Standard Aircraft Characteristics

NAVY MODEL
A-7E
AIRCRAFT
(TITLE UNCLASSIFIED)

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STANDARD AIRCRAFT CHARACTERISTICS

A-7E

[ALLISON TF41-A-2 ENGINE]
### MISSION AND DESCRIPTION

The A-7E (TF41-A-2) is a single-place, carrier-based, turbofan, light attack airplane developed from the A-7E (TF30-P-8). The airplane is designed to provide high attack utility and flexibility for close support and interdiction missions by virtue of a large number of external store stations to provide ordnance loading capacity and freedom of ordnance choice, a large internal fuel capacity to make external fuel unnecessary for most missions, retaining a maximum number of stations for armament, an excellent overload capability in terms of wind-over-deck requirements, flying qualities, and structural integrity. Features to expedite maintenance and airplane turnaround are important A-7E design characteristics.

The A-7E has fixed wing incidence and a high-lift system composed of leading edge flaps and single slotted trailing edge flaps. Lateral control is provided by outboard ailerons and inboard spoilers. Superior stability and control qualities over the entire aircraft speed envelope, including transonic, are features of the A-7E.

A stick steering autopilot is provided to augment the weapon system capability. An approach power compensator provides automatic speed control for carrier landing.

In addition to the basic A-7H features, the A-7E provides a high accuracy flexible weapons delivery system, an M61 Vulcan cannon, a head-up display to aid the pilot during weapons delivery, enroute, and terrain following and landing modes. Weapon delivery improvements include a new all-weather type radar, digital weapon delivery and navigation computer, inertial quality platform, head-up display, projected map display, a new air data computer, and a new roll stabilized doppler radar system.

### POWER PLANT

- **Engine** TF41-A-2 (68 and Subsequent)
- **Manufacturer** Allison
- **Type** Turbofan
- **Length** 165.36 inches
- **Diameter** 37.18 inches
- **Specification** 798 (26 Jan 1969)
- **Compressor and Fan** Axial Flow
- **Tail Pipe Nozzle** Fixed

### DIMENSIONS

- **Wing**
  - Area: 375 Sq ft
  - Span: Maximum: 38.73 ft
  - Folded: 23.77 ft
  - Aspect Ratio: 4
  - Sweep 1/4 Chord: 35°
  - MGC: 130.08 In
  - Length: 46.13 ft
  - Height: 16.00 ft
  - Maximum Tread: 9.49 ft

- **A-7E Specific Notes**
  - Includes 652 pounds Special Equipment

### INPUT AND OIL

- **Fuel Capacity** 1,476 Gal
- **Fuel Specification** MIL-J-5624F
- **Fuel Grade** JP-5
- **Oil Engine Oil Tank (total)** 3.5 Gal
- **Oil Specification** MIL-L-33409

### WEIGHTS

- **Empty** 18,546 Pounds
- **Basic** 19,576 Pounds
- **Design** 29,575 Pounds
- **Combat (Clean A/P)** 25,834 Pounds
- **Max T.O. (Overload)** 42,000 Pounds
- **Max T.O. (Normal)** 37,279 Pounds
- **Max Ldv (Carrier)** 25,300 Pounds

### ORDANANCE

- **20 MM Aircraft**
  - **1,000** (Normal) Rounds of 20 MM Ammunition
  - **500** (Max) Internal
  - **2 Fire Control Pylons for Single Sidewinders** (360-lb capacity)
  - **6 Wing Mounted Pylons (3 per side)** (3,500-lb capacity (wet), 2,250-lb capacity (wet))
<table>
<thead>
<tr>
<th>TAKEOFF LOADING CONDITION</th>
<th>1 HI-HI-HI MISSION CLEAN AIRPLANE</th>
<th>2 PRIMARY ATTACK MISSION 6 MK 81 SNAKEYES</th>
<th>3 PRIMARY ATTACK MISSION 12 MK 81 SNAKEYES</th>
<th>4 5,000 FT LOITER MISSION 12 MK 82 AND 6 MK 81 BOMBS</th>
<th>5 DEEP STRIKE MISSION 1 MK 43 AND 3,000-GAL TANKS</th>
<th>6 FERRY MISSION 2-300-GAL TANKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Takeoff weight</td>
<td>lb</td>
<td>lb</td>
<td>lb</td>
<td>lb</td>
<td>lb</td>
<td>lb</td>
</tr>
<tr>
<td>Fuel (internal/external)</td>
<td>lb</td>
<td>lb</td>
<td>lb</td>
<td>lb</td>
<td>lb</td>
<td>lb</td>
</tr>
<tr>
<td>Payload</td>
<td>lb</td>
<td>lb</td>
<td>lb</td>
<td>lb</td>
<td>lb</td>
<td>lb</td>
</tr>
<tr>
<td>Wing loading</td>
<td>lb/sq ft</td>
<td>lb</td>
<td>lb</td>
<td>lb</td>
<td>lb</td>
<td>lb</td>
</tr>
<tr>
<td>Stall speed</td>
<td>kn</td>
<td>kn</td>
<td>kn</td>
<td>kn</td>
<td>kn</td>
<td>kn</td>
</tr>
<tr>
<td>Takeoff gnd run/over 50 ft obs - calm 59°F SL</td>
<td>ft/ft</td>
<td>2,670/3,710</td>
<td>3,310/4,440</td>
<td>3,670/5,080</td>
<td>4,890/6,800</td>
<td>5,060/7,060</td>
</tr>
<tr>
<td>Takeoff gnd run/over 50 ft obs - calm 89.6°F SL</td>
<td>ft/ft</td>
<td>3,450/4,870</td>
<td>4,170/5,190</td>
<td>4,770/6,780</td>
<td>6,390/9,670</td>
<td>6,650/9,670</td>
</tr>
<tr>
<td>Intermediate max speed/altitude</td>
<td>kn/ft</td>
<td>602/36</td>
<td>567/46</td>
<td>518/49</td>
<td>513/49</td>
<td>513/49</td>
</tr>
<tr>
<td>Intermediate rate of climb at SL</td>
<td>rpm</td>
<td>912</td>
<td>670</td>
<td>670</td>
<td>670</td>
<td>670</td>
</tr>
<tr>
<td>Intermediate time: SL to 20,000 ft</td>
<td>min</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Intermediate time: SL to 30,000 ft</td>
<td>min</td>
<td>40</td>
<td>40</td>
<td>40</td>
<td>40</td>
<td>40</td>
</tr>
<tr>
<td>Intermediate service ceiling (100 fpm)</td>
<td>ft</td>
<td>421</td>
<td>421</td>
<td>421</td>
<td>421</td>
<td>421</td>
</tr>
<tr>
<td>Combat range</td>
<td>nmi</td>
<td>nmi</td>
<td>nmi</td>
<td>nmi</td>
<td>nmi</td>
<td>nmi</td>
</tr>
<tr>
<td>Average cruising speed</td>
<td>kn</td>
<td>kn</td>
<td>kn</td>
<td>kn</td>
<td>kn</td>
<td>kn</td>
</tr>
<tr>
<td>Cruising altitude</td>
<td>ft</td>
<td>39,170/44,970</td>
<td>36,180/49,980</td>
<td>34,380/49,920</td>
<td>28,290/41,680</td>
<td>30,110/40,710</td>
</tr>
<tr>
<td>Combat radius/mission time</td>
<td>nmi/hr</td>
<td>894/3.1</td>
<td>488/2.4</td>
<td>432/2.3</td>
<td>252/2.5</td>
<td>916/4.06</td>
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<tr>
<td>Average cruising speed</td>
<td>kn</td>
<td>479</td>
<td>403</td>
<td>403</td>
<td>403</td>
<td>403</td>
</tr>
<tr>
<td>Fuel transferred/distance from base</td>
<td>lb/nmi</td>
<td>5,241/978</td>
<td>5,517/335</td>
<td>6,247/690</td>
<td>5,979/515</td>
<td>5,979/515</td>
</tr>
<tr>
<td>Acceleration at CES at 89.6°F</td>
<td>ft/sec/sec</td>
<td>6.02</td>
<td>4.8</td>
<td>4.17</td>
<td>3.02</td>
<td>2.86</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>COMBAT LOADING CONDITION</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Combat weight</td>
<td>lb</td>
<td>26,117</td>
<td>28,731</td>
<td>30,767</td>
<td>35,451</td>
<td>33,036</td>
</tr>
<tr>
<td>Engine power</td>
<td>lm</td>
<td>6,262</td>
<td>13,200</td>
<td>15,480</td>
<td>17,415</td>
<td>18,315</td>
</tr>
<tr>
<td>Fuel lb</td>
<td>lb</td>
<td>6,022</td>
<td>6,022</td>
<td>6,022</td>
<td>6,022</td>
<td>6,022</td>
</tr>
<tr>
<td>Combat speed/comb altitude</td>
<td>km/h</td>
<td>572/23,000</td>
<td>560/SL</td>
<td>553/SL</td>
<td>502/5,000</td>
<td>580/SL</td>
</tr>
<tr>
<td>Rate of climb/comb altitude</td>
<td>rpm/ft</td>
<td>6,780/23,000</td>
<td>8,630/SL</td>
<td>7,970/SL</td>
<td>5,220/5,000</td>
<td>7,840/SL</td>
</tr>
<tr>
<td>Combat ceiling (500 fps)</td>
<td>ft</td>
<td>44,490</td>
<td>35,300</td>
<td>29,210</td>
<td>37,210</td>
<td>39,490</td>
</tr>
<tr>
<td>Rate of climb at SL</td>
<td>rpm</td>
<td>7,970</td>
<td>6,309</td>
<td>5,220</td>
<td>5,220</td>
<td>5,220</td>
</tr>
<tr>
<td>Max speed at SL</td>
<td>kn</td>
<td>602</td>
<td>553</td>
<td>500</td>
<td>580</td>
<td>574</td>
</tr>
<tr>
<td>Max speed/altitude</td>
<td>km/h</td>
<td>567/23,000</td>
<td>527/3,000</td>
<td>505/10,000</td>
<td>584/5,000</td>
<td>576/0,000</td>
</tr>
<tr>
<td>Landing weight</td>
<td>lb</td>
<td>21,367</td>
<td>22,245</td>
<td>23,916</td>
<td>23,816</td>
<td>23,916</td>
</tr>
<tr>
<td>Fuel lb</td>
<td>lb</td>
<td>1,272</td>
<td>1,272</td>
<td>1,272</td>
<td>1,272</td>
<td>1,272</td>
</tr>
<tr>
<td>Stall speed</td>
<td>km/h</td>
<td>106,800/104.6</td>
<td>110,210/7.4</td>
<td>110,710/8.2</td>
<td>112,710/9.2</td>
<td>111,710/9.2</td>
</tr>
</tbody>
</table>

Notes:
1. Payload is droppable ordnance. Does not include 500 rounds of ammunition or external fuel tanks.
2. Intermediate thrust, 25° flap, 82 Cg max.
3. Climbing time considered weight reduction due to fuel used.
4. Mission time excludes time for warming up and takeoff and 20 minute loiter at sea level.
5. Refuel radius is determined with refueling to full internal fuel capacity of 10,036 pounds.
6. Refueling altitude is cruise ceiling with full internal fuel or 35,000 ft.
7. Refuel altitude is 34,190 ft.
8. Refuel altitude is 33,660 ft.
9. Refuel altitude is 26,980 ft.
10. 283 lb ammunition retained.
11. External fuel tanks retained. No ammunition carried.
12. Antiskid braking, 40° flap.
13. With 4,300 gallon tanks, range is 2,485 nmi.
14. Combat loading performance includes stores and ammunition.
<table>
<thead>
<tr>
<th>Mission Loadings</th>
<th>100 NMI in and Out</th>
<th>200 NMI in and Out</th>
<th>Low-Lo-Lo</th>
<th>5,000 FT Loiter</th>
<th>Hi-Hi-Hi</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fuel - Gal</strong></td>
<td>R/A NMI</td>
<td>Time HR</td>
<td>R/A NMI</td>
<td>Time HR</td>
<td>R/A NMI</td>
</tr>
<tr>
<td><strong>Takeoff WT - LB</strong></td>
<td>R/A NMI</td>
<td>Time HR</td>
<td>R/A NMI</td>
<td>Time HR</td>
<td>R/A NMI</td>
</tr>
<tr>
<td><strong>CG-28.06% MGC</strong></td>
<td>1 MK 43</td>
<td>32,573</td>
<td>4.09 FT/SEC²</td>
<td>266</td>
<td>2.74</td>
</tr>
<tr>
<td><strong>CG-25.60% MGC</strong></td>
<td>1 MK 43</td>
<td>900 GAL EXT</td>
<td>2.84 FT/SEC²</td>
<td>266</td>
<td>4.44</td>
</tr>
<tr>
<td><strong>CG-28.27% MGC</strong></td>
<td>6 MK 81 SE</td>
<td>32,745</td>
<td>4.80 FT/SEC²</td>
<td>485</td>
<td>2.47</td>
</tr>
<tr>
<td><strong>CG-27.21% MGC</strong></td>
<td>6 MK 81 SE</td>
<td>1,079 GAL EXT</td>
<td>2.54 FT/SEC²</td>
<td>832</td>
<td>4.32</td>
</tr>
<tr>
<td><strong>CG-25.87% MGC</strong></td>
<td>6 MK 82 SE</td>
<td>34,371</td>
<td>4.28 FT/SEC²</td>
<td>460</td>
<td>2.37</td>
</tr>
<tr>
<td><strong>CG-27.27% MGC</strong></td>
<td>6 MK 82 SE</td>
<td>900 GAL EXT</td>
<td>2.53 FT/SEC²</td>
<td>772</td>
<td>3.97</td>
</tr>
<tr>
<td><strong>CG-28.17% MGC</strong></td>
<td>20 MK 82 SE</td>
<td>1,250 GAL INT</td>
<td>2.57 FT/SEC²</td>
<td>195</td>
<td>1.28</td>
</tr>
<tr>
<td><strong>CG-25.11% MGC</strong></td>
<td>12 MK 82</td>
<td>42,000</td>
<td>2.48 FT/SEC²</td>
<td>184</td>
<td>1.20</td>
</tr>
</tbody>
</table>

**Notes:**
- Mission time: Excludes time for warmup and takeoff and 20-Minute loiter time
- BCS: Best cruise speed
- ACCEL: Acceleration after catapult at 0.82 CLα max at 80.6°F, intermediate thrust
- Partial fuel load to maintain 42,000 lb maximum takeoff weight
- Unable to maintain mission definition

April 1972
CARRIER SUITABILITY

MINIMUM WIND OVER DECK REQUIRED FOR CATAPULTING
VS. GROSS WEIGHT

MINIMUM WIND OVER DECK REQUIRED FOR ARRESTING
VS. GROSS WEIGHT

SEA LEVEL STANDARD DAY
TF41-A-2 ENGINE AT INT
12 MK 01 SE
C-11-1

- 0° FLAP
- 25° FLAP

AIRSPEED FOR TRIMMED FLIGHT AT 82% CLmax
ZERO FEET OF SINK

GROSS WEIGHT—1000 LBS.

GROSS WEIGHT—1000 LBS.
**PRIMARY ATTACK MISSION**
(12 MK 81 SE)

*Warmup, taxi, takeoff:* 5 min SL Max Continuous  
*Climb:* on course to opt cruise alt with Intermediate thrust  
*Cruise out:* at speed for max range at opt cruise alt  
*Descend:* to SL (no fuel used, no distance gained)  
*Run in:* 200 NMI at SL at speed for max range  
*Combat:* 5 min at Intermediate (stores on, no dist gained) drop bombs  
*Climb:* on course to opt cruise alt with Intermediate thrust  
*Cruise back:* at max range speed at opt alt  
*Reserve:* 5% of initial fuel +20 min at max endurance speed at SL

**5000 FT LOITER MISSION**

*Warmup, taxi, takeoff:* 5 min SL Max Continuous  
*Climb:* on course to opt cruise alt with Intermediate thrust  
*Cruise out:* at max range speed at opt cruise alt (drop fuel tanks when empty)  
*Descend:* to 5,000 ft (no fuel used, no dist gained)  
*Loiter:* 1 hour at max end. speed (no dist gained) stores dropped at end of loiter  
*Climb:* on course to opt cruise alt with Intermediate thrust  
*Cruise back:* at max range speed at opt alt  
*Reserve:* 5% initial fuel +20 min at max endurance speed at SL

**DEEP STRIKE MISSION**

*Warmup, taxi, takeoff:* 5 min SL Max Continuous  
*Climb:* on course to opt cruise alt with Intermediate thrust  
*Cruise out:* at max range speed at opt cruise alt (drop fuel tanks when empty)  
*Descend:* to SL when 50 NMI from target (no fuel used, no dist gained)  
*Run in:* 50 NMI at V<sub>max</sub> at Intermediate  
*Combat:* 5 min at Intermediate (stores on, no dist gained) drop bombs  
*Run out:* 50 NMI at V<sub>max</sub> at Intermediate at SL  
*Climb:* on course to opt cruise alt with Intermediate thrust  
*Cruise back:* at max range speed at opt alt  
*Reserve:* 5% initial fuel +20 min at max endurance speed at SL

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**Note:**  
*Mission Time:* Excludes time for warmup and takeoff and 20-minute loiter time  
*Cycle Time:* Mission time +20 minutes SL loiter
**HI-LO-LO-HI MISSION**

- Warmup, taxi, takeoff: 5 min SL Max Continuous
- Climb: on course to opt cruise alt with Intermediate thrust
- Cruise: at max range speed at opt cruise alt (drop fuel tanks when empty)
- Descend: to SL when 100/200 NMI from target (no fuel used, no dist gained)
- Cruise: at max range speed at SL (drop fuel tanks when empty)
- Combat: 5 min at Intermediate (stores on, no distance gained)
- Drop stores
- Cruise back: at max range speed at opt alt
- Reserve: 5% initial fuel +20 min at max endurance speed at SL

**LO-LO-LO MISSION**

- Warmup, taxi, takeoff: 5 min SL Max Continuous
- Cruise: at max range speed at SL (drop fuel tanks when empty)
- Combat: 5 min at Intermediate (stores on, no distance gained)
- Drop stores
- Cruise: at max range speed at sea level
- Reserve: 5% initial fuel +20 min at max endurance speed at SL

**HI-HI-HI MISSION**

- Warmup, taxi, takeoff: 5 min SL Max Continuous
- Climb: on course to opt cruise alt with Intermediate thrust
- Cruise: at max range speed at opt cruise alt (drop fuel tanks when empty)
- Combat: 5 min at Intermediate (stores on, no distance gained) at alt for max mach no.
- Drop stores
- Cruise back: at max range speed at opt alt
- Reserve: 5% initial fuel +20 min at max endurance speed at SL

**COMBAT RADIUS MISSION TIME**

**LOADING CONDITION COLUMN NUMBER**

APRIL 1972