

NAVMAN

# *Introducing* NAVMAN



**A Leading Worldwide Supplier of GPS Solutions**

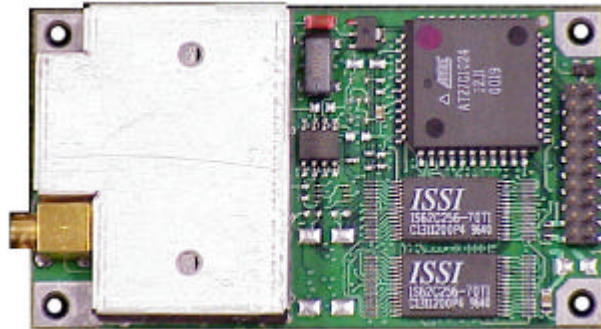
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V1.0

# NAVMAN OEM Standard Products

- **Jupiter 11** - GPS navigation module
- **Jupiter 12** - advanced GPS navigation module
- **Jupiter Pico** - miniature GPS navigation module
- **Jupiter-T** - GPS timing reference receiver
- **IVN Sensor** - GPS hardware solution for in-vehicle navigation
- **TeliNAV** - complete hardware solution for vehicle tracking
- **MDT** - automotive data terminal
- **DGPS** - GPS receiver with differential beacon receiver
- **GPS Antennas** - ruggedized antennas for industrial applications



# Jupiter 11



Twelve-channel GPS  
navigation receiver

- High accuracy (<5m, 95%)
- Best in class for urban tracking
- On-chip LNA (active or passive antenna)
- Specialized modules
  - Dead Reckoning
  - Hardware Accelerator
- High reliability
  - MTBF 5.3 million hours
- Rugged
  - exceeds SAE specs for shock and vibration

# Jupiter 11 Configurations

TU30-D400

**3.3 VDC**

Low power / battery operation

TU30-D410

**5.0 VDC**

Imbedded vehicle applications

TU30-D420

**3.3 VDC Dead Reckoning**

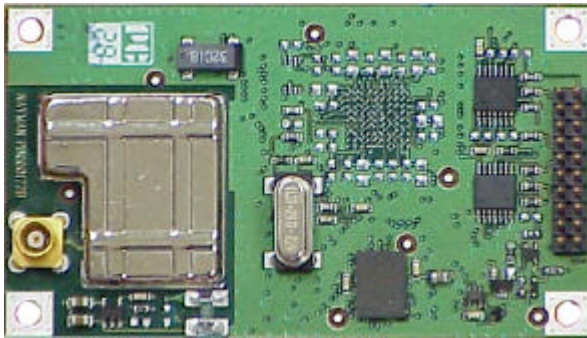
Sensor inputs – gyro, speed, reverse gear

TU30-D430

**3.3 VDC with Hardware Accelerator**

Fastest possible acquisition

# Jupiter 12 (4Q 02)



Advanced  
GPS navigation module

- Backward compatible with Jupiter 11
- Low power  
(85 mA, 0.5 uA keepalive)
- 3.3V/5V autosense
- Flash memory
- Improved jamming immunity
- RF1A BiCMOS RF front end
- Best in class for urban canyon tracking

# Jupiter 12 Configurations

TU35-D410-XXX

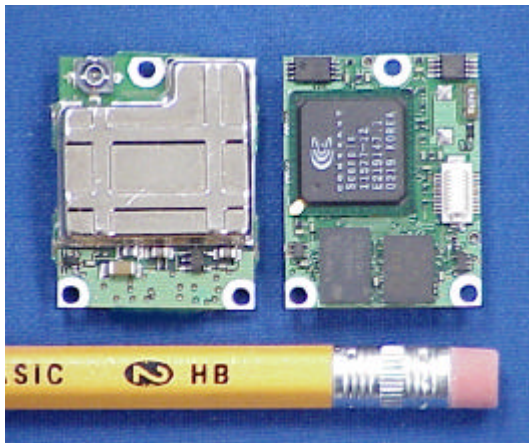
**Jupiter Standard 3.3V/5V**

TU35-D420-XXX

**Jupiter 3.3V/5V Dead Reckoning**  
Sensor inputs – gyro, speed, reverse gear

XXX designates RF connector type

# Jupiter Pico



Miniature GPS Receiver Module

- Backward compatible with Jupiter (HW/SW interface)
- Small footprint
  - 23.6 x 30.6 mm
- 3.3 VDC low power
  - 85 mA, 0.5 uA keepalive
- Improve jamming immunity
- Flash memory – 4 MB
- RF1A BiCMOS RF front end
- Best in class for urban canyon tracking

# Jupiter Pico Configurations

TU36-D100-XXX

**Jupiter Pico Standard**

TU36-D120-XXX

**Jupiter Pico DR**  
Dead Reckoning

TBD (4Q 02)

**Jupiter Pico T**  
Timing

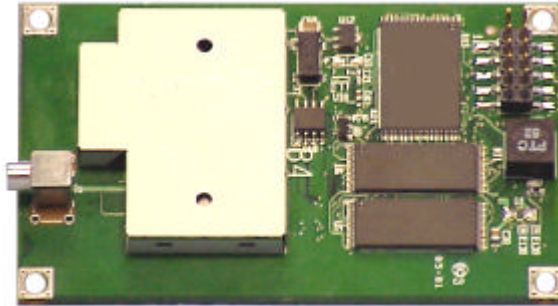
XXX designates RF connector type



# Jupiter DR (Dead Reckoning)

- Tightly-coupled DR integration with patented industry-leading algorithm
- Significantly more accurate city tracking
- Maintains navigation solution in tunnels & urban canyon
- Instant DR lock
- Fast reacquisition (<1 second)
- DR sensor inputs
  - Gyro
  - Wheel tick (typically from ABS)
  - Reverse gear (typically from backup light)
- Automatic calibration of sensor inputs with GPS

# Jupiter-T



Twelve-channel GPS  
timing module

- Optimized for precision GPS time alignment
  - Time maintained within 25 nsec, 1 sigma of GPS or UTC time (user selectable)
  - Coherent 1 PPS and 10 KHz
- Self-survey capability
- Robust T-RAIM (time-receiver autonomous integrity monitoring)
- 4 MB Flash memory.
- NAVMAN binary, NMEA and Motorola compatible message formats
- Backward compatible with other module formats

# Jupiter-T Configurations

TU60-D120-001

Jupiter-T with RA OSX and full RF shield for RF sensitive environments

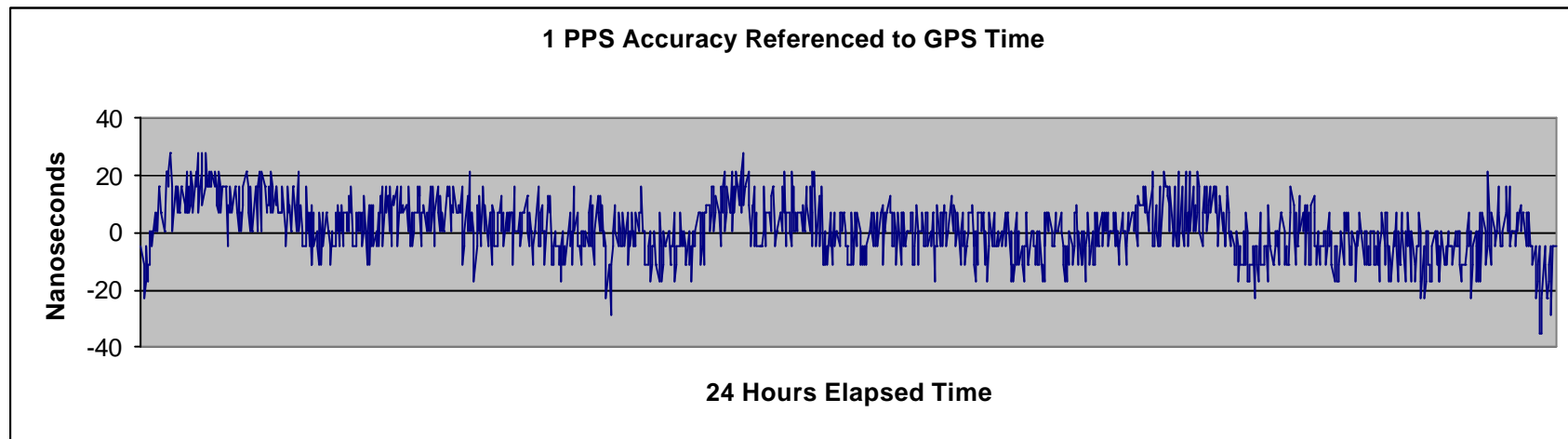
TU60-D120-031

Standard Jupiter-T with RA OSX

TU60-D120-041

Standard Jupiter-T with ST OSX

# Jupiter-T Timing Accuracy



Demonstrated 25 nsec accuracy over 24 hours referenced to a NIST GPS Time Measurement System and Cesium Standard

# Jupiter Development Kits



- Provides a test bed for
  - Application development
  - Performance baseline
- Includes
  - WinLabMon windows-based interface software
  - LabMon DOS-based interface software
    - Source code in C
  - Complete technical documentation
  - PC serial interface cable
  - Vehicle power cable
  - AC power supply
  - Antenna
  - Gyro (DR model only)

# Jupiter Development Kit Configurations

TU10-D007-051

Jupiter LP 3.3V

TU10-D007-061

Jupiter Standard 5V

TU10-D007-091

Jupiter 3.3V with H/A

TU10-D007-101

Jupiter 3.3V with D/R

TU10-D007-121

Jupiter-T 5V

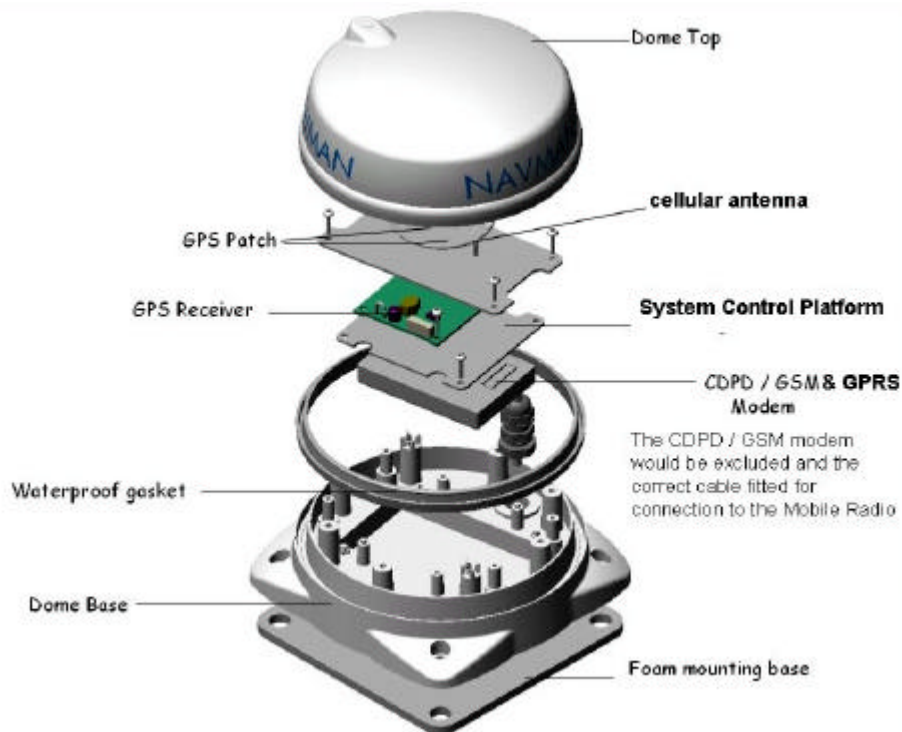
# IVN (In-Vehicle Navigation) Receiver with Antenna



Twelve-channel GPS receiver with patch antenna

- Complete GPS to PC / PDA navigation solution
  - Navigation messages are in the industry standard NMEA-0183 format
  - Compatible with many popular digital map programs
- USB or RS-232 serial interface cable options

# TeliNAV



- GPS & Wireless Transceiver
- Software Developers Kit available
- Serial interface for PDA or MDT-800
- Optional Battery-backed memory
- Expandable to support voice and external I/O
- IP Networks supported;  
GPRS, CDPD and CDMA 2000  
1xRTT



# TeliNAV Configurations

AA004400

CDPD

AA004401

GPRS/GSM 900 MHZ

TBD (1Q 03)

CDMA 2000 1xRTT

# Mobile Data Terminal



Rugged, high-resolution terminal  
for fleet applications

## MDT-800:

- Fully customizable
- Low cost, reliable and flexible mobile terminal for use in mobile fleet management applications
- Backlit Grayscale Graphics LCD
- Windows based Software Development Kit
- Multilingual support
- 2xRS232 or optional RS422 / RS486

# Enhanced Mobile Data Terminal

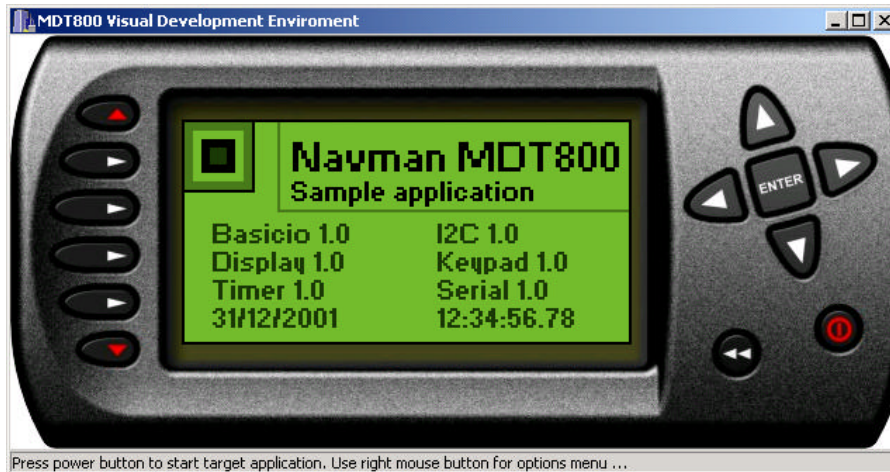


Mobile Data Terminal with expanded software capability

MDT-850 additional features include:

- Multilingual Support using DBCS Fonts (single-byte and double-byte)
- International PC AT Keyboard interface
- Programmable sub-processor
- Memory : 1Mb Flash / 10Kb internal memory / 256Kb battery backed SRAM / 32Kb EEPROM
- 12v / 24 v Automotive PSU

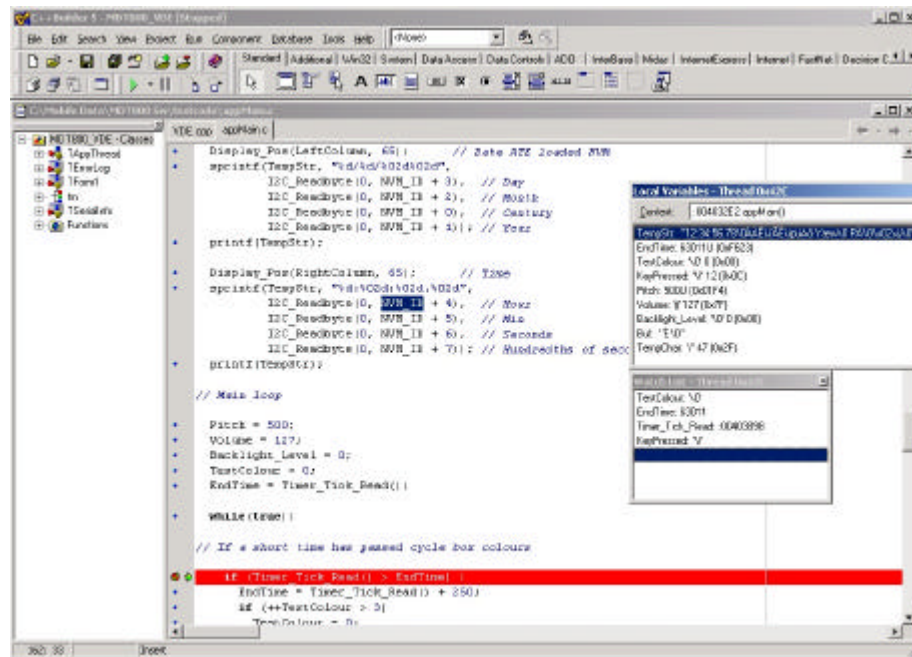
# MDT-800 Series & TeliNAV Software Developers Kit



Third party development platform  
for MDT / TeliNAV

- Hardware abstraction model to support I/O, RS-232, display, keypad and buzzer
- High level access to graphic display with shape and image display capabilities
- In-circuit programming utility for onboard flash memory, via the MDT800 serial port
- Multilingual Font support of multiple font types and sizes and text display functions
- Communications protocol libraries (TCP/IP, Map27, NMEA GPS etc.)
- Programmable Sub-processor that can manage time consuming functionality such as PC
- Full control of MDT peripherals (serial ports, keypad buzzer, backlight etc.)
- Keyboard support and external interfacing

# MDT / TeLiNAV SDK Cross Development Environment



- Supports:
  - Microsoft Visual C++
  - Borland C++
- Applications can be cross-compiled with the Mitsubishi M16 ANSI C Compiler to create the flash-upgrade binary image for the MDT