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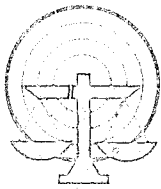
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# Technical Bulletin

featuring emerging technologies in criminal justice information management

Number 1

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## Hand-held Ticket-issuing Computers

By David J. Roberts  
and Kelly J. Peters, SEARCH

Rapid advances in micro-computer technology have enabled manufacturers to develop increasingly powerful and portable tools for law enforcement officers. Mobile digital terminals, laptop computers and the rapidly expanding market of notebook computers demonstrate the extent to which automated information management is moving from the police station to the patrol car.

A relatively new technology that police departments throughout the nation are adopting in increasing numbers is the hand-held computer. Used principally in parking enforcement, the hand-held units enable officers to issue computer-generated citations and simultaneously check the vehicle for outstanding (unpaid) tickets. The tickets issued by the systems are weather-resistant and tear-proof. The units themselves are rugged, weather-resistant and designed for use outdoors. These lightweight, battery-driven systems contain enough memory to hold as many as 40,000 records, such as records on scofflaws (violators with three or more outstanding citations) or stolen/wanted vehicles. The officer is prompted for all

### Bureau of Justice Assistance, SEARCH Explore New Technologies

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The *Bulletins* will identify, describe and assess new and emerging technologies that have existing or potential application in criminal justice information management. They will alert practitioners to the existence of technologies which can benefit their management of information.

We hope you find this publication of value. Please feel free to contact SEARCH, The National Consortium for Justice Information and Statistics, to suggest technologies future *Bulletins* should address.

information necessary for ticket issuance (that is, type of vehicle, license number, car make, etc.). The units automatically time- and date-stamp each ticket issued and serialize the citations, thereby providing a record of the officer's daily activity for later management analysis. The units can also be operated in search mode, enabling the officer to check vehicle tags without issuing citations.

At the end of each shift, the

unit is returned to the station, where it is plugged into the main receiving unit which downloads the data to a PC, recharges the unit's battery and updates the scofflaw and "hot sheet" list in preparation for the next day's work. By downloading the data at the end of each shift, managers receive statistical and administrative reports at the end of the day and the city's data processing center is able to post receivables/collections on a daily basis. The

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## featuring emerging technologies...

systems have the potential of increasing the city's revenues by reducing the number of tickets lost by illegibility, increasing the number of tickets issued by officers and improving the apprehension of scofflaws.

The configuration of the units varies by vendor. Some are single, self-contained units with the printer built in that weigh a mere two pounds. Others feature a separate printer and magnetic card readers. In addition to parking and traffic enforcement, the units can also be used for field interviews, code enforcement, utility meter reading and a host of other non-law enforcement functions. Future applications of this promising technology

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may include expanding the range of databases the systems hold (for example, wanted persons, drivers with suspended licenses, etc.) and incident reporting. Hand-held units also have applications in the issuance of moving violations. Manufacturers have incorporated a magnetic stripe

reader into the units to enable direct entry of data from the new generation of driver's licenses. The California Highway Patrol has recently concluded pilot-testing the hand-held units in Ventura County, California, and will be issuing a final report in March. □

## Operational Experiences

With such benefits as dramatically higher revenue collections for unpaid tickets, increased rate of citation issuance, and the near-elimination of illegible tickets due to sloppy handwriting, law enforcement agencies surveyed throughout the United States are reporting positive operational experiences with their automated ticket/citation writing systems. While some agencies have run into slight technical problems with their systems, the general conclusion is that the benefits realized from these systems far outweigh any problems agencies have encountered.

The most frequently noted benefits of the automated ticket/citation systems are the dramatic increases in both collections for unpaid tickets and the rate of citation issuance.

### • Higher Ticket Collections

Many law enforcement agencies found that the automated systems' accurate and timely tracking of automobiles with outstanding tickets contributed to an increase in revenue collections for those unpaid tickets. Before purchasing its system, the Laguna Beach (California) Police Department had a 40 percent

collection rate for outstanding tickets. After it began using the automated ticket system, the collection rate zoomed to 90 percent — a 125 percent increase.

In the first month of using its automated system, the Ann Arbor (Michigan) Police Department also saw a 125 percent increase in the number of outstanding tickets it collected, compared to the same month a year earlier, when the manual ticket system was still in use. In August 1990, for example, 74 cars were impounded, for a total revenue income of \$13,830. One year later, after Ann Arbor purchased its ticket-writing system, 143 vehicles were impounded and \$30,089 collected — a total increase of 69 vehicles and approximately \$16,000. During August to October 1991, the department increased its ticket revenue over the same three months in 1990 by \$44,949. "The system, which cost us \$30,000, paid for itself in the first three months of operation," said Jim Stein, Assistant Parking Manager in Charge of Enforcement for the Police Department's Parking Enforcement Division.

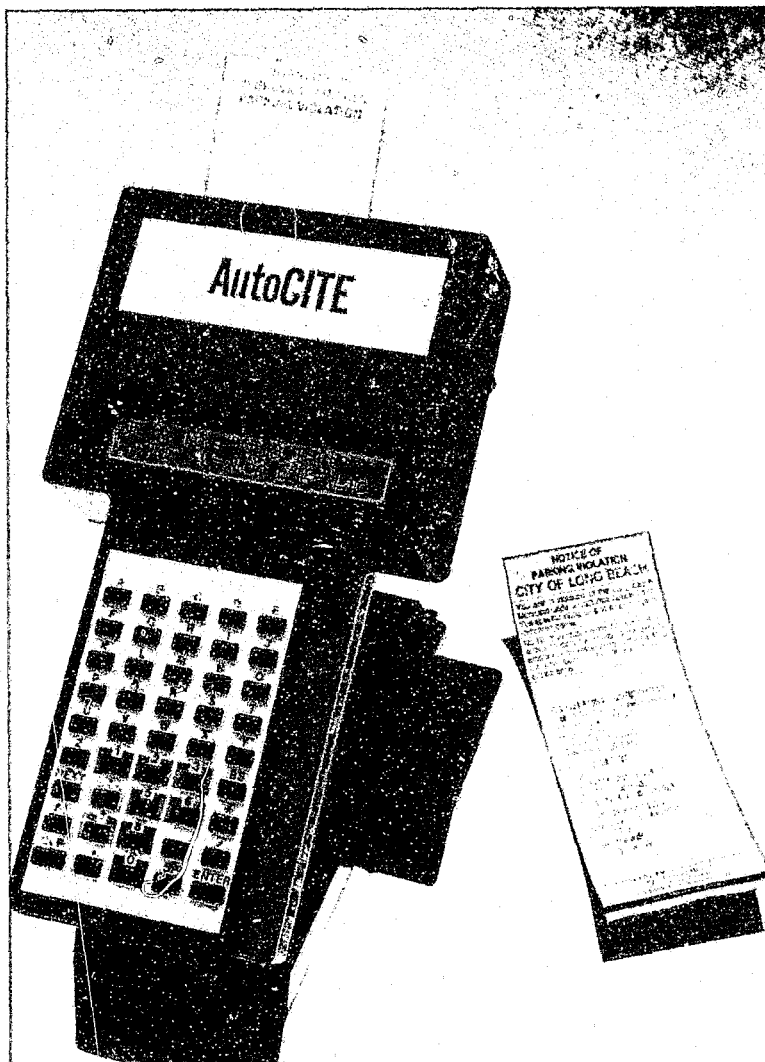
The University of Utah Traffic Enforcement Division

also reported a growth in ticket fine collections; this was attributed to an increase in the number of cars being impounded for outstanding tickets. The impound rate jumped from two to three cars per week to 10-15 cars per week following the division's implementation of an automated system. Finally, the City of Reading (Pennsylvania) Traffic Enforcement Department reported that the number of cars it "booted" for outstanding citations increased dramatically since the department implemented its automated citation system. ("Booting" vehicles refers to attaching a device on the vehicle which prevents it from being driven.)

- **Higher Ticket Issuance**

Automated "hot sheets" and pre-coded violation functions stored in the hand-held units contribute to the increased number of tickets and citations officers are able to issue. These functions save officers a great deal of time that normally would be spent manually hand-searching through pages of information. "With a touch of a few keys," said Sergeant Henry Marchman of the Palm Beach (Florida) Police Department, "the officers quickly have the information at their fingertips." For example, after the Laguna Beach Police Department purchased an automated citation system, the department noted a 30 percent increase in the number of tickets issued.

At the University of Kentucky Traffic Enforcement Division, Systems Operator Ruby Webb points out that a default function in the hand-held units allows an officer to write several tickets for the



**The AutoCITE™ Computer**

same violation without having to re-key the information each time a new ticket is written, thus saving time and eliminating errors. The California Highway Patrol (CHP), which is testing an automated system for moving violations in Ventura County, has installed pre-coded violations into the hand-held computer so that officers do not have to memorize the violation numbers and the corresponding descriptions.

- **Eliminating Illegibility**

The automated systems have also been successful in reducing the number of tickets lost and fines that have gone uncollected due to illegible, handwritten citations. Many departments have reported that the number of illegible tickets has been greatly reduced with the automated systems. In addition, the pre-coded violation function decreases the chance of human errors when

entering violations. Many departments warn, however, that there are still mistakes present in the citations due to typing errors.

Another innovation that can potentially reduce human error and the number of illegible tickets is the system's ability to read magnetically-stripped drivers' licenses. The CHP's automated citation system includes a magnetic-stripe reader for the new drivers' licenses that are being issued by the California Department of Motor Vehicles. The mag-stripe reader enters all of the personal information contained on the license and greatly reduces the amount of information that the officer must key in, thereby reducing error and increasing the number of violations officers can issue.

#### • Revenue Enhancements

Most agencies noted that indirect revenue savings can be realized with the automated ticket/citation systems. Once or twice a day, each department plugs the hand-held units into a downloader that transfers all the ticket and citation information to a PC while recharging the unit's batteries. With the automated transfer of this information to the department's databases, the demands on data entry and clerical personnel are significantly reduced, thus allowing the departments to downsize or divert those resources elsewhere. At the University of Utah, for instance, where 250-300 tickets are issued per day, it takes 15 minutes to download the information from 17 hand-held units to the main computer system.

Courts that receive the automated information from

the enforcement agencies experience some indirect revenue enhancements as well. In Ventura County, California, the courts are automated and can receive the CHP citation information via computer each day. The court can collect ticket fines more expeditiously than the normal waiting period of five to seven days it takes to receive a hard copy of the ticket.

Some law enforcement agencies using the systems believe computer-generated tickets and citations are paid faster than those written by hand. "There seems to be a psychological reaction when people see the computerized ticket — they know that they are being tracked by a computer system and seem to pay their fines more quickly," said a systems operator at the University of Nebraska.

#### • Complaints

Complaints regarding the automated systems most often occurred in relation to the two-part ticket-writing device and printer. Some systems are self-contained, with the computer and printer in one hand-held unit, such as the AutoCITE™ and Cardinal systems. Other systems consist of two separate devices, a hand-held unit and a printer, such as those manufactured by Radix® and Cardinal. (Cardinal manufactures both a single unit and a two-part device.) The most common complaint was the heavy weight of the two-part system, which includes the hand-held unit and a printer that is carried over the shoulder. However, most officials added that once officers had become acclimated to the system, they agreed that

the benefits far outweighed the initial awkwardness of the system. Systems Operator Ruby Webb said officers at the University of Kentucky were pleased when they realized the system would replace their ticket book, hot sheet and violation list.

Cable hook-ups have reportedly presented a problem with the two-part system as well. Some departments found that the cables that link the hand-held unit to the downloader, which transfers information from the units to a PC, were initially prone to breakage. Several departments noted the breakage problem occurred due to the cords' "phonecord"-style design. Those cords have since been updated and replaced with straight cords that appear to have corrected the problem.

Other isolated complaints were also expressed. During dry times of the year, the Albuquerque (New Mexico) Police Department reported trouble with the hand-held units going down due to static electricity interference. Similarly in Utah, when the weather turned very cold (below 30 degrees) the printer jammed more often. Some complained about the rolls of paper the citations are printed on, which, if not rolled evenly, can be difficult to feed into the computer.

Overall, the departments surveyed were pleased with their systems. Several indicated that they had plans to purchase more units. Many departments also commented on the quality of the technical support and swift attention they received from the manufacturers. □

**A Computer-Generated  
Moving Violation in the  
California Highway Patrol  
Test of Hand-held Units.**

## Vendors of Hand-held Computers

There are numerous vendors of hand-held computers that have application to law enforcement and other justice agencies. The following is a brief listing of vendors who were contacted in the course of researching this report.

- AutoCITE™  
Enforcement Technology, Inc.  
Corporate Offices  
P.O. Box 4726  
Irvine, California 92716-4726  
(800) 654-ETEC
- TicketMaster™  
Radix Corporation  
4855 Wiley Post Way  
Salt Lake City, Utah 84116  
(800) 367-9256
- Cardinal Tracking, Inc.  
3205 Justin Road  
Lewisville, Texas 75028  
(800) 285-3833

*This report was written by David J. Roberts, Deputy Director, and Kelly J. Peters, Administrative Assistant, both of SEARCH. Points of view or opinions are those of the authors and do not necessarily represent those of SEARCH or the SEARCH Membership Group.*

CALIFORNIA HIGHWAY PATROL				<input type="checkbox"/> MISDEMEANOR	
NOTICE TO APPEAR				<input type="checkbox"/> TRAFFIC <input type="checkbox"/> NONTRAFFIC	
DATE: 09/16/91	TIME 02:15 PM	DAY OF THE WEEK MONDAY	TICKET NO. 500000 *DUPLICATE*		
NAME DAVID JOSEPH MORRISON					
MAILING ADDRESS 1234 SO. WESLEY DR.		CITY VENTURA	ST CA	ZIP 93009	
DRIVERS LICENSE NO. 5233844C		ST. CA	BIRTH DATE 04/12/55		
SEX M	HAIR BRN	EYES BRN	HEIGHT 5'05"	WEIGHT 145	RACE CAUC
VEH TYPE 0100   VEH YEAR 88   MAKE BMW   CLR RD   BODY STYLE 2DR					
VEH LIC 2WDS885   REG EXP 11/91   ST. CA					
REGISTERED OWNER OR LESSEE SAME					
MAILING ADDRESS OF OWNER OR LESSEE SAME					
FINAN RESPON: Y STATE FARMH 12-DI33-008A-Q   [ ] BOOKING REQ					
C40610BVC> SEE REVERSE   VIOLATIONCS>   CHP/DOJ/PUC/ICC					
I N I CVC 2235> EXCEEDING POSTED SPEED LIMIT					
I N I CVC 24003 UNLAWFUL LIGHTS GREEN LIGHTS ON FRONT OF VEHICLE.					
I N I CVC 12951CA> NO DRIVER'S LICENSE IN POSSESSION					
SPEED APPROX:PF/MAX VEH LIM  SAFE   AREA   BEAT   A-I   SPECIAL					
88   55   55   55   765   123   055					
VIOLATION LOCATION: Radl. offices in Salt Lake City, UT					
[ ] VIOLATIONCS> NOT COMMITTED IN MY PRESENCE, DECLARED ON INFORMATION AND BELIEF.					
I DECLARE UNDER PENALTY OF PERJURY UNDER THE LAWS OF THE STATE OF CALIFORNIA THAT THE FOREGOING IS TRUE AND CORRECT, EXECUTED ON 09/16/91 AT (PLACE) VENTURA CALIF					
CHP OFFICER: HORROCKS		ID: 30055	VAC: 04/01/91 - 04/15/91		
OTHER OFFICER:		ID:	AREA:		
WITHOUT ADMITTING GUILT, I PROMISE TO APPEAR AT THE TIME AND PLACE DESIGNATED BELOW.					
SIGNATURE					TICKET NO. 500000
<input checked="" type="checkbox"/> MUNICIPAL COURT <input type="checkbox"/> JUSTICE COURT <input type="checkbox"/> JUVENILE <input type="checkbox"/> TO BE NOTIFIED					
ADDRESS					
800 S VICTORIA AVE RM 118 VENTURA CA 93009					
ON THE 10/05/91 APPEAR AT 12:00 PM					
OR YOU MAY APPEAR AT PM ON					
TO ANSWER CHARGES OF VIOLATIONS DESCRIBED ABOVE					





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