illustrated throughout this article, the seat manual alone runs over 400 pages of parts and instructions. The rigid seat survival kit, *without* its contents, is over 40 pages of diagrams and instructions. It is very easy to understand why the current generation of ejection seats are no longer a simple aluminum frame, but rather a million dollar plus engineering facet of the aircraft itself.

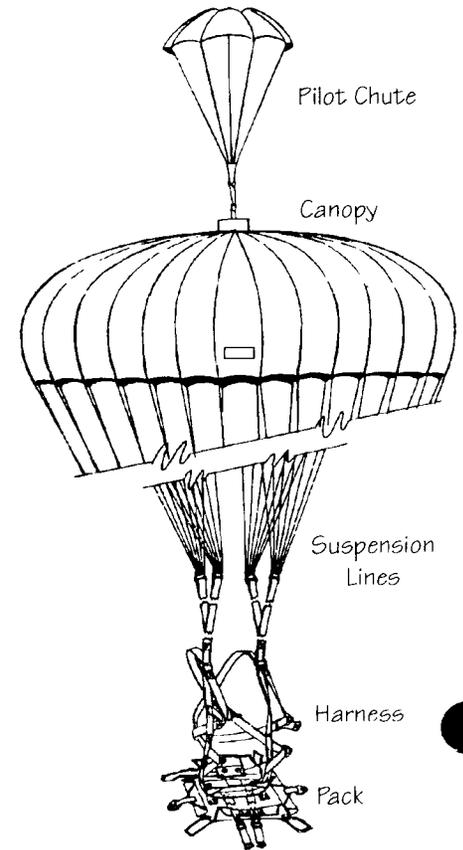
Another limiting factor which demonstrates the cost of these seats is that the government has apparently stopped the practice of providing an ejection seat to each pilot who has survived their ejection from a modern jet.. The cost of a modern ejection seat prohibits it from being removed from inventory unless damaged beyond repair.

Parachute Parts:

It is also appropriate that we concern ourselves briefly with the parachute itself and its basic nomenclature. This will permit you to have a better understanding of the complexity of the ejection seat, the

firing sequence and the pilots eventual ascent. The basic parachute is comprised of several major parts, as illustrated in the drawing below..

Parachute Parts



Pilot's Attachment to the seat:

Important to the modeler's understanding of the seat is that the pilot is attached to the seat, which is turn attached to the aircraft. The pilot's attachment is intended to be a strong one and designed to carry him with the seat should it or he become separated from the aircraft. Much of this attachment system is intended to act and or perform independent of the pilot himself (I'll use the old fashioned "him" but should point out that there are both men and women flying in military aircraft today). The way this is done is through the basic torso harness (which is usually separate from the pilots "G-suit" and survival vest or equipment, but not always, some pilots chose to have their survival vest or "suit" sewn onto the torso harness. In modern U.S. equipment this is usually the MA-2 lightweight harness (which is lightweight only when consid-

(Continued on next page)

ered next to the aircraft itself). It is very constricting and if worn properly may not allow the pilot to walk fully erect while on the ground. Such a harness is shown below, both with the harness' nylon covering cut away (the way most pilots choose to use it), with the nylon "body" in place and as it might appear on a pilot (with the balance of the survival vest and oxygen mask attached).

Attaching oneself to the seat isn't always as easy as you might think. The actual attachment of the pilot (already safely buckled into his harness) is usually a matter of attaching only four location

points (two at the waist or lap belt and two on the shoulder harnesses) and usually done using Koch release fittings. These are spring loaded devices which contain two openings and are designed to prevent accidental openings (as one moves about in or out of the cockpit). The should strap Koch fittings also now commonly contain a small cylinder device called SEAWARS release fittings (automatic sea water actuated release system). These automatically release the parachute risers from these Koch fittings whenever submerged in sea water.

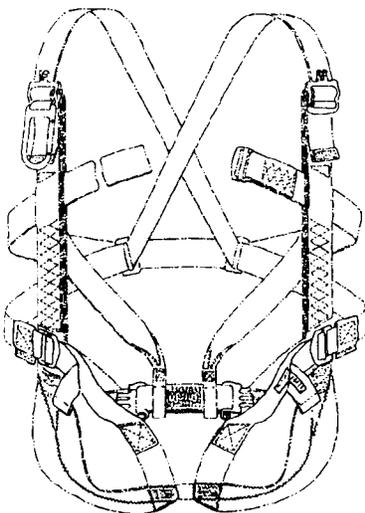
There are also usually leg garters worn by the crewman to prevent his legs

from moving away from the seat during the ejection sequence (and often employ a device to pull the legs back and down against the seat front). Keeping ones hands, arms and legs close to the seat is of great importance as the pilot and seat are ejected from the aircraft. It is also the reason that the preferred method of ejection initiation is for the crewmen to use both hands and pull the face curtain down over their helmet. When done properly, this keeps the pilots' arms and hands in a safe position and greatly reduces the traumatic effects which usually accompany automatic or involuntary departures from the aircraft. As you can see from the M-B MK 7 drawing, there are often two sets of garters, an upper and lower, which provide even greater support for the pilot's legs.

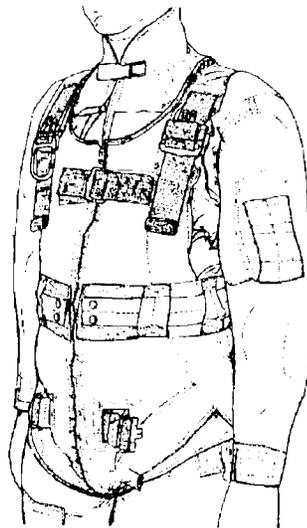
The pilot is also "plugged into" the aircraft, normally at their left side using a simple (and uniform) connector, which supplies him with oxygen, air for his g-suit and communications connections for his helmet and mask (to the aircraft). After these connections are made, normally the pilot's seat safety pins are removed and the seat is ready for full operation. This final step is normally not taken until the final moments before the aircraft is about to be started, for the simple reasons that the operation of the seat may result in ejection when not necessary. Many of you will remember the sad story of the small child who was killed during his ejection from an S-3 about 15 years ago during an airshow demonstration. The crew had left a seat in the "unsafe" configuration and the seat was fired while the child was sitting in it. For these reasons, the "insertion" of the air crewman is usually done (like almost every aspect of aviation) using two crucial tools: a crew chief and a checklist.

Ejection Initiation, Sequence and Timing:

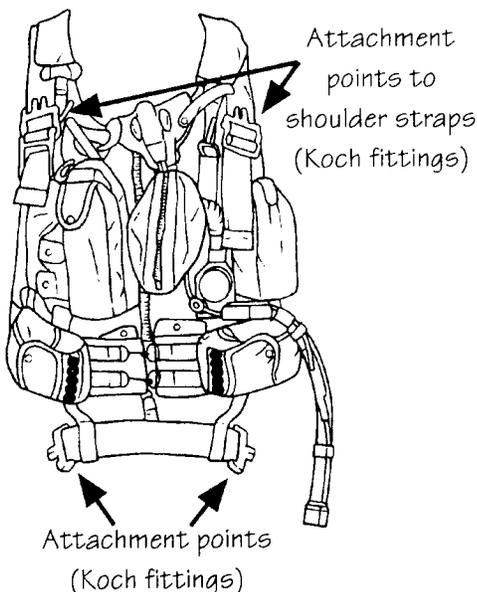
One would think it might be easy to "just get out of the airplane" and "hit the silk." You've seen it the Flying



MA-2 Harness
(without nylon enclosure)



MA-2 Harness on aviator
(with nylon enclosure)



MA-2 Harness with survival vest and seat attachments
(without nylon enclosure)



MA-2 Harness on dashing Naval Aviator

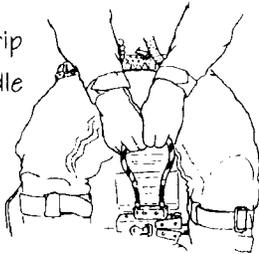
Typical Koch Fittings



Tigers and many other Hollywood epics. The pilots pull back the canopy, stand up (often not even taking the time to undo their seat belts...I'm telling you, those were when men were real men....), stand out on the wing and jump into the mattresses carefully laid out for them. I've spoken with two members of the Caterpillar Club (both Navy pilots) who, during WW II, jumped and survived. Neither thought it was such a neat deal at the time and both thanked their stars and God to be alive after the experience. Two other acquaintances related their experiences in "leaving" an F-4 and F-8; both said they never really wanted to go through it again, their ejection seats both "worked as advertised" and they say "it was the most thrilling ride they did not want to take." They each sustained some minor physical damage. One lost his rear seat RIO. As a direct result of the all to numerous ejections encountered in our Viet Nam efforts, the current seats are much more highly automated than earlier seats and have built-in features which will hopefully greatly increase the pilots survival, even when unaware of the ejection. Current U.S. military studies point to about a 90% survival rate when the ejection suit is properly deployed.

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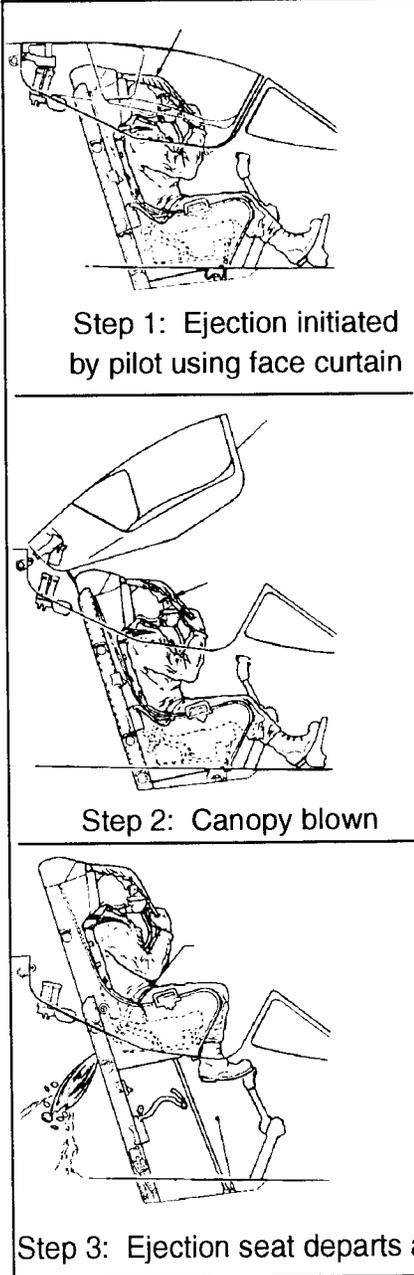
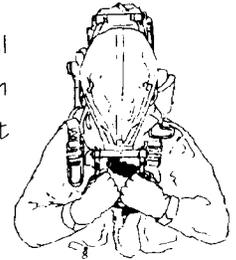
Two-handed grip
on lower handle



Both hands grip
face curtain



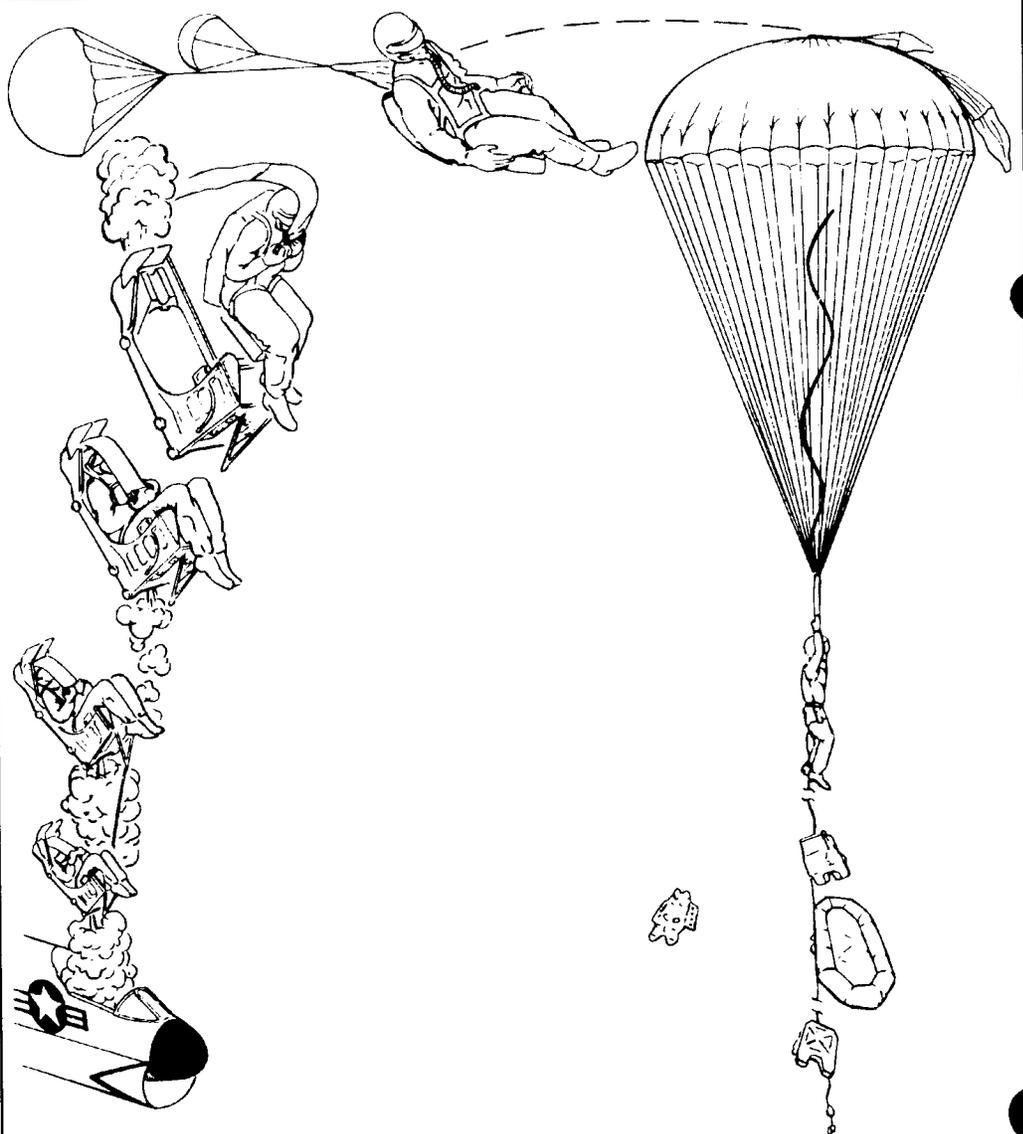
Both hands pull
face curtain down
and over helmet



Step 1: Ejection initiated
by pilot using face curtain

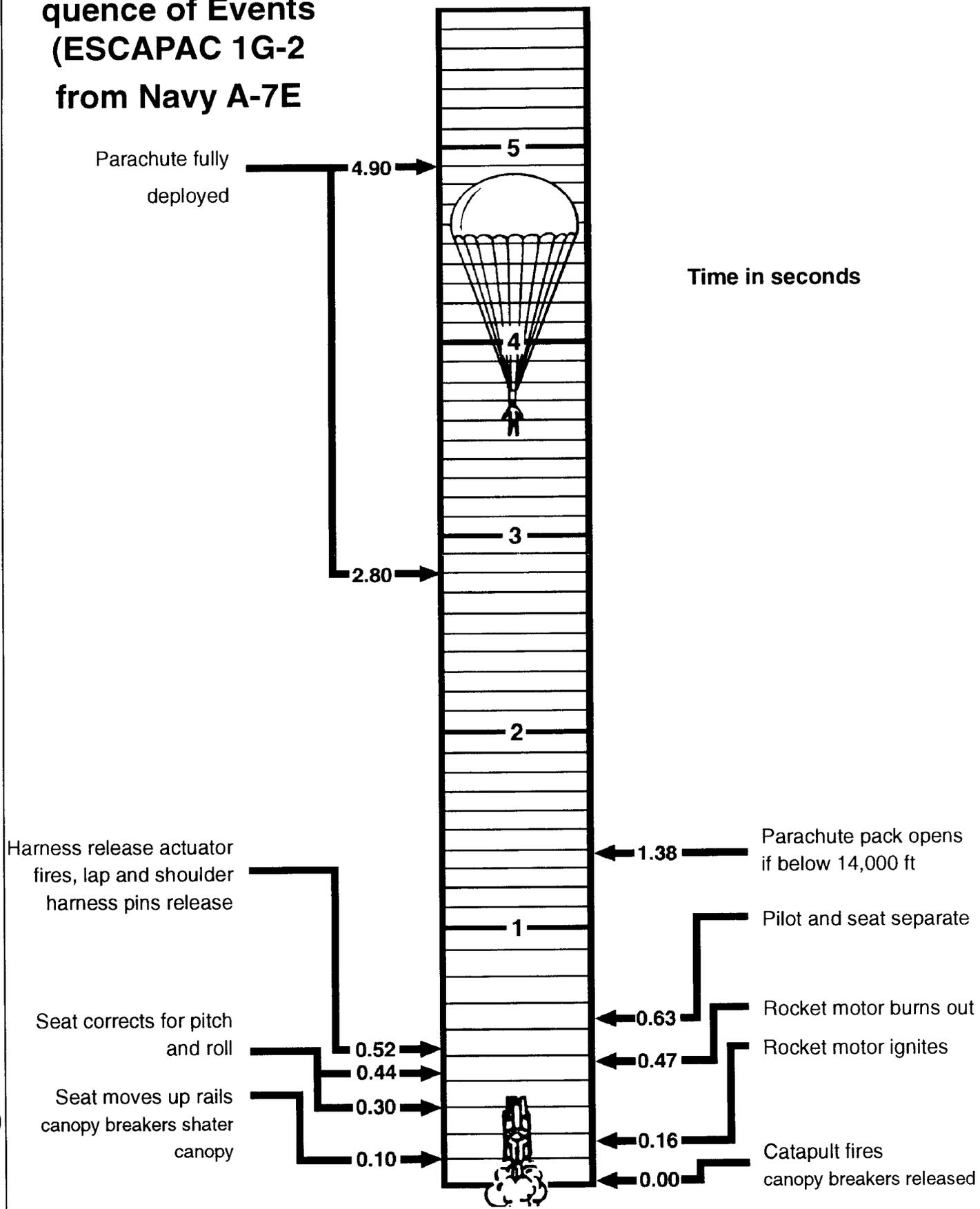
Step 2: Canopy blown

Step 3: Ejection seat departs a/c



Step 4: Seat leaves a/c, pilot is separated from seat, pilot and main chute deploy with survival kit and raft deployed beneath pilot

Ejection System Sequence of Events (ESCAPAC 1G-2 from Navy A-7E



(Continued from page 8)

Beginning the initiation process (assuming the pilot is capable of doing so under his own power) is normally handled in one of two methods: (1) using the lower handle (between the legs and in front of the seat) or (2) using the face curtain. Both methods are best illustrated above.

For the best understanding, I have "borrowed" several drawings, which I hope will better illustrate the ejection sequence itself. The first of these shows the sequence in the order of ejection (from an A-7), the second set, to give a bit more detail to the major steps as the pilot is ejected (again from an A-7) and the third, the actual times involved in the full ejection sequence. As you will see from the time-line graph, the entire time, from initiation of the pilot's ejection sequence in only about 5 seconds! The timing is quite precise and very quick as you will notice. In an aircraft such as the F-14, F/A-18 or EA-6B (which has four ejection seats and aircrew positions) the timing is even more critical and there are built-in time lapse sequences between the various seats as they are fired and ejected from the aircraft

In an EA-6B, for example the timing sequence is even more critical, when you realize there are often a full crew of 3 or 4 pilots and NFOs (or ECMO: electronic counter measures officer) in the aircraft, each of which has to have his precise departure from the aircraft in a very exact position and apart from the others.

Their sequence is (following the ejection initiation):

ECMO 3 (left rear position)	0 sec's
ECMO 2 (right rear position)	0.40 sec's
ECMO 1 (right front position)	0.80 sec's
Pilot (left front position)	1.20 sec's

There are a few other small details incorporated into modern seats. One is the ability for the seat to work effectively underwater (should the aircraft be submerged), with full oxygen supply to the pilot (assuming his oxygen mask is in place) and the ability of the pilot's parachute and harness to separate while in the water. One was mentioned earlier in these notes. The Navy (and subsequently all services) have incorporated this unique device in the parachute harnesses called "SEAWARS" releases. It automatically releases the chute from the pilot's harness as it senses salt water, thereby relieving them of the often fatal drag of water into

the parachute. While it may seem like fun to be in the water, apparently drowning in the sea is one of the most common problems encountered by pilots downed at sea.

Modelers Notes

I will discuss and enumerate two seats most often used in the Navy's A-7 Corsair II and F-4 Phantom II aircraft to illustrate these notes. As noted earlier, your input and suggestions are most welcome about other systems and seats, which I will pass on to others as well. Both seats, the ESCAPAC 1G-2 and Martin-Baker MK H7 seats are often modeled (sometimes correctly) and has several easily discernible features. Much of what I am outlining below holds equally true to the ejection seats used by Air Force aircraft today. Given the wide spread use of American built aircraft and interior packages with other nations operating U.S. aircraft or equipment, similar features are found on the modern military aircraft of many other nations as well. In fact, from what little Soviet (or license built) equipment I have seen, our design features seem to be very similar with much of what they fly today as well. One wonders how their ejection seats could be so similar in design, features and appearance? (I am sure they were just thinking along the same lines, right...?) With the recent appearance of the many fine F-4 models in all scales and the A-7 in both 1/72nd and 1/48th scales, either of these may be the ideal ejection seats to try your modeling and detail efforts. Each set is also now widely available in aftermarket detail kits and a large amount of detail is shown in these parts, but not always fully understood by the modeler. At least I had a number of questions and was just guessing about much of the attached or associated equipment. I hope this helps you.

There are also several very attractive figures of modern pilots, both Navy and Air Force available and when painted, they create great additions to your model collection and give another sense of size and reality to your completed models of the associated aircraft. Additionally many of you like to add the aircrew to your completed models and this information will hopefully add to that realism.

At least in one sense, I hope this

basic description will allow you to understand and better visualize what the basic seat parts are and possibly more accurately demonstrate or model them in your completed models. As a "sometimes judge," I often hear the complaints of others that a nicely modeled interior misses in some basic area: omitting throttles, a flight control device, having just one lap belt in the area or the belt having two long pieces of material and having a large metal buckle on one end or having shoulder harnesses which are seemingly never-ending (sometimes reaching the floor of the cockpit). The basic attachment pieces in a modern ejection seat are not like automobile seat belts (nor are they equipped with air bags). These items are reasonably simple to replicate.

I am not of the belief that a modeler can faithfully replicate all of the detail in a cockpit, the ejection seat or the area and structure surrounding the seat, especially in 1/72nd or smaller scales. However, there are some basic "shapes" and features which seem (to me at least) to "jump out" at you when you look into the cockpit. With the advent of the latest highly detailed interiors and with many of the fine aftermarket parts and cockpit areas, the modelers appears to have gained a significant advantage over the Airfix, Revell, Frog or even Hasegawa model of old. Additionally, even when you don't elect to open the cockpit up, the many very clear canopies beg for the modeler to do something with the interior, including the ejection seat.

Modelers' Color Suggestions

Colors are of special interest and can sometimes be a bit confusing. I try to locate a color picture of the aircraft & seat in question, often relying upon a magazine or book for color reference. I have several books which I tend not to use simply because my experience leads me to believe the author, photographer or publisher has made mistakes or appears to overstate their expertise (some of you have seen these mistakes and know of where I speak). I also suggest you start taking an active interest inside the aircraft you see, photograph and research. Gone are the days when some junior grade

lieutenant would come rushing up and warn you against taking photographs of interiors and what your camera catches today will surely be gone in the future and you'll pay some "expert" to describe the colors and features to you. I also use the word "suggestions" because for color suggestion I submit here there are exceptions. In the world of "personal survival and support" equipment there are often local construction, repair or fabrication of many of these items and you will notice changes or other colors being used. These seats and the associated metal edges and equipment are almost always scratched and show the constant wear of pilots climbing in and out of the aircraft. In this respect some weathering is called for in and around most seats and cockpits. This is often very realistic and done with "dry brushing" metallic colors over the ejection seat edges and sides (I like Floquil's Gunmetal and its finishing effect).

Generally most modern seat pads, lumbar supports and parachute packs (U.S. that is) are of an olive drab or darker green colors, the various belts and straps either light grey, light green-gray or sometimes

almost white heavy nylon strapping, the metal fittings aluminum. Most head rests now seem to be in almost a black color or dark gray, while they were often bright red, orange or light gray in the mid-50's through late 60's (experience with combat in S.E. Asia and air-to-air visibility taught us some valuable lessons about how far away an adversary could see a head rest and especially the gloss white flight helmets). Most ejection seats themselves are painted metal. The USN and USAF appears to have used light grays throughout the 60s, 70s and early 80s. Recently most seats are painted in black. Most seats also have a variety of small placards, warning labels and ejection prompts, most of which contain red, yellow, bright silver or white instructions (many of them intended for external readers, not the pilots). A standard feature in every ejection seat I've seen (including the Soviet seats) is the very prominent "safe" flag or streamer attached to the seat. This normally is about the head rest or seat top and can be easily seen by ground personnel and crewmen alike. In fact a normal check list ritual is for the pilot to hold up

or display his final "safe" pin and flag to demonstrate that the seat is active before startup or movement of the aircraft.

Many of these are clearly visible to people outside the aircraft in case of external rescue operations to remove an unconscious pilot. Hoses and connectors are also usually metallic or mid-olive green as well, with gunmetal or aluminum connection fittings. Almost all ejection initiating handles (for the face curtains), between the legs and along the seat sides are almost universally bright yellow and often crossed with black warning stripes (e.g., the M-B yellow and black dual face curtain handles prominently seen in every F-4 Phantom). Again, it may be that only the brief highlight of colors about the seat and its features will convey the appearance of the complex and highly detailed ejection seat. If you're modeling the 1/32nd Phantom, you had best be attuned to some of these details, their respective function and color. Such detail attention will go a long way to create the highly accurate presentation we strive for as scale modelers.

Basic Ejection Seats Used In Modern Naval Aircraft:

<u>Seat Type:</u>	<u>Aircraft Type:</u>
Martin-Baker GRUEA-7	EA-6B
M-B MK GRU-7	A-6
M-B MK GRU-7A	F-14
M-B MK MK-H7	F-4
M-B MK SJU-5/A, 6/A	F/A-18A/B/C/D
M-B MK SJU-17(V)1/1, 2/A	F/A-18C/D
Stencel SJU-4A/13/14	AV-8B & TAV-8B
Stencel SJU-8A/11A/12A	A-7E, TA-7C & EA-7L
ESCAPAC 1G-3	A-4, TA-4
ESCAPAC 1G-2/4/5	A-7E, TA-7C & EA-7L
ESCAPAC 1E1	S-3
North American LS-1A	T-2C
North American LW-3B	OV-10
Northrup M-38	T-38, F-5
ACES-II	F-16

These are the seats and basic Navy aircraft known to me. Some of these aircraft are no longer active with the fleet, but may be used by contractors for the Navy/Marine Corps, hence their inclusion in the Navy's support system for ejection seats. This list also covers a significant number of current modern U.S. aircraft of which there are numerous models available. Almost all are readily available to the modeler and offer a wide range of modern modeling subjects.

Remember !

Bill Johnson

There is no right or wrong way to build a model. Each of us does what we do for our own reasons and to whatever level or standard we choose. However, to master anything, one has to work at it, invariably putting in long, hard hours, constantly experimenting and trying ideas new to us, even though they may be known to the rest of the world. Model building be likened to learning to swim: you have to get into the water. With model building you have to build. That means getting out of the armchair, or off of the sofa. Push your capabilities somewhat, but not to the point that you are constantly frustrated by a lack of skill or knowledge; ask questions. Set your sights a little high, but not too high. Raise your goals as you progress. And always remember...It's supposed to be fun!

[This is a great reminder from Bill, who saw it in a note he had seen in the Chicago area some time ago.]

Kit Reviews & Notes:

Academy 1/48th MH-60K with Cobra Company superdetail set.

Tracy White

The MH-60K Blackhawk is the latest addition to the US Army's 160th Special Operations Aviation Regiment. With special terrain following radar, FLIR, radar warning sensors, and mission management avionics, the K model Blackhawk can carry around eight to ten soldiers deep within enemy lines during night and adverse weather conditions. Minicraft's recent release of the MH-60K is a welcome addition to their line of Blackhawks. Unfortunately, their kit is a poor representation of this bump-laden bird. The kit covers the lines of the aircraft fairly well, but suffers from an abysmal cockpit/interior and inaccurate parts for the K model. The solution is the Cobra Company's \$14.95 MH-60K superdetail set. I was extremely happy with their service. I placed an order on a Thursday or Friday; the set arrived the following Monday! Not having done much with resin parts (aside from a smattering of True Details cockpits), I cannot really compare their work to other companies. However, I was very impressed with the level of detail provided in the parts, which are crisply molded. I spent about half an hour drooling over the pieces and comparing them to those provided with the kit. There is really no comparison. This set blew Minicraft's pieces out of the water!

In addition, the molds were engineered to make it as easy as possible to remove the parts without causing damage. Their set includes a new console and instrument panel with the correct glass cockpit layout, armored seats, a new nose section replacing the kit's pieces, an accurate SATCOM GPS array, and new sponsons with the RWR antennae that are missing from the kit's. In addition, weighted tires, avionics cabinets, and a hand-trembling array of antennae are provided for your super detailing pleasure. The only thing the set lacks that the kit needs are the interior covers for the main landing gear oleos, which should not be visible from inside the aircraft. Wings and

Wheels Publications has an excellent book on the Blackhawk entitled "UH-60A Black Hawk in Detail" that has many shots of the interior; these should provide amply information for the construction of these structures. I have so far blocked one gear strut off and packed the box surrounding it with epoxy putty to reinforce Academy's rather weak mounting for the gear. So far, the only problem I have had with the Cobra Company's set is a wrong measurement in the instruction sheet. Instead of measuring a 1/4" for removal of the forward cockpit floor called out in their instructions sheet, a measurement of 1/16" should be used. Otherwise the cockpit floor will stick out too far and will prevent the new nose section provided in their set from even touching the fuselage.

I have been lucky enough to meet a friend of a Cobra Company mold-maker through the Internet. I was able to ask some questions about details that would otherwise be hard to find. The seats on the aircraft they took pictures of had red seats covered by black fleece covers. The headrests were a faded maroon color. The once black seat belts have faded to a dark green color. However, another aircraft he had pictures of had seats that were all black. The rest of the cabin and the lower parts of the avionics boxes are all gray, light ghost probably being apropos. The MH-60K can be fitted with either the external tanks depicted in the box art and instructions or an internal one that sits in the rear of the cargo bay. The parts are provided for this (#37-40) but aren't shown in the instructions. If you want to use the internal tank, substitute parts 6 and 8 for the fuel tank wings. Because the bracing's won't be used, be sure to glue the mounting fairings (#s 10-13) where the supports would normally meet the fuselage. Academy's kit fit is good to poor. The air intakes for the engines are tricky to locate correctly and left a sizable gap on the bottom where they meet the top of the fuselage. There were also areas of flash on the intakes that needed to be removed before they would sit right.

The interior features heavy pock marks from the knock-out pins that need to be removed as well. Due to the detailing I'm doing on the interior, I haven't actually glued the fuselage halves together, but as this is the third Academy

Black Hawk I've built, I'm going to say that the fuselage goes together well, with only a bit of putty needed along the joint just aft of the rotor mast. In conclusion, the Academy MH-60K is a decent kit, but lacks accuracy. The Cobra Company's superdetail set gives this model a chance to shine. People new to resin conversions should take their time, but the time and effort the Cobra Company put into engineering this set will make it a good first conversion to undertake.

Is Vac-u-form a four letter word?

Bill Osborn

Why is it that when you mention vac-u-form most modelers act like you've said a bad word in front of their wives and children?

Vac-u-form models are fun. True, they are a little messy (wet and dry sanding), but they are the only place you can find some the models you will never find in an injected kit.

You can add as much or as little detail as you want. Yet some of our most talented members shudder at the very thought of having to cut parts from a sheet of white plastic and fit parts together without index pins.

However, if you ask several of our members, Terry Moor, Norm Filer and Brian Mulron to name a few, they will tell you the vac-u-forms are fun. Sure, they require a little more work, but so what, we're model builders aren't we?

Vac-u-forms are just like other kits bet they injected or resin. Some are top quality with decals photo etched and white metal parts. Some are basic shapes with very little surface detail or small parts (wheels, landing gear, struts or props).

O.K., so now I've got you to the point where you say, what the heck is this guy talking about? I haven't the slightest idea either, but maybe this babbling will get some of you thinking that maybe it might be fun to try just one small vac-u-form model.

Pacific Northwest Model Contest Events - 1997

John Chilenski

Thursday	January 9, 1997	NWSM meeting
Saturday	January 11	IPMS/Seattle meeting
Saturday	January 18	NWSM/MOF Show
Thursday	February 6	NWSM meeting
Saturday	February 8	IPMS/Seattle meeting
Sunday	February 23	Car Modelers' Contest. Sedro Wollev. WA
Thursday	March 6	NWSM meeting
Saturday	March 22	IPMS/Seattle RECON 7
Thursday	April 3	NWSM meeting
Saturday	April 5	Galaxy Hobby Shop Contest. Lynnwood. WA
Saturday	April 12	IPMS/Seattle meeting
Saturday	April 19	HobbyTown Spring Contest. Lvnwood. WA
Saturday	April 26	HobbyTown Spring Contest. Tukwila, WA
Saturday	April 26	IPMS/Spokane 2nd Annual Show (contest). Spokane. WA
Sunday	April 27	Puget Sound Ship Modelers 2nd Annual Ship Model Exhibition & Competiton, Seattle
Thursday	May 1	NWSM meeting
Sunday	May 4	PSAMA 8th Annual Spring Contest. Puyallup. WA
Saturday	May 10	IPMS/Seattle meeting
Thursday	June 5	NWSM meeting
Saturday	June 7	NWSM Model Show '97 (contest)
Saturday	June 21	IPMS/Seattle meeting
Thursday	July 3	NWSM meeting,
Saturday	July 5	IPMS/Yakima Model Makers Annual Invitational, Yakima, WA
Wed.-Sunday	July 9-July 13	IPMS/USA National Convention, Columbus, OH
Saturday	July 12	IPMS/Seattle meeting
Thursday	August 7	NWSM meeting
Saturday	August 9	IPMS/Seattle meeting
Thursday	September 4	NWSM meeting
Saturday	September 20	IPMS/Seattle meeting
Thursday	October 2	NWSM meeting
Saturday	October 11	IPMS Vancouver, B.C., Fall Model Show & Swap Meet, Burnaby, B.C.
Thursday,	November 6	NWSM meeting
Thursday	December 4	NWSM meeting

IPMS/Yakima Model Makers Annual Invitational Model Show Selah, WA Saturday, July 5th, 1997

This Yakima valley contest and show will begin with Registration from 9:00 am -1:00 pm, Judging from 1:00 pm - 4:00 pm, and Awards Presentation at 4:30 pm. The fees include: Entry Fee: \$5.00 - includes 5 models, \$1.00 for each additional model; juniors age 10 & under FREE and General Admission: \$1.00. Vendor tables: \$10.00 per table.

The Contest Trophies will be awarded for: Judges's Best of Show - Junior, Judges's Best of Show - Senior and People's Choice. Special Awards will be given for: Farthest Traveled, Best Tall Ship, Best Street Rod, Best Number 43 (Any Richard Petty NASCAR Racer), Best Artillery - Towed or Static, The Medicare Award (For Entrants Age 65 or Older), and The Sow's Ear Award for the best rendered aircraft model built & reworked from an old, poorly engineered kit (i.e. old Airfix, Matchbox, Aurora, Lindberg, Smer, Artiplast, etc) - the builder must document the kit by displaying the model with the original kit instructions. Additionally, a "Best Of" award will be given for the major category subdivisions, and ribbons will be awarded for First, Second, and Third Place in each category. (See category list at our February 8th Meeting)

FOR MORE INFORMATION CONTACT: Stu Alvord (509) 697-7914 (7 pm-9 pm), Rich Hoard (509) 965-6913 (7 pm-9 pm) or Jim Green (509) 965- 0553 (7 pm-9 pm).

EVOLUTION (OR DEVOLUTION) OF A PLASTIC MODELER

Stage 1: (unskilled innocence)

Has bought a kit or two and glues them together, without painting them. Often has decals on upside down. Breaks the parts from the sprue with his hands. Does not build kits except in garage, basement or other areas where friends or family won't see them. Usually buys his kits at K-Mart or Fred Meyer. Feels like this is something missed from his childhood. Doesn't own any real modeling tools and isn't sure what's really needed. Completed models are usually completed at the pre-school level and may be exploded with firecrackers. Builds one of his models on the dining room table and drops glue on the top and mars finish. Many dropouts.

Stage 2: (innocence without conscience) Survives stage 1! Some models finished and occasionally successful at using all of the kit's parts, including those containing parts for several versions. Buys, reads, rereads and enjoys *Scale Modeler*. Has acquired a few basic tools (e.g., fingernail clippers, file and blunt point school scissors). Paints kits with Testors gloss enamel, using a brush and sometimes leaves finger prints to evidence his efforts. Has, without duress, purchased Airfix or Matchbox kits and feels they are "nifty kits." Is heard making "airplane sounds" as he playfully zooms the kits through the air in mock flight. Can also make diving klaxon sounds for model submarines and a good metallic sound when running his tank kits around his desk top. Kits are painted in gloss colors. Has heard there are modelers clubs and actively considers joining a modeling group. Will admit to family and friends that he enjoys modeling (though some think he is talking about demonstrating new clothing and walking down elevated runways). Buys a book on modeling and has seen *Fine Scale Modeler*, but doesn't subscribe. Has heard about the neatest tool, the "hair brush" but hasn't actually seen one or watched it work.

Stage 3: (experienced and sometimes ethical) Usually successful. Is aware of different kits and several

manufacturers, believing that the kits are of equal quality. Acquires first craft knife, tweezers, liquid modeling adhesive and a sheet of after-market decals. Builds models of different scales. Paints and includes the model figures into his kits. Most completed kits are painted in authentic matched colors, most of which are in matt finish. Joins a local modeling club. Hears about IPMS and wonders what the initiation is like and if there are other adult members? Takes a modeling class. Has several books on modeling and a few books on airplanes, ships or automobiles. Usually opens the new kit, cuts the parts from the sprue trees carefully and holds parts together to insure their fit.

Stage 4: (turning point) Decides to only build kits of aircraft or ships and continues to mix his scales. Has 20 or more books on modeling and various types of aircraft. Starts to buy almost every newly released kit and can't complete more than 1 kit each week. Comes to the fantasy conclusion that the greatest wife in the world would be a woman who is rich and owns a hobby shop. Freely gives advice to modelers in stage 1-2. Becomes a board member in a modeling club and marvels at the demonstrated skill and completed models at each meeting. Joins IPMS and becomes a more fulfilled and skilled modeler. Can finally stop reading, much looking at, the kit instructions. Only purchases aftermarket decals. Buys an "air brush" and stocks up on expensive cans of compressed gas propellant for his brush. Can often get both wings or fuselage done with a single can of gas. Purchases his first copy of *Fine Scale Modeler*. Enters models into several categories at the regional annual model contest and receives at least one award for his modeling excellence. Sets up a totally secure area in his basement or the linen closet to build his models; this area is "off limits" to others in the family.

Stage 5: (Involved) Models every chance he gets. Hangs around only with other modelers and is snobbish about it. Finishes his kits and displays them around the house and office, usually with small bases and likes to display the ribbon he won last year at the "regional." Will talk with other modelers the club meetings and ask how they did something or where they got the materials to make that kit or those decals. Takes his family on a vacation to

such garden spots as Valley Plaza and Brookhurst Hobbies. Owns from 40-60 unfinished kits, a bookcase full of reference books. Subscribes to several modeling magazines. Reads every issue of IPMS journal from cover to cover and writes a letter to the other members asking for help or assistance. Starts planning what he will build to insure his successful entry in one of the IPMS categories and memorizes the contest rules and regulations. Learns that there is modeling information on the internet. Teaches someone less experienced how to build a kit "properly" and becomes an officer of his modeling club.

Stage 6: (Obsessed, demented)

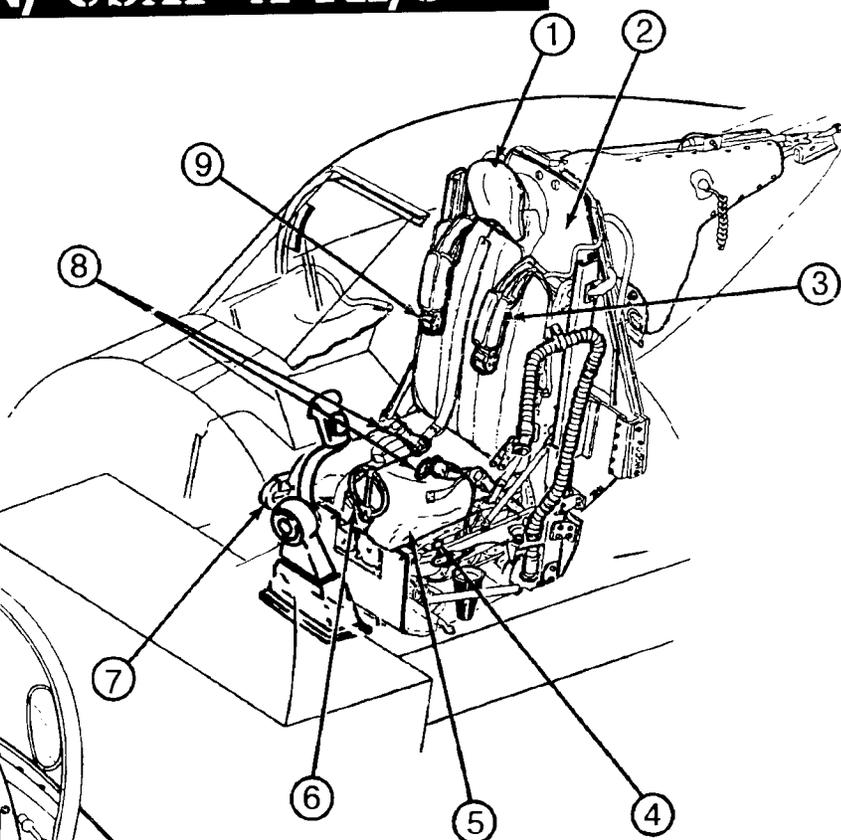
Talks of starting a hobby shop business or after-market detailing parts business. Collects kits, decals, paints, tools and modeling magazines. Badgers modeling friends about spare parts, decals and older kits. Reads and catalogues every issue of IPMS journal on a PC, writes letters to the editor and contributing authors asking for further information or assistance. Subscribes to several foreign, *non-English speaking* modeling magazines and modeling groups. Takes vacations which always include the IPMS-USA convention and spends countless hours in the vendors' rooms. Immediately takes all kits, decals, magazines, catalogues and books to his hotel room and stays away for hours reviewing each item. Plans his way home from work or week-end travel so he can visit hobby shops alone to buy modeling supplies. Is heard to say that he is going out for a beer with some women at work, but secretly goes to his hobby shop where he buys more "stuff." He inaccurately describes his "kit collection" as being in the "hundreds" and has specific plans to build them all. Will drive from Seattle to Spokane to visit the White Elephant and buy lots of kits. Doesn't remember when he completed his last kit. Writes articles for club newsletter. Tries to sell his services as a "professional modeler." Offers to give talks, show slides or lead discussions at his local modeling club, or to any group that will actually invite him. Wife, boss, family and close friends complain that all he talks about is modeling. His bank account dwindles and he obtains several new bank cards. Buys a used sport utility vehicle to insure his year-around access to hobby shops and modeler meetings..

Stage 7 (lost to humanity) Quits job and lives on unemployment compensation and attempts to use federal food stamps to purchase kits and decals. Installs small refrigerator next in his modeling room, so he won't have to leave for beer, soft drinks or rations. Writes lengthy letters to modelers magazines and IPMS publications, argues his ideas, points out the errors in others works and articles, including the fact that the Germans never actually used the specific markings and colors attributed to them in an article about hypothetical stealth aircraft and pointing out the IPMS judging is also a blatant attempt by the communist to take over the society! . Builds only 1/72nd kits and feels all other scales are a part of the communist plot to take over the world. Is planning to build a diorama of the battle of Kursk....in 1/72nd scale Lloyds of London is initially interested in insuring his kit collection but decides eventually they can't take such a risk. Drives cross county to the IPMS conventions, visiting airports, hobby shops and museums along the way and usually registers in the host hotel several days early and sits in the lobby area a day early hoping to register and get into the vendor area early. Writes a lengthy and very persuasive letter to the International Olympic Organizing Committee pointing to the obvious need for a scale modeling category in future Olympic games. Has spend at least a hundred hours trying to perfect the detailed interior of the Barling Bomber. Sleeps in car at his hobby shop on the day they have said they will receive the new kits from Japan. Has redesigned an entire section of his home to store his kit collection which numbers in the thousands; the entire collection can not be safely approached because it constitutes an unsafe and hazardous area. Rarely, if ever, finishes kits. Babbles incessantly about decal colors, errors in wing dihedrals, the clarity of kit canopies, leaving his kit collection to a museum and has memorized the latest kit collectors listings and values. Has will prepared in which he directs that his remains be spread on the lawn of the Monogram or Revell plants.

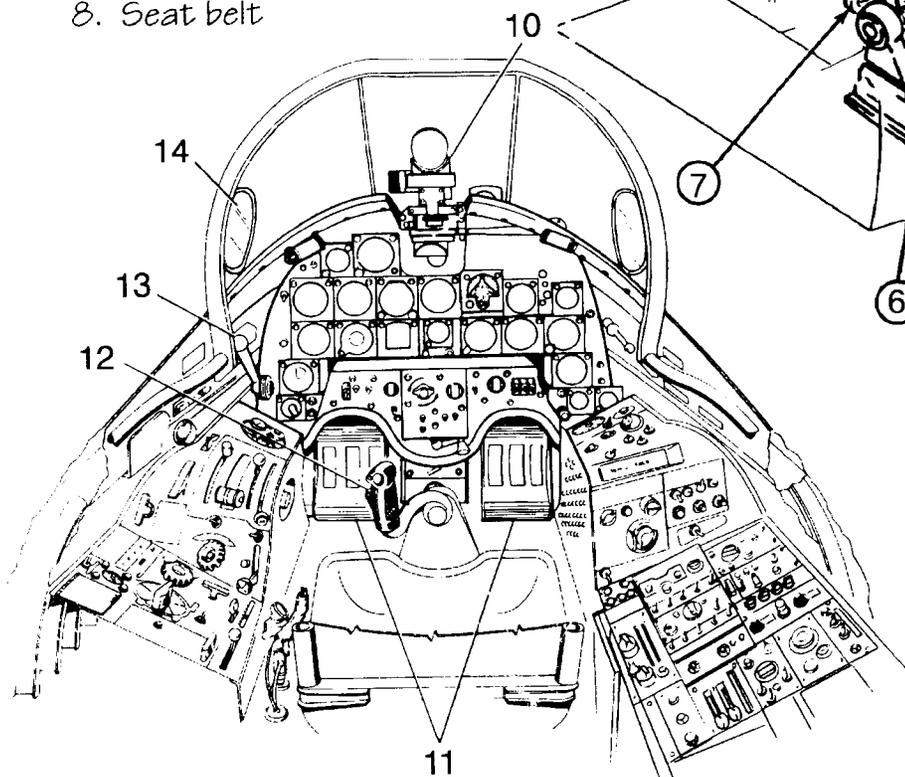
TECH MANUAL: USN/ USAF A-1H/J

Key:

1. Head rest
2. Armor plate
3. Shoulder restraint straps
4. Shoulder strap lock handle
5. Parachute (Navy MdNB-7)
6. Extraction firing handle
7. Emergency harness release handle
8. Seat belt



9. Parachute release fittings (koch types)
10. Gunsight
11. Rudder pedals
12. Control stick
13. Landing gear handle
14. Rear vision mirror



Meeting Reminder:

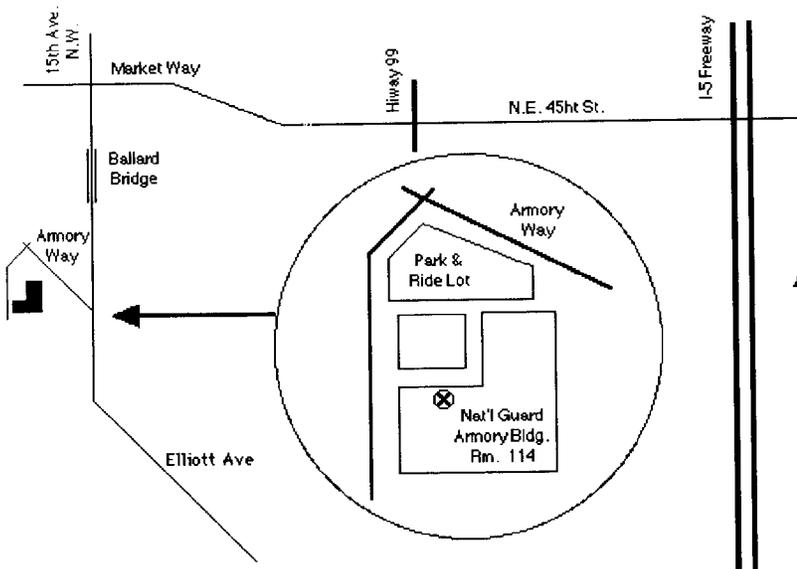
Saturday, May 10, 1997

National Guard Armory
Room 114
1601 West Armory Way
Seattle



Directions: From North or Southbound 1-5, take the N.E. 45th St. exit. Drive West on 45th, crossing under Highway 99 (or Aurora Ave North) toward N.W. Market St. in the Ballard district. Continue West on Market St. toward 15th Ave. N.W. Turn left (south) onto 15th Ave. N.W. and drive across the Ballard Bridge until you reach Armory Way (just as you see the Animal Shelter). Watch for signs. You should park in the Metro Park & Ride Lot.

If coming from South Seattle, take Highway 99 onto the Alaska Way viaduct to Western Ave. Follow Western Ave. north to Elliott Ave. until it turns into 15th Ave N.W., then to the Armory Way turnoff.



	Seattle Chapter - IPMS-USA Terry Moore, President 3612 201st Pl. S.W. Lynnwood, WA 98036
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230 173rd Pl. N.E.
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