ERICSSON ⧩ | ⊕

Mobile Communications

VGE KEYLOADER

Operator's Manual

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INTRODUCTION

The General Electric VGE algorithm Keyloader is a small handheld unit used to load cryptographic keys in the VOICE GUARD unit. The Keyloader can store up to 7 keys or optionally up to 8 groups of 7 keys each (56 total keys). Each key consists of 8 pairs of 2 hexidecimal digits displayed as two sequences of eight digits. The cryptographic keys can only be entered, one digit at a time, by means of the keyboard. They then can be selected for transfer to the VOICE GUARD unit through an interconnecting cable. Keys cannot be redisplayed once they are stored in memory.

VGE Keyloader code version 1.1 supports two key transfer options. Option 1 transfers the key (1 through 7) and its respective position number to the Voice Guard unit. Option 2 assigns each key (1 through 7) the position number 1, irregardless of where it was stored in the Keyloader.

The Keyloader operates in the MASTER MODE or SLAVE MODE. The MASTER MODE is the normal operating mode whereby all operating functions can be performed. The SLAVE MODE disables all operating functions except the key transfer function. This feature allows one person (security officer) to program the keys and another to load the keys in the user's VOICE GUARD units without being able to alter any key.

DEFAULT CODES. If, for some reason, power has been removed (batteries changed) the password for the MASTER and SLAVE modes will have been erased along with all keys. Upon power up, the default codes are loaded into memory. They are: MASTER MODE=0000, SLAVE MODE=0000, TEST MODE=FFFF.

NOTE

If the passwords are unknown, remove and replace batteries to restore default codes.

TO TURN POWER ON

Press and hold **PWR** button down to turn unit on. A brief code version message will appear. Release when the following message is displayed (briefly).

Then one of the following messages is displayed: BATTERY LOW, MEMORY ERASED, LOCKED, MASTER MODE or SLAVE MODE. If MEMORY ERASED is displayed, the unit will be unlocked and in the MASTER MODE.

```
□ G E □ V G E □
L D R □ V 1 . 0
```

OR

```
V G E □ V 1 . 1
O P T I O N □ x
```

x = 1 or 2

NOTE

The unit will automatically power down 60 seconds after the last key-stroke was made.

PWR	ALT	Z	CLR	EXE
0	1	2	3	LOK
4	5	6	7	TRN
8	9	A	B	LOD
C	D	E	F	STA

TO CHECK STATUS OF KEYS

| | M | A | S | T | E | R | |
| | | M | O | D | E | | |

Press **PWR** to turn unit on. Display indicates MASTER or SLAVE MODE.

| | S | L | A | V | E | | |
| | | M | O | D | E | | |

Press **STA** to check status of keys. Enter the group and key number desired. Display indicates status of first key in group 1* - "ERASED or STORED".

| | K | E | Y | | 1 | . | 1 |
| | E | R | A | S | E | D | |

Press **ALT** to advance to next key or group. Press and hold to automatically sequence through all keys and groups.

Press **EXE** to exit and return to MASTER MODE.

| | M | A | S | T | E | R | |
| | | M | O | D | E | | |

TO LOAD A KEY

Press **PWR** to turn unit on.

| | M | A | S | T | E | R | |
| | | M | O | D | E | | |

Press **LOD** . Enter the Group* and key number (1-7). Now enter the crytographic key consisting of two sets of eight (HEX) digits. Display shows each digit as it's entered.

| L | O | A | D | | 1 | . | 1 |

After all 16 digits have been entered, press **ALT** to view first and second key halves. Verify they are correct.

| L | O | A | D | | 1 | . | 1 |
| F | B | 7 | A | B | A | 9 | E |

1st half key ↗

| 9 | B | F | 7 | E | C | A | B |

↑ 2nd half key

*If only strapped for 1 group.
If strapped for 8 groups, cursor stops at 1st digit awaiting entry of 1-8.

NOTE

It is recommended that cryptographic keys not start with the digit pair "00". The use of "00" as the first digits in a VGE key presents no operational cryptographic compromise; however, it could result in a spurious indication within the keyloader that no key was stored, when actually there was one.

TO CORRECT AN ERROR

```
┌─────── NOTE ───────┐
│ Errors must be corrected │
│ before the key can be │
│ entered into memory. │
└──────────────────┘
```

Press **CLR**. The **CLR** button will clear the last digit entered first and then the next digit until all digits have been cleared. Corrected data can be entered at any time. (Press **CLR** again to clear the key number and return to MASTER MODE).

```
┌L┐┌O┐┌A┐┌D┐┌ ┐┌1┐┌.┐┌1┐
┌9┐┌B┐┌F┐┌7┐┌E┐┌C┐┌.A┐┌ ┐
        cursor flashing ↑

┌ ┐┌M┐┌A┐┌S┐┌T┐┌E┐┌R┐┌ ┐
┌ ┐┌ ┐┌M┐┌O┐┌D┐┌E┐┌ ┐┌ ┐
```

Press **EXE** to store the key in memory. Once **EXE** is pressed, the key cannot be recalled or displayed. If a wrong digit is stored, it must be zeroed and reentered.
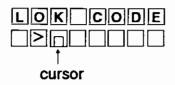
Press **LOD** to repeat loading sequence.

```
┌ ┐┌K┐┌E┐┌Y┐┌ ┐┌1┐┌.┐┌1┐
┌ ┐┌L┐┌O┐┌A┐┌D┐┌E┐┌D┐┌ ┐
```

TO LOCK THE LOADER

```
┌─────── IMPORTANT ───────┐
│ Remember (record) the 4- │
│ digit password in order to │
│ unlock the unit. │
└────────────────────────┘
```

Press **LOK** . Enter the 4-digit MASTER MODE password. If you do not enter any code but just press **EXE** , the previously stored Lock code will be used again.

```
┌L┐┌O┐┌K┐┌ ┐┌C┐┌O┐┌D┐┌E┐
┌ ┐┌>┐┌□┐┌ ┐┌ ┐┌ ┐┌ ┐┌ ┐
        ↑
      cursor
```

Press **EXE** to lock the loader. The loader is now locked. The unit will not accept a key entry nor can it be used to transfer a key into a radio until it is unlocked.

```
┌ ┐┌L┐┌O┐┌C┐┌K┐┌E┐┌D┐┌ ┐
┌h┐┌I┐┌t┐┌ ┐┌E┐┌X┐┌E┐┌ ┐
```

TO UNLOCK THE LOADER

Press **PWR** to turn unit on. Display indicates locked status.

```
┌ ┐┌L┐┌O┐┌C┐┌K┐┌E┐┌D┐┌ ┐
┌h┐┌i┐┌t┐┌ ┐┌E┐┌X┐┌E┐┌ ┐
```

Press **EXE** .

Enter 4-digit MASTER MODE password.

```
┌ ┐┌ ┐┌C┐┌O┐┌D┐┌E┐┌ ┐┌ ┐
┌ ┐┌>┐┌ ┐┌ ┐┌ ┐┌ ┐┌ ┐┌ ┐
```

Press **EXE** . The unit is now unlocked and will operate normally.

```
┌ ┐┌M┐┌A┐┌S┐┌T┐┌E┐┌R┐┌ ┐
┌ ┐┌ ┐┌M┐┌O┐┌D┐┌E┐┌ ┐┌ ┐
```

`[ ][L][O][C][K][E][D][ ]`
`[h][I][t][ ][E][X][E][ ]`

TO ZERO AN EXISTING KEY OR GROUP OF KEYS

`[ ][M][A][S][T][E][R][ ]`
`[ ][ ][M][O][D][E][ ][ ]`

Press **PWR** to turn unit on.

Press **Z** and enter group and key number to be erased. Enter **A** for key number if all keys in group are to be erased.

`[Z][E][R][O][ ][1][.][1]`

Press **EXE** to erase.

`[ ][K][E][Y][ ][1][.][1]`
`[ ][E][R][A][S][E][D][ ]`

TO ZERO AN EXISTING KEY OR GROUP OF KEYS (ALTERNATE METHOD)

OR

Press **PWR** to turn unit on.

`[ ][G][R][O][U][P][ ][1]`
`[ ][E][R][A][S][E][D][ ]`

Press **LOD** and enter group* and key number to be erased. Press **EXE**.

`[ ][M][A][S][T][E][R][ ]`
`[ ][ ][M][O][D][E][ ][ ]`

*If Strapped for 8 groups

`[ ][K][E][Y][ ][1][.][1]`
`[ ][E][R][A][S][E][D][ ]`

OR

`[ ][G][R][O][U][P][ ][1]`
`[ ][E][R][A][S][E][D][ ]`

TO ZERO ALL EXISTING KEYS

Press **Z** and hold while pressing **PWR**. All keys are erased and the unit will be unlocked and in the MASTER MODE.

`[ ][M][E][M][O][R][Y][ ]`
`[ ][E][R][A][S][E][D][ ]`

`[ ][M][A][S][T][E][R][ ]`
`[ ][ ][M][O][D][E][ ][ ]`

TO TRANSFER A KEY

(Connect interconnect cable between loader and VOICE GUARD unit).

Press **PWR** to turn unit on.

`[ ][M][A][S][T][E][R][ ]`
`[ ][ ][M][O][D][E][ ][ ]`

Press **TRN**. Unit will display last used group and key number. If a different key is to be loaded, enter the group* and key number as prompted.

`[ ][T][R][N][ ][1][.][1]`

PORTABLE RADIO UNITS ONLY

Before pressing **EXE**. to transfer a key to a portable radio unit, the portable radio must be turned OFF and then back ON. Refer to portable radio unit Operator's Manual for additional information.

Press **EXE** to transfer key(s).

`G` `O` `O` `D` `☐` `1` `.` `2`
`T` `R` `A` `N` `S` `F` `E` `R`

NOTE
If transfer fails, an ERROR Code is displayed. Reenter command and try again.

Error Codes- Example:
  VGE unit failure

`☐` `E` `R` `R` `O` `R` `☐` `3`

Refer to Keyloader Maintenance Manual, LBI-31684 for a complete listing of ERROR Codes.

1 thru 5 - Keyloader or VGE unit failures.

*Only if strapped for 8 groups

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To transfer the same key repeatedly, press **TRN** and then **EXE** .

`☐` `T` `R` `N` `☐` `1` `.` `2`

Disconnect the cable between the loader and the VOICE GUARD unit.

TO CHANGE FROM MASTER TO SLAVE MODE

(THE PASSWORD FOR THE SLAVE MODE MUST HAVE ALREADY BEEN ENTERED).

`☐` `M` `A` `S` `T` `E` `R` `☐`
`☐` `☐` `M` `O` `D` `E` `☐` `☐`

Press **PWR** to turn unit on.

`☐` `☐` `C` `O` `D` `E` `☐` `☐`
`☐` `>` `☐` `☐` `☐` `☐` `☐` `☐`

NOTE
The password for the MASTER and SLAVE modes must be different.

Press **ALT** and enter 4-digit code for the SLAVE MODE.

`☐` `S` `L` `A` `V` `E` `☐` `☐`
`☐` `☐` `M` `O` `D` `E` `☐` `☐`

Press **EXE** to change modes.

TO CHANGE FROM SLAVE TO MASTER MODE

`[ ][S][L][A][V][E][ ][ ]`
`[ ][ ][M][O][D][E][ ][ ]`

Press **PWR** to turn unit on.

`[ ][ ][C][O][D][E][ ][ ]`
`[ ][>][ ][ ][ ][ ][ ][ ]`

Press **ALT** and enter 4-digit code for the MASTER MODE.

`[ ][M][A][S][T][E][R][ ]`
`[ ][ ][M][O][D][E][ ][ ]`

Press **EXE** to change modes.

TO ENTER PASSWORD FOR MASTER OR SLAVE MODE

Press **PWR** to turn unit on. Loader should be in MASTER MODE.

`[ ][M][A][S][T][E][R][ ]`
`[ ][ ][M][O][D][E][ ][ ]`

Press **LOK** .

`[L][O][K][ ][C][O][D][E]`
`[ ][>][ ][ ][ ][ ][ ][ ]`

Press **ALT** . Enter 4-digit pass word.

`[S][L][V][ ][C][O][D][E]`
`[ ][>][ ][ ][ ][ ][ ][ ]`

Press **EXE** to return to MASTER MODE.

`[ ][M][A][S][T][E][R][ ]`
`[ ][ ][M][O][D][E][ ][ ]`

___ NOTE ___

Not entering a new password but pressing **EXE** will restore old password.

TO ENTER TEST MODE

Press **PWR** to turn unit on.

`[ ][M][A][S][T][E][R][ ]`
`[ ][ ][M][O][D][E][ ][ ]`

OR

`[ ][S][L][A][V][E][ ][ ]`
`[ ][ ][M][O][D][E][ ][ ]`

Press **ALT** and enter TEST MODE. Code =FFFF .

`[ ][ ][C][O][D][E][ ][ ]`
`[ ][>][F][F][F][F][ ][ ]`

Press **EXE** to enter TEST MODE.

`[ ][ ][T][E][S][T][ ][ ]`
`[ ][ ][M][O][D][E][ ][ ]`

Press **STA** . Enter number of desired test (0-F HEX).

`[ ][ ][T][E][S][T][ ][ ]`
`[N][U][M][B][E][R][ ][ ]`

SEE TESTS LISTED BELOW.

↑ prompt

Press **EXE** . Display indicates test completed.

`[ ][T][E][S][T][ ][2][ ]`
`[C][O][M][P][L][E][T][E]`

Press **STA** again to continue tests.

Press **EXE** to return to TEST MODE and then **EXE** again to exit test mode. Display will indicate locked status for unit.

`[ ][L][O][C][K][E][D][ ]`
`[h][i][t][ ][E][X][E][ ]`

TEST DEFINITIONS

DISPLAY	TEST	DESCRIPTION
	0	Illuminate all pixels of the display
K E Y □ H I T □	1	Echo key being depressed
□ M E M O R □ □ □ P A S S E D □	2	Verify external memory (non-destructive)
□ □ M U T T □ □ □ F A I L E D □	3	Verify watch dog (unit will reset and come up in the TEST MODE if circuit is working)

(momentarily followed by TEST MODE

DISPLAY	TEST	DESCRIPTION
□ A C K □ P I N S E T □ H I G H	4	Set ACK line high
□ A C K □ P I N □ S E T □ L O W	5	Set ACK line low
□ C L K □ P I N S E T □ H I G H	6	Set CLK line high
□ C L K □ P I N □ S E T □ L O W	7	Set CLK line low
D A T A □ P I N S E T □ H I G H	8	Set DATA line high
D A T A □ P I N □ S E T □ L O W	9	Set DATA line low

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DISPLAY	TEST	DESCRIPTION
□ R E Q □ P I N □ □ H I G H □ □	A	Continuous read of REQ line displaying high or low
D A T A □ P I N □ □ H I G H □ □	B	Continuous read of DATA line displaying high or low
(TURNS UNIT OFF)	C	Turn unit off
□ E P R O M □ □ □ P A S S E D □	D	Verify EPROM check-sum
□ C L O C K □ □ P U L S I N G □	E	Generate 9600 baud signal on CLK line for 30 seconds
□ T E S T □ F □ C O M P L E T E	F	Reserved for future expansion

TO REMOVE BATTERIES

Remove 4 Phillips screws securing back cover.
Remove and replace batteries. Verify battery polarity.

---NOTE---

The memory in the Keyloader may be erased when the batteries are replaced. Upon power up, the default codes are loaded into memory and the display may show "MEMORY ERASED". If this occurs, press **EXE** to get into the MASTER MODE.

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