

**User's Guide**  
**638A LoanMaker®**  
**Scotiabank**



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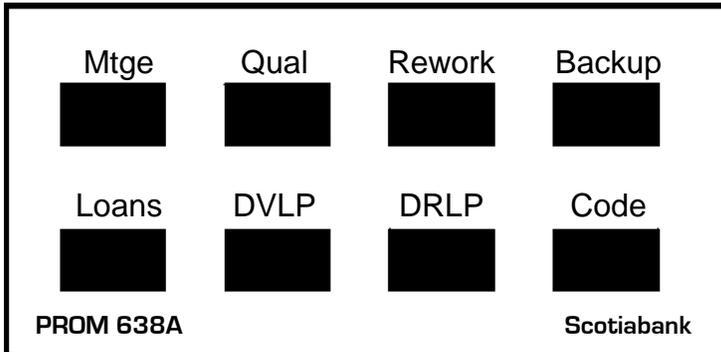
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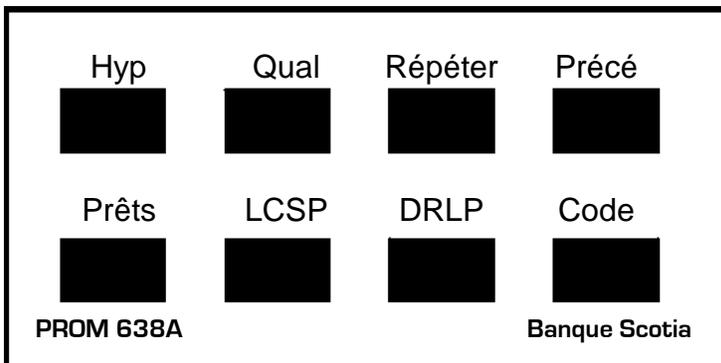
## Template Layout

The eight function keys on the face of the calculator are used to run various programs that are identified by the template to be placed on the calculator.

### English



### French



Be careful when installing the template over the calculator's keys. If the template is not aligned correctly, it may keep one or more of the keys depressed. If this happens, the calculator will fail to operate at all. Remove the template and install it again correctly.

## **Dealer Value Lease Plan - [DVLP] Function Key**

### Prompt

PMT/PR 1/2 x?\_

PRICE?\_

PMT?\_

### User Response

Enter "1" to compute the payment, or "2" to compute the price from an entered payment.

Enter the price of the vehicle.

Enter the desired monthly payment.

DLR OPT?_	Enter the amount of dealer installed options.
INSUR?_	Enter the amount of life and disability insurance.
LSE REG?_	Enter the lease registration fee.
WARRANTY?_	Enter the cost of an extended warranty.
SRV FEE?_	Enter the lease service fee.
OTHER?_	Enter any other amount capitalized into the lease.
G CASH?_	Enter the total cash downpayment (including taxes).
G TRADE?_	Enter the gross trade-in allowance (including taxes).
LIEN?_	(Appears only if there is a trade-in.) Enter the amount owed on the trade-in vehicle.
GST CREDIT Y?_ HST CREDIT Y?_	(Appears only if there is a lien.) Push [YES] to allow a GST (or HST) tax credit on the lien.
PST CREDIT Y?_	(Appears only if there is a lien and only in some provinces.) Push [YES] to allow a PST tax credit on the lien [NO].
RESID?_	Enter the residual value of the new vehicle.
EQUIP?_	Enter the amount of equipment add-ons or deductions.
EX KM 1?_	If the odometer reads over 1200 km at delivery, enter the number of excess kilometers.
\$/KM 1?_	Enter the cost per kilometer for excess kilometers at delivery in dollars, e.g., enter "0.05" for 5 cents per kilometer.
EX KM 2?_	If the user has contracted for excess kilometers (over 24,000 per year), enter the number of excess kilometers. This entry reduces the residual value.
\$/KM 2?_	Enter the cost per excess contracted kilometer.
EX KM 3?_	If the user has contracted for excess kilometers (over 24,000 per year), enter the number of excess kilometers. This entry increases the amount due at signing.
\$/KM 3?_	Enter the cost per excess contracted kilometer.
TERM (MTH)?_	Enter the lease term in months.

FACTOR x.xxxxx?\_

Enter the lease factor as a decimal, e.g., "0.00545".

GST x% Y/N x?\_

HST x% Y/N x?\_

To charge the indicated GST or HST tax rate push [YES]. If no tax is due, push [NO]. To keep the same selection, push [ENTER].

pp x% Y/N x?\_

To charge the indicated PST tax rate push [YES]. If no tax is due, push [NO]. "pp" represents the province abbreviation, e.g., "ON" for Ontario. (In British Columbia, no tax rate is shown because of the tiered-rate schedule.) To keep the same selection, push [ENTER].

PMT	xxx.xx
ADV PT	xxxxx.xx

The computed payment (or price).

Total of advance payments (if more than 1).

SEC DEP?\_

Enter the correct security deposit.

VEH REG?\_

Enter the vehicle registration fee.

OTHER S?\_

Enter any other costs due at signing.

CAP COST CALC	
PRICE	xxxxxx.xx
DLR OPT	xxxxx.xx
INSUR	xxxx.xx
LSE REG	xxxx.xx
WARRNTY	xxxx.xx
SRV FEE	xxxx.xx
OTHER	xxxx.xx
N CASH	-xxxxx.xx
N TRADE	-xxxxx.xx
LIEN	xxxxx.xx
C COST	xxxxxx.xx

Net cash down (excludes taxes)

Net trade (excludes taxes)

Payoff due on trade

Total Capitalized Cost

RESID VAL CALC	
RESID	xxxxxx.xx
EQUIP	xxxxxx.xx
	xxxx KM @ \$x.xx
EX KM 1	-xxxx.xx
	xxxx KM @ \$x.xx
EX KM 2	-xxxx.xx
ADJ RV	xxxx.xx

Excess km at delivery

Contracted excess km

Adjusted residual value

MONTHLY DEPR	
C COST	xxxxxx.xx

ADJ RV	-XXXXX.XX
T DEPR	XXXXXX.XX
TERM (MTH)	XXX
MO DEPR	XXXX.XX

MONTHLY INT COST	
C COST	XXXXXX.XX
ADJ RV	XXXXX.XX
CC+ARV	XXXXXX.XX
FACTOR	X.XXXXX
MO INT	XXXX.XX

TOT MONTHLY PMT	
BASE P	XXXXX.XX
X.XX% GST	XXX.XX
ALT GST USED	
X.XX% pp	XXX.XX
ALT PST USED	
PMT	XXXXX.XX

TOT PMT AT SIGN	
N CASH	XXXXX.XX
N TRADE	XXXXX.XX
EQUITY	XXXXX.XX
TOT DN	XXXXX.XX
X.XX% GST	XXXX.XX
X.XX% pp	XXXX.XX
ADV PT	XXXX.XX
SEC DEP	XXXX.XX
VEH REG	XXXX.XX
EX KM 3	XXXX.XX
OTHER S	XXXXX.XX
TOT DUE	XXXXXX.XX

BNS DEALER ADV	
C COST	XXXXXX.XX
LSE REG	-XXXX.XX
SRV FEE	-XXXX.XX
ADJ CC	XXXXXX.XX
ADV PT	-XXXX.XX
SEC DEP	-XXXX.XX
EX KM 3	-XXXX.XX
DLR ADV	XXXXXX.XX

Appears only if the alternate GST/HST tax computation method was used  
Appears only if the alternate PST tax computation method was used

Net cash down  
Net trade  
Equity in trade (appears if a lien exists)  
Total downpayment  
GST on downpayment  
PST on downpayment  
Advance payments(s)  
Security deposit

Excess contracted KM 3

Total due at lease signing

Capitalized cost  
Lease registration fee  
Service fee  
Adjusted cap cost  
First monthly payment  
Security deposit  
Contracted excess KM 3  
Net dealer advance

## Dealer Retail Lease Plan - [DRLP] Function Key

<u>Prompt</u>	<u>User Response</u>
PMT/PR 1/2 1?_	Enter "1" to compute the payment, or "2" to compute the price.
PRICE?_	Enter the vehicle price.
PMT?_	(Appears if solving for the vehicle price.) Enter the desired monthly payment.
G CASH?_	Enter the gross cash down.
G TRADE?_	Enter the gross trade-in allowance.
LIEN?_	Enter the amount owed on the trade-in vehicle.
RESID?_	Enter the residual value of the new vehicle.
TERM (MTH)?_	Enter the term in months.
RATE x.xx%?_	Enter the lease interest rate as a percentage, e.g., enter 9.0 for a rate of 9%.
GST x% Y/N Y?_	Push [YES] to apply the indicated GST tax rate, or [NO] if there is no tax, or [ENTER] to keep the option shown.
pp x% Y/N Y?_	Push [YES] to apply the indicated PST tax rate, or [NO] if there is no tax, or [ENTER] to keep the option shown.

PMT          xxxxx.xx	Calculated payment (or price).
-----------------------	--------------------------------

SEC DEP?_	Enter the security deposit.
VEH REG?_	Enter the vehicle registration fee.
OTHER S?_	Enter any other amount due at lease signing.

LEASE LIABILITY		
PRICE	XXXXXX.XX	
N CASH	-XXXXX.XX	Net cash downpayment
N TRADE	-XXXXX.XX	Net trade-in allowance
LIEN	XXXXX.XX	Amount owed on trade-in
NET VAL	XXXXXX.XX	Net value
MONTHLY RENTAL		
TERM (MTH)	XXX	Term in months
RATE	X.XX%	Interest rate
RESID	XXXXX.XX	Residual value amount
RV FTR	X.XXXXXXX	Residual value factor
RV PMT	XXXX.XX	Residual value payment
T DEPR	XXXXX.XX	Total depreciation
DEP FTR	X.XXXXXXX	Depreciation factor
DEP PMT	XXXX.XX	Depreciation payment
BASE P	XXXX.XX	Base payment
X.XX% pp	XXX.XX	PST on payment
ALT PST USED		
X.XX% GST	XXX.XX	GST on payment
ALT GST USED		
PMT	XXXX.XX	Total payment
PMT DUE AT SIGN		
ADV PT	XXXX.XX	Advance payment
SEC DEP	XXXX.XX	Security deposit
VEH REG	XXXX.XX	Vehicle registration
N CASH	XXXX.XX	Net cash down
X.XX% pp	XXX.XX	PST on cash down
XXX% GST	XXX.XX	GST on cash down
OTHER S	XXXXX.XX	Other
TOT DUE	XXXXX.XX	Total due at signing

This tape can be printed with the optional printer. (The printer needs to be enabled -- See Setup Routine - [Code] Function Key on page 28.)

## Qualify Routines - [Qual] Function Key

Computes total debt service for personal loans and gross debt service for mortgages.

LOAN/MTGE 1/2?\_ Enter "1" for Loan/TDS computation, or "2" for Mtge/GDS computation. (Default is 1.)

### Loan/TDS Routine

TDS xx%?\_ Enter the correct total debt service percentage.

INC/YR xxxxx?\_ Enter the annual income of the borrower.

MTGE/RENT xxxx?\_ Enter the monthly mortgage or rent payment.

LOAN/MTH xxxx?\_ Enter any existing monthly loan payments.

TAX/YR xxxx?\_ Enter the annual property taxes.

HEAT/YR xxxx?\_ Enter the annual heating costs.

CONDO/MTH xxxx?\_ Enter the monthly condominium fees.<sup>1</sup>

PMT FREQ 12?\_ If the payment frequency shown is correct, push [ENTER]; otherwise enter the desired payment frequency.

If the resulting debt service payment is greater than \$1.00, the program will automatically enter the Personal Loan routine and calculate the available amount.

### Mortgage/GDS Routine

GDS xx%?\_ Enter the desired GDS percentage.

INC/YR xxxxx?\_ Enter the annual income of the borrower.

TAX/YR xxxx?\_ Enter the annual property taxes.

HEAT/YR xxxx?\_ Enter the annual heating costs.

CONDO/MTH xxxx?\_ Enter the monthly condominium fees.<sup>1</sup>

If the resulting debt service monthly payment is greater than \$1.00, the program will automatically enter the Mortgage Routine and calculate the amount.

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<sup>1</sup> Only half of the entered fee amount is used in the calculations.

## Personal Loan Routines - [Loans] Function Key

This routine computes a loan payment, amortization period, or available proceeds.

<u>Prompt</u>	<u>User Response</u>
PMT/AM/\$ 1/2/3?_	Enter "1", "2", or "3" for the Payment, Amortization, or Amount Routine.
AMT xxxxx.xx?_	(Does not appear in the amount routine.) Enter the amount to be borrowed.
PMT xxxx.xx?_	(Does not appear in the payment routine.) Enter the desired payment amount. (If the TDS Routine has passed a payment, just push [ENTER] to use it.)
AMORT (MTH) xxx?_	(Does not appear in the amortization routine.) Enter the amortization period in months.
RATE xx.xx%?_	Enter the interest rate (as a percentage).
PMT FREQ 12?_	If the payment frequency shown is correct, push [ENTER]; otherwise enter the correct frequency. <sup>2</sup>  (This prompt does not appear if the TDS routine has passed a payment and payment frequency.)
COMP FREQ xx?_	If the compounding frequency shown is correct, push [ENTER]; otherwise enter the correct frequency. (Frequencies allowed are the same as above.)
INS 1?_	If the life insurance code shown is correct, push [ENTER]; otherwise enter the correct code.  0 - None 1 - Single life on primary borrower 2 - Disability on primary borrower 3 - Single life & disability on primary borrower 4 - Joint life 5 - Joint life & disability on primary borrower

---

<sup>2</sup> Allowed frequencies are 1, 2, 4, 12, 24, 26, & 52, corresponding to annual, semi-annual, quarterly, monthly, semi-monthly, biweekly, and weekly payments.

AGE #1 xx?\_

Enter the age of the primary borrower. (An entry is required. This borrower is the only one eligible for disability insurance.)

**Computed Payment Disclosure**

TERM (MTH) xx?\_

Enter the interest term in months. This must be a whole number of payments and less than or equal to the amortization period.<sup>3</sup>

PMT-xx	xxxxxx.xx
--------	-----------

Payment frequency and amount.

AMT	xxxxxx.xx
L xxxx	xxxxxx.xx
D xxxx	xxxxxx.xx
T PREM	xxxxxx.xx
T AMT	xxxxxx.xx
INT	xxxxxx.xx
OBLIG	xxxxxx.xx
BAL	xxxxxx.xx
# PMTS	xxxx
PMT	xxxxxx.xx
SEMI %	xx.xx%
SCOTIABANK	
638A/ttt	
(C) 1998 PROM	

Amount of loan.

Life rate and premium.

Disability rate and premium.

Total insurance premiums.

Total amount, including insurance premiums.

Interest term costs.

Total obligation of borrower.

Remaining principal balance.

Number of payments (within interest term).

Payment amount.

Equivalent semi-annual percentage.

<sup>3</sup> The interest term entry is checked to see that it corresponds with a whole number of payments. In the case of semi-monthly (24 per year), monthly, quarterly, semi-annual, or annual payments, the interest term can be any number of whole periods (3 months, 6 months, or 12 months) that is equal to or less than the amortization period.

In the case of biweekly (26 per year) payments, the interest term must be a multiple of 6 months (there being exactly 13 biweekly payments every 6 months). In the case of weekly payments, the interest term must be a multiple of 3 months (there being exactly 13 weekly payments every 3 months.) If the amortization period is less than the minimum whole number of payments, i.e. an amortization term of 4 months for a biweekly loan, it is not possible to disclose the loan.

## Computed Amortization Disclosure

AMORT (MTH)	xxx	Amortization period in months. <sup>4</sup>
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## Computed Amount Disclosure

AMT	xxxxxx.xx	Available amount to borrower(s). <sup>5</sup>
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## Rebate Routine - Subprogram #2

Computes rebates of unearned personal loan credit-insurance premiums.

### Prompt

### User Response

Push the [Code] key and enter a "2" to run this routine.

ORIG MTHS?\_      Enter the original amortization period (in months) on which the original premiums were based.

REMAIN MTHS?\_    Enter the remaining amortization period in months.

ORIG LIFE?\_      Enter the original life insurance premium.

ORIG DIS?\_      Enter the original disability premium.

The unearned portion of the premium is computed.

L REB	xxxx.xx	Life premium rebate.
D REB	xxxxx.xx	Disability premium rebate.

The rebate factor is rounded to four decimal places before the rebate is computed.

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<sup>4</sup> When the amortization is computed, no credit insurance is included. If the same loan is rewritten with credit insurance, the payment will increase to cover the cost of credit insurance.

<sup>5</sup> When the available loan amount is computed, no credit insurance is included. If the same loan is rewritten with credit insurance, the payment will increase to cover the cost of credit insurance.

## Buydown/Int Diff Subprogram - Subprogram #1

This subroutine computes the required payments for personal loans in which the interest rate has been "bought-down" for some portion of or the entire amortization term. Calculations are made by two methods: Present value and difference in interest charges.

<u>Prompt</u>	<u>User Response</u>
	Push the [Code] key and enter "1" to run this routine.
AMT xxxxx?_	Enter the amount of the loan.
AMORT (MTH) xxx?_	Enter the amortization period (in months).
REQ RATE % xx.xx?_	Enter the required interest rate percentage.
RATE % xx.xx?_	Enter the actual contract interest rate percentage.
PMT FREQ 12?_	If the payment frequency displayed is correct, push [ENTER], otherwise enter the desired frequency. <sup>6</sup>
TERM (MTH) xx?_	Enter the interest term. This must be greater than 0 and less than or equal to the amortization period.

PMT-xx	xxxxxx.xx	Payment frequency and amount.
PV IDIF	xxxxx.xx	Present-value interest differential. <sup>7</sup>
INT DIF	xxxxx.xx	Difference in interest charges. <sup>8</sup>

---

<sup>6</sup> Allowed frequencies are 12, 24, 26, & 52, corresponding to monthly, semi-monthly, biweekly, and weekly payments.

<sup>7</sup> The present-value interest differential calculation (PV IDIF) is the present value of the difference in interest charges (INT DIF) over the term.

<sup>8</sup> The difference in interest charges calculation (INT DIF) is the straight dollar difference of interest earned between the two rates for the specified term.

## Mortgage Routines - [Mtge] Function Key

These routines compute mortgages with true monthly, semi-monthly, biweekly, or weekly payments and either monthly or semi-annual compounding of interest. Accelerated and "Option" semi-monthly, biweekly, and weekly payments can also be computed.

The equivalent semi-annual rate of interest is also disclosed.

<u>Prompt</u>	<u>User Response</u>
MORT/C/F 1/2/3?_	Push the [Mtge] function key and enter "1" to compute a mortgage.
PMT/AM/\$ 1/2/3?_	Enter "1", "2", or "3" for Payment, Amortization, or Amount routine.
AMT xxxxxx?_	(Does not appear in the amount routine.) Enter the amount to be borrowed.
PMT xxxx.xx?_	(Does not appear in the payment routine.) Enter the desired payment amount. (If the GDS routine has passed a payment, just push [ENTER] to use it.)
AMORT (MTH) xxx?_	(Does not appear in the amortization routine.) Enter the amortization period in months.

*The following four prompts appear if the Ontario Effective Cost of Borrowing Option is enabled. (See Setup Routine.) If enabled, enter the amounts for the items shown regardless of whether they are paid in cash or deducted from the principal amount of the mortgage. See the Ontario regulation for more information.*

COMM?_	Enter any commission amount paid to obtain the mortgage.
BONUS?_	Enter any bonus amount paid to obtain the mortgage.
LEGAL?_	Enter any legal or title fees paid to obtain the mortgage.
OTHER?_	Enter any other fees paid to obtain the mortgage.
RATE xx.xx%?_	Enter the interest rate (as a percentage).

PMT FREQ 12?\_ (Appears only in the payment routine.)  
Enter the desired payment frequency.<sup>9</sup>

ACCEL (0/1/2) x?\_ (Appears only in the payment routine and only if the  
payment frequency is 24, 26 or 52.) Enter "1" to  
compute an "option" mortgage, a "2" for an accelerated  
mortgage, or a "0" for a conventional mortgage.

COMP FREQ 2?\_ If the compounding frequency shown is correct, push  
[ENTER]; otherwise enter the correct frequency. (Default  
is 2. Frequencies allowed are 2 and 12.)

### Find Payment Routine

LIFE x?\_ Enter the life insurance code desired from the following  
table:

- 0 - None
- 1 - Borrower only
- 2 - Co-borrower only
- 3 - Borrower & Co-borrower

AGE #1 xx?\_ Enter the age of the primary borrower.

AGE #2 xx?\_ Enter the age of the coborrower.

PMT-xx	xxxxxx.xx	Payment frequency and amount. <sup>10</sup>
LIFE x	xxx.xx	Life code and premium per payment

AMORT (MTH)	xxx	Recalculated amortization. <sup>11</sup>
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TERM (MTH) xx?\_ Enter the interest term in months (see footnote 3 on page 11).

DAYS TO IAD xx?\_ Enter the interest adjustment period in days.

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<sup>9</sup> Allowed frequencies are 12, 24, 26, & 52, corresponding to monthly, semi-monthly, biweekly, and weekly payments.

<sup>10</sup> The payment shown here includes the life insurance premium.

<sup>11</sup> If the mortgage is an accelerated or option type, the amortization term in months is recalculated using the mortgage payment. The recalculated amortization will always be less.

AMT	xxxxxxx.xx	Mortgage amount.
INT	xxxxxxx.xx	Interest term costs.
OBLIG	xxxxxxx.xx	Total obligation of borrower.
BAL	xxxxxxx.xx	Remaining principal balance.
IAD AMT	xxxxx.xx	Interest adjustment amount.
# PMTS	xxx	Number of payments (within interest term).
PMT	xxxxxxx.xx	Payment amount (not including insurance).
SEMI %	xx.xx%	Equivalent semi-annual percentage.
NETADV	xxxxxxx.xx	Ontario "Net advance" to be disclosed. <sup>12</sup>
ECB	xx.xx%	Ontario Effective Cost of Borrowing.

TDS/LOAN (Y/N)?\_                      Answer [YES] to run a TDS/Loan routine or [NO] to quit.

### Amount Disclosure

T AMT	xxxxxxx.xx	Mortgage amount available. <sup>13</sup>
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### Amortization Disclosure

AMORT (MTH)	xxx	Calculated amortization period in months.
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### CMHC Routine

This routine computes the minimum required downpayment<sup>14</sup> for conventional and CMHC insured mortgages. If the CMHC option is chosen, the CMHC fees are computed.

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<sup>12</sup> See the Setup Routine to enable the Ontario Effective Cost of Borrowing.

<sup>13</sup> This does not take into account life or disability insurance. For a given payment amount, the available mortgage amount will be less if insurance is elected.

<sup>14</sup> For conventional mortgages, the minimum downpayment is computed as 25% of the price. For CMHC mortgages, the minimum downpayment is 5% of the price. The minimum downpayment is adjusted upwards to the next whole dollar.

The mortgage amount is computed from the entered price and downpayment and is passed to the Mortgage Find Payment Routine - [Mtge] function key.

<u>Prompt</u>	<u>User Response</u>
MORT/C/F 1/2/3?_	Push the [Mtge] function key and enter "2" to run this routine.
PRICE 0?_	Enter the price of the property.
CMHC (Y/N)?_	Push [YES] to compute the minimum downpayment with CMHC insurance, or [NO] to compute it without.
DN PMT xxxxx?_	The minimum downpayment is computed and displayed. To use it, just push [ENTER]; otherwise, enter the desired downpayment amount. If a downpayment less than the computed amount is entered, an error will be reported.
CMHC \$ xxxxx.xx	The amount of the CMHC fee is displayed. <sup>15</sup> If no CMHC insurance was selected, this line will be 0.
AMT xxxxxx?_	The adjusted mortgage amount <sup>16</sup> will be displayed; to use it, push [ENTER]; otherwise enter the desired mortgage amount. The routine will continue through the standard mortgage routine to find the payment -- see Find Payment Routine on page 15.

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<sup>15</sup> Rates effective as of July 14, 2003. The CMHC Fee computation is based on the LTV% (loan-to-value ratio). The LTV% is found by dividing the mortgage amount by the price of the property and rounding the result to the nearest hundredth of a percent. The CMHC Fee is a percentage (see table below) of the mortgage amount based on the LTV%. The CMHC Fee is rounded to the nearest whole dollar.

<u>LTV%</u>	<u>Fee</u>
90.01 - 95.00%	3.25%
85.01 - 90.00%	2.00%
80.01 - 85.00%	1.75%
75.01 - 80.00%	1.00%
65.01 - 75.00%	0.65%
00.00 - 65.00%	0.50%

<sup>16</sup> The adjusted mortgage amount is the sum of the price and the CMHC fee less the downpayment.

## Equivalent Future Rate (EFR)

This routine performs a comparison between two renewal options of different terms and interest rates. The short term can be of any length, and the long term is longer than the short term but not greater than the remaining amortization of the mortgage. The long-term rate can be higher or lower than the short-term rate.

The comparison is based over the number of months in the longer term and calculates the future short-term rate that would have to be in effect for the remainder of the comparison period to make the short-term option financially equivalent to the long-term option.

If the actual interest rate in effect for the remainder of the comparison period happens to be exactly the computed equivalent future rate, it does not matter which option (short or long) the borrower takes. If the actual rate happens to be higher than the computed equivalent future rate, the borrower will gain by selecting the longer option. Conversely, if the actual rate happens to be lower than the equivalent future rate, the borrower will gain by selecting the shorter option.

If the investment opportunity interest rate is set to zero, the differences are compared by simple arithmetic. If the investment opportunity rate has a value, the time values of the differences are compared. See Investment Opportunity Rate below.

### Prompt

### User Response

MORT/C/F 1/2/3?_	Push the [Mtge] function key and enter "3" to start this routine.
BAL 0?_	Enter the current balance of the mortgage.
PMT 0?_	Enter the current mortgage payment.
PMT FREQ 12?_	Enter the payment frequency. <sup>17</sup>
INT RATE 0%?_	Enter the current interest rate.
SHORT TERM 0?_	Enter the shorter option interest term in months.
SHORT 0%?_	Enter the interest rate percentage offered for the shorter term.
LONG TERM 0?_	Enter the longer option interest term in months.

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<sup>17</sup> Allowed frequencies are 1, 2, 4, 12, 24, 26, & 52, corresponding to annual, semi-annual, quarterly, monthly, semi-monthly, biweekly, and weekly payments.

LONG 0%?\_

Enter the interest rate percentage offered for the longer term.

INV RATE 0%?\_

Enter the investment opportunity interest rate percentage (see text).

AMORT	xxx	Remaining amortization.
EF RATE	x.xxx%	Equivalent future rate.

### **Equivalent Future Rate (EFR) Example**

This example shows a practical application of the EFR routine. A borrower has a mortgage with a current balance of \$104,930.57, a current interest rate of 9.00%, and a monthly payment of \$915.74. The remaining amortization is 253 months.

The borrower is faced with renewing his or her mortgage and is trying to decide between a one-year and five-year renewal term. The one-year term offers a rate of 7.75% and the five-year renewal term offers a rate of 8.25%. We are going to compute the interest rate that would have to be in effect for the four-year period remaining after the one-year renewal term that would put the borrower in an equivalent financial position as taking the five-year option. Clearly, the rate for this four-year period would have to be higher than 7.75% (the short term rate) and even higher than the 8.25% rate. Using an investment opportunity rate (see below) of zero, we calculate the equivalent future rate to be 8.388%.

To illustrate that the calculated rate of 8.388% is correct, you can follow through the calculations below using the Mortgage routine in your calculator.

If the five-year renewal option is taken, the monthly payment will be \$866.98 and the principal balance at the end of the five-year term will be \$93,311.12.

If the one-year renewal option is taken, the monthly payment will be \$835.06 and the principal balance at the end of the one-year period will be \$102,841.67.

At the end of the one-year renewal period, the remaining amortization is 241 months ( $253 - 12 = 241$ ). Using the principal balance of \$102,841.67 that exists at the end of the one-year renewal period, we calculate the monthly payment for the subsequent four years at the equivalent future rate of 8.388% to be \$874.53. The principal balance at the end of the four-year period is \$93,331.90.

The total of monthly payments over the five-year period with the short-term renewal option is \$51,998.16 ( $12 \times 835.06 + 48 \times 874.53 = 51,998.16$ ). With the long-term renewal option, the total is \$52,018.80 ( $60 \times 866.98 = 52,018.80$ ). Subtracting these two totals, we find the borrower will make \$20.64 more in payments if he elects the long-term option.

However, we also find by comparing the remaining principal balances at the end of the five-year period that he will owe \$20.78 less by taking the long-term option ( $93,331.90 - 93,311.12 = 20.78$ ).

Thus if the interest rate for the four-year period happens to be exactly 8.388%, the borrower is in an equivalent financial position with either choice. (The small difference of \$0.14 occurs because the equivalent future rate is calculated to only three decimal places.)

If the borrower thinks that the four-year rate available after the first year will be greater than 8.388%, the long-term option is the better choice. On the other hand, if the borrower feels the four-year rate will be less than 8.388%, the short-term option will be the better choice.

The above computations assume an investment opportunity rate of 0%. If this rate is 4.75%, the equivalent future rate increases slightly to 8.401%. The inclusion of the investment opportunity rate takes into account the timing of the differences in payments. By selecting the long-term option, over the first 12 months the borrower is making a payment each month that is \$31.92 higher ( $866.98 - 835.06 = 31.92$ ). However, for the subsequent 48 months, the borrower will be making a payment that is \$7.55 lower ( $874.53 - 866.98$ ), and at the end of the five years, will owe \$20.78 less on the principal balance.

### **Investment Opportunity Rate**

The purpose of the investment opportunity rate is to take into consideration the fact that one of the options (usually the shorter one) will have a lower interest rate and consequently a lower payment amount and that the savings could be invested to earn interest.

In the previous example, the long-term option has 60 monthly payments of \$866.98, and the short-term option 12 monthly payments of \$835.06, followed by 48 payments of \$874.53. If the borrower elects the short-term option, he will save \$31.92 for each of the first 12 payments, but will pay an extra \$7.55 for each of the 48 subsequent payments. The investment opportunity rate is the interest rate that the borrower would receive on this account into which he would make a series of 12 monthly \$31.92 deposits followed by a series of 48 monthly \$7.55 withdrawals.

At the end of the comparison period, there would be some interest left in this account which the borrower could apply to reduce the principal balance if the short-term option is selected.

The program suggests an investment opportunity rate that is 3.00% less than the short-term rate, however, any rate can be entered. The additional interest that the borrower earns with the investment opportunity rate has the effect of raising the equivalent future rate slightly.

## Blend Mortgage Routine - Subprogram #4

This routine computes the blended interest rate to be used when an older mortgage is rolled over into a larger mortgage.

<u>Prompt</u>	<u>User Response</u>
	Push the [Code] function key and enter "4" to run this routine.
CUR MTGE 0?_	Enter the balance of the existing mortgage.
MTHS TO GO 0?_	Enter the number of months remaining in the original mortgage term. <sup>18</sup>
INT RATE % 0?_	Enter the interest rate percentage of the existing mortgage.
NEW MTGE 0?_	Enter the entire amount of the new mortgage, including the existing mortgage amount. <sup>19</sup>
NEW TERM 0?_	Enter the mortgage renewal term in months. <sup>20</sup>
NEW RATE % 0?_	Enter the new mortgage interest rate percentage for the renewal period.

RATE %	xx.xx%	Blended interest rate.
AMOUNT	xxxxxx.xx	Additional funds to be provided.

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<sup>18</sup> This can be whole months, or whole and fractional months, e.g., 24.5 month.

<sup>19</sup> E.g., if the existing mortgage is \$30,000 and the borrower wants an additional \$20,000, enter \$50,000 at this prompt. The entry at this prompt cannot be less than the existing mortgage balance.

<sup>20</sup> This must be at least as long as the remaining term entered above at the MTHS TO GO prompt, and it must be a whole number of months.

## Interest Rate Differential Routine - Subprogram #5

This routine computes three months' bonus interest on a principal amount and computes the difference in interest earned on two interest rates over a term.

### Prompt

### User Response

	Push the [Code] function key and enter "5" to run this routine.
PR BAL xxxxx?_	Enter the current principal balance.
MTHS TO GO 0?_	Enter the number of months over which to compute the interest rate differential amount.
CUR RATE % 0?_	Enter the current interest rate.
NEW RATE % 0?_	Enter the new interest rate.

BONUS3	xxxxxx.xx
IN DIF	xxxxxx.xx

Three months' bonus interest.  
Interest differential.

## **Error Messages**

From time-to-time, the program may report an error. The information here provides a more detailed explanation of the error and the corrective action to be taken.

Errors take two general forms:

The first type is produced by one of the programs installed in the calculator and usually is the result of a data entry error or an unreasonable result (such as a loan with negative payments). If possible, you will be returned to the prompt that needs to be changed.

**AGE REQUIRED**                      The entry of the primary borrower's age is required -- it is used to determine the insurance plans available to the primary borrower.

**AMORT TOO LONG**                      Although the payment entered will amortize the loan or mortgage being computed (See "PMT TOO SMALL" below), it will take more than 480 months. Increase the payment and/or reduce the proceeds and recompute the loan.

This error can also occur when entering the amortization period in the Rebate and Interest Differential Routines because the

	entered value exceeds the maximum amortization period.
DOWN PMT < MIN	In the CMHC routine, the entered downpayment is less than the minimum requirement.
INVALID CMP FREQ	The compounding frequency entered is not valid. For loans and residual loans, the compounding frequency may be 1, 2, 4, 12, 24, 26, or 52, corresponding to annual, semi-annual, quarterly, monthly, semi-monthly, biweekly, and weekly compounding. For mortgages, it can be either 2 or 12, corresponding to semi-annual and monthly compounding.
INVALID ENTRY	The entry just made is not allowed. The program will return to the prompt.
INVALID INS CODE	The insurance code entered is not legal. Codes can be from 0 to 5.
INVALID INT TERM	The interest term entered is not valid. This can occur if the interest term 1) is equal to zero, 2) is greater than the amortization period of the loan or mortgage, or 3) does not correspond with a whole number of payments. This last condition can occur when the payment frequency is weekly or biweekly.
INVALID PMT FREQ	The payment frequency entered is not valid. For loans, the payment frequency may be 1, 2, 4, 12, 24, 26, or 52, corresponding to annual, semi-annual, quarterly, monthly, semi-monthly, biweekly, and weekly payments. For mortgages, it can be 12, 26 or 52, corresponding to monthly, biweekly, and weekly payments.
PMT < \$1.00	The available payment computed by either of the Qualify Routines is less than \$1.00, indicating that the borrower is already at or above his or her maximum debt service.
PMT TOO SMALL	The payment entered will not amortize the loan or mortgage because the periodic interest due exceeds the payment amount. The payment must be increased or the proceeds reduced. (See also "AMORT TOO LONG!" above.)
RATE TOO LOW	The entered interest rate is below the minimum interest rate allowed.
REMAIN > ORIG	In the credit-insurance premium rebate routine, the remaining amortization period entered is greater than the original amortization period.

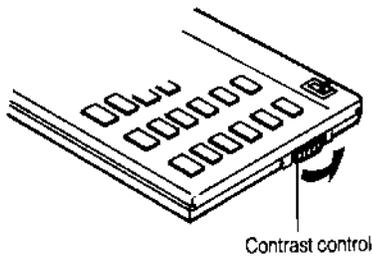
The second type appears as "ERROR # (IN ###)" and is a system error whose significance can be determined from the following table. If one of these errors occurs, push the [CA] key to clear the error before starting a routine.

ERROR 1 (IN ###)	The batteries may be weak. Try replacing them with new ones. If this error persists, the program has been changed due to some mechanical failure and will no longer operate. The calculator needs to be returned for maintenance.
ERROR 2 (IN ###)	A calculation error occurred because of a divide by 0 or overflow problem. This can occur if the amortization period or other items are not entered causing the calculator to use a value of zero.
ERROR 3 (IN ###)	The calculator needs to be initialized by using the Setup Routine. The data arrays have not been established and the programs are trying to obtain data from them.
ERROR 4 (IN ###)	If your calculator is equipped with a Software Cartridge, you may be able to correct this error by following the instructions in the section Initializing the Software Cartridge.
ERROR 7	A computed or entered number is too large to be displayed. Generally, dollar amounts are limited to \$999,999.99. (For transactions over \$999,999.99, the amounts can be divided by 10 before being entered into the calculator and the computed results multiplied by 10 to obtain the correct results.)
ERROR #	Other errors should be reported with the circumstances under which they occurred.

It is possible to attempt to compute illogical loans with the calculator (for example entering a proceeds amount of 0). Although the program will usually abort with an "ERROR 2 IN ###" message indicating an underflow or overflow condition, in a few cases the calculator may "hang" (the display will stay blank and the keys become inoperative). If this occurs, push the [CA] key or turn the calculator off and back on.

# Battery Replacement & Maintenance

## Adjusting the Display Contrast



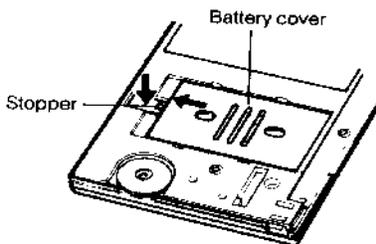
The calculator is equipped with a control to adjust the contrast of the LCD (liquid crystal display). While looking at the display from a position about 70 degrees above the keyboard, first increase the contrast until black squares are clearly visible behind the characters and then decrease the contrast slowly until the squares just disappear.

If the display contrast becomes too dim, the batteries should be replaced.

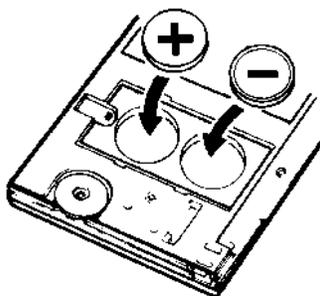
## Battery Replacement

To replace the batteries, you should first have replacement batteries at hand. Two lithium type CR2032 batteries and a small screwdriver are required.

- 1) Make sure the calculator is turned off. Place the calculator face down on a table with the contrast control in the upper left-hand corner (the writing on the back of the calculator will be right-side up).
- 2) Remove the Software Cartridge from the calculator.
- 3) Using a small screwdriver, remove the two screws holding the back. While lifting the edge of the calculator's back cover closest to you, slide it up to remove it.



- 4) Slide the silver-colored battery compartment cover upwards to open the compartment; remove the cover. The batteries are now disconnected; remove and discard them.

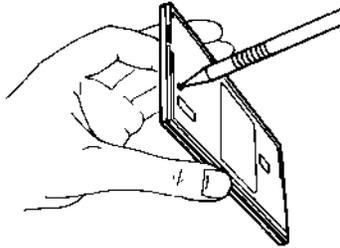


- 5) Install the new batteries, making sure the polarity (+ and -) is correct, and replace the battery compartment cover. (Make sure to replace the battery compartment cover--the batteries are not connected unless the battery compartment cover is in place.) Replace the back of the calculator by first hooking the 3 tabs on the top and then lowering the edge closest to you so you can replace the 2 screws.
- 6) Replace the Software Cartridge in the calculator. If

it has been out of the calculator for more than about 5 minutes, you will have to initialize it. See below.

### **Initializing the Software Cartridge**

After replacing the batteries or if you remove the Software Cartridge from the calculator, you may need to initialize the Software Cartridge with the following steps. Software Cartridges have a label on the back side (the side that faces the calculator) which has instructions similar to the following.)



1) Install the Software Cartridge in the calculator. With a pencil or straightened paper clip and the calculator ON, push the "ALL RESET" button on the left side of the back of the calculator. You should see 4 stars in the display (2 on the left, 2 on the right). (On some calculators, there may be a white label over the "ALL RESET" button. If so, gently lift up the lower left corner to reveal it)

2) Push [ENTER]. You should now see a single star at the right edge of the display.

3) Turn the calculator off, wait a few seconds, and then turn it back on. You should see "0." in the display. The calculator is now ready to be configured.

4) Push the [Code] key. You should see "CONFIGURING . . ." appear for a moment and then, after several seconds, the "CODE?" prompt will appear. Refer to Setup Routine - [Code] Function Key on page 28 to select the correct province and desired language.

### **Year 2000 Compliant**

The routines in this calculator are not date aware. They will run properly in the Year 2000 and thereafter.

## Installing Your Name in the LoanMaker

You can install your name (or an identification number, telephone number, or other message) in the LoanMaker Calculator. Once installed, your name will appear briefly each time you start a routine.

To install your name, push the [Setup] key and enter a code of 726 in response to the "CODE?\_" prompt. The message "INSTALL NAME" will appear briefly, followed by a single question mark, "?\_".

To enter a character (letter, number, or symbol), enter the appropriate code number from the table below and push [ENTER]. The character will appear in the display followed by a question mark. Enter the code number for the next character and push [ENTER] again. Continue entering code numbers for all the characters you wish to enter, and then push [ENTER] when you're done. If you make a mistake, push the [Backup] key to erase the last character.

You can enter up to 16 characters. The first character must not be a space (code 27), however, spaces can be used in any other position.

For example, to enter the name "LARRY 555-1234", enter the code numbers 12, 1, 18, 18, 25, 27, 35, 35, 35, 28, 31, 32, 33, 34.

To remove a name without installing a new one, start the Install Name routine and just push [ENTER] when the "?\_" prompt appears.

### Character Code Table

A	1	P	16	1	31	(	46
B	2	Q	17	2	32	)	47
C	3	R	18	3	33	+	48
D	4	S	19	4	34	,	49
E	5	T	20	5	35	.	50
F	6	U	21	6	36	/	51
G	7	V	22	7	37	:	52
H	8	W	23	8	38	;	53
I	9	X	24	9	39	<	54
J	10	Y	25	!	40	=	55
K	11	Z	26	"	41	>	56
L	12	(space)	27	#	42	?	57
M	13	-	28	\$	43	@	58
N	14	*	29	%	44		
O	15	0	30	&	45		

## Setup Routine - [Code] Function Key

CODE = 15

### Select Province

To select the province, enter a code of 15, and then enter the appropriate code number from the table below.<sup>21</sup>

AB	1	NS	7
BC	2	ON	8
MB	3	PE	9
NB	4	QC	10
NF	5	SK	11
NT	6	YT	12

PROV pp Y/N?\_

Push [YES] to confirm the desired province, or [NO] to reenter the province code.

Code = 16

ENG(1)/FRAN(2)?\_

### Change Language

Enter "1" for English, or "2" for French.

Code = 4851

SGL PMT LSE? N

Push [YES] to compute single payment leases in the DVLP routine.<sup>22</sup>

Code = 4842

ADV PMT LSE? N

Push [YES] to compute multiple advance payment leases in the DVLP routine.<sup>23</sup>

Code = 6356

Enables or disables the calculation of the Ontario Effective Cost of Borrowing in the Mortgage Routine.

Code = 9911

### Enable Printer

For the Dealer Value and Dealer Retail Lease Plans only, you can use an optional printer and print the worksheet. This code enables the printer.

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<sup>21</sup> It is important to select the correct province. Calculations vary by province, and the results will not be correct if the wrong province is selected. The Ontario Effective Cost of Borrowing option is activated in Ontario (see code 6356 above to turn this option on or off in any province).

<sup>22</sup> In a single-payment lease, the lessee makes one payment at the inception of the lease.

<sup>23</sup> The lessee makes some number (greater than 1) of payments in advance. If all are made in advance, the lease becomes a single-payment lease.