

Keynotes

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3-D Master Keying for SFIC

By William M. Lynk, CRL

Understanding the basics of master keying is difficult, at best, for many individuals. Add to that the complexities of numerical relationships between change key bittings and incidental master key cuts and you have a quandary of lost souls. If one can visualize the mechanical structure of master keying in a three-dimensional context within the realm of small format interchangeable cores (SFIC), sometimes miracles can happen. Here is a fable that may inspire you.

Once upon a time in a small town known as Sficville, there lived an entrepreneur by the name of Mr. Keying. He was the owner of a large real estate company. One day he had an idea to build a beautiful, large hotel that could accommodate many guests from across the country. He chose the name: Hotel 6-Pin, as he had earned six distinguished pins of honor for previous acts. This was all good. But, his hotel was not without quirks.

He envisioned his hotel to be constructed with four beautiful towers, each containing 16 floors. The towers would be connected by a top master suite, which would contain the lobby, office and baggage check area for the guests. The floors of each tower would have the physical dimension of 16' x 4'. Each floor would be equivalent to a "room" for each guest. Even though 16' x 4' is small by our terms, it was extravagant for the travelers to Sficville. And so it was done.

The floors and ceilings were made of glass, an unusual, but illuminating feature. The total area of each floor was 64 square feet. Inside of each room, along the sides appeared ample closet space, as the guests were known to bring many, many secret travel items not to be listed. Also, knowing that many of the guests would arrive with a plethora of baggage through their travels, Mr. Keying decided with the help of the local Fire Marshall (the AHJ) that each room could accommodate a maximum of 64 pieces of travel luggage called Travel Bittings. He quickly realized that all of the baggage that many of the guests will be bringing into all four towers would be inundating. So, he decided to hire someone to help him keep the hotel organized. Through a job-search on ClearStar he found Mr. Ression, the perfect candidate. Mr. Ression was an expert

in organizational skills. His first name was Prog, hailing from Eastern Europe, and was the ideal person to organize this situation.

In a creative flash, Mr. Prog Ression decided that instead of giving out random baggage check claims to each guest as they arrive, he would first organize each floor in each tower into pre-assigned travel bittings in a special numerical order. He did that per each floor, and, to each square foot on each floor by a unique travel biting ID. That amounted to 64 travel bittings per each floor (room). Prog also noted that there were many more ways to organize the bittings, but thought it best to just shut his mouth for now. In any event, within 16 floors of each tower, that would be 1,024 travel bittings. Within four towers that amounted to 4,096 travel bittings. That was a lot of luggage!

Mr. Keying announced that the town could now host grandiose conventions, and this would be done. Prog had scored big time, and Mr. Keying was appreciative of Prog's efforts. Because of Mr. Keying's insight, the entire staff now referred to him as "Master" Keying and all was right in the world. And, Prog Ression became a permanent fixture within Master Keying's properties.

The first convention brought travelers from all parts of the country. Needless to say, each traveler brought with them the limit: 64 pieces of travel bittings. Hotel 6-Pin was booked in hours! It was a miracle to Master Keying. All sixteen floors of all four towers were filled! That amounted to only 64 people, each with 64 travel bittings, but the convention was a progressive success. And, to accommodate all of the interested people who were unable to secure a reservation, the address was posted on the internet for future bookings:

**Hotel 6-Pin
4096 Page View
Sficville, IC 41664**

It was many weeks later that Master Keying had a vision through a dream. He saw another beautiful hotel just like the first, but it was much higher and able to accommodate many, many more guests. When he awoke he reached for the phone to contact his staff to investigate a property several miles down the road. Within hours, he purchased a new plot of land onto which would host a second hotel. It's address:

**Hotel 7-Pin
16384 Page View
Sficville, IC 41664**

Construction began and the townsfolk exploded with excitement. Now everyone who wanted to come to Sficville could do so. If one hotel was filled (as it usually was), they could come to another - bigger and very close, just down the road.

Master Keying used the same architectural plan to construct the 7-Pin Hotel. It was also constructed with four beautiful towers, each containing an amazing 64 floors reaching the sky! As before, the towers were connected to a top master suite, which contained the lobby, office and baggage check area for the guests. Each floor of each tower had the same physical dimension of 16' x 4'. Again, each floor was equivalent to a "room" for each guest. And so it was done.

But now, within the 64 floors of the towers, each tower could accommodate 4,096 travel bittings. Within four towers that now amounted to 16,384 travel bittings. That totaled to a whole lot of luggage!

After some thought Mr. Prog Ression said to Master Keying: "Why not just make one tower of 256 floors to accommodate our guests?", Master Keying aptly replied: "This theoretically could be done. But, aside from the threat of wind sheers toppling our structure, it seems much easier to view, analyze, comprehend and service our guests with four towers." Words of wisdom-

The years progressed and everyone was happy - Prog Ression, with his organizational way to compre-

hend the workplace - and Master Keying, who maintained his reign over all that happened in Sficville. What the town had accomplished was both extraordinary and enduring. Thus, many townsfolk added a little bit of organization into their daily lives from what they had experienced. So it was said and so it was done."

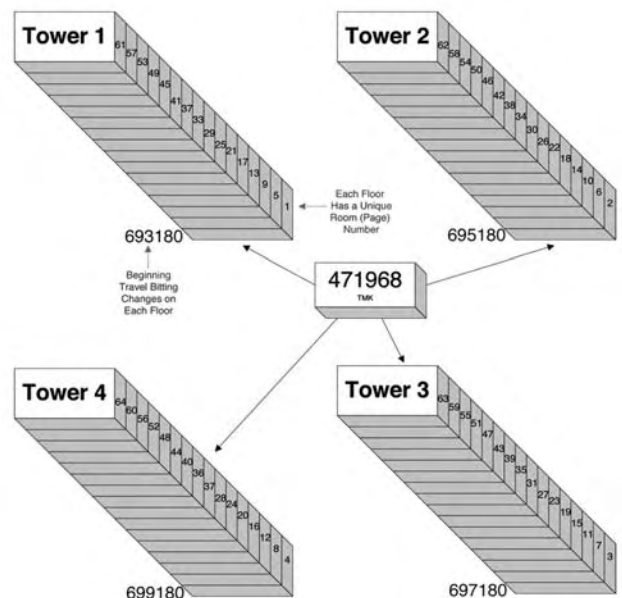
Reflections on a Fable

What is it that you're going to take from this story? It's your choice. Actually, it is quite a profound saga within the master keying genre. Is it a joke? No. Is it meant to focus people toward what master keying is all about? Yes. Can it help to refocus one toward the many levels of master keying? Yes.

The Towers were constructed using a Total Position Progression Method. They utilized an A2 SFIC System and a 2-Step Increment Type Progression. You were viewing them in your head as towers via a Standard Progression Format.

To follow is a drawing of the design, secured from Master Keying, of the Hotel 6-Pin. To follow that is a copy of the Hotel 6-Pin Floor Plan for the first complex built. Notice how cleverly Prog Ression sets up the travel bittings for each floor (room). Shown is the First

Hotel 6-Pin Design



Hotel 6-Pin Floor Plan

First Floor - Travel Bittings Claim Check

Tower #1

693180	693182	693184	693186
693380	693382	693384	693386
693580	693582	693584	693586
693780	693782	693784	693786
693100	693102	693104	693106
693300	693302	693304	693306
693500	693502	693504	693506
693700	693702	693704	693706
693120	693122	693124	693126
693320	693322	693324	693326
693520	693522	693524	693526
693720	693722	693724	693726
693140	693142	693144	693146
693340	693342	693344	693346
693540	693542	693544	693546
693740	693742	693744	693746

Floor of Tower #1.

The Power of 4

It is undisputable that multiples of four exist within this fable. To wit:

4.....16.....64.....256.....1,024.....4,096.....16,384

And, if you allow the Power of Four to take over your mind, body and soul, you can then appreciate how it affects all aspects within the A2 SFIC master keying realm (Note: the Power of Five resides in every A4 SFIC System and other Powers also exist).

Masters

Don't worry about the term. BEST uses the term in one way while others use it differently. But, in effect, it is what is hidden in the closets of the guests at Sficville.

Yes, incidental masters are the unheard of heroes in many a SFIC nightmare. As in this fable, they come out of the closet like ghosts or phantoms and reveal themselves for us to use as clearly as if they were standing in front of us. They are waiting to be used, for those who understand. But, they won't reveal themselves to everyone. It's just like the TV show, "Ghost

Whisperer". You have to be attuned to get the clue. And, all of us CAN be attuned.

Within a 7-pin SFIC system, over 21,000 incidental masters (ghost masters or phantom masters, as they may be called) are waiting to be found! In a 6-pin SFIC system, there are over 5,000.

Drop-Down Digits

TMK:

4	7	1	1	9	1	6	1	8		
6	9	3	1	1	8	1	0	2		
8	1	1	5	1	3	1	0	2		
0	1	3	1	7	1	5	1	2	4	
2	1	5	1	9	1	7	1	4	1	6

SOP: F E D A B C

Creating incidental masters can be simple if one studies the Key Biting Array (KBA). Here is the progression matrix for Hotel 6-Pin:

The Top Master Key (TMK) is shown within the black box and each possible progressive is shown in the column below each digit of the TMK. In this system, the Sequence of Progression (SOP) begins with the fourth column. Using letters, the SOP is shown below the KBA.

If the 9 in the TMK, for example, is dropped down from

Block Master:	6 9 3 9 8 0
Change Key #1:	6 9 3 1 8 0
Change Key #1:	6 9 3 3 8 0
Change Key #1:	6 9 3 5 8 0
Change Key #1:	6 9 3 7 8 0

that column into the first biting directly below it, this will become the Block Master for the first four progressives:

Each time an additional TMK digit is dropped down into a change key biting within this A2 system, the number of change keys that will be operated by that incidental master will increase by four, as hinted earlier. Notice that none of the incidental masters (like the

Number of TMK Digits Dropped Down into a Change Key Biting:	Keys Operated Under that Master:
1	4 bittings
2	16 bittings
3	64 bittings
4	256 bittings
5	1,024 bittings
6	4,096 bittings
7	16,384 bittings

one we just made visible) are part of the KBA. They are like lazy employees – they’ll never be seen unless you call them to work.

Laser Light

Remember when Prog Ression talked about “shutting his mouth”? This was in reference to the many ways that the travel bittings could be organized and referenced.

In one of Prog’s drunken stupors, he stated that: “You can shine a laser light horizontally across any floor – say Floor #7 and a master key can be derived from all of those bittings. Also, make your laser turn the corner with mirrors and cover Towers #1, #2, #3 and #4 and you can have another master key!”

Prog was not wrong. He also said: “Let’s go wild! Go to the roof and take that laser and pick any square foot on any tower and shine it down. There is a commonality that is there. You can create a master key for all of those bittings below!” Isn’t that the ultimate in 3-D thinking?”

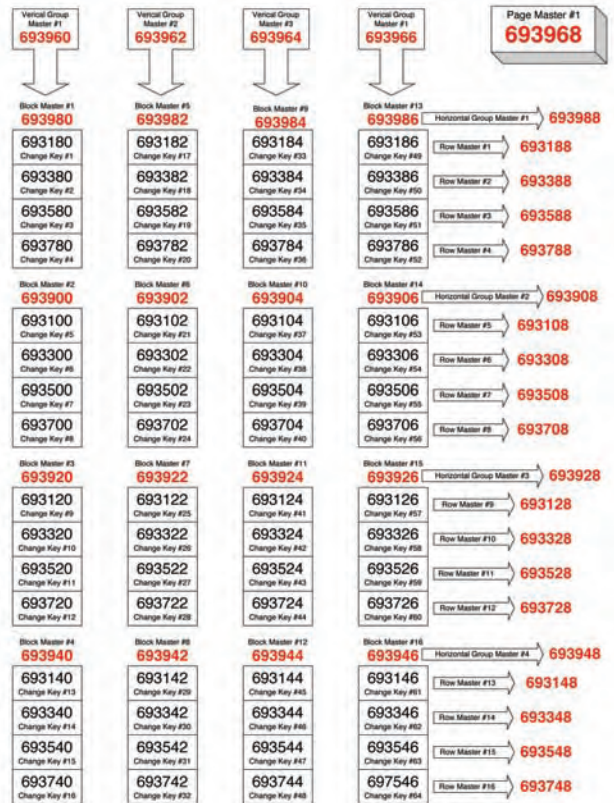
Page View

The Standard Progression Format (SPF) is one way to visualize a master keying scheme. List Format and Matrix Format are also possibilities. However, the SPF seems to be a clear-cut way to see how incidental masters play an important role within any SFIC system.

Here is Prog Ression’s Floor Plan in a more organized way (I am sure he would have figured it out in time):

Hotel 6-Pin, A2 SFIC - Page View

First Floor/Tower #1 - Page #1



CONCLUSION

The answers to some of the SFIC master keying challenges you will encounter may be addressed in the previous fable. Thinking in a 3-D mode may alter some of the ways you think about master keying. Hopefully, the analogies presented here will call to mind the practicalities of incidental masters as a tool.

The control key bitting is conspicuously absent from this story. That is because it is not relevant to understanding the 3-D relationships between the TMK and change key bittings. Traditionally, it is merely a change key excluded from the system.

Block masters, vertical group masters, horizontal group masters and page masters are only a few of the characters in this story. Prog called to our attention a master derived from the first change key bitting on each page. All of these masters lay dormant, like a sleeping giants...but beware! Know HOW to use them or they can work against you, as well.

If this fable was not “for you,” I would highly recommend the book on master keying by Jerome Andrews, CML entitled: “Fundamentals of Master Keying,” ©1990. For those more adept at master keying, I suggest the book by Billy B. Edwards, CML, entitled: “Master Keying by the Numbers” ©1990 Within these pages lay the answer that you may be looking for. And for many, so it will be done.