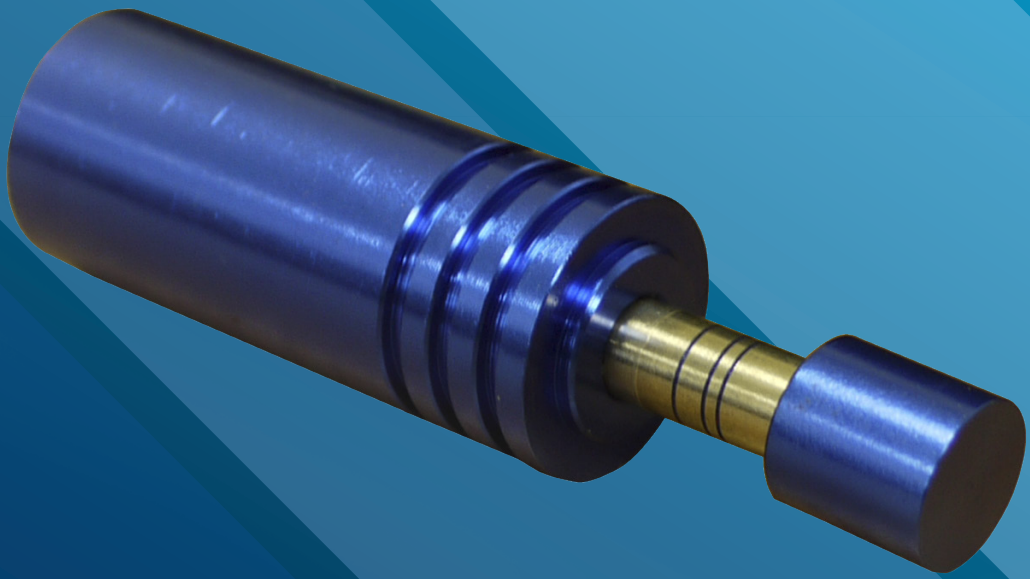
CB Button Gauge

COMPLETE USER MANUAL
By Chris Belcher



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CB BUTTON GAUGE

CB Digital-Lock Button Gauge
&
'Simplex Made Simple' [P17]

NOW Manipulating other Digital Locks [P16]
[A Guide to Manipulating Simplex Digital Mechanical Locks]

Digital-Lock Button Gauge

- Handy Tool to Help Manipulate the Simplex Digital Locks

Simplex Made Simple

- Use a Procedure
- Use Logic

Pack consists of:

- 1 Button Gauge in Plastic Container
- CD with Instructions

Forward

I liken manipulating the Simplex Mechanical Digital Lock to that of picking a 5 Lever Mortice Lock, in that it has 5 Code Gears, each with a Gate. When picking a 5 Lever Mortice Lock, my aim is to align each Lever's Gate with the Bolt-Stump, when all the Lever's Gates are in alignment with the Bolt-Stump – the bolt will be able to move to the open position.
In picking 5 Lever Mortice Locks **The Golden Rule** is to only move that Lever which shows most resistance to moving and it is this **Procedure** which I am applying to the Simplex Mechanical Digital Lock. The Multi-Stump Slide [Unlocking Slide] is similar to a Multi-Stump Lock, and when we apply Tension to the Slide, one or more Stumps will make contact with its own Code Gear. We are able to detect which Code Gears are in the **Code** and which position they are in within the **Code,** as well as detecting when a Code Gears Gate is in alignment with its Stump.

Chris Belcher

CB.Button Gauge

Figure 1

What does it look like?

Aluminium cylindrical shaped Gauge with an inner Shaft, with a Button on either end to prevent the Shaft and the Gauge Body from separating, see Figure 3 on this page

Figure 2

What is it for?

To enable the user to measure the position of a Button when it is depressed.
[to see Depressed Positions see Chart on page 5]

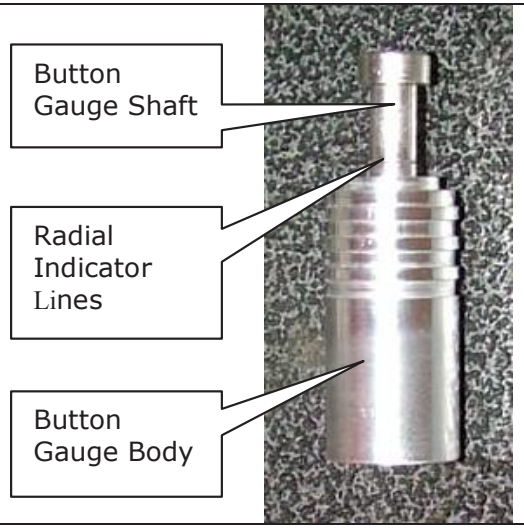
Figure 3

How does it work?

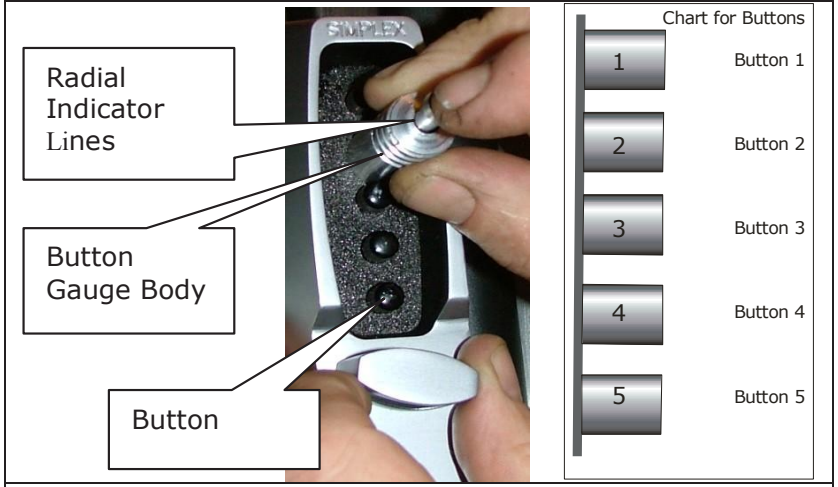
Using light pressure place the Gauge over the Button depress the Button until it stops moving, the Button Gauge will indicate one of the 4 possible positions of a Button.
[referred to as Depressed Positions, see Chart on page 5]

CB.Button Gauge

On the internal of the Button Gauge is a Shaft which simply slides in and out of the Gauge Body, on the visible end of that Shaft there is a single Radial Indicator Line, this is a 'guide' to detect the amount of movement.



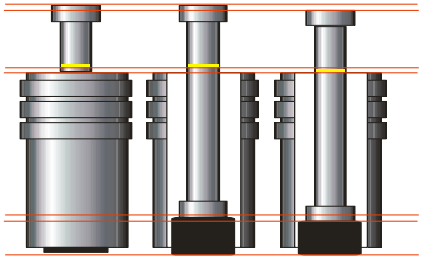
The Button Gauge will allow you to better judge the difference in depressed position of each button which can vary from lock to lock due to the wear and tear within the Lock / Buttons themselves.



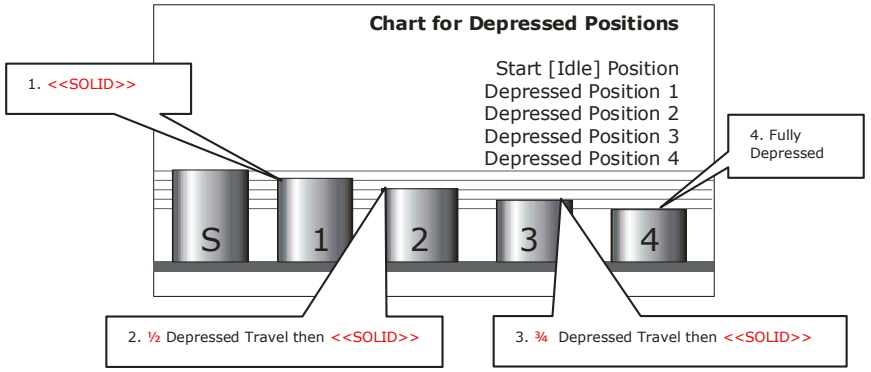
The amount of difference in movement of each Button is quite small and for some it maybe difficult to differentiate, without some sort of gauge. Therefore, what appears to be a very simple little 'widget' is actually a very handy tool.

CB.Button Gauge

This tool is to enable you to detect whether a Button Number is in the Code or not. It is to be used as a gauge, hence its name.



After decoding has started and either Button 1 is not in the Code or has been pressed and advanced to align its Gate, other Buttons may be tested [those that do not feel solid].
The Button Gauge is placed over the lock Button to be tested whilst applying light tension, the Shaft of the Button Gauge is gently pressed until the Shaft comes to a 'Stop' position [solid].
There is a single Radial Indicator Line on the Button Gauge Shaft which indicates whether a Button number is in the Code or not.
To familiarize your-self with the difference between Depressed Position 2 & Depressed Position 3.
Test the CB. Button Gauge on a Simplex Mechanical Digital Lock where the Manufacturers Code is set, ref Code 2 & 4 – 3.
Apply tension and test Button 1 with the Button Gauge to see where the Radial Indicator Line comes to – this is Depressed Position 2.
Repeat the same procedure for Button 5 to see where the Radial Indicator Line comes to – this is Depressed Position 3.



Practical: 'Simplex made Simple'

A little advice:

I would advise anyone working through this 'practical', to take their time. It would be almost impossible to take this Guide to site for the 1st time, and expect to follow through the **Procedure** to manipulate a Simplex lock. This has been written in an effort to keep up with technology – we do not de-value technology by expecting to have a Instant ***1-2-3*** answer to overcoming such products – take your time to really understand this **Procedure** using this 'practical', and you should be able to use this method when needed. There should be enough information here to allow you to cope with most Codes without resorting to ploughing through hundreds of different permutations, please take note that the codes quoted in this 'practical' are for example purposes and the results of testing may differ from lock to lock.
What is important, is the **Procedure**.

Terminology: As said before, in this 'practical' Guide to manipulating the range of Simplex locks, we are approaching this in the same vein as manipulating a 5 Lever Mortice Lock, that means that we are using terminology similar to that within a mortice lock, if you are already accustomed to using Simplex terminology, the chart below contains some of the equivalent words. Also I have deliberately named the 3 sets of gears, to simplify the procedure.

Otherwise known as:	Here:
Push Buttons/Buttons	Button
Half Number Function	Half Number Press
	Depressed Position
Code Gear	Code Gear
	Common Gear Rail
Gears	Primary Gear
	Primary Gear Cut-Away
Unlocking Slide	Multi Stump Slide
Unlocking Slide Toe	Stump [Bolt Stump]
Gear Pockets	Gate
	Contact Area for Button Plunger

This Guide to Manipulating the Simplex Digital Mechanical Locks is Colour Coded.

Green represents the Three Sets of Gears – therefore the colour **Green** relates to these activities.

Three Sets of Gears

Example: **Code Gear 1**– **Common Gear Rail**– **Primary Gear Gear**

Blue represents Buttons & Depressed Positions – therefore the colour **Blue** relates to these activities.

Buttons & Depressed Positions

Example: **Buttons** ① – **Depressed Position 1**

Red represents the Tension & Pressure – therefore the colour **Red** relates to these activities.

Tension & Pressure

Example: **Apply tension** – using light **pressure**

Purple represents Logic – therefore the colour **Purple** relates to an activity when Logic is required or used.

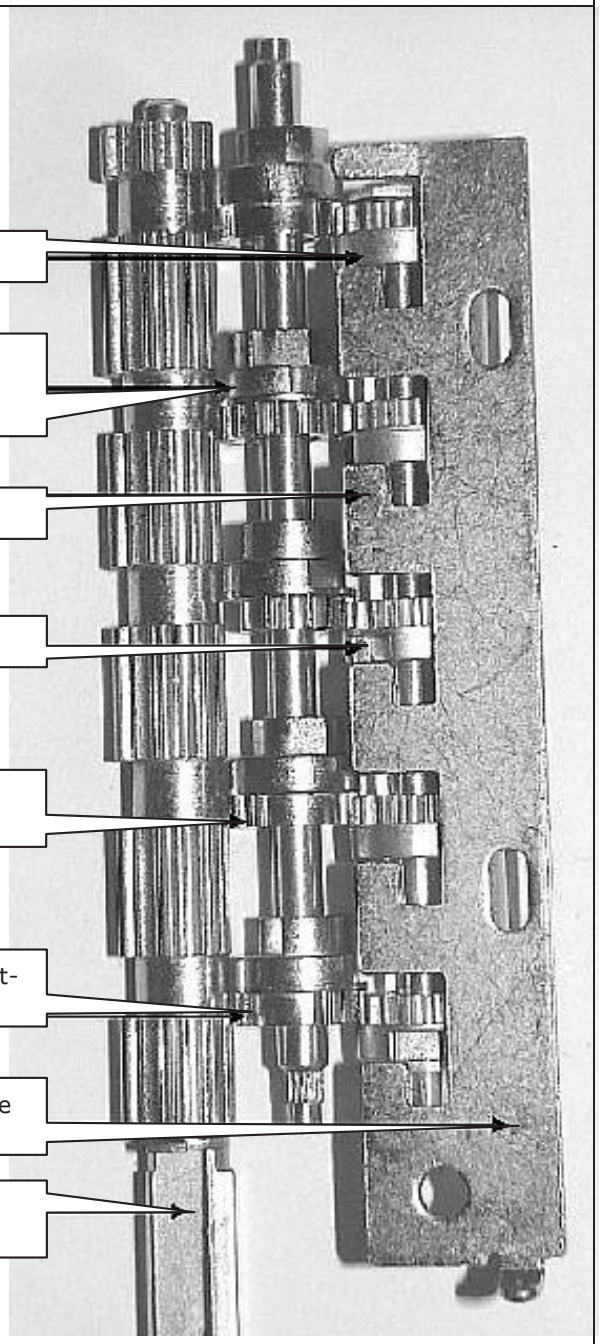
◇ ***>>> Logic<< <***

Logic is concerned with WHAT is TRUE and HOW we can know whether something is TRUE.

Black [bold] represents the **Code** numbers – therefore the colour **Black** relates to an activity when referring to the **CODE** itself.

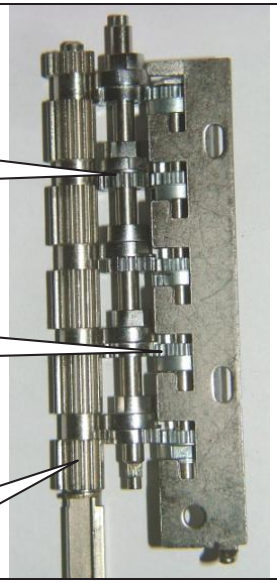
Code

Photo Breakdown of **Code** Chamber



Part i. Section 3	Identifying the Parts of the **Code** Chamber	Firstly: Let's look at these a little closer:
	Name:	Detail:
1	Code Gear	
2	Contact Area For Button Plunger. [when a Button is pressed it contacts this point on it's Primary Gear]	
3	Stump	
4	Gate	
5	Primary Gear	
6	Primary Gear Cut-Away	

Common Gear Rail	Primary Gears	Code Gears & Multi-Stump Slide
		

Part i. Section 4	The Three Sets of Gear Gears
	
	Explanation
1. Primary Gear Gears:	The Primary Gears are moved by their own Button and are permanently engaged with their own Code Gears. Also a segment of each Primary Gear is removed in the area where it would otherwise be engaged with the Common Gear Rail, this prevents movement of the Gears if they are not in the **Code**. When a Button is depressed, the Primary Gear, firstly moves into engagement with the Common Gear Rail then advances the Common Gear Rail 1 Step Change. (Because of this there are two parts to this movement; the Code Gear has actually advanced/moved 2 Step Changes. This is only of interest if ½ Number Presses are used in the **Code**.)
2. Code Gears:	Each Code Gear has a Gate which has to be aligned with its Stump (part of the Multi-Stump slide) and is driven initially by the Primary Gear, then, when another Button is depressed it will be advanced another single step change driven by the Common Gear Rail and its own Primary Gear.
3. Common Gear Rail:	The Common Gear Rail connects each Code Gear into the chain when their Buttons have been depressed. Therefore in a **Code** of **1 - 2 - 3 - 4 - 5** we are able say that Code Gear 1 is advanced not only by depressing Button ①, it is also advanced 1 Step Change for each of the subsequent Button presses.

1. Primary Gear
2. Code Gears
3. Common Gear Rail

Part i. Section 5

Charts for Step Changes

In **Code** 2 – 1 – 3 – 4 – 5				
Number	2	Has	5	Step Changes
Number	1	Has	4	Step Changes
Number	3	Has	3	Step Chang□s
Number	4	Has	2	Step Changes
Number	5	Has	1	Step Changes

In **Code** 2 – 1 – 3 - 4				
Number	2	Has	4	Step Changes
Number	1	Has	3	Step Changes
Number	3	Has	2	Step Changes
Number	4	Has	1	Step Changes

This is an important point to remember as it will tell us the position in the **Code** of the number we are working on. It will also help to determine double or triple pressed number **Codes** etc.

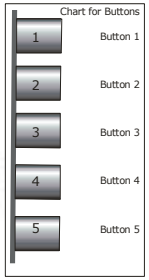
Codes:

There are 5 Buttons numbered 1 to 5.
A **Code** may consist of 1 number, 2 numbers, 3 numbers, 4 numbers or 5 numbers.
A **Code** may also consist of double numbers where 2 numbers are pressed at the same time, e.g. You might want to input 2 sets of double numbers such as 2 & 4 - 1 & 5.
A **Code** may consist of 1 triple number such as 1 & 2 & 3.
A **Code** may consist of 1 quadruple number or if you have nimble fingers 5 numbers all at once.
A **Code** may consist of ½ Number Presses.

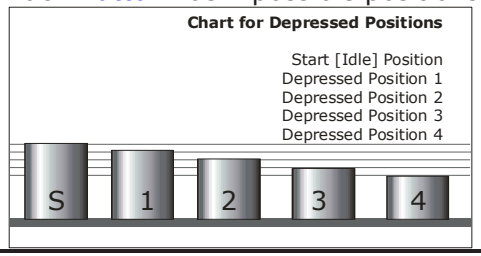
Notes:

Part i. Section 6

Construction & Operation.



There are:
5 Buttons
① ② ③ ④ ⑤
One for each Code Gear.
Each Button has 4 possible positions.



Depressed Position 1

When tested using light pressure, the Button moves a little against spring pressure then feels <<solid>>. This indicates a Button in the **Code**.

Depressed Position 2

When tested using light pressure the Button moves about ½ its travel then feels <<solid>>, this indicates a Button not in the **Code**. This is because its Stump has engaged its Gate.

Depressed Position 3

When tested with light pressure, the Button moves ¾ of its travel, this indicates a Code Gear which may or may not be in the Code, because its Stump is not in contact with its Code Gear, and is also the position used for Half Number Press **Codes**.

Depressed Position 4

Is a Button fully depressed and its Code Gear has been advanced.

Part i. Section 7

Tension & Pressure

Tension & Pressure

Tension:
In a 5 Lever Mortice Lock, one applies Tension on the Levers using a tension-wrench to pull back the Bolt Stump until it touches the Levers.

With the Simplex mechanical digital locks such as the Simplex 7000

or 900 we have a thumb turn which is effectively direct drive on the Multi Stump slide of the Code Chamber.

With the 1000 series etc we have a knob or handle, these locks incorporate a clutch between the handle and Multi Stump Slide of the Code Chamber.

With direct drive, Tension is achieved by turning the thumb turn clockwise, only light Tension is required. If too much Tension is used more than more 1 Button will indicate as being <<SOLID>>.

With those locks that have clutches there is little control, you have to turn the knob/handle clockwise/anti-clockwise depending on the variation of the product model [in the opening direction], just enough to apply Tension but not so much that the clutch slips. (this could be a bit tiresome)

Part i. Section 8

The Number 1 Code Gear.

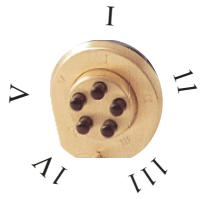
Within the Code Chamber, the Code Gears are held in place by spacers incorporated into a pressed steel cage.
The construction of the cage limits the amount of free axial movement of the Number 1 Code Gear so much so that when Tension is applied, the Multi Stump Slide only initially makes contact with the Number 1 Code Gear, therefore we always start the process by testing Number 1 Code Gear. This effect may not be present in all Code Chambers.

Button ① will usually be the 1st to indicate if it is in the **Code**.

This effect is not present in the new 5000 series locks and will be dealt with in the next publication.

Button info:

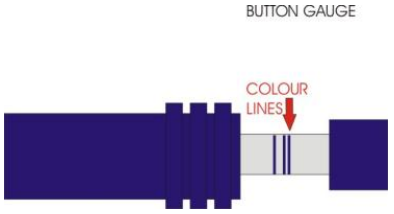
Info: The button numbers in this practical correspond to the button numbers on the products.



I ①
II ②
III ③
IV ④
V ⑤

Further Uses For the CB Button Gauge:

Supra:
Apply tension using the opening button, this allows you to measure the amount of movement on the buttons.
There is a distinct difference in movement between those buttons that are in the code, and those buttons that are not in the code.
The radial line that is nearest the top of the spindle [with the new blue button] is used for this purpose. The Button Gauge has been updated yet again. It now has 3 lines to accommodate manipulating the Supra buttons.



Keylex:
To decode the Keylex, press all the buttons except the “C” button [Clear].
Now use the button gauge to measure each of the CODE buttons by depressing them lightly until they come to a STOP.
Buttons that are NOT the CODE will stop moving when the top indicator line of the button gauge [nearest the blue button] just enters the spindle hole of the gauge, and will remain just visible.
Those buttons that are in the code will travel further and the indicator line will disappear completely.

Don’t forget to press the CLEAR button before you enter the code to OPEN the lock.

Part ii.	Section 1
	Let's Start to Manipulate the Simplex 1000 and similar locks with the same chamber.
Example A.	**Code of 1 - 2**
1	
Apply	Tension: Test all Buttons by attempting to depress each Button in turn using light Tension & Pressure only.
	What we are looking for is any Button that feels <<SOLID >> Sometimes 2 Buttons indicate. Choose the Button most resisting movement as the next Button to press, and the other Button as the test Button.

2	
	In this case: Button ① will feel <<SOLID >> **Depressed Position 1** it is therefore in the **Code**.
Press	Button ①: (this is a 1 Step Change of the Code Gear)
Test	remaining Buttons ② - ③ - ④ - ⑤ they will depress to **Depressed Position 3** indicating that the Number 1 Code Gear is not yet in position.
	We also now know that **1** is not the last number of the **Code**, (see **Code** charts Chapter ii Part 3) as it needs more than a 1 Step Change to align its Gate. Therefore to advance Number 1 Code Gear one further Step Change we press another Button.
Release	Tension **.....**
Press	Button ② This means that Number 1 Code Gear has advanced 2 Step Changes . In this case the lock will open when Tension is applied. **Code is: 1 - 2**

Part ii.	Section 2
	Let's Start to Manipulate the Simplex 1000 and similar locks with the same chamber.
Example B.	**Code of 2 - 3 - 4**
1	
Apply	Tension: Test all Buttons by attempting to depress each Button in turn using light Tension & Pressure only.
2	
	Button ① will depress to **Depressed Position 2**
	(because it is not in the **Code** and its Gate is already aligned)

3	One of the other Buttons will feel <<SOLID >>.
	In this case Button ② is <<SOLID >>. and Buttons ③ and ④ depress to
	Depressed Position 3 with Button ⑤ being depressed to **Depressed Position 2**
	(not in **Code**, this tells us that there only 3 numbers in the **Code**)
4	We now need to find the position of Number 2 Code Gear within the **Code** as Button ② felt <<SOLID >> therefore it is in the **Code**.
Release	Tension **.....**

Press	Button ②
Apply	Tension
Test	Buttons ③ and ④
	③ and ④ will depress to **Depressed Position 3**

5	
	We now know that Button ② is not the last number of the **Code**, because, if the Gate of Number 2 Code Gear had come into line, either Buttons ③ or ④ would feel <<SOLID >>, and that would mean that it only required 1 Step Changes to align its Gate, therefore we need to advance Number 2 Code Gear 1 Step Change (a total of 2 Step Changes).
Release	Tension **.....**
Press	Button ③
Apply	Tension
Test	Button ④ using light Tension & Pressure.
	Button ④ will depress to **Depressed Position 3**

◇	**>>> Now we will take a logical leap<< <** This means that we are taking in the information which we have gleaned, and put it together to make certain deductions.

6	This means that Number 2 Code Gear's Gate is still not aligned.
	Therefore, because we know that there are only 3 numbers in the **Code**:- Button ② has to be the 1st number of the **Code**, this also tells us that there are no double or triple numbers in the **Code** because there are 3 numbers in the **Code**, and Number 2 Code Gear needed 3 Step Changes to align its Gate.
	If there had been a double number, then the maximum Step Changes any Code Gear could make, would be 2 in this instance.
	The reason is that double, triple or quadruple simultaneous presses are seen mechanically as a 1 Step Change.
	We now know that there are only three numbers in the **Code** and the 1st number is number Button ② **2 - ? - ?**
	The other numbers are Buttons ③ - ④.
	We could carry on decoding, it is not required in this case as there are only 2 possible combinations, and they are
	or **Code of 2 - 3 - 4** **Code of 2 - 4 - 3**
	Notes:

Part ii.	Section 3: **Code Charts**
	Here are 4 charts which show the position in a **Code** of a given number, depending on how many Step Changes a Code Gear has to take to bring its Gate into alignment with its Stump.
CODE CHARTS	**Number of Presses to Align Gate for 5 numbers in a Five Number Code**

Position In Code

	1	2	3	4	5
1					X
2				X	
3			X		
4		X			
5	X				

CODE CHARTS — **Number of Presses to Align Gate for 4 numbers in a Four Number Code**

Position In Code

	1	2	3	4	
1				X	
2			X		
3		X			
4	X				

CODE CHARTS — **Number of Presses to Align Gate for 3 numbers in a Three Number Code**

Position In Code

	1	2	3		
1			X		
2		X			
3	X				

CODE CHARTS — **Number of Presses to Align Gate for 2 numbers in a Two Number Code**

Position In Code

	1	2			
1		X			
2	X				

Do not go on until you understand all of the previous process.
It is important for the next process. The previous examples show how we find a number that is in the **Code**, and then advance its Code Gear one Step Change at a time to determine when its Gate is lined up with its Stump, this tells us the position in the **Code**; we have also found other numbers that are not in the **Code** by looking at how far a Button is depressed.

Part ii.	Section 4:
	Let's Start to Manipulate the Simplex 1000 and similar locks with the same chamber. **Double Number Press** : [indicated by the '**&**' sign between 2 Button numbers]
Example C.	**Code of 3 & 4 together then 1 & 2 together**
Apply	Tension and test all Buttons
	Button ① is <<SOLID >> – therefore, indicating that it is in the **Code**.
Release	Tension **.....**
Press	Button ① and
Apply	Tension
Test	Buttons ②- ③ - ④ -⑤, Button ② shows to be <<SOLID >> therefore, [indicating that it is in the **Code** and Button ① is last number of the **Code**.] Buttons ③ - ④ -⑤ all move to **Depressed Position 3**
Release	Tension **.....**
Press	Button ② and then ① advancing Number 2 Code Gear
Apply	Tension
Test	Buttons ③ - ④ -⑤ all move to **Depressed Position 3** NB. We could not test Button ② in its 1st position as Number 1 Code Gear was already located in that position **Depressed Position 1**
Release	Tension **.....**

Press	Button ③
Apply	Tension
Test	Buttons ④ - ⑤ Buttons ④ - ⑤ have moved to **Depressed Position 3**
Release	Tension **.....**
Press	Button ④
Apply	Tension
Test	Button ⑤ it has moved to **Depressed Position 3** [This means that we still have not found the No 2 Code Gear Gate position.] At this stage we have 2 Options. No 1 Option: is that Button ② is doubled up with Button ① as a **Double Number Press** , or No 2 Option: is that it is the 1st number of the **Code**.
Reset	[by resetting - this action releases the Tension as well]
	We'll start with No 1 Option and …
Press	Button ①&② together
Apply	Tension
Test	Buttons ③ - ④ -⑤ Button ③ is <<SOLID >> therefore, is in the C**ode**. Button ④ moved to **Depressed Position 3** Therefore, may or may not be in the **Code**. Buttons ⑤ moved to **Depressed Position 2**

	Therefore, not in the **Code**.
	This proves that the 1st Option was correct. You will note that Buttons ①&②only had 1 Step Change each. **? - ? - 1 & 2 - x**
Reset	[by resetting - this action releases the tension as well]
Press	Buttons ③ -①&②
Apply	Tension
Test	Button ④ Button ④ is <<SOLID >> therefore, is in the C**ode**. Button ③ with 2 Step Changes is 2nd from last number [Remember that a **Double Number Press** is seen mechanically as a Single Number. In this case 1 & 2 are both in the last number position.] **? - 3 - 1 & 2 - x**
	This leaves the following permutations to test

Buttons ④-③	①&②
Buttons ④&③	①&②
Buttons ③	④&①&②

3 & 4 - 1 & 2 - x

Notes:	In the next Section of this 'Practical', all the 'obvious' actions have been removed , for example : Release tension / Apply tension etc etc. By this stage you should be well practiced with these procedures. Also the next Section of this 'Practical' will be using abbreviations.

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Part ii.	Section 5
	Let's Start to Manipulate the Simplex 1000 and similar locks with the same chamber.
Example D.	**Code of 2 & 3 together and 1 – 4 – 5**
	By now, working through this 'practical', you have become accustomed to the value/meaning of certain part names and activities; you will find it quicker to use initials. See index below:
Index	Abbreviations Index Button ① — **B①** etc **Depressed Position 1** — **DP/1** etc Number 1 Code Gear — **No 1 C/G** etc <<SOLID >> — **<S>** etc Step Change — Step/C etc
1	
Apply	Tension and test all **B's**
	B① = **<S>**, therefore, is in the **Code**.
Press	**B①** and
Test	**B's** ② - ③ - ④ - ⑤ all move to **DP/3**

2	
Press	**B** ② to advance **No 1 C/G** one further Step/C
Test	**B's** ③ - ④ - ⑤
	all move to **DP/3**
3	
Press	**B**③ to advance **No 1 C/G** one further Step/C
Test	**B's** ④ - ⑤
	B ⑤ = **<S>** number 4 moves to **DP/3**

	As there has been a change in state of number 5 it means that we have found the position of number 1 in the **Code**. It has been advanced 3 Step/C's; therefore it is 3rd number from last in the **Code**. We have to say this at this time because we do not yet know how many numbers in the **Code**. As number 1 is 3rd from last number in the **Code** and requires 3 Step/C's to align its Gate, we must advance number 1 for all further tests, by 3 Step/C's. The known **Code** thus far is **? - ? – 1** [3 Step/C's] -? -?. **? - ? - 1 - ? - ?**
	So far we pressed **B's**: ① - ② - ③ and found **B**⑤ = **<S>**

4	
Test	**B** ⑤ as we know it is in the **Code**
Press	**B's** ① - ② then **B**⑤
	(**No 1 C/G** has been advanced 3 Step/C's and 5 by 1 Step/C)

5	
Test	**B's** ③ - ④
	B ③ = **<S>**and **B** ④ moves to **DP/3**
	Therefore, now we know that **No 5 C/G** only required 1 Step/C to align its Gate and is therefore, the last number in **Code**.
	The known **Code** thus far is **:** **? - 1** [3 Step/C's] – ? - **5** [1 Step/C]. **? - ? - 1 - ? - 5**
As	**B** ③ = **<S>**, it is in the **Code**, therefore, we find out where **B** ③ is, in the **Code**.
We do NOT test	**B** ③ at its 1st Step/C as **No 5 C/G** is already in the last position with 1 Step/C.

Press	**B's** ① - ③ - ⑤
	No 1 C/G has advanced 3 Step/C's, **No 3 C/G** has advanced 2 Step/C's and **No 5 C/G** has advanced by 1 Step/C
Test	**B's** ② - ④ both move to **DP/3**
	This tells us that **No 3 C/G** is not aligned yet, having only been advanced by 2 Step/C's. We cannot test it with 3 Step/C's because **No 1 C/G** has already been advanced by 3 Step/C's [already taking that position]. Therefore, we advance **B** ③ to detect whether it is the 1st or 2nd number of the **Code**.

7	
Press	**B's** ③ - ① - ② and ⑤.
Test	**B** ④ this shows **<S>**
	Therefore, **No 3 C/G** required 4 Step/C's to align its Gate and is 4th from last number in **Code**. NB. This also means that there can only be ONE **Double Number Press** number in this **Code**.
	The known **Code** thus far is : **? - 3** [4 Step/C's] - **1** [3 Step/C's] **- ?** - **5** [1 Step/C's]. **? - 3 - 1 - ? - 5**
	We now need to find the position of number **No 4 C/G** in the **Code.**
Reset	
Press	**B's** ③ - ① - ④ - ⑤.
Test	**B** ②, and this shows to be **<S>** Therefore, **B**② is in the **Code**. And **No 4 C/G** is in its correct position.
Press	**B's** ② - ③ - ① - ④ - ⑤
	Try to open the lock – and in this instance it will not open, therefore, there must be a **Double Number Press** set of numbers in the **Code,** therefore, **B**② has to be one of the **Double Number Press's** .

	The only permutations left are:				
1]	**B's**	②& ③	①	④	⑤
2]	**B's**	③	①& ②	④	⑤
3]	**B's**	③	①	② & ④	⑤
4]	**B's**	③	①	④	② & ⑤
	Code of 2 & 3 together and 1 – 4 – 5				

Part ii. Section 6

Half Number Press

- As mentioned before, Half Number Press's may be used in the code.
- A Half Number Press is when a Button is moved to Depressed Position 3 when in-putting the code.
- This can be added to your manipulation procedure.
- When testing the Buttons that are <<SOLID>>, test at Depressed Position 3 first, then test when fully depressed.

Notes:

Suffix:

The worst scenario is a **5 digit/number Code** with no double or triple **Codes**, and the **B①** or **No 1 C/G** is the first number of the **Code**. This **Code** is rather difficult to de-code because **No 1 C/G** will need 5 steps to place it in its Gate, leaving no Buttons to test.
Therefore, you will know the **1st Code Number** and it's position, leaving you with having to try all the permutations of a **5 digit/number Code** with **number 1** always being the first number, see the chart following.

There are 24.

12345	12543	13524	14523	14352	15342
12354	12534	13542	14532	14325	15224
12453	13452	13245	14235	15234	15423
12435	13425	13254	14253	15243	15432

Abbreviations Index	See Chapter ii Part 5
Button ①	**B①** etc
Depressed Position 1	**DP/1** etc
Number 1 Code Gear	**No 1 C/G** etc
<<SOLID >>	**<S>** etc
Step Change	Step/C etc

Numbers in the Code	**1**	**2**	**3**	**4**	**5**
TEST No? PRESS No? No ? SOLID					
Position in the Code	**last**	**2nd from last**	**3rd from last**	**4th from last**	**5th from last**
PB1 [PUSH BUTTON 1] ? PB2 ? PB3 ?					

Mark these empty grids to chart your findings:

CODE CHARTS	Number of Presses to Align Gate for 5 numbers in Code			
Position In Code				
	Five Number Code Chart			
CODE CHARTS	**Number of Presses to Align Gate for 4 numbers in Code**			
Position In Code				
	Four Number Code Chart			
CODE CHARTS	**Number of Presses to Align Gate for 3 numbers in Code**			
Position In Code				
	Three Number Code Chart			
CODE CHARTS	**Number of Presses to Align Gate for 2 numbers in Code**			
Position In Code				
	Two Number Code Chart			
12345	12543	13524	14523	14352
12354	12534	13542	14532	14325
12453	13452	13245	14235	15234
12435	13425	13254	14253	15243