Programmable TI 58/59

Business Decisions

Quick Reference Guide

CONTENTS

CALCULATING NOTES

Low Battery Indication

If the display flashes erratically, fades out, gives incorrect results or is inconsistent in any way, recharge the battery. Calculator operation can be resumed after several minutes of recharging.

Algebraic Hierarchy

Operations and functions are performed automatically in following order.

1. Math Functions (x^2, cos, etc.)
2. Exponentiation (y^x) and Roots ($\sqrt[x]{y}$)
3. Multiplication, Division
4. Addition, Subtraction
5. Equals

Order applies to each set of parentheses. You can use up to 8 pending operations and 9 open parentheses, except where noted.

Flashing Display

A display flashing off and on indicates that an invalid key sequence has taken place or that the limits of the display have been exceeded. See Appendix B in *Personal Programming* for possible causes.

CONVERSIONS

Angle Formats

[2nd] [D.MS] — **DEGREES, MINUTES, SECONDS TO DECIMAL DEGREES** — Converts an angle measured in degrees, minutes and seconds to its decimal degrees equivalent. [INV] [2nd] [D.MS] reverses this conversion. Also used for time conversions. **Operates on display value only.** Submit 2 digits each for minutes and seconds. Entry and display format is DD.MMSSsss where DD is degrees, MM is minutes, SS is whole seconds and sss is fractional seconds.

Polar to Rectangular

R [x:t] Θ [2nd] [P→R] → y; [x:t] → x

Rectangular to Polar

x [x:t] y [INV] [2nd] [P→R] → Θ; [x:t] R

Only 4 pending operations are available for other uses when using D.MS or Polar/Rectangular conversions.

Angular Conversions

FROM \ TO	Degrees	Radians	Grads
Degrees		$\times \dfrac{\pi}{180}$	$\div\, 0.9$
Radians	$\times \dfrac{180}{\pi}$		$\times \dfrac{200}{\pi}$
Grads	$\times\, 0.9$	$\times \dfrac{\pi}{200}$	

STATISTICS

Initialize: [2nd] [Pgm] 1 [SBR] [CLR]
Data Entry: x_i [x:t] y_i [2nd] [Σ+]
Data Entry Removal: x_i [x:t] y_i [INV] [2nd] [Σ+]
Trendline Data Entry: x_1 [x:t], y_1 [2nd] [Σ+], y_2 [2nd] [Σ+], etc.
Trendline Point Removal: [x:t] [−] 1 [=] [x:t] y_i [INV] [2nd] [Σ+]

| Calculations	Key Sequence
Mean of y-array	[2nd] [x̄]
then x-array	[x:t]
Standard Deviation	
(N − 1 Weighting) of y-array	[INV] [2nd] [x̄]
then x-array	[x:t]
(N Weighting) of y-array	[INV] [2nd] [Op] 11 [√x̄]
then x-array	[x:t] [√x̄]
Variance	
(N Weighting) of y-array	[2nd] [Op] 11
then x-array	[x:t]
(N − 1 Weighting) of y-array	[2nd] [x̄] [x^2]
then x-array	[x:t] [x^2]
Y-Intercept	[2nd] [Op] 12
Slope after y-intercept	[x:t]
Correlation Coefficient	[2nd] [Op] 13
y' for new x	[2nd] [Op] 14
x' for new y	[2nd] [Op] 15

SPECIAL CONTROL OPERATIONS

Each special control operation is called by pressing [2nd] [Op] **nn** where **nn** is the 2-digit code assigned to each operation (short form addressing can be used here). These operations use up to 4 pending operations and 1 subroutine level.

Code nn	Function
00*	Initialize print register.
01*	Alphanumerics for far left quarter of print column.
02*	Alphanumerics for inside left quarter of print column.
03*	Alphanumerics for inside right quarter of print column.
04*	Alphanumerics for far right quarter of print column.
05*	Print the contents of the print register.
06*	Print last 4 characters of OP 04 with current display.
07*	Plot $\div$ in column 0-19 as specified by the display.
08*	List the labels currently used in program memory.
09	Bring specified library program into program memory.
10	Apply signum function to display register value.
11	Calculate variances.
12	Calculate slope and intercept.
13	Calculate correlation coefficient.
14	Calculate new y prime (y') for an x in the display.
15	Calculate new x prime (x') for a y in the display.
16	Display current partition of memory storage area.
17	Repartition memory storage area.
18	If no error condition exists in a program, set flag 7.
19	If an error condition exists in a program, set flag 7.
20-29	Increment a data register 0-9 by 1.
30-39	Decrement a data register 0-9 by 1.

*Designed specifically for use with optional PC-100A Print Cradle

ALPHANUMERIC PRINT CODES

The first seven control operations allow you to create and print out alphanumeric messages. Twenty characters can be printed on each line. They are assembled and stored in groups of 5 characters at a time as shown below.
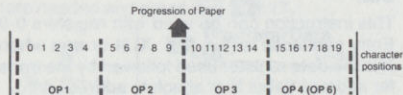
Each printed character is represented by a two-digit, row-column address code according to the following table:

	0	1	2	3	4	5	6	7
0		0	1	2	3	4	5	6
1	7	8	9	A	B	C	D	E
2	–	F	G	H	I	J	K	L
3	M	N	O	P	Q	R	S	T
4	.	U	V	W	X	Y	Z	+
5	×	*	Γ	π	e	(	)	,
6	↑	%	÷	/	=	°	×	X̄
7	≥	?	÷	∿	Ⅱ	∆	Ⅲ	Σ

For instance, A is code 13 and + is code 47

PROGRAMMING NOTES

Labels

Any key on the keyboard can be used as a label except 2nd, LRN, Ins, Del, SST, BST, Ind and the numbers 0-9.

DSZ

This instruction can be used with registers 0-9. Entry sequence is 2nd Dsz X, N or nnn where X is the data register used followed by the transfer address (label N or absolute address nnn).

Flags

Ten flags are available (0-9). Entry sequence for setting, resetting or testing flags is the flag instruction, flag number, then transfer address (testing only).

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MEMORY PARTITIONING

Memory area is partitioned in sets of 10 registers where each register can hold a data value or 8 program instructions. To check placement of current partition, press 2nd Op 16. To repartition, enter number of sets (N) of 10 data registers needed and press 2nd Op 17.

	Program/Data	
N	TI-58	TI-59
N < 0 = N		
0	479/00	959/00
1	399/09	879/09
2	319/19	799/19
3	**239/29***	719/29
4	159/39	639/39
5	079/49	559/49
6	000/59	**479/59***
7	Flashing	399/69
8	Flashing	319/79
9	Flashing	239/89
10	Flashing	159/99
N > 10	Flashing	159/99

*Partition when calculator is turned on.

Key Code	Key	Key Code	Key	Key Code	Key
00	0	39	cos	72*	STO Ind
↓	↓	40	Ind	73*	RCL Ind
09	9	42	STO	74*	SUM Ind
10	E'	43	RCL	75	−
11	A	44	SUM	76	Lbl
12	B	45	y^x	77	x=t
13	C	47	CMs	78	Σ+
14	D	48	Exc	79	x̄
15	E	49	Prd	80	Grad
16	A'	50	|x|	81	RST
17	B'	52	EE	83*	GTO Ind
18	C'	53	(	84*	Op Ind
19	D'	54	)	85	+
20	CLR	55	÷	86	St flg
22	INV	57	Eng	87	If flg
23	lnx	58	Fix	88	D.MS
24	CE	59	Int	89	π
25	CLR	60	Deg	90	List
27	INV	61	GTO	91	R/S
28	log	62*	Pgm Ind	92*	INV SBR
29	CP	63*	Exc Ind	93	.
30	tan	64*	Prd Ind	94	+/−
32	x≷t	65	×	95	=
33	x^2	66	Pause	96	Write
34	√x	67	x=t	97	Dsz
35	1/x	68	Nop	98	Adv
36	Pgm	69	Op	99	Prt
37	P→R	70	Rad		
38	sin	71	SBR		

*Merged codes

RECORDING MAGNETIC CARDS (TI-59 Only)

Display When Write Pressed, Card Entered	Calculator Response
1, 2, 3, 4	Writes a card side with this number from the bank of this number (program and/or data) and records current partition on card.
−1, −2, −3, −4	Writes and protects card side with this number from the bank with this number. Also records current partition on card.
Any other number	Card is passed but not recorded. Rightmost two integer digits of display are flashed.

If the display is flashing any value when trying to read or record a card, the card is passed but not read or recorded and the rightmost two integers in the display are flashed.

The calculator should be in standard display format when reading or recording cards.

Only the integer portion of the display is recognized, i.e., 1.234 = 1.

READING MAGNETIC CARDS
(TI-59 Only)

Display When Card Entered	Calculator Response
0	Reads information into bank number listed on card if current partition matches that on card.
	If partition incorrect, card is passed, but not read — display flashes card side passed.
1, 2, 3, 4	Expects card with this side number to be read — displays that side number.
	If another side is entered or if partition is incorrect, card is passed but not read — display flashes card side passed.
-1, -2, -3, -4	Forces side to be read into this bank number regardless of the partition or the number on the card.
	A protected program cannot be forced into any bank or alternate partition.
Any other number	Card is passed but not read — rightmost two integers in display flash.

LIBRARY USER INSTRUCTIONS

The remainder of this booklet contains the User Instructions for each program of the library.

REMOVING AND INSTALLING MODULES.
The library module can easily be removed or replaced with another. It is a good idea to leave the module in place in the calculator except when replacing it with another module. Be sure to follow these instructions when you need to remove or replace a module.

CAUTION
Be sure to touch some metal object before handling a module to prevent possible damage by static electricity.

1. Turn the calculator OFF. Loading or unloading the module with the calculator ON may cause the keyboard or display to lock out. Also, shorting the contacts can damage the module or calculator.
2. Slide out the small panel covering the module compartment at the bottom of the back of the calculator.
3. Remove the module. You may turn the calculator over and let the module fall out into your hand.
4. Insert the module, notched end first with the labeled side up into the compartment. The module should slip into place effortlessly.
5. Replace the cover panel, securing the module against the contacts.

BUSINESS DECISIONS MODULE CHECK   BD-01

STEP	PROCEDURE	ENTER	PRESS	DISPLAY
	Library Module Check			
A1	Select Program		[2nd] [Pgm] 01	
A2	Run Module Check		[SBR] [2nd] [R/S]	9.[1]
	Initialize Linear Regression			
B1	Select Program		[2nd] [Pgm] 01	
B2	Initialize Linear Regression		[SBR] [CLR]	0.

NOTES: 1. The number 9. indicates the Business Decisions Library.

STEP	PROCEDURE	ENTER	PRESS	DISPLAY
1	Select Program		[2nd] [Pgm] 02	
2	Initialize		[SBR] [CLR]	0.00
3	Enter earnings applied to funding needed for period 1 of summary. If none, enter 0.[1]	E	[2nd] [E']	E†
4	Enter the following in any order:			
	a. Expected revenue in sales	REV	[A]	REV†
	b. % Gross profit of sales	%GPS	[B]	%GPS†
	c. Capital assets needed per sales dollar	CAS	[C]	CAS†
	d. % Maximum debt allowed	%MD	[D]	%MD†
	e. Present total assets[2]	TA	[E]	TA†
	f. % Present debt level[2]	%PD	[2nd] [A']	%PD†
	g. % Dividend rate	%DR	[2nd] [B']	%DR†
	h. % Cost of capital for bonds	%CB	[2nd] [C']	%CB†
	i. % Cost of capital for stock	%CS	[2nd] [D']	%CS†
5	Perform financial summary[3]		[2nd] [E']	period†*
	Gross Profit			p†*
	Dividends			D†*
	Retained Earnings			RE†*
	Capital Assets Needed			CAP†*
	Funding Needed			FN⁵†*
	Amount of Stock Sold			S†*
	Amount of Bonds Borrowed			B⁶†*
6	To continue the summary for subsequent periods, go to Step 4 and update inputs as necessary[4]			

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NOTES:

1. If entry is miskeyed, go to Step 2.

2. No further inputs required after initial data is entered.

3. Be sure Step 4 inputs are correct before performing Step 5. Correct mistakes by reentering data in Step 4.

4. If an input error is discovered after execution of Step 5, start over at Step 2.

5. A negative value for FN indicates the amount by which the Capital Needed was exceeded by the Present Assets and Retained Earnings applied from the previous period. This amount is added to the retained earnings for the next period.

6. A negative value for B indicates the amount by which the present debt level exceeds the maximum debt allowed. This excess debt amount is liquidated by proportionately increasing the sale of stock, thereby ensuring that the present debt level equals the maximum debt allowed.

† These values are printed if the PC-100A is connected.

* These values are displayed for approximately 4 seconds.

STEP	PROCEDURE	ENTER	PRESS	DISPLAY
1	Select Program		[2nd] [Pgm] 03	
2	Initialize		[SBR] [CLR]	0.
3	Enter Number of Periods	N	[A]	N
4	Enter Market Price of Bond (Net)	MP	[B]	MP
5	Enter Face Value of Bond	FACE	[C]	FACE
6	Enter Coupon Interest Rate per Period (decimal)	Coupon	[D]	Coupon (dec.)
7	Enter Corp. Tax Rate (decimal)	TAX	[E]	TAX (dec.)
8	Compute Payment Factor		[2nd] [E']	PMT factor
9	**Install Master Library Module**			
10	Select Program		[2nd] [Pgm] 19	
11	Initialize		[2nd] [E']	0.
12	Select Ordinary Annuity/PV		[2nd] [C']	0.
13	Enter N	N	[A]	N
14	Enter PMT Factor (Step 8)	PMT factor	[C]	PMT factor
15	Enter Market Price (Net)	MP	[D]	MP
16	Enter Face Value	FACE	[E]	FACE
17	Compute Cost of Capital	0	[B]	CB

NOTES: 1. Depressing the TRACE key on the PC-100A following Step 2 will provide a printout.

STEP	PROCEDURE	ENTER	PRESS	DISPLAY
	Uneven Cash Flows			
1	Select Program		[2nd] [Pgm] 04	
2	Initialize		[SBR] [CLR]	0.
3	Enter Investment	INV	[A]	INV
4	Enter Cash Flows Using One or Both of the Following Methods:			
	I. Enter Cash Flow			
	● If Received	CF	[B]	CF
	● If Paid	CF	[+/−] [B]	−CF
	(Repeat as Needed)			
	II. a. Enter Expected Growth Rate of Cash Flows (decimal)	Growth	[2nd] [C']	Growth
	b. Enter 1st Cash Flow	CF	[C]	CF
	c. Enter Number of Cash Flows	N	[R/S]	CF_N
	(Repeat as Needed)			
5	To Change or Correct a Cash Flow Entry:			
	a. Enter Cash Flow No.	CF#	[2nd] [A']	CF#
	b. Enter Cash Flow			
	● If Received	New CF	[2nd] [B']	New CF
	● If Paid	New CF	[+/−] [2nd] [B']	−New CF
6	Compute Internal Rate of Return		[D]	i
7	Enter i As Decimal and Compute Present Value	i	[E]	PV
8	Enter i As Decimal and Compute Future Value	i	[2nd] [E']	FV
	Stock Flotation			
1	Select Program		[2nd] [Pgm] 04	
2	Initialize		[SBR] [CLR]	0.
3	Enter Current Value of Stock	INC	[A]	INC
4	Enter Dividend Payments Using One or Both of the Following Methods:			
	I. Enter Dividend Payment	DIV	[B]	DIV
	(Repeat as Needed)			
	II. a. Enter Expected Growth Rate of Dividends As Decimal	Growth	[2nd] [C']	Growth
	b. Enter 1st Dividend Payment	DIV	[C]	DIV
	c. Enter Number of Payments	N	[R/S]	DIV_N
	(Repeat as Needed)			

STEP	PROCEDURE	ENTER	PRESS	DISPLAY
5	To Change or Correct a Dividend Entry:			
	a. Enter Dividend No.	DIV #	[2nd] [A']	DIV #
	b. Enter Dividend Payment	New DIV	[2nd] [B']	New DIV
6	Enter Normal Growth Rate	Growth	[2nd] [C']	Growth
7	Enter Normal Dividend and Compute Rate of Return	DIV_∞	[2nd] [D']	i

NOTES: 1. 16+N data registers are required by the program. N is the number of cash flows or dividend payments.

PROJECT PLANNING & BUDGETING BD-05

STEP	PROCEDURE	ENTER	PRESS	DISPLAY
1	Select Program		[2nd] [Pgm] 05	
2	Initialize		[SBR] [CLR]	0.00
3	Enter Maximum Number of Rows	Max No.	[2nd] [B']	Max No.
4	Reset Partitioning	n^1	[2nd] [Op] 17	Partitioning
	ENTER ELEMENTS 1–12 OF A ROW			
	Method A			
5	Enter Row Number	Row No.	[2nd] [C']	Row No.
6	Enter Element i (Repeat for i = 1–12)	E_i	[C]	E_i
	Method B			
7	Enter Row Number	Row No.	[2nd] [C']	Row No.
8a	Enter Element 1	E_1	[C]	E_1
8b	Enter Growth Rate[2] (decimal) and Complete Entry of Columns 2–12	Growth	[R/S]	Row No.[3]

	ENTER ELEMENT 13 OF A ROW (Following 1–12 Entry)			
	Method A			
9	Enter Element 13	E_{13}	[C]	E_{13}
	Method B			
10a	Compute and Store Sum of Elements 1–12 in Column 13	Row No.	[E]	ΣR
10b	Compute and Store Average of Elements 1–12 in Column 13		[R/S]	$\bar{x} R$
	ENTER SINGLE ELEMENT			
11a	Enter Row Number	Row No.	[2nd] [C']	Row No.
11b	Enter Column Number	Col. No.	[R/S]	Col. No.
12	Enter Element[4]	E	[C]	E
	COLUMN TOTALS			
13a	Compute and Store Sum of Column Elements 1 Through (R−1) in Row R (See Step 3)	Col. No.	[2nd] [E']	ΣC
13b	Compute and Store Average of Column Elements in Row R		[R/S]	$\bar{x} C$

	ROW OPERATIONS[3]			
14a	Enter Row A or Enter Constant	Row_A K	[A] [2nd] [A']	Row_A K
14b	Enter Row B	Row_B	[R/S]	Row_B
15	Enter Resulting Row if Different From Row B[5]	Row_C	[B]	Row_C
16	Select Operation[6]			
	a. Add		[SBR] [+]	C_{13}[7]
	b. Subtract		[SBR] [−]	C_{13}[7]
	c. Multiply		[SBR] [×]	C_{13}[7]
	d. Divide		[SBR] [÷]	C_{13}[7]
	SHIFT OPERATIONS			
17a	Enter Row to be Shifted	Row_A	[A]	Row_A
17b	Enter Resulting Row[5]	Row_B	[R/S]	Row_B
18a	Enter Number of Locations Row is to be Shifted and			
	Shift Left or	No. Loc.	[D]	0.
	Shift Right	No. Loc.	[2nd] [D']	0.
18b	Enter New Data[8] (Repeat as Needed)	Data	[R/S]	Data
	RECALL A ROW			
19a	Enter Row Number	Row No.	[B]	Row No.
19b	Recall Row[3]		[R/S]	C_{13}

NOTES: 1. Set partitioning by pressing n [2nd] [Op] 17 according to the following:

No. of Rows	n
3	5*
4	6*
5	8**
6	9**
7	10**

*TI-58, within power-up partition for TI-59.
**TI-59 only.

2. Enter 0 for a constant value in each column.

3. Output format of the printer is

No.	Row		No.	Row
E_1			E_7	
E_2			E_8	
E_3			E_9	
$\sum_{i=1}^{3} E_i$	Σ		$\sum_{i=7}^{9} E_i$	Σ
E_4			E_{10}	
E_5			E_{11}	
E_6			E_{12}	
$\sum_{i=4}^{6} E_i$	Σ		$\sum_{i=10}^{12} E_i$	Σ

Observe that the data is organized by quarters for easy reference. Quarterly totals are also printed. If a printer is not available, the user should note that each of these values is displayed for approximately 2 seconds in the above order.

4. Note that at this point, Step 12 may be repeated to enter successive elements of a row. However, if too many entries are made the data will "spill over" into the next row.

5. The resulting row (row C) is where the new row is to be stored.

6. The sequence of operation is $R_A \square R_B = R_C$ or $K \square R_B = R_C$ (the $\square$ represents the selected operation). Note that if you want to subtract R_B from K, you select [SBR] [−]; however, if you want to subtract K from R_B you must enter −K and select [SBR] [+]. Similarly, to divide R_B by K, enter 1/K and select [SBR] [×].

7. In most cases C_{13} is simply the sum of elements 1–12. However, if the operation selected is $R_A \div R_B = R_C$, then C_{13} becomes the 13th element of R_A divided by the 13th element of R_B. If the operation is $K \div R_B = R_C$, C_{13} becomes the harmonic mean of the first 12 elements of the row ($12K \div \Sigma R$).

8. If the row is shifted left, the data is stored in the next available location. If it is shifted right, new data is stored from the front. A flashing display indicates an attempt to store data when the row is filled.

STEP	PROCEDURE	ENTER	PRESS	DISPLAY
1	Select Program		[2nd] [Pgm] 06	
2	Initialize		[SBR] [CLR]	0.
3	Input In Any Order:			
	a. Variable Cost ($/unit)	VAR CST	[A]	VAR CST
	b. Cost Learning Rate (%)[1]	LEARN	[B]	100 + LEARN
	c. Fixed Cost ($)	FIX CST	[C]	FIX CST
	d. Unit Price ($/unit)	U PRICE	[D]	U PRICE
	e. Price Erosion Rate (%)[1]	EROSION	[E]	100 + EROSION
	f. Command as Follows:	COMMAND	[2nd] [D']	COMMAND
	1—Find number of units to generate specified GPM.			
	2—Find GPM from sale of specified number of units.			
	3—Find total cost to produce specified number of units.			
	4—Find total revenue from selling specified number of units.			
	5—Find units for maximum GPM			
	g. Enter GPM% if Command is 1 Enter units if command is 2, 3, or 4. Not required if command is 5.	UNIT/GPM	[2nd] [E']	UNIT/GPM
4	Start Calculation		[2nd] [C']	RESULT

NOTES:

1. Constant percentage change in unit cost (price) for learning curve or erosion effect.

2. All dollar amounts are displayed to the nearest cent.

3. All unit outputs are displayed to the nearest unit.

4. All percentage outputs are displayed to the nearest hundredth of a percentage point.

5. Error indications (flashing display):

   a. No maximum GPM.
   b. GPM specified greater than maximum.
   c. GPM specified greater than or equal to 100%.
   d. Learning or Erosion Rate ≤ −50%.

6. Taxes are ignored in this program.

FACILITY CAPACITY

STEP	PROCEDURE	ENTER	PRESS	DISPLAY
1	Select Program		[2nd] [Pgm] 07	
2	Initialize		[SBR] [CLR]	0.
3	Input In Any Order:			
	a. Arrivals per time period	$\lambda^{1,2}$	[A]	λ
	b. Service rate	μ	[B]	μ
	c. Number of servers, or	C^3	[C]	C
	Number of phases	K^4	[C]	K
	d. Cost per time period of customer waiting time	CW	[D]	CW
	e. Cost per time period of facility idle time	CI	[2nd] [B']	CI
	f. Option desired:	OPT	[2nd] [A']	OPT
	−1−Series case			
	0−Parallel case (expon)			
	1−Parallel case (const)			
4	Compute with Printer, or Compute without Printer		[E] [2nd] [E']	See Library Manual p. 37

NOTES: 1. $\lambda < C\mu$ for parallel server case.   3. $C > 0$

2. $\lambda < \mu$ for series server case.   4. $K > 0$

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ECONOMIC REORDERING & PROD. RUNS

STEP	PROCEDURE	ENTER	PRESS	DISPLAY
1	Select Program		[2nd] [Pgm] 08	
2	Initialize		[SBR] [CLR]	0.
3	Repartition if Necessary[1]	No. Reg./10	[2nd] [Op] 17	0.
4	Enter Number of Price Breaks[2]	n	[B]	0.
5a	Enter Quantity at i^{th} Price Break[3]	Q_i	[C]	0.
5b	Enter Unit Price at i^{th} Price Break	CPU_i	[R/S]	0.
5c	Repeat 5a and 5b for n Pairs (Q_i, CPU_i)			
6	Enter Unit Holding Cost[4]	UHC	[D]	UHC
7	Enter Cost/Order Placed	CPO	[E]	CPO
8	Enter Demand Quantity/Year	DPY	[2nd] [A']	DPY
9	Enter Expected Demand During Lead Time	EDDLT	[2nd] [B']	EDDLT
10	Enter Std. Dev. of EDDLT	σ	[2nd] [C']	σ
11	Specify Type of Run[5]	CTL	[A]	0.
12	Enter Data	See Note 5	[R/S]	Data
13	Enter Prod. Quantity/Year[6]	P	[2nd] [D']	P
14	Enter Stockout Cost[7]	St	[STO] 17	St

15	Enter Probability of Stockout[7]	Pr	[STO] 15	Pr
16	Start Computation		[2nd] [E']	TAC[8]
			[R/S]	EOQ or EPQ
			[R/S]	R
			[R/S]	E(DDLT > R)
			[R/S]	Pr
			[R/S]	St

NOTES:

1. Each price break requires two data registers beginning with R_{29}. The TI-59 will handle up to 15 price breaks with power-up partitioning (479.59). The TI-58 must be repartitioned as follows:

        No. of Price Breaks: 1–5   Press: 4 [2nd] [Op] 17
                           6–10   5 [2nd] [Op] 17
                          11–15   6 [2nd] [Op] 17

2. n must be ≥ 1 and must be immediately followed by Q_1 on input.

3. Q_1 must be 0.

4. UHC is a decimal fraction of CPU

5.
CTL	Type of Run	Data Entered After CTL
0	Calc. TAC	Order or Production Qty.
1	Calc. EOQ w/known St	St
2	Calc. EOQ w/known Pr	Pr
−1	Calc. EPQ w/known St	St
−2	Calc. EPQ w/known Pr	Pr

6. P is always required if CTL is −1 or −2. Required for CTL = 0 if TAC is to be calculated for a given production quantity.

7. Steps 14 and 15 are required only if ... ... is to be calculated with a known cost of stockout or with a known probability of a stockout.

8. Output values are printed if the PC-100A is connected.

Error Conditions

1. n ≠ number of (Q_i, CPU_i) pairs
2. Illegal CTL digit
3. $Q_1 \neq 0$
4. For CTL = 0, both Pr and St = 0
5. Calculated Pr ≥ 1
6. St = 0 for CTL = ±1
7. Pr outside the range 0 to 1 for CTL = ±2
8. DPY ≥ P for EPQ run
9. n < 1
10. CPU ≤ 0

REORDER TIMING   BD-09

STEP	PROCEDURE	ENTER	PRESS	DISPLAY
1	Select Program		[2nd] [Pgm] 09	
2	Initialize		[SBR] [CLR]	0.
3	Enter Review Period (yrs)	T	[D]	T
4	Specify Type of Run (CTRL)	0 or 1	[A]	0.
5a	If CTRL = 0, enter prob. of backorder[1]	Pr	[R/S]	Pr
5b	If CTRL = 1, enter cost of backorder	Cb	[R/S]	Cb
6	Enter Lead Time (yrs)	t	[B]	t
7	Enter Holding Cost	C_h	[C]	C_h
8	Enter Review Cost	C_r	[R/S]	C_r
9	Enter Cost to Place an Order	C_p	[R/S]	C_p
10	Enter Demand Per Year	D	[2nd] [A']	D
11	Enter Demand During Lead Time	μ	[2nd] [B']	μ
12	Enter Std. Dev. of Demand During Lead Time	σ	[2nd] [C']	σ
13	Enter Unit Price of Item	P	[2nd] [D']	P
14a	Compute (without printer)		[2nd] [E']	TC^2
14b	Compute (with printer)		[E]	TC
				R
				T
				Pr
				Cb
				Eb
				SS
				ERC
				EPC
				EHC
				EBC

NOTES: 1. $0 < Pr < 1$

2. Press [R/S] to obtain subsequent output values without printer.

DEMAND FORECASTING

STEP	PROCEDURE	ENTER	PRESS	DISPLAY
	INITIALIZE FUNCTION			
1	Select Program		[2nd] [Pgm] 10	
2	Initialize		[SBR] [CLR]	0.
3	Enter Level Constant	α_F	[A]	α_F
4	Enter Trend Constant[1]	α_T	[R/S]	α_T
5	Enter Seasonal Constant[1]	α_S	[R/S]	α_S
6	Enter number of time periods of historical data[6]	t	[C]	0.
7	Enter Historical Data	D_i	[R/S]	0.
	Repeat until t values have been entered.			
8	Enter T = 0 if t + 1 periods of historical data required[2]	0	[2nd] [C']	0.
9	Enter data for period (t + 1)	D_{t+1}	[R/S]	D_{t+1}
10	CTRL = −1 for Initialize	1	[+/−] [2nd] [D']	−1.
11	Compute[3],[4]		[E]	T_t,* F_t,* S_i; i = 1, M*
	REVISE FUNCTION			
1	Select Program		[2nd] [Pgm] 10	
2	Initialize		[SBR] [CLR]	0.
3	Enter Level Constant[8]	α_F	[A]	α_F
4	Enter Trend Constant	α_T	[R/S]	α_T
5	Enter Seasonal Constant	α_S	[R/S]	α_S
6	Enter number of time periods of seasonal periodicity[5]	M	[B]	0.
7	Enter seasonal coefficient[5]	S_i	[R/S]	0.
	Repeat Step 7 until M values have been entered			
8	Enter Level Coefficient	F_t	[2nd] [A']	F_t
9	Enter Trend Coefficient	T_t	[R/S]	T_t
10	Enter time period of new actual demand value	τ	[2nd] [C']	0.
11	Enter new actual value	D_τ	[R/S]	D_τ
12	Set CTRL = 1 for Revise	1	[2nd] [D']	1.
13	Compute[3],[4]		[E]	F_τ,* T_τ,* S_τ*

	FORECAST FUNCTION			
	Steps 1 through 9 same as REVISE			
10	Enter time period of latest actual data	τ	[2nd] [C']	0.
11	Enter number of time periods to be forecasted[7]	Limit	[D]	Limit
12	Set CTRL = 0 for Forecast	0	[2nd] [D']	0.
13	Compute[3]		[E]	i* $DF_{t, t+1}$* (i = 1, limit)

NOTES:

1. If no trend and/or seasonal components in data, α_T and/or $\alpha_S = 0$.

2. t + 1 periods of historical data are required if data contains *both* trend and seasonal components.

3. Key [E] is used in conjunction with PC-100A. [2nd] [E'] should be used in the absence of a PC-100A.

4. With the TI-59: α_F, α_T, α_S, M, S_i (i = 1, M), F_t, and T_t may be stored on a magnetic card by pressing [2nd] [Fix] 9, 3 [2nd] [Write], insert card in slot.

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5. M and S_i required only if $\alpha_S \neq 0$.

6. t must equal M (seasonal periodicity) if $\alpha_S \neq 0$.

7. Limit must be ≥ 1.

8. For the TI-59, Steps 3 through 9 may be replaced by: [2nd] [B'], insert data card in slot.

* Printed on PC-100A.

ASSEMBLY LINE BALANCING

STEP	PROCEDURE	ENTER	PRESS	DISPLAY
1	Select Program		[2nd] [Pgm] 11	
2	Initialize		[SBR] [CLR]	0.
3	Enter Number of Tasks	No. Tasks	[A]	No. Tasks
4	Enter Task Time of Task i[1] (in XXX.X format)	Task Time	[B]	Task Time
5	Enter Task Number of Each Follower of Task i (Repeat as Needed)	Follower No.	[C]	Follower No.
6	Repeat Steps 4 and 5 for each Task			
7	After all Entries are made		[D]	0.
8a	Enter Cycle Time (with printer)	Cycle Time[2]	[E]	See Note 3
8b	Enter Cycle Time (without printer)	Cycle Time[2]	[2nd] [E']	See Note 4

NOTES:
1. The format of the task time is restricted to 4 digits, 3 to the left of the decimal and 1 to the right. Tasks must be entered in numerical sequence starting with Task No. 1.

2. The cycle time must be greater than or equal to the largest task time. If the cycle time is too small, the largest task time is flashed in the display.

3. The cycle time is printed upon entry. Then the number of each work station is printed followed by the numbers of the tasks assigned and the idle time at the station. When all tasks have been assigned, 0. is displayed following the last idle time.

4. Without the printer, [R/S] must be pressed between each output. Work station numbers are displayed as negative numbers. The numbers of the tasks assigned to the station are then displayed one at a time. Finally the idle time is flashed in the display. When all tasks have been assigned, 0. is displayed following the last idle time.

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