



**CUBIC**  
TRANSPORTATION SYSTEMS, INC.  
*A member of the Cubic Corporation family of companies*

# **USER MANUAL**

for the

**Cubic Transportation Systems, Inc.**

**Hand Held Unit**

**UM0001-3  
Revision A.00  
September 16, 2002**

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## Trademarks

Casio<sup>®</sup> is a registered trademark of Casio Computer Co., Ltd.

Cassiopeia<sup>™</sup> is a trademark of Casio Computer Co., Ltd.

**GO CARD<sup>®</sup>** is a registered trademark of Cubic Transportation Systems, Inc.

Tri-Reader<sup>™</sup> is a trademark of Cubic Transportation Systems, Inc.

## CHAPTER 1    **Hand Held Unit**

### **1.1    Introduction**

The HHU consists of an off-the-shelf Casio® Industrial Cassiopeia™ Personal Digital Assistant (PDA) and a CTS-designed peripheral called the Micro Tri-Reader™ (μTR) for reading Contactless Smart Cards (CSCs). The μTR resides in the CompactFlash (CF) slot of the Cassiopeia. The HHU is capable of securely reading and writing to ISO 14443 Type A, ISO 14443 Type B (with appropriate software), and **GO CARD**® CSCs. It can disable cards that are negative listed, resolve incomplete trips, and adjust tickets on CSCs as needed. It is capable of carrying full-fare tables and validating and issuing all ticket types. When combined with a belt printer, the HHU can be used as a Portable Ticket Issuing Device.

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## CHAPTER 2 User Interface

**Figure 1** illustrates the user interfaces of the Cassiopeia base unit without the  $\mu$ TR installed.



**Figure 1. Cassiopeia User Interface**

Valid/invalid card reads will be signaled by one of the tri-color (red, green, orange) lamp indicators. Red will signal an invalid read. Green will signal a valid read. Audio tones will also signal a valid or invalid card read.

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## CHAPTER 3 Enclosure

### 3.1 Case

The main body of the HHU is the Casio Cassiopeia (see **Figure 2**) PDA. The external CF Slot will be populated by a  $\mu$ TR CF Card that will be protected by a cover. The Cassiopeia can be held comfortably in one hand and the  $\mu$ TR cover will face the passenger with an easily recognizable target area.



Figure 2. HHU (Cassiopeia + Micro Tri-Reader)

## 3.2 Micro Tri-Reader

The  $\mu$ TR is a low-power, compact device that can securely read and write to ISO 14443 Type A, ISO 14443 Type B, and **GO CARD** CSCs. It enables secure CSC processing in portable Hand Held Devices.

### 3.2.1 Host Interface

The physical connector for interfacing to the host system conforms to the CF PC Card Standard.

## 3.3 Security Access Module

The Active Antenna Board has a slot to accommodate an optional ISO 7816 Security Access Module (SAM).

## 3.4 Casio Cassiopeia Description

The Casio Cassiopeia supports the HHU transit application. It can store and process fare tables, fare rules, negative lists, and transaction data. The Cassiopeia makes read and write requests to the  $\mu$ TR. The  $\mu$ TR acts as the channel by which secure communication takes place between the transit application and the CSC.

### 3.4.1 Operating System

The Cassiopeia uses the Windows CE Version 3.0 Pocket PC operating system.

### 3.4.2 CF Expansion Slot

A second internal CF slot is available for memory expansion or addition of peripherals such as a radio modem. A radio modem can be used to communicate with other equipment such as a printer that has the same wireless communication capability.

### **3.4.3 Data Upload/Download**

The Cassiopeia communicates to a central system for the uploading or downloading of data via a charging and communications cradle. Communication between the unit and the cradle is via an IrDA interface.

### **3.4.4 Display**

A 3.8-inch monochrome liquid crystal display (LCD) with touch panel capability is used. The resolution of the display is  $240 \times 320$ . The display uses FSTN technology and employs a light emitting diode (LED) backlight.

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## **CHAPTER 4    Physical Characteristics**

### **4.1        Dimensions**

The physical dimensions of the HHU are 85 mm (3.40 inches) in width, 200 mm (7.87 inches) in length and 38 mm (1.50 inches) in depth.

### **4.2        Weight**

The HHU is <415 grams (0.915 lbs), including a long-life battery.

### **4.3        Read Range**

The card read range from the center of the target to the center of the CSC is 1 cm.

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## **CHAPTER 5    Notices**

### **5.1.1    Federal Communications Commission Notices**

The following Federal Communications Commission (FCC) notices apply:

1.     The user is cautioned that changes or modifications to the Tr-Reader that are not expressly approved by CTS could void the user's authority to operate this equipment.
2.     NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense."

### **5.1.2    Industry Canada Notices**

The following Industry Canada notices apply:

1.     This Class A digital apparatus complies with Canadian ICES-003.
2.     Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.
3.     Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device."

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