

1. Couple the aircraft oxygen supply hose (right side of the ejection seat) to the lower port of the oxygen omni-connector.
2. Insert the male connector, on the end of the face mask hose, into the female receiving port of the oxygen omni-connector.
3. Connect the emergency oxygen supply hose to the oxygen omni-connector.

MK-H7 EJECTION SEAT

NOTE

Refer to foldout section for Ejection Seat illustration.

The MK-H7 ejection seat system can provide the crew with a safe and efficient escape from the aircraft. The seat is propelled from the aircraft by an ejection gun on the back of the seat which is assisted by a rocket motor on the bottom of the seat. The seat system includes an automatic ejection sequencing system through which three ejection sequences can be selected. In the event of an ejection-sequence system malfunction, the automatic features can be manually overridden. If necessary, ejection can be accomplished at ground level between zero and 550 knots airspeed with wings level and no sink rate providing the crewmember does not exceed a maximum boarding weight of 247 pounds. If the 247 pound boarding weight is exceeded, a 50 knot minimum airspeed restriction for safe ground level ejection must be observed. However, the canopy must be closed for it to jettison and remove the interlock block for the zero and 50 knot speed. Boarding weight is defined to include the crewman, his clothing, and personnel equipment; excluding his parachute and seat pan survival kit. Due to the aerodynamic instability of the seats at higher airspeeds, a minimum ejection altitude of 50 feet should be observed at airspeeds greater than 550 knots. The ejection seat is an automatic device that primarily regulates the opening of the personnel parachute at a predetermined altitude or, if below that altitude, after a specified time period. Operation of the ejection seat is divided into two phases: primary and secondary operation. Primary operation of the seat includes all operating events that occur during the ejection sequence. This sequence begins with actuation of the face curtain or lower ejection handle which causes the canopy to jettison and the ejection gun to fire. It continues until a normal parachute descent of the occupant is accomplished. After the seat is initially fired during the ejection sequence, seat operation is completely automatic and requires no additional action by the occupant during the sequence. Secondary operation of the seat consists of controlling shoulder movement, seat bucket positioning, manual release of the leg restraint lines, and leg restraint line adjustment.

EJECTION SEAT SEQUENCING

Three ejection sequences (figure 1-22) may be selected: (1) Dual ejection may be initiated from the front cockpit, and (2) dual, or (3) single ejection may be initiated from the rear cockpit. A command selector valve is provided in the rear cockpit to select single or dual ejection. Ejection is initiated by pulling the face curtain or the lower ejection handle. When the face curtain or lower ejection handle is pulled to the first position, the seat mounted initiator fires

and the automatic ejection sequence is initiated. The ejection gun can be fired manually as soon as the canopy jettisons and removes the interlock block. A safety pin (interdictor link) which safeties the ejection gun firing mechanism sear is also removed when the canopy is jettisoned. If the pull is maintained on the ejection handle the seat is fired before it is fired automatically by the sequence actuator. During single automatic ejection from the rear cockpit the rear canopy is jettisoned after which the seat is fired approximately 0.54 seconds after ejection initiation. During dual automatic ejection initiated from either cockpit, the rear seat fires as in single ejection, that is, approximately 0.54 seconds after initiation. Front canopy jettison is initiated after approximately 0.75 seconds and the front sequence actuator will fire the front seat automatically approximately 1.39 seconds after initiation. This ensures adequate clearance between the two ejection seats and the aircraft canopies. The sequence of seat operation after the powered retraction system retracts the shoulder harness (which occurs immediately after ejection initiation) and after the canopy is jettisoned is as follows. As the canopy jettisons, the canopy interlock block, which is attached to the canopy, is pulled from the interruptor mechanism of the seat. A safety pin (interdictor link) which safeties the ejection gun firing mechanism sear is also removed when the canopy is jettisoned. This allows the ejection gun firing linkage to be actuated by the automatic ejection sequencing system or by a continued pull on the ejection handle, thus firing the primary cartridge in the ejection gun. Gas pressure generated by the primary cartridge causes the inner and intermediate tubes of the gun to extend. The initial upward movement of the inner tube unlocks the top latch mechanism which releases the seat from the aircraft. As the gun extends, two auxiliary cartridges are fired as they become exposed to the hot propellant gases within the gun. Staggered firing of the ejection gun cartridges furnishes even stroke. As the seat rises, the emergency oxygen is tripped. Trip rods attached to the aircraft structure trigger the drogue gun and time release mechanisms, and the emergency IFF/SIF is switched ON. As the crewmember ejects, his legs are drawn back, the restraint lines pull through the snubbers, and when all the slack is taken up in the lines, the floor attachments break away at the shear rivets. His legs are restrained against the front of the seat bucket by the snubbers. The rocket pack fires to propel the seat to a greater height and is fired through the action of a 6 foot lanyard connected between the cockpit floor and the rocket initiator sear. Approximately 0.75 second after ejection the drogue fires a drogue projectile to deploy the 22-inch controller drogue which, in turn, deploys a 60-inch stabilizer drogue. The seat is stabilized and decelerated by the drogues as the man/seat descends rapidly through the upper atmosphere with the occupant securely restrained in the seat. Automatic operation of the time release mechanism occurs approximately 2.25 seconds after reaching the preset barostat altitude (11,500 + 3000 - 0 feet) or, in ejections below this altitude, the time release operates approximately 2.25 seconds after the trip rod is pulled. When the time release mechanism operates, the harness attachment locks are released through mechanical linkages on the seat. At the same time, the scissors open to release the drogues from the seat. The pull of the drogues is transferred to the parachute withdrawal line which releases the face curtain restraint straps and the parachute restraint straps, and the drogues pull the personnel parachute safety pin line and deploy the

personnel parachute. The personnel parachute safety line is connected on one end of the parachute withdrawal line and the other end secures the flap on the top of the personnel parachute. The purpose of the pin is to secure the parachute from premature opening due to windblast during descent prior to time release mechanism actuation. The occupant is held to the seat by the sticker clips until the opening shock of the parachute snaps him out of the seat. The automatic ejection sequence takes approximately 4 seconds from firing the ejection gun to full parachute deployment. If the automatic sequencing system malfunctions, the canopies can be separately jettisoned by the normal canopy control handles or emergency canopy release handles or manual canopy unlock handles; and the ejection seats can then be fired individually from each cockpit by an additional pull on an ejection handle.

Dual Ejection Initiated From the Front Cockpit

The dual ejection sequence is initiated whenever the crewmember pulls either the face curtain handle or the lower ejection handle to fire the front seat mounted initiator. Gas pressure from the seat mounted initiator is routed to the sequencing system which ejects the rear seat prior to front seat ejection.

WARNING

If the front canopy is lost, the front canopy interlock block with its ejection sequence time delay will also be lost. If ejection is then initiated from the front seat, this could expose the rear crewmember to the front seat's rocket blast and a collision between seats could possibly result. If loss of the front canopy or both canopies occur, the rear crewmember should rotate the command selector valve handle to the horizontal (open) position and initiate ejection for both crewmembers. With loss of the rear canopy only, normal ejection can be initiated from either cockpit. If the rear seat ejection system fails for any reason, the front seat ejection sequence will still occur in normal time frame. The rear cockpit crewmember must then initiate corrective action.

Dual Ejection Initiated From Rear Cockpit

The rear crewmember initiates a dual ejection by placing the command selector valve handle to the horizontal (open) position and pulling either the face curtain or lower handle.

Single Ejection Initiated From Rear Cockpit

Single ejection occurs when the rear cockpit crewmember pulls the face curtain handle or lower ejection handle with the command selector valve handle in the vertical (closed) position.

EJECTION SEAT COMPONENTS

The main components of the ejection seat system include: the ejection sequencing system, the main beam assembly, the firing linkages and canopy interlock mechanism, the ejection gun, the drogue gun, the drogue chute scissors mechanism, the time release mechanism, the guillotine assembly, the sticker clips, the rocket motor, the personnel parachute, the leg restrainers, the shoulder harness powered inertia reel lock, and a seat-mounted emergency oxygen bottle. Ejection seat controls include: the face curtain ejection handle, the lower ejection handle, the lower ejection handle guard, the command selector valve handle, the seat positioning switch, the leg restraint release handle, the shoulder harness release handle, the emergency harness release handle, and the emergency oxygen knob.

Main Beam Assembly

The main beam assembly is a strong lightweight structure built to withstand high G loads. This assembly is the main frame of the seat assembly which supports the seat bucket, drogue container, drogue shackle scissors, drogue gun, time release mechanism, and personnel parachute. It is composed of two vertical beams bridged by three crossmembers. The top latch mechanism is attached to the top of the left vertical beam and secures the seat structure to the catapult gun barrel.

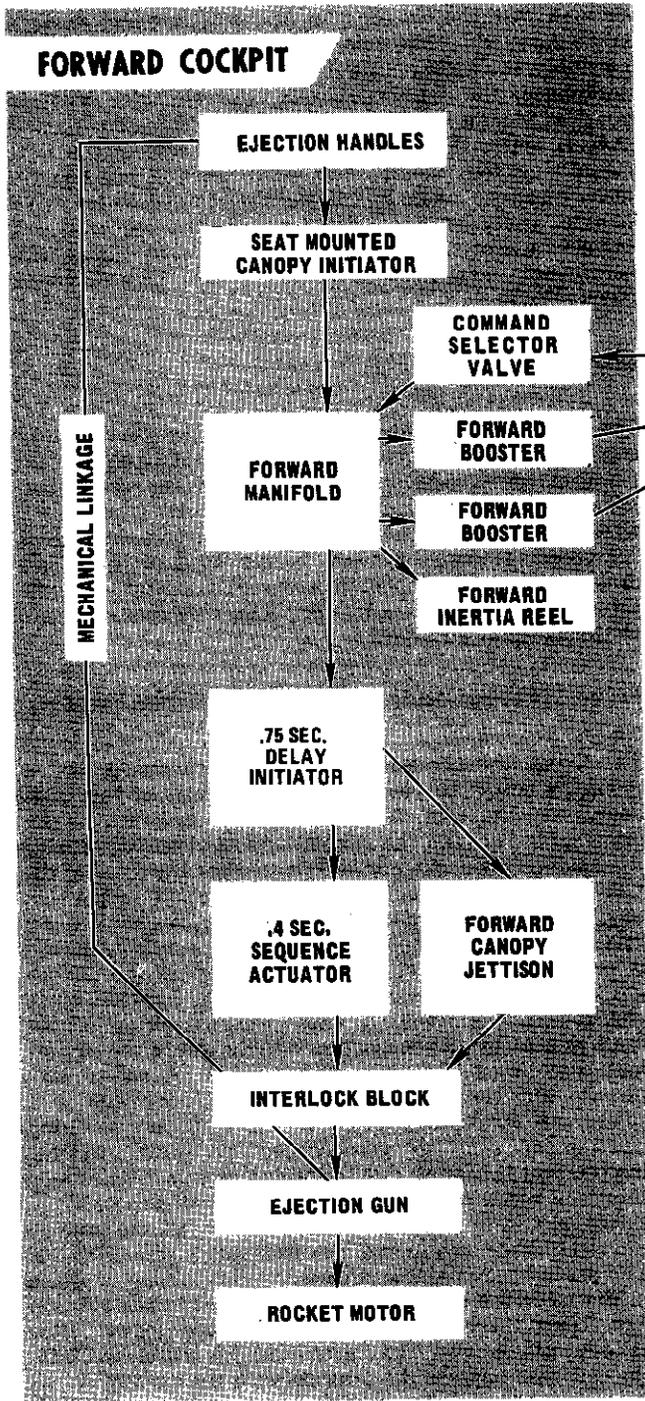
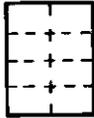
Firing Linkages and Canopy Interlock Mechanism

The firing linkages and canopy interlock mechanism is mounted across the top of the aft corners of the main beams on the seat. This mechanism provides proper sequencing between the canopy and ejection seat during the ejection sequence and also transmits the force of the face curtain handle or lower ejection handle to the seat mounted initiator and ejection gun firing mechanism. An interlock block is connected to the canopy by a cable and is pulled from the interlock mechanism as the canopy jettisons during the ejection sequence. The interlock block engaged in the firing linkage prevents firing of the ejection seat by either ejection handle before the canopy has been jettisoned from the aircraft. A safety link (interdictor) connects the canopy interlock block to a safety pin which is inserted in the ejection gun firing mechanism sear to give added protection against inadvertent initiation due to foreign objects. The canopy interlock block and cable, and the interdictor link and safety pin, are collectively referred to as the canopy interlock cable and interdictor link safety pin assembly. The assembly remains connected to the canopy, inserted in the interlock mechanism, and inserted in the ejection gun firing mechanism sear at all times, except after canopy jettison when the entire assembly withdraws from the seat and departs the aircraft with the canopy.

WARNING

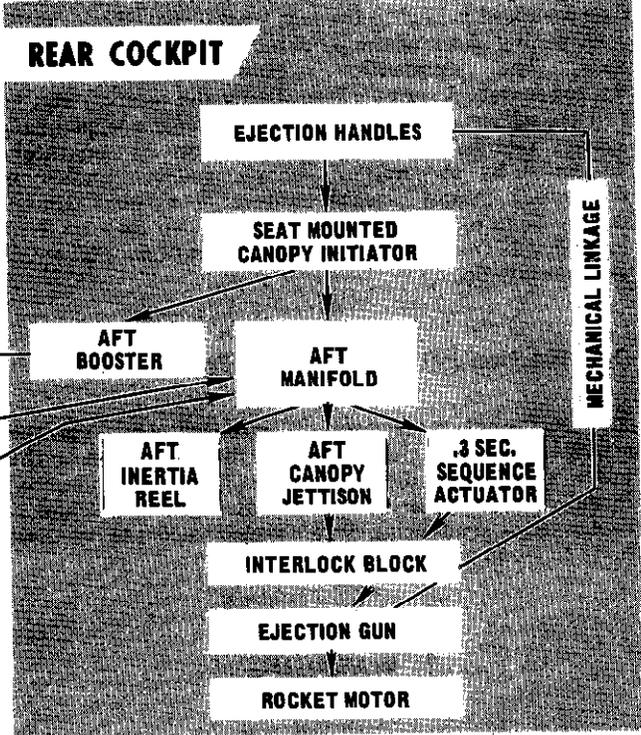
No foreign objects should be placed on top of the ejection seat. When required, the safety pin bag should be suspended along the left side of the

AUTOMATIC SEQUENCING SYSTEM



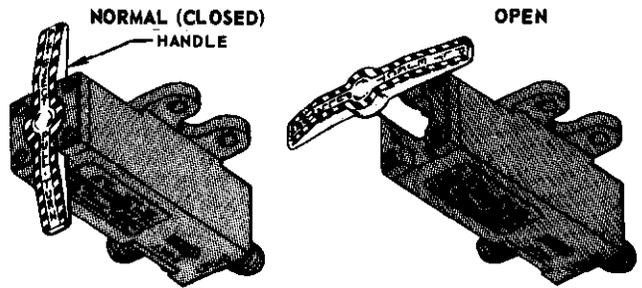
Note

ELAPSED TIME TO EJECTION GUN FIRING - 1.392 SECONDS.

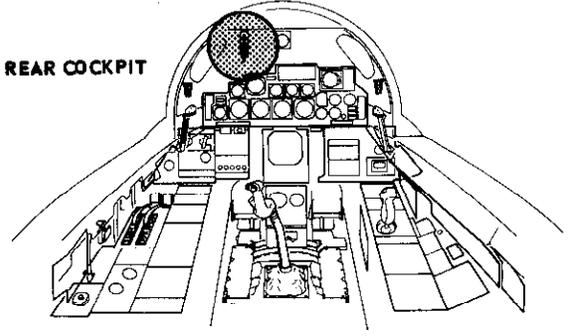


Note

ELAPSED TIME TO EJECTION GUN FIRING - 0.54 SECONDS.



COMMAND SELECTOR VALVE



REAR COCKPIT

Figure 1-22

headbox utilizing the face curtain safety pin streamer.

Ejection Gun

The ejection gun is mounted between the main beams and is attached to the bulkhead of the cockpit by two mounting lugs. It propels the seat from the cockpit during the ejection sequence.

Drogue Gun

The drogue gun is mounted on the upper left side of the main beam assembly and is fired by a trip rod connected to the aircraft structure. The unit is triggered by seat ejection and fires a drogue projectile to deploy a 22-inch controller drogue, approximately 0.75 second after ejection. The controller drogue in turn deploys the 60-inch stabilizer drogue. On some aircraft, a cocking indicator is installed on the bottom of the drogue gun. When the gun is cocked, the indicator extends approximately ½ inch below the gun housing with the indicator shaft showing. If the indicator is flush with the bottom of the gun housing without the shaft showing, the drogue gun is not cocked and will not fire during ejection.

Drogue Chute Scissors Mechanism

The drogue chute scissors mechanism is on the top of the seat and is attached to the top crossmember of the main beam assembly. This mechanism connects the drogue chutes to the top of the seat. A movable jaw of the scissor releases the drogue chutes from the seat when the time release mechanism actuates. The right (looking forward) scissors arm, which is allowed to move outboard to open the movable jaw when the time release mechanism actuates, is protected by a guard. The guard prevents lodgement of objects against the scissors arm to prevent opening of the scissors.

Time Release Mechanism

The time release mechanism is on the right side of the ejection seat headrest. Its function is to delay deployment of the personnel parachute and separation of the occupant from the seat until the occupant has descended from the upper atmosphere and/or has slowed enough to prevent excessive opening shock of the personnel parachute. The mechanism is armed upon ejection. Initiation of the timing sequence follows immediately, providing the altitude is within preset limits. The time release mechanism, releases the drogue chute attachment shackle from the scissors allowing the personnel parachute to be pulled from its container by the drogue chutes. At the same time, it releases the parachute restraint straps, face curtain (if used), lap belt, shoulder harness, and leg restraint lines to allow the occupant to be pulled from the seat when the personnel parachute deploys.

Guillotine Assembly

Components of the guillotine assembly are on the right side of the seat bucket and on the left side of the main beam assembly near the drogue gun. Under normal ejection conditions, the parachute withdrawal line withdraws from the guillotine as the drogue chutes deploy the personnel parachute. During manual separation from the seat, guillotine actuation is accomplished when the emergency harness release handle is pulled. The guillotine cartridge fires and forces a blade assembly upward which severs the parachute withdrawal line connected to the drogues.

Sticker Clips

The sticker clips are attached by belts to the survival kit-harness and retain the occupant in the seat until the personnel parachute blossoms and pulls the occupant clear, thus insuring no risk of man seat collision.

Rocket Motor

A rocket motor sustains the seat thrust after ejection gun separation and increases the ejection altitude of the seat without additional loading on the occupant. The rocket motor is on the bottom of the seat bucket and consists of a number of small diameter combustion tubes containing solid propellant. The rocket motor thrust angle is automatically adjusted according to seat bucket position to compensate for varying CG. As the ejection seat nears the end of the ejection gun stroke a static line attached to the cockpit floor fires the igniter cartridge, causing simultaneous ignition of the propellant. A fiberglass protector is installed on the bottom of the seat around the rocket sear and sear cable. The purpose of the protector is to prevent accidental pulling of the rocket sear. The protector breaks off during ejection when the sear cable becomes taut.

Personnel Parachute

The personnel parachute is a 28-foot parachute incorporating a hardshell container. The container rests on a bracket on the backrest part of the seat and held in place by two parachute restraint straps and two lines attached to the bottom of the container. The lines are routed downward to loop around the sticker clip lugs. When the restraint straps are installed, two box springs are inserted between the parachute container and ejection seat. These springs are held compressed by the restraint straps. When the restraint straps and lines are released through action of the time delay release mechanism or the emergency harness release handle, the springs serve to eject the parachute container from the seat during ejection or emergency egress. The container separates from the crewmember after chute deployment. There are cross connector straps attached to the front and rear risers to assure the canopy will not collapse in the event one shoulder harness fitting becomes disengaged. The parachute canopy also incorporates two pull down vent lines (PDVL) which provide for a more rapid canopy inflation. During parachute deployment, the pull down vent lines will more than likely be severed by the opening

shock of the parachute, and the crewmember should not be overly concerned by the dangling lines. Inclusion of the PDVL on any 28-foot diameter (C-9) canopy does not affect the canopy performance nor does it affect or interfere with normal use of the four line jettison lanyards system. If the PDVL weak links fail (high speed ejection) the C-9 reverts to its normal configuration. If the weak links do not fail (low speed ejection) the C-9 canopy is slightly flattened in shape with an increase in oscillation and decrease in rate of descent. Four line jettison release will relieve the oscillation and institute a slightly higher glide than the normal C-9. In addition, the parachutes incorporate a four line jettison lanyards system which reduces chute oscillation and provides steerability. The lanyards, when pulled, release four lines from the chute to produce a large lobe, or scallop, at the rear center of the canopy. In this configuration, the chute can be steered by pulling on the four line jettison lanyards. The four line jettison lanyards are identified by two red loops, one located half way up the inboard side of each rear chute riser. Pulling the parachute risers has little steering effect.

WARNING

Do not pull lanyards until canopy has been checked free of torn panels or partial canopy inversions. A partial inversion makes the canopy form a figure eight when viewed from below, and can be corrected by pulling on the suspension lines of the smaller loop of the figure eight. The four line jettison lanyards should never be pulled at night unless there is sufficient light to definitely check the canopy for no damage and unless the ground can be seen.

Face Curtain Ejection Handle

The face curtain ejection handle is at the top of the seat, projecting forward and is connected by cables to the firing linkages on the seat. The face curtain extends approximately 10 inches before the canopy initiator is fired, and approximately 12-14 inches to fire the ejection gun. The face curtain provides protection for the face and eyes, and a measure of head restraint against the airblast that may be experienced in ejections at high airspeeds. A break-out force of 50-70 pounds is required to release the handle from its stowage and the pull must be in a forward or downward direction. The handle is designed to withstand forces in an upward direction to minimize the risk of inadvertent actuation by airblast in the event of canopy loss in flight. Thus, if the occupant sits high in the seat with the face curtain ejection handle below the level of the flight helmet, some difficulty may be experienced in locating and pulling the handle without sacrificing correct posture on ejection. Ideally, the sitting height should be adjusted to allow the face curtain to be drawn forward over the helmet without interference. When using the face curtain ejection handle a momentary stop may be encountered while the canopy is jettisoning and the pull force must be maintained on the handle to fire the seat as soon as the interlock block is withdrawn.

Lower Ejection Handle

The lower ejection handle is on the forward edge of the seat bucket, between the crewmembers legs. The handle is connected to the firing linkages on top of the seat and fires the same canopy initiator as does the face curtain. An upward pull (45 pounds maximum) is required. Approximately 1¼ inch extension of the handle will fire the canopy initiator, and 4½ to 5 inch extension will fire the seat, once the canopy interlock block is removed.

Lower Ejection Handle Guard

The lower ejection handle has a guard which prevents inadvertent operation. With the guard handle in the down position, the handle is unlocked. With the guard in the up position, the lower ejection handle is locked and cannot be used for ejection.

Command Selector Valve Handle

The command selector valve handle above the instrument panel on the left side of the rear cockpit, is used to select single or dual ejection. The vertical (closed) position of the handle is the single ejection position. The horizontal (open) position of the handle enables the rear seat occupant to initiate sequenced ejection of both crewmembers. To select dual ejection, the handle should be pulled straight out without applying torque to the handle. The handle will rotate 90° clockwise to the open position through cam action. On some airplanes, the command selector valve is replaced by a more durable valve capable of 20,000 cycles. The new valve operates essentially like the old valve except for the following: the new valve is opened by applying torsion to the handle instead of a pulling action; the valve handle does not move away from the valve body when opening or closing; and the handle, if released in an intermediate position, will not always return to the vertical position, but to the vertical or 90° position depending on which side of the center of travel it is released. The more recent valve handle is stenciled PLT EJECT TURN instead of PLT EJECT PULL TURN as it is on the earlier valve.

Seat Positioning Switch

The ejection seats may be adjusted vertically only. Seat positioning is accomplished by actuating a momentary contact switch located on the right forward side of the seat bucket. Each seat can be adjusted (up or down) through a total distance of 6 inches. It is not necessary to adjust the seat height before ejection; however, if it is decided to eject by using the face curtain, the seat should be lowered to afford adequate clearance between the helmet and face curtain ejection handle.

Leg Restrainers

The leg restraint assembly consists of garters worn by the crewmember, leg restraint lines with lock pins, snubber units, and shear fitting secured to the floor. When the seat is ejected, the slack in the leg restraint lines is taken up by the upward travel of the seat, pulling the occupant's

legs to the front face of the seat bucket. When all of the slack has been removed in the leg restraint lines, the tension of the lines will cause the shear fitting to fail. The occupant's legs are firmly held against the seat bucket by the snubber unit until the harness is released and the occupant is separated from the seat. Rings on the face of the snubber units are provided to adjust the amount of slack in the leg restraint lines. If the seat is raised and then lowered, it may be necessary to readjust the leg restraint lines by pulling the finger rings and drawing the lines forward through the snubbers. The leg restrainers utilize two garters on each restraint line, a calf garter worn above the flight boot and a thigh garter worn on the thigh above the knee. Each garter contains a quick release which allows the garter to be released and left in the aircraft without disturbing garter adjustment. When buckling the garters, the releases should be on the inside of the legs. The garter with the double ring is worn above the flight boot and the single ring garter is worn on the thigh. When routing the restraint lines through the garters, be certain the lines are not twisted and route through the calf garter (first through outboard ring of calf garter then through inboard ring) then through the thigh garter before inserting the lock pins in the snubber boxes (figure 1-23). To reduce garter slippage, the calf and thigh garters have Velcro tape on one side of each garter strap. After a garter is adjusted, the loose end of the garter strap is pressed and secured to the other part of the garter. In addition, a snap ring is incorporated on the loose end of each garter to prevent loss of the movable male-type garter buckle.

Leg Restraint Release Handle

The leg restraint release handle is on the left forward side of the seat bucket. When the handle is moved to the aft (unlocked) position, the lock pins on the leg lines are released from the leg lock mechanism and the leg lines can then slide out of the garters.

Shoulder Harness Powered Inertia Reel Lock

The rocket seat contains a powered inertia reel lock which provides a velocity (G sensing) system (inertia lock) and a power retraction system. The inertia lock system provides safe restraint during aircraft violent maneuvers. Restraint is accomplished by a G sensing mechanism functioning in accordance with reel strap pay-out (strap velocity). In addition, manual locking of the inertia lock can be accomplished by the shoulder harness release handle. The powered retraction system provides automatic retraction of the shoulder harness for ejection. The device is gas powered and functions only when ejection is desired by pulling the face curtain or lower ejection handles.

Shoulder Harness Release Handle

The shoulder harness release handle has two positions, a forward or locked position, and an aft or unlocked position.

NOTE

Selecting the unlocked position of the shoulder harness release handle will not prevent the inertia lock from locking when the velocity (G

sensing) system detects a high rate of velocity change of the crewmember in a forward direction. Once the shoulder harness is automatically locked, it must be manually unlocked by cycling the release handle full forward then full aft. It is noteworthy that G forces on the aircraft by itself will not lock the inertia lock.

Emergency Harness Release Handle

The emergency harness release handle is on the right front edge of the seat bucket. The primary purpose of this handle is to provide single action release of the lap belt and leg restraint locks for rapid emergency evacuation on the ground. The handle may also be used to separate manually from the seat after ejection in the unlikely event that the automatic sequence fails. To actuate the handle, squeeze the trigger and pull the handle up and aft until it locks in the UP position. When the handle is pulled, the lap belt, shoulder harness restraints, and leg restraints are released and the guillotine unit fires to cut the parachute withdrawal line. The parachute restraint straps are also released to allow the personnel parachute pack to separate from the seat. Once released from the seat, the lap belt, shoulder harness, etc. cannot be reconnected during flight.

WARNING

The emergency harness release handle should not be pulled in flight for the following reasons:

- During uncontrollable flight, negative G forces may prevent the occupant from controlling the aircraft or assuming the correct ejection position.
- A hazard to survival is created if the pilot is required to proceed with a forced landing since no harness restraint will be available.
- Safe ejection is impossible because the occupant will separate from the seat during ejection, and severe shock loads will be imposed on the body.

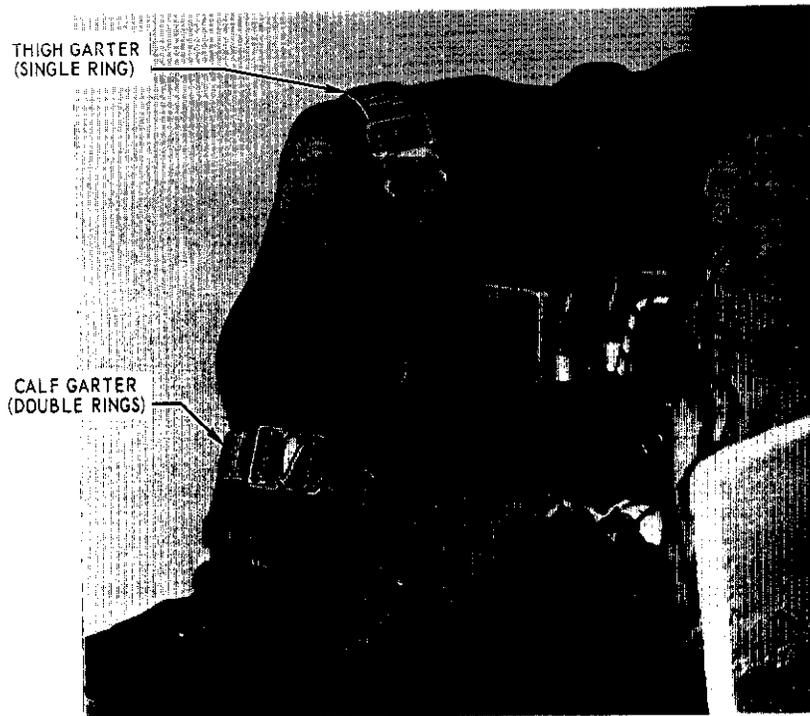
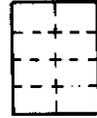
Seat-Mounted Emergency Oxygen Bottle

A bailout oxygen bottle system is installed on the left side of the ejection seat bucket. Actuation of the oxygen bottle is accomplished automatically on ejection. An actuating arm, attached to the bottle valve by a cable, strikes a bracket mounted on the seat rails as the ejection seat moves up the rails. Manually, the emergency oxygen can be actuated by pulling up on the emergency oxygen knob. The bottle provides approximately a 10 minute supply of oxygen.

Emergency Oxygen Knob

The emergency oxygen knob is on the forward left side of the seat bucket, just aft of the leg restraint release handle. Once the emergency oxygen knob is pulled the emergency oxygen cannot be shut off.

LEG RESTRAINERS



4E-1-(15)

Figure 1-23

INTEGRATED (PARACHUTE) HARNESS

The harness is a vest-like garment worn by the crewmember, and serves the purpose of providing attachment points for connecting the parachute riser-shoulder harness and survival kit to the individual.

SURVIVAL KIT

Provisions for survival after ejection, bail-out, or ditching are stored in the survival kit (figure 1-24). The kit is composed of a two piece fiberglass container. The kit contains a rucksack filled with emergency provisions, and an inflatable raft. The upper portion of the kit serves as the kit cover and has a cushion attached to the top for the crewmember to sit on. The kit is attached to the crewmember's harness by attachment fittings on the kit retaining straps. The retaining straps are secured to the kit by retaining strap locks on both sides of the kit. The survival kit release handle, on the right forward outboard corner of the kit, is pulled after seat separation to separate the upper and lower portions of the kit. Following actuation of the survival kit release handle, the upper kit container shell falls away, and the lower kit container shell containing the raft and the emergency provisions

drop to a position below the crewmember, where they are held during descent by a drop line which remains attached to the harness by the left retaining strap. During kit deployment, the life raft CO₂ bottle will be actuated by gravity pull to inflate the raft when the drop line reaches full extension. In the event of emergency egress on the ground when it is desired to leave the survival kit in the aircraft, the survival kit release handle is pulled after releasing the parachute riser fittings. Pulling the survival kit release handle actuates the locking assemblies; which releases the survival kit lid and allows the retaining strap locks to release. A lanyard sensor assembly, located on the bottom of the left side of the kit, controls release or retention of the container assembly to the crewmember during emergency egress. If the kit is seated against the ejection seat, this sensor prevents the left-hand retaining strap from engaging the drop line and provides no connection with the crewmember. If the sensor is extended (kit bottom off the ejection seat), the left-hand retaining strap will be attached to the drop line as would be the case during ejection.

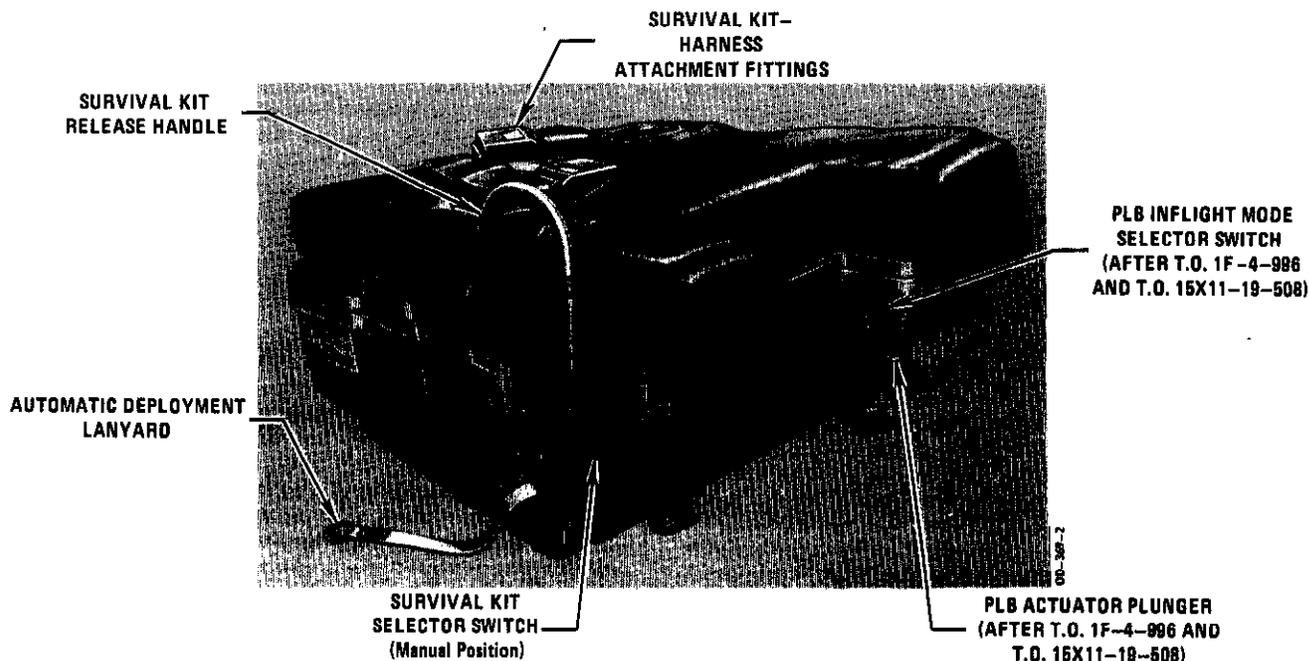
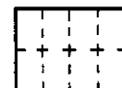
SURVIVAL KIT**TYPICAL**

Figure 1-24

4E-1-(31)

WARNING

If the survival kit release handle is pulled and the survival kit is not resting on the seat bucket, the crewmember will be attached to the survival kit container by a 25-foot lanyard.

Four hold-down straps are installed on the survival kit. The hold-down straps are on each corner of the kit and are used to attach the kit to the ejection seat so that the kit will not rise above the seat during negative G conditions. The rear hold-down straps attach to the seat at the lap belt lug attachment points and the forward hold-down straps are attached at the leg restraint lines lock pin attachment points. The hold-down straps are released from ejection seat attachment when the time release mechanism releases the leg restraint lines lock pins and lap belt lugs during ejection, or whenever the emergency harness release handle is pulled. The kit incorporates selective deployment which gives the crewman the option of manual or automatic hands off separation of the kit and deployment of raft/rucksack assembly, depending on the mode selected on the survival kit selector switch. Automatic operation is controlled by a lanyard attached on one end to an actuator in the bottom of the kit and to the seat emergency harness release handle on the other end. When man/seat separation occurs, the lanyard pulls the actuator which subsequently fires a cartridge activated piston. Four seconds later, this piston strikes an

arm which is attached to the lid latches, unlocking them and allowing the kit to drop away in a deployed condition, while still being attached to the crewman by his left hand kit-to-man connector. For this sequence to occur the crewman has to select automatic on his selector switch located on the kit forward and slightly below the survival kit release handle. Once the emergency harness release handle is pulled, such as occurs during manual man/seat separation, the automatic feature is negated and the survival kit release handle must be pulled to open the kit. If automatic deployment is not desired, the crewman can select the manual mode and actuate the kit when desired by pulling up on the survival kit release handle. The manual mode is selected by placing the selector switch in the down position and the automatic mode is selected by placing the selector switch in the up position. Selector switch travel is approximately ¼ inch.

Personnel Locator Beacon (PLB)

Before TO 1F-4-996 and TO 15X11-19-508, a URT-33 personnel locator beacon (PLB) is carried in the survival kit. With the PLB installed, a beacon actuator plunger protrudes from the left side of the kit. An actuation lanyard cotter pin is inserted in the plunger to keep the beacon from operating. Removal of the cotter pin activates the PLB. When automatic operation is desired, the actuation lanyard snaphook is connected to a D ring attached to the sticker clip bracket on the left inside of the seat. The cotter key is pulled automatically at man/seat separation during ejection or cockpit egress with the kit.

Manual actuation is accomplished by pulling the actuation lanyard cotter pin by hand. Once activated the PLB can be turned off by pushing the actuator plunger toward the kit and rotating it into a retaining detent. After TO 1F-4-996 and TO 15X11-19-508, the AN/URT-33 PLB is replaced by the AN/URT-33(B). The new PLB is located in the survival kit left thigh support, forward of the old PLB installation. The AN/URT-33(B) PLB provides a more convenient means of controlling the operation of the beacon and contains a ground selectable timed battery operation feature which, after the PLB is activated, turns the beacon off automatically after 10 ± 2 minutes of operation. The intended use of the timed battery is to eliminate continued beacon transmission after a parachute landing in hostile territory in the event the crewmember is incapacitated or otherwise fails to manually turn off his beacon. The timed battery operation feature is a one shot operation which can be used only once per flight. However, timed battery operation, if selected (TIMED position on battery switch), can be overridden on the ground (NORMAL position) so that the beacon can transmit beyond the 10 ± 2 minute limit. With the battery switch set to NORMAL the beacon, when activated, transmits for approximately 15 hours. Inflight operation of the PLB is dependent on the action of the actuator plunger and the setting of the inflight mode selector switch. The actuator plunger, under the left thigh support, is pushed up to a retracted position when the survival kit is installed in the seat pan. The actuator plunger extends whenever the kit is removed from the seat, such as at man/seat separation during ejection and cockpit egress with the survival kit. The PLB is activated automatically

when the actuator plunger extends, provided the inflight mode selector switch is in the red dot or A position. The inflight mode selector switch, on the inside of the left thigh support, has two positions. With the switch in the red dot or A position, the beacon is activated with the actuator plunger extended as previously described. The switch is positioned to the red dot position by pressing inward on the rear arm of the switch. With the switch in the green dot or M position, the beacon will not activate although the actuator plunger is extended. The switch is positioned to the green dot position by pressing inward on the forward arm of the switch. If ejection is accomplished with the the PLB inflight mode selector switch in the green dot position, the beacon can be activated during the parachute descent by placing the switch to the red dot position, provided the survival kit has not been deployed.

SERVICING

See figure 1-25 for servicing requirements.

AUXILIARY EQUIPMENT

Information concerning the cockpit air conditioning and pressurization system, cockpit defrosting and anti-icing system, autopilot, navigation equipment, air refueling system, fire control system, armament and miscellaneous equipment are found in section IV.

CAUTION

Early analysis of a bleed air duct failure is required in order to prevent serious damage to, or possible loss of the aircraft.

If several of the preceding symptoms occur in close sequence -

1. Avoid high power settings.
2. Check for other indications of fire.
3. Land as soon as practical

On airplanes without slats -

4. Lower flaps to 1/2 as early as possible to dump BLC air.

BLEED AIR CHECK VALVE FAILURE

No indication of a bleed air check valve failure will be noted in flight until the throttle is retarded and then readvanced on the engine with the failed bleed air check valve. If the throttle has been retarded and then readvanced, either rpm will hang-up or a minor compressor stall and flame-out will occur at approximately 85% rpm. If a flame-out occurs, a restart can be made, but rpm will probably not go above 65%, EGT will rise to approximately 625°, and the nozzle will go full open. In either case normal engine performance can be regained as follows:

1. Throttle good engine - IDLE
Idling the good engine will equalize the pressure in the air line.
2. Throttle bad engine - ADVANCE
3. Throttle good engine - ADVANCE
The good engine should not be accelerated to, or operated at, a rpm greater than that of the affected engine for the remainder of the flight.
4. Land as soon as practical

DOUBLE EXHAUST NOZZLE FAILURE

In the event both exhaust nozzles fail to the open position, the total thrust available in MIL range will be approximately equal to the thrust available during single-engine operation in MIL range. Afterburner light-off above 15,000 feet is marginal; however, afterburner light-off probability increases with a decrease in altitude and normal afterburner thrust is available.

GLIDE DISTANCE

The aircraft will glide approximately 6 nautical miles for every 5000 feet of altitude. The recommended glide airspeed is 215 knots. Below 50,000 feet 215 knots provides near maximum glide distance and allows the windmilling engines to maintain power control hydraulic pressures within safe limits.

EJECTION**WARNING**

With the rear canopy gone above 500 knots or 0.8 Mach, resulting negative pressures on the front canopy could preclude its separation above this speed. If ejection is necessary above this speed, and time permits, the front canopy should be jettisoned using the canopy emergency jettison handle, followed by a dual sequenced ejection initiated from the rear seat only. Do not initiate the ejection sequence from the front seat with the front canopy gone. With the addition of the forward canopy thrusters after TO 1F-4-906, the above airspeed limitations due to negative pressure on the front canopy do not apply.

Ejection can be accomplished at ground level between zero and 550 knots airspeed with wings level and no sink rate providing the crewmember does not exceed a maximum boarding weight of 247 pounds. If the 247 pound boarding weight is exceeded, a 50 knot minimum airspeed restriction for safe ground level ejection must be observed. Boarding weight is defined to include the crewman, his clothing, and personnel equipment; excluding his parachute and seat pan survival kit. Due to the aerodynamic instability of the seats at higher airspeeds, a minimum ejection altitude of 50 feet should be observed at airspeeds greater than 550 knots. Although the H-7 seat is qualified to 600 knots, a human factors study and analysis reveals that ejections between 450 and 600 knots exposes the crewmember to hazardous windblast forces which can result in possible serious injury. It is therefore recommended that ejection be initiated at or below 450 knots, circumstances permitting. Under level flight conditions, eject at least 2000 feet above the terrain whenever possible. Under out-of-control conditions, eject at least 10,000 feet above the terrain whenever possible.

WARNING

- Do not delay ejection below 2000 feet above the terrain in futile attempts to start the engine, or for other reasons that may commit you to an unsafe ejection or a dangerous flame-out landing. Accident statistics emphatically show a progressive decrease in successful ejections as altitudes decrease below 2000 feet above the terrain.

- The emergency harness release handle shall not be pulled prior to ejection, regardless of altitude, because of several serious disadvantages:

During uncontrollable flight negative G forces may prevent proper body positioning for ejection

Extreme hazard to survival in the event altitude becomes too low for ejection and a forced landing is required.

Ejection will result in premature seat separation and severe shock loads will be imposed on the body.

Cancellation of the automatic features of the ejection seat and parachute actuator, which precludes parachute deployment if the crewmember is unconscious.

If the harness release handle is pulled during flight, do not shift body position in seat and immediately reseal harness release handle in an attempt to refasten the lap belt restraint. If the handle is pulled and the lap belt cannot be refastened and escape from the aircraft then becomes necessary, the recommended procedure is to open the canopy with either normal or emergency procedures, and then escape from the aircraft using the procedures (without pulling an ejection handle) outlined in Manual Bailout, figure 3-4.

SEAT EJECTION PROCEDURES

Basic ejection seat escape procedures and associated separation sequences are shown in figure 3-4. The following ejection procedures should be utilized by all crewmembers:

- Time and circumstances permitting, the pilot will make the decision to eject.
- Time and circumstances permitting, the pilot will alert the WSO to prepare for ejection and then direct individual ejections or initiate ejection for both crewmembers, as briefed. The following sequence will be used to alert the WSO for ejection:

Primary - Intercom

First Alternate - Eject light

Second Alternate - Rapid movement of stick from side to side to gain crewmembers attention, then -

daylight: Signal with left fist, thumb up, over left shoulder

night: Signal with vertical wave of flashlight over left shoulder.

- WSO initiated ejection of the pilot shall be limited to emergency/combat situations when so directed by the pilot or when the pilot is incapacitated. The pilot shall consider the experience level of the WSO, the degree of training/proficiency, and meticulously brief on ejection signals (ICS and visual) and the exact circumstances under which the WSO will eject the crew.

d. The above procedures in no way preclude either occupant from initiating ejection at any time he determines that circumstances warrant such action.

WARNING

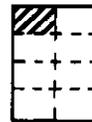
- If the dual ejection sequence is initiated from either cockpit without first alerting the other crewmember, incapacitation from improper body position on ejection could result.
- If fire/smoke is the major cause factor for ejection, a dual sequenced ejection should be used. An individual ejection by the rear seat occupant could result in incapacitation of the pilot from intense heat and fire caused by windblast and draft effects of a jettisoned canopy.
- Should the front canopy be lost, the front canopy interlock cable and interdictor link safety pin assembly with its ejection sequence time delay will also be lost. If ejection is then initiated from the front seat, this could expose the rear crewmember to the front seats rocket blast and a collision between seats could possibly result. Should loss of the front canopy or both canopies occur, the rear crewmember should rotate the command selector valve handle to the horizontal (open) position and initiate ejection for both crewmembers. With loss of the rear canopy only, normal ejection can be initiated from either cockpit. If the rear ejection system fails for any reason, the front ejection sequence will still occur in normal time frame. The rear crewmember must then initiate corrective action.

LOW ALTITUDE EJECTION

During any low altitude ejection, the chances for a successful ejection can be greatly increased by zooming the aircraft (if airspeed permits) to exchange airspeed for altitude and to gain an upward vector for ejection. The zoom should not exceed a 20° nose up attitude. Ejection should be accomplished while the aircraft is in a positive climb. This will result in a more nearly vertical trajectory for the seat, thus providing more altitude and time for seat separation and parachute deployment. After ejection do not attempt to beat the automatic system in low altitude ejection or benefits of automatic seat separation/parachute deployment will be lost. Fastest parachute deployment occurs at approximately 250 knots. At speeds below 130 knots, airflow is not sufficient to affect rapid chute deployment. Optimum speed for minimum time for chute to deploy is 250-300 knots. After ejection, manual separation from the seat should only be made if the seat fails to function automatically (approximately 2 seconds required). If manual seat separation is performed, the automatic feature of the parachute is lost. If a decision is made to manually separate:

- Emergency harness release handle - LOCK UP.
- Push free of sticker clips and clear of the seat.
- Pull parachute ripcord handle.

EJECTION PROCEDURES



BEFORE EJECTION

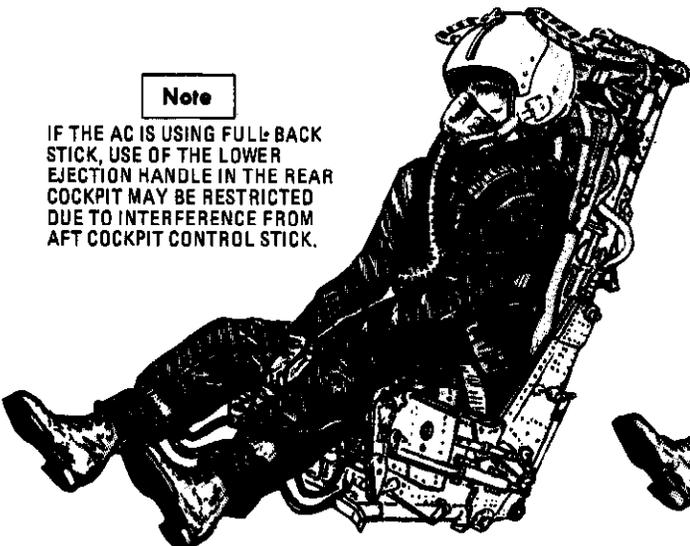
- A. IF TIME AND CONDITIONS PERMIT
 - ALERT OTHER CREWMEMBER
 - LOCK SHOULDER HARNESS
 - TIGHTEN LAP BELT
 - INSERT OXYGEN MASK BAYONETS TO LAST LOCKING POSITION OF HELMET RECEIVERS
 - LOWER HELMET VISOR(S) AND TIGHTEN CHIN STRAP
 - ADJUST SITTING HEIGHT AS NECESSARY
- B. SIT ERECT, BUTTOCKS BACK, SHOULDERS 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 AC 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.

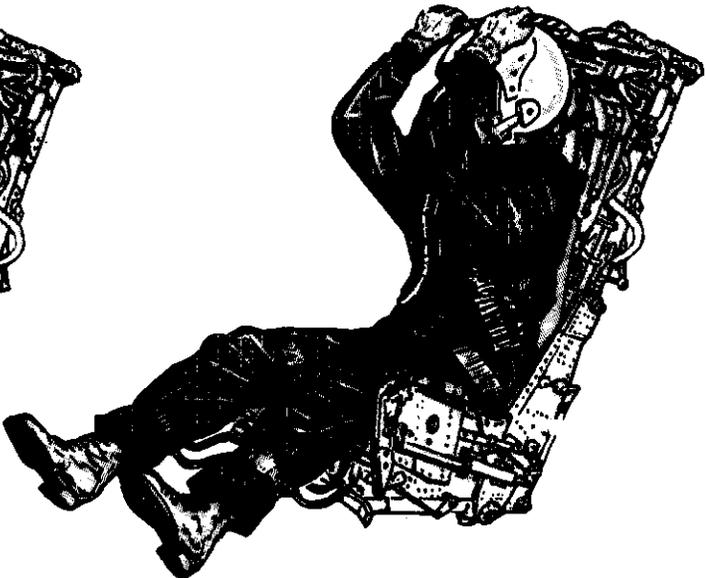


GRASP THE LOWER EJECTION HANDLE USING A TWO HANDED GRIP WITH THE THUMB AND AT LEAST TWO FINGERS OF EACH HAND. PULL STRAIGHT UP ON LOWER HANDLE AND MAINTAIN A CONTINUED PULL. WHEN CANOPY JETTISONS, CONTINUE PULLING UP ON LOWER EJECTION HANDLE UNTIL FULL TRAVEL IS REACHED.

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

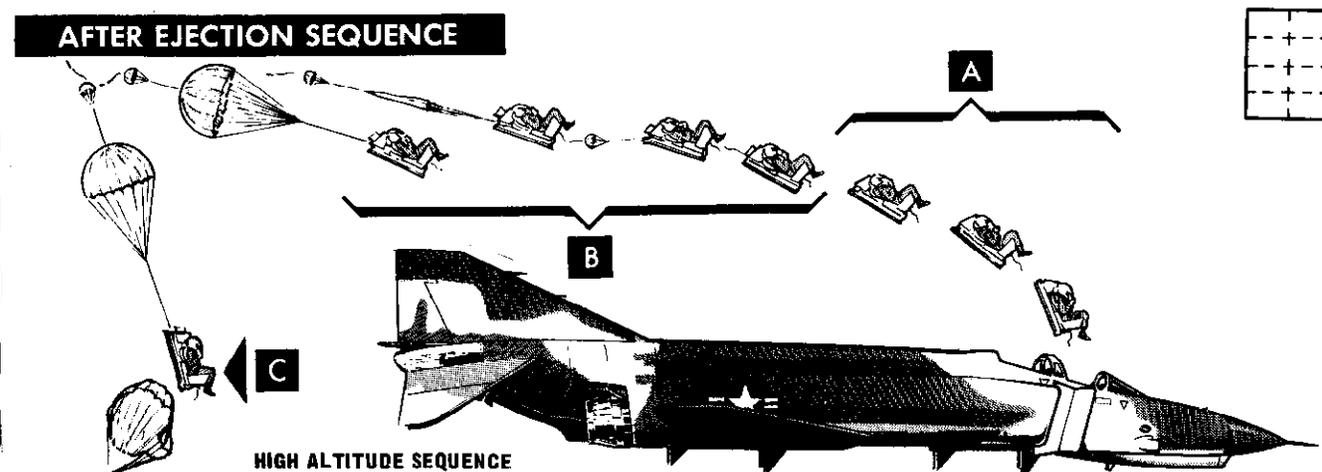
ONCE FACE CURTAIN HAS BEEN UTILIZED, DO NOT RELEASE HANDLE. IF THE HANDLE IS RELEASED IT MAY BECOME ENTANGLED IN THE SEAT DROGUE CHUTE DURING THE EJECTION SEQUENCE.

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 3-4 (Sheet 1 of 4)

AFTER EJECTION SEQUENCE



HIGH ALTITUDE SEQUENCE

PULL EITHER EJECTION HANDLE TO INITIATE THE EJECTION SEQUENCE, CANOPY JETTISONS PULLING THE CANOPY INTER-LOCK BLOCK, INERTIA REEL RETRACTS AND LOCKS, SEQUENCE SYSTEM FIRES EJECTION GUN. A CONTINUED PULL ON HANDLE DURING A SEQUENCED EJECTION IS DESIRED TO PROVIDE POSITIVE FIRING IN SHORTEST POSSIBLE TIME AND TO PROVIDE AN IMMEDIATE FIRING OF SEAT IN CASE OF AUTOMATIC SYSTEM MALFUNCTION.

- A** SEAT IS PROPELLED UP GUIDE RAIL. LEGS ARE RESTRAINED, EMERGENCY OXYGEN IS ACTUATED, TIME RELEASE MECHANISM AND DROGUE GUN ARE TRIPPED, EMERGENCY IFF IS ACTUATED, AND THE ROCKET PACK FIRES.
- B** DROGUE GUN FIRES .75 SECOND AFTER EJECTION, DEPLOYS CONTROLLER DROGUE, WHICH IN TURN, DEPLOYS STABILIZER DROGUE. SEAT IS STABILIZED AND DECELERATED BY DROGUE CHUTES.
- C** SEAT AND OCCUPANT DESCEND THRU UPPER ATMOSPHERE WHEN AN ALTITUDE OF APPROXIMATELY 11,500 FT. IS REACHED. THE BAROSTAT RELEASES THE ESCAPEMENT MECHANISM, WHICH IN TURN, ACTUATES TO RELEASE THE OCCUPANT'S HARNESSING, LEG RESTRAINT LINES AND CHUTE RESTRAINT STRAPS. THE DROGUE CHUTES PULL THE PARACHUTE WITHDRAWAL LINE TO DEPLOY THE PERSONNEL PARACHUTE.

11,500 + 3000-0 FEET IF NECESSARY PROCEED WITH MANUAL SEPARATION

- D** OCCUPANT IS HELD TO SEAT BY STICKER CLIPS UNTIL OPENING SHOCK OF PARACHUTE SNAPS SEAT FROM HIM. PERSONNEL LOCATOR BEACON (PLB) IS ACTIVATED AT MAN/SEAT SEPARATION IF AUTOMATIC IS SELECTED. THE SURVIVAL KIT, IF IN THE AUTOMATIC MODE, OPENS IN 4 SECONDS.

LOW ALTITUDE SEQUENCE

- E** SAME AS CORRESPONDING STEPS **A-B** IN HIGH ALTITUDE SEQUENCE EXCEPT:
- F** APPROXIMATELY 2-1/2 SECONDS AFTER IT IS TRIPPED THE TIME RELEASE MECHANISM ACTUATES TO RELEASE THE OCCUPANT'S HARNESSING, LEG RESTRAINT LINES AND CHUTE RESTRAINT STRAPS. THE DROGUE CHUTES PULL THE PARACHUTE WITHDRAWAL LINE TO DEPLOY THE PERSONNEL PARACHUTE. PERSONNEL LOCATOR BEACON (PLB) IS ACTIVATED AT MAN/SEAT SEPARATION IF AUTOMATIC IS SELECTED. THE SURVIVAL KIT, IF IN THE AUTOMATIC MODE, OPENS IN 4 SECONDS. TOTAL TIME FROM EJECTION INITIATION TO FULL PARACHUTE FOR THE BACK SEAT VARIES FROM APPROXIMATELY 3.5 SECONDS AT HIGH SPEED TO 6.5 SECONDS AT LOW SPEED. THE FRONT SEAT REQUIRES AN ADDITIONAL 1.4 SECONDS OVER THE BACK SEAT TIME.

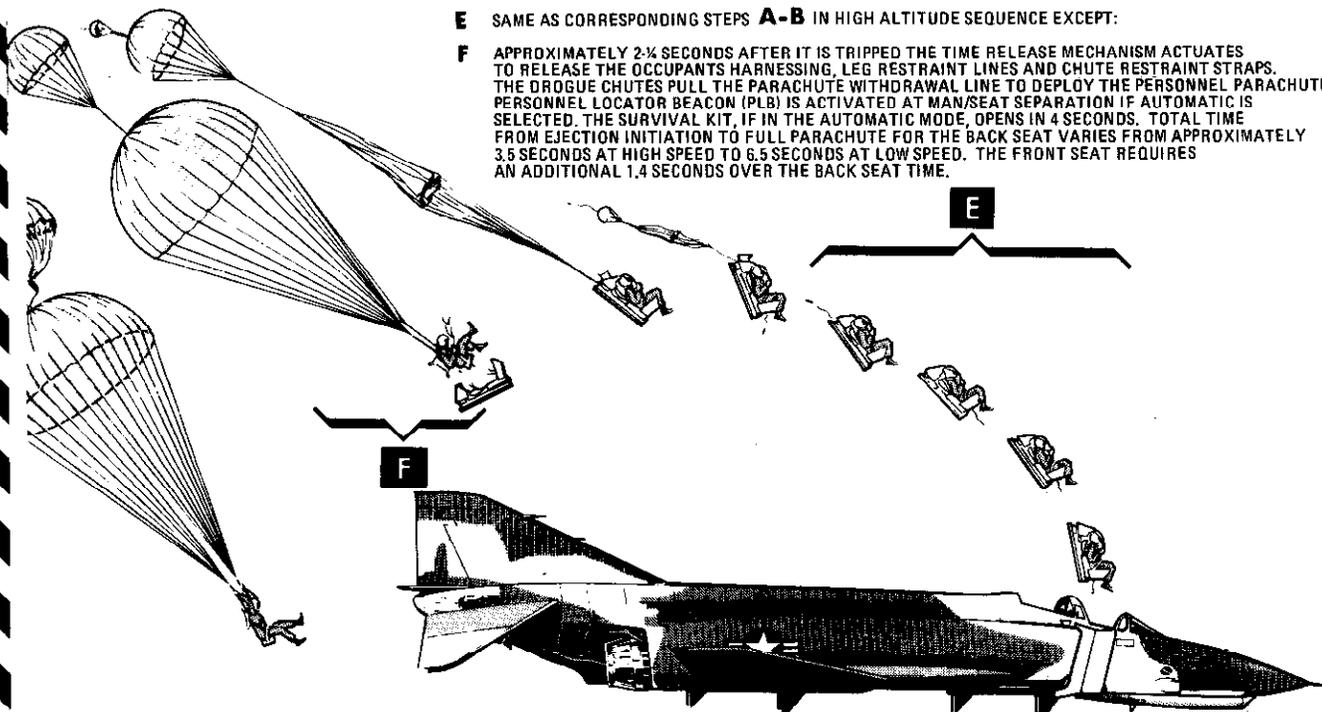
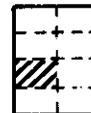


Figure 3-4 (Sheet 3 of 4)

4E-1-(75-3)C

PARACHUTE DESCENT AND SURVIVAL EQUIPMENT DEPLOYMENT



Prior to man/seat separation –

1. Emergency oxygen knob (green apple) – PULL (if necessary)

If for some reason the oxygen fails to trip automatically, pull the emergency oxygen knob on left side of seat.

WARNING

Do not pull inside handle before man/seat separation since this causes the kit to be lost.

AUTOMATIC MAN/SEAT SEPARATION FAILURE

If time release mechanism fails to operate automatically, manually separate from the seat as follows –

1. Outside handle (emergency harness release handle) – LOCK UP
Actuate outside handle on right side of seat to full aft position. This will release the parachute restraint lines, lap belt, leg restraint cords, and severs the parachute withdrawal line. The occupant is now held in seat only by sticker clips.

CAUTION

Activation of outside handle results in loss of both parachute and survival kit automatic features. PLB activation is not affected.

2. Push free of sticker clips and clear seat.

Note

If all other means of separation are exhausted and crewmen is still unable to push free from sticker clips due to injury, etc, lean forward with upper torso nearly resting on top both knees, and pull ripcord assembly.

3. Ripcord handle – PULL
Locate parachute ripcord assembly with left hand (located on left shoulder) and pull ripcord handle sharply with the right hand. When possible, re-stow ripcord handle.

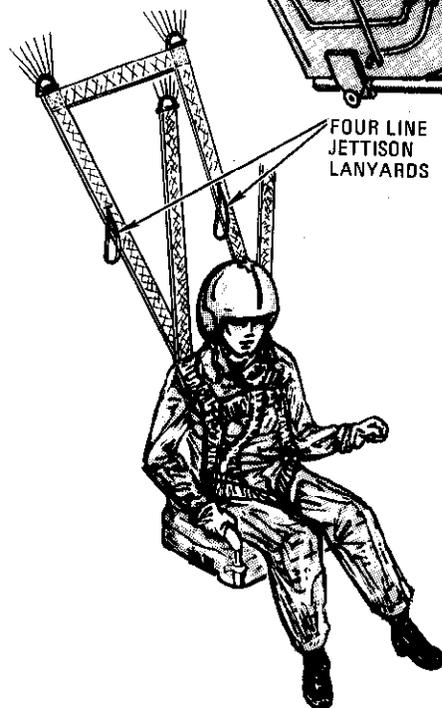
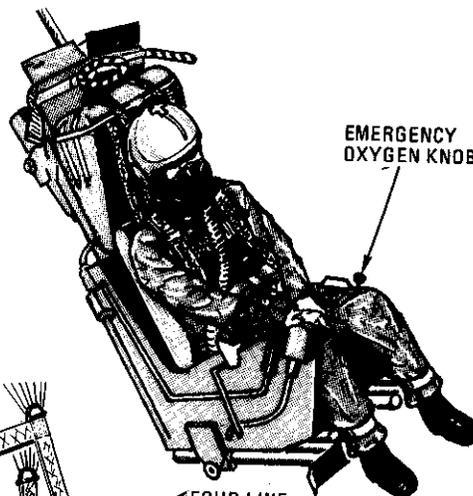
After man/seat separation during parachute descent –

1. Check parachute canopy and suspension lines.

Note

The fourline jettison system will not be used if any parachute suspension line is cut. The pulldown vent lines (PDVL) should not be confused with cut suspension lines.

2. Raise helmet visor and unmask.
After the parachute has opened (about 11,500 ft) open face visor/mask to prevent suffocation when emergency oxygen supply is disconnected.
3. Personnel locator beacon (PLB) – ACTIVATE (if required)
PLB must be activated before survival kit is opened.
4. Inside handle (survival kit release handle) – ACTUATE (if required)
If survival kit has not automatically deployed, actuate inside handle, if required. Continue pull on handle until it completely releases from the kit. Pulling the kit handle opens the survival kit. Life raft inflation is initiated by gravity when the drop line is fully extended after kit opening. If landing terrain so dictates, do not deploy the survival kit.
5. Actuate underarm life preserver, if applicable.



6. Four line jettison system – DEPLOY (if permissible)

During daylight, accomplish fourline jettison by pulling on both fourline jettison lanyards, after assuring canopy and suspension lines are intact. To steer parachute, pull down on the right fourline jettison lanyard for a right turn and pull the left fourline jettison lanyard for a left turn.

7. Turn into the wind and assume appropriate parachute landing fall (PLF) position.

If fourline jettison system cannot be used, steer with the parachute risers, pulling down on the right rear riser for a right turn and pulling down on the left rear riser for a left turn.

WARNING

- Do not attempt parachute corrections below 200 feet.
- After landing, to insure the collapsing of the parachute canopy, it is necessary to release both parachute riser-shoulder harness release fittings.

Figure 3-4 (Sheet 4 of 4)

WARNING

The minimum ejection altitudes quoted in figure 3-5 are provided to show seat capability (with and without reaction time) as effected by the aircraft sink rate. Figure 3-6 shows the minimum ejection altitude for a given airspeed and dive angle. These figures do not provide any safety factor for such matters as equipment malfunction delays in separating from the seat, etc. The above minimum ejection altitudes shall not be used as the basis for delaying ejection when above 2000 feet, since accident statistics emphatically show a progressive decrease in successful ejections as altitudes decrease below 2000 feet.

HIGH ALTITUDE EJECTION

For a high altitude ejection the basic ejection procedures (figure 3-4) are applicable. The zoom maneuver is still useful to slow the aircraft to a safer ejection speed, or to provide more time and glide distance as long as an immediate ejection is not necessary. After high altitude ejections, considerable time will elapse during drogue chute descent before automatic chute deployment. Refer to figure 3-7. No attempt should be made to manually separate from the seat except when terrain altitude exceeds the preset barostat altitude or there is a definite failure of the automatic sequence. Manual separation requires considerably more time and altitude before chute deployment than automatic operation.

EJECTION SEAT FAILURE

In the event the canopy jettisons, but the seat does not fire, pull face curtain or lower ejection handle again. If the first handle tried does not work, attempt pulling the other ejection handle. Care should be taken not to release the face curtain handle once it is pulled. Refer to figure 3-4 for ejection seat failure procedures.

TIME RELEASE MECHANISM FAILURE (ACTIVATION) INFLIGHT

Isolated instances have occurred in which the timer mechanism has failed (actuated) inflight. In this situation, the crewmember is not restrained in the seat since the lap belt, leg restraints, and parachute restraints are released and cannot be reset inflight. If ejection is attempted personal parachute deployment will occur approximately 1 second after ejection because the scissors also opens upon timer mechanism failure (activation). If the emergency harness release handle is pulled prior to ejection in this situation then the automatic features of the parachute are removed and the chute would have to be manually deployed. In either case, ejection when not restrained in the seat would be extremely hazardous and should be attempted only as a last resort. In the event of timer failure (actuation) inflight and escape from the aircraft then becomes necessary, the recommended procedure is to pull the emergency harness release handle, which fires the guillotine assembly, allowing the crewmember to separate

from the seat, open the canopy with either normal or emergency jettison procedures, and then escape from the aircraft by using the procedures (without pulling an ejection handle) outlined in Manual Bailout, figure 3-4.

WARNING

Escape from the aircraft will be impossible until the emergency harness release handle is pulled because the drogue projectile restraining pin cannot be manually sheared thus the crewmember is still linked to the seat.

SURVIVAL KIT DEPLOYMENT

The survival kit functions under two conditions, ejection and emergency evacuation. During ejection as the seat leaves the aircraft, the emergency oxygen is automatically tripped, and is supplied to the occupant as the occupant and seat are descending. If emergency oxygen was not tripped automatically upon ejection, an emergency oxygen knob on the left forward side of the seat can be pulled to provide emergency oxygen for descent from altitude. The emergency oxygen provides a 10 minute supply of breathing oxygen while the crewmember is in the seat. Once man/seat separation occurs, the emergency oxygen bottle remains with the seat and there is no oxygen available to the crewmember. At approximately 11,500 - 0 + 3000 feet the ejection seat time release mechanism deploys the personal parachute, the occupant and survival kit are snapped from the seat. At this time the survival kit release handle should be actuated to release the kit and inflate the raft. If the survival kit selector switch is in the automatic (up) position when man/seat separation occurs, the kit deploys approximately 4 seconds later. Whenever the emergency harness release handle is pulled, the automatic feature of the survival kit is lost and manual opening procedures must be used. With the selector switch in the manual (down) position, the kit is deployed by pulling the survival kit release handle. The handle should be pulled with one continuous motion. The handle separates from the kit when the kit lid is unlatched. After kit opening, the upper kit container falls free, the life raft inflates by gravity pull when the drop line attached to the raft CO₂ bottle actuator reaches its limit of downward travel, and the lower kit container with the emergency provisions drops below the life raft. The drop line, which retains the raft and lower kit, remains attached to the crewmember's harness by the left retaining strap.

WARNING

- During ejection, do not pull the survival kit release handle while sitting in the seat. The kit drop line from the crewmember will be detached, and the kit will be lost when the personnel chute opens.
- If the survival kit handle is pulled after landing in water, the kit cover must be pulled from the lower portion of the kit and a snatch pull on the drop line is required to inflate the life raft.

EJECTION ALTITUDE VS. SINK RATE

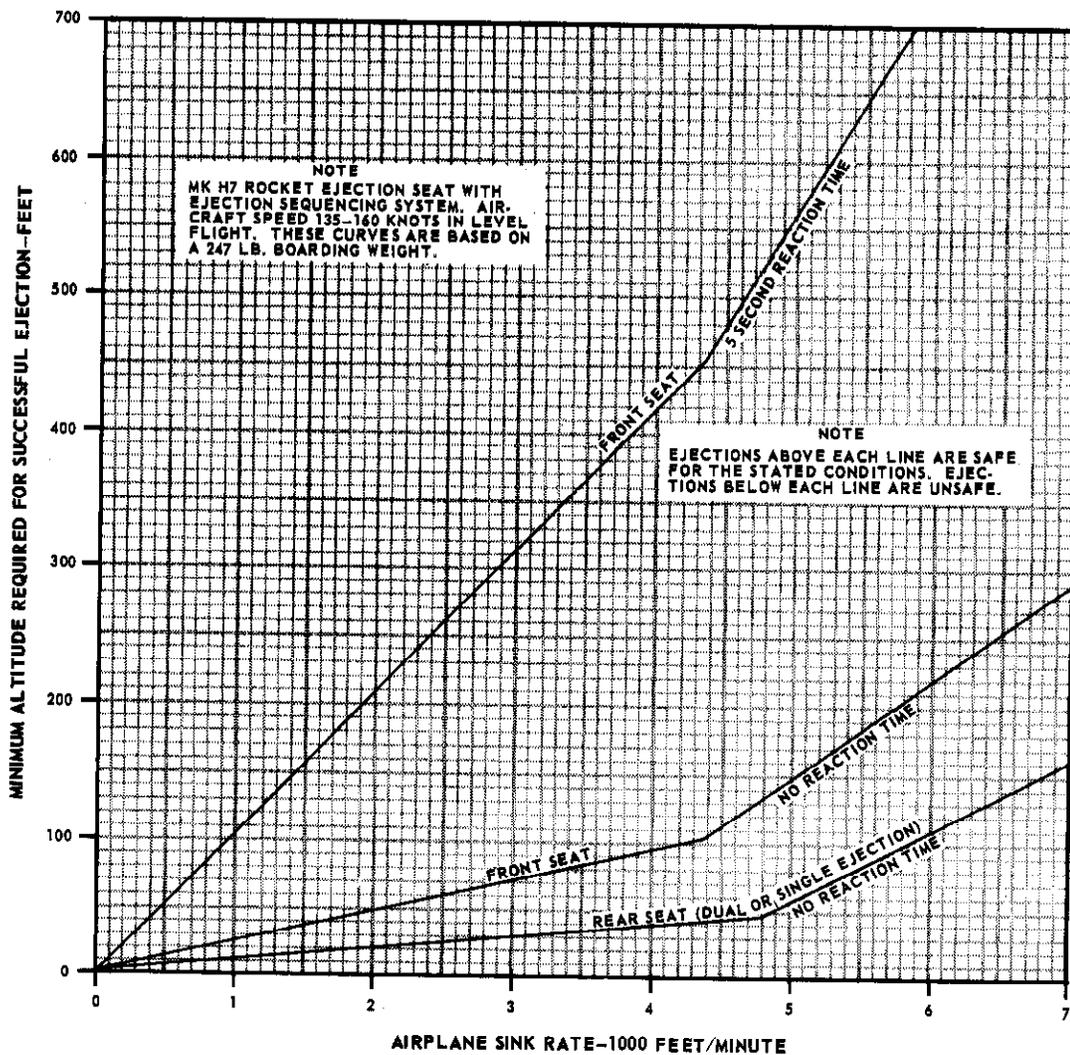
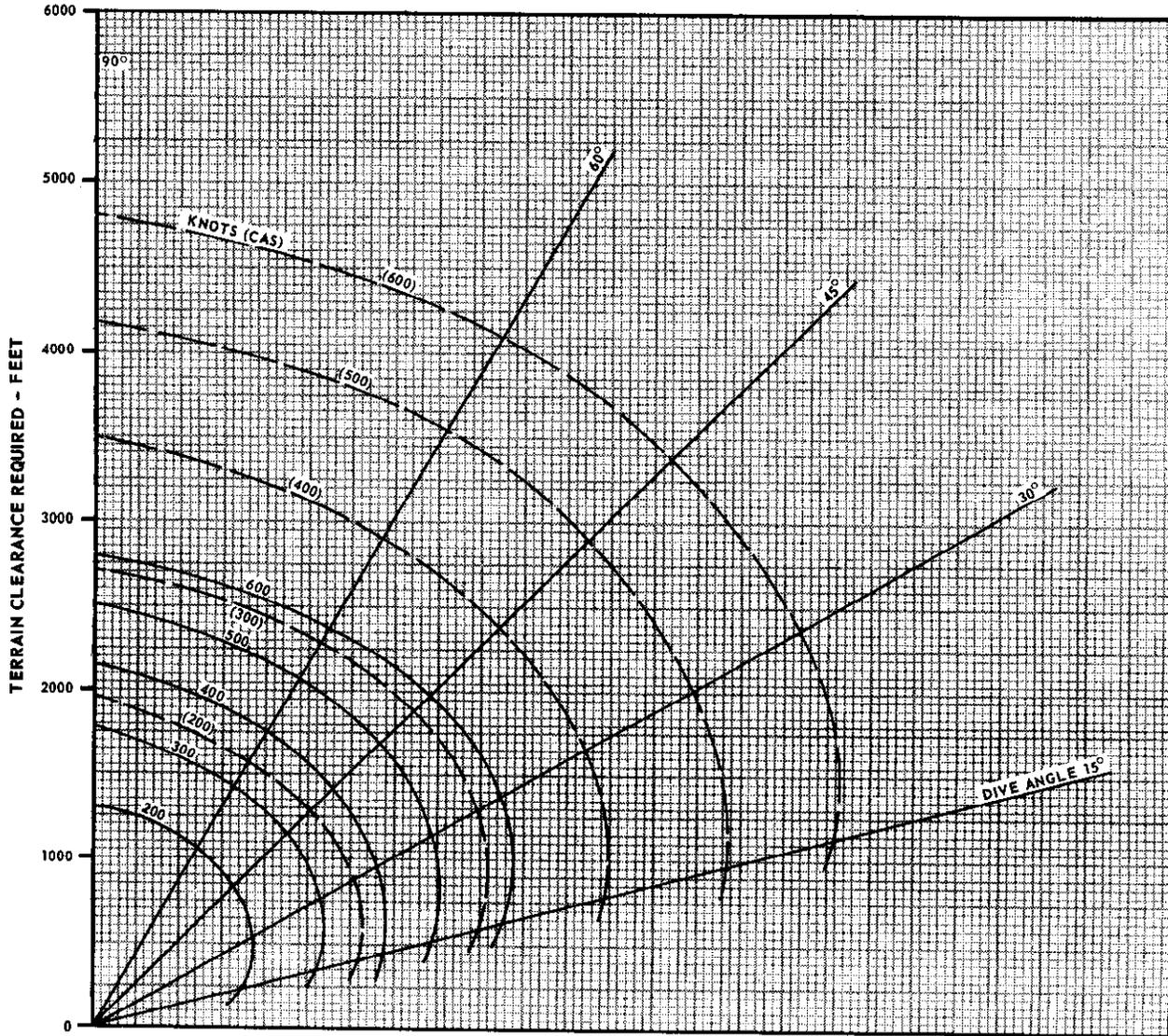


Figure 3-5

MINIMUM EJECTION ALTITUDE vs. AIRSPEED AND DIVE ANGLE



Note

These curves are based on a 247 lb. boarding weight. The solid curves indicate minimum terrain clearance with no crew member reaction time. The dashed curves indicate minimum terrain clearance with a two (2) second crew member reaction time. The curves are based on wings level bank attitude and appropriate angle of attack. Time required for the sequencing system to eject both canopies and both seats is included. It is assumed that the pilot initiates the sequencing system and continues pulling either ejection handle to fire the front seat as soon as the front canopy and interlock block are clear. If the pilot does not continue pulling, or the sequence is initiated by the rear crew member, relying on the front seat mounted time delay initiator to fire the front seat, an additional 250 feet altitude is required for a 90° dive angle at 600 knots, with proportionately less additional altitude required as dive angle and speed decrease. The curves do not include a correction for barometric altimeter lag; for proper values refer to part 1 of applicable index.

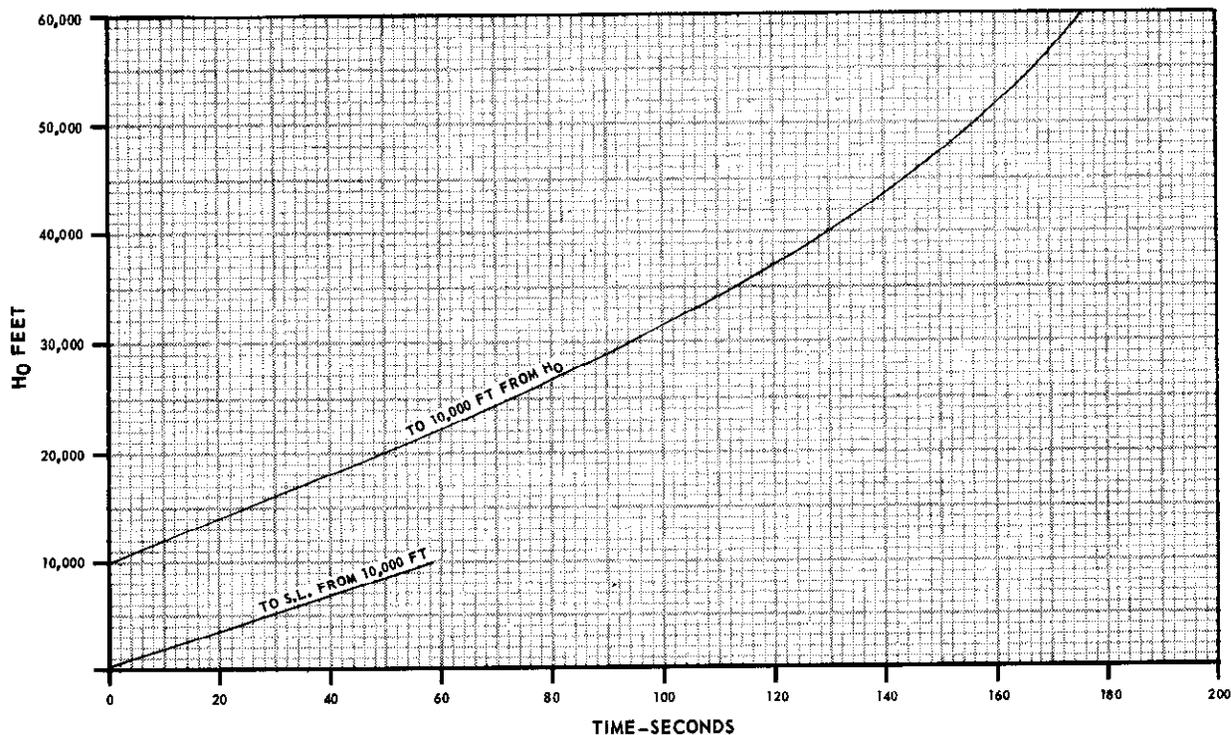
Figure 3-6

EJECTION SEAT DESCENT TIME

STABILIZER DROGUE DEPLOYED

NOTE

TIME OF DESCENT FROM HEIGHT H_0 TO 10,000 FT.
AND FROM 10,000 FT. TO SEA LEVEL OF EJECTION
SEAT WITH 5 FT. DROGUE CHUTE DEPLOYED.
TOTAL WEIGHT OF SEAT AND PILOT—450 LB.



4E-1-(28)

Figure 3-7

Personnel Locator Beacon (PLB) Operation

Before TO 1F-4-996 and TO 15X11-19-508 the personnel locator beacon is activated automatically at man/seat separation, if the actuation lanyard snaphook is connected to the D ring on the ejection seat. For manual operation (without the lanyard connected to the seat D ring), the beacon is actuated by pulling the lanyard by hand to withdraw the cotter pin from the actuator plunger on the left side of the survival kit. Once activated, the beacon can be turned off by pushing the actuator plunger toward the kit and rotating it into a retaining detent. After TO 1F-4-996 and TO 15X11-19-508, operation of the beacon is dependent on the position of the PLB inflight mode selector switch on the inside of the left thigh support of the survival kit. With the switch in the red dot or A position, the beacon is activated at man/seat separation (when PLB actuator plunger extends). With the switch in the green dot or M position, the beacon will not activate although the actuator plunger is extended. When possible, the proper

switch position should be selected prior to ejection or egress, depending on whether over friendly, neutral or unfriendly territory. If ejection is accomplished with the PLB inflight mode selector switch in the green dot position, the beacon can be activated during the parachute descent by placing the switch to the red dot position, provided the survival kit has not been deployed. Once on the ground the beacon can be turned off (or on) by placing the PLB inflight mode selector switch to the appropriate position. The beacon may be removed from the survival kit for ground operation. If the timed mode of operation has been used, a red fuse post plunger will be extended into the hole on the side of the survival kit. This plunger must be depressed before the PLB can be extracted from the kit. The beacon has two antennas, a flexible type and a telescopic type. If the beacon is removed from the kit for ground operation, the flexible antenna must be removed from the beacon and the telescopic antenna extended. Retaining the flexible antenna reduces the beacon's range. In addition, the timed battery operation feature can be turned off or on when on the ground. With the battery

mode switch in NORMAL the beacon should transmit for approximately 15 hours. With the switch in the TIMED position, the beacon transmits for 10 ± 2 minutes and then automatically shuts off. The TIMED position can be used only once, and time expiration is indicated by the small red fuze post extending below the bottom edge of the beacon. After timed battery operation is expired, the switch can be placed to NORMAL and the beacon will resume operation. A complete set of operating instructions for the PLB is contained on the beacon case.

ELECTRICAL FIRE

Circuit breakers and fuses protect most circuits and tend to automatically isolate an electrical fire. If an electrical fire occurs:

1. Generator switches - OFF

NOTE

When both generator switches are turned off, boost pump pressure and primary attitude reference systems will be lost. However, the front cockpit emergency attitude indicator is usable for approximately nine minutes even if the OFF flag is in view.

2. Stab aug switches - OFF
3. All electrical switches - OFF
4. Generator switches - ON
5. Essential electrical equipment - ON
6. Stab aug switches - ENGAGE

If fire persists -

8. Generator switches - OFF
9. Land as soon as practical.

SMOKE AND FUMES

To eliminate smoke and fumes from cockpit -

1. Oxygen - 100%
2. Emergency vent knob - PULL

NOTE

When necessary to depressurize the cockpit, descend to below 25,000 feet if possible.

If smoke or fumes persists -

3. Command selector valve - OPEN

WARNING

Aircrews should exert every effort to eliminate smoke and fume contaminants and should be prepared for an immediate ejection prior to

jettisoning the aft canopy. If the canopy is jettisoned, the resultant draft and wind blast may cause smoldering materials to burst into flame with catastrophic and possible incapacitating effects.

4. Aft canopy - JETTISON

If front canopy is jettisoned, proper ejection sequencing will only be possible from the rear cockpit.

EXTREME COCKPIT TEMPERATURES

WARNING

Extreme cockpit temperatures due to equipment malfunction may result in aircrew disablement and permanent injury. If the cockpit temperature becomes extreme, abort the mission and land as soon as practical.

If the cockpit air conditioning system malfunctions with a resulting extreme hot or cold cockpit temperature, check suit vent air lever off and proceed as follows: (Perform only those steps necessary to control temperature for safe recovery).

1. Temperature control switch - MANUAL
Temperature adjustment may be obtained by bumping the temperature control switch to the hot or cold position.
2. Temperature control switch - AUTO
When the cockpit temperature becomes extreme and cannot be controlled with manual temperature controls, placing the temperature control switch to auto will allow temperature range schedule to be selected by positioning the defog foot heat control lever forward for high and aft for low.
3. Defog foot heat control lever - FORWARD OR AFT
4. Cockpit air conditioning inlets - OPEN
Placing the defog foot heat lever forward and checking the eyeball type nozzles in the rear seat open will give maximum dispersion of the extreme temperatures and prevent a concentration being deflected toward confined body areas.
5. Cockpit heat and vent circuit breaker - PULL (C8, No. 3 panel)
6. Emergency vent knob - PULL

NOTE

When necessary to depressurize the cockpit, descend to below 25,000 feet if possible.

7. Reduce airspeed to below 220 knots and lower flaps to full down (aircraft without slats and conditions permitting)
8. Command selector valve - OPEN
9. Aft Canopy - JETTISON