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Dear members,

I have to start off with a little presidential business by reminding those  
unpaid members that this is the last issue of Keynotes that you will  
receive until dues are paid. Who would want to miss out on the exciting  
and informative articles that grace this magazine each month? I am  
pleased that renewals remain at the levels that they were at this time last  
year. That is a positive reflection that the majority of the membership  
feel that the legislative assessment was a much-needed and positive  
action. I am optimistic about what the legislative funds will help us

accomplish. The equivalent of contributing the cost of two extra common keys a month can bene-  
fit our membership greatly. If any of us could single-handedly undertake something as huge and  
far-reaching as ALOA's legislative efforts, there would be no need for this vital and difficult effort.  
Thanks for teaming up with us - I assure you that, in the end, your decision to support ALOA will  
pay you back several times over.

I must next make a plug for the two most important shows for our collective organization, and for locksmiths and safemen in general. For you stragglers, there is still time to get in on the action at SAFETECH 2004 in Reno, NV, at the end of this month. But hurry, because you don't want to miss this event. I am planning on sitting for the Safeman's PRP to test my knowledge in a field that I think I am pretty good at. Well see what I really know.

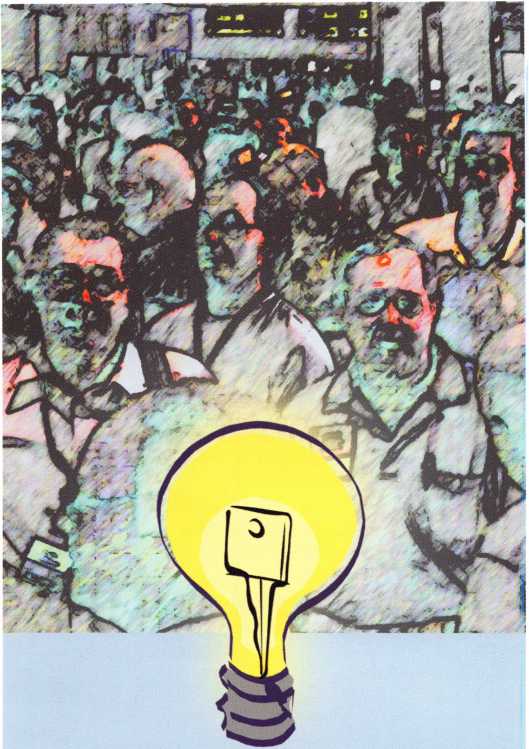
This year, the March issue is dedicated to access control. This is an area that we are constantly having to battle for, in order to ensure our right to perform this work. I am not an access control expert, but I have realized how important it is to offer this service and employ people who are experts. Many locksmiths are hesitant to get into this field (as I certainly would be), because it is unfamiliar to them. A great way to start is the way that my company did. We hooked up with alarm companies who had no expertise in the areas of locking hardware. So, we used our expertise and were soon subcontracting the installation of electric strikes, mag locks and electri­fied exit devices; then, the alarm companies would "tie in." This is the hard part. It wasn't long before we were doing our own systems.



Read on and learn!



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The WONDERFUL WORLD OF EAC

I can still remember the first time I saw it. The fear in my eyes, the sweat on my brow ... I was tormented. I was working on a lock, and my worst nightmare had come to my conscious realm: a "wire" was attached to the lock!



By Adam Black, CRL

Greg's Corner: Don't Drop The Lock!

As I was taking the last screw out holding the Von Duprin 99 exit device through door to the OSI OMNILOCK OP2000, I received a call. I took my hand off the OMNILOCK to answer the call. Turning back to the job at hand, I finished removing the last screw. Most of you can guess what happened next. It did not survive! The buttons scattered around the impact site. I looked at my customer and back at the now broken lock on the ground. He was stunned, and the only thing he could say was, "Its Monday."

By Greg Perry, CML, CPS

Safes

**24**

Changing Safe Combinations (Third and Final Installment of Series)

Before you begin changing combinations, you must first understand the rotations of the dial and what you accomplish when turning the dial. This will not only enable you to change the combination, but also allow you to explain the dialing sequence to the customer, which will save a return trip in the event the customer doesn't under­stand the dialing procedure.

By Jim Hancock, CRL

Automotive Locksmithing

Transponders — Kicking The CAN

From the first transponder-equipped vehicle to hit the road, locksmiths  
have been plagued with the need for tools and instructions on pro-  
gramming these vehicles. Over the last several years, my colleagues  
and I have done our best to keep you informed on this ever-changing  
technology; up till now, this evolved around the introduction and use  
of aftermarket programming tools.

By Tom Seroogy

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Volume 50, Issue 3



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contacting the ALOA office at 3003 Live Oak Street; Dallas, TX 75204; (800)532-2562;  
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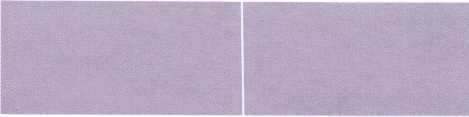
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MAY I APRIL MARCH

upcoming events

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| 3 Minnesota Chapter | 11-13 California Locksmith | 12-14 Education Weekend | 26-27 LASA |
| Regular Meeting | Assoc Convention | Minnesota Chapter | San Antonio • Two classes |
| Dave Nissen | Ontario, California | Dave Nissen | Contact Steve Morse |
| [mnchapternews@aol.com](mailto:mnchapternews@aol.com) |  | [mnchapternews@aol.com](mailto:mnchapternews@aol.com) | Phone # 512-353-8615 |
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7 Minnesota Chapter Regular Meeting Dave Nissen mnchapternews@aol.

16-18 East Coast Regional Locksmith Convention Somerset, New Jersey

24-25 Alabama Locksmith Association Membership Meeting, Dinner, Discussion & Seminars Call 1-800-893-5487



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| 3/28/2004 | Northbrook, IL • Clark Security Products Joan Emrick • 619-718-7308 |
| 4/8/2004 | Dallas, TX • ALOA  Hope Rodriguez • 800-532-2562x30 |
| 4/17/2004 | Somerset, NJ • MLANJ Convention  Bill Timmann, CML • 610-253-2325 |
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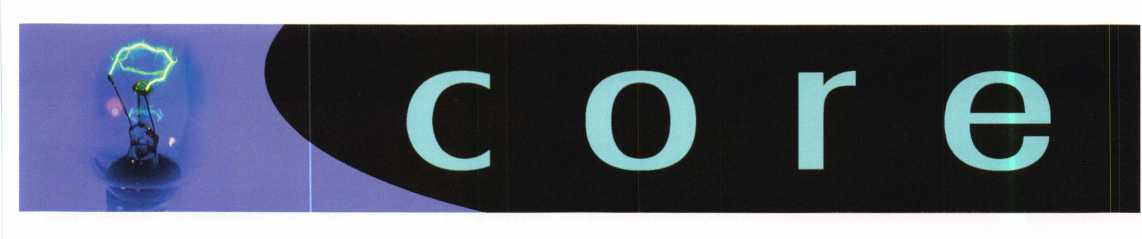
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In Memory

David L. Griffin (ALOA #19228) of Doctor Key in Olney, MD, recently died while visiting a friend in Pennsylvania. David was a member of MLA and LADC. On behalf of everyone at ALOA, we wish to extend our sympa­thies to the Griffin family.

ALOA Code of Ethics

All members of the ALOA by acceptance and continuance therein, shall be deemed to have subscribed to the following Code of Ethics:

That the dignity of our chosen profession may be perpetuated, it is the duty of all members of the ALOA.

* To practice their profession in the spirit of fairness to their clients, with fidelity to security in conformance with appropriateness, and with high ideals of personal honor;
* To properly and impartially analyze security problems, and to advance the best possible solution for the protection of their clients;
* To conduct themselves in a dignified manner;
* To abide by applicable licensing and business regulations;
* To abstain from using improper or questionable methods of soliciting patronage, and to decline to accept such incompatible patronage;
* To refrain from associating themselves with or allowing the use of their names by any enterprise of questionable character, or in any manner countenancing misrepresentation;
* To cooperate in advancing the best interest of the locksmithing industry by interchange of general information and experience with fellow lock­smiths;
* To encourage and promote loyalty to the profession, always ready to apply their special knowledge, skill and training for the use and better­ment of our industry.

Letters to the Editor Great Auto History Article

A great article about automobile keys in the January 2004 issue.

Especially about the Model Ts. Mr. Perkins did a fine job. I do have one interesting addition. The Ford garages of the era had a set of Master keys (I have a set) so you could drop your vehicle off for service and take your keys with you. There are four keys riveted together. Number one key would start ignition units 51 through 56, number two would start ignition units 57 through 62, number three would start ignition units 63 through 68 and the fourth key would operate vehicles 69 through 74. These keys were made by Ford Motor Company, and issued to the Ford dealers. The blades are flat, .035 steel, one inch in length by .365 inches in height. I keep mine on the clipboard just in case a guy at a car show loses his keys! Ha! No, I wouldn't part with them.

Respectfully, Alex Cartwright, Hoopeston, IL

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Sincerely, Bruce D. Stevenson, Buckingham, PA

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Videx Announces CyberLock® Intelligence in Padlocks

Padlocks that Report Who, What, Where, and When!

Videx recently released CyberLock Electronic Padlocks, designed to bring key control and an audit trail of every opening to padlocks. A standard padlock can be quickly converted into a full-functioning access control system by replacing its mechanical cylinder with a CyberLock electronic cylinder. Padlocks retrofitted with these intelligent cylinders aim to provide smart security wherever controlled access and an audit trail are needed. These padlocks report Who, What, Where, and When.

This electronic padlock system consists of the pick-proof CyberLock cylinder in a padlock, a CyberKey® that cannot be duplicated, and CyberAudit® access control software. Access privileges and battery power are located in the key. A key can be programmed to restrict each authorized user’s access to specific padlocks on pre-selected days and times.

Each time the CyberKey opens a padlock, a record of the user ID, date, and time is stored in both the lock and the key. A key can be set to automatically expire within minutes, hours, days, months, even shift-by-shift, depending on the specific task that has been assigned to the user.

CyberLock padlocks are ideal for securing equipment, containers and gated areas — anywhere an audit trail would be beneficial. New padlocks with the electronic cylinders already pre-installed are also available. In addition to padlocks, CyberLock cylinders can be installed in safes, server cabinets and doors, throughout entire facilities.

For more information about CyberLock padlocks, please contact Videx by phone at 541.758.0521, by fax at 541.752.5285, by email at [sales@videx.com](mailto:sales@videx.com), or visit the web site at [www.videx.com](http://www.videx.com).

**Key Name**

Andy Dummore Juanita Banks Evelyn Idler John M chads Sussman

haney

1 **Lock Name jc Date/Time jStatus [ Source** \*

South Equipment Yard 11/12/01 1:38 58 PM No Permissions Key

South Equtpwftf Yard 11/12/01 1215:44 RM Authorized to Open Key

**{West Equipmen**t Yard South Equipment Yard **Cel Tower 3**

11/12/01 1021:04AM  
11/12/01 8 4538 AM  
**111/12/01\*21:08 AM**

Authorized to Open Key

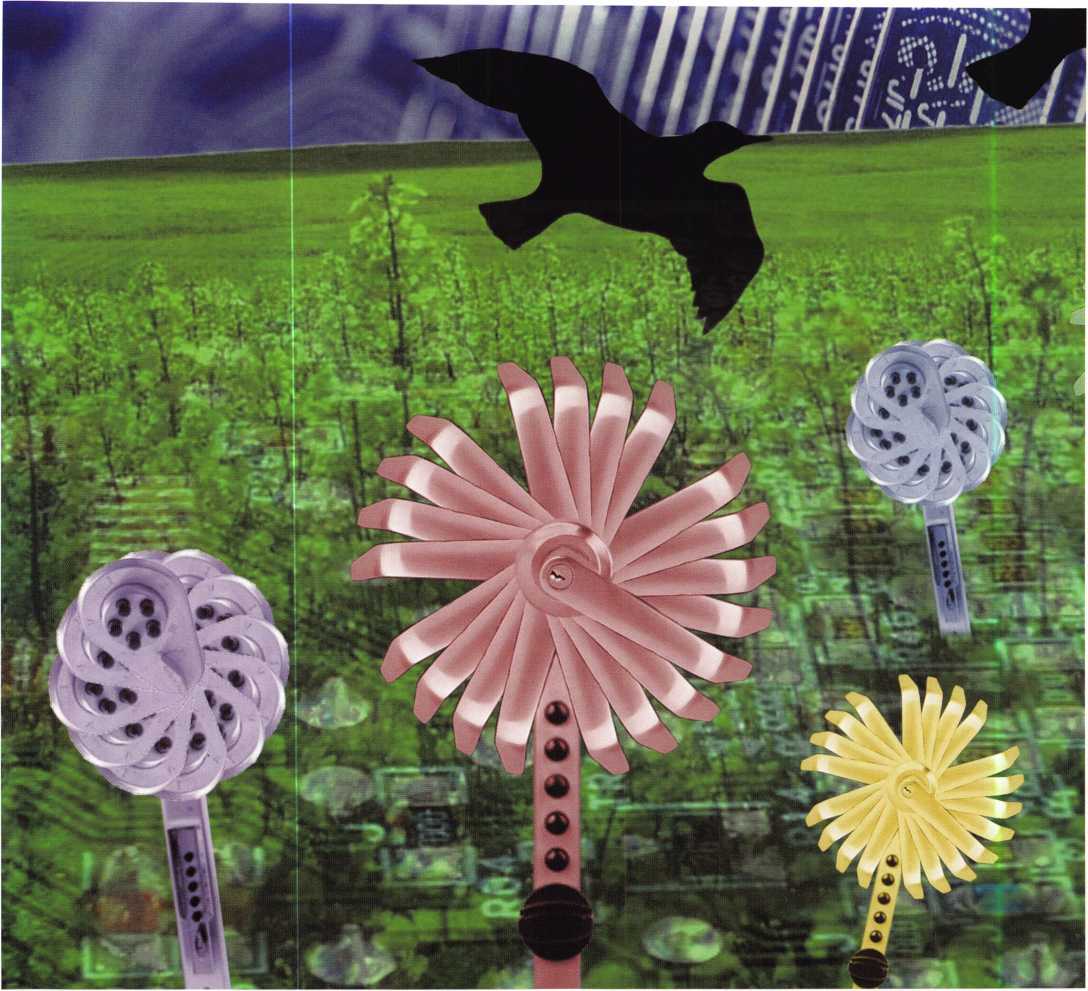
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Out of SchecMe Key

West Equipment Yard Cel Tower 7

11/12/01 **81521** AM

11/12/01 7:15:22



Wonderful World of EAC

By Adam Black, CRL

II

**2**

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I can still remember the first time I saw it. The fear in my eyes, the sweat on my brow ... I was tormented. I was working on a lock, and my worst nightmare had come to my conscious realm: a “wire” was attached to the lock!

Locksmiths have no problem ripping apart a mortise case, installing concealed panic hardware from scratch and fixing all the honey-dos on the weekend, (which include working with all kinds of electrical appli­ances), but when we see that a lock is electrified, we go into fear mode. In locksmithing, the “fear factor” is not eating cockroaches and dangling from a helicopter over a bed of anacondas; it is electronic locks, circuit boards and relays.

Well, never fear; hopefully we can work together to take away some of that fear and turn it into big bucks. One of the most lucrative parts of locksmithing is Electronic Access Control (EAC). We are going to start with simple EAC systems and finish up with some more complicated systems (such as used in large buildings, nationwide businesses and world-wide cor­porations). Before the fear starts growing again, well start at the beginning.

Access control is a catch phrase that our industry uses to explain what skills we offer that are related to elec­tronics. Let’s have a little fun and define what “access control” is, and how it is perceived by our patrons. Access control means ... are you ready? ... controlling access. Ta-da! We’re all Rhodes’ Scholars. Actually, access control is any mechanism by which a system grants or revokes the right to access some data, or perform some action. (©2004 M-Tech Information Technology, Inc.) For such a simple definition, it sure causes a lot of confusion. Let’s use an analogy to explain this. Before dinner, my mom’s slapping of my hand at the cookie jar is access control. That is how our customers see access control; however, that is not how we understand it, and after we try to explain it (our way), customers’ heads explode. We probably

would be better off explaining that we install “those card swipe thingies that let you in a door.” (Unfortunately, that doesn’t fit on the side of a van.)

OK, my lame jokes have run out, so let’s jump in and begin gaining confidence in a portion of our industry that will become a major part of what we do. We are first going to define the three main levels of EAC and then we take it from there and run with it.

Electronic Access Control (EAC) comes in three main levels:

* Stand-alone units: Key pads, card readers, biomet- rics and battery-operated devices - these units are controlled and programmed from the device itself and are not connected to a computer or other doors.
* Simple computer-managed systems - These sys­tems use the same style of products (i.e. keypads, card readers, etc.), but are managed by a PC-based system using software to add users, set up time zones, access levels and pull audit reports of users.
* Multi/Complex/Enterprise systems — These take our system to the next level where we integrate with alarm systems, CCTV, building automation and multiple sites.

We are going to talk about all of these and much more over the course of our discussion. Let’s get started.

STAND-ALONE ACCESS CONTROL

Stand-alone access control basically offers a little more convenience over a mechanical lock and key It allows us to enter a door, gate or secured area with nothing other than our knowledge (code), card or bio­metrics (fingerprint, handprint). Codes are great because they allow access with nothing more than punching a number. The downfall with a code is that someone could discover the code by looking as we push the buttons, or by us giving it out. This brings us



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to cards or key-fobs. Cards are the next level of secu­rity We tend to hang on to our ID card or key-fob, whereas we might give out our pin number (especially with a financial deposit). And finally, with biometrics our unique bodies are virtually impossible to duplicate and give the highest level of security All of these (pins, cards and biometrics) are called “credentials.” We will be using the term “credential” in the future. Finally, with stand-alone systems, you get convenience with no accountability, no way of finding out who came in, or when.

SIMPLE COMPUTER-MANAGED SYSTEMS

This leads us to the next level: computer managed systems. I realize that many people familiar with the stand-alone systems know they offer audit capabili­ties. I didn’t forget; it’s just that they require a good oF computer to retrieve the audits. Computer-man- aged systems (CMS) allow data, such as users, time zones, etc., to travel back and forth from the system to the computer. This is not magic, no Doug Henning or David Copperfield required. We just need a cable, modem, wireless device or a local or wide-area net­work (LAN WAN). With CMS, we can attach times, days and locations to either a person or a door. We can allow someone to only gain access to an area at certain times, while someone else may go to other areas at completely different times. We can control when doors lock or unlock. We can “re-key” a whole building with the click of a mouse. One of the great­est features with CMS is the ability to see who went where, and when. Management is able to track when employees come or go, and can help narrow down who is involved in any situation, such as theft or acci­dent. The only real limitation with smaller CMS’ is the size of the memory on the units themselves. The memory holds the users and event buffer, which, when full, can cause problems as well as lost data.

MULTI / COMPLEX /

ENTERPRISE SYSTEMS

Finally, are our larger and more complex systems. These are the ones that make you want to pull your hair out. (I am the poster child for this.) These sys­tems are really only an extension of the smaller sys­tems with the ability to integrate with CCTV, alarm panels, building automation and networking with many other buildings. One of my favorite things to do is to unlock and lock doors 3,000 miles away with the click of a mouse. (Obviously, I have no life.) Bigger systems allow a security department to control multi­ple buildings from a central location without the man­power required with mechanical hardware. Adding cameras to these systems gives a visual verification that doors are secure, dropping manpower even fur­ther. Larger systems communicate through the cus­tomers’ network. Like many other enterprise pro­grams (network), they can be managed from several locations. This is accomplished by using a single data­base on the server. Maybe a little Greek sounding, but hey, we need a little Greek to prepare for the summer games. Large systems do require careful preparation and very detailed organization. Even with the extra work, the basics are still the same, and the satisfac­tion of seeing a larger system come on-line and work is akin to opening a TL-30 that’s been burglarized. Quite nice! EAC still has one element that it cannot perform on its own: maintenance and physical inspec­tion. Much like larger master key systems, EAC needs us to keep everything running smoothly. That is why it is crucial that we understand the basics of EAC, lock function, wiring, power, relays, resisters, diodes, MOVs, and transorbs. With this basic knowledge, we can service and satisfy our customer base as well as future prospects. As locksmiths we have a distinct advantage in EAC. Our competitors are not the big hardware chains as in traditional locksmithing, but alarm and building automation companies. We have such an advantage over these competitors:



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* They can run wire; so can we.
* They can hang card readers and access panels; so can we.
* They can hook up to a computer and set up the system; so can we.
* They can install locking hardware, rekey locks, hang door closers and finish the job...Oops, I think not! WE CAN!

Locksmiths can offer a full package of security that no others can. From file cabinets to lock-outs, to safe openings, to Life Safety applications, to master-keying and now Electronic Access Control.

We are going to start with a very simple single door, pin number access system and grow from there. I hope by the end, we can all have a better understand­ing of Electronic Access Control and how we can be an integral part of its future.

About the Author: Adam Black has been in the locksmithing profession since 1981 starting with Vincent Safe and Lock in Bakersfield California. He has been with Cothron's Safe and Lock since 1997. He has instructed ACE classes in Access Control, Safe Lock Servicing, Impressioning and Picking and is a cur­rently an instructor for Cothron's School of Professional Locksmithing in Austin, Texas.

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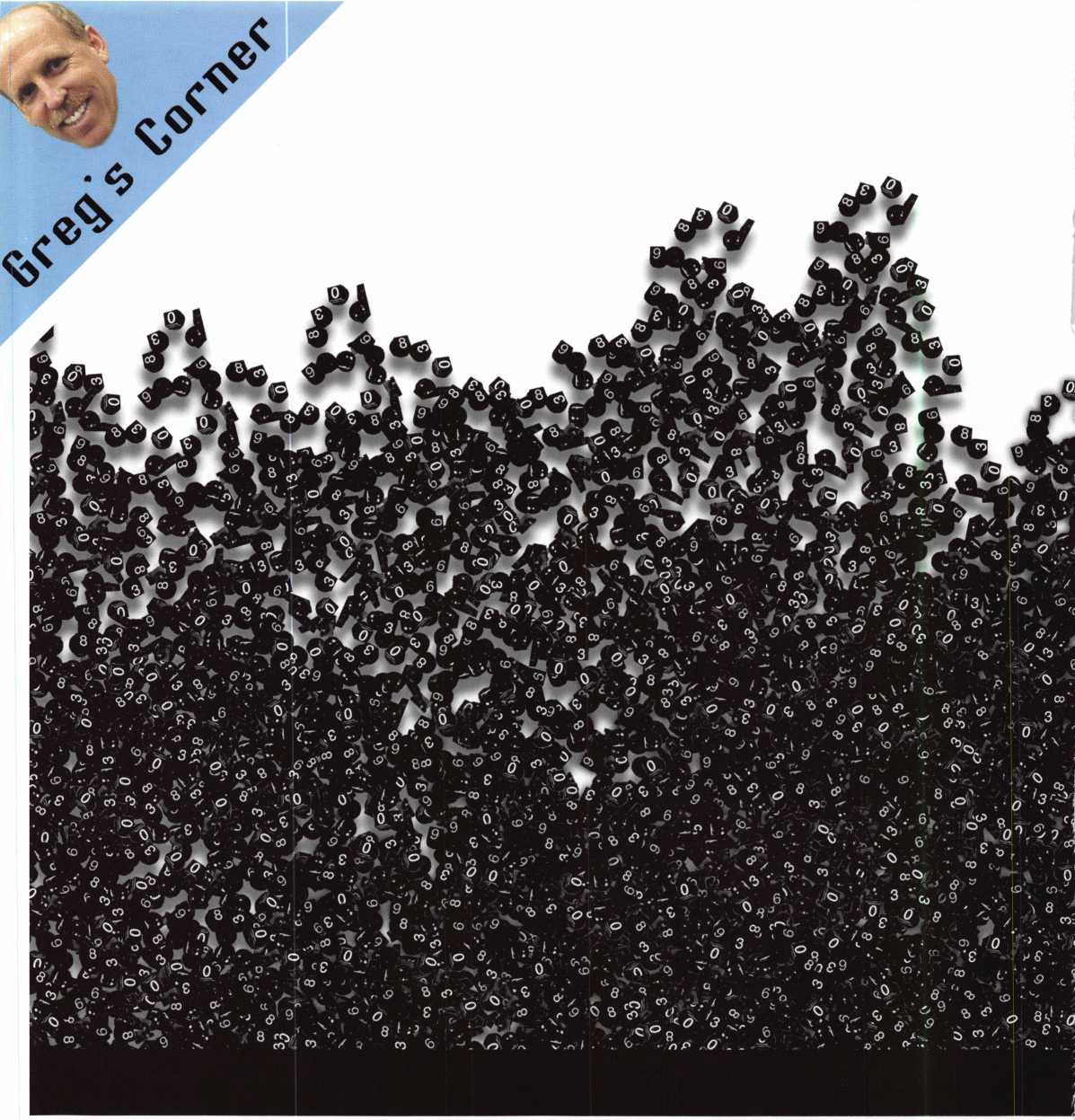
**& Institutional**

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Over

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Don’t Drop The Lock!

By Greg Perry CML, CPS

**16**

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This article came about because of a mistake on my  
part. As I was taking the last screw out holding the  
Von Duprin 99 exit device through door to the OSI  
OMNILOCK OP2000, I received a call. I took my  
hand off the OMNILOCK to answer the call. Turning  
back to the job at hand, I finished removing the last  
screw. Most of you can guess what happened next.

The OMNILOCK fell off the door and the high  
impact plastic proximity reader received a high  
impact test as it hit the concrete. It did not sur-

vive! The buttons scattered around the impact

site. I looked at my customer and back at  
the now broken lock on the ground. He  
was stunned, and the only thing he

could say was, “It’s Monday.”

Looking at the pieces revealed that the lock could be  
reassembled. The only part broken was the reader on  
the front of the lock. But it also holds the stainless  
steel plate in place that holds the buttons in position.  
My customer has a spare cylindrical lock for training,  
and has a spare for his facility. This was the panic ver-  
sion. I disassembled the lock to disconnect the reader  
while he went to retrieve the other lock and download

the program to his pocket PC handheld computer.  
Once he got back, I installed the new reader onto the  
panic lock and reinstalled it on the door, making sure  
not to drop it this time. He reprogrammed the lock  
and I took the now broken reader with the cylindrical  
lock back to the shop to send in for repair. But first,  
let’s look inside at the boards and get an idea how this  
lock works.

Starting with photo 1, we see the OMNILOCK  
OP2000 lock as it should look (with the addition of a  
little tape to hold the reader in place). This lock is  
built on a Schlage D80 Rhodes chassis. The panic  
version is built with a back plate to mate with a Von  
Duprin 99. The back plate has through-bolt type  
studs that match the hole pattern of the 99. Turning  
the lock over (photo 2) reveals the gasket and

battery cover. If this were the panic version, the

back plate would need  
to be removed

to reach  
this  
point.  
Peeling

back the gasket  
from the top,  
removing the  
screw in the  
center of the

&&& upper plate

and remov-

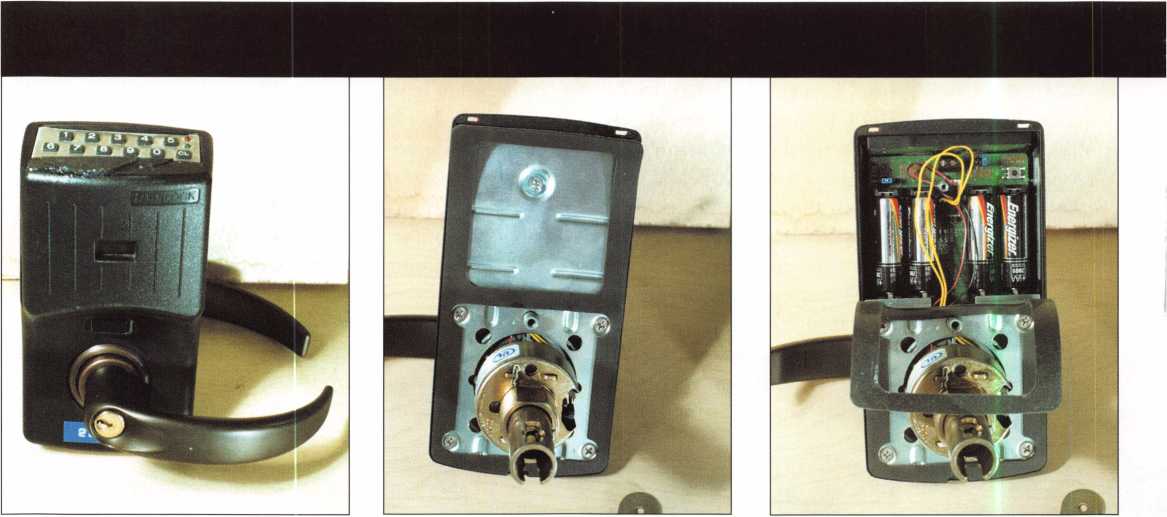
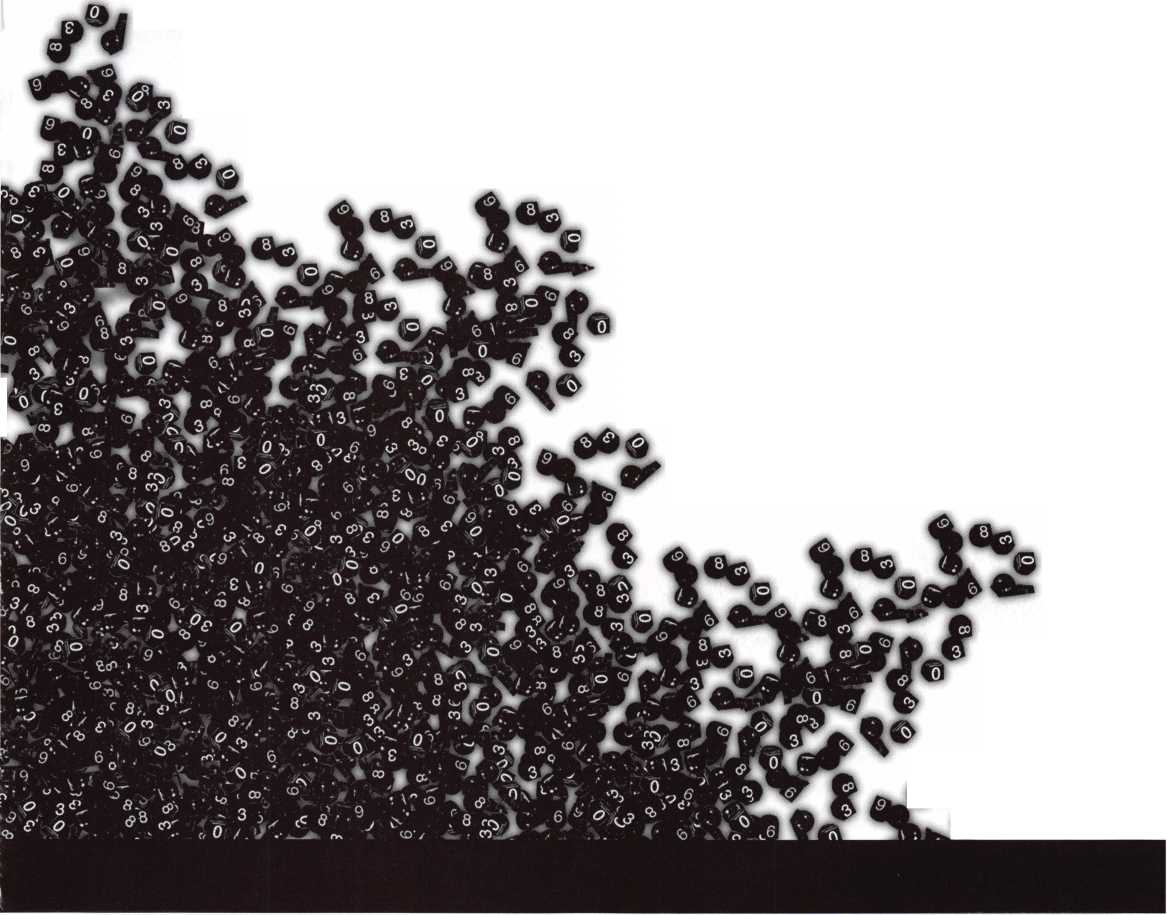
The OMNILOCK fell off the door

and the high impact plastic proximity reader

received a high impact test as it

hit the concrete.

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ing the plate reveals the batteries as seen in photo 3. Normally this is as much disassembly as might be required. If the hand of the lock needs to be changed, the lower plate is removed. Next, seen in photo 4, the two wires running from the lock chassis are discon­nected from the circuit board. The red and black wire pair is from the lock solenoid; the yellow pair is from the optional key bypass detection switvu

The lock can now be rotated to the other hand, and the wires reinstalled (using care with the red and black wire pair to install the plug in the orientation seen on the circuit board). Install the batteries and reassemble the lock back plates before installing the lock on a door. Before leaving this picture, we need to look at the top center of the circuit board. Here we find a two-screw terminal connector. This is to allow for a remote release switch, as might be found at a receptionist’s desk.

If this lock had not fallen off the door, a few program­ming instructions might be all that is left. But this lock did fall and break, so let’s look a little deeper into the lock case and see what some of the compo­nents look like. After disconnecting the wires, the lock chassis can be removed from the outside hous­ing. Removing the coupling nut/stud just above the wire connectors and the two lower screws allows us to remove the main circuit board (photo 5). The board still in the lock is the interface board from the prox

1

reader on the outside. The ribbon cable running from the lock housing to the main circuit board is from the keypad. Also seen in the photo at the top of the now upside-down circuit board are the two LEDs used by the lock to send and receive information from a pock­et PC. The window for these LEDs is seen between the interface board and the hole for the lock set.

The cable running to the prox reader can also be seen plugged in on the upper right side of the inter­face board. Photo 6 is of the reader, the loose buttons and the button cover plate. Photo 7 shows how the buttons just sit on the keypad membrane requiring the stainless steel button retaining plate to keep them in place.

Why use an OMNI LOCK? First is ease of installa­tion. Unless you need to have a remote release, there is no wiring involved. The lock is part of a self-con­tained, full-featured access control system. Multiple doors and/or locations can all be controlled with the same software. In some cases, wiring is not feasible, or you don’t prefer (or don’t have experience) running wire. Multiple locations miles apart require the use of modems or Internet connections which, for most of us, is outside our skill level. OMNILOCKs are a great fit for this application. Another great fit for the OMNILOCK is a fire-rated opening, since the door or frame cannot be altered unless you are a UL door shop. The OMNILOCK is available in several config-

**8**

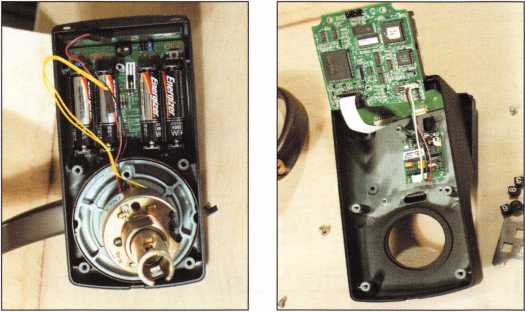
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urations. First is the standard cylindrical door prep built on either the Schlage or Arrow Grade i chassis.

It is available mated to either a Falcon or Schlage mortise lock. They also produce a switch lock version for use with a magnetic lock or electric strike. The panic version has already been mentioned. Select existing Schlage D series locks can be retrofitted with the OMNILOCK Quick Adapter. And finally OSI produces an OMioo, OM200, and OM500 keypad only users who need fewer features.

What is the downside to using OMNILOCKs? First and probably the biggest drawback is the need to actually be at the lock to perform changes to the pro­gram or to download the event history. Unlike a hard­wired or modem-based system that can be accessed from a single location, the OMNILOCK requires the use of a pocket PC to transfer data between the lock and the host computer. Another downside is the need to remove the lock from the door to change the bat­teries. Batteries should be changed one a time. Removing all the batteries at the same time will cause a loss of programming. Most users are not skilled enough to properly remove the lock and reinstall it. Some might even drop the lock off the door if it is mated to a panic.

Programming as mentioned earlier is accomplished with a PC and pocket PC. The OFM or OMNILOCK Facility Manager software is installed on the PC after installing your pocket PC software. The software is similar to the software used by most other access control manufacturers. The programming



manual is over 50 pages long, so I won’t cover all the programming. I will provide a brief overview. Several parameters are selected starting with the facility, loca­tion and lock. The locks can be set in any of 8 modes, from unlocked, to code-and-card, to complete shut­down, allowing access only to the programmer. Time schedules and holidays are set into the lock, if desired. After all of the user and lock information is entered at the PC, the information is loaded onto the pocket PC for transfer into the lock. A trip to the lock is now required to download the program to the lock.

The OMNILOCK is a great choice for many applica­tions. It is probably the most easily installed full access control system out there today. Battery life is four to five years, and it will continue to operate for over 1000 uses, giving plenty of time to change the batteries before total shutdown (provided someone notices the low battery alert). The need to use a pocket PC to transfer information can be a real problem, although in general, that is the user’s responsibility. All things considered, OSI OMNILOCK offers a lot of versatility in a small package. And that’s the name of the game in today’s electronic access control market.

About the Author: Greg Perry, CML, CPS, has been in the locksmith industry for  
20 years. He's spent half of that time as a field technician for Security  
Engineering in Ridgecrest, CA. Greg is also a past president of the Desert

Counties Chapter of the California  
Locksmiths Association. He has also  
won the 2002 and 2003 Keynotes  
Author of the Year Award. You can e-  
mail him at [glmperry@iwvisp.com](mailto:glmperry@iwvisp.com).



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“That’s three rings! Somebody get the phone please!”

I glanced at the clock: 8:02 a.m.!

“Somebody turn the OPEN sign around please!” “Right away!” Dave replied.

“Where did all the calls go?” I looked at the empty dispatch board.

“Right here!” Chad thumbed through them. “There’s a lot of em’!”

“What’s first?”

The phone rang again.

“Let me get that!” he replied.

Monday! I grabbed my almost empty cup of coffee and used the moment to walk the facility. Lights. Bathroom.

“When’s the bathroom getting cleaned?” I bellowed, in my usual broadcast fashion.

A voice echoed from the stock room, “Right after I put this stock away.” It was Mac. His real name’s Dave, but since we already had a Dave, he suggested we call him Mac. Then I heard Chad hang up the phone.

“Who was that?” I asked.

Lowering his head a bit, he said, “That was Jim.”

“Great!” I raised my eyes to the top of their sockets. “Let me guess: He’s sick, right?” “Kinda,” Chad said. “He twisted his ankle yesterday watching NASCAR and today it’s worse. He’s going to the doctor this morning.”

“Twisted his ankle watching NASCAR — in his living room? Oh that’s just wonderful!” I thought to myself, “We’re already short handed. What’s next?”

Phone rings again. Thinking quietly to myself, “I’ve got to get a handle,” I picked up the phone. “Tri-City Security this is Ray may I help you?”

“Ray, this is Fred, Big Mountain.”

Big Mountain is one of the local Harley Davidson dealerships in our service area. Fred’s been working there in Parts since the place was built, which is about how long I’ve been trying to make him a steady cus­tomer.

“Hey Fred, how’s it going?”

Fred cut to the chase. “Remember when you stopped by and said you can service our (Harley) locks?”

“Yep. But you said you already had someone doing that.”

“I know, I know. I guess I was wrong, dead wrong! I’m really upset with him because now I have a really big problem!”

“What’s up?” I asked.

**aYour** competitor” he said (as if I only have one), “has a switch of ours for two days now and it’s not done, and he can’t say when it’s gonna’ get done.”

“Oh.”

“Somebody came in here a few weeks ago and bought a brand new $30,000 bike, but the ignition lock failed. We replaced it, but it uses a different key and that’s not good enough for him, and he’s gonna’ scream bloody murder if his bike isn’t ready this after­noon, cause he’s supposed to leave for Sturgis tonight.”

“Oh!”

Then, after a long sigh and with the humility of a beg­gar he asked, “Can you help me?”

I had no idea which switch Fred was talking about, but after all the time I spent hounding him for busi­ness, this was no time for questions or excuses; it was time for action. It was time to pluck him immediately from the jaws of impending embarrassment. With confidence and a sense of urgency, I said, “Well, what are you waiting for? Go get that bad boy and bring it to me now!” and hung up the phone. With that job

Cycle Chronicles - Part 4:

Harley Davidson and The Miracle Man

By Ray D’Adamo, CML

**20**

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locked down, it was time to get other jobs moving. “Dave!” I screamed, “You and Mac get on those calls.

I have a rush job coming in,” and I prepared for Fred’s arrival.

When Fred arrived he brought the lock, its operating key and the bike’s operating key (photo i). The Harley tubular tank mount ignition switch is a handsome thing. The entire upper part of it is plated in chrome. In the past, I had fit keys to identical units without the need for disassembly, but re-keying was something with which I had no experience. After an initial inspection of the unit, I realized that in the past two days, absolutely nothing had been done to it. I thought to myself, ‘At least I won’t have to repair it first.” As I proceeded with my inspection, I couldn’t help but wonder why my competitor was so chal­lenged by this re-key? I opened the dust cover and then I saw it (photo 2). One cannot see this in the photo, but the dust cover was blocking access to the cylinder retainer pin (Photo 3). Additionally, the dust cover hinge pin was installed into a blind chase (only one end). With all we had going on that day, time was tight, but regardless of the work load, I felt this job was doable, as long as I didn’t get distracted with other work. Saying nothing, I continued examining the lock, making sure I didn’t miss anything obvious.

All the while, Fred was leaning over the front counter facing me. With a stark look on his face, he whis­pered, “Impossible, huh?” Feeling confident I was capable of doing this, I took into consideration all we already had on our plate that day and answered

“Impossible things we do right away. This is gonna take a miracle.” Just as his jaw dropped completely to the floor in despair, I followed up that statement with, “Since miracles take a little longer, we won’t have it done until lunch time.” Fred raised his head, closed his eyes and breathed a big sigh of relief. “If you pull this off for me,” he said, “you’ll get all my business from now on.” and he walked out the door. As I heard his departing steps I thought, “I’ve been waiting for a long time to hear him say that.” Then it reality hit me and I felt the full impact of the situa­tion. I thought, “If I fail, I’ll be the laughing stock of the entire Harley dealership and I’ll never see or hear from Fred again.” Cautiously, I began servicing the lock, knowing full well this was do or die!

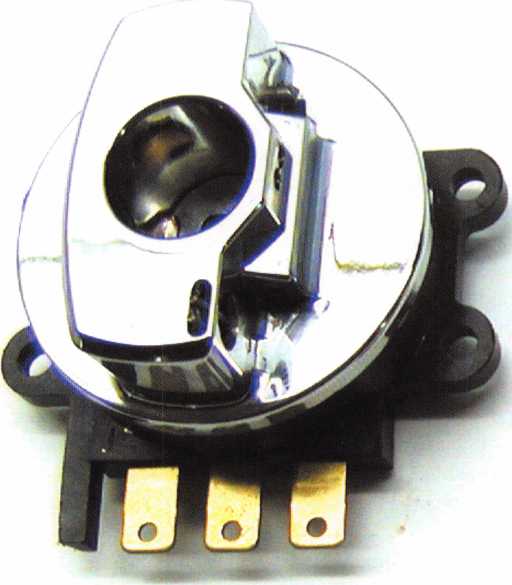
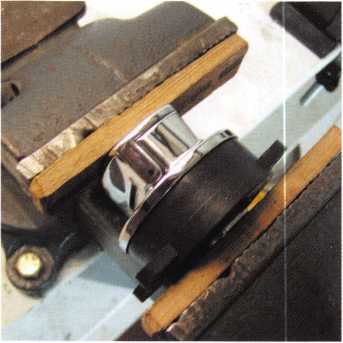
The way I saw it, I had two options for removing the dust cover. The first was to drill a hole into the hinge pin from the open end of the chase and try to extract it. The second was to drill a small hole at the other end of the dust cover directly over the blind end of the hinge pin, and drive out the hinge pin. I chose the second option, understanding that when finished, the newly opened chase end must look just as good (if not better) than the stock open end. This would require precise measurements before drilling. Then, the unex­pected happened! Something came up that I could not avoid, and I was forced to discontinue servicing the lock. Frustrated, I searched for a solution. Just then, one of my more competent apprentices, who realized that the situation had taken a turn for the worse, leaned over my shoulder and asked “What’s up?” I looked at him square in the eyes, thought to

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Photo 1

Photo 2

Photo 3



ing across the room as they exited the chase. After removing the dust cover from the assembly and then combing the area for a minute or two to locate and retrieve the brass pin retainer and the hinge pin, the rest of the process was academic.

The cylinder retainer pin (photos 6) was next to be

myself, “He can do this,” and after going over my thoughts with him, I turned over the job to him, and this is what he did in my absence.

He decided to stick with the second option. After  
carefully estimating and marking the location of the  
hidden hinge pin end (photo 4) and choosing a small

drill, he opened the closed end of the  
hinge pin chase (photo 5). Choosing a  
small punch and anticipating some resist-  
ance (thinking the hinge pin had a press  
fit); he struck it with what he felt was  
appropriate force. Then, once again, the  
unexpected happened. Unknown to both  
of us, what we thought to be the end of a  
press fit brass hinge pin at the open end  
of the chase was in reality a short brass  
retainer plug, which secured the relatively  
loose steel hinge pin in place. Needless to  
say, when the hammer hit the punch, the  
hinge pin and retainer plug went careen-

&



Photo 4

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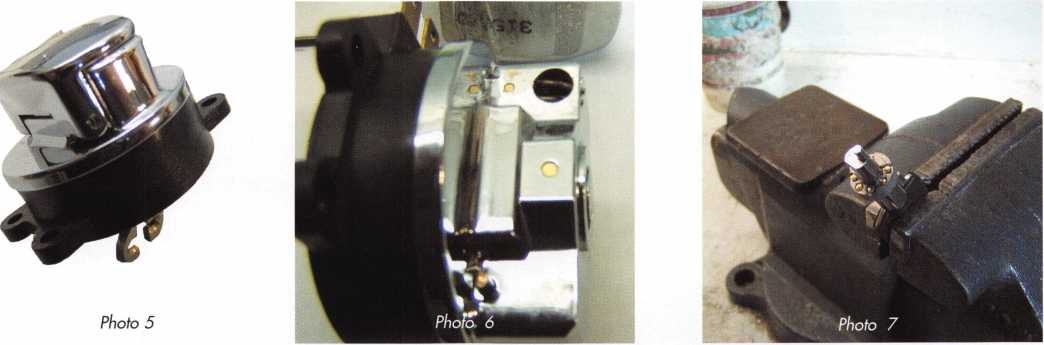


Photo 8

removed. Drilling a small hole next to the cylinder retainer pin, he used this space  
to pry up and remove the pin with an awl. After lifting the cylinder from the hous-  
ing, re-keying it first required removing the serrated retainer pin (similar to Chicago  
ACE’s retainer pin), which keeps the cylinder together. This pin has a hole drilled  
through the center, so a sheet metal screw and a slap hammer did the job. Photo 7  
displays the bottom of the nose plate, which houses the bottom pins. Note the anti-  
tamper notches. When pinning, always use a pin that will shear with the thickest  
part of the nose plate. As with most tubular lock pinning, also make sure the round-

ed end of the bottom pin faces the top pin; the flat end should face the key.

Though Harley top pins (photo 8) are cupped to contain the spring,  
the short master pins, which are contained in the Chicago ACE

pin kit (Harley also utilizes the same specs as Chicago ACE)

will substitute when necessary. An exploded view of the

entire assembly can be seen in photo 9. Soon the cylin-

der was re-keyed, re-installed. And soon after that,

the dust cover, hinge pin and hinge pin retainer  
cap were re-installed, and the lock looked

and worked great!

Things don’t always go the way we expect.  
Somehow, though, with enough experience, intu-  
ition, perseverance and a desire to succeed,  
they sometimes turn out better

than expected and the results  
astonish us. That’s probably  
why we call them miracles.

Now let’s see if the other mira-  
cle happens. You know. When  
Fred calls me for more work!

See you next time for another  
exciting installment of Cycle  
Chronicles.

Photo 9

Raymond D'Adamo, CML is originally from Hoboken, NJ. In 1973 he graduated Rutgers University and in 1977 he began locksmithing in Boulder Colorado. In 1981 he began writing automotive locksmithing technical articles for locksmith publications, and began instructing automotive lock- smithing courses at trade association meetings and conventions. In 1983 he and his wife Tina D'Adamo moved to Fort Collins, CO and opened Fort Security Center. Since then their business, TRI-CITY Security, has grown to two additional facilities in Greeley and Loveland, CO. Ray is an active member of ALOA since 1978 and continues to contribute to the education of locksmiths all over the world. ■■

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Changing Safe Combinations

By Jim Hancock, CRL

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Before you begin changing combinations, you must first understand the rotations of the dial and what you accomplish when turning the dial. This will not only enable you to change the combination, but also allow you to explain the dialing sequence to the customer, which will save a return trip in the event the customer doesn’t understand the dialing procedure.

The majority of all safe locks will utilize a left-right- left dialing sequence. It will be a surprise to you how many people will falter on their left versus their right when it comes to dialing a safe combination. Dialing a safe combination to the left means rotating the dial in a counterclockwise rotation; another way to view it is turning left will increase the numbers on the dial while turning right (or clockwise) will decrease the numbers on the dial. Also, the majority of these same safes will work on a 4-3-2 rotational pattern. This means you will rotate the dial 4 times left, then 3 times right, then 2 times left to dial your combination numbers. The last turn in this sequence would be to the right to open the safe. As you see combinations written on paper, you generally will see a number asso­ciated with this rotation; however, you need to under­stand and make your customer understand that this number is simply a reference point. If the combina­tion is dialed correctly, in 90 percent of all safes, the dial will come to a complete stop by itself and will not turn any further. The usefulness of the last number is to give you, the safe technician, a reference as to where the drop-in point is in the event you have a lock-out situation. It also acts as a good benchmark for your customer in the event of a lockout, as it gives them a point of reference for opening.

Let’s think about what is happening inside the lock as we rotate the dial to move the wheels. Start by turning the dial to the left, counterclockwise, slowly. At first, there should be little resistance, since all you are mov­ing is the drive cam. As the dial approaches a full 360 degree turn, you should feel the drive pin on the drive cam contact the fly on the third wheel. The third wheel is now moving as you turn. As you rotate the dial another revolution, you should feel the drive pin

on the third wheel contact the fly on the second wheel. Now both the third and second wheel are turn­ing with the dial. As you approach another 360 degrees, you should feel the drive pin of the second wheel contact the fly of the first wheel, which now will rotate as you turn the dial. It took four complete revolutions to make all the wheels rotate. This is why all three wheel combinations start with, “Turn the dial four times left,” or right, depending upon the type of lock. With each change of direction in the rotational pattern, by turning one revolution less, you leave the previous wheel “parked” in the position designated by the number on the dial where you stopped. For exam­ple, let’s assume your combination is four times left to 25, three times right to 50, two times left to 75, right one time to open. The procedure would be as follows:

1. Turn the dial left, counterclockwise, at least four times to make sure all the wheels are moving together. It hurts nothing to rotate the dial more than four times since all you are doing is moving them together. Stop on your first number, which is 25.
2. Now rotate your dial right or clockwise. With each successive turn of the dial, every time you pass 25, you will make another wheel move there­fore you will pass 25 twice, which will make your third and second wheel rotate and stop on your second number, 50. **You** now have parked your first and second wheels on their respective num­bers.
3. Rotating left, pass your second number once, then stop on your third number. Again by rotating the dial one complete revolution you have begun to move the third wheel. Once you have stopped on your third number, all of the gates in the wheels should now be lined up under the fence and the safe is ready to open with one more step.
4. **You** now should rotate the dial right until it no longer turns. The safe is now open if everything was done correctly.



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The same sequence of rotations you use to open a safe will be the sequence you will use to change the combination, with two notable exceptions. First, you will dial the existing combination to the change indi­cator on the dial ring. The dial ring should have two marks on it. One mark, the opening index, is the mark located at the 12 o’clock position and generally referred to as the crow’s foot, because of the unique shape of the mark. This is the mark you will use to dial the combination for opening the safe. However, there are several brands of dial ring that use only a single line mark, or even a dot, for this purpose. The mark you will use for changing the combination is the mark slightly off center of the dial ring. This mark, the changing index, is generally a single line mark and is almost always 8.25 number points to the left of the opening index. I say generally because, again, there is always an exception to every rule. **You** will see some safes that have the change index to the right of the opening index and even some that have no index. We will first deal with a standard change index.

The second exception is that you will never dial the fourth number in the combination to the index. As you learned earlier, this number will never change, as it is pre-determined by the drive cam gate and can’t be changed without changing the position of the drive cam. So with this in mind, let’s change the combo.

COMBO CHANGING

Rotating the dial left at least four revolutions, stop your first number on the change index. Rotating right, pass your second number twice and stop it the third time on the change index. Now, rotating the dial left, pass your third number once stopping it the second time on the change mark. At this point there is no need to rotate the dial any further as all the wheel gates should be lined up at the change position. No you should be able to insert your combination change key into the slot in the back of the lock box. Make certain it seats properly because if it does not, the results of a failed attempted change could be cata­strophic. Once the key is seated, turn the key, general­

ly a quarter turn, which will unlock the inner hub from the outer wheel, allowing the hub and wheel to change relationships with each other, thereby chang­ing the combination. Once the wheels are unlocked, dial the desired new combination to the change index, turn the key back to the neutral position and remove it. If all of these steps were completed correctly, the combination is now changed. Test the new combo several times to verify that it works correctly. DO THIS WITH THE DOOR OPEN. Also, allow the customer to try it multiple times at this point. If indeed it works on the new combination, you are ready to write your invoice and go to your next job.

OUT OF THE ORDINARY

Now let’s discuss a couple of the out-of-the-norm things you might find. First might be a change index on the opposite side of the opening index. This pres­ents no problem and should change exactly like the regular index. Second might be no change index at all. This will indicate one of three possibilities. One would be the wrong dial ring was put on the safe pos­sibly during a previous repair. This is not a real prob­lem; simply add eight numbers to your combination, which should line up your change key hubs with the access hole in the box cover. Another would be what is called a direct change combination. This is a combi­nation that is both opened and changed at the same index. This type of combination lock requires a spe­cial change key that, when turned, actually holds the lever out of the way, disallowing it to drop into the gates while you change the combination. The third possibility is a hand change combination.

A hand change combination requires some disassem­bly, but is relatively simple to accomplish. When you remove the two screws that hold the back cover in place, the cover will come off with the wheels attached. The drive cam remains in the lock body. After removing the spiralox washer or retainer, each wheel will lift off the hub post. As you look at these wheels, you will see a mark on the wheel where the inner hub and outer wheel connect. This mark points



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to the number associated with the combination. By firmly pressing the hub, it will separate from the outer wheel. By realigning the mark to a new number, you have changed the combination. Keep in mind that the wheel closest to the hub is the third number in your combination. Do not get confused by the fact that the drive cam is in a reverse location from the normal lock, as this will cause you to pull your hair out trying to figure out why the combo doesn’t work when what you are doing is moving the wheels in an opposite manner from what is required.

Another thing to watch out for is the four wheel com­binations and the reverse rotation combinations. Neither of these are a real problem in that they will change just like the others, by either reversing your rotation or adding an extra rotation to the front end of your dialing procedure to accommodate the added wheel. Again, visualize what is happening inside the lock as you turn the dial and there should be no prob­lems with any small quirk thrown your way.

THE GOOD, THE BAD AND THE UGLY

Now, are there good and bad numbers to set a combi­nation to? YES!! Never set combos on easy-to-obtain numbers, such as birthdays, phone numbers, address­es, etc. If they are easy to find, they can be found by anyone. Never use all os or 5s such as (20-30-40 or 25- 50-75). These are stock “easy” numbers and anyone familiar with safes will try these. Many of these com­binations were, at one time, factory combinations. In other words, safes were shipped from the factory set on these combinations and again, anyone knowing safes knows this. Also, we must follow the “forbidden” zone rules. These rules relate directly to the move­ment of the flies and drive pins based on the thick­ness of each. These rules are:

1. The only number in the entire combination that can be anything on the dial is the first number. It can be any number from 0-99.

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1. The second number can be anything provided it maintains a 10 plus or minus from the first num­ber. This must be done so as not to accidentally move wheels when we don’t want to move them, based on the thickness of the flies and pins.
2. The third number must maintain a 10 plus or minus cushion from the second number, and also cannot be set in the opening index area, which as a generalization, will be from 90 to 20.

This means that realistically instead of having 100 numbers times three wheels (100 to the third power, or 100 x 100 x 100, or a million possible combos), there are actually 100 x 80 x 50, or 400,000 combina­tion possibilities. This is still many more than you would possibly use on one safe. The key is making certain that the numbers follow all the rules so as not to create problems for your customer or yourself.

And I can not express this one emphatically enough: NEVER, EVER, EVER set a combination to just one number; if you do, you have severely damaged the security of this safe. I realize how hard some of these things will be, because every customer out there wants an easy number, and wants to pick it for you, and usually wants to use one of the “no-nos” we’ve discussed. Your job is to find a polite way to talk them out of it and convince them to use numbers that will maintain the security of the container.

2

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**2**

ALTERNATE OPENING METHODS

As stated earlier, the majority of safe locks will rotate left-right-left and end with a right rotation, with the dial coming to a screeching halt when the lever drops in place and the bolt fully retracts. However, there will be a few other types of openings that you need to be aware of. There is nothing worse than assuming there is a problem with a safe when, the whole time, it is simply a matter of your opening procedure being wrong.

The first opening procedure that is different would be the lock in a right hand rotation. This would generally follow the same steps as a left hand rotation, in reverse. Are there ways to determine left from right rotation? Absolutely! The first and most obvious would be the change index. As a general rule, the change index will be located on the same side of the opening index as the rotation of the lock. Index left of center, left rotation. Index right of center, right rotation. Another generalization will be the number of wheels. An odd number of wheels usually indicates a left rotation, but this is very general. A great deal of older locks will have four wheels, but will be a right rotation. The almost foolproof way to determine loca­tion would be to learn the feel of the drive cam as its gate passes under the nose of the lever. The gate has both a soft edge (one that graduates down to the bot­tom of gate) and a hard edge (one that has a severe drop to the bottom). Because the hard edge is easier to feel, we will use this as our indicator. If, as you rotate the dial to the left, you feel the hard “bump” of this edge, it will indicate a right rotation. This should make sense, since it is this hard edge that traps the lever and retracts the bolt.

Another type of common opening procedure is the type of lock used on direct drive locks. These locks do not use a lever to drop into the wheel pack for opening, but rather use an extension of the handle cam assembly to go directly into the wheels as the proper combination has is dialed. In other words, you simply dial the combination associated with the

wheels and instead of dialing for a drop-in, after dial­ing the last number of the combination, you turn the handle. This drives the assembly into the wheels, releasing the lock. Probably the most common use of this type of lock was the John Brush or Sentry safe.

Finally, you may encounter a manipulation-resistant lock. These locks are designed in such a manner so as not to allow a safeman with manipulation skills the ability to feel the gate on the drive cam, which is the heart of manipulation. These locks will require an added action to release the lever such as pushing in on the dial at the load-up area, generally zero. Or, per­haps pulling out on the dial at this same area. Or even rotating a spindle key, a “peanut” if you will, in the center of the dial to release a spring-loaded blocking plate to allow the lever to contact the drive cam in the opening area.

There are certainly other types of locks out there: indirect drive, gear drive, offset drive, etc., etc., but the servicing and operation will remain virtually unchanged.

FINAL THOUGHTS

Something to discuss that could create problems is modifying parts or “making” change keys. Any foreign part introduced into one of these locks that is not specifically designed for one of these locks could cause serious problems, including a mechanical failure resulting in a lockout. Some safe technicians will man­ufacture a combination change key when the correct key is not available; however, this requires a great amount of expertise to guarantee that no problems arise from wheels not being fully locked or unlocked. Any part introduced into a lock as a daily working part that is not designed for the lock is a bad idea. Again, these locks are made to precision specifica­tions and designed to work together in a certain man­ner. Any outside influence on the way the parts inter­act is detrimental to the ability of the lock’s contin­ued operation. This is a fancy way of saying “DON’T DO IT!” **You** may also encounter locks that have been

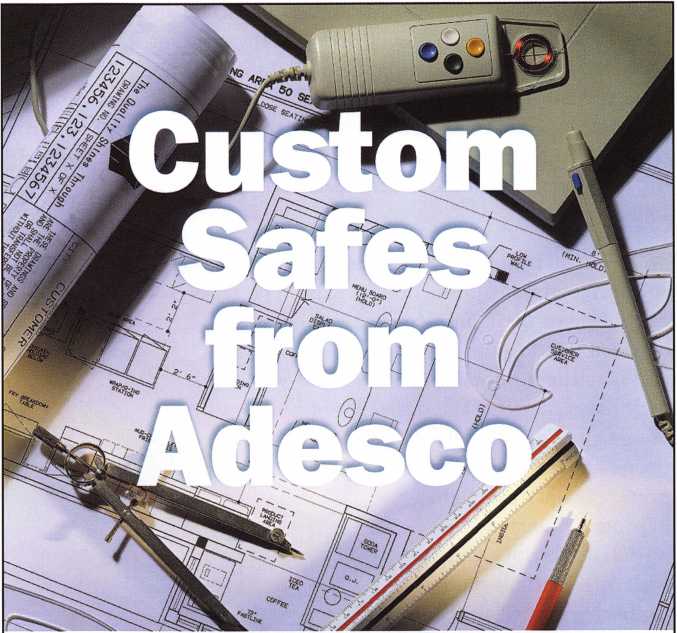
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attacked by people with no clue as to how to diagnose and correctly repair a lock. You will see locks where the gates have been filed wider, usually an indication of locks that would not open where they were set, or a cus­tomer winning the argument that it was too difficult to open because they were having to dial too precisely You’ll see fences filed down to sliver thinness for the same reason. You will encounter lock bolts that have been filed and shape modified to accommodate an inability to get the lock to, well, lock. And you will find safes where the door doesn’t shut cor­rectly and is hard to lock because the bolts will not go into the pockets on the frame. The uneducated quick fix will be a filing of the bolts to reshape them to go into the pockets. Or worse, you will find that a bolt or slide has been removed completely, which is a bad, bad thing.

There are so many more things to know about safe work; servicing, troubleshooting, manipulation, pene­tration, etc., that NO written word piece can begin to scratch the sur­face. This piece is by no means meant to replace a good hands-on, in- your-face class. There are a number of excellent and dedicated instructors out there who can give so much insight and education in this field.

Contact ALOA or your local associa­tion now about classes in your area.

About the author: Jim Hancock, CRL, began his locksmithing career at the age of 8 in his grandfathers lock shop in Gulfport, Mississippi. He has been working as a locksmith since 1974. He currently is the manager of Cothron's Lock & Safe and the lead instructor of Cothron's School of Professional Locksmithing in Austin, Texas. Jim has taught for many regional associations and is an ALOA Certified Instructor who teaches at ALOA conventions and at ACE classes throughout the country.



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**2**

From the first transponder-equipped vehicle to hit the  
road, locksmiths have been plagued with the need for  
tools and instructions on programming these vehicles.  
Over the last several years, my colleagues and I have  
done our best to keep you informed on this ever-  
changing technology; up till now, this evolved around  
the introduction and use of aftermarket programming  
tools.

Still, with all of the new tools and information avail-  
able, programming problems still exist. The most

perplexing of these problems is the lag time  
between the ongoing technological changes and  
access to the information and tools for working  
with these changes. The onslaught of program-  
ming-failure phone calls received with

the new-year vehicle introductions is a

prime example. Now, changes  
in programming and soft-  
ware send the locksmiths  
with original tools scurry-  
ing back to the dealers and  
distributors with fists full of  
money for the latest updates.

Despite all of the advan-

tages offered in a  
multi-manufacturer

tool, locksmiths owning aftermar-  
ket transponder programming  
units are sent reeling until the  
manufacturers have the time to  
research (and then backwards  
engineer) all of the new systems.

In fact, although it’s been available in Europe for some time (and in North America for about the last four or five years), the notorious “CAN” system has sent the aftermarket tool manufacturers on a rollercoaster ride of programming successes and failures. Even with the benefit of advanced notice afforded the Original Equipment Manufacturers (OEM), finding updated

software and hardware usually lags a good number of  
months behind the introduction of the new vehicles.  
Needless to say, locksmiths owning tools from either  
camp find themselves frustrated when asked to  
explain their inability to program the latest model  
vehicle with their expensive programming tool.

So, What Is CAN?

CAN is an acronym for “Controller Area

Network.” Despite its relatively new  
emergence in automotive control,

this technology has actually been  
around since the mid-1980s,

when it was first developed  
by Bosch. Since then, the

CAN protocol has  
gone through several  
versions and is used in  
various forms for  
industrial automation.

For auto manufacturers, the  
turn to the CAN protocol offers

several benefits. Today’s standard system configura-  
tions employ protocols that require dedicated, point-  
to-point wiring. Under such systems, a separate wire is

used for carrying specific data from one module, or  
point, to another. As such, these systems require

intense quantities of wire. (See illustration 1.)

Using the CAN protocol, however, communication  
between all modules and/or systems can be accom-  
plished over a single serial bus or cable, drastically

reducing the amount of wire needed to accomplish  
the same tasks. An added benefit of reduced wiring is

the dramatic reduction in weight and space for accom-

plishing the same tasks that current systems provide.

(See illustration 2.)

What makes all this possible? Well, without getting

too technical, the CAN protocol provides several

unique characteristics to all modules or systems so

CAN program­ming, simply pull the standard VIM and software card(s) out from the NGS and replace them.

Automotive Locksmithing

Transponders — Kicking The CAN

By Tom Seroogy



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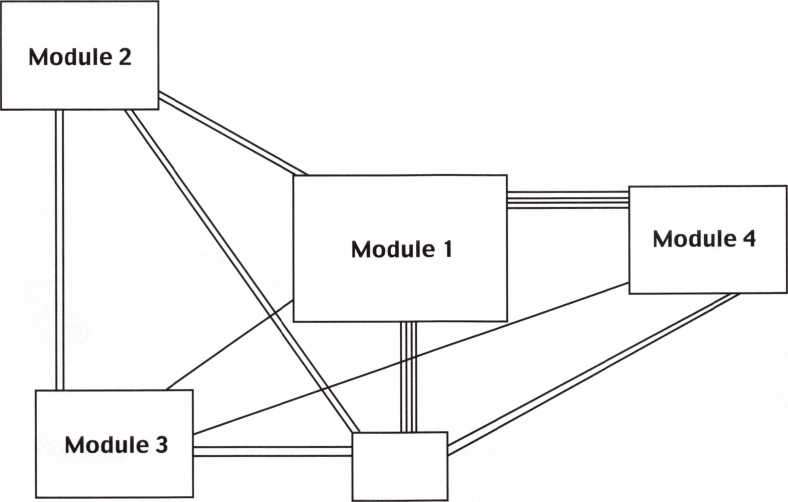


Module 5

they can communicate with each other over a single line. Aside from the high-speed communication capabilities of this protocol, the two most important features include frame identification and frame arbitration.

In short, a frame is a packet of information that is pro­duced by a sensor or a module and output to the net­work over the serial bus. The frame passes over the net­work and is detected and read by all devices attached to the network. However, only the device or module recog­nizing the frame’s identification will read and process the information contained in the frame. All other devices will ignore the frame, recognizing that the information was not meant for that device.

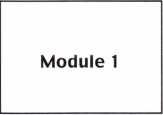
The arbitration feature dictates the priority a frame is given when released to the network. As the frame or data is being prepared for release onto the network, the network is checked for the transmission of an existing frame or data and the priority level of that data or frame. If two frames are released at the same time, the one hav­ing the lower arbitration is given the higher priority and first access to the network. The frame with the higher arbitration is given the lower priority and its transmis­sion is stopped until the network is clear.



1. The standard module or sys­tem configuration involves a sepa­rate point-to- point wiring con­figuration.

The new CAN VIM, Vehicle interface Module and CAN software card.

Module 5



Module 2

Module 3

Module 4

2. With CAN, a single serial bus or wire can be used for all modules to communicate.



5.

Connect the DLC to the vehicle



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Step-By-Step CAN Programming

8. Select and trigger ENTER SECURI­TY ACCESS

From this point on, programming is identical to the standard NGS. Begin by selecting and triggering SERVICE BAY FUNCTIONS

7. Then select the module. Here, it is PCM.

SFfiPE KCV SW

SELECT ner, TfilQnSR TO

9. Choose your vehi­cle year and model.

Choose the key programming func­tion of your choise and the job is com­plete.

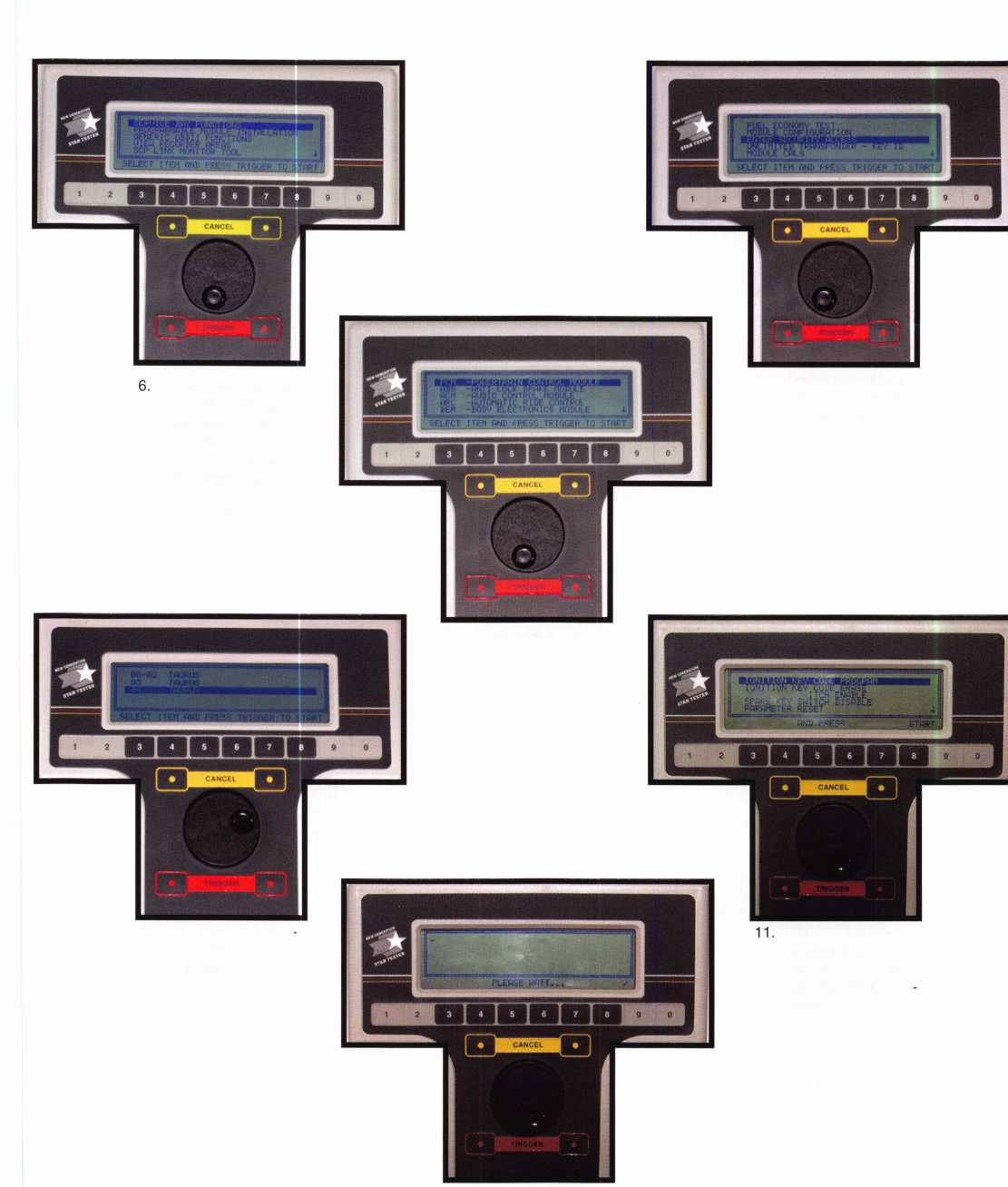
ACCESS DELAY : 10 MINUTES.

10.



Wait for the 10- minute security delay tolapse.

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So, What Does This All Mean?

OK, so what does all this mean to the locksmith?

Well, only that the tools for programming transpon­ders may be a step behind, making some vehicle key programming impossible to our trade. GM, for exam­ple, is scheduled to use a “Single Wire CAN” system in place of theJi85oVPW protocol it currently uses. Although it’s a variation of the standard GAN system, tool manufacturers will have to make engineering con­siderations when developing for the new system.

Making matters worse, a manufacturer may employ more than one system or protocol in any given model. Nissan, for instance, has used the CAN protocol for some time, but only used it for modules controlling certain systems. And, up until recently, the key pro­gramming function was located in a module not con­nected to the CAN.

Ford, too, is producing vehicles that employ both CAN and J1850PWM protocols. Which system is used for key programming is dictated by the module that stores the PATS or transponder key program­ming instructions.

According to a release provided by Hickok, Inc., man­ufacturer of Ford’s NGS, the number of Ford models produced with CAN are 50 percent for 2004 and moving to 100 percent by 2007.

According to the release, the following Ford vehicles have the PATS programming located in modules using the CAN protocol:

* 2003 Focus with 2.3L engine
* 2004 F150 (except F150 Heritage)
* 2004 Explorer
* 2004 Mountaineer
* 2004 Taurus
* 2004 Sable

Fortunately, although future vehicle releases promise more problems, the aftermarket SDD, T-Code and Code-Seeker have already addressed most current CAN-related issues, and can be used to successfully program the keys for the most common North American vehicles equipped with transponder technology.

For users of the Ford Original Equipment NGS tool, there’s no need to worry Hickok will soon be intro­ducing an adapter and software allowing the current NGS to be used on all CAN. Although not scheduled for release until the middle of March, I was able to get a sneak preview and short demonstration of the new system.

The adapter, known as the CAN VIM or “Vehicle Interface Module,” is the lower and removable elec­tronic portion of the NGS, and is swapped out with the current VIM when programming a CAN- equipped vehicle. (See photograph 3.)

To use, simply pull out the standard VIM and Service or Diagnostic card, and plug in the CAN VIM and CAN card. (See photograph 4.) Use the standard VIM for programming the standard Ford systems.

From here on, simply plug the DLC into the OBDII port and follow the standard six-step key program­ming procedure used for programming all PATS II- equipped Ford vehicles. (See photograph 5.)

So, what is all this going to cost? A complete NGS XL kit that includes both the standard and CAN VIMs, plus two additional software card updates is around $3,000. For current owners of the NGS, the CAN VIM and software card will run about $600. (See photograph 12.)

For more information on the NGS XL and CAN VIM, contact a Hickok distributor. Tom Seroogy can be contacted at [tgseroogy@hotmail.com](mailto:tgseroogy@hotmail.com).

About the Author: Tom Seroogy is a 20-year locksmith specializing in automotive and access control. He is co-author of "The National Locksmith Guide to Basic Master Keying/' "Saber Tool Company's Guide to Ford Transponder Systems/' "The National Locksmith's Guide to GM Steering Column Service/' as well as BWD's manual series on GM VATS service. Seroogy is the founding editor of The National Locksmith Automobile Association and has been a contributing author to Keynotes, The National Locksmith and Locksmith Ledger. He is author of numerous articles on general locksmithing, access control, basic electronics, general automotive, high-security automotive, keyless remotes, automotive diagnostic tools and techniques, and transponders. Seroogy is an ALOA ACE certified instructor and has taught various locksmith related courses around the country. Seroogy has served on the sales and prod­uct development teams with STRATTEC, BWD (formerly All Lock), and, most recently Lockmasters. He is the founder, developer and former director of Lockmasters' PUREAuto Automotive training program. Seroogy is currently pur­suing a career in forensic/investigative automotive locksmithing. You can con­tact Seroogy at [tgseroogy@hotmail.com](mailto:tgseroogy@hotmail.com).



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The title of this article sounds like a great title for a  
book! That’s because it is the title of a book, an out-  
standing book written by Jerome V. Andrews, CML.  
This book, first copyrighted back in 1990, has been  
used as the course outline for many master keying  
classes, and is a great primer on master keying.  
Jerome’s resume is extensive, from

his BA and graduate studies to his  
time as key records manager for  
Lori and Kaba, to writing for  
Keynotes, and as board member

for ALOA. Most of what I’ve  
seen taught and written about  
pertains to total position pro-  
gression. Some on rotating  
constants, but it’s usually not  
emphasized or listed as an  
advanced concept. Jerome’s  
book explains the differ-  
ences between rotating con-  
stants and total position pro-

gression. Before explaining progressing, he covers how  
to design systems, key coding, the mechanics of mas-  
ter keying and many other important aspects related  
to master keying. Although I felt I had a pretty good  
grasp of total position progression, rotating constants

has always been a little difficult for me to trust my  
skills enough to write about it. I prefer to handwrite  
systems instead of using a computer. The flexibility  
offered by handwriting, and the understanding that  
comes with handwriting a chart, is important. I’ve  
watched others who only use a computer, and they’re

lost if something goes wrong.

Like many of you, I learned master keying in steps  
from several different people, and instructors. Some

Book Review:  
Fundamentals

of what I learned was good, and a lot was not so good.  
The first thing I learned was how to take a plug and  
stick bottom pins and match the change key, and then  
stick the master key in and fill the chambers with  
wafers to the shear line (not so good). Next, I learned  
that a good master key system will never have a cut

common between the master key and  
the change key (not true). In his book,  
Jerome offers a thorough explanation  
of total position progression, and

also rotating constants; he does  
it all in a well-thought-out format.  
He reinforced the good  
I learned many years ago

and corrected a few of my short-  
comings.

Over the years, I started learning  
why the rules originally taught to

me were wrong. I took a few  
classes, read some articles and a

couple of books. Slowly, the lights started to come on,  
and one day, the whole concept of progression using  
total position progression became clear. Fundamentals  
of Master Keying turned the lights on for me regard-  
ing rotating constants. Most of us are taught total  
position progression starting with one chamber, and  
then adding chambers until we have progressed  
through all the chambers. An example is that a five-  
pin progression chart for Schlage will result in 1,024  
theoretical changes. Then we are told if we need fewer  
change keys to “just not progress all the chambers.”

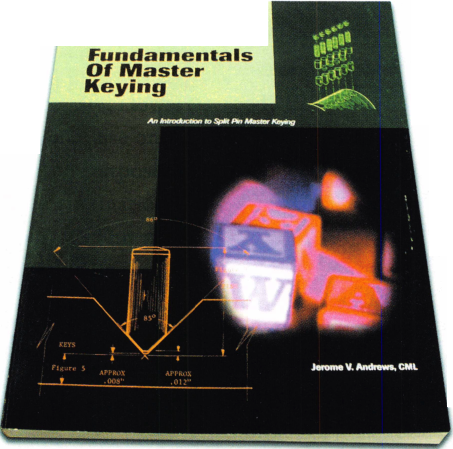
Jerome’s book explains the differences between rotat-  
ing constants, and total position progression. He  
explains that anything less than all the chambers pro-  
gressed is rotating constants. Rotating constants is

Jerome Andrews’ of Master Keying

By Greg Perry, CML, CPS



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simply maintaining one or more of the chambers the same as the top master key, or not progressed. Instead, the location of progressed chambers is rotated. This means at least one position and often two or three of the positions will share the same cut as the master. Once again, another one of those poorly taught or understood concepts on my part, proven wrong.

If both rotating constants and total position progres­sion are acceptable, why not learn one and stick with it? Simple: They both have advantages and disadvan­tages. Rotating constants means fewer master pins or wafers in a lock; fewer master pins mean fewer chances of a stray key from outside the system operat­ing a lock. It also means the lock is more secure against picking. The disadvantage comes in the form of fewer incidental master keys. These are master keys that operate groups of changes within the system. In general, total position progression works better for more complicated systems. Rotating constants will generate more changes within a system, again at the expense of incidental master keys, but if you simply need a two level system, change keys and a master key, it’s the best method. Depending on your needs Jerome explains how to divide the key and create a three-level system with two levels of master keys using rotating concepts.

One more benefit of learning rotating constants is the ability to further progress a system. Occasionally, a customer might need only two or three chambers pro­gressed for their system; later, their needs may grow. If you are not familiar with how to rotate the constants, this could mean a new system, but using rotating con­stants means you’ll have plenty of changes available.

Any book on master keying would not be complete without covering many other topics. Before covering progression methods Jerome explains system struc­ture, key coding systems and record keeping. The mechanics of how a cylinder is master keyed and MACS (or maximum adjacent cut specifications) are well covered. Also, Jerome explains how to design the

top master key. A topic I haven’t seen covered in mag­azine articles that is covered in the Fundamentals of Master Keying is the methods of writing the bitting list. As Jerome points out, this is not the same as the progression chart. The basic difference is that the progression list is all the possible combinations avail­able within a system. The bitting list is all the combi­nations in use. The bitting list may be written in on of the three different formats explained by Jerome. First is the list format; in this form, the combinations are written top-to-bottom, as a list. Standard progression format differs in that the combinations are written in groups of four, assuming o to 9 cut depths and two- step progression. There are then four groups of four, vertically and horizontally totaling 64 combinations on each page. Finally, matrix format is explained. Jerome explains a crossword puzzle is a matrix. Using a matrix is simply a different way of laying out the form. It looks like a graph. The cuts on the key are selected by choosing a cut (or cuts) from the top of the graph, and a second cut (or cuts) from the side; where they intersect on the graph is marked with the standard key code. It works well for many applica­tions. Medeco uses the matrix format of writing the bitting list.

Fundamentals of Master Keying should be not just a required read, but required understanding and compre­hension for anyone involved in master keying. It has changed some of my thinking. I now write systems using rotating constants much more often and look at using rotating constants first instead of handwriting a system using total position progression. Fundamentals of Master Keying is available from the ALOA store, or take Jerome’s master keying class at the convention in Baltimore; the book will be included as the course outline.

About the Author: Greg Perry, CML, CPS, has been in the locksmith industry for 20 years. He's spent half of that time as a field technician for Security Engineering in Ridgecrest, CA. Greg is also a past president of the Desert Counties Chapter of the California Locksmiths Association. He has also won the 2002 and 2003 Keynotes Author of the Year Award. You can e-mail him at [glm- perry@iwvisp.com](mailto:glm-perry@iwvisp.com).

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Welcome to the Associated Locksmiths of America, Inc., an association for persons involved in the security industry as  
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* APPRENTICE MEMBERSHIP Individuals who are in initial train­ing and meet all the requirements for Active Membership except for the length of time in the security industry.
* ALLIED MEMBERSHIP Individuals whose position in the security industry relates to the aims, policies and promotion of the locksmith and his/her craft.

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(PR, VI, Guam]

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* Apprentice Member 80.00

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* Partner □ Employee □ Student

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1. How did you learn locksmithing or security work?

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Sponsors ALOA Number

Please note, if you are sponsored by an ALOA member, your application will be immediately processed with a 90-day probation period. Otherwise, final processing fakes up to 120 days.

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Address

*Name*

*Address*

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I certify that all statements are true and, if accepted as a member, I agree to abide by the rules, regulations, and Bylaws of ALOA, and further agree to  
adopt the Code of Ethics of ALOA as my own, and adhere to it to the best of my ability. Should my membership be discontinued, I agree to return my mem-  
bership card, and cease use of all ALOA insignia.

Signature

Date

Revised 1 2/03



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Arkansas:

A bill taxing the actual service of locksmithing was intro­duced at the last minute in the special session of Arkansas' legislative year. The Bill, AR HI030b was introduced by Assemblyman Boyd. A previous version seeking to tax all services in Arkansas was defeated and HI 030b was quickly formulated to target a few groups. ALOA sprung into action and joined forces with the Pest Control Association (another affected group) to stage a last minute coup. Unfortunately, greed and fiscal irrespon­sibility won out when an amendment to strike locksmiths and pest control workers from the legislation failed by one vote in committee.

New Jersey:

Applications for locksmith licensing began circulating recently. The cost for a license will be $150.00 and fin­gerprinting (currently $68.00) will also be necessary. There is no deadline for when these applications currently are due. In fact, the exact rules and regulations have not even been promulgated yet. When they are received, they will be held until the state finishes processing burglar alarm licenses. At that point, a letter will be automatically sent out, advising the applicant when and where they can get fingerprinted. If you have any questions regarding the legislation, or would like to learn about committee meet­ings, grandfathering or exam exemptions, please visit NJ on the web at [http://www.state.nj.us/lps/ca/nonmed- ical/electrical.htm](http://www.state.nj.us/lps/ca/nonmed-ical/electrical.htm)

You may also call George DeLuca with the licensing board at (973) 504-6410

Mississippi:

Senate Bill 2322 was recently introduced calling for the licensing of anyone involved with the servicing and/or installation of burglar alarm systems. ALOA has closely monitored the situation and made sure that all definitions within the law are beneficial to locksmiths. The law DOES NOT affect a locksmith's ability to install or repair non- monitored systems.

Chapter & Affiliate News:

The Oahu Chapter of ALOA has officially begun! The Chairman's name is Wayne Lockhart. They meet on the first Tuesday of every month at Aloha Lock and Key. For more information please call 1-808-593-91 14 or email them at [alohakey@gte.net](mailto:alohakey@gte.net)



ALOA would like to congratulate John Choko, who was recently named Chairman of the San Diego Chapter of ALOA! John has big plans for growing the membership and instituting a strong educational environ­ment. Please feel free to call him at 1-619-823-0073 for more information.

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minimum of $40. Each ad will run for two issues. For blind boxes there is a $5 charge to members and non-members. All ads must be submitted in writing to the ALOA  
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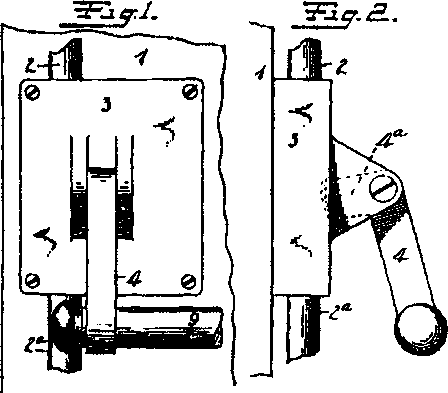
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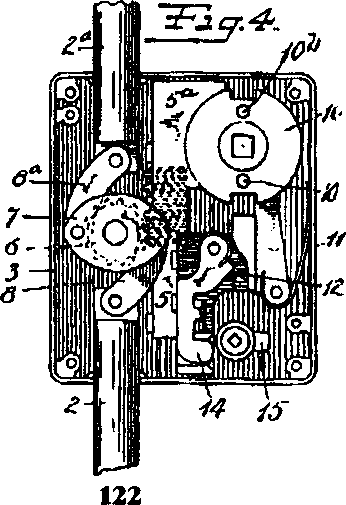
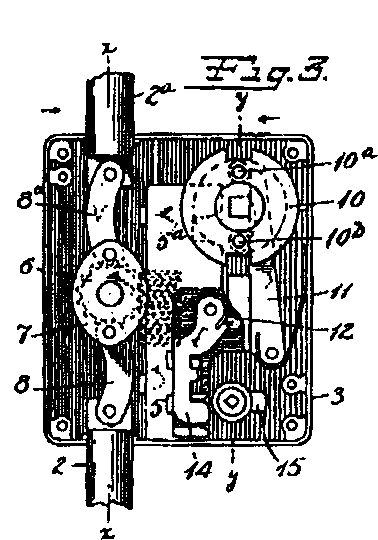
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Mr. Voight undoubtedly was one of the most talented hard­ware inventors in the history of the American builders hardware industry His hardare career started with Russell & Erwin, and ended with Sargent and Co. Almost equally dividing his career between the two companies over a 66-year span, he received over 300 patents. His expertise covered the entire hardware spectrum, from door closers, to exit devices, to cylinders and locksets. His last efforts at Sargent were in the development of their post-WWII “Integralock.”

The following exit door device patent, 983011, dated January 31,1911, was issued while his was employed at Russell & Erwin.

Editor’s Note: Courtesy of The Builders Hardware Industry

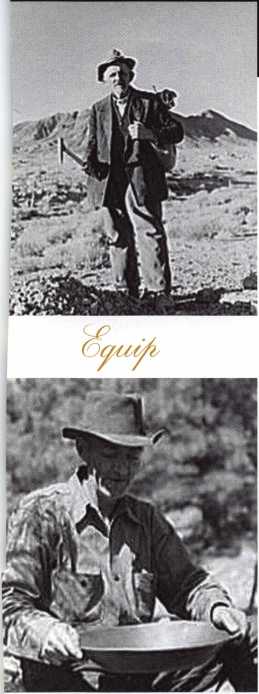


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