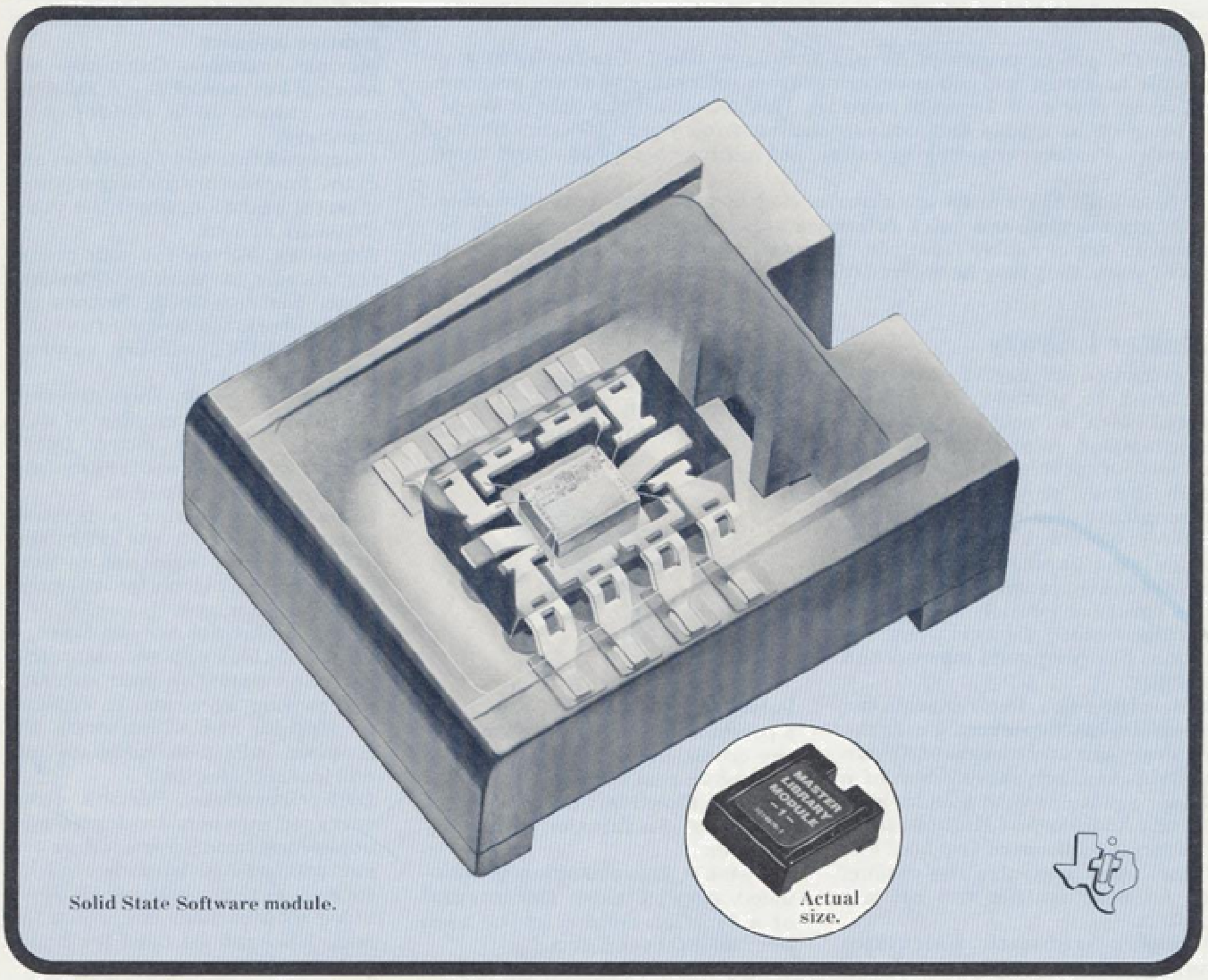
TI Programmable 58/59

Solid State Software™ libraries and other accessories.



Solid State Software module.

TEXAS INSTRUMENTS
INCORPORATED

Solid State Software™ libraries... up to 5,000 program steps each!

TI's state-of-the-art technology reduces the contents of up to 25 magnetic cards to one tiny plug-in Solid State Software module.

New programming versatility and power!

You'll be amazed at the convenience. The equivalent of a 25-card library can be contained in one small module. Drop in a tough, durable Solid State Software module in seconds and quickly access a program with a few keystrokes. The Master Library Module, provided with the TI Programmable 58 and TI Programmable 59 calculators, provides extended power in solving mathematical, statistical, financial, and other problems. Optional plug-in modules allow you to customize your TI Programmable 58/59 into a specialty calculator. For statistics. Real estate and investment. Surveying. Aviation. Marine navigation. Business decisions. Securities analysis. Leisure time recreation. Each library module includes a self-teaching, easy-to-understand manual, and a handy pocket-size quick reference guide.

Use the pre-programmed library module by itself. Use the 5,000 step module as a base and call subroutines from your magnetic card program (TI-59 only) or your keyed-in program. Use your magnetic card or keyed-in program as a base and call subroutines from your 5,000 step library modules. Perform chaining by calling subroutines both ways. And much more.

These Solid State Software libraries each consist of one plug-in module, a library manual, and quick reference guide. Software libraries and accessories are available from your TI retail dealer or, if he is temporarily out of stock, they may be ordered directly from Texas Instruments.

Master Library

A collection of useful programs designed to provide the professional with a "tool kit" of pre-programmed solutions to a wide variety of problems. Familiarity with library programs is gained through use of calculations of daily interest like checking accounts and calculator games. Coverage includes mathematical operations like function solution and matrix manipulation, financial calculations like compound interest and annuity.

Matrix Inversion, Determinants and Simultaneous Equations. Finds the determinant and inverse of an nxn matrix. Also solves a system of n linear equations with n unknowns.

Matrix Addition and Multiplication. Performs addition of two mxn matrices. Also computes the product of an mxn matrix and an nxp matrix.

Complex Arithmetic. Calculates sum, difference, product, and quotient of two complex numbers X and Y. Also calculates Y^X, $\sqrt[X]{Y}$, and log X (to the base Y).

Complex Functions. For a complex number x, this program calculates X^2, $\sqrt{X}$, $1/X$, e^X, ln x, and the polar form (r,Θ) of X.

Complex Trig Functions. Calculates sin X, cos X, tan X, $\sin^{-1} X$, $\cos^{-1} X$, and $\tan^{-1} X$ for a complex number X.

Polynomial Evaluation. Evaluates a polynomial at any real number if the coefficients of the polynomial are known real numbers.

Zeros of Functions. Calculates the real roots of a function defined by the user.

Simpson's Approximation (Continuous). Approximates the integral of a function defined by the user, over an interval x_0 to x_n.

Simpson's Approximation (Discrete). Approximates the integral of a function over an interval x_0 to x_n if the value of the function is known at n + 1 equally spaced points in this interval.

Triangle Solution (1). Given three elements of a triangle (SSS, SSA, or SAS), the remaining angles and sides are calculated.

Triangle Solution (2). Given three elements of a triangle (ASA, SAA), the remaining angles and sides are calculated. Calculates area given the three sides.

Curve Solution. Solves problems associated with a chord and the arc of a circle.

Normal Distribution. Solves for areas under the standard normal distribution curve.

Random Number Generator. Generates sequences of uniformly or normally distributed random numbers.

Combinations, Permutations, Factorials. Calculates the number of possible combinations and permutations of n items taken r at a time. Also calculates the factorials of positive integers.

Moving Averages. Calculates the moving average of the n most recent values in a sequence of numbers.

Compound Interest. Calculates any of the four factors in the compound interest equation when the other three are known.

Annuities. Solves for any one of the factors in annuity situations when the remaining factors are known. Includes sinking fund, annuity due/FV, ordinary annuity/PV, annuity due/PV.

Day of the Week, Days Between Dates. Calculates number of days between any two dates. Determines day of the week for any date. Uses Gregorian calendar.

Hi-Lo Game. Deduce a mystery number between 1 and 1023 using a high or low response to each guess. Or the calculator will guess a number you have chosen.

Checking/Savings Account Management. Enables you to maintain a current balance on your checking and savings accounts. In addition to deposits and withdrawals, the program will also calculate and add interest credits.

DMS Operations. Permits direct entry of numbers in degree-minute-second format for addition and subtraction. Also a number in DMS format can be multiplied or divided by a number in decimal format. Also can be used for hours, minutes, seconds.

Unit Conversions (1). Calculates length conversions.

Unit Conversions (2). Calculates volume, weight, and temperature conversions.

Diagnostic. Checks operation of calculator and library module. Initializes calculator for linear regression. Provides universal print routine for user-defined keys.

Applied Statistics Library

This branch of applied mathematics is useful in many fields: from medicine to political science and quality control to mechanical design. Yet few of the professionals who could benefit from statistical analyses know how to perform them. The field-tested programs in this library help close that gap.

Random Number Generator. Develops uniform and standard normal deviates for use in sample selection and Monte Carlo simulations.

Data Entry Programs. Creates univariate, bivariate, trivariate, analysis of variance, and histogram data bases for future analysis by later programs.

Means and Moments. The arithmetic, geometric, harmonic, and generalized means, the first four moments, and the kurtosis and skewness of distribution are calculated for grouped or ungrouped data.

Histogram Construction. Constructs a histogram over a given range and given observed data points. The frequencies are calculated for each cell and the mean and variance are calculated for the entire range.

Theoretical Histogram. Constructs a histogram from a user designed theoretical frequency function. Compares the resulting counts to observed histogram counts and computes a chi-square goodness of fit measure.

Data Transforms. Transforms input data bases by functions such as e^x, ln x. Linear data can thus be fit to power relations, quadratic curves, etc., using the calculator's built-in linear regression function.

t Statistic Evaluation. Uses t statistics to test the difference between the means of two normally distributed populations.

Contingency Table Analysis. Computes expected cell frequencies and chi-square evaluation of row and column effects.

Two-way Analysis of Variance. Allows F statistic comparison of both row and column effects on experimental results.

Rank Sum. Computes Wilcoxon Statistic to compare means of two distributions.

Multiple Linear Regression. The coefficients of the linear least-squares fit of given points (x,y) are calculated as well as the z corresponding to given x and y for this line. The multiple correlation coefficient is also computed.

One Way Analysis of Variance. Performs a one way analysis of variance on k treatment groups. Includes the F statistic, degrees of freedom, and sums of squares.

Normal Distribution. The standard normal frequency distribution for a given x is calculated.

Binomial Distribution. The binomial density function, the cumulative distribution, mean, variance, and probability of at least k successes are calculated given n, p, and k.

Chi-Square Distribution. The chi-square density and probability function are calculated, given the degrees of freedom, and value of chi-square.

t Distribution. The integral of the t distribution is calculated, given the degrees of freedom and x.

F Distribution. The probability of an event $X \geq x$ (area of the "upper tail") for the F distribution is calculated given degrees of freedom and x.

Diagnostic. Verifies proper operation of calculator and calculator-library interface.

Real Estate/ Investment Library

For those interested in capital investments such as real estate, this library contains cash flow, return on investment, depreciation, tax audit, and other calculations that can make the difference between profitable ventures and expensive mistakes. The programs feature complete treatment of important practical details like the tax laws on excess depreciation.

Annuities. Given the required variables as input data, this program will calculate the remaining variable in any of following situations:

a. Sinking Fund
b. Annuity Due/FV
c. Ordinary Annuity/PV (with or without baloon payment)
d. Annuity Due/PV (with or without balloon repayment)

Remaining Balance / Accumulated Interest. Calculates the remaining balance on an ordinary annuity and calculates the accumulated interest between any two payments.

Compound Interest. Given any three of the four variables, solves for fourth variable in compound interest equation.

Straight Line Depreciation. Calculates depreciation, remaining depreciable value, remaining book value, and depreciation to date using straight line method.

Declining Balance Depreciation. (Same as above for Declining Balance Method.)

Sum of the Years Digits Depreciation. (Same as above for sum of the years digits method.)

Composite Depreciation. Calculates component depreciation by using the straight line, declining balance, or sum of the years digits methods. Calculates accumulated depreciation for each component, remaining depreciable value for each component, the composite depreciation for each year, total remaining depreciable value for the year, and the accumulated composite depreciation.

Excess Depreciation. Calculates the excess depreciation of the accelerated method over the straight line method.

Curve Fit (Regression Analysis). Fits curves to data like land prices, construction cost per square foot. Improves accuracy of forecasts, bids, estimates, and other important calculations.

Optimal Regression. Helps select which curve fit will produce best results. Used with curve fit program.

Internal Rate of Return. Uses sophisticated numerical techniques to calculate the rate of return on a capital investment based on the resulting cash flows generated.

Cash Flow Analysis. Calculates reductions to mortgage principals per year. Can handle up to three mortgages. Types of mortgages that can be handled are:

a. Amortized
b. Amortized with balloon
c. Constant payment to principal
d. Standing

Calculates cash flows before and after taxes for each year.

Yearly Amortization Schedule. Calculates annual debt service, mortgage constant, remaining balance, payment to principal, payment to interest, accumulated principal, and accumulated interest *for each year.*

Investment Feasibility. Evaluates an investment in any income producing property where the majority of the purchase price must be financed.

Residential Purchase Analysis. Calculates the total monthly payment, the income tax deductions, and the equity buildup resulting from the purchase of a home.

Diagnostic. Verifies proper operation of calculator and calculator-library interface.

Aviation Library

A collection of programs for the private or business pilot. Flight planning, including full schedules. Expanded way point capacity makes coast to coast flight plans feasible. Generates in-flight checklists, printed on PC-100A, before you leave the ground. In flight radio fixes with both VOR and DME gear. You'd need thousands of dollars worth of avionics to match the RNAV capability of this library.

Flight Plan With Wind. Calculates heading, speed, fuel, ETA, etc., for a trip of multiple legs, allowing for windage.

Flight Plan and Verification. Like Flight Plan With Wind, but may be updated in-flight.

Long Range Flight Plan. Calculates for great circle routes: distance, time, fuel, course. Covers overall flight plan and details each leg.

Atmosphere, Speed, Temperature, and Altitude. From pressure altitude, calculates speed of sound, temperature, pressure, and density relative to standard sea level; mach number, true air temperature, true airspeed, and density altitude.

Predicting Freezing Level; Lowest Usable Flight Level. Wet and dry freezing levels.

Wind Components and Average Vector. Crosswind and tail/headwind components of a single wind vector; average wind vector of several single vectors.

The Wind Triangle. Heading, course, speed, windage. Can be used with Dead Reckoning.

Dead Reckoning. Dead reckoning position (latitude, longitude) from previous position, speed, time. Allows for wind if used with The Wind Triangle.

Rhumbline Navigation. Course and distance along rhumbline between positions (latitude, longitude); cumulative distance from several legs.

Great Circle Flying. Initial course and distance along great circle between positions (latitude, longitude); intermediate positions and vertex.

Line of Sight Distance and Altitude; DME Speed Correction. Altitude to clear horizon and distance at that point; corrected speed from DME readout.

Position and Navigation by one VOR. Computes magnetic course, distance, and ETA to destination given either two reading from a VOR, or a VOR and DME.

DME Area Navigation. Designed to be compatible with VOR Area Navigation program. Operation identical except position is determined by radial and DME distance from a single VORTAC station.

VOR Area Navigation. Powerful program set; to navigate VOR networks: course, speed, distance, ETA; constant position check VFR or IFR.

Course Correction. Course and distance to fly to correct flight path deviation.

Rate of Climb; Turn Performance. Climb or descent, altitude change, distance. G-force, stall speed, bank angle, turn diameter, time.

General Weight and Balance. Computes total weight, total moment, center of gravity for an aircraft with several items aboard. Convenient conversions.

Customized Weight and Balance. Like General Weight and Balance, but provides master program to allow user to tailor calculations to his particular aircraft.

Pilot Unit Conversions. Length, volume, weight, English and metric temperature conversions of interest to flyers.

RNAV Flight Plan. Facilitates planning flight for RNAV equipped aircraft that require radial/DME distance to establish way points.

Customized Unit Conversions. User programs his own conversions by use of master program.

Time Zone Conversions. Converts time from one time zone to another.

Diagnostic. Verifies proper operation of calculator and calculator-library interface.

Marine Navigation Library

A comprehensive library which meets the needs of the racing sailor or ocean-crossing navigator. With coastal navigation programs you can compute relative or absolute position, speed made good, and true course. Or use the celestial navigation programs for the least complicated error-free, sight reduction and position plotting system available. The section on racing tactics gives you a competitive edge.

Coastal Navigation

Time-Speed-Distance With Current Sailing. Solves time-speed-distance equations and considers the current in determining the proper course to steer and speed through the water necessary to reach a given destination in a specified length of time.

Distance Short of, Beyond, or to Horizon. Computes the distance to the apparent horizon as well as the distance to and visibility of an object of known height.

Velocity Needed to Change Relative Position. Determines course and speed necessary to change position relative to a guide vessel whose course and speed are known.

Velocity, VMG, and Current Vectors. Given two of the following, (1) drift and set of the current, (2) speed and course through the water, and (3) speed and course made good, the third is found.

Course to Steer and SMG (Planning). Calculates the course to steer and resulting speed over the bottom *when given the current,* speed through the water, and desired course.

Distance Off One Object and Time of Nearest Approach. Given two observations of a single object, the

distance to the object at the second observation and the distance and time of nearest approach are calculated.

DMG, SMG, CMG from Two Objects. Computes the distance, speed, and course made good during the time interval between two observations. Bearings to each of two objects are taken at both observations.

Course Made Good from Three Bearings. Uses three separate bearings to a single object to find the course made good.

Map Initialization. Computes and loads constants for LAT/LON programs.

Running Fix from One Object (LAT/LON). Uses two bearings to an object of known position to determine the fix at the second observation.

Fix from Two Objects (LAT/LON). Calculates a fix of the vessel from simultaneous observations of two objects whose coordinates are known.

Celestial Navigation

Time of Sunrise/Sunset/Twilight. Estimates the expected times of sunrise, sunset, and a.m. and p.m. twilight from a dead reckoning position and data from the Nautical Almanac.

Planet Location. Predicts the approximate altitude and azimuth of the four navigational planets. The GMT of twilight may be entered manually or by using Time of Sunrise/Sunset/Twilight.

Star Identification. Calculates the approximate SHA and declination of an observed star so that it may be identified from tables found in the Nautical Almanac.

Sextant Correction. Computes the observed altitude of a body by correcting the sextant altitude for various errors.

Sight Reduction (Sun, Moon, Planet, Star) (4). Determines the computed altitude, azimuth, and intercept of a body from the observed altitude, DR position, GMT time and date, and information extracted from the Nautical Almanac.

Fix by Two Observations. Computes a fix from any two of six sights stored in the calculator memories.

Time of Local Apparent Noon and Sun Lines. Predicts the optimum times to take a.m. and p.m. sun lines and determines the expected time of local apparent noon passage.

Noon Sight Fix. Determines a fix from the observation of the sun at meridian passage and data obtained from the Nautical Almanac.

Ocean Sailing

Great Circle Sailing. Calculates the initial great circle course and distance given the coordinates of the starting and destination positions. Also determines intermediate points of latitude for specified longitudes.

Dead Reckoning. Determines the dead reckoning position when given the speed, course, and time sailed since departing from a known position.

Rhumbline Navigation. Calculates the rhumbline distance and true course between two points on the globe.

Sailing and Tactics

Modified Wind. Computes and loads various wind factors for use in the remaining sailing programs in this section.

SMG, CMG, and Time to Lay-Line. Determines the time to remain on a computed tack, course to steer on the opposite tack, and time required to reach a specified destination. Also calculates the speed and course made good on each tack.

Distance and Bearing to the Mark. Given the initial distance and bearing to a specified mark, the distance and bearing at any later time may be found.

Diagnostic. Verifies proper operation of calculator and library–calculator interface.

Surveying Library

Programs for surveyors, civil engineers, architects and other professionals involved in land measurement and earthwork. Whether you're working in vertical or horizontal curve design or electronic distance measurement, this library contains programs to solve the problems you find most time-consuming. Our solid-state software makes field work much easier by eliminating program card juggling.

Azimuth/Bearing Traverse. Given reference coordinates, leg length, and azimuth or bearing and quadrant, calculates endpoint coordinates, departure, latitude, and total distance.

Inverse Traverse. Given reference and endpoint coordinates, calculates direction and length of traverse leg, latitude, departure, also area of a closed traverse.

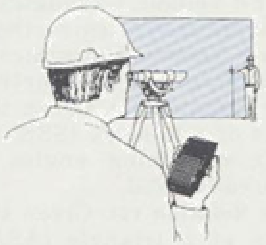
Field Angle Traverse. Given reference coordinates, angle, and leg length, computes direction leg, endpoint coordinates, departure, and latitude.

Circle Arc Traverse. After using one of the above traverse programs to establish coordinates, and given the central angle, computes direction and length of leg, endpoint coordinates, departure, latitude, arc distance, and includes or excludes sector area.

Closure. For closed traverse, calculates closure error (closure distance and bearing from computed to correct coordinates), area, and precision ratio.

Compass Rule Balance. Computes adjusted coordinates by compass rule.

Vertical Curve Design. Given starting and ending grades and curve length (or rate of change of grade per station), or intersect station and elevation, computes elevation for any station on the curve, and the minimum or maximum station and elevation.



Horizontal Curve Design. A three program set which calculates all elements of a circular curve joining two lines, such as stationing, deflection angles, arc and chord length, areas, degree of curve, etc.,: then prints or displays all information needed to stake out a curve in the field.

EDM Slope Reduction – Slope Angle. Converts slope distance measured by Electronic Distance Measuring equipment to horizontal distance at sea level and at the elevation of the EDM unit. Corrects for instrument heights, earth's curvature, and refraction of light. Also computes delta elevation.

EDM Slope Reduction – Delta Elevation. Like EDM Slope Reduction – Slope Angle, but given delta elevation instead of slope angle, will also compute the horizontal distance at any specified elevation.

Stadia Reductions and Traverse. Calculates the horizontal distance and delta elevation between two stations by stadia methods. Also determines elevation closure error and balances error among stations.

Intersection – Bearing/Bearing. Calculates the point of intersection of two lines given a point on, and the bearing of, each line.

Intersection Distance / Distance. Calculates the point of intersection of two lines given a point on each line and the distance from the point to the intersection.
Intersection – Bearing / Distance. Calculates the point of intersection of two lines given a point on each line, the distance from the point to the intersection of one line, and the bearing of the other.
Three Point Resection. Calculates location of unknown point from three known points and angles.
Intersection – Bearing if Perpendicular. Given the bearing of, and a point on, the base line, and an offset point, this program calculates the point of intersection of the base line and a perpendicular to the offset point, as well as the distances from intersection to offset, and from intersection to base point.
Borrow Pit Volume. Calculates volume by truncated prism method.
Earthwork Volume. Calculates volume by average end area method.
Triangle Solution (1). Given three elements of a triangle (SSS, SSA, or SAS), remaining angles and sides are calculated.
Triangle Solution (2). Given three elements of a triangle (ASA or SSA), remaining angle and sides are calculated. Also calculates area of a triangle.
Curve Solution. Solves for unknown elements of a curve segment: areas, arc and chord length, radius, central angle.
Diagnostic. Verifies proper operation of calculator and library-calculator interface.

Leisure Library

Leisure activities are shared by professionals of all fields. By plugging in the Leisure Library Solid State Software module you can make the calculator work while you play. The library includes simple recreational diversions, challenging games of skill, and programs which simplify tedious calculations that are a part of several popular games. And with the PC-100A printer, plotter you can also enjoy becoming familiar with the alphanumeric capabilities of your calculator.
Photo I: Exposure Compensation. Use in the darkroom to calculate exposure required to compensate for a change in photo enlargement magnification.
Photo II: Fill-in Flash. Computes correct lens f-stop when a flash is used in the presence of strong ambient light to fill-in undesired shadows.
Football Predictor. Forecast score and point spread based on past performance of opposing teams. Record data on magnetic cards (TI Programmable 59 only) and you can keep a continuous record for predictions throughout the season.
Bowling Scorekeeper. Keep score for up to 90 bowlers (50 with TI Programmable 58) bowling simultaneously. Scoring for individual bowlers may be done in any order.
Chess Rater. Computes ratings of chess players using guidelines established by the United States Chess Federation for established, provisional, and unrated chess players.
Golf Handicapper. Calculates handicap according to the handicap system of the USGA. Data may be stored on a magnetic card (TI Programmable 59 only), providing easy updateing of handicap after each round.

Bridge Score. Calculates the result of each deal in duplicate (tournament) bridge. Makes it easy to keep an accurate traveling score. And, with Solid State Software you may turn the calculator off except when needed for scoring.
Codebreaker. Determines which one of 3,024 possible 4-digit codes the calculator has generated each time you play.
Memo Pad. Write and enter messages. Print them out on the PC-100A, or record them on magnetic cards (TI Programmable 59 only). Then use the card to replay the message.
Blackjack. Try your luck against a "calculating" dealer. Win or lose, you're assured of an honest game.
Acey-Deucy. A numbers game where you know the odds. If a calculator-generated random number is between the two known numbers, you win.
Craps. Electronic dice and automatic banking replace the ivories and greenbacks in this familiar game.
Mars Lander. Take the controls and pilot a spacecraft to a safe landing on the Martian surface.
Jive Turkey. Guess a mystery number – the calculator tells you if you're high or low – but it may be jiving you.
Hangman. Enter a word or words with up to twenty characters and spaces. Second player tries to guess all the characters used in the message before he accumulates seven wrong guesses. PC-100A prints used and unused letters and keeps score.
Learning Nim. Play this game against the calculator and try to make it take the last "chip". You'll find the calculator makes better moves in each successive game.
Football. Pick an opponent and play this game using the PC-100A printer, plotter. The players call the offensive plays, while movement of the ball is determined by the calculator.
Computer Art. Use this program with the PC-100A to create your own computer art.
Sea Battle. You've got fifteen missiles to sink an evasive enemy submarine. The sub's action is determined by the miss distance, so you must make every shot count.
Biorhythms. Plots all three cycles simultaneously on the PC-100A.
Diagnostic. Verifies proper operation of calculator and library-calculator interface.

Securities Analysis (available spring 1978)

This collection of programs aids both financial professionals and individuals in the evaluation, selection, and management of investment portfolios. It features: coverage of stocks, bonds, convertible securities, options, warrants, and annuities; realistic treatment of taxes and commissions; and portfolio selection methods previously available only on large scale computers.
Earnings Per Share Estimation. Uses historical balance sheet and income data to estimate future earnings per share.
Compound Interest. Given any three of the four terms, solves for the fourth term in the compound interest equation relating future value of a deposit to interest rate, time period, and present value.
Annuities. Solves for any one of five terms in the annuity equation relating future value, present val-

ue, interest rate, periodic payment, and balloon payment for ordinary annuities, sinking funds, and annuities due.

Uneven Cash Flows. Uses sophisticated numerical techniques to calculate the rate of return on a capital investment based on the resulting cash flows generated. Also finds future value and present value of a series of uneven flows.

Stock Valuation. Finds current and future values of a stock and before and after tax rate of return. Also considers commissions in all calculations.

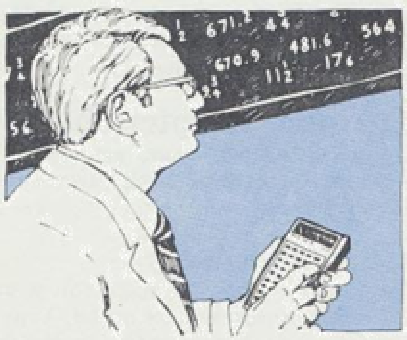
Option Valuation (Black-Scholes Model). Calculates the Black-Scholes value and optimum hedge ratio of any option.

Option Writing. When selling partially covered calls, or when selling puts and shorting stock, this program is used to find the maximum profit, investment, maximum return, and upper and lower breakeven points.

Warrant Valuation. Determines the value of both short and long term warrants.

Bond Valuation. Given present value, coupon interest, yield to maturity, maturity value, or number of periods (3 out of 4), the remaining term is found by this program. Also considers taxes and commissions and computes the current yield.

Stock Indicators. Given historical market index data and stock prices, this program finds the expected return of the index and standard deviation of that return, as well as the alpha, beta, expected return, and standard deviation of return for each stock.



Portfolio Selection (Sharpe's Model). Determines the proportion of funds that should be allocated to each security in a portfolio to maximize returns. Calculations are based on historical stock indicators and an acceptable level of risk.

Portfolio Bookkeeping. Evaluates the historical profitability of a given portfolio. Also computes realized gains for income tax purposes.

Capital Accumulation Planning. Determines the future net worth of an individual or a business based on current worth, rate of investment, and rate of investment return.

Diagnostic. Verifies proper operation of calculator interface. Initializes calculator for linear regression operation.

Business Decisions Library (available spring 1978)

With today's inflationary presures and uncertain business conditions, all businessmen share a need for better decision making. This library helps by providing aids to more accurate market forecasting, improved inventory utilization, and estimation of financing requirements.

Long Term Financing Requirements. Computes the cost of capital for various forms of funding (common stocks, preferred stocks, and bonds). Selects the cheapest form and computes the amount needed to support operating plans.

Short Term Financing Requirements. Computes the amount and timing of short term financing based on sales forecasts, inventory purchases, collection and payment policies.

Planning and Budgeting. Aides in spread sheet computations by storing planning factors and applying them to monthly, quarterly, or annual operating projections without reentry.

Breakeven Analysis. Computes breakeven points for projects or products based on fixed and variable costs and selling prices. Learning curves can be applied to both variable cost and price.

Investment Evaluation. Computes internal rate of return, payback period, and present value for series of uneven cash flow.

Economic Reordering and Production Runs. Computes economic reorder or production quantities by minimizing sum of ordering, production, and carrying costs.

Reorder Timing. Computes reorder point based on inventory carrying costs, stockout costs, and demand variation.

Facility Scheduling. Computes job shop performance (average turnaround time, percent late, etc.) based on a variety of scheduling rules (first in-first out, most overdue items first, etc.) and on job processing times.

Assembly Line Balancing. Balances line by assigning tasks to work stations so as to minimize slack time.

Demand Forecasting. Computes forecast of future demand by exponentially smoothing past demand.

Facility Capacity. Computes multiple facility throughput performance (average waiting time, percent busy, etc.) based on job arrival rate, service times, and queueing theory.

Watch our Professional Program Exchange PPX-59 Newsletter for availability announcements on future libraries.

Custom Libraries

All of the capabilities of Solid State Software are now available to organizations desiring to have their own library programs put into custom modules similar to TI's standard library modules. These custom modules must be tooled and produced by Texas Instruments. If you are involved in systems development for your company, or as an OEM supplier, you should consider the following advantages:

- A full 5,000 steps are available, as in standard libraries.
- Common subroutines can be shared, making still more space available.
- Solid-state programs cannot be accidently erased. And, they can be protected—preventing disclosure of proprietary information.
- Several programs can be executed without having to handle magnetic cards.
- Quick access to programs becomes available with the less expensive TI Programmable 58 rather than just the TI Programmable 59.

These advantages make custom libraries especially applicable to situations where at least 500 potential users share a common task, e.g. sales forces, auditors, accountants, designers, insurance agents.

Specialty Pakettes for the TI Programmable 59.

Specialty Pakettes are a new way to extend the usefulness of your TI Programmable 59. Offering programs of interest to groups of specialists in a wide variety of fields. The convenient notebook format includes program listings. Just key them onto your own magnetic cards and you are ready to tackle problems without the need to do any programming.

Securities Pakette. Universal rate of return. Value of call options. Call option ratio writing. Screen stocks (quality and quantity). Call option spreading. Internal rate of return. Forecasting.

Statistical Testing Pakette. Randomized block design (ANOVA test). Chi square. Two-way ANOVA. Two-way ANOVA without replication. One-way ANOVA. Two-way ANOVA with interaction. Nonparametric correlations (Spearman, Kendall). 3 x 3 covariance matrix and correlation coefficient. Wilcoxon/Mann-Whitney 2 sample test. Wilcoxon/Mann-Whitney test (2 frequency distributions). Rho: the Spearman rank correlation coefficient, multiple partial correlation.

Civil Engineering Pakette. Trapezoidal channel depth and velocity. Moments of inertia. Dynamic loading with single degree of freedom. Warren truss solution. Four span moment distribution. Concrete beam stress analysis.

Electronic Engineering Pakette. Solution of resistive networks. Bipolar junction transistor analysis. RF amplifier analysis. Resistive voltage divider. Power supply filter design. Class "A" amplifier design. Zener power supply design.

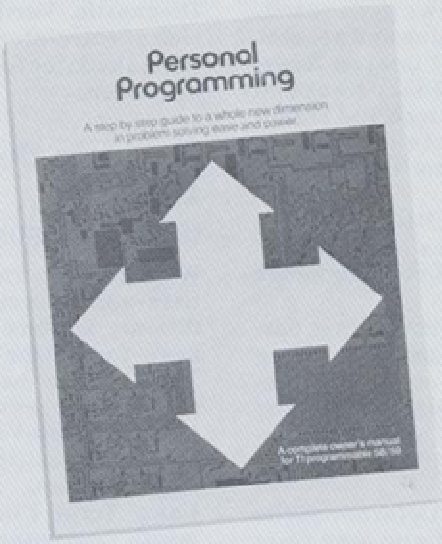
Blackbody Pakette. Blackbody photon radiance. Spectral responsivity. Blackbody energy radiance, detectivity, and responsivity. Blackbody flux signal.

Oil/Gas/Energy Pakette. Production schedule for exponentially declining wells. Gas well deliverability. Compressibility factors for sweet natural gas. Well log interpretation. Oil reserve estimate, constant percent decline.

Programming Aids Pakette. TI-Programmer simulator. ASCII to alphanumeric decoder. EBCDIC to alphanumeric decoder. TMS 9900 disassembler. INTEL 8080 disassembler.

Printer Utility Pakette. Function plotter for TI Programmable 59/PC-100A. Bar graph plotter. TI Programmable 59 banner program. Alphanumeric register listing. Flag tester. Printing clock. Memo pad. Cartesian graph plotter.

Astrology Pakette. Astro I – interpolation and midpoints. Astro II – aspects, individual and mutual. Astro III – interpolation factors. Placidus houses. Astropoints – solstice/Arabian parts.



Personal Programming

Much more than an owner's manual, *Personal Programming* shows you how easy and useful programming can be. Over 240 pages take you through the basic operations of your TI Programmable 58 or 59. You'll find plenty of illustrated examples. And, when you're ready, a complete section on advanced applications.

Programming Workbook

A collection of graded programming exercises designed to increase your programming proficiency.

Program record forms

Pad of 50 numbered and sequenced coding forms to facilitate program writing and editing.

Rechargeable battery pack

Three nickel-cadmium batteries enclosed in a shock proof, high-impact plastic case. Fast charging, high capacity power cells can be fully recharged in the calculator in 4-6 hours. Keep a spare battery pack on hand for those long sessions away from an ac outlet.

AC adapter/charger

Standard AC110-120V adapter/charger. Provides fast 4-6 hour recharging for rechargeable battery pack, or permits calculator operation directly from an ac outlet. Line cord has built-in strain relief, short circuit proof connector to calculator. UL/CSA approved. Input: 6W, 60 Hz, 120V ac. Output: 3.3V ac, 500 milliamps.

Switchable ac adapter/charger, 120-210V

Convenient adapter-charger for students, businessmen, others who travel or live in countries where 220-240 Vac power is used. A flick of the switch converts unit from standard 110-120V to 220-240Vac. UL/CSA approved. Input: 60 Hz, 120Vac. 50 Hz 240Vac. Output: 3.3 Vac, 500 miliamps.

12 volt dc adapter/charger

Plugs into car, boat, or aircraft electric systems with cigarette lighter plug.

Carrying case

Protective carrying case for your TI Programmable 58 or 59. Vinyl case has pockets for *Quick Reference Guide* and card carrying case.

Magnetic cards

Package of 40 blank magnetic cards for writing, labeling, and storing your own programs. Includes compact vinyl carrying case. (For TI Programmable 59 only).

The PC-100A turns your TI Programmable 58/59 into a high-speed alphanumeric printer...plotter.

PC-100A printer, plotter.

The PC-100A printer, plotter expands the versatility of your TI Programmable 58 or 59 by turning it into a quiet, high-speed printing calculator. Featuring TI's reliable thermal printhead, the PC-100A provides a hard copy record of your data. Print, list, or trace your program each step of the way for easy editing and debugging of your program listings. You can print audit trails, as needed, and on command. The printout shows the actual keystroke symbol as well as the key number. Alphanumeric capability allows you to print headings, label outputs, or program-in prompting messages. You can even plot curves and histograms. A handy, built-in battery charger keeps your calculator fully charged while you are operating the PC-100A from a standard 115V/60Hz power source.

Alphanumeric printing.
The PC-100A provides print capability for 64 characters (including blank space). Each character is entered by means of a 2-digit address code directly from the keyboard of the TI Programmable 58 or 59. Maximum line length is 20 characters. Headings, data labels, and user instructions may all be recorded on 2½-inch wide thermal printing paper.

	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
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7	²	?	÷	÷	Ⅱ	^	π	Σ

Data plotting.
The PC-100A allows you to input data from your TI Programmable 58 or 59 to plot curves or histograms. You can make a plot of data from the calculator keyboard, or directly from a program.

See your Texas Instruments retail dealer for additional information on this product.

```
PRINTS ALPHA,PLOTS
      *
        *
         *
        *
       *
     *
    *
     *
LISTS,
      437   43 RCL
      438   58  58
      439   65  ×
      440   34 √X
      441   95  =
      442   91 R/S
TRACES,
     47.3652     IDMS
     47.2155
   47.215472     SIN
      0.7339
 .7339133123      ÷
 .7339133123     eˣ
      2.0832
 2.083216956      +
AND MORE.....
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PC-100A thermal tape.

Special heat-activated paper tape for use with the PC-100A thermal printer, plotter. Provides clear, sharp character images. Each roll contains 250-feet of 2½-inch wide tape, three rolls per package.

TI Programmable 59 owners can share programs with their colleagues, through PPX-59.

There may be times when you need a complex specialty program. But you'd like the convenience of having a ready-made program that's not a bother to obtain. This is where TI's Professional Program Exchange (PPX) can be of enormous help.

Your yearly PPX-59 membership will open the door to discovery of the many interesting programs being written by others in your profession. As an active member, you become part of a network designed to exchange TI Programmable 59 programs within all professions. Using PPX-59 as a vehicle to contribute and obtain programs, you will be able to broaden your professional base while you increase your productivity.

Here is what your yearly membership provides:

Source Catalog. Describes the wide selection of programs available to you in dozens of categories: Business, Mathematics, Astrology, Engineering, Games, Air and Marine Navigation. And much more.

Three free programs. As a new member, you select three programs from your source catalog. These programs are sent to you at no charge (postage prepaid) as an introduction to the Professional Program Exchange. Order additional programs for only $3.00 each. (Programs are furnished with documentation only.)

Newsletter. The bi-monthly *PPX Exchange* contains helpful TI Programmable 59 programming hints, unusual applications, new product and software announcements, and feature articles. Special software sales, available to members only, are also offered via the newsletter.

Member's guide and program submission forms. These materials tell you how to submit your programs for acceptance into PPX-59. A description and author credit for each program is presented in the latest *PPX-59 Source Catalog.*

Programs in dozens of professional categories are available to you through your PPX-59 membership: Business, Finance, Statistics and Probability, Mathematics, Natural Sciences, Life Sciences, Engineering, Technical, Social and Behavioral Sciences, Natural Resources, General. You can open the door to program sharing by becoming a member of PPX-59.

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Carrying case	CC-5859	7.95		
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