Revised: October 17, 1996

Motorola ONCORE™ Product Summary

Product Overview

Motorola produces several Global Positioning System (GPS) Receivers under the registered trade name **ONCORE**. These low cost, high performance 8 channel GPS core receivers are available in configurations optimized for tracking, positioning and precision timing applications. ONCORE™ GPS receivers are available in low quantities for application specific projects and in high volumes for OEM, embedded applications. Versions included in Motorola's current product line are summarized in table 1 below.

The VP ONCORE™ possesses the most robust command set and has been field proven in demanding ground, air and sea tracking and positioning systems. The VP ONCORE™ has also earned the reputation for being the price/performance champion in telecommunications and power industry timing applications. Two new, lower cost, 8 channel GPS receivers introduced during the Summer of 1996 offer even higher levels of performance. the new GT ONCORE™ contains firmware greatly enhancing operation in Automatic Vehicle Location (AVL) systems and the UT ONCORE™, has been optimized for applications requiring precise timing.

All 8-channel VP ONCORE™, GT ONCORE™ and UT ONCORE™ Series receivers are mechanically and electrically plug-compatible with previous 6-channel VP ONCORE™ units (identical dimensions, RF and data connectors). The software commands for 8 channel VP ONCORE™ units are generally backward compatible with the 6-channel VP ONCORE™ and the 8-channel VP ONCORE™ includes a "6-Channel" mode (see Tech-Note #495 for details). Firmware for the GT ONCORE™ and UT ONCORE™ is based on a subset of the VP ONCORE™ command set and enhancements have been made to optimize these new receivers for their intended AVL and timing applications. All Motorola receivers handle the GPS week rollover in 1999 properly.

Timing Applications

ONCORE™ GPS receivers have excelled against numerous other GPS Receivers in tests conducted by the U.S. Naval Observatory and third party developers for application in a broad range of timing products. Both the VP ONCORE™ and the UT ONCORE™ feature Timing Receiver Autonomous Integrity Monitoring (T-RAIM). This on-board, "timing quality indicator" - a first in the industry - provides users with a confidence reference for the quality of the 1PPS output signal (a minimum of 3 satellites need to be in view for this feature). Additional information and technical papers are available on request.

Table 1: A summary of Currently Available Motorola ONCORE™ GPS Receivers

Model	Description	GT/UT Common Features
GT ONCORE™	8 channel receiver optimized for AVL and general tracking and positioning applications. Backward compatibility with VP ONCORE™ electrically and mechanically (same size and connectors). Uses a sub-set of the VP ONCORE™ command set.	• Fast hot & cold start TTFF • Low power (0.9 W), 5VDC • Works to -40 deg C • Excellent performance around foliage • Antenna sense circuit • TTL interface • Small size and weight • 50 ns accuracy for UT (Position Hold Mode)
UT ONCORE™	8 channel receiver optimized for precision timing in telecommunications, metrology and range applications. Includes industry proven T-RAIM. Same backward compatibility as listed for GT ONCORE™.	
VP ONCORE™	8 channel unit with options for Carrier Phase & 1pps. Ideal for low cost base stations and mobile units requiring full NMEA, RTCM-104 or a robust Binary command set. 1PPS option includes T-RAIM.	**VP ONCORE™ Features** • 5VDC, 1.1 W, TTL • Robust command set • Low Carrier Phase noise

For configuration assistance, order placement and technical support call:

SYNERGY SYSTEMS, LLC
Working together for better results
P.O. Box 262250 • San Diego, CA 92196
Phone: (619) 566-0666 • Fax: (619) 566-0768
Internet E-Mail: synergy@compuvar.com

ONCORE™ CONFIGURATION MATRIX

Motorola ONCORE™

Miniature, Board Level, OEM GPS Receivers

February 27, 1997

Standard Production Configurations

	DGPS INPUT	1PPS	CARRIER PHASE	RTC (CLOCK)	BATT B/U	COAX CONN	OUTPUT MESSAGE
GT ONCORE™ (AVL/Tracking)							
R1121N1114	Binary	1MS		X		RA/OSX	BIN/ASCII
R1221N1114	Binary	1MS		X	X	RA/OSX	BIN/ASCII
R1121N114x	Binary	1MS		X		RA/SMB	BIN/ASCII
UT ONCORE™ (Precision Timing)							
R1121A111x		<50ns		X		RA/OSX	Binary
R1121A115x		<50ns		X		ST/OSX	Binary
R1221A111x		<50ns		X	X	RA/OSX	Binary
VP ONCORE™ (All Apps)							
B3121B111x	BIN/RTCM			X		RA/OSX	BIN/NMEA
B3221B111x	BIN/RTCM			X	X	RA/OSX	BIN/NMEA
B3121P111x	BIN/RTCM	<50ns		X		RA/OSX	BIN/NMEA
B4121P115x	BIN/RTCM	<50ns		X		ST/OSX	BIN/NMEA
B3121Z111x	BIN/RTCM	<50ns	X	X		RA/OSX	BIN/NMEA
B3221Z111x	BIN/RTCM	<50ns	X	X	X	RA/OSX	BIN/NMEA

Note: The Basic ONCORE,™ XT ONCORE™ and all 6 channel GPS receivers were phased out late last year to make way for the new GT ONCORE™ and UT ONCORE™ units. Synergy Systems, LLC now provides a plug - compatible replacement for the old XT ONCORE.™ The new XTS/II may be powered by any of the Motorola ONCORE™ receivers to suit specific applications.

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Internet E-Mail: synergy@compuvar.com