

JETLOG®
empowering 24x7 readiness™

Reviewers Guide

The JETLOG 24x7 PNE – Gopala™



Reviewer's Guide

Thank you for reviewing the pioneering *JETLOG 24x7 Power-Napping-Enabler (PNE)*. This guide provides you with general information about Power Napping and model features. For detailed user guidance, please download the Operation Manual at the product's page. For all other information and product loan agreements, please contact Joerg Heynlein at joerg@jetlog.com

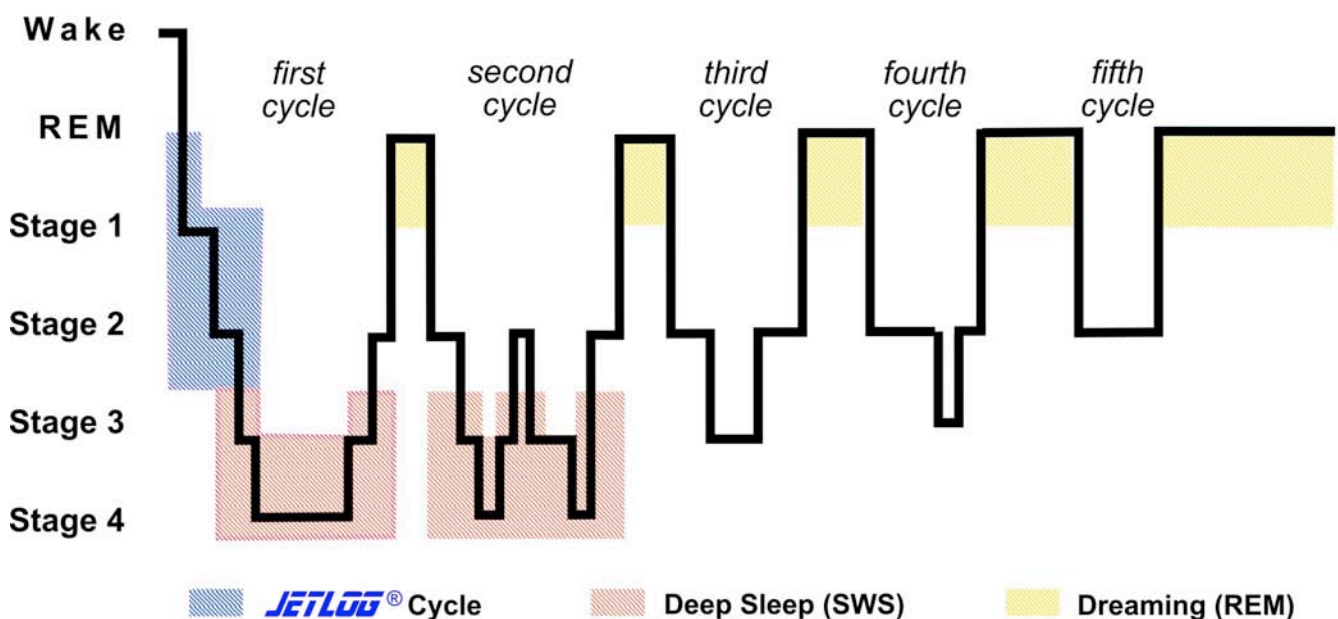
Summary

The *JETLOG 24x7 PNE* is the world's first portable physiologic wakeup for human-centered Strategic Napping providing *Maximum Fatigue Recovery in Minimum Time™*.

The PNE is suitable for anybody at any time – anywhere. JETLOG's bionic *NanoTouchTronic™* technology times Power Naps according to the most beneficial sleep stages. The PNE allows rapid fatigue countermeasure deployments following proven and reliable napping strategies, which are recommended by NASA. One single Power Nap provides with:

- 75% more Efficiency
- Fatigue Relief for up to Six Hours
- Improved Judgments
- Increased Alertness
- Reduced Mental Error Ratio
- Optimized Time Management

Sleep Stages



The key innovations and functions of the *JETLOG 24x7 PNE* include:

- Maximum Fatigue Recovery in Minimum Time™
- Embedded 40min. NASA Napping Policy + Sensoric Deep Sleep Prevention
- Bionic NanoTouchTronic™ Technology with NanoTech Fabric
- Vibration + Acoustic Alarm, Shock Resistant
- Ready for Embedded Corporate Identity

The *JETLOG 24x7 PNE* has a suggested retail price of €199.00

Napping Policy Background

Fatigue

The term "fatigue" defines the decreased capability of doing physical or mental work, or the subjective state in which one can no longer perform a task effectively. If fatigue increases, performance becomes more variable and decisions less reliable:

- Reduced speed of physical reaction time and speed of thought processes
- Increased tendency to make mental errors and flawed judgments
- Increased false responding, or responding when a stimulus isn't present
- Increased memory errors and lapses
- Reduced vigilance and motivation

NASA Nap

These significant damaging effects of fatigue prompted the US Congress in 1980 to request NASA's Ames Research Center to study fatigue thus leading to the creation of "The NASA Ames Fatigue/Jet Lag Program". In 1991, the name of the program was changed to the "Fatigue Countermeasures Program" in order to provide a greater emphasis on the development and evaluation of fatigue in general.

As a result of NASA Ames' Fatigue Countermeasure Program, during which pilots were provided with a 40-min., preplanned, in-flight nap opportunity during cruise, the resting pilots maintained almost consistent performance night and day, at the end of flights, and after multiple flight legs.

In addition to minimize the potential negative effects of napping the limitation to 40-min. was designed for transparent implementation into operational environments.

Negative Effects of Naps

The most significant negative effect of napping is Sleep Inertia. In a generic sense, it includes the grogginess, disorientation, sleepiness, headaches, and bad mood that accompany awakening out of SWS (Slow Wave Sleep - deep sleep) as well as the sweating and visual hallucinations from awakening out of intense dreaming (REM - Rapid Eye Movement). Sleep Inertia is associated with an initial performance decrement immediately upon awakening out of SWS or REM and may last until regular sleep cycles.

The severity of these effects is mainly related to the duration of SWS, intensity of REM and circadian time (internal body clock) of the sleep.

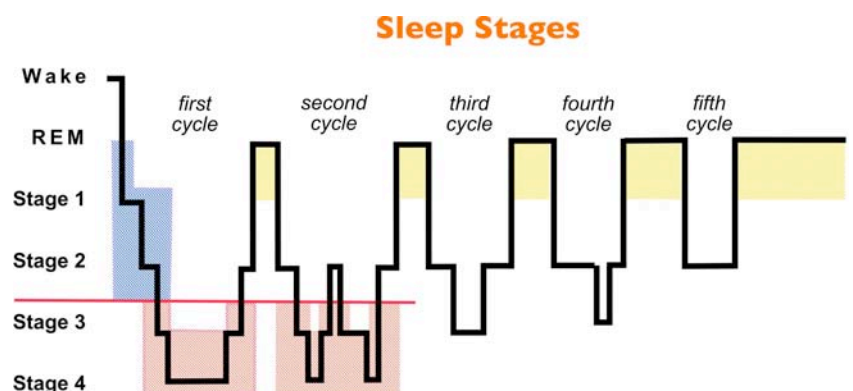
The occurrence of SWS and REM is related to the circadian rhythm. Any circadian disruption, which is caused by e.g., multiple time-zone crossing or irregular duty hours, results in an uncertainty when SWS and REM will occur, and therefore increases the risk of experiencing Sleep Inertia.

Since the "NASA-nap" is only a timed nap, NASA's operational validations resulted in peaks of up to 22% of pilots experiencing SWS.

Another negative consequence of a Power Nap is the effect on subsequent sleep episodes: While a nap will improve waking alertness and performance, it might increase subsequent sleep loss by disrupting later sleep periods if it is not properly timed to exclude SWS.

JETLOG Cycle

Deploying JETLOG's award-winning and internationally patented technology which prevents to enter deep sleep and REM, post nap alertness and performance increases by up to 75%, eliminating fatigue for an average of six hours with no negative post-nap effects to occur.



JETLOG 24x7 PNE Hard- and Software

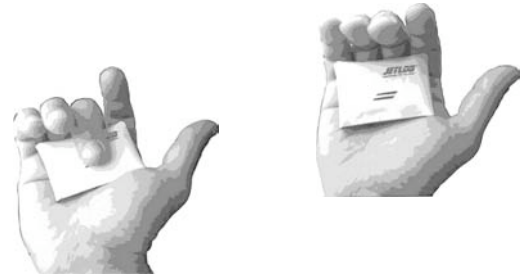
The Power-Napping-Enabler incorporates the following major hardware components:

- ATMEL® Microchip with picoPower™ technology
- NanoFabric
- Micro Vibration Alarm + Micro Buzzer

NanoFabric

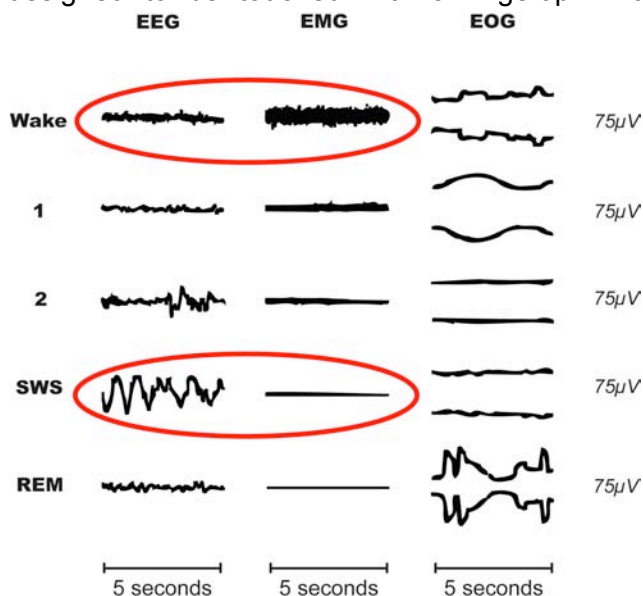
JETLOG's R&D succeeded in exclusively using nano-fabric for the sensor interface (*NanoTouchTronic™*) and bridged the fundamental gap between fabric- and microelectronic properties. The *JETLOG 24x7 PNE* is the world's first commercially available product of its kind with the following properties:

- Conductive Parachute Silk, PU at 500nm resolution
- Anti-Bacterial and Anti-Static
- Retention of Natural Softness (Silk)
- Extreme Mechanical- and Thermal Resistance
- Minimal EM Signature



NanoTouchTronic™

The *JETLOG 24x7 PNE* comes with bionic *NanoTouchTronic™* technology, which measures specific electric properties of the human body. While the complete backside of the PNE provides the surface ground electrode, the nano-fabric sensor on top of the PNE acts as a switch. It is designed to be touched with a fingertip. With continued touch, the Power-Napping-Enabler



calibrates automatically before initiating an alarm sequence when the fingertips disengage with the nano-fabric sensor area. After nod-off, this point in time corresponds to a significant drop in muscle tension and cerebrum shut down, i.e., to deep sleep (Slow Wave Sleep - SWS).

Embedded Software

The *JETLOG 24x7 PNE* is powering its ATMEL® Microchip with embedded software written in assembler code. In conjunction with ATMEL®'s picoPower™ technology, it is designed for maximum power savings and highly reliable operations as well as a transparent and easy deployment.

Bionic User Interface

The *JETLOG 24x7 PNE* operates fully automatically and incorporates bionic design reproducing the electric characteristics of the human body in conjunction with smart materials (stress memory) representing biological tissue properties of the hand. All it takes for *Maximum Fatigue Recovery in Minimum Time™* is to touch the sensor with a fingertip. Another finger-tip turns the default 40min. NASA-Nap timer off or cuts off the alarm sequence.

Customization

The *JETLOG 24x7 PNE* is ready to embed the customer's corporate identity. The topside of the PNE is ready for any color or printable motive such as a corporate name and logo.

Product Specifications

Type: Power-Napping-Enabler (PNE)
Model: Gopala™ NanoTouchTronic™
Function: Deep Sleep and REM prevention
Compliance: NASA Napping Policy
Origin: Made in Germany

Power: DC 3V Battery (CR2032 Lithium Cell)
Weight: about 15 g (0.53 oz) including Battery
Dimension: about 65W x 47D x 13H mm (2.56" x 1.85" x .51")

Power Characteristics

Off: about 0.1 µA
Nap: about 0.19 mA
Buzz: about 40.0 mA

Battery Life: under 1x daily use: minimum 2 Years (720 Cycles)
non-used: maximum 12 years
Operating Temp: -20°C to +50°C (-4°F to 122°F)
Ambient Humidity: maximum 80% RH
G-Specification: Shock Resistant

Certifications

FCC according to Part 15 Sec.109
CE EMC according to EN 61000-6-1:2001 and EN 61000-6-3:2001

Package Contents

JETLOG 24x7 Power-Napping-Enabler – Gopala™
Operation Manual
NASA Napping Policy
JETLOG Sticker

Warranty

USA only: Mechanical and General Finish Warranty: A Limited Lifetime Quality Warranty is provided on all mechanical parts and the finish to be free from manufacturing defects in materials and workmanship under normal use for the original purchaser

Rest of World: 30 years Limited Quality Warranty on materials and workmanship

Service and Battery Replacement

JETLOG Corporation
Service Center
Hinueberstr. 20
D-30175 Hanover
Germany

Battery + NanoTouchTronic™ replacement for €29.99

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