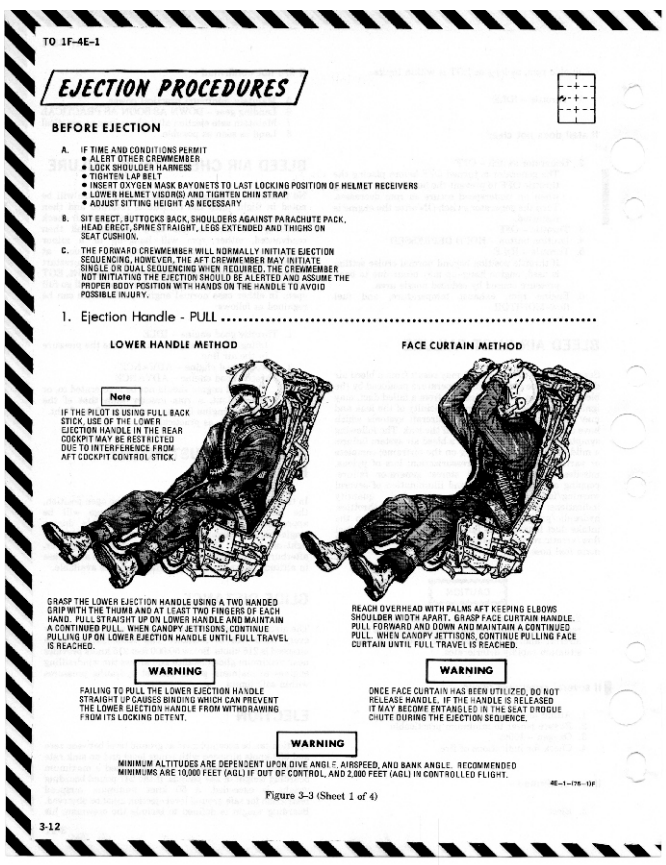
Ejection Seat

The F-4 Phantom used various models of the Martin-Baker ejection seat system which has been one of the most widely used systems in fighter aircraft. It has a zero-zero capability which means the two crewmen can eject from ground level with the aircraft stationary and get a full parachute before landing on the ground. Crewmen can survive high altitude ejections as well as supersonic ejections. There are restrictions such as your ejection trajectory. For instance you could not safely eject if you were inverted and close to the ground.

In an ejection of both crewmen, the backseat canopy would be blown off first, an explosive charge would propel the seat up when the canopy cleared the cockpit (the canopy pulls a pin out of the ejection seat when it departs the plane), at about five to ten feet of upward movement a lanyard attached to the plane pulls a pin that starts a small rock motor on the bottom of the seat that will take the seat up another 100 feet. While the seat is moving upward, lanyards pull the crewman's leg in toward the seat to hold them close to the seat and it pulls the shoulder harness in to keep the crewmen tight in the seat. At high altitude the chute will not fully open immediately to allow time to get to a lower altitude quickly and avoid long exposure to cold temperatures and low breathable air pressure. The seat has a small emergency oxygen bottle so allow the crewman to get enough oxygen until they get down to breathable air. When the chute deploys, the crewman is separated from the rest of the ejection seat but his survival kit which was sitting on remains connected to him. The entire sequence is automated once one of the crewmen initiates the ejection. The front ejection seat starts the same sequence a few seconds after the backseat canopy separates to maintain separation between the two seats.



TO 1F-4E-1

EJECTION PROCEDURES

BEFORE EJECTION

A. IF TIME AND CONDITIONS PERMIT
- ALERT OTHER CREWMEMBER
- LOCK SHOULDER HARNESS
- TIGHTEN LAP BELT
- INSERT OXYGEN MASK BAYONETS TO LAST LOCKING POSITION OF HELMET RECEIVERS
- LOWER HELMET VISORS AND TIGHTEN CHIN STRAP
- ADJUST SITTING HEIGHT AS NECESSARY

B. SIT ERECT, BUTTOCKS BACK, SHOULDERS AGAINST PARACHUTE PACK, HEAD ERECT, SPINE STRAIGHT, LEGS EXTENDED AND THIGHS ON SEAT CUSHION.

C. THE FORWARD CREWMEMBER WILL NORMALLY INITIATE EJECTION SEQUENCING, HOWEVER, THE AFT CREWMEMBER MAY INITIATE SINGLE OR DUAL SEQUENCING WHEN REQUIRED. THE CREWMEMBER NOT INITIATING THE EJECTION SHOULD BE ALERTED AND ASSUME THE PROPER BODY POSITION WITH HANDS ON THE HANDLE TO AVOID POSSIBLE INJURY.

1. Ejection Handle - PULL .....

LOWER HANDLE METHOD

Note

IF THE PILOT IS USING FULL BACK STICK, USE OF THE LOWER EJECTION HANDLE IN THE REAR COCKPIT MAY BE RESTRICTED DUE TO INTERFERENCE FROM AFT COCKPIT CONTROL STICK.

GRASP THE LOWER EJECTION HANDLE USING A TWO HANDED GRIP WITH THE THUMB AND AT LEAST TWO FINGERS OF EACH HAND. PULL STRAIGHT UP ON LOWER HANDLE AND MAINTAIN A CONTINUED PULL. WHEN CANOPY JETTISONS, CONTINUE PULLING UP ON LOWER EJECTION HANDLE UNTIL FULL TRAVEL IS REACHED.

WARNING

FAILING TO PULL THE LOWER EJECTION HANDLE STRAIGHT UP CAUSES BINDING WHICH CAN PREVENT THE LOWER EJECTION HANDLE FROM WITHDRAWING FROM ITS LOCKING DETENT.

FACE CURTAIN METHOD

REACH OVERHEAD WITH PALMS AFT KEEPING ELBOWS SHOULDER WIDTH APART. GRASP FACE CURTAIN HANDLE. PULL FORWARD AND DOWN AND MAINTAIN A CONTINUED PULL. WHEN CANOPY JETTISONS, CONTINUE PULLING FACE CURTAIN UNTIL FULL TRAVEL IS REACHED.

WARNING

ONCE FACE CURTAIN HAS BEEN UTILIZED, DO NOT RELEASE HANDLE. IF THE HANDLE IS RELEASED IT MAY BECOME ENTANGLED IN THE SEAT DROGUE CHUTE DURING THE EJECTION SEQUENCE.

WARNING

MINIMUM ALTITUDES ARE DEPENDENT UPON DIVE ANGLE, AIRSPEED, AND BANK ANGLE. RECOMMENDED MINIMUMS ARE 10,000 FEET (AGL) IF OUT OF CONTROL, AND 2,000 FEET (AGL) IN CONTROLLED FLIGHT.

Figure 3-3 (Sheet 1 of 4)

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Upper right: Ejection seat in the museum at the Joplin Airport's old control tower.

Left photo: Ejection test using a test dummy.

Right photo: Copy of the pilot's emergency procedure for ejection.