

Atec®

# Military Turbine Engine Test Support

Capabilities Overview  
Equipment Reference



Atec, Inc. 08/28/06

Cage Code: 09552



## Table of Contents

<b>Overall Capabilities</b>	<b>5</b>
<b>Introduction</b>	
Engine Test Facilities	6
Thrust Stands	7
Adapter Kits	7
Instrumentation	8
Support Equipment	8
<b>New Product Highlights</b>	
Standard Day Unit - P/N 4606-0973	9
Pressure Test Set - P/N AHT56038	9
Electronic Throttle - P/N 5400	9
M37 Replacement Thrust Stand - P/N 159-5100-1	10
Extended Bellmouth - P/N 129-8200-1	10
T-20 Cab Digital Timer - P/N 140-1412-1	10
1/2+ Drive Spanner - P/N 27-0142-1	10
Starter Gearbox - P/N 129-8000-1	11
Multifunction Instrument- P/N 4715-0967	12
Consolidated Instrument- P/N 4716-0968	12
Remote Display Unit- P/N 4717-0969	12
Intercom System- P/N AHT63505-1	13
<b>Engine Adapter Kits &amp; Subassemblies</b>	
F100 Support	<b>14-15</b>
É AHT56126 - Adapts A/M37T-20, T-20A Fuel System to High-Flow Requirements for F100-229 or F110-129 Requirements	
É AHT50079 & AHT50080 - Adapts A/M37T-6 & T-20, Test Stand for Running F100 Series Engines	
É AHT56017 - Adapts AHT50079/AHT50080 & A/M37T-20 for F100-220/220E	
É AHT56064 - Adapts AHT50079/AHT50080/AHT56017 & A/M37T-20 for F100-229	
É AHT56365 - Adapts AHT50079 Kit & A/M37T-20 for Testing F100-229 Engines	

## Table of Contents, Continued

### Engine Adapter Kits & Subassemblies, Continued

F110/F101/J85 Support **16-17**

É 3C3988/3C3627 · T-9 Test of F101

É 21C8501/8503/8504 · A/M37T Test of F404

É 21C14500/4501/4504 · A/M37T Test of F414

**Atec's Refurbishment Capabilities 18**

**Contact Information 19**

## Overall Capabilities

Atec's expertise in Ground Support Equipment is a result of our long involvement with the military. Our work in this arena can be found in military facilities around the globe. We specialize in projects where technical challenges require creative, cost-effective solutions. We have direct experience and capability in manufactured, refurbished gear for most U.S. DOD Turbine Engines.

### Highlights

- É Established 1956
- É Houston, TX
- É \$10-15M Annual Sales
- É 80 Personnel
- É DLA Best Value Medalist
- É ISO 9001:2000 with Design Certification
- É Woman Owned Small Business-TX HUB Certified
- É Engine Test Equipment & Facilities (over 30 years)
- É Specialized in Relocatable & Mobile Test Systems
- É Involved with the F100-PW Engine Series since 1974
- É Involved with F119 since YF119 in 1988

### Services Provided

- É Aerospace, Electrical & Mechanical Engineering
- É Finite Element Analysis (FEA)
- É Logistics & Spares Management
- É Evaluation & Repair
- É Refurbished Equipment
- É Telephone & On-Site Maintenance Support
- É Service "After-the-Sale"
- É Prototyping
- É Production Engineering & Project Management
- É Manufacturing & Assembly
- É Integration
- É Component Testing
- É Field Installation
- É Drawings & Technical Manuals
- É Legacy Instrumentation Support (Obsolescence & Cost Reduction)
- É Engine Support Services

## Introduction

### Engine Test Facilities

Atec provides Finite Element Analysis, modeling, manufacture and installation of Engine Test Facilities. Some examples of Atec's *Engine Test Facility Projects* are:



Atec designed, modified and installed a T-9 overhead test bed in an A/F37T-10 Hush House at McClellan AFB.



At six separate test cells in Saudi Arabia, Atec analyzed and redesigned existing F100 engine facilities to correct design flaws in the cables, bellmouth mount and fly-by-wire throttle system.



Atec converted a J79 engine test facility to an F100-PW-220E engine test facility in support of the Italian Air Force conversion to F-16's.



Atec developed and manufactured the mechanical restraint and electrical test systems for the Pratt & Whitney F119 vectored thrust engine.



Atec fully integrated a complete test facility, including project management and engineering consulting for the Greek Air Force. Atec directed work crews during installation of the thrust frame, engine adapter, fuel room equipment, and control room instrumentation.

## Introduction, Continued

### Thrust Stands

Atec can design, manufacture, test and install thrust stands for various engine types.

Some examples of Atec's *Thrust Stand Projects* are:



Atec designed, manufactured, tested and installed a new A/M37T-20 style thrust stand for testing the F100-PW-229 engine.



Atec installed the new X159 thrust stand at Base 25 in Ramon, Israel. This project was done for the IAF in support of the F100-PW-229 engine.



For the A/M37T-16 and A/M37T-21 systems, Atec performed analysis and design for a T-21 test stand (running T-56 engines).

### Adapter Kits

Atec performs major thrust cell conversions, refurbishment of old engine adapters, turnkey assembly/fabrication and manufacture/installation of new engine adapters.

An example of an Atec *Adapter Kit Project* is:



Atec provided analysis, concept, design, refurbishment and installation of a higher thrust capacity F100-PW-229 engine adapter.

*Specific Adapter Kits and Subassemblies (for F100/F110/F101/J85 support) are defined on pages 12-15.*

## Introduction, Continued

### Instrumentation

Atec, Inc. has fielded over 14,000 discrete instrument systems during its 50+ years of operation. Atec has been involved on numerous upgrades to correct for obsolescence, procedural changes, additional requirements, reverse engineering, etc. Atec provides electro-mechanical assembly of instrumentation, such as data acquisition systems, as well as surface instrumentation manufacture and test.



### Support Equipment

- É Spare Parts
- É Front & Rear Engine Mounts
- É Bellmouths & Screens
- É Starter Gearboxes
- É Electronic Throttles (for F100-F119 Engines)
- É Adapter Kits· Engine Specific Intermediate & Depot Level (for F100-100, 200, 220, 220E, 229; F110-100, 129; TF30, TF34, J-52, F101, J58, J85, F119-100 Engines)
- É Engine Control Panel Fuses (for AHT56017/17 Kit)

<u>Atec PN</u>	<u>Description</u>	<u>NSN</u>
393-0100-00	1amp	5920-00-942-7907
393-0200-00	2amp	5920-00-938-7660
393-0300-00	3amp	5920-00-926-7445
393-0500-00	5amp	5920-00-782-6179

\*\*Fuses can be found at DSCC



## New Product Highlights

### Standard Day Unit (SDU) - P/N 4606-0973

(Replaces : 4458-0623, 4606-0810, 20-2400)

Atec's newest Engine Data Acquisition System was designed in 2003 and has the latest in modular electronics. The present-day technology increases field reliability and significantly reduces calibration time. Multiple circuit cards were replaced resulting in a lower unit price. Our SDU has been in the USAF engine test support system for over 15 years.



### Pressure Test Set - P/N AHT56038

(Replaces : H-605)

Atec's Pressure Test Set is a ruggedized, supplemental instrument for troubleshooting specific malfunctioning components on installed (flight-line) or uninstalled (test cell) aircraft engines.



### Electronic Throttle - P/N 5400

(Replaces Electronic: 20-4001-1 & 20-4002-1)

(Replaces Mechanical: 9458M56G02)

Atec's Digital Throttle is a smaller, higher torque unit that works with the latest generation F100 and F110 engines in the test cell. Atec undertook the redesign effort and achieved a reduced package size, a lower parts count, and a lower cost per unit.



- É Common Throttle (used with F100 - F119 engines)
- É Replaces Antiquated Mechanical & Electric Versions
- É Fast Changeover Between Engine Types (in same hush house/test facility)
- É Digital Electronic Controls & Servo Motor Technology
- É Adapter Kits
- É Eliminates Problems with Drift, Offset/Repeatability, Temperature & Vibration



## New Product Highlights, Continued

### M37 Replacement Thrust Stand with Height Adjustment - P/N 159-5100-1

(Replaces: 20-240)

- É High Strength for High Thrust Loads such as F100. 229 Engines
- É Eliminates Need for Rail Stiffeners & Cross Members
- É Cutaway Center Section for Accessibility to Engine
- É Hydraulic Height Adjustment for Easy Engine Transfer
- É Extender Rails Eliminates Need for Rail extension



### Extended Bellmouth - P/N 129-8200-1

(Replaces: 103-3002-1, 120-3020-1)

Atec's latest one-piece extended bellmouth decreases multi-item logistics support while improving long-term reliability.

- É Eliminates Need for Separate Bellmouth & Extension Duct
- É Lighter Weight, Easier to Handle
- É Mounting Point Repositioned for Improved Balance
- É Stronger, More Durable than Solid Laminate Fiberglass
- É Works with All Existing F100 Dress Gear
- É Is Suitable for Immediate Use with Engine Models:  
F100-220/220E/220I/229I/229



### T-20 Cab Digital Timer - P/N 140-1412-1

(Replaces: 610046)

Replaces old electro-mechanical timers and fits in the same location as the originals.



### 1/2+ Drive Spanner - P/N 27-0142-1

Used on M37 Rear Mounts, with a 1/2" drive ratchet, to remove the engine thrust pins. Prevents breaking of the thrust pin handles.



## New Product Highlights, Continued

### Starter Gearbox - P/N 129-8000-1

(Replaces: 103-3019-1)

- É Functionally Equivalent to the Obsolete 103-3018-1
- É Redesigned for Higher Speed & Load
- É Gearbox Envelope Clears the F100-PW-229 Engine Inlet Fan Components
- É Can be Positioned for Test in One-Fluid Motion (Without Raising or Lowering It)
- É Simplified Engagement Shaft System (75% Fewer Parts)
- É Roller Bearings Used:
  - Eliminates Needle Bearings
  - Eliminates Previously Required Adjustment
  - Eliminates High Failure Rate
- É No External Springs to Wear Out & Repair Times Reduced
- É All Bearings High Speed Rated with Positive Lubrication System
- É Easier to Maintain
- É Readily Mounts to Both Overhead Adapters & A/M37T-20 Ground Based Stands
- É New Case Material Dissipates Heat Much Faster, Reducing Thermal Viscosity Breakdown of Lubricating Oil
- É Port for Additional Oil-Mist Lube System



## New Product Highlights, Continued

The newly designed replacement products are a form, fit and functional equivalent to the technically outdated A/M37T-20B instruments currently existing in the field. Atec undertook a redesign effort to update these instruments' internal electronics to present-day technology, utilizing Commercial Off-The-Shelf (COTS) modules. The result is an instrument that has reduced the total parts count by 85% and will allow sustainability of the system for years to come. All indications, interface connections and inputs have been retained to make the installation and use of these instruments as simple as plug and play.

### Common features of these three instruments include:

- É Digital Output for Data Acquisition Interface
- É High accuracy due to integrating analog to digital conversion with 16-bit resolution and 50/60 Hz noise rejection.
- É High Component Reliability
- É Minimal Components
- É Supportability
- É Interchangeable With Other COTS DAQ Modules By Changing Software Drivers
- É Connected to CPU Via a Single RS232 Cable
- É Modules are factory repairable.

### Multifunction Instrument - P/N 4715-0967

(Replaces: 20-500-1)



### Consolidated Instrument - P/N 4716-0968

(Replaces: 20-501-1)



### Remote Display Unit - P/N 4717-0969

(Replaces: 20-503-1)



## New Product Highlights, Continued

### Intercom System - P/N AHT63505-1

(Replaces: 20-215)

The Atec AHT63505-1 Intercom System allows for seamless communications between ground personnel, control room personnel and A/M37T-20 control cab personnel during off-wing testing. It also interfaces with the aircraft communications panel during on-wing testing.

This system allows for a safer testing environment by allowing everyone involved in the engine test to communicate. The AHT63505-1 Intercom System is a direct drop-in replacement for all intercom systems in all configurations of the A/M37T-20 Jet Engine Test Stand



## Engine Adapter Kits & Subassemblies. F100 Support

### AHT56126 (126 Kit)

Adapts A/M37T-20 & T-20A Fuel System to High-Flow Requirements for F100-229 or F110-129 Requirements

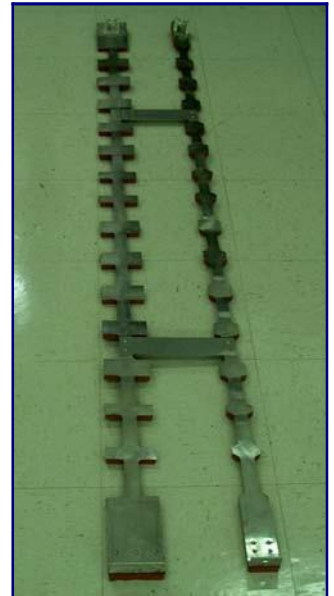
- É Pumps & Motors
- É Motor Starters
- É Circuit Breakers
- É Plumbing
- É Gaskets & Hoses



### AHT50079 (79 Kit) & AHT50080 (80 Kit)

Adapts A/M37T-6 & T-20, Test Stand for Running F100 Series Engines

- É Starter Jaws
- É Screens & Bellmouths
- É Probes
- É Nozzle Bands
- É Upgraded Engine Mounts
- É Starter Gearboxes
- É Anti-Chuck Assemblies
- É Fuel Couplings
- É Dress Gear & Cables



## Engine Adapter Kits & Subassemblies. F100 Support, Continued

### AHT56365

(Replaces: 103-2020-1)

Adapts AHT50079 Kit & A/M37T-20 for Testing F100-229 Engines

- É Mounts
- É Lug Adapters
- É Clevises



### AHT56017 (17 Kit) & AHT56064 (64 Kit)

17 Kit-Adapts AHT50079/AHT50080 & A/M37T-20 for F100-220/220E

64 Kit-Adapts AHT50079/AHT50080/AHT56017 & A/M37T-20 for F100-229

- É Rail Extensions (M37)
- É Bellmouth Extensions
- É Engine Control Panels
- É Engine Control Panel Fuses  
\*\*Fuses can be found at DSCC
- É Vibration Probes
- É Rail Clamps & Crossmembers
- É Ignition Test Boxes
- É Hot Start Relay Boxes
- É Cables
- É Dress Gear



# Engine Adapter Kits & Subassemblies. F110/F101/J85 Support

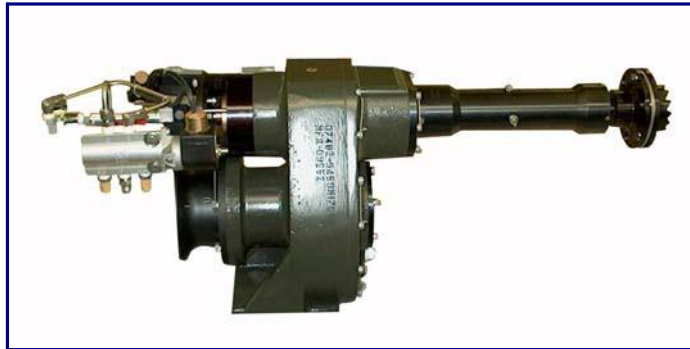
## 3C6015/3C3801

Adapts A/M37T-20 for Testing of F110-GE-100/129

## 3C3800

Adapts T-9 Test Cell for Testing of F110-GE-100/129

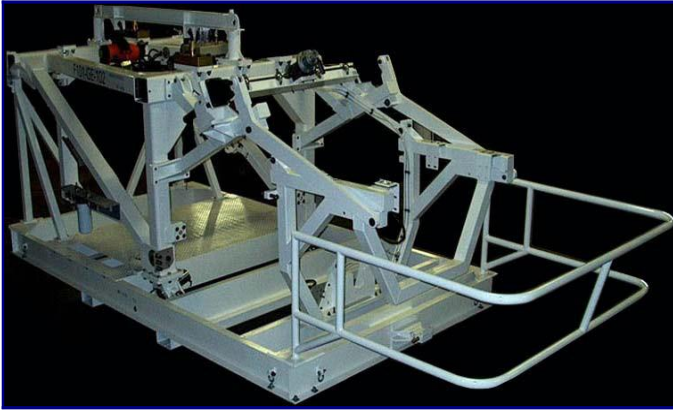
- É Bellmouths & Screens
- É Engine & Bellmouth Mounts
- É Starter Gearboxes
- É Engine Dress Gear
- É T-20 Instruments
- É Engine Preservation Systems
- É Throttle Systems
- É 1553 Computers & Monitors



If Its Engine Test Cell Related, Contact Us:  
Toll Free 1-877-514-2218 or visit [www.atec.com](http://www.atec.com)

# Engine Adapter Kits & Subassemblies. F110/F101/J85 Support, Continued

Engine Adapters - F101, F110, F404 & F414



**F101 Adapter**



**F110 Adapter**

3C3988/3C3627

T-9 Test Cell Engine Adapter for F101 Engine Testing



**F101 Adapter**

21C8501/8503/8504

A/M37T Test of F404



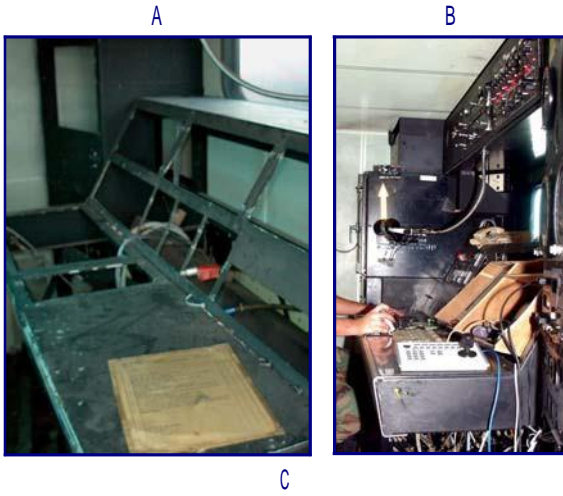
**F404 & F414 Adapter**

21C14500/4501/4504

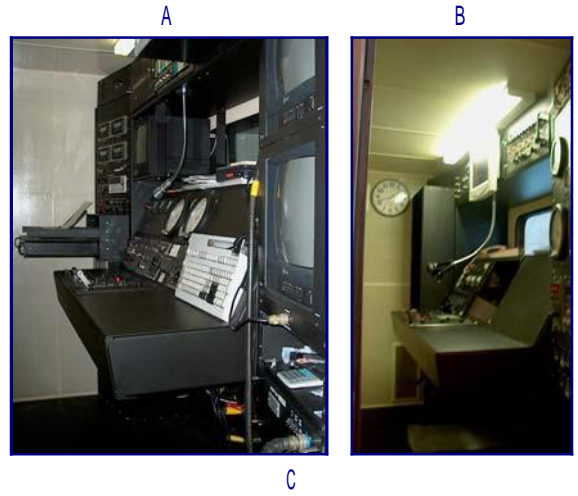
A/M37T Test of F414

# Atec Refurbishment Capabilities

Example Shown is an A/M37T-20B  
Before



Example Shown is an A/M37T-20B  
After



If Its Engine Test Cell Related, Contact Us:  
Toll Free 1-877-514-2218 or visit [www.atec.com](http://www.atec.com)

## Contact Information

Atec, Inc.  
12600 Executive Dr.  
Stafford, TX 77477-3604  
Cage Code #09552

Toll Free: 1-877-514-2218  
Government Sales - ext. 688  
Technical Support - ext. 671  
Fax: 281-240-2682  
Email: [sales@atec.com](mailto:sales@atec.com)  
Web: [www.atec.com](http://www.atec.com)

**Atec, Inc. Accepts IMPAC & Government Credit Cards**

