PMDG EXPRESS B1900D

Aircraft Operating Manual

REVISION 1.0

AIRCRAFT OPERATING MANUAL

This manual was compiled for use only with: *PMDG Express B1900D.* The information contained within this manual is derived from multiple sources, and is not subject to revision. This manual is not be used for training or assumed to provide operating procedures for use on any aircraft. The manual is for entertainment purposes as required by the simulator software.

Acknowledgement:

PMDG wishes to recognize **Jim Driscoll** for his generous consultation and advice during the development of this product. Without Jim's support this product might never have flown the distance between inception and completion.

Thank you, Jim!

The Precision Manuals Development Group Web Site can be found at:
http://www.precisionmanuals.com

Precision Manuals Development Group is an organization of aviation, aeronautical and software development professionals dedicated to the task of producing software for aviation enthusiasts.

PMDG products have gained worldwide recognition for the innovative use of new ideas to realistically portray the challenges of commercial aviation. PMDG simulations are designed for use by those interested to learn about commercial airliners and commercial airline operations.

The PMDG Express B1900D is the first product in the new PMDG Express product line. PMDG Express products are designed to expand the simulation experience by providing a realistic flight environment that is uncompromising in it's visual immersion and handling quality.

Designed to be attractive to flight simulator users who are interested in a less study-intensive simulation experience, PMDG Express products marry highly detailed visual models with realistic flight dynamics and a comprehensive cockpit environment without also requiring the user to study for an ATP exam.

Currently PMDG is developing additional technologies to enhance the simulation of commercial airline operations within Microsoft Flight Simulator. Please visit our website for more information on future release dates, products and purchases!

Our PMDG 737 product line will expand during early 2004 with the release of our PMDG 737-800/900 package bringing new cockpit displays, airliner options and unique capabilities to the PMDG 737 product line!

All of us at PMDG are grateful that you have purchased this product and we stand committed to support you in your enjoyment of this software. If you find yourself in need of support, please email us or visit our customer support forum for help. The PMDG staff is generally available to assist customers through these two venues.

Thank you again for your support of PMDG.

The Development Team
Precision Manuals Development Group
http://www.precisionmanuals.com

MASTER TABLE OF REVISIONS

PMDG strives for completeness and innovation in our products. On occasion we will issue free updates to our software, and we strongly encourage all customers to download and install these updates as they ensure the trouble-free operation of your software and add functionality that we may not have been able to offer in the initial release version of the product.

Note: This manual is being continually updated and expanded to cover additional topic areas and to add additional depth to existing aircraft functions. You can obtain the most current version of the manual free by visiting the PMDG Express B1900D Operators Information Center (Tech Support) at www.precisionmanuals.com

REVISION HISTORY

REVISION NUMBER	REVISION DESCRIPTION	ENTERED BY	DATE ENTERED
1.0	Manuals as originally issued	PMDG	07FEB04

Customer Support

PMDG is committed to providing strong support to our customers 'after-the-sale.' When you purchased this PMDG product, you also purchased the support and dedication of the entire team to provide you with the finest high quality flight simulation experience possible on a modern computer.

Occasionally it is you may find it necessary to obtain help in the installation, operation or maintenance of your PMDG product. PMDG provides a number of avenues for you to receive support when you need it!

PMDG Express B1900D Operator's Information Center: The PMDG Express B1900D Operator's Information Center (PMDG B1900D OIC) is a located in the Support section at www.precisionmanuals.com.

The PMDG Express B1900D OIC is a continually updated page that will provide users with current information on the operation and maintenance of your PMDG B1900D. If you find that you are having problems from installation to operation of the airplane, please visit the PMDG B1900D OIC and consult the FAQ sections contained there. When PMDG identifies a problem that is being experienced by many users, the information is posted into the FAQ in order to ensure that users are made aware of the causes and solutions for common problems.

Additionally, the PMDG B1900D OIC is your best source for easily ensuring that your PMDG Express B1900D is up to date with the latest updates for functionality.

If you have a problem with your airplane, start out at the PMDG B1900D OIC!

PMDG Customer Support Forum: PMDG supports a customer service forum that is hosted by AVSim as a courtesy to PMDG. (Thank you!) This forum is frequented by thousands of other PMDG customers and has become a welcome gathering place for experts on the operation and support of this sophisticated airplane! Additionally, all members of the PMDG team frequent the forum at different times to ensure that we are in tune with the experience our customers are having with our products!

The support forum is a great place to share flying tips/tricks/tales with other PMDG B1900D pilots.

PMDG Technical Support Operations by Email: PMDG's technical support duties in the customer support forum are shared by a number of PMDG team members, but email support is handled directly by PMDG's Manager of Technical and Customer Support Operations, as well as by PMDG's Executive Director. Most email messages are answered within 24 hours and in most cases the direct interaction with the PMDG technical support resolves nearly all customer problems. Problems related to downloads, payments, irresolvable errors or other items of a serious nature can be addressed directly to support@precisionmanuals.com.

Again, please note that while we strive to answer all email with 24hrs, both support representatives are professional airline employees who's schedules may be affected by flight schedules, inclement weather or other industry events so occasionally response times may take a bit longer.

Telephone Support: PMDG developers are located in five countries and spread across ten time zones. For this reason we are unable to provide telephone support under any circumstances.

Replacement of Lost Download Products: PMDG is unable to replace lost or user damaged CD media, however we can easily replace a product that was originally purchased as a download from our website. PMDG provides free product replacement for a period of one year from the date of original purchase, provided the customer can provide enough identifying information to help us locate the order within our records! Please write support@precisionmanuals.com and provide your name, approximate date of purchase, Confirmation ORDER ID (if possible!) and any other information that may help us identify you and your order. *DO NOT SEND YOUR CREDIT CARD NUMBER, NOR WILL ANYONE FROM PMDG EVER ASK YOU FOR YOUR CREDIT CARD NUMBER.*

After the first year of ownership, PMDG may, at it's own discretion require a nominal charge to cover the cost of the replacement download. The nominal charge will not exceed 25% of the original purchase price.

Development Team

About PMDG: This product was developed by a team of five PMDG members. Vin Scimone (Project Lead – B1900), Captain Robert. S. Randazzo ATP, Dr. Evangelos Vaos Phd, Bob Jones and Pete Sterling.

You can learn more about the PMDG team by visiting www.precisionmanuals.com and clicking the ABOUT tab.

Sounds: PMDG sounds packages are developed by SkySong Soundworks of Dayton, VA.

Important Notes:

PMDG has worked carefully to produce a realistic and enjoyable simulation of the B1900D aircraft within Microsoft Flight Simulator. For tips to further your enjoyment of the airplane model animation, please see the end of this manual.

In some areas PMDG has taken a different approach to modeling than is traditionally seen within Microsoft Flight Simulator:

Door/Stairway Lanyards: The lanyards linking the door/stairway to the aircraft have been modeled to behave like wire lanyards. They include hundreds of individual animation frames and pieces to represent the actual folding of the door lanyards as the door is closed.

Propeller Feather/Shutdown Position: It has become fashionable to allow users to control propeller blade angle within Flight Simulator by mapping the propellers to an animation control. While unique, this animation provides unrealistic results when used on turbine powered engines. PMDG has chosen to provide a more realistic animation control of the propeller blade angles by showing them in the feathered position when the engine is not rotating. The PT6 is a free turbine engine that uses oil pressure to control propeller blade angle. Oil pressure is available when the engine core is running. Thus, propeller blade angles cannot be controlled by cockpit control when the engines are shut down.

PMDG B1900D Specifications

Weights

Max Ramp	17,230 lb. (7,815 kg.)
Max Takeoff	17,120 lb. (7,766 kg.)
Max Landing	16,765 lb. (7,605 kg.)
Max Zero Fuel	15,165 lb. (6,879 kg.)
Basic Operating*	10,790 lb. (4,894 kg.)

Payload / Capacities

Max Payload	4,375 lb. (1,984 kg.)
Useful Load	6,440 lb. (2,921 kg.)
Max Fuel Capacity	4,458 lb. (2,022 kg.)
(6.7 lb./US gal.)	665 US gal.
Fuel w/max payload	2,065 lb. (937 kg.)

- *Includes typical options and two crew at 200lb each*

Loading

Seating (Crew + Pax)	2 + 19
Wing Loading	54.7 lb./sq. ft.
Power Loading	6.63 lb./SHP

External Dimensions

Length	57.8 ft. (17.62 m)
Height	15.5 ft. (4.72 m)
Span	57.9 ft. (17.64 m)

Engines

Manufacturer	2 P&WC
Model	PT6A-67D
Output	1,279 SHP
Inspection Interval	8,000 hrs

Cabin Dimensions

Length	25 ft 3 in. (7.69 m)
Height	5 ft 11 in. (1.80 m)
Width	4 ft 6 in. (1.37 m)

Airport Performance
Takeoff Field Length

Max. TO Wt., SL, ISA	3,813 ft. (1,162 m)
Max. TO Wt., 5,000 ft. elevation, 25°C	5,235 ft. (1,596 m)

Landing Distance

Max Landing Wt., SL, ISA	2,790 ft. (850 m)
Vapproach	117 kt

Climb Performance (Max Takeoff Weight)

Time to Climb / Altitude	16 min / FL 200
All-engine Climb Rate, flaps up	2,615 fpm (797 m/min)
Engine-out Rate, T/O flaps	650 fpm (198 m/min)
Engine-out Gradient, T/O flaps	314 ft/nm (96 m/km)

Ceilings

Certified	25,000 ft. (7,620 m)

All Engine Service ..... 33,000 ft. (10,058 m)
Engine-out Service ..... 17,200 ft. (5,243 m)

Cruise Performance
High Speed Cruise
Speed ..... 280 kt/322 mph (518 km/hr)
Fuel Flow..... 888 lb./hr. (403 kg./hr)
Altitude ..... FL 200
Long Range Cruise
Speed ..... 230 kt/264 mph (425 km/hr)
Fuel Flow..... 562 lb./hr. (255 kg./hr)
Altitude ..... FL 250

Maximum Range with Reserves
Maximum Payload with Available Fuel (4,375 lb. payload)
Range ..... 316 nm 585 km
Average Speed ..... 249 kt. 460 km/hr
Trip Fuel..... 1,056 lb. 479 kg.

Maximum Fuel with 19 Passenger Payload (3,800 lb. payload)
Range ..... 527 nm 975 km
Average Speed ..... 257 kt. 476 km/hr
Trip Fuel..... 1,636 lb. 742 kg.

Ferry (Zero payload)
Range ..... 1,245 nm 2,304 km
Average Speed ..... 274 kt. 507 km/hr
Trip Fuel..... 3,504 lb. 1,589 kg.

Example Mission: (19 passengers)
100 nm mission
Flight Time ..... 0 hr. 24 min
Trip Fuel..... 417 lb. 189 kg.
Flight Level ..... FL 150

300 nm mission
Flight Time ..... 1 hr. 10 min
Trip Fuel..... 1,015 lb. 460 kg.
Flight Level ..... FL 230

500 nm mission
Flight Time ..... 1 hr. 56 min
Trip Fuel..... 1,551 lb. 703 kg.
Flight Level ..... FL 250

PMDG B1900D Operating Procedures

Takeoff:
Flaps 17 (one notch)
Set Props FULL FORWARD 1700 RPM (CTRL-F4)
Bring power up to 100% Torque
Rotate at 105 KIAS (approx depends on weight)
Use pitch to maintain speed at the blue line on the airspeed indicator
At 500 feet AGL, retract flaps and continue acceleration

Climb:
At 500 feet AGL, turn Yaw Damp ON.
Set 96% Torque
Reduce propeller RPM to 1550 RPM. (Note: This is the max continuous limit.)
Maintain this thrust setting as closely as possible during the climb.
(Some users will find it easier to use F2 and F3 keys due to joystick insensitivity)

High Speed Cruise:
Adjust power until fuel flow is approximately 450lbs/hr
Resulting Speed will be approximately 280 Knots TRUE AIR SPEED.

Economy Speed Cruise:
Adjust power until fuel flow is approximately 280lbs/hr
Resulting Speed will be approximately 230 Knots TRUE AIR SPEED.

Descent:
Pitch down to commence descent, but do not initially reduce power.
Allow aircraft to accelerate to the barber pole or 247 KIAS (whichever is higher)
Once reaching maximum speed, adjust power to maintain descent as desired.

Visual Approach to Landing:
Downwind Leg: Select Flaps 17 and slow to 160 KIAS
Base Leg: Select Gear Down and Flaps 35 and Set Propellers to 1700 RPM
Final Approach: Slow to the Blue Line (appx. 123 KIAS) Yaw damp OFF.
Landing: Cross Threshold at 35ft and approximately Vref.

Instrument Approach to Landing:
Before intercepting final approach course: Select Flaps 17 and slow to 160 KIAS
At Final Approach Fix: Select Gear Down and Flaps 35 and Set Propellers to 1700 RPM
Above Decision Altitude: Slow to the Blue Line (appx. 123 KIAS) Yaw damp OFF.
Landing: Cross Threshold at 35ft and approximately Vref.

Landing:
Bring power to idle as main wheels touch down.
Lower nose gently until contact is made with the runway.
Select propellers to BETA (reverse) as necessary.
Brake as necessary to exit runway safely.

Turboprop Engine Management Notes:
The PT-6 engines are free turbine engines. Occasionally in order to make torque adjustments it is sometimes necessary to adjust the power levers more than intended, tuning to the desired setting after torque has begun changing.

It is necessary to manage *three* limitations when setting power on turboprop engines:
Maximum torque is 100%
Maximum RPM is 1700.
Maximum EGT is 715 C.

While making power adjustments, the normal technique is to bring the engine performance parameters as closely as possible to the maximum limitations. If, after setting power, one of the limitations is exceeded, adjust the engine power settings until none of the limitations are exceeded.

In order to gain the best performance, do not leave the engines at 100% RPM longer than necessary. This results in only a marginal gain in performance while dramatically increasing fuel consumption.

Once reaching cruise altitude set the desired engine performance by using the Fuel Flow as the primary means of power setting.

PMDG B1900D Performance

Weight Limitations

Maximum Ramp Weight	**17230 lbs**
Maximum Take-Off Weight	**17120 lbs**
Maximum Landing Weight	**16765 lbs**

Take Off/Landing Field Limitations at MTOW / MLW (Distance in feet)

Sea level, ISA+0	**3813 / 2790**
5000 ft asl, 25 C	**5235 / 2790**

Speed Reference

V_{MO} - Maximum Operating Speed	**247 KIAS**
M_{MO} - Maximum Operating Speed Mach	**.48 Mach**
Turbulent Air Penetration Speed	**170 KIAS**
V_{LE} – Maximum Gear Operating Speed	**180 KIAS**
V_{LO} – Maximum Gear Retraction Speed	**180 KIAS**
V_A - Maneuvering Speed	**184 KIAS**
V_{MC} - Minimum Control Speed	**96 KIAS**
V_S - Stall speed at MTOW (Clean)	**104 KIAS**
V_{SO} - Stall speed at MTOW (Landing Flaps)	**88 KIAS**
V_X – Two-engine Best Angle-of-Climb	**123 KIAS**
V_Y – Two-engine Best Rate of Climb	**135 KIAS**
Best Glide Speed both engines inoperative	**112 KIAS**

Maximum Flap Placard Speeds

Flaps	**KIAS**
Approach (17)	**198**
Landing (35)	**153**

Take-Off and Initial Climb-Out Speeds (KIAS) dry runway, ISA+0, round up to nearest gross weight

WEIGHT (lbs)	Flaps	V1	VR	V2	Venr
17120	UP	115	116	123	128
	17	103	106	112	128
16000	UP	110	111	120	(119)
	17	100	102	109	119
15000	UP	107	107	117	(116)
	17	100	100	107	116
14000	UP	104	104	114	114
	17	100	100	107	114
13000 and below	UP	103	103	113	113
	17	100	100	108	113

Cruise Climb Schedule (Altitude in feet, Speed in KIAS)

Altitude (feet asl)	KIAS
Sea level to 10000	**160**
10000 to 15000	**150**
15000 to 20000	**140**
20000 to 25000	**130**

V_{REF} - Landing Speeds (KIAS)

Weight (lbs)	Flaps UP	Flaps 35
16765	**133**	**118**
16000	**131**	**116**
15000	**128**	**113**
14000	**124**	**111**
13000	**121**	**108**
12000	**117**	**106**
11000	**115**	**104**

PMDG B1900D Tips / Notes

Animated Parts:
There are three animations included with this model that may be activated using keystrokes within Microsoft Flight Simulator:

Main Entry Door	(All Models)
Rear Cargo Door	(All Models)
Cockpit Door	(Virtual Cockpit / Cabin model only!)

Main Entry Door:
The main entry door is operated using the latent Microsoft Flight Simulator Key Assignment:

<SHIFT> + <E>

Rear Cargo Door:
The rear cargo door is operated using the latent Microsoft Flight Simulator Key Assignment:

<SHIFT> + <E> + <2>

Cockpit Door:

To add a new and interesting feature to the Virtual Cockpit / Virtual Cabin model, we installed a cockpit door that can be opened and closed using a key assignment combination normally reserved for animating the Concorde Nose in previous editions of Flight Simulator.

If you load the Virtual Cockpit / Virtual Cabin model *and* you are using a utility such as Active Camera to be able to walk into the cabin, you will notice that the cockpit door is closed!

To open the door, you simply need to assign it's motion commands to a set of keys on your keyboard as follows:

- Within MSFS, access the CONTROLS menu, then the ASSIGNMENTS menu.
- Assign a key to EXTEND CONCORDE NOSE and VISOR FULLY (I recommend CTRL+F10)
- Assign a key to RETRACT CONCORDE NOSE and VISOR FULLY (I recommend CTRL+F9)

  Now the door is mapped to your CTRL+F9 and CTRL+F10 keys so that you can operate it within MSFS!

It is important to note that we have included the virtual cabin models for those customers who enjoy using the Active Camera utility to be able to move about within the aircraft. Without Active Camera, it is generally not possible to leave the cockpit viewing position.

Reality XP Users:

PMDG Express is offering panel configuration files as a courtesy to our customers who own any combination of the following Reality-XP products:

-JetLine2 XP EFIS
-FlightLine 530 XP GPS
-WX500 Radar XP

These configuration files will enable users to employ any combination of these three Reality-XP products in the PMDG Express 1900D.

You can download these configuration files from the DOWNLOADS area at www.precisionmanuals.com

Note: Reality-XP avionics are sold separately by Reality-XP (www.reality-xp.com) These configuration files are provided as a courtesy to Reality-XP users to make integration simple. ***PMDG will not provide technical support for the installation/use of Reality-XP gauges.***