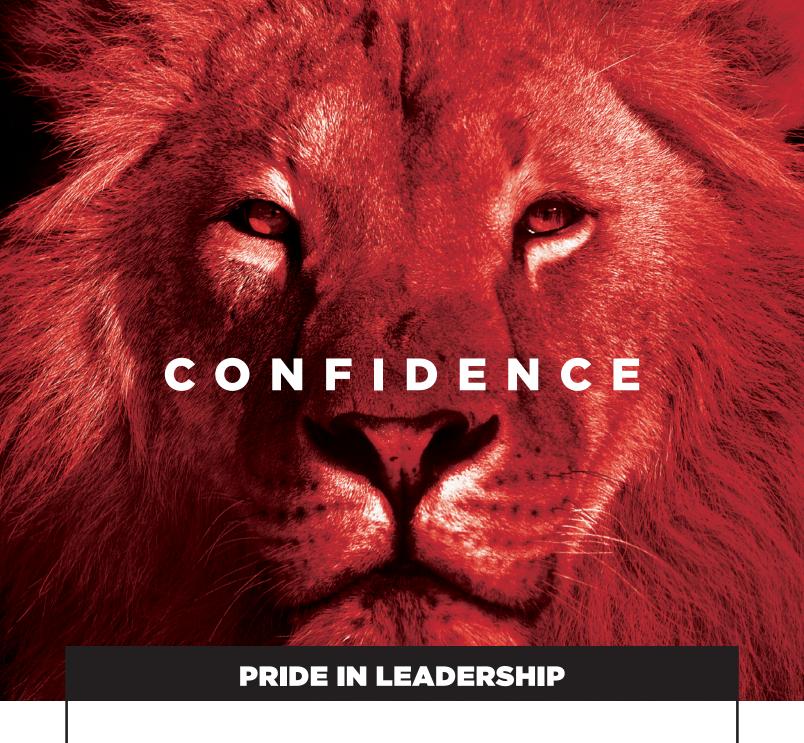
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What Is Physical Security Acumen?

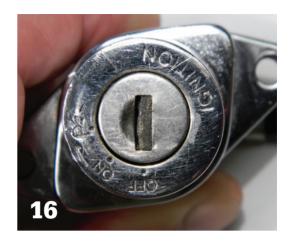
By educating institutional decision makers using physical security acumen, institutional locksmiths can perform better.

Repurposing Push Plates

Tyler J. Thomas, CFDI, CJIL, CMKA, CRL, explains a few ways push plates come in handy on the job.

What Makes an Institutional Locksmith?

Sal Dulcamaro gives insight into this area of locksmithing and how it differs from commercial work.



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Mission Statement: The mission of the ALOA Security Professionals Association, Inc., as dedicated members of the security industry, is to ensure professional excellence and ethics; create a public demand for professional locksmith services; represent and speak for the locksmith industry; and expand the exchange of trade information and knowledge with other security-related organizations to preserve and

enhance the security industry. Policies and Disclaimer: Keynotes is the official publication of the ALOA Security Professionals Association, Inc. (ALOA SPAI). Keynotes does not guarantee the accuracy of any data, claim or opinion obtained or quoted from an acknowledged source. The opinions expressed by the authors do not necessarily reflect the official views of ALOA SPAI. Advertisements and new products or service information does not constitute an endorsement by ALOA SPAI, nor does the Association accept responsibility for the inaccuracy of any data, claim or opinion appearing in this publication due to typographical errors on the part of the authors, Association staff or its agents. ALOA SPAI reserves the right to refuse any article for any reason, and to edit submissions for accuracy, clarity and fairness.

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Plan Your Future and Improve in 2018

HOPE THAT EVERYONE HAS HAD A very merry Christmas and is looking forward to a brand new year full of hope and prosperity.

I would like to encourage each and every one of our members that are reading this to take some time to reflect. Reflect on this past year of business and the industry as a whole. Ask yourself: What direction is our industry headed? What kinds of work are our customer base asking to be done? Do we have the training and equipment to handle these requests, or are we turning work away? If the latter, are there enough requests for this specific type of work to justify making an investment in acquiring the education and equipment needed to perform this type of work? Could we generate enough of this kind of work if we actively sought customers who needed it?

These are just a few questions that are helpful for us to reflect upon. Maybe 2017 was a record-breaking year for you, and you are doing everything exactly right. However I think if we are honest with ourselves, we can always find ways to improve. It's also particularly helpful to keep up with changes and trends within our industry so that we are better prepared to handle the needs of our customers and offer new and improved solutions

to meet these security needs.

I don't think it wise to dwell on and/ or drive yourself crazy thinking about these things. However, I do think it is wise to develop a good strategy for moving forward. Whether you want to grow, sell, downsize or close your business, it's a good idea to develop and a plan and follow it. Don't let things happen to you or become a victim of circumstances. Be proactive and develop a plan for what you want out of your business. Be flexible and willing to change as this industry changes around us, and — above all — be deliberate in your choices and actions.

"Whether you want to grow, sell, downsize or close your business, it's a good idea to develop and a plan and follow it."



No matter if you are in need of some business classes, technical classes or want to keep up with the most current products our industry has to offer, please plan to attend this year's ALOA Convention and Security Expo in National Harbor, MD, just south of Washington, D.C. Also plan on attending this year's SAFETECH in Milwaukee, WI. Both events will be a great benefit to you and your business. Hope to see you there!

For all of those institutional locksmiths among us, tell other institutional 'smiths about AIL (ALOA Institutional Locksmiths). As I finish writing this, I am getting ready to pack and head to Salem, VA, for an AIL board meeting, where we will be working on even more programs and benefits for this segment of our membership.

Best regards,

Jim Wiedman, CML
President
ALOA Security Professionals
Association, Inc.
president@aloa.org

ALOA Membership Benefits You

opportunities for your career and your business. Whatever is in store for you — whether it's furthering your education, expanding into a new service area or getting more vans on the road — we hope 2018 brings you happiness and prosperity.

And, of course, ALOA wants to help you meet all of your goals. As it's January, that means that you've renewed your ALOA SPAI dues. Thank you so much for being a part of this association. We truly want to be of service to our members and give you the most value we can. We are always looking for ways to assist our members and provide services to them. I wanted to take a few moments to remind you of some of the benefits your membership provides for you.

Visibility

Through your membership, you receive a free listing on the FindALocksmith.com website, which we've been updating with a fresh new look and increased function. Aimed at consumers, this website allows users to look for security professionals in their local area. They can search by distance, keyword or services offered, and listings pop up on a map as well as in text for easy location.

For a small fee, you'll soon be able to enhance your listing on the new site as well, giving you a bit more allowed information and prime placement in search results.

In addition to FindALocksmith.com,

we also have a referral service where we will put the public in touch with local professionals when we receive calls. We do all that we can to funnel business to you, our trusted members.

Link to Education

Education is key to security professionals' continual growth, and we want to help you achieve it. Through our two main yearly conferences — the ALOA Convention & Security Expo and SAFETECH — we provide you with world-class handson education through the industry's most trusted instructors. We additionally hold many other classes regionally and locally throughout the U.S., and this year we're also holding an IAIL forensics conference in October

Our Education Department is always adding new classes as well as finding ways to make education more attainable for our members, such as adding video instruction and home-based testing for the PRP exam. For the most recent updates or for suggestions, please email education@ALOA.org.

Keep Informed

Not only do we provide you with news via the very *Keynotes* magazine you're reading now, but we also bring to you our weekly electronic newsletter packed with industry information and ALOA updates. To ensure you receive it each week, please contact membership@ALOA.org to ensure your email address on file is up-to-date. Don't miss out!



The Right Sources

We know that finding the right sources for your business is essential; you want to purchase from the most trusted partners. That's why we bring to you the Ultimate Guide for Security Professionals, located online at www.ultimateguideforsecurityprofessionals.com. On this useful site, you can find listings for nearly any category of product that your business might need. From door hardware and key machines to vehicles, access control products and tools and supplies, it's all there.

These are but a small sampling of the many member benefits we supply. Be sure to take advantage of everything that's available to you! If you have any questions or suggestions about what you'd like to see, we're always here and listening; please contact membership@ALOA. org. We'd love to hear from you.

Mary A. May

Mary A. May

Executive Director

mary@aloa.org



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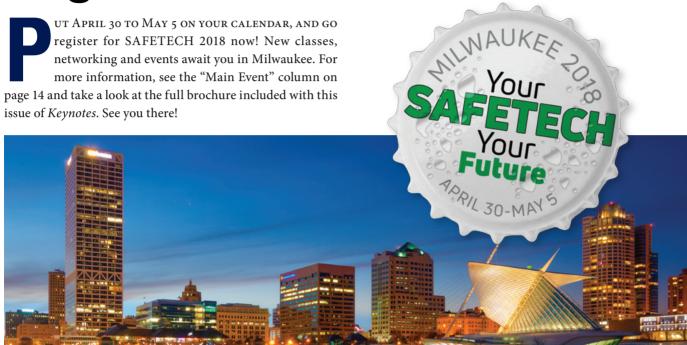
For complete application list, visit: aftermarket.strattec.com

PRODUCT DESCRIPTION	SSC#	BUTTONS	APPLICATIONS
3 Button Toyota Remote (315 MHZ)	5931638	L, U, P	1999-09 Toyota 4 Runner
		L, U, F	2000-05 Toyota Celica
4 Putton Toyota Pamata (215 MHZ)	5931639	L, U, TG, P	1999-09 Toyota 4 Runner
4 Button Toyota Remote (315 MHZ)			2003-07 Toyota Sequoia
4 Putton Toyota Pamata (215 MHZ)	5931641	L, U, T, P	2003-08 Pontiac Vibe
4 Button Toyota Remote (315 MHZ)			2002-06 Toyota Camry
2 Dutten Niccon / Infiniti Demote (215 MHZ)	5931636	L, U, P	2003-07 Infiniti FX35/45
3 Button Nissan / Infiniti Remote (315 MHZ)			2002-03 Infiniti QX4
4 Button Nissan / Infiniti Remote (315 MHZ)	5931642	L, U, T, P	2003-05 Infiniti G35
			2002-04 Infiniti I35
4 Button Nissan / Infiniti Remote (315 MHZ)	5931643	L, U, T, P	2007-08 Infiniti G35
4 Button Nissan / Infiniti Remote (315 MHZ)			2003-13 Infiniti G37
4 Dutton Culpani, Dometa (215 MLIZ)	5931637		1999-04 Subaru Forester
4 Button Subaru Remote (315 MHZ)		L, U, T, P	1999-04 Subaru Impreza



What's New

Register for SAFETECH 2018



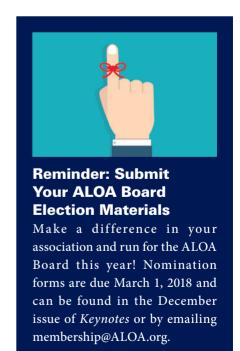
Schlage Announces Sense Smart Deadbolt Integration With Amazon Alexa

has enabled integration of the Schlage Sense Smart Deadbolt with Amazon Alexa. End users can now use Alexa-enabled devices — such as the Amazon Echo or Echo Plus — or the Alexa app to verbally lock or check the status of their front door. Users can also enable functions such as creating a "good night" routine that will automatically lock the door and turn lights off.

The Schlage Sense WiFi Adapter acts as

the connecting link between the lock and Alexa, eliminating the need to purchase a central hub. The adapter provides added functionality, such as allowing consumers to access their locks from anywhere in the world, directly through the free Schlage Sense app, which is available in the Apple App Store and in the Google Play store.

The Schlage Sense Smart Deadbolt is available in a variety of finishes, including Matte Black, Satin Nickel and Aged Bronze.



NEWS BRIEFS

Allegion has launched Overtur, a new cloud-based platform for the design and specification of door hardware. Overtur includes a suite of tools designed to improve efficiency, accuracy and collaboration for the door hardware specification process. The platform allows architects to upload door data, schedules and plans directly from Revit to

Overtur, where all stakeholders can review designs, floor plans, hardware sets and product data online. The program tracks all changes to the hardware set throughout the project. Users can view a list of doors that were modified during a specific timeframe by product type or hardware changes to the door schedule.

PRODUCT BRIEFS

Framon's desktop software Genericode is now available as a web-based subscription called Gcode Online. Gcode allows users to access the full database of Genericode software using any Internet or data connection without the need to download or update. Users can search by year, make and model for

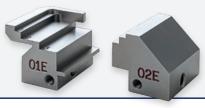




vehicles and motorcycles to access the cutting information needed.

The program supports all popular code machines, including HPC, Framon, IIco, ITL, Laser Key Products, A-1 and Curtis. There is a dedicated section for high security keys and information for keys such as utility, padlock, Illinois/Chicago double sided and antique keys. For more information, visit www.gcodeonline.com.

Pro and Futura Pro One. The kit and software will allow engraving of a variety of metal and aluminum keys, small medallions and plates using special jaws. The software includes more than 220 default user templates (models) and identifies the areas for inserting text. The User Model Editor allows the user to customize an existing template to create new templates. The free software will automatically load when an update is performed.



Yale Commercial, an ASSA ABLOY group company, is offering an A-ALR Emergency Exit Option for 6000 Series Exit Devices, which is suitable for commercial applications concerned with loss prevention, including retail, hospitality and more. The 6000 Series Exit Device with A-ALR emergency exit option has an aluminum rail design with ANSI/BHMA Grade 1 certification. The built-in alarm is powered by a 9V battery and sounds at 90 dB at 10 feet from the device. A complete range of Yale exit device trim is available. Other features include several alarm modes, low battery warning, tamper resistance and a red LED indicator to clearly display that the device is armed.



• 0

Medeco Security Locks, a division of ASSA ABLOY N.A., has introduced the new MedecoB Small Format Interchangeable Core (SFIC) as an affordable alternative for end users using industry-standard unpatented SFIC keyways. MedecoB is available in the following 27 industry standard keyways: 1C, 1D, AB, BB, CB, DB, EB, FB, GB, HB, JB, KB, LB, MB, QB, RB, TA, TB, TC, TD, TE, WA, WB, WC, WG, WH and WY. This new option allows the user to choose from Medeco^b cylinders that are compatible with popular keyways such as A through R, T, W, 1C and 1D. The product is available in standard 6- and 7-pin format, and the reinforced sleeve design provides added strength and durability. The cores are plain-faced and available in 14 architectural finishes.



CALIFORNIA

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Liad Sasson, 7 Locksmith

San Jose

Moshe Almasi, 5 Star Locksmith

FLORIDA

DeLeon Springs

Randall B. Boyer, Boyers Lock &

Sponsor: Randall L. Boyer, CML, CPS

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These applicants are scheduled for clearance as members of ALOA. The names are published for member review and for comment within 30 days of this *Keynotes* issue date, respectively, to ensure applicants meet the standards of ALOA's Code of Ethics. Protests, if any, must be addressed to the ALOA membership department, signed and submitted via e-mail to membership@aloa.org or via fax to 214-819-9736.

We Need Your Help

Attention, ALOA members: Help us eliminate the ongoing industry problem of scammers by screening the new applicants listed on these pages. If you have questions or concerns about any of the applicants, please contact Kevin Wesley, membership manager, at (214) 819-9733, ext. 219, or email kevin@aloa.org.

CALENDAR

For a complete calendar of events, visit www.aloa.org.

JANUARY 2018

January 9

CLL TESTING

Second Tuesday each month at LLSSA 208 W. Gloria Switch Rd., 112

Lafayette, LA 70507 education@aloa.org or (800) 532-2562, ext. 101

January 14

PRP Test Sitting at the Penn-Ohio Locksmith Assoc.

Ramada Canton/Hall of Fame North Canton, OH Contact Bill Mandlebaum at brasskey@woh.rr.com or (419) 352-9119

FEBRUARY

February 5-10

Six-Day Basic Locksmithing

ALOA Training Center Dallas, TX education@aloa.org or (800) 532- 2562, ext. 101

MARCH

March 18

PRP Test Sitting at IDN Hardware Sales

Holiday Inn-Cleveland South Independence, OH Contact Bill Mandlebaum at brasskey@woh.rr.com or (419) 352-9119

March 22

Classes at HL Flake:

Life Safety Codes - Demont Advanced Shop Management

- Demont

Comprehensive Safe Servicing

- Woodyear

Pro Picking Techniques – Woodyear Contact Linda Payne at Linda.payne@hlflake.com or (800) 231-4105

APRIL

April 30-May 5

SAFETECH 2018

Hyatt Regency Milwaukee 333 West Kilbourn Avenue Milwaukee, WI 53203 conventions@aloa.org or (800) 532-2562, ext. 240

MAY

May 14-19

Six-Day Basic Locksmithing

ALOA Training Center
Dallas, TX
education@aloa.org or

(800) 532-2562, ext. 101

JULY

July 8-14

2018 ALOA Convention & Security Expo

Gaylord National Harbor 201 Waterfront Street National Harbor, MD 20745 conventions@aloa.org or (800) 532-2562, ext. 240

OCTOBER

October 1-6

Six-Day Basic Locksmithing

ALOA Training Center Dallas, TX education@aloa.org or (800) 532- 2562, ext. 101

DECEMBER

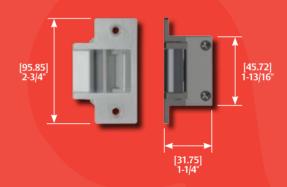
December 3-8

Six-Day Basic Locksmithing

ALOA Training Center Dallas, TX education@aloa.org or (800) 532- 2562, ext. 101



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THE TOTAL ASSOCIATION AND THE TOTAL ASSOCIATION ASSOCIATION AND THE TOTAL ASSOCIATION ASSOCIATION

Gearing Up for This Year's Conference

Division President Tom Resciniti Demont provides information about IAIL and the 2018 Forensics Conference.

HAT IS THE IAIL? THE INTERNATIONAL ASSOCIATION OF Investigative Locksmiths was established to follow the principles of forensic science in lock investigation. It was founded in 1999 by Lieutenant James Glazier (retired) of the Montgomery County Police Department and Don Shiles, chief instructor at the U.S. Army 902nd Military Intelligence School in Ft. Meade, MD.

Each member, by their acceptance of membership in the International Association of Investigative Locksmiths, shall subscribe to the following code of ethics:

- 1. To pursue their professional work in the spirit of fairness to their clients, with fidelity to security in conformance with appropriateness, and with high ideals of personal honor.
- 2. To properly and impartially analyze and examine all material that is entrusted to their custody.
- 3. To conduct themselves in a dignified manner at all times, and to avoid using any improper or questionable methods of soliciting professional work.
- 4. To refrain from associating themselves with or allowing the use of their name by any enterprise of questionable character, or in any manner countenancing misrepresentation.
- 5. To cooperate with other investigate locksmiths through the interchange of general information and experience.
- 6. To cooperate with local law enforcement officials and insurance investigators in all matters relating to the cases that they are working on, and to diligently pursue the education of the consumer in relation to their security.
- 7. To encourage and promote loyalty for the investigative locksmith profession and interest themselves in public welfare, always ready to apply their special knowledge, skill and training to enhance the security of the public.
- 8. To consistently abide by all applicable licensing and business regulations.

 All members of IAIL must also follow and abide by the ALOA SPAI code of ethics.

 The Certified Forensic Locksmith (CFL) exams have been rewritten and are now available to be taken by qualified personnel. You can hold multiple CFL certificates.

 The exams available now are CFL-General Forensics and CFL-Safes and Vaults,

CFL-Automotive and CFL-Architectural Fire Door Assembly. There are two areas that attorneys look at for expert witnesses: credentials and certificates. More is better! Complete your ALOA PRP credentials and start on your CFL credential today. Big news coming up in the next paragraph!

Mark your calendars for the IAIL Forensics Conference, October 18-21, 2018 in Dallas, TX, at ALOA's Aaron M. Fish Security Training Center. We'll have three to four different forensic classes per day for three full days to fulfill your requirements and then you can sit for the CFL exam! When you pay your ALOA or SAVTA dues, just check off the IAIL dues, and for \$50 annually, we can open up a new world of forensic locksmithing for you. Don't forget about this great offer and consider an IAIL lifetime membership! At \$500, it's a bargain. Start the year off with a purpose.

If you have any questions please send me an e-mail at IAILPresident@ALOA.ORG ®



Tom Resciniti Demont, AHC, CAI, CFDI, CFL, CMIL, CML, CMST, ICML, IFDI, LSFDI, ARL, President, International Association of Investigative Locksmiths,

IAILPresident@aloa.org.

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IAIL members: Submit your articles for the Investigative Spotlight department. Send your information to Ross Squire at ross@abcforensic.com.

10th

Anniversary

COMPANY



Only The Best

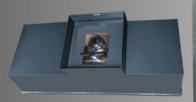
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Milwaukee has many nightlife options, including several area casinos, and who can forget the many craft breweries that the city is known for? If you're not a beer

fan, try the local specialty Bloody Marys, which are often outrageously garnished with anything from mini burgers or sushi to lobster claws and a whole chicken (we're not kidding).

Education

The focus of SAFETECH is education, and you'll receive world-class training there. Experience hands-on learning that you won't get anywhere else, in classes taught by the industry's best.

We have a few new classes for you this year. For your convenience, there are two sessions available for the two-day class Mechanical Key Lock Decoding, Theory & Practice, taught by St. John Goldfingle and Edvard Middelthon. In this class, students will learn how to decode high-security safe locks. This hands-on class will cover several high-security locks and the tools you'll need for decoding. Also offered for the first time is Machine Shop Fundamentals - Vertical Mill Machine, taught by Dan Billheimer, CPS. In this class, you'll augment your machine shop skills to include the vertical mill. This handy skill allows you to create a special-length bolt for your safe lock instead of special-ordering it. This class will include the basics, such as





climb milling, conventional milling, picking up edges and centers, indicating your vise in and other basic operations.

In addition to those new classes, SAFETECH also has all of your favorite fundamental and advanced sessions. Get prepared for your Certified Forensic Locksmith (CFL) exam by taking Forensics for the Safe Tech I & II, or learn a new skill with Safe Lock Embellishing. Want to brush up on skills before the Manipulation Contest? Take SAFETECH favorites: Basic Group 2 Combination Lock Manipulation and Advanced Combination Lock Manipulation.

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SAFETECH has some of the best events in the industry for fun, business and networking. Find new tools and equipment at the Swap Meet and Friends of SAVTA Live Auction. Catch up with old



ALOA2018

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friends and get to know new attendees at the Kick-Off Party Friday night, where you can also network with suppliers. Be sure to make plans to stay for Saturday's tradeshow, where you can learn about new products and develop new relationships with manufacturers and distributors. Then take a break to try your hand at the Harry C. Miller Manipulation Contest, or watch to see if anyone will beat Scott Gray, CPS, or Roy Watters, CPS, CRL, this year.

Hotel

This year's SAFETECH is being held at the Hyatt Regency Milwaukee, a sophisticated hotel located close to the Milwaukee River and near an abundance of nightlife and restaurants. Rates are \$120 plus tax per night. Make your reservations before the cutoff date of April 5 to ensure you get a room at this special rate. ®

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SAFETECH

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Hyatt Regency Milwaukee 333 W. Kilbourn Ave Milwaukee, WI 53203 888-421-1442 Rate: \$120/night Hotel Reservation Deadline: April 5

Hotel Reservation Deadline: April 5 Group Code: SAVTA or SAFETECH

Registration

Go to SAVTA.org to register, or

Questions?

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2006 Triumph Speedmaster

Robert Sieveking, RL, ACE, discusses how to make a key for the 2006 and up Triumph Speedmaster using the easiest method.

omething new comes in the door every day. The owner of the bike had removed the ignition cylinder and brought it in to have a key made. I didn't have access to the bike, so this article is built around the ignition cylinder alone. Because of the location of the ignition on the bike, it probably wasn't difficult to remove. For most locksmiths who use the "sight reading" technique, this would have been a rather short job. Read the cylinder and make the key. I hope you enjoy this article. Read 'em and reap.

The current Triumph motorcycles have introduced a new keyway. This will be published in the 12th edition of the "Fast Facts" auto key guide with the new Jet key number (Jet introduced this key in 2017). The TMC-3 key fits the: America 2002-05, America & America LT 2006+, Bonneville & Bonneville T100 2006+, Scrambler 2006+, Speedmaster 2003-05 & 2006+, Thruxton 2004-05, Thruxton-900 2006+ and Thunderbird & Thunderbird Storm/Nightstorm 2010+. This article will address key making procedures for these bikes.

Bikes prior to 2005 may use an alternate keyway, interchangeably. They will use the earlier code series (C8001-C9000). Be aware of this when fitting the key. The alternate key is a modified KA29 (Jet).

Locksets are Minda Huf products manufactured in India. Cylinders are "convenience" configuration. This simply means that all wafer bittings will be found on one side of the keyway. The key is double-sided for convenience. There are three depths in this seven-position cylinder. We will be code cutting the key on an HPC 1200CM code machine. The code is only found on the stamped aluminum tag that accompanies the original keys.

The ignition cylinder, shown in *Figure 1*, is mounted below the seat at the left side of the bike. This cylinder will contain wafers in positions 1,2,3,4,5,6 and 7. The ignition cylinder is shoulder gauged. The cylinder is convenience. Wafers will be found on only one side of the keyway. Wafers will be found at the forward side of the keyway shown in the photo. The ignition cylinder controls the electrical power. Right rotation of the cylinder

powers the bike. A push-down function of the cylinder allows the key to be rotated one stop further, to the parking lights position, and removed.

Getting Started

The first step in any automotive or motorcycle key making assignment is to find specific information for the vehicle. The Triumph Speedmaster was located in the "Fast Facts" motorcycle index. The index identifies Key Plate TR02 (*Figure 2*), as the correct plate to use for this bike. All of the necessary key making information will be found here.

From the "Fast Facts" Key Plate, we find:

Code Series: 3001-4006 (the series

has no letter prefix)

Published Codes: InstaCode program Keys: TMC-3 (JET) Key is Gauged: Shoulder Gauged

#	Space	#	Depth
1-	.169	1-	.278
2-	.268	2-	.250
3-	.366	3-	.222
4-	.465		
5-	.563		
6-	.661		
7-	.760	step increr	ment is: .028
	5	spacing is: .	0985 cut-to-cut

Using a Framon #2?

Cut a key using these dimensions and space block #5.

Tip Gauge using the Ford clip

Tumbler Locations

Ignition: 7 wafers 1 2 3 4 5 6 7 Gas: unknown

Key Making:

Read the Ignition, to make the key. No codes found.

Alt: Read or impression cylinder carefully.

Other important key making informa-

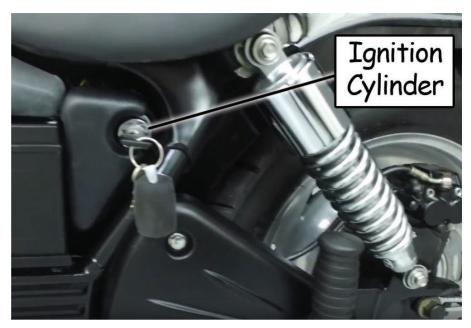


Figure 1. The ignition cylinder is mounted below the seat at the left side of the bike.

Triumph	ma	any models			0	2+ TR02
1200 CM G-Keys ITL# unkno Gauge tip	nicro. Card - DSD# India	codes 3001-400 Baxter - NL:HPC - Reed -	6	2		Tacco
Curt -		other Instacode			_	
Curt: -		-	S & D	0	-	Ilco TMC-3 (Jet)
Fr:S-B-I	.0985	5 .028	.169	1	.278	EZ
Manufactured in India, MINDA-Huf Ignition contains all tumblers. All tumblers at one side of keyway. (Convenience) Shouldered key is "TIP" gauged. 1200CM? use red			.268	2	.250	Tay
			.366	3	.222	B&S
			. 100	4		Bör
			.563	5		Curt
tip stop. Framon? use Ford Tip Gauge.		.661	6		SIL	
Code on Key Tag only. No Codes on bike. Read or			r .760	7		ign. 1234567
impression carefully.		TIP G.	8		M gas B hel.	

Figure 2. The "Fast Facts" motorcycle index identifies Key Plate TR02 as the correct plate to use for the Triumph Speedmaster.

tion is found on this Key Plate, but the above is the most important, along with the key making suggestions in the lower left corner of the plate. Most important is: "read or impression carefully."

The face of the ignition cylinder is shown in *Figure 3*. This is a three-position ignition. The positions are: off, on and parking lights. The key is removable in the off and parking lights positions. To access the parking lights position, the ignition is pushed inward and rotated right.

Figure 4 shows the rear of the ignition



Figure 3. Shown in this photo is the face of the ignition cylinder.

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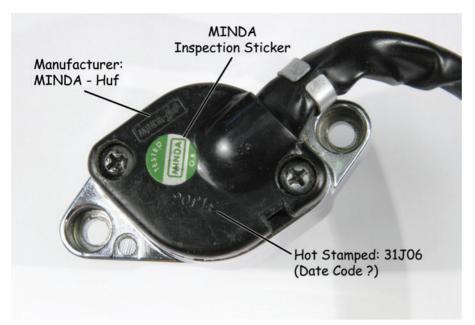


Figure 4. This image shows the rear of the ignition switch.

switch. This ignition could be further disassembled, but it's unnecessary. The manufacturer's mark is shown. This ignition was manufactured by Minda Huf, an Indian manufacturer, and the inspection sticker repeats the Minda label. The ignition is also stamped with "31J06." This is most probably a manufacturing date; it is not a key code.

The spring dust shutter is shown in *Figure 5*. This dust shutter was blocked open when the ignition was received at the shop, which made reading easy. A little spray oil and a bit of gentle coaxing freed it to close, as you can see in the photo.

Figure 6 shows the keyway. Major wards at the upper right and lower left define the key blade (left over right). This keyway did not show any minor warding, and close inspection did not find any remnants of worn minor wards in this keyway.

Figure 7 shows a photo and graphic representation of the keyway. Major wards at the upper right and lower left corners of the keyway make this a "left over right" key configuration. Minor wards were not

found. The first wafer in the cylinder photographed was a #3 depth.

The key bittings illustrate the relative positions of the wafers in this keyway. Wafers are shown with the cylinder in the locked (or key pull) position. This cylinder is not picked. A #1 depth wafer will rest at the height of the top of the major ward (This is the shallowest cut in the key). A #2 depth wafer will rest .028" above the top of the major ward. A #3 depth wafer will rest decidedly higher than the top of the major ward (.056" higher) A #3 depth is the deepest cut in the key. There are only three depths in this key configuration, which makes reading the relative heights of the bittings in the keyway easier than most.

The actual process of reading the wafer bittings is covered in-depth and exhaustively defined in "The National Locksmith Guide to Advanced Wafer Lock Reading."

A dust shutter tool is used to hold the dust shutter open, and the Universal Wafer Lock Reader tool is used to depress and read the various wafer bittings, from the front of the cylinder to the rear of the cylinder. An otoscope or lighted magni-



Figure 5. This dust shutter was blocked open when the ignition was received at the shop, which made reading easy.



Figure 6. This photo shows the keyway.

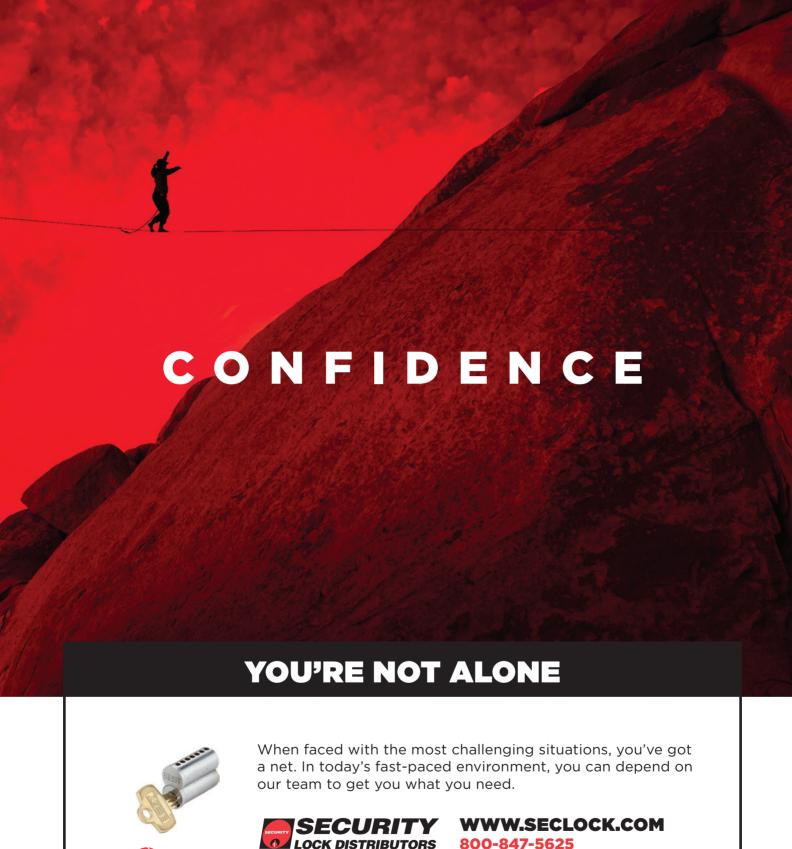
fier is used to illuminate and view the wafer bittings in the keyway. The Universal Wafer Lock Reader tool is the same tool we use on automotive, desk, cabinet and ...motorcycle cylinders.

There is nothing new about reading these cylinders. There are, however, four basic rules of wafer lock reading that will make your job easier.

They are:

- 1. Always read the lock in the key pull position (not picked).
- 2. Read the cylinder from front to back. Read the wafers from front to back to avoid accidentally picking a wafer. A wafer that is picked or hangs at the shear line will not read correctly.
- 3. Position your eye directly in front of and centered on the keyway. This will avoid parallax errors in reading.
- 4. Position the light of your otoscope or lighted magnifier above the wafers being read. This simply means that the light source should be on the opposite side of the keyway as the wafers being read.

It is only necessary to cut one side of the key to operate this cylinder. When a satisfactory key has been generated and





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confirmed (tested) to be correct, duplicate the working key onto both sides of a second blank, and then use the second key as a pattern to cut the second side of the first blank.

The process of creating this key should require only 15 to 20 minutes. No disassembly, cylinder removal or impression techniques are required. No keyway-specific reader tools are needed. If there is a faster or easier way of making this key, I have not seen it. Reading wafer lock cylinders is a skill that requires a bit of specific knowledge and some practice, but it is a skill that all professional locksmiths should cultivate.

Figure 8 shows the completed key for this motorcycle. The bitting reads: 3 2 3 1 1 3 2 (bow to tip). There are seven positions in this configuration. The spacing is defined as tip gauged in the code series, but the cuts are listed bow to tip.

If you will be making this key with a hand file, you will notice that the #3 depth cut very nearly touches the offset at the base of the bitting portion of the key blade. A #1 depth cut is very nearly the full width of the blank. A #2 depth cut is halfway between the #1 and #3 depth of cut. Hand cutting this key should not be difficult. Cut spacing can easily be determined by blacking the edge of the key with a Sharpie marker. Insert the blackened key into the cylinder and exercise the key (left and right rotation) in the keyway. This will mark the wafer positions.

Figure 9 shows the 1200CM code card used to generate this key. In an abbreviated fashion, it gives the same information found in the Fast Facts Key Plate. Depths and spaces are given to check the finished key for dimensional accuracy. The Jet TMC-3 key is given as the work key and a representation of the keyway is shown. The keyway illustration shows an approximation of the wafer bitting heights, for reading purposes.

"The process of creating this key should require only 15 to 20 minutes."

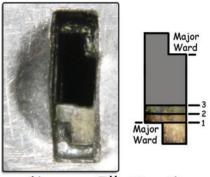
If you would like a copy of this card, drop me an email at bob@sieveking-prodco.com. I'll be happy to send you a PDF copy for your personal use. Include your name, shop name and physical address. If locksmith licensing is required in your state, include your locksmith license number. Be sure to let me know if you found this article helpful.

The Triumph ignition cylinder was a pleasure to service and should pose no special challenges for the professional locksmith. Read 'em and reap.



Robert Sieveking is an RL & ACE Instructor. But he prefers the very simple title "locksmith." Formerly Senior Technical Writer, Technical Editor

and then Contributing Editor of The National Locksmith. Robert has authored many instructional books in the locksmith industry. He is the author of "Fast Facts," the encyclopedic reference to auto and motorcycle key making. "Fast Facts" was awarded the "Best New Product in Print" by ALOA in 1998. He began locksmithing in 1974 and continues to operate a full-time licensed professional locksmith business in Rockford, IL. He has invented many tools for the locksmith trade and continues to manufacture tools and books under the trade name Sieveking Products Company. You can reach him at bob@sievekingprodco.com or (815) 985-5663.



Keyway Illustration

Figure 7. Major wards at the upper right and lower left corners of the keyway make this a "left over right" key configuration.

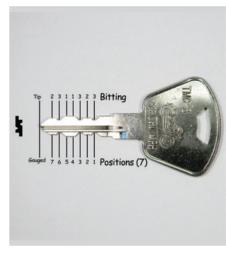


Figure 8. This photo shows the completed key for this motorcycle.

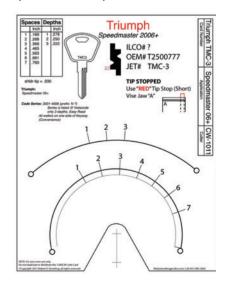


Figure 9. Depicted in this image is the 1200CM code card used to generate the key.







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Inviting and Conducting a Stellar Interview

Katelyn Radtke explains how to save future heartache and liability through the hiring process.

he hiring process can be incredibly stressful. In the security industry, many owners are also working inside the business, which brings added challenges to the hiring debacle. Often, a new hire is needed to fill a current operational void or to meet the demands of your customers, and if you are also working in your business, chances are you yourself are extra busy as well!

The process of writing, publishing and monitoring the success of an advertisement for

an open position can be grueling. When you are ready to interview a prospective hire, you are already incredibly invested in the person and process because of how valuable your time is. It is important that the process flow as efficiently as possible. In this article, you'll find a few helpful hints to help make sure that your interviews are worth your effort and lead to a hireable candidate.

Review Applications Carefully

One of the most important steps in the hiring process is filtering through your applicants and selecting those who will enter the interview phase. When reading resumes and reviewing applications, be sure that your applicant displays an appropriate level of experience. Review your original advertisement to remember exactly what you have asked for in applicants. Make notes about experience,

specific technical knowledge or skills and any questions you may have. Keeping a Google or Excel Sheet may be a helpful way to organize these notes.

Look out for gaps in employment that may merit an explanation, any brief stints of employment and any consistencies, such as six months spent at every job, or working for all the other local companies in your area. These may be red flags, or at least worth a conversation.

Be aware of spelling and grammatical errors, quality handwriting and the ability to follow instructions. If you asked for the submission of particular materials, pay special attention to how those directions were followed. If you are having to ask for the same thing repeatedly, it could be an indicator of communication issues or an inability to follow instructions. You will have to use your best judgment to determine whether it is a simple oversight or a symptom of a larger problem.

Communicate Diversely

If the applicant submitted his or her information via email, you may want to consider calling and asking any specific questions you have about their resume. This gives you an idea of how they communicate on a different medium. If your technicians are required to text, email and call their customers and coworkers, you will want to get an idea of the applicant's comfort in these areas. If a person seems like a great fit but is not comfortable texting or using phone apps when your business is completely reliant on these resources, you'll run into problems almost immediately! (If this is the case, it's beneficial to include this as a requirement in your initial advertisement.)

Set Up for Success

Do not feel pressured to conduct the interview at your business location. It may be in everyone's best interest to conduct "As you transition the individual from applicant to new hire, it's critical to his or her success that you create some sort of training plan."

the interview in a neutral public place. A coffee shop can work wonderfully. This way, you can have a semi-private conversation away from any distractions, and you don't have to have your first meeting behind the scenes of your business.

Prior to the interview, be sure to confirm the date, time and location with your applicant. It is best to confirm via email so that all the details are in writing and mutually agreed upon. This will avoid confusion and any potential mishaps. Time is precious, so it is best to be very clear with your expectations. It may also be helpful to tell the applicants the anticipated length of the interview and encourage them to bring any questions with them that day.

Come Prepared

Prepare any necessary documents and carry them in some sort of folder. It may be useful to bring a printed copy of the original job advertisement to refer to throughout the interview. Make sure you have the basics: your own business card, a pen and the applicant's information. Other helpful documents to have on hand may include a leaflet on your company, a consent form for a background and/or driving history check and a list of relevant questions.

Be sure that your own phone is silent and that you are available to your interviewee as planned. This is also their first impression of you — and maybe your company as well.

Schedule a Second Interview

A second interview is always a great idea. At the very least, this gives the applicant another opportunity to show up at the promised time ready to be successful. The second interview can be held at your business location and may involve another member of your staff. It can be beneficial to have the person who will be directly responsible for the new hire participate in the second interview to offer his or her insight. It's definitely useful to have a second person involved in the conversation. They may contribute certain questions or raise concerns that did not stand out to you immediately. Having an informed person to help you discuss various applicants and compare strengths can be incredibly helpful. Of course, you will want to make sure this person is wellintentioned and that you trust his input.

Many security companies will also have an applicant complete a hands-on assessment. This might include some sort of written test of locksmith knowledge, the removal and re-installation of door hardware at your site or the master-keying of a lock. This can be beneficial to guage the level of training that may be required for the new hire. It is always a good idea to confirm that they are as knowledgeable as they claim.

Professional Honesty

Nobody likes to waste time. If you are 10 minutes into your questions and conversation, and you are completely certain you will not be able to offer someone a position, try to wrap up the interview in an appropriate and modest way. If you are

23

able and interested in continuing your conversation, go for it. However, if you are noticing red flags and serious concerns, do not feel pressure to go through every single one of the questions that you would ask a viable candidate. If they vocalize a desired pay rate that you are not able to meet, it may be appropriate to share that with them right on the spot, unless you are willing to review your hiring budget and consider further extending yourself. Be clear about the position and its compensation and benefits. One of the worst things you can do to a new hire is mislead them. If it is not a promotable position, be honest with the applicant.

Professional honesty provides the foundation for a great working relationship. Even if you know you will not be hiring a candidate, it can be beneficial to get to know them a bit. After all, they may end up working for a competitor, attending local trainings or reapplying in the future.

Lessen Liability

Running some sort of background check can decrease liability in the future. Given the sensitive nature of the security industry, it's best to rule out any serious indiscretions on top prospects' records. If your state requires a locksmith license, this is something to ask for. You can easily research online to learn if it's current or has any pending disciplinary actions. The same thing goes for driver's licenses. Just because the applicant provides the number to their license, it does not mean that it is current, valid or free and clear.

Moving Onward and Upward

As you eliminate prospective hires and zoom in on your top prospects, it's proper etiquette to reach out to folks and let them know that you are moving in a different direction. This can be simply done via email, but it's most definitely a best

"If you asked for the submission of particular materials, pay special attention to how those directions were followed."

practice to inform applicants of their status. This helps make for an efficient hiring process and will prevent prospects from showing up at your storefront to follow up, leaving messages or engaging in awkward conversations as you try to recall who exactly they are. It is best to communicate with folks as you are making decisions, rather than waiting and assuming that they will not follow up with you.

Don't be afraid to retain quality applications in the event you receive more qualified applicants than you have space for. Letting these folks know that you will hold onto their information until a position becomes available, leaves the door open for you to reach out in the future rather than leaving them to feel under-qualified. Be sure you save their information and follow through on this task as well.

Make a Formal Offer

A formal offer is the final step in the hiring process and should not be overlooked. This can be a one-page sheet that contains the job title, description, start date, benefits and compensation — with a spot for the new hire and owner to both sign. This can be helpful if a prospect needs to discuss the opportunity with a spouse or family or needs some time to review the offer and make a sound decision. Be

sure to include any probationary periods, trainings or the like. Keep in mind that the applicant may be comparing several offers, so it's appropriate to include the various benefits of employment with your company. It's always preferred that an applicant take a moment to commit rather than agree quickly and quit after a few weeks.

Follow Through

As you transition the individual from applicant to new hire, it's critical to his or her success that you create some sort of training plan. Even experienced locksmiths and contractors will need to learn how your company drafts invoices and structures pricing. To accomplish lucrative independence, these things should be discussed as early as possible. The prospect may also benefit from learning about specific, frequent customers and practicing certain installs to ensure your company's standard is met. Be sure to introduce new hires to their direct supervisors and remind them of their chain of command.

As you probably already know, once an applicant is hired, the journey is just beginning. Though hiring sometimes can feel like the end of the race, the finish line often looks like successful employee retention — which may be a year or so down the road! Completing due diligence in the hiring process may improve both retention rates and company profits.



Katelyn Lucas Radtke is

a fourth-generation security professional based in the San Francisco Bay area. She is an expert contributor to *Blackhawk*

Living Magazine and lead contributor to Give-A-Hoot.com, a website, blog and You-Tube channel empowering communities by providing safety and security information, tips and education.



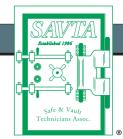


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A Strange Trip To Detroit

Signs point to the supernatural during simple "big old" safe opening.

By Bob DeWeese, CML, CPS, CJS, ACI



Figure 1. The customer had called about a "big old safe," which upon examination revealed itself to be a Detroit. (A mysterious "orb" can be seen to the right of the safe.)

GOT A CALL ABOUT A "BIG OLD safe" in an old building in downtown Baltimore. After having the customer email me a picture, I was able to determine that it was really a Detroit safe (see Figure 1). (To this day, I've yet to come across a safe made by "Big Old.")

Looking at the photo I took of the safe, I apparently wasn't alone. Check out the "orb" just to the right of the safe. That circle was not on the wall. I didn't even see it until I opened up the picture on my computer (if you believe in that kind of stuff).

Quickly Identifiable

Anyway, the safe, though pretty obscure around here, was pretty easy to ID. I went into my personal database, brought up the "Antique" file, and searched "Hinges" (*Figure 2*).

Once I found a good match for the hinge, I looked at wheels in my Detroit folder. Between that and the "border" around the safe, I was confident that it was a Detroit (*Figure 3*).



Figure 2. Matching the hinges to others on antique safes in the database made the Detroit easy to identify.

"Not knowing the thickness of the door and drilling on an angle, I'd be scared to death of hitting something in an irreplaceable lock. But not this guy. Nope."



Figure 3. Between the wheels and the "border" around the safe, it could be confidently deemed a Detroit.



Figure 4. The lock on this safe was made by Sargent & Greenleaf specifically for Detroit.



The lock on this safe was made by Sargent & Greenleaf specifically for Detroit (*Figure 4*). I chose a drill point just outside the dial ring at about 67 (*Figure 5*). On stuff this old, I would rather steer clear of anything I might damage, so I chose just to transfer to drop in at 99.

A side note: I made a rookie mistake

in choosing my drill point. Safe Opening 101: If there is a sticker just above the dial on an old safe like that, pull it off and look under it.

Once I had the safe open and pulled the wheel pack to service the lock, I noticed two holes behind it from a previous opening. On closer examination, I noticed the slightly boogered-up dial ring. The lighting



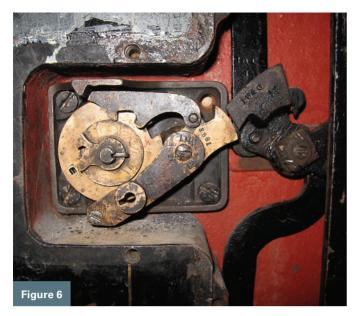
Figure 5. A drill point was selected just outside the dial ring at about 67.

in the small room was horrible, and I just hadn't seen it. And since I was not even considering drilling there, it didn't occur to me to look. (Defecus occurus!)

A Bold Move

The guy who'd opened it had guts! (I'd say "stones," but they probably won't print that.) Not knowing the thickness of the

27





Figures 6 and 7. This lock has a very odd bolt operation. When the lever drops, the drive cam pulls the bolt up, out of the way of the handle cam, allowing it to turn.



Figure 8. The drilling location was perfect for scoping the gates and transfer.



Figure 9. All four wheels were dialed left, starting at 67, then 68, then 69, and at 70, with a turn to the right, the lever nose bounced. With a little movement of the dial, it was unlocked.

door and drilling on an angle, I'd be scared to death of hitting something in an irreplaceable lock. But not this guy. Nope.

His first hole had come in too low and was just above the wheel post, but he never hit the wheel (I looked!). His second hole was on the money — right in front of the fence — and he never hit the fence (I looked!).

I gotta look this guy up at City-Wide and buy him a drink.

Odd Operation

This lock, as you can see, has a very odd bolt operation. When the lever drops, the drive cam pulls the bolt up, out of the way of the handle cam, allowing it to turn (*Figures 6 and 7*).

I came in at a perfect location to scope the gates and transfer (*Figure 8*). But what I saw when I stuck my scope in blew me away. All the gates were already lined up almost right in front of my scope! (And you don't believe in ghosts?) My first thought was, "Why in the world would the gates all be lined up in that area of the lock?" Then the light bulb came on. The wheels were all set on one number, and it was just dumb luck (or ghosts) that they happened to be parked *right there*.

Easy Open

I dialed all four wheels left, starting at 67, then 68, then 69, and at 70, when I turned right, I felt the lever nose bounce. A little oscillating of the dial





Figures 10 and 11. The door on this thing was a beast. The 6-inch StrongArm bottomed out just as the lock case was entered.

and it was unlocked (*Figure 9*). Easiest \$250 I've made in a long time! (I quoted \$250 to \$300 for the opening fee.) With the trip charge, opening, lock servicing and a nice tip, I walked away with \$500. Not a bad morning.

For those taking notes, the door on this thing was a beast (*Figures 10 and 11*)! Drilling straight in, my 6-inch Strong-Arm bottomed out just as I entered the lock case. *③*



Bob DeWeese, CML, CPS, CJS, CAI, has been in the locksmith industry since 1980. He began specializing in safe opening and servicing in the late '90s. "Bobby" lives in Baltimore, MD, where he and his wife, Theresa, own and operate Bear Lock & Safe Service, which they

started in 1988.



PHYSICAL SECURITY ACUMEN?

By educating institutional decision makers using physical security acumen, institutional locksmiths can perform better. By Steve B. Fryman, CRL, CAI, CISM

AST SUMMER, I ATTENDED THE ASSOCIATION FOR TALENT DEVELOPMENT Conference in Atlanta, where a business acumen class was offered by Kevin Cope, author of "Seeing the Big Picture." During the class, Cope talked about people who don't understand how the organizations they work for financially operate. Once members understand how things work financially, there is a natural buy-in.

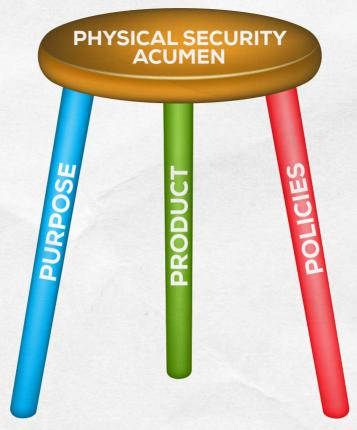
While Kevin was talking about this gap in understanding, it made me think about how our institutions don't fully understand what we do as security professionals; this was an "aha" moment for me. Physical security acumen helps decision makers make better decisions when budgeting for changes regarding physical security. In an age of financial belt tightening, we are all doing more with less. Helping decision makers understand the effects of budget cuts on safety can help you to work together to find better solutions.

Another important element of physical security acumen is improving security culture. "If you see something, then say something" has become a common phrase that has helped improve overall security culture in the United States. Improving security culture can be accomplished in a proactive way as to avoid epic events as seen in Texas with 26 killed at the church shooting. Now, the public has a heightened awareness of security in places of worship. This has become more the rule than the exception,

and security teams are becoming more common at places of worship. And after 9/11, airport security changed radically; the Transportation Security Administration (TSA) was established, changing the way we travel forever.

While these events are beyond the scope of most of our jobs as security professionals, the lessons learned from improving security culture carry over to our realm. As physical security professionals, we wear many hats. We are often put in the position to teach, making our coworkers and the folks we work for aware of procedures and best practices concerning use of keys, credentials, CCTV, electronic key management systems through gentle instruction. We cannot take for granted that everyone understands what it costs to rekey hundreds of doors because there was a lost master key; we must help them understand and create a culture of security awareness and knowledge.

Education and self-examination are also vital parts of physical security acumen. Wellness checks of institutional



The author taught a class at ALOA 2017 called The Three Ps of Physical Security, which touched on physical security acumen.

physical security systems are a large part of being proactive and responsible. When we speak in terms of fiduciary responsibility, we are talking about a trust that must be upheld as we carry out a mandate from the administration to protect life and property. We need to be honest with ourselves and staff regarding the state of our enterprise-sized master key systems. Like driving a new car off the lot the first day, a master key system in use loses value. There are often "tipping points" that are ignored, such as a large number of lost and stolen keys that have had no remediation. Or perhaps out-of-patent cores that have extensive delivery dates, causing problems with making completion dates, or costs of cores doubling from the date that the system was established.

Most master key systems are old, numerically worn out and corrupted. Once we as security professionals admit that there is a problem, then we can communicate and guide administrators to see the big picture. Everyone has their areas of expertise and takes for granted how specialized their scope of knowledge and work is. There are even folks in our own trade who don't fully understand what an institutional key shop does. How can we expect administrators to have that knowledge without our help in learning?

At the 2017 ALOA convention, I taught a class called "The Three Ps of Physical Security." The class was intended to help us as institutional locksmiths evaluate areas of institutional physical security that pertain to our purpose, product and policies and determine their wellness. Once we grasp where improvements are needed, we can then share with the administration, thereby helping us be fiducially responsible to staff.

We are truly helping ourselves as we

help others to see the big picture. In essence, as institutional locksmiths, we need to be forward thinking. We need to stay ahead of the curve in budgeting for changes that need to take place institutionally that will affect the security of life and property. By educating decision makers using physical security acumen, everyone wins! ©



Steve B. Fryman, CRL, CAI, CISM, has worked in the physical security field for more than 40 years. Now working as the key shop manager at Florida

State University, he previously served as an institutional locksmith at the University of Florida and in the private sector with his own locksmith business. He developed the first curriculum and testing for the Certified Institutional Shop Manager designation, making him the first recipient of this credential.

REPURPOSING PUSIL



Tyler J. Thomas, CFDI, CJIL, CMKA, CRL, explains a few ways push plates come in handy on the job.

ush plates can be one of the most multiuse items on our trucks and in our shops. Originally meant to protect a door's surface, they can be used for so much more without encroaching on practicality, integrity, or safety and security so long as they're used correctly. In this article, I'm going to share a few repurposing ideas for push plates that go beyond their original intent. A word of caution before we begin: Be extremely careful with the use of push plates on fire-rated assemblies. I do use one to repair a fire-rated assembly in this article, but it was done per code. Simply slapping a push plate to cover a hole or holes in a fire-rated assembly isn't up to code; do things right.

Covering

The most common repurposing of push plates is to cover existing holes. *Figure 1* shows a push plate covering a 161 prep on a door. The previous locksmith installed a panic device with no exterior trim. The locksmith could have used filler plates specifically designed for that prep, but that would fall into the "minor nitpick" category. With a coat of paint, the visual impact of the push plate is minimal, although I would have opted for rivets instead of screws. In my opinion, the appearance of a push plate is more in



Figure 1. A push plate is covering a 161 prep on a door. The previous locksmith installed a panic device with no exit trim.

line with a door's appearance (right angles and rectangular shape) than a hole filler, but hey, that's just my take on things.

If your customer wants to change the door hardware and the new hardware won't cover all of the existing hardware's holes, then a push plate works great as well. *Figure 2* shows an E-Plex we installed in conjunction with a Von Duprin 99. The old pitcher handle hardware obviously couldn't be reused, and the E-Plex wouldn't fully cover all of its prep holes. A carefully laid-out push plate underneath is just the ticket.

Repairing

It's not uncommon to be called to a job where so much material has been removed from a door and the door hardware won't function as designed because of the lack of material. This may be from damage that occurred to the door, or it could be the result of the last person's attempt to install or repair something. An example of the latter can be seen in *Figures 3 and 4*.

We were recently called to a job where the person before us failed horribly at installing multiple maglock armature plates. Unfor-



Figure 2. This image shows an E-Plex the author installed in conjunction with a Von Duprin 99.





Figures 3-4. Sometimes door hardware won't function as designed because so much material has been removed during a previous person's attempt to install or repair something.





Figures 5-6. The author removed the armature plates and mounted each push plate to the affected area one side at a time (*Figure 5*). Clamps greatly assisted for a perfect layout (*Figure 6*).

tunately, this wasn't on one, two or even three doors; this happened to six doors. Regardless of the absurdity of repeating an obvious mistake five more times, it was now our responsibility to fix the doors.

In the case of bad and damaged installations, the existing holes — give or take a bit — are already there. A simple transfer of measurements to the push plate are usually all that's needed, so it makes for a quick and economical fix for

both you and the customer.

I started by removing the armature plates and mounted each push plate to the affected area, one side at a time (Figure 5). Clamps greatly assisted for a perfect layout (Figure 6). Once positioned, I riveted the first plate in place. I prefer a seamless appearance in my installations and, in my opinion, rivets are a better choice than screws in those situations. With one plate installed, I marked

for the armature's carriage bolt (trying to reuse one of the holes left behind in each door and still use as much of the door as possible) and drilled. The second plate was then installed on the other side of the door and riveted in place. Using the first hole as a reference, I drilled my second hole. *Figures 7 and 8* show the inside and outside of the door when complete. Looks as good as can be expected considering the situations.

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Figures 7-8. These two photos show the inside and outside of the door when complete.



Figure 9. This wooden door had its carriage bolts ripped from the door after years of usage and was subsequently repaired with a push plate.

Damaged wooden doors can also be repaired with push plates. *Figure* 9 shows a wooden door that had its carriage bolts ripped from the door after years of usage and was subsequently repaired with a push plate. This is the fire door I warned about in the introduction. The holes were ¾" in diameter, give or take a bit, considering they were ripped through. I filled these holes with fire door caulk first. The fire door caulk I used was approved for holes up to ¾" diameter and 90-minute doors. This door was rated at 90 minutes, and the hole was less than ¾", so it adhered to the manufacturer's specifications and satisfied the repair method requirements of NFPA 80, 5.5.7 (2016 Edition).

Next, I mounted the push plates on both sides to cover the fire door caulk and then installed the new closer. Could I have just elected to replace the carriage bolts with a larger size or put a washer behind them? Sure, but I guarantee that fix wouldn't have lasted as long as the one I chose. Fast ain't always right. If screws are used to secure the push plates to the door, you must use sex-nuts and bolts. No sheet metal or wood screws are allowed to secure anything on fire listed door and frame assemblies.

In the last three examples, careful planning goes a long way. Anyone can throw a push plate on a door and drill new holes. A professional will lay it out and plan things in a way that look as seamless as possible.

Other Options

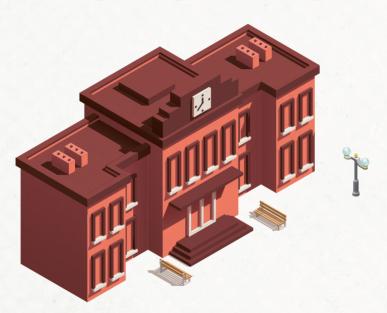
I realize that dedicated remodeling kits exist for many conversion/repair situations — and perhaps they are the better choice depending on the situation — but nothing beats the ubiquity of push plates. They're also dirt cheap and easily stocked. Available in many sizes, finishes and base materials, they can also be altered quite easily in the field to match a specific situation such as a desired length or bolt pattern of the door hardware they're being used with. I also keep stock steel plates on my truck for repair situations. They are analogous to push plates in use, but they're generally thicker and stronger and can be used for demanding situations (for example, rim strikes that have had their screw holes stripped). Many times, I've cut some of that steel stock, mounted it to the frame and drilled and tapped for new screw holes. If you have a good imagination, push plates and steel plates can used in very clever and very effective ways; just use them right. \mathfrak{D}



Tyler J. Thomas, CFDI, CJIL, CMKA, CRL, is a locksmith in Atlanta, GA. He maintains a physical security blog at http://asecured.life.



WHAT MAKES AN INSTITUTIONAL LOCKSMITH?





Sal Dulcamaro gives insight into this area of locksmithing and how it differs from commercial work.

FTER COMPLETING THE BELSAW (LATER TO BECOME FOLEY BELSAW) locksmith correspondence course at age 17, I started my journey as a commercial locksmith. It was 1975, and I was still in my junior year of high school. In fact, some of my very first customers were my high school teachers. I advanced and upgraded my locksmithing skills from on-the-job practice and experience serving my earliest customers.

Not long after, I joined a local locksmith association where there were monthly meetings along with in-meeting seminars and full-day classes on some weekends. I further advanced my skills and education by joining ALOA a few years later and attending the ALOA annual conventions that included classes and a tradeshow.

As a commercial locksmith, my primary focus was residential, commercial and

automotive locksmithing. I dabbled a bit in safe work, but it was mostly combination changing and deciphering the current combination if the door was already open. I referred safe lockouts to safe technicians or specialists. I had taken a safe lock manipulation class but never developed the skill sufficiently to feel confident taking on safe lock outs.

My venture into the world of institutional locksmithing started just a few years ago. After 39 years as a commercial locksmith, I became an institutional locksmith after the long time in-house locksmith at a local hospital decided to retire. I started the job in May 2014, and although I didn't need help in the area



Figure 1. Within the first few days I started as the hospital lock-smith, there was a locked compartment near the top of one of the elevators in a parking deck that needed to be opened. The lock shop at the hospital didn't have the equipment to do the job, so I went to my personal lock shop at home and brought a tubular lock pick in to open the compartment and then to decode and fit keys to it. I frequently bring jobs home with me when the equipment at the hospital lock shop is inadequate for the task.

of skills and knowledge, the former hospital locksmith stayed over part-time for about a month to show me around the shop and hospital. The hospital is quite large, and I started to learn my way around, although it took more than a year before I fully knew my way around the place. I also learned what was where in the shop.

Commercial Locksmith Versus Institutional Locksmith

As a general rule, a commercial locksmith tends to service a wider selection of lock hardware — both in brand and variety of lock types — than an institutional locksmith. An institutional locksmith tends to be more of a specialist, and the commercial locksmith more of a general practitioner. Another big difference is that the commercial locksmith has numerous customers, while the institutional locksmith tends to have just one customer: his or her employer.

Just as all institutional locksmiths are not alike, the same applies to commercial locksmiths. The commercial locksmith can be solo operator — a single locksmith who is both the locksmith and the company — or one of a group of locksmiths in a larger commercial locksmith company. A single locksmith operator is spread somewhat thin because he or she must handle all the service calls in potentially numerous service categories. The morning might start with a homeowner locked out the homeowner's condominium, followed by lost car keys and then redoing a



Figure 2. One area of service I never did as a commercial locksmith was to service, repair and change combinations for (school-type) lockers. I remember the combination lockers from my school days, but I never had a customer in all my years as exclusively a commercial locksmith that needed lockers serviced. These are just one of many varieties and brands of lockers used throughout the hospital.



Figure 3. This is a closer view of the Master dial combination locker lock and the lift handle that opened the locker after the combination was dialed.

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Figure 4. This photo gives an inside view of the locker door shows the mechanism that lifts when the lift handle on the outside is engaged. With the different locker styles, we used basically three types of Master combination locker locks. They are typically available in left and right hand versions of a particular style lock. This is a lift bolt style. When the correct combination is dialed, the outside lift handle is moved upward, which causes the mechanism to physically lift the bolt, allowing the locker door to open.



Figure 6. I'm not sure if it is an accurate term, but these types of lockers have been referred to as "purse lockers." These are smaller, more compact lockers that don't have a separate lift or opening handle. The Master combination locker locks for these are similar to the retractable bolt style locks, but they instead have retractable spring latches.



Figure 5. This style of locker uses a retractable bolt lock. After the first two numbers in the combination are dialed, the last motion to the right (clockwise) retracts the bolt. Whereas with the lift bolt style you lift the handle when you stop at the third number, you dial the first two numbers and after you pass the third number, you continue dialing clockwise until the dial stops turning. The bolt will then be fully retracted and the handle will be able to be lifted because the bolt will have been retracted and moved from the path of the mechanism that locks the door. The handing on these lockers is deceptive. What appears to be a right-handed door uses a left-handed lock and vice versa for left-handed doors.



Figure 7. Here is one of the purse locker locks where the nose of the dial has broken off. Like the retractable bolt locks, the combination is dialed similarly to the lift bolt style except the final rotation clockwise will retract the spring latch if the combination was entered correctly. This lock will lock when the door is pressed inward to cause the spring latch to retract and then extend to catch into the door strike. There are at least four or five different types of lockers in the hospital in the various locker rooms, but basically three types of combination locker locks that have been installed on them. I have nowhere near been into all the locker rooms within the hospital. There are multitudes of them. We only can consistently replace broken combination locks. We have very few parts for general locker service or repair.



Figure 8. Office furniture is a very common reason for making keys for locks. While working as a commercial locksmith, many of my customers had locking desks, drawers, cabinets or other office furniture, but most of my customers didn't want to spend the money to fit keys. They'd rather not lock the furniture up than to pay to make a key. Key fitting for office furniture is a very common order of business as the institutional locksmith at a hospital.



Figure 9. This is the often very uncomfortable view of the locking mechanism of a Steelcase desk from under the desk. Fitting keys to desks is often not the last part of a work order regarding office furniture. I fit the key and test it in the lock. The key turns easily, which means I cut the key properly and it turns. When the unit either doesn't lock, unlock or operate smoothly, the next step can be to trace the movement of the locking mechanism to see what's wrong.



Figure 10. Here is another view of the parts that lock the center drawer. Office furniture repair has become a secondary skill to me. I never really repaired office furniture as a commercial locksmith. Heck, they wouldn't even want to pay me to fit a key, let alone actually repair the mechanism itself.

group of locks that are masterkeyed at a small factory. A single locksmith operator must have a wide range of skills and knowledge or risks having to turn down a lot of potential service calls.

A larger commercial locksmith shop with numerous locksmiths can have an

automotive locksmith, a commercial lock specialist, a safe technician, an installer and electronic lock specialist, all of whom have specialized knowledge in their areas of expertise. They may all have limited or virtually no knowledge in the other specialties that the shop services and have



Figure 11. This is what it looks like inside the opening for the side drawers of a Steelcase desk with the drawers out. The little protruding metal pieces that look like flags are what locks the side drawers. An improperly assembled desk is one reason for a variety of lockouts and other obstructions. I have used an old (retired) Slim Jim car-opening tool to open desk drawers when they lock accidentally on their own. It is one of my experimental tools I've made when I didn't have anything better to handle a problem.

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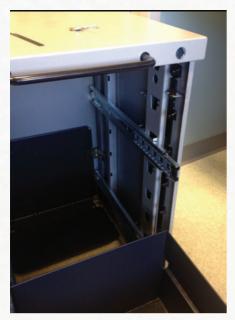


Figure 12. Here is a portable file cabinet with wheels that I opened with the assistance of gravity when the locking mechanism malfunctioned. It locked accidentally without anyone using a key to do it. There are many brands and types of office furniture at the hospital that operate mechanically in so many different ways.



Figure 15. In an institutional setting, there's sometimes an overlap of responsibilities. While I am the only locksmith at a rather large hospital, some level of lock service, repair and installation is shared by carpenters and maintenance personnel. The skill and knowledge level will vary between technicians, and sometimes someone lacking knowledge will be assigned a work order involving a lock before I get it. Sometimes they work on a lock first and make my job a bit more difficult or worse. This lock is an example.



Figure 13. Here's an underneath view of the locking mechanism of the same portable file cabinet. I came to the job with extensive knowledge on fitting keys to all the different types of locks, but I had very little practice working on or repairing the actual mechanisms beyond the lock itself. Little by little, I've taught myself to be an office furniture repairman.

extensive knowledge and/or experience in their own areas of expertise. Whatever their specialties, they will typically need to be able to service different brands of products and different models of the product within the same brand. The other thing about the commercial locksmith is that a commercial locksmith will need to travel to various customer locations and be responsible for billing and collecting upon completion of a job.

Institutional locksmiths will vary from one institution to another. The type of institution will often affect the responsibilities of an institutional locksmith. Among the categories of institutions that might employ an institutional locksmith are hospitals (where I fit in), schools (from elementary schools to universities), prisons, office buildings and more. There are differences and similarities by institution categories based on the type of people who might populate the organization.



Figure 14. The Best Combinator is the workhorse key punch that makes virtually all the non-office-furniture keys in the hospital. Best A2 Small Format Interchangeable Cores are used throughout our hospital, and all the Best keys are cut on the Combinator. This is probably the only place where the hospital lock shop has better tools or equipment than my own personal lock shop. I routinely bring tools to work or bring jobs home — where I have the proper equipment to fit keys — for work orders when the hospital lock shop is inadequate to the task.

There are even differences in how one management group might operate an institution compared to other management groups.

One thing that is often (but not always) common to institutions is that the buildings are master keyed with one or just a few brands of locks or door hardware. Although many commercial keyways can be common to locks of multiple brands, the practicalities of consistency and inventory control will suggest using one brand whenever possible.

A locksmith who starts out as a commercial locksmith will usually have to know how to service many brands and models of locks because you never know what to expect to see on any house or building you are called to for a service call. An institutional locksmith can often get away with being skilled at servicing only one brand or even one model of lock, if the building uses only one kind of lock. That



Figure 16. What looked like a retainer access hole in *Figure 15* is now a bit more clearly scraped plating in the general location where the retainer access hole should have been. The metal ring must have been rotated by someone who didn't know how the lock came apart.



Figure 17. To compensate for what the earlier person did wrong, I had to take a pair of pliers to rotate the ring again so the retainer hole returned to its correct position about 3 o'clock.



Figure 18. After rotating the ring with the pliers, it was apparent that the retainer access hole was back where it was supposed to be to access the retainer and remove the lever handle.



Figure 19. A poke tool is lined up with the access hole to attempt removal of the handle.

being said, if a locksmith is mechanically inclined, it isn't that big of a stretch to expand one's knowledge or skill to work on other brands of models of lock.

The size of an institution can determine if lock servicing is farmed out to a commercial locksmith company or if an in-house locksmith (or more than one) is hired to service the locks. There are limits to how much one locksmith can do, so a huge institution may have multiple locksmiths and/or service personnel to maintain their locks, door hardware and electronic security sys-

tems. As with the hospital where I work, sometimes carpenters or other service or maintenance personnel are lock installers along with the locksmith.

The Customer

I mentioned earlier that commercial locksmiths have multiple customers but institutional locksmiths have just one customer: their employer. Although that is basically true, the institutional locksmith (in practical terms) can have even more "customers" than the typical commercial locksmith. Although I don't write up invoices to the person who directs a work order where I replace a lock, I interact with fellow employees of the hospital that employs me. I still have to be friendly, courteous and helpful to them as if they are the ultimate customer.

"Helpful" People Who Make Your Job More Difficult

Just as in the hospital where I work, many institutions will have job descriptions that overlap. The hospital where I am



Figure 20. A slightly closer view shows the tool about to engage the retainer. This was a slight inconvenience when someone made a previous attempt to service the lock and apparently didn't quite know what he was doing. Sometimes it can be a lot worse.

the (only) locksmith is too big for me to do everything related to all the various locks that are installed throughout the institution. There are literally thousands of locks, and one person can only do so much. As I mentioned earlier, there are carpenters and other service or maintenance personnel who work on locks in some sort of capacity. There is a dispatch system where work orders are directed to one group (or person) or another.

I can't expect the ladies who dispatch the work orders to know what jobs should go to me as the locksmith as opposed to maybe a carpenter or maintenance person. In many cases, the job can be completed equally well by me or one of them. In other situations,

when the work order goes elsewhere first, the other person does not have enough knowledge or skill to do the job properly. A customer who tries to fix a lock before the commercial locksmith shows up at his house can often make a mess of the lock that makes the job way more complicated than if the locksmith touched it first. I often have the same situation with "helpful" maintenance guys who don't realize their limitations and made a mess of a job that would have been both simple and fast if I would have touched it first. Usually, it's just a slight inconvenience. There have been times, however, where a simple task turns into a major nightmare when someone else gets there first.



Figure 21. This is the inside handle assembly for a Powerplex electronic keypad lock. The die cast metal at the end where it engages the inside plate broke off, allowing the inside handle to come completely off the door. Being in a hospital, it's appropriate that a bandage is holding the spindle piece from coming out.

Tasks I Rarely Did As a Commercial Locksmith

Other institutional locksmiths will have different experiences, but there are jobs I do as an institutional locksmith that I rarely did as a commercial locksmith. Making keys for desks, cabinets and other types of office furniture are well within the repartee of a commercial locksmith. Although I could easily make keys to desks or cabinets in a home or a business. I have rarely had a customer have me proceed with the task after I quote the price. Now, I can duplicate a desk key for a few dollars, but when I have to fit the key to the lock, a lot more labor is involved. If you ask for more than \$3 to make a key to a desk, a large number of residential



Figure 22. A much closer view gives a clearer view of the broken die cast metal at the end of the handle and the bandage holding the spindle in place.

or commercial customers will say they can just not lock up the desk rather than spend the money. As a hospital locksmith, making keys for desks, cabinets or other office furniture is a pretty good chunk of the work I do. People like to lock up their belongings, and not having a key to do it makes many people very unhappy.

Although my key fitting skills for office furniture trace back to my days as a commercial locksmith, I have inherited a bit more responsibility when it comes to office furniture. I will typically come out to an office and fit keys to a desk or cabinet. I proceed to test the key to make sure it works properly, and if it does, my job is completed. It seems that almost 10 percent of the time that after I confirm that the key turns, I realize the locking mechanism of the office furniture is malfunctioning and I end up doing surgery on it. Every different type of office furniture seems to have a unique way to operate, and over the last few years, I have become fairly skilled at repairing office furniture. These tasks can be very awkward and uncomfortable. I am often on my back under a desk imitating a con-



Figure 23. This is what it looks like with the inside handle plate removed from the door and the various parts disengaged. This problem is not so much what was done by a less-than-knowledgeable technician, but that it got assigned to the wrong people first. When it gets assigned to me first and the door is left open or there is a second point of entry to the room where this lock is installed, the fix is fast and simple. Just remove the broken interior handle assembly and replace it with another one. Where it becomes a nightmare is when someone lets the door close and there is only one point of entry to that room.

tortionist as I work on the mechanism in less-than-ideal conditions. When I am done and get up, I often feel very sore and ache for a considerable time afterward.

One other thing I do a lot as an institutional locksmith that I didn't do as a commercial locksmith is to work on lockers and locker locks. My first memories of locker locks go back to my days in junior high school. I change combinations and open and repair lockers and locker locks. I know how they work now because I frequently work on them, so they are no longer a mystery to me as they were many years ago.

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Figure 24. One of the consequences of the inside handle breaking off on a Powerplex lock is that a spring is located in the inside handle, and without the spring, the spindle can disengage. If the door closes with the spindle disengaged, it's impossible to open the door from the outside. This is the case with both entering the combination or even using the mechanical key bypass. The only option — if there is no other point of entry to a room —is to drill the lock off the door. Two holes at the top and one hole at the bottom will release the mounting screws so the lock will come off the door and the latch can be actuated manually.



Figure 25. The lock is drilled off the door, and the previous mounting holes are exposed to view. A job can be made more difficult if someone unqualified tries to do the job first or if it doesn't get assigned to the right person in a reasonable amount of time before the situation degrades.

Problems that Only (Most Only) Institutional Locksmiths See

As a commercial locksmith, most of my customers were very price- and cost-conscious. I rarely saw grade 1 hardware on my customers' doors. Also, doors had very little traffic going in and out. As a hospital locksmith, virtually all hardware is grade 1 and — because of regulations and responsibilities that few other businesses deal with — cost was not the most important factor when hardware was selected. There are locks that I saw in my life as a commercial locksmith that rarely wore out. In many cases, I thought they were nearly indestructible until I

saw what happens on high-traffic points of entry and egress. We have doors that get more use in one day than most commercial building doors get in six months. I see wear and breakdown in locks that I never saw in other environments. If you want to test how tough a lock is, install it on a high-use institutional door.

There is more to the differences between commercial and institutional locksmiths. You can see that the skills of both types of locksmiths overlap, but there are important and very significant differences to the experiences they encounter.

I most recently wrote for *The National Locksmith*, but it closed after the October 2017 issue. It is a bit ironic that I start out

2018 writing for *Keynotes* on the theme of Institutional Locksmithing, where I currently practice. *⊗*



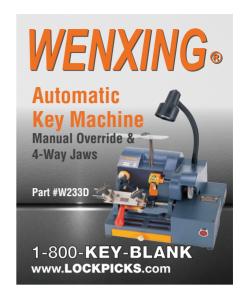
Sal Dulcamaro started out in locksmithing in 1975 at age 17. He first practiced as a commercial locksmith before becoming an institutional locksmith in May

2014 for a large hospital. He has been a technical writer for more than 30 years with more than 300 magazine articles published. He previously served as a contributing editor and a technical editor for *Reed's Security Reporter* magazine and a senior writer for *The National Locksmith*.

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Saving Lives

Tony Wiersielis, CPL, CFDI, gives a walk-through of a Securitech antiligature door alarm installation.

HIS MONTH I'M GOING TO TAKE YOU THROUGH A RECENT INSTALLATION of a Securitech anti-ligature door alarm. This was performed at a psychiatric unit in a hospital in my area. Because I was busy installing this device, I don't have as many pictures as I'd like, but there are enough to explain how it's done and how it works.

Some of you — particularly the newer guys — might be unfamiliar with antiligature hardware, so I'll go over it before we get into the installation. Some of this may be a bit graphic.

The definition of ligature is "a thing used for tying or binding something tightly." Unfortunately, for someone who uses a rope or wire to commit suicide by hanging, that "something" is his neck, and whatever he used to do it is the ligature.

Anti-ligature hardware, as you might have guessed, is used to prevent people

from hanging themselves. It's commonly installed in psychiatric or "behavioral health" units in hospitals to lessen the chances that someone will commit suicide.

If you've never worked in this type of environment, here are some examples of different types of items that are included in anti-ligature hardware. Clothes hooks are spring-loaded so that nothing heavier that a bathrobe can be hung on them. Sinks don't have faucets or knobs; you push a button for water, and it comes out of a hole like a water fountain. Locks don't have knobs; they have levers that are freewheeling and not rigid, and rosettes that are tapered so a ligature will slide off of it.

Be aware that anything a person could loop a rope or cord around that could hold their weight could be used to hang himself. Victims have been found sitting





Figure 1-2. In *Figure 1*, at the top of the door is the sensor bar that detects if someone has looped a ligature over the top of the door and applied weight to it. *Figure 2* is a close-up of the sensor bar. These two photos are courtesy of Securitech.

a few inches from the floor with their backs to a tall dresser. The other end of the rope was tied to a top-drawer pull. They just sat down and expired.

How It Works

The Securitech unit combines a full-surface continuous hinge with a sensor at the top of the door. The continuous hinge replaces regular butt hinges and removes the possibility of someone using a hinge as a "suspension point." *Figure 1* is an example of a self-contained system installed in a door. At the top of the door is the sensor bar that detects if someone has looped a ligature over the top of the door and applied weight to it in an attempt at suicide. *Figure 2* is a close-up of the sensor bar. The first two pictures are courtesy of Securitech; the rest are mine.

In practice, we've never installed it exactly as you see in *Figure 1*. Because we have it set up to be monitored at the nurses' station, wires are run from each door to the control box there. You'll see what I mean later. We mount the strobe on the ceiling or on the wall over the door and the key switch approximately as you see it in the picture.

If someone tries to hang himself over the door, the pressure of the ligature on the sensor bar will cause it to close one of the switches inside it. This triggers an audible alarm at the monitoring panel, and lights the red light for that door, as shown in *Figure 3*. At the same time, the strobe near the door will turn on, giving hospital personnel a visual indicator of the door that is causing the alarm.

The audible alarm can be silenced at the monitoring panel, but the light will remain red. The only way to turn out the light and shut off the strobe is to physically go to the key switch at the door and turn a key to shut off the alarm. This ensures that one of the staff checks the patient in that room to see if he/she is okay.

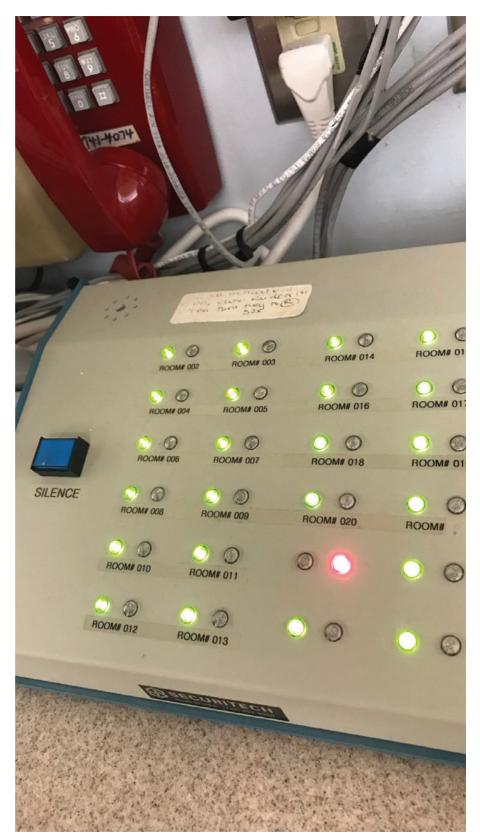


Figure 3. This image shows the alarm at the monitoring panel and the red light that indicates which door's sensor bar was activated.

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Figure 4. This is a shot of the existing door.



Figure 5. This photo shows the anti-ligature mortise lock made by Securitech.



Figure 6. This image is a view of the existing full mortise continuous hinge. Take note of the mish-mash of different screws: black is a high-security torx, blue is a "snake eyes" spanner screw and green is a stripped #3 Phillips.



Figure 7. This photo shows the sensor bar. The black arrows point to the adjusting nuts on the bracket and cover. The cover is secured at the bottom with two screws, one of which is in a yellow circle at the bottom of the image.

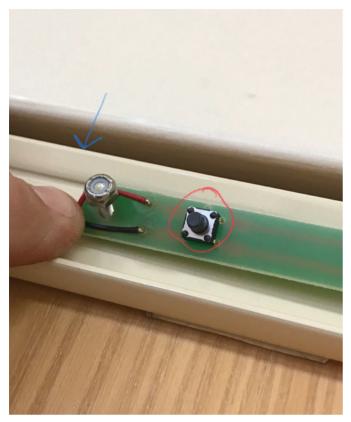


Figure 8. In the red circle is a close-up of the button that triggers the alarm. The blue arrow is pointing to the flange at the top of the bracket that the cover fits over.



Figure 9. The author's partner is wiring the strobe to the wire the electrician ran.

The Installation

This installation was for a room that was added on to an existing system of about 20 doors, all of which were patient rooms. The monitoring panel and control box were already at the nurses' station. All we needed was a six-conductor run from the control box to the ceiling above the door. This was provided for us when we got there.

Figure 4 is a shot of the existing door and Figure 5 is a shot of the anti-ligature mortise lock, also made by Securitech. Figure 6 is a view of the existing full mortise continuous hinge. Take note of the mish-mash of different screws: black is a high-security torx, blue is a "snake eyes" spanner screw and green is a stripped #3 Phillips.

For the new guys, you want to be extra careful when removing spanner screws.

This is because it's very easy to break the spanner bits used to remove these screws if you over-torque them. I use a MEGA-PRO high-security screwdriver for these. Whatever tool you choose to use, I'd recommend you have several extra spanner bits for it in case you break one. Nothing kills a job like breaking one of those bits without a replacement.

Figure 7 is a shot of the sensor bar. The top is the mounting bracket, and the bottom is the cover that fits over it. The cover is spring-loaded and fits over the top of the mounting bracket. It's secured at the bottom with two screws, one of which is in a yellow circle at the bottom of the photo. The screws allow the cover to move slightly when pressure is applied to it.

When the cover closes, one or more of the buttons (in the blue circles) is depressed and closes a circuit that triggers

an alarm at the control box. The green circles are the connectors for the wire that connects the buttons to the box via the wire runs. The black arrows point to the adjusting nuts on the bracket and cover. These are used to adjust the length of the sensor bar to the width of the door.

Figure 8 is a close-up of the button that triggers the alarm, in a red circle. Notice that my finger is pushing down on the small circuit board the button is mounted on; it's spring-loaded. The blue arrow is pointing to the flange at the top of the bracket that the cover fits over. This allows the cover to rock back and forth, somewhat like a clamshell opening and closing. Once the sensor bar was set up, we started on the wiring.

In *Figure 9*, my partner is wiring the strobe to the wire the electrician ran for us. Shortly after that, we fished a length





Figures 10-11. In *Figure 10*, the author and his partner are cutting out the opening for the key switch, and *Figure 11* shows the finished cutout.





Figures 12 and 13. These two photos show the key switch, front and back.

of two conductors down to the spot where we decided to mount the key switch. In *Figure 10*, we're cutting out the opening for the key switch. Normally, we would have cut the opening before we fished the wire, but we pushed the fish tape up to see if there were any issues and just decided to pull the wire down. *Figure 11* is the finished cutout.

Figures 12 and 13 show the key switch, front and back. It is designed to lay flat on the wall and is pretty straightforward in its design. Normally, this is mounted to a single-outlet metal box that we specify to be installed ahead of time. This door was an add-on and we didn't have that luxury, so we used a low-voltage ring instead.

We didn't want the ring to be on the surface of the Sheetrock for the switch to lie on because this would have created a small gap between the switch and the wall. To solve this issue, we removed the plastic "wings" on the ring and reversed it, as in *Figure 14*. The tape is holding it in place while some adhesive on the ring dries and so we can screw the ring in at the same time.

Now the heavy lifting begins. We removed the door and old hinge, marked the frame and drilled for the wire that will connect the bar to the control box through the hinge. Once that was done, we pulled the wire down through the hole (*Figure 15*).

We cut the hinge at the bottom to fit the door and frame, as you can see by the piece we cut off (*Figure 16*). I used my DeWalt 20-volt bandsaw for this. That's a tool I thought about buying for a long time, and it has proven to be a joy to use.

Figures 17 and 18 show the position of the wires as they pass through the hinge and how the hinge will look on the frame once it's installed. Notice that the top of the hinge is tapered downward, and take a look at the cutout in the hinge itself. The sensor bar fits into this cutout, so it spans



Figure 14. The author removed the plastic "wings" on the ring and reversed it. Tape is holding it in place while the adhesive dries.



Figure 15. The author pulled the wire down through the hole after removing the door, marking the frame and drilling for the wire that connects the bar to the control box



Figure 16. The author cut the hinge at the bottom to fit the door and frame, as you can see by the piece he cut off.





Figures 17-18. These photos show the position of the wires as they pass through the hinge and how the hinge will look on the frame once it's installed.



Figure 19. This image shows the wires connected and the splice inside the frame

the full width of the door.

Figure 19 shows the wires connected and the splice inside the frame. This is the only really dicey part of the installation because you need to be careful not to let the hinge fall accidentally and damage the wires. I often tape it to the frame, if necessary, to keep it from doing so.

In this case, we marked, drilled and installed the hinge on the frame, and shimmed and installed the door in the opening so we could mark our holes. We removed the door and drilled the two holes you see in *Figure 20*. The bottom hole is where the wire on the hinge comes into the door, and the top hole is where it comes out and into the sensor bar.

Figure 21 shows the hole we drilled on the top of the door to join the other two holes to create a path from one to the other. It's a good idea to have one person watch the angle of the bit while the other one drills the hole so there are no surprises. Once we did that, it was easy to fish a wire from top to bottom hole so we could pull the hinge wire up when we needed to. We filled in the top hole when we were done.

We reinstalled and shimmed the door and pulled the hinge wire up through the holes, being careful not to pinch the wires when we applied the hinge leaf against the door. We completed rehanging the

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Figure 20. The bottom hole is where the wire on the hinge comes into the door, and the top hole is where it comes out and into the sensor bar.



Figure 22. Under the spring with the yellow tape on the end of the wire is the cable that will connect to the hinge wire.



Figure 21. This photo shows the hole we drilled on the top of the door to join the other two holes to create a path from one to the other.

door and installed the sensor bar. *Figure 22* shows the cable that will connect to the hinge wire, seen under the spring with the yellow tape on the end of the wire. Once this is connected it completes the circuit to the control box. *Figures 23 and 24* are the cover of the bar being pushed down over the flange at the top of the bracket and one of the bottom screws that hold it in place being screwed in.

Figure 25 is the control box for the system. Each of the green mollex connectors represents one door, and there are two boards in this box. To the right of the box is a smaller power supply for the system. There are six wires in total coming from each door: two for the key switch, two for the strobe and two for the sensor. It's fairly simple to install, with the biggest issue being the wires to each door, which is often done by an electrician. In large systems, we often use junction boxes in each hallway and make the splices in those.

Figure 26 shows me getting ready to test the sensor by simulating a ligature thrown over the door. Figures 27 and 28 show the bar untriggered and triggered. My partner was at the control box checking to see if the red light came on, but I knew that it worked because I could see the flash of the strobe outside the door. It doesn't take a lot of pressure to trigger it.

Figure 29 is the control box and the power supply at the nurses'





Figures 23 and 24. These photos show the cover of the bar being pushed down over the flange at the top of the bracket and one of the bottom screws that hold it in place being screwed in. The screw phases through an oval hole so the cover can open and close.

station. When they originally installed the system years ago, an electrician was supposed to come back and hard-wire the power supply. You can see how that worked out. We had nothing to do with the clock either.

Go back and look at *Figure 26*, and you'll notice a tool bag on a Rubbermaid cart and a ladder on the other side of the window. We were in an area that was closed off from the patients while we were there, so we were able to do this. This is the only instance where it is safe to do so.

If you've never worked in an environment like this, it is critical that you understand that you must keep track of your tools. It's a good idea to count them before you go in and when you leave, and in some places it's a requirement. This is also applicable in jails, where a missing tool can cause a lockdown of the entire facility. The last thing anybody needs is for one of his tools to be used to hurt someone.

There have been times we've worked while patients were around us, and this is particularly dangerous because it's possible to be distracted and not see a tool disappear. If you're forced to work in a situation like this, you need to have somebody watching the tools at all times. Sometimes that person is your partner. Never, ever leave your tools alone unless they are locked in a secure room. Always keep yourself between a



Figure 25. Shown here is the control box for the system.

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Figure 26. The author is getting ready to test the sensor by simulating a ligature thrown over the door.



Figure 29. When the original system was installed years ago, an electrician was supposed to come back and hard-wire the power supply. You can see how that worked out.





Figures 27 and 28. These photos show the bar untriggered and triggered.

patient and your tools. This is especially important around teenaged patients.

There have been times I've installed these sensors on bathrooms inside patient rooms. In this case, the staff usually moves the patients out so you can lock yourself in and work in peace. I make it a habit to check the entire room, including the shower, to make sure nobody is hiding in the room.

It's very important to clean up after yourself and make sure you pick up what you drop, such as metal parts. If there's a wastebasket in the room, don't use it — not even for sawdust, which can be eaten. Bring your own bag in with you, and double check that nothing is left behind.

Sometimes you'll have patients engage you in conversation, and it's best to keep that to a minimum. Be polite, but let them know you're busy and look for a staff member to guide them away. Realize that most of them are probably bored to death and don't have any bad intent, but you need to be careful.

Never explain what you're doing; if anything, you're "fixing the door," and that's it. That's what the staff usually says. If you were to explain how this particular system works, it's possible that some of the patients would trigger the alarms just for fun, driving the staff crazy in the process. The less you say, the better.

I'd like to give a shout out to Mark Berger, president and resident genius at Securitech for his assistance with this article. Maranda and Ajay — also of Securitech — also helped me out with some technical questions. Visit them at www.securitech. com and take a look at what they've got.



Tony Wiersielis, CPL, CFDI, has more than a quarter century of experience and has worked in most phases of the trade throughout the New York metropolitan

area. He was named *Keynotes* Author of the Year for 2016.



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Ar routine background check is performed on all new applicants, unless you live in a State in which passing a background check is a part of the licensing requirements. Non-US citizen background checks are required. If you live in a country that does not allow third party background checks, you will be required to submit an authentic report upon request (no copies/duplicates allowed) before final membership approval can be granted. A copy of your business permit/license, license number, business card, company letterhead or suitable proof of employment in the locksmith/access control business must accompany application.

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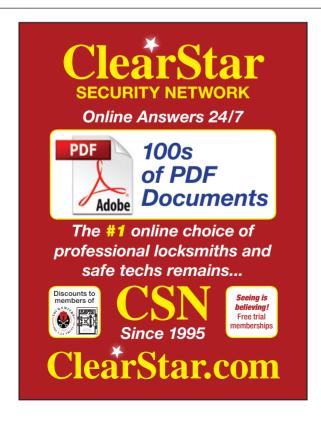
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