



# TechData Sheet

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TDS-2093-SHR

October 2004

## *Kaba Mas (Formerly Mas-Hamilton Group) X-07/X-08/X-09 Combination Locks*

### INTRODUCTION

All X-07, X-08, and X-09 combination locks are approved for securing classified information. Each lock has been tested against the version of Federal Specification FF-L-2740 (Locks, Combination) current when the lock was submitted for testing. At present, only the X-09 lock is being produced. Since March 10, 1992, manufacturers of containers and vault doors approved for protection of classified information have been required to install locks meeting Federal Specification FF-L-2740 at the time of manufacture.

Installation and operating instruction manuals for all three locks are posted on the Department of Defense (DoD) Lock Program Web site: [http://locks.nfesc.navy.mil/Documents\\_Forms.htm](http://locks.nfesc.navy.mil/Documents_Forms.htm). The manuals provide detailed directions on lock operation and explain all associated features and displays.

### SIMILARITIES

All three X-0 series locks are electromechanical, powered by turning a dial, which operates a generator. The generator powers a supercapacitor in the X-07 and X-09 and two supercapacitors in the X-08. When the lock has been powered up, a liquid crystal display (LCD) in the dial ring shows the numbers as they are dialed. There are no graduated markings on the dial.

Each lock should be dialed using full wrist turns. In dialing the combination, numbers progress as power is generated (in the X-07 and X-09). If the operator dials past the target number, continue dialing in the same direction until the target number appears.

Also, each lock has a “back-up” feature. If the target number has been passed by only a few numbers, reversing the dialing direction to a position just prior to the target number allows a second chance to dial the correct number. The “back-up” feature should not be used when changing the combination.

All the locks have three modes of operation: single, dual, and supervisor-subordinate. The same change key is used in all three locks. All the locks have two audit features. One, which is resettable, records consecutive failed attempts to open since the last opening. The other, which is not resettable, records total number of openings. The audit features can only be displayed when the lock has fully powered down.

Each lock has a penalty mode for cumulative failed attempts to open. The penalty mode is different for each lock, as is the clearing method.

### DIFFERENCES

The X-07, X-08, and X-09 can be distinguished from one another by appearance. They each have unique operating characteristics and installation procedures.



X-07

X-08

X-09

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## X-07

The dial on X-07 locks are black and have a 1-1/4-inch diameter knob. The “Mas-Hamilton Group” logo is in the center of the dial knob.

### Dialing Procedure

When the lock is powered up to the left, an arrow pointing left will appear to the left of the numbers; the numbers increase as the dial is turned. The numbers begin at a randomly different number each time the lock is powered up and each time the direction of dialing is reversed.

The dialing sequence for the X-07 is left – right – left – right. When the target number is reached, select it by pausing at least 1/4 second before reversing the dialing direction. After the first number has been selected, pause and then turn the dial to the right. The decreasing numbers will be followed by an arrow pointing right. Dial right to the second number and select it by pausing and then reversing direction. After the third number has been reached by dialing left, it is selected by pausing and then turning the dial to the right. This enters the complete combination. Either “OP→” or a lightning bolt will be displayed. “OP→” indicates that the correct combination has been entered, and directs the operator to open the lock by continuing dialing right. When the bolt is retracted, the dial will stop. (The lightning bolt display is discussed in the Penalty Mode subparagraph.)

### Backup Feature

If the target number is passed by no more than three numbers, stop dialing, and slowly reverse the dialing direction. The displayed numbers will “jump back” four previous numbers. Then dial to the target number, and resume dialing the combination.

### Audit Features

Powering up the lock to the right causes a flashing display on the LCD. A left arrow followed by two digits will alternate with two digits followed by a right arrow. This four-digit number is the number of times the lock has been opened.

If there have been three or more consecutive unsuccessful attempts to open the lock, a two-digit number will be displayed beneath a lightning bolt the

next time the lock is powered up (dialing left). The next successful opening will clear this count.

### Penalty Mode

Entering an incorrect combination results in a lightning bolt. In the X-07 lock, the following manners of dialing *even the correct combination* are interpreted as robotic dialing, resulting in a lightning bolt:

- Dialing the combination in less than 15 seconds
- Dialing with short choppy movements
- Reversing direction without pausing at least ¼ second
- Turning the dial more than 1-1/3 revolutions without pausing at least ¼ second

Ten unsuccessful attempts to dial the correct combination will result in a lockout of 1-1/2 minutes. The LCD will be blank during the lockout penalty. Do not turn the dial until the penalty period is over or the penalty will restart. Entering the correct combination will reset the failed attempts count and clear the penalty.

## X-08

The dial on X-08 locks are black and have a 2-1/8-inch diameter dial knob. There is no logo on the dial knob and the dial ring is 1 3/8-inch thick.

### Dialing Procedure

Dialing the X-08 is unique. The X-08 lock must be powered up to the left, and all subsequent dialing is to the right. The X-08 may require 50 or more full wrist turns to the left to power up.

When the lock is powered up, “E1→” will appear on the LCD. Dial to the right, and numbers will begin at either “00” or “50,” alternately. If either of these is the target number, continue dialing until the target number is reached again. Pausing on the number for 2 seconds selects that number. The display will then show “E2→.” Dial to the right to the second target number. Pause on it for 2 seconds, and “E3→” will appear. Dial to the right to the third target number. After pausing on it for 2 seconds, either “OP→” or a lightning bolt will appear. Continue dialing right to retract the bolt. (The lightning bolt display is discussed in the Penalty Mode subparagraph.)

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## Backup Features

When dialing the X-08, numbers will appear to advance more rapidly than with the X-07 or X-09. If the target number is passed, reversing the dialing direction will cause the numbers to jump back *ten* numbers, instead of four as on the X-07 and X-09.

Another backup feature (found *only* on the X-08) is that, if an incorrect number is dialed, dialing left while the next prompt is displayed will display the previous prompt. For instance, if “E2→” is displayed, but the first number was incorrectly dialed, dialing left will display “E1→” (if you have not turned the dial right). This allows the first number to be redialed.

## Audit Features

Powering up the lock to the left and not pausing at the “E1→” display causes a flashing display on the LCD. A left arrow followed by two digits will alternate with two digits followed by a right arrow. This four-digit number is the number of times the lock has been opened.

If there have been three or more consecutive unsuccessful attempts to open the lock, a two-digit number will be displayed beneath a lightning bolt the next time the lock is powered up. The next successful opening will clear this count.

## Penalty Mode

The only time a lightning bolt appears on an X-08 lock is when an incorrect combination is entered. Fifteen consecutive unsuccessful attempts puts the X-08 in “SA” (surreptitious activity) error condition. The lock will not operate normally until this mode is cleared.

To clear the “SA” mode, first let the lock completely power down (no dialing for at least 2 minutes). Then dial continuously to the left until the number of successful openings is displayed, and stop dialing. After the unsuccessful attempts count is displayed, dial right to 99. “E1→” will appear. Dial the reset combination right – right – right. (The reset combination is factory set at 50 – 25 – 50. If the reset combination is unknown, open the lock and use the serial number to change the reset combination.) A lightning bolt will appear. *IMMEDIATELY* dial left, while the lightning bolt is displayed, until “SA” appears. Then dial the correct combination for the lock. This will reset the failed attempts count and clear the penalty.

To open a lock in “SA” condition, *enter the correct combination five times without letting the lock power down*. This will not clear the “SA” condition, but it will allow access to the back of the lock.

Clearing the “SA” error condition *requires the correct combination*. The *serial number will not clear* the “SA” mode.

## X-09

The dial on X-09 locks are gray and have a 2-1/8-inch diameter dial knob. There is no logo on the dial knob, and the dial ring is 1 3/8-inch thick. The X-09 has a clutch in the dial so that overtorquing the dial will not damage the lock.

## Dialing Procedure

The dialing procedure for the X-09 is the same as the X-07. When the lock is powered up to the left, an arrow pointing left will appear to the left of numbers; the numbers will increase as the dial is turned. The numbers begin at a randomly different number each time the lock is powered up and each time the direction of dialing is reversed.

The dialing sequence for the X-09 is left – right – left – right. When the target number is reached, select it by pausing at least 1/4 second before reversing the dialing direction. After the first number has been selected, pause and then turn the dial to the right. The decreasing numbers will be followed by an arrow pointing right. Dial right to the second number and select it by pausing and reversing direction. After the third number has been reached dialing left, it is selected by pausing and turning the dial to the right. This enters the complete combination. Either “OP→” or a lightning bolt will be displayed. “OP→” indicates that the correct combination has been entered, and directs the operator to open the lock by continuing dialing right. When the bolt is retracted, the dial will stop. (The lightning bolt display is discussed in the Penalty Mode subparagraph.)

## Backup Feature

The backup feature on the X-09 is the same as the X-07. If the target number is passed by no more than three numbers, stop dialing, and slowly reverse the dialing direction. The displayed numbers will “jump back” four previous numbers. Then dial to the target number, and resume dialing the combination.

Table 1. Summary of X-07, X-08, and X-09 Lock Characteristics

	X-07	X-08	X-09
<b>Appearance</b>	Black Dial knob 1-1/4 inch diameter Logo on dial knob	Black Dial knob 2-1/8 inch diameter Dial knob blank Dial ring 1/2-inch thicker than the X-07	Gray Dial knob 2-1/8 inch diameter Dial knob blank Dial ring 1/2-inch thicker than the X-07
<b>Cover lock pin</b>	No	Yes	Yes
<b>Dialing sequence</b>	L-R-L-R	R-R-R-R	L-R-L-R
<b>Numbers begin at</b>	Random	00 or 50, alternately	Random
<b>To select a number</b>	Reverse dialing direction	Pause on number for 2 seconds	Reverse dialing direction
<b>Lightning bolt caused by</b>	Wrong combination, "robotic" dialing	Wrong combination	Wrong combination, "robotic" dialing

### Audit Features

Both audit features on the X-09 are the same as the X-07. Powering up the lock to the right causes a flashing display on the LCD. A left arrow followed by two digits will alternate with two digits followed by a right arrow. This four-digit number is the number of times the lock has been opened.

If there have been three or more consecutive unsuccessful attempts to open the lock, a two-digit number will be displayed beneath a lightning bolt the next time the lock is powered up (dialing left). The next successful opening will clear this count.

### Penalty Mode

Entering an incorrect combination results in a lightning bolt. In the X-09 lock, the following manners of dialing *even the correct combination* are interpreted as robotic dialing, resulting in a lightning bolt:

- Dialing the combination in less than 10 seconds
- Dialing with short choppy movements
- Reversing direction without pausing at least ¼ second
- Turning the dial more than 1-1/3 revolutions without pausing at least ¼ second

After ten unsuccessful attempts, the lightning bolt will remain. The lock must be kept powered up for 3 minutes. After 3 minutes, the lightning bolt display will be replaced with a left arrow followed by increasing numbers. Entering the correct combination will reset the failed

attempts count and clear the penalty.

Another failed attempt will result in another 3-minute penalty. After fifteen consecutive failed attempts, the penalty is 4 minutes.

The CD-X07, CD-X08, and CDX-09 pedestrian deadbolt locks each consist of an FF-L-2740-compliant lock mounted on a deadbolt baseplate. The combination lock on each deadbolt operates exactly the same when used in these applications as when mounted in a GSA-approved container or vault door.

Table 1 provides a summary of the X-07, X-08, and X-09 lock characteristics.

### X-09 AND CDX-09 LOCK PROCUREMENT PROCEDURES

The X-09 and CDX-09 are available from the Defense Supply Center Philadelphia (DSCP). Information on installing, operating, troubleshooting, and training regarding the X-07, X-08, X-09, and the CDX-0 series locks is available on the DoD Lock Program Web site at <http://locks.nfesc.navy.mil>.

**For further information on X-07, X-08, or X-09 combination locks contact:**

Technical Support Hotline:  
(800) 290-7607  
(805) 982-1212  
DSN 551-1212

or

E-mail: [NFESCLock-TSS@navy.mil](mailto:NFESCLock-TSS@navy.mil)