True Q Dynamic Motion Seats

G-Cueing Simulated Ejection Seat

True Q® Motion Seats are high fidelity replications of the actual ejection seat with all-electric motion cueing built-in to the seat

The seats look, feel, and function like the actual aircraft ejection seats and translate simulator signals into realistic motion sensations for training.

Realistic, full-motion cueing for any fighter simulator

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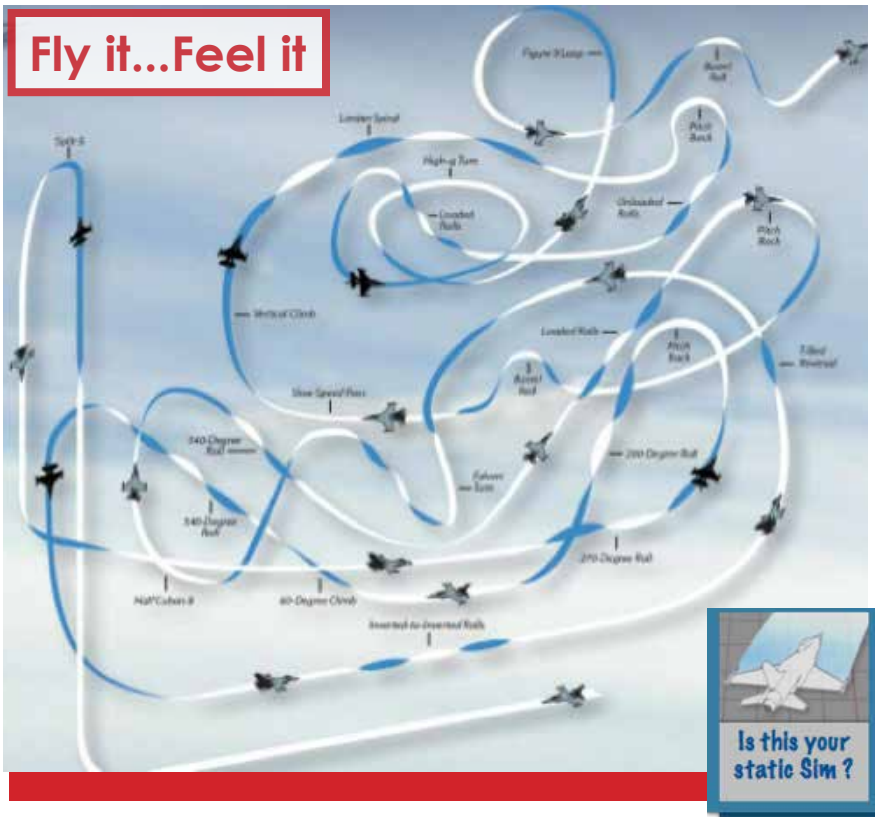
Why Dynamic Motion Seats?



Motion Matters

Fighter jets operate in a dynamic world of banks, climbs, dives, rolls, vibrations, shudders, and continuously changing accelerations and g-forces. Crews use the motion, pressure, and vibrations to monitor the jet's status and situation.

Unfortunately, most fighter simulators have no motion cueing.

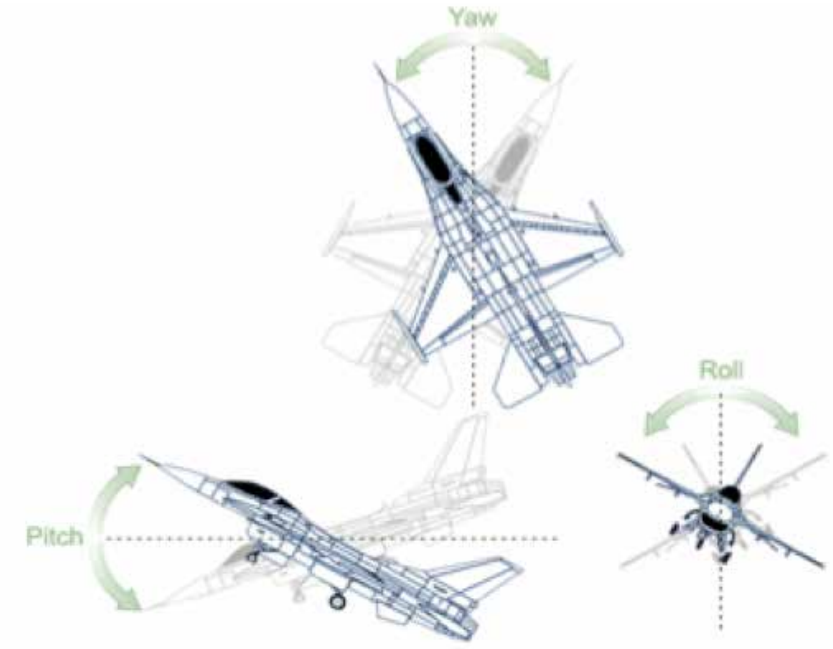
During landing touchdown or ordnance release, motion is the first cue the pilot receives. With motion, crews can specifically train for these events. And motion reinforces critical fighter skills like energy management.

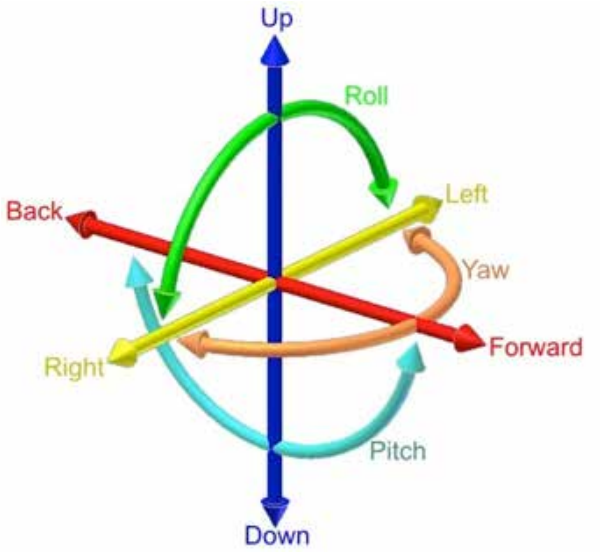
Crews on ACME seats during cooperative research with the US Air Force Research lab highlighted the seat's value for Energy Management. They noted that pulling high g's at low energy is an all-too-easy habit to embrace in motionless sims. This 'habit' can be life-threatening in flight.

Are you feeling the full mission?

Are you *training* the full mission?

Motion Matters





Feeling the Flight In all Six Degrees of Freedom

ACME's seats provide motion cues to emulate the sensations felt during the entire mission, from engine start to shutdown, lift-off to touchdown, ground ops to flight ops.

The seats use a patented, all-electric system with individual motion plates/pans that provide motion cues directly to the crew's body. The key to realistic motion cueing is not just the number of motion channels; it's the seamless interaction between the channels to provide complete, realistic, motion cueing. In True Q® seats, multiple motion channels work together to provide a single cue at each moment in the simulation.

Cueing speed is critical for replicating the fighter environment and ACME's motion seats excel at rapid-fire small transients and large channel excursions. The seats can simultaneously replicate the tiny pulses, vibrations, and turbulence plus the huge changes of g's, attitude, and acceleration felt in the jet.

The seats also smoothly handle the transition between normal and inverted flight. And, unique among cueing systems, motion seats provide cueing for g-onset using motion and sustained g's using pressure on the crew's body.

Formation Flight Effects

Taxiing & Braking

Air Refueling Effects

Motion Cues are *Training* Cues

Gear, Flaps, & Air Brakes

Engine Effects

Feel all these effects and more in an ACME Dynamic Motion Seats.

ACME Motion Seats include up to 20 specialized buffets and impacts that can be customized for the user.

Need to feel the gear retract? Sure, the seat can cue that. Important to feel the speed-brakes deploy? Absolutely, the seat cues that effect. Turbulence in close formation flight or during refueling? The seat can cue those effects too. How about cues for engine vibrations and weapon release? Yes, those too.

Missile Launch

G-Cueing

Ordnance Release

Optional G-Suit System- *Exceptional G-Cueing*

In the jet, crews wear a bodysuit of pneumatic bladders that pressurize against the body to combat the blood-pooling effects of g-forces. Pressure in the suit increases as g-forces increases.

In the simulator, the varying pressures of the g-suit can be used to provide dramatic cues for simulating g-forces.

ACME motion seats can be equipped with an optional pneumatic g-suit system to provide additional g-cues for crews.

The system uses a pressure and vacuum components to rapidly inflate & deflate the g-suit in response to simulated g-forces.

Eye Point Correction - *Keep Eyes Aligned with the HUD*

The Heads-Up Display is a critical feature in fighter jets and simulator motion systems must ensure that the crews' eye-point through the HUD does not change even during extensive cueing movements.

ACME's True Q® seats provide continuous eye-point correction. The seat bucket assembly and the seat pan have coordinated motion so crews feel the vertical motions but their eye-point in the HUD remains unchanged.

Optional Actuated Harness

Improves Inverted Flight and Deceleration Cues

During flight maneuvers, fighter pilots are often inverted, decelerating, or unloading the jet, situations where they're light on seat and heavy on the harnesses. ACME's motion seats can include an actuated harness system to replicate the belt sensation. In the simulator, during maneuvers, the seat's harnesses tightens or loosens on the crew to provide the sensation of crew weight into the straps.

The harness system works with the inertia reel allowing the crew to extend or retract the harnesses as normal and when in the locked position, engages the harness actuator so it responds to the host computer flight model. The system is designed to work seamlessly with the crew personal harness and connects just as it does in the jet with as-actual latches and buckles.

Seats tailored to meet budget, fidelity, and training needs.

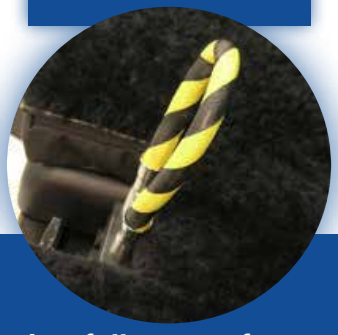
Seats are available as ultra-high fidelity replicas where the motion seat is just like the actual ejection seat or as base designs that emulate just the basic size and form of the ejection seat or any combination of features and fidelity. Customers can specify exactly the features desired for the seats.

Ejection Seat OEM Licensing

ACME has a licensing agreement with Martin-Baker UK, a world leader in aircraft ejection seats. Under the agreement, ACME builds motion seats using the actual OEM ejection seat engineering data. This means ACME seats are the absolute highest fidelity, true-to-life replicas of the Martin-Baker type ejection seats.

Arming Lever

Ejection Handle



Safing Pins

Emergency O^2 Ring

ACME motion seats can include a full range of sensors and I/O controls coupled with high fidelity replica handles and levers. Crews can practice safing, arming, and even ejection procedures. Instructors can monitor the seat status through the I/O. The motion seat's handles replicate the feel, force and function of the handles on the actual ejection seat so the training experience is true-to-life.

Capabilities

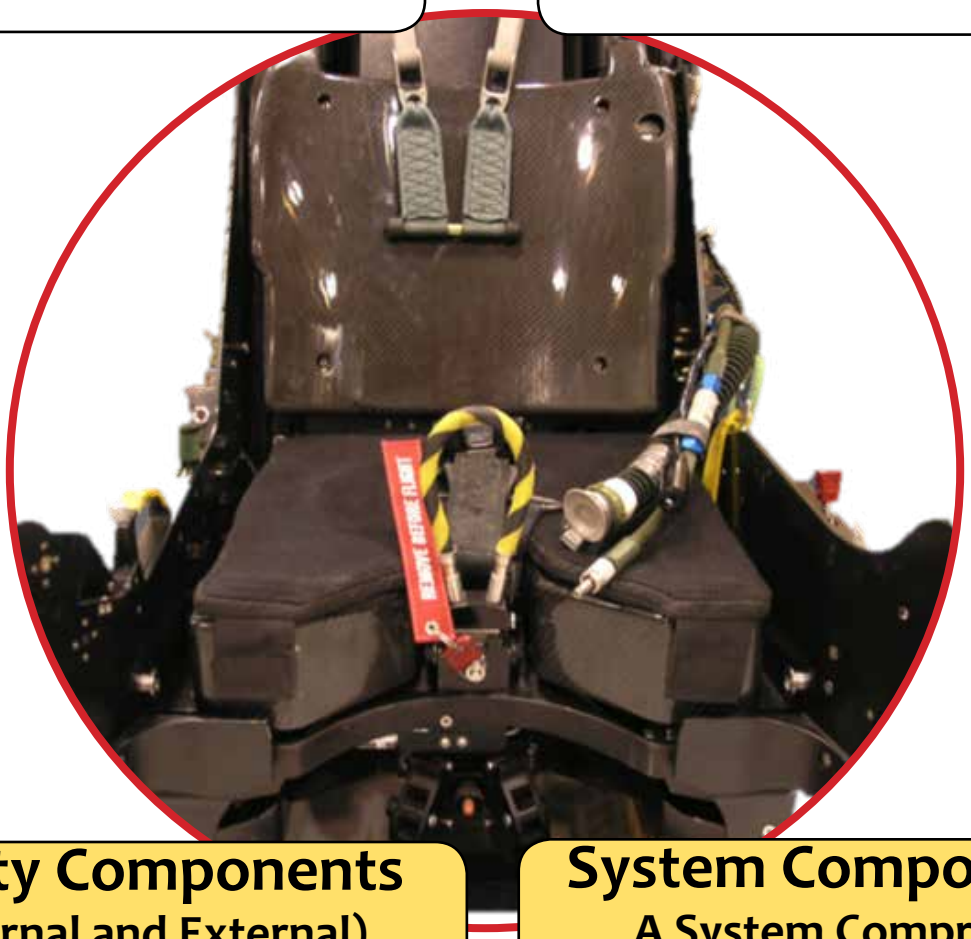
Patented Motion Seat Technology

- True Q® Motion Seats feature COTS core motion components and outer shape that can be built emulate any ejection seat in any fighter simulator.
- 1.8 G's Vertical acceleration for seat and crew
- Crews Up to 250lbs-no affect on motion seat performance--no re-tuning required

Power

System can be provided for US or European Power Sources

- 120VAC 60Hz 20AMP or 230VAC 60Hz
- 230 VAC 50/60Hz, Single Phase 20 Amp
- Can be connected to customer's interruptible Power Supply or Emergency Power Off System



Safety Components (Internal and External)

- Seat Safety Interlocks ensure seat does not move unless commanded.
- Optional Instructor Consent Switch
- Optional Crew Consent Switch
- Consents must be activated within brief (user-settable) time for seat to activate
- Programmable Logic Controller monitors host computer signal and shuts off seat if signal is lost
- Electronics and Motors continuously self-monitor for over-current and over-temperature
- CE Certified seats are ready for European Applications

System Components A System Comprises:

- Dynamic Motion Seat (two seats in Shipset)
- Electronics Cabinet (19" Components)
- Electronics Chassis
- Dynamic Motion Computer with integral motion software
- Motion algorithms, real time monitoring & Control
- A single computer can drive two seats in the same simulator.
- Power Distribution Unit
- Keyboard/Video/Mouse assembly
- Power and Signal Cables (Up to 100')