PPX EXCHANGE

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Beginning in the July Issue of the PPX Exchange, we will have a corner devoted to program suggestions for PPX-59. The purpose of this is twofold: Those members who need a program not currently available can communicate their programming needs to other members. Those members who enjoy programming will become aware of needed programs. This corner hopefully will bridge the gap between those PPX-59 members who are primarily programmers and those who are users. **PPX-59 is not staffed to do custom programming; therefore, member suggested programs will become available only if another member of PPX-59 comes to the rescue.** Send program suggestions to the PPX address shown on the back page of this newsletter.

PPX POTPOURRI

1. In the March issue, PPX announced that any TI-59 **utility** programs sent before April 30 and accepted would entitle the author to the Pakette of his choice. As the newsletter was delayed in mailing, this deadline is extended to July 31.
2. Remember — for better service, all correspondence and orders should include your membership number. If you have misplaced your **membership number**, check the mailing label on your latest newsletter or catalog from PPX.
3. Rain nor sleet nor bleak of night . . . Due to **delays in the mail**, orders are taking an average of 10 days (from the date postmarked) before delivery to PPX Order Processing. We are doing our utmost to fill these orders in a timely manner. It only slows down the process when members call to see if their order has been processed. Please allow a minimum of 4 weeks from date of mailing your order until expected receipt of order.
4. **Members of both PPX-52 and PPX-59**: Please do not order 52 programs/accessories on 59 order forms and vice-versa. This causes confusion when filling orders.
5. An Addendum to the PPX-59 Catalog will be distributed to PPX-59 members in July. This Addendum will incorporate many new abstracts of programs.
6. The last date for postmark of PPX-52 membership renewals is June 30. Membership renewals will not be available after that date.

TRAFFIC ACCIDENT ANALYSIS WITH THE AID OF PROGRAMMABLES

Haim Reizes, P.E.

Editor's Note: *Mr. Reizes has over 25 years of experience in automobile engineering, specializing in accident reconstruction and analysis of accident cases in Europe and the United States. He is the author of* ***The Mechanics of Vehicle Collisions****, Charles C. Thomas Publisher, 1973.*

Traffic accidents are an everyday occurrence over which we have no control. Reconstructing a traffic accident is like putting the pieces of a jigsaw puzzle together. If the pieces are few and easily matched, it is easy. However, most of the time the task is more complex because pieces of the puzzle are missing or are deliberately withheld. Difficulties often arise because pieces that are not part of the puzzle are mixed with pieces that are.

The accident analyst becomes involved in any automobile accident where liability is disputed, bodily harm has occurred, or damage is excessive. He must draw from several sources to answer the who, how, and why of the accident. If an accident scene is analyzed using only the brief description of the accident in the police report and having limited knowledge about the road layout and traffic flow, pieces of the puzzle are missing. The analyst must take data from the police report and witnesses' statements, study photographs of the scene, and examine the vehicles and pavement to determine various factors such as speed from skidmarks, angle of impact, and the resultant forces put on the passengers. These fragments of information are studied in depth to produce a picture of the events leading to the accident. Many grueling hours of work go into performing the calculations and measurements required during an investigation.

In an effort to decrease the amount of time spent doing manual calculations, "Traffic Accident Analysis and Reconstruction with the Aid of a Programmable Calculator (TAAR)" was developed. The TAAR system is centered around the programmable calculator. TAAR uses field data, the Laws of Physics, and various accident criteria to obtain mathematical solutions based on physical evidence from the scene of the accident. The analyst can perform "what iffing" (i.e., try out all possible values of input parameters) to determine the validity of each participant's story. With the aid of a programmable, it takes only a couple more seconds to try 4 sets of variables instead of 1. Whereas manually, the amount of time required to perform "what iffing" is prohibitive.

The TAAR System includes: a programmable calculator, a handbook, and programmed instructions and magnetic cards for over 50 programs. The areas of analyses are:

Skidmarks	Head-On Collision
Braking and Stopping	Rear-End Collision
Overtaking	Critical Speed for Curve
Intersection Collision	Vehicle Pedestrian Collision
Angular Collision	Car Projection

Also included is a series of model cases that describe a variety of accident occurrences with as few parameters as possible. Each model case classifies a type of accident, lists the required field data and supplies the formulae necessary to provide the user with exact mathematical solutions.

Further information about the TAAR System can be obtained by writing: Haim Reizes, 4616 Glasgow Drive, Rockville, Md. 20853.

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CALCULATOR DOCTOR

This column is intended to answer frequently occurring questions relating to either SR-52 or TI-59 operation and programming. These questions are obtained from TI's Consumer Relations Department. If you are having difficulty with your calculator, contact TI's Consumer Relations Department for assistance.

QUESTION: My SR-52 will not record a card after I run my program. Why?

ANSWER: If the decimal has been fixed by your particular program, the calculator will not record a magnetic card. Remove the fixed decimal format from the calculator by keying in INV *fix or *fix 9. (This also applies to the recording of cards on the TI-59.)

QUESTION: Why won't ML-08 (TI-59), "Zeros of Functions", work if I define f(x) using powers greater than 2, when searching for negative roots?

ANSWER: When defining f(x) in program ML-08, you may use powers greater than 2 as long as you do not use the y^x key. The y^x key is not capable of raising a negative number to a power. An alternative: Use the x^2 key and then multiply the result by the base number the proper number of times. For example, $f(x) = x^3 + 1 - x$ can be entered by the following sequence: (STO 10 x^2 x RCL 10) + 1 - RCL 10).
Note: The same technique applies to ML-09, "Simpson's Approximation (Continuous)".

QUESTION: Program ML-17 (TI-59), "Moving Averages", gives correct values if I call the program and key in the data. However, if I store the data on a magnetic card and try to run the program later, I get the wrong answers. Why?

ANSWER: ML-17 requires that you call the program, read the data card, and then key in your new data. **Do not press E' to initialize** when updating.

UNSUNG HEROES OF PPX-52

Since its inception, PPX-52 has been greatly supported by those members who have chosen to participate in the contribution aspect of PPX-52. Of these contributors, there is a basic core of members who have contributed above and beyond the call of duty. PPX feels it is time to give recognition to these people. (The following summary takes into account those programs accepted through Addendum D.)

The most prolific of the unsung heroes is Donald Lambert whose 20 programs are in the areas of Business, Statistics, and Math. Eleven other members contributed 10 or more programs. These members include Maurice Swinnen and David Patterson. Maurice Swinnen's programs have been specifically in the Electrical Engineering area. David Patterson has had programs accepted in both Genetics and Anthropology. Oliver Benson has written programs in Political Science and Statistics, while Theodore Bones has contributed his expertise to the Mathematics Category. Pierre Brind'Amour's calendar programs have added great depth to the Astronomy area. Thomas Ferguson, George Wilkins, and James Stoker have not limited their programming talents to any one category. Michael Brady, Jack Irwin, and B.R. Kelso have advanced development in the areas of Mechanical Engineering, Astrology, and Engineering, respectively.

Thirty-one members have had 5 to 9 programs accepted. These members include: Philip Barker, J.A. Blythe, Serge Borodin, John Buchwald, Clarence Carpenter, Silas Cool, Stephen Corey, Steve Dodds, J.E. Eller, Maurice Fox, Herman Harrison, Bruce Karnopp, George Knapp, Thomas Lehman, Elbert Maloney, Michael Marguis, Lem Matteson, Larry Mayhew, Eugene McClain, Stephen Meaks, James Parker, Paul Peterson, Joseph Shigley, Harry Stern, Robert Varcoe, Roger Vaughn, Warren Vreeland, Otto Walther, Andrew Watson, Francis Wolek, and Daniel Ziegelmiller.

PPX-52 would like to take this opportunity to thank **all members** who have submitted programs to the Exchange. We realize the enormous amount of time and effort that is required to prepare a submission. We salute you!

THE LAW OF HIERARCHY

Mr. Sam Block, Chicago, Illinois, shares the following information to aid you in manipulating mathematical equations, thus saving program steps:

The user can access the hierarchy registers with the HIR (hierarchy) command, code 82. This command cannot be directly keyed in, but may be written into a program by going into learn mode and pressing STO 82 and deleting the STO. There is a two digit number XY which follows the 82 command. X stands for the hierarchy register operation, where 0 is STO, 1 is RCL, 3 is SUM, 4 is *Prd, 5 is INV SUM, and 6-9 are INV *Prd. Y stands for the hierarchy register to be accessed (1-8). XY may be entered in the same manner as code 82 if XY by itself is an invalid keyboard entry.

The following sequence will be used to demonstrate the hierarchy command. Key in learn mode (location 000): *LBL A 4 x (3 - 2 x (6 - 1 x (8 - 7 x (5 - 9 INV SBR. (Do not despair — the open parentheses will be closed when = is encountered, as shown below.) Execution of this sequence will cause all eight hierarchy registers to be filled. The 4 will be placed in the first hierarchy register, 3 in the second, 2 in the third, ..., 5 in the eighth, and 9 in the display register. A number is not placed into a hierarchy register until an operator is pressed (e.g., 4 by itself is in the display register, 4 followed by x forces the 4 into a hierarchy register). At location 024, key in: LBL B A HIR 13 = R/S. Press B, the following will be executed: 4 x (3 - 2 x (6 - 1 x (8 - 7 x (5 - 2 = -140. HIR 13 recalls the contents (2) of hierarchy register 3 and places it in the display register (i.e., replacing the 9 in the above sequence, LBL A). As another example, key in learn mode (location 031) the routine: LBL D A HIR 43 = R/S. Press D, the following will be executed: 4 x (3 - 18 x (6 - 1 x (8 - 7 x (5 - 9 = 2172. HIR 43 multiplies the contents of hierarchy register 3 by the contents (9) of the display register.

SR-52 MAGIC

The following program, "GONE", was sent to PPX-52 by Mr. Lawrence Pangburn. It demonstrates self-modifying code on the SR-52. Before you execute the program be sure to store the program on a magnetic card — you will soon see why! Mr. Pangburn's knowledge of self-modifying code led us to request that he share his knowledge with us. If you are as curious as we were about this technique on the SR-52, an article explaining the process of self-modification will be presented in **July's issue** of the PPX Exchange. Until then, try to figure out what events occurred in "GONE". Do not

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send your answer to PPX as we will not let the answer out until July. To execute "GONE", press *CMS CLR A. Good Luck!

000	46	LBL	055	00	0	110	13	C	165	00	0
001	12	B	056	02	2	111	10	E'	166	08	8
002	85	+	057	20	1/X	112	16	A'	167	07	7
003	01	1	058	85	+	113	81	HLT	168	03	3
004	00	0	059	53	(	114	46	LBL	169	22	INV
005	95	=	060	36	IND	115	10	E'	170	44	SUM
006	42	STO	061	43	RCL	116	01	1	171	01	1
007	01	1	062	01	1	117	42	STO	172	00	0
008	09	9	063	07	7	118	01	1	173	43	RCL
009	65	×	064	65	×	119	00	0	174	01	1
010	59	π	065	43	RCL	120	42	STO	175	00	0
011	95	=	066	00	0	121	01	1	176	52	EE
012	45	Y^X	067	06	6	122	03	3	177	94	+/-
013	59	π	068	85	+	123	36	IND	178	00	0
014	42	STO	069	36	IND	124	43	RCL	179	08	8
015	00	0	070	44	SUM	125	01	1	180	36	IND
016	08	8	071	00	0	126	01	1	181	44	SUM
017	95	=	072	08	8	127	45	Y^X	182	00	0
018	42	STO	073	95	=	128	05	5	183	08	8
019	01	1	074	44	SUM	129	29	X²	184	56	RTN
020	01	1	075	01	1	130	95	=	185	46	LBL
021	44	SUM	076	08	8	131	42	STO	186	13	C
022	00	0	077	02	2	132	01	1	187	43	RCL
023	08	8	078	52	EE	133	07	7	188	01	1
024	01	1	079	07	7	134	93	.	189	01	1
025	93	.	080	09	9	135	06	6	190	44	SUM
026	06	6	081	36	IND	136	36	IND	191	01	1
027	44	SUM	082	22	INV	137	44	SUM	192	03	3
028	01	1	083	44	SUM	138	01	1	193	44	SUM
029	01	1	084	00	0	139	01	1	194	00	0
030	94	+/-	085	04	4	140	36	IND	195	04	4
031	42	STO	086	36	IND	141	44	SUM	196	01	1
032	00	0	087	43	RCL	142	00	0	197	52	EE
033	04	4	088	01	1	143	08	8	198	03	3
034	44	SUM	089	08	8	144	52	EE	199	49	PRD
035	01	1	090	36	IND	145	06	6	200	01	1
036	09	9	091	42	STO	146	94	+/-	201	07	7
037	01	1	092	01	1	147	44	SUM	202	42	STO
038	00	0	093	03	3	148	01	1	203	00	0
039	49	PRD	094	36	IND	149	09	9	204	06	6
040	01	1	095	43	RCL	150	05	5	205	55	÷
041	01	1	096	00	0	151	00	0	206	09	9
042	42	STO	097	09	9	152	00	0	207	95	=
043	01	1	098	85	+	153	44	SUM	208	42	STO
044	08	8	099	43	RCL	154	01	1	209	00	0
045	56	RTN	100	01	1	155	00	0	210	09	9
046	46	LBL	101	07	7	156	43	RCL	211	02	2
047	16	A'	102	85	+	157	01	1	212	93	.
048	08	8	103	43	RCL	158	00	0	213	07	7
049	94	+/-	104	00	0	159	52	EE	214	36	IND
050	44	SUM	105	00	0	160	94	+/-	215	44	SUM
051	01	1	106	46	LBL	161	00	0	216	01	1
052	07	7	107	11	A	162	01	1	217	01	1
053	44	SUM	108	12	B	163	36	IND	218	56	RTN
054	00	0	109	10	E'	164	44	SUM			

HOW'S YOUR MMIF?

By William Wheeler, P.E.

***Editor's Note:** Mr. Wheeler, an associate with Clinton Bogert Associates, plans and designs public works construction. For the last 4 years Mr. Wheeler has been both using and supervising engineers who use programmables.*

Human Factors Engineering is the scientific discipline concerned with designing machines and operations to be compatible or complementary to human beings. The most important part of Human Factors Engineering is Man Machine Interface (MMIF). MMIF is the arrangement of a machine to function as intuitive extensions of the human's natural senses and actions.

Programmables with user-defined keys have an MMIF superior to other programmables and computers. However, much depends on the way the user-defined keys are used by the programmer. The programming instructions should be concise and unambiguous. The designation of user-defined keys should be planned to follow "natural" input and execution.

The benefits of planning and designing a program with good MMIF might not be obvious until a program is set aside for a month or two and then used under pressure. At this moment of truth, the programmer will instantly see the wisdom of his design choices, any ambiguities in his instructions, and the value of a superior MMIF.

The MMIF of a program cannot be measured; but, there are several guidelines which may improve it. These guidelines are:

1. A program should be written to use the user-defined keys to your best advantage. If the program is too large, segment it with user-defined keys. If it is too small, add user-defined keys for conveniences such as initialization routines or unit conversions.

2. As the corner keys are the easiest to remember and use, save keys A and E for the most frequent use.

3. Programs requiring many user-defined keys should utilize the keys from left to right. Key E should be the final key pressed.

4. Designate first row keys (A-E) for primary functions and second row keys (A'-E') for secondary functions.

5. Provide feedback. The display should show that data has been entered or that a function has taken place. If a lot of data must be entered, count the data entries for the user. If an error is encountered during execution, this should be signified.

6. Give the user the option of using default values. You may write common values of variables automatically into a program or let the latest values entered by the user become the default values.

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TI ANNOUNCEMENTS

• Texas Instruments' newest TI-59 Library, Securities Analysis, is now available through PPX. The Securities Analysis Library will be a tremendous asset to both financial professionals and individuals in the evaluation, selection, and management of investment portfolios.

Programs in the Library include: Earnings Per Share Estimation; Compound Interest; Annuities; Uneven Cash Flows; Stock Valuation; Option Valuation (Black-Scholes Model); Option Writing; Warrant Valuation; Bond Valuation; Stock Indicators; Portfolio Selection (Sharpe's Model); Portfolio Bookkeeping; Capital Accumulation Planning; and Calculator Diagnostic.

• Texas Instruments' first easy-to-read Liquid Crystal Display (LCD) Scientific calculator, the Slimline TI-25, combines both state of the art features and attractive slimline styling. This electronic calculator, designed for professionals and students, provides versatile, built-in capabilities for handling algebraic, trigonometric, and statistical problems. Three levels of parentheses are available to the user. In addition, a versatile four-key memory allows storing, recalling, exchanging, and summing of data into the unit's memory. A special "battery-saver" feature automatically turns the power off after about seven minutes of non-use. Two years of normal operation (over 1000 hours) are available from a single set of miniature batteries. The TI-25 comes with a vinyl cover wallet with insert pockets for business cards and note pads. The TI-25 is now available at your local Texas Instruments retailer. Suggested retail price is $30.

HOME OWNERSHIP ANALYSIS FOR THE SR-52 AND TI-59

HOME OWNERSHIP ANALYSIS

This program permits rapid analysis of home ownership for a potential buyer or owner of residential property. The user inputs the following: sales price, down payment, annual interest rate of loan, term of loan, annual property taxes, annual insurance, buyer's tax bracket, projected property appreciation, and analysis month number. The following results are obtained: property value, loan balance, current equity, loan payment, components of payment (interest and principal), property tax, income tax deduction, income tax saved, total monthly payment, net monthly cost, equity increase, and effective monthly cost. Property taxes are assumed to increase at the same rate as property appreciation.

PPX wishes to thank the author of "Home Ownership Analysis", Roy W. Defenbach, for his excellent SR-52 program.

EXAMPLE: You are interested in purchasing a particular house. The sale price of the property is $100,000 and you would like to put $20,000 down. You should be able to obtain an $80,000 mortgage at 9% interest for 30 years. The annual property taxes are $2,400. Annual insurance costs will be $1,200. The homes in the area are appreciating in value at the rate of 12% per year. What is the property value, loan balance, current equity, loan payment, components of payment (interest and principal), property tax, income tax deduction, income tax saved, total monthly payment, net monthly cost, equity increase, and effective monthly cost this month and one year from this month?

Enter	Press	Display+	Comments
0	B	0.	Initiate Month #
0	RUN++	0.	Month #
100000	RUN	0.	Sales Price
20000	RUN	0.	Down Payment
9	RUN	0.	Ann. Int. Rate (%)
30	RUN	0.	Term of Loan (yrs)
2400	RUN	0.	Ann. Property Tax
1200	RUN	0.	Ann. Insurance
35	RUN	0.	Tax Bracket (%)
12	RUN		Projected Apprec. (%)
		100000.	Property Value
	RUN	80000.	Loan Balance
	RUN	20000.	Current Equity
	RUN	644.	Loan Payment
	RUN	600.	Interest Portion
	RUN	44.	Principal Portion
	RUN	200.	Property Tax
	RUN	800.	Income Tax Deduction
	RUN	280.	Income Tax Saved
	RUN	944.	Total Monthly Payment
	RUN	664.	Net Monthly Cost
	RUN	993.	Equity Increase
	RUN	—329.	Effective Monthy Cost
	B	0.	Previous Month #
12	RUN	100000.	Sales Price
	E	112000.	Property Value
	RUN	79453.	Loan Balance
	RUN	32547.	Current Equity
	RUN	644.	Loan Payment
	RUN	596.	Interest Portion
	RUN	48.	Principal Portion
	RUN	224.	Property Tax
	RUN	820.	Income Tax Deduction
	RUN	287.	Income Tax Saved
	RUN	968.	Total Monthly Payment
	RUN	681.	Net Monthly Cost
	RUN	1111.	Equity Increase
	RUN	—430.	Effective Monthly Cost

+TI-59 and PC-100A: See User Instructions "TI-59 Printer Output".
++TI-59, R/S

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HOME OWNERSHIP ANALYSIS (SR-52)

000	46	LBL	025	45	Y^x	050	57	FIX	075	93	.	100	49	PRD	125	01	1	150	01	1	175	42	STO	200	43	RCL
001	10	E'	026	53	(	051	09	9	076	00	0	101	01	1	126	48	EXC	151	03	3	176	09	9	201	00	0
002	42	STO	027	43	RCL	052	10	E'	077	01	1	102	01	1	127	01	1	152	55	÷	177	09	9	202	05	5
003	00	0	028	00	0	053	36	IND	078	49	PRD	103	95	=	128	03	3	153	13	C	178	81	HLT	203	95	=
004	00	0	029	00	0	054	43	RCL	079	00	0	104	42	STO	129	45	Y^x	154	48	EXC	179	44	SUM	204	81	HLT
005	56	RTN	030	75	-	055	00	0	080	03	3	105	01	1	130	43	RCL	155	01	1	180	01	1	205	75	-
006	46	LBL	031	43	RCL	056	00	0	081	49	PRD	106	03	3	131	01	1	156	03	3	181	05	5	206	43	RCL
007	19	D'	032	00	0	057	60	IFF	082	01	1	107	75	-	132	08	8	157	75	-	182	43	RCL	207	00	0
008	43	RCL	033	09	9	058	00	0	083	01	1	108	01	1	133	10	E'	158	43	RCL	183	00	0	208	07	7
009	01	1	034	95	=	059	00	0	084	85	+	109	95	=	134	95	=	159	01	1	184	07	7	209	95	=
010	01	1	035	56	RTN	060	06	6	085	01	1	110	48	EXC	135	49	PRD	160	03	3	185	81	HLT	210	42	STO
011	56	RTN	036	46	LBL	061	05	5	086	95	=	111	01	1	136	00	0	161	81	HLT	186	85	+	211	09	9
012	46	LBL	037	12	B	062	81	HLT	087	45	Y^x	112	05	5	137	07	7	162	49	PRD	187	19	D'	212	08	8
013	13	C	038	02	2	063	36	IND	088	01	1	113	75	-	138	65	×	163	01	1	188	95	=	213	81	HLT
014	53	(	039	85	+	064	10	E'	089	02	2	114	43	RCL	139	43	RCL	164	01	1	189	81	HLT	214	75	-
015	19	D'	040	46	LBL	065	22	INV	090	49	PRD	115	01	1	140	01	1	165	95	=	190	65	×	215	43	RCL
016	55	÷	041	11	A	066	58	DSZ	091	00	0	116	04	4	141	06	6	166	81	HLT	191	43	RCL	216	01	1
017	53	(	042	22	INV	067	12	B	092	09	9	117	95	=	142	95	=	167	43	RCL	192	00	0	217	05	5
018	01	1	043	46	LBL	068	36	IND	093	20	1/X	118	65	×	143	57	FIX	168	00	0	193	03	3	218	81	HLT
019	75	-	044	15	E	069	10	E'	094	49	PRD	119	13	C	144	00	0	169	01	1	194	95	=	219	95	=
020	53	(	045	50	STF	070	58	DSZ	095	00	0	120	44	SUM	145	81	HLT	170	81	HLT	195	81	HLT	220	81	HLT
021	01	1	046	00	0	071	00	0	096	05	5	121	00	0	146	49	PRD	171	75	-	196	48	EXC	221	41	GTO
022	85	+	047	01	1	072	05	5	097	49	PRD	122	05	5	147	01	1	172	19	D'	197	00	0	222	12	B
023	19	D'	048	06	6	073	03	3	098	00	0	123	42	STO	148	05	5	173	81	HLT	198	07	7			
024	54	)	049	95	=	074	65	×	099	07	7	124	00	0	149	48	EXC	174	95	=	199	85	+			

Listing produced with a TI-59/PC-100A using the program "SR-52 Program Listing" (PPX-59 #908010).

TI-59 Printer Output: Delete R/S at the following program locations: 151, 167, 175, 182, 190, 198, 207, 216, 225, 236, 247, 261. Store the following alphanumeric codes in registers 60-79.

3032.	60
3633.	61
1633.	62
2435.	63
4535.	64
3744.	65
243136.	66
3714.	67
3313.	68
3342.	69
2714.	70
1517.	71
2733.	72
24.	73
33.	74
3337.	75
3716.	76
3736.	77
333037.	78
311737.	79

The input and output data will be printed, you need not press R/S at step 4 of the User Instructions and Sample Problem.

USER INSTRUCTIONS

1. Enter Program (TI-59, Partition 319.79).
2. Initiate month number, press B.
3. Enter month number (where 0 is the present month), press RUN (TI-59, R/S).
4. Enter the following data, pressing RUN (TI-59, R/S) after each entry:
   - Sales Price
   - Down Payment
   - Annual Interest Rate (%)
   - Term of Loan (years)
   - Annual Property Tax*
   - Annual Insurance Premium and Fee
   - Owners Tax Bracket (%)
5. Enter Projected Appreciation (%)**. Press RUN (TI-59, R/S) to obtain each of the following results:
   - Property Value
   - Loan Balance
   - Current Equity
   - Loan Payment (monthly)
   - Interest Portion of Loan Payment
   - Principal Portion of Loan Payment
   - Property Tax Per Month
   - Income Tax Deduction Per month
   - Total Monthly Payment
   - Net Monthly Cost
   - Equity Increase
   - Effective Monthly Cost
6. Press B (previous month will be displayed), enter new month #, and press RUN (TI-59, R/S), Sales Price will be displayed. Press E and Property Value will be displayed. Continue with Step 4.

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*Check with your local tax accessor for an estimate.
**Check with your local Realtor Company.

HOME OWNERSHIP ANALYSIS (TI-59)

000	76	LBL	033	09	09	066	91	R/S	099	45	Y^x	132	43	RCL	165	00	0	198	91	R/S	231	95	=	264	01	1
001	17	B'	034	95	=	067	72	ST*	100	01	1	133	18	18	166	17	B'	199	44	SUM	232	32	X:T	265	07	7
002	42	STO	035	92	RTN	068	00	00	101	02	2	134	42	STO	167	91	R/S	200	15	15	233	07	7	266	03	3
003	19	19	036	76	LBL	069	76	LBL	102	49	PRD	135	00	00	168	49	PRD	201	43	RCL	234	08	8	267	00	0
004	73	RC*	037	12	B	070	14	D	103	09	09	136	95	=	169	11	11	202	07	07	235	17	B'	268	01	1
005	19	19	038	02	2	071	22	INV	104	35	1/X	137	49	PRD	170	95	=	203	32	X:T	236	91	R/S	269	05	5
006	69	OP	039	85	+	072	97	DSZ	105	49	PRD	138	07	07	171	32	X:T	204	07	7	237	75	-	270	69	OP
007	04	04	040	76	LBL	073	00	00	106	05	05	139	65	×	172	07	7	205	05	5	238	43	RCL	271	04	04
008	32	X:T	041	11	A	074	12	B	107	49	PRD	140	43	RCL	173	01	1	206	17	B'	239	07	07	272	32	X:T
009	69	OP	042	22	INV	075	72	ST*	108	07	07	141	16	16	174	17	B'	207	91	R/S	240	95	=	273	69	OP
010	06	06	043	76	LBL	076	00	00	109	49	PRD	142	95	=	175	91	R/S	208	85	+	241	42	STO	274	06	06
011	92	RTN	044	15	E	077	87	IFF	110	11	11	143	58	FIX	176	43	RCL	209	43	RCL	242	20	20	275	98	ADV
012	76	LBL	045	86	STF	078	00	00	111	95	=	144	00	00	177	01	01	210	11	11	243	32	X:T	276	98	ADV
013	13	C	046	00	00	079	00	00	112	42	STO	145	32	X:T	178	32	X:T	211	95	=	244	07	7	277	91	R/S
014	53	(	047	01	1	080	85	85	113	13	13	146	98	ADV	179	07	7	212	32	X:T	245	09	9	278	00	0
015	43	RCL	048	06	6	081	32	X:T	114	75	-	147	98	ADV	180	02	2	213	07	7	246	17	B'	279	91	R/S
016	11	11	049	95	=	082	43	RCL	115	01	1	148	06	6	181	17	B'	214	06	6	247	91	R/S	280	76	LBL
017	55	÷	050	42	STO	083	22	22	116	95	=	149	09	9	182	91	R/S	215	17	B'	248	75	-	281	19	D'
018	53	(	051	00	00	084	17	B'	117	48	EXC	150	17	B'	183	75	-	216	91	R/S	249	43	RCL	282	22	INV
019	01	1	052	05	5	085	97	DSZ	118	15	15	151	91	R/S	184	43	RCL	217	65	×	250	15	15	283	58	FIX
020	75	-	053	09	9	086	00	00	119	75	-	152	49	PRD	185	11	11	218	43	RCL	251	32	X:T	284	22	INV
021	53	(	054	42	STO	087	16	A'	120	43	RCL	153	15	15	186	32	X:T	219	03	03	252	01	1	285	57	ENG
022	01	1	055	22	22	088	65	×	121	14	14	154	48	EXC	187	07	7	220	95	=	253	07	7	286	25	CLR
023	85	+	056	76	LBL	089	93	.	122	95	=	155	13	13	188	03	3	221	32	X:T	254	02	2	287	06	6
024	43	RCL	057	16	A'	090	00	0	123	65	×	156	55	÷	189	17	B'	222	07	7	255	04	4	288	69	OP
025	11	11	058	01	1	091	01	1	124	13	C	157	13	C	190	91	R/S	223	07	7	256	69	OP	289	17	17
026	54	)	059	44	SUM	092	49	PRD	125	44	SUM	158	48	EXC	191	95	=	224	17	B'	257	04	04	290	47	CMS
027	45	Y^x	060	22	22	093	03	03	126	05	05	159	13	13	192	42	STO	225	91	R/S	258	32	X:T	291	08	8
028	53	(	061	73	RC*	094	49	PRD	127	42	STO	160	75	-	193	21	21	226	48	EXC	259	69	OP	292	69	OP
029	43	RCL	062	00	00	095	11	11	128	01	01	161	43	RCL	194	32	X:T	227	07	07	260	06	06	293	17	17
030	00	00	063	87	IFF	096	85	+	129	48	EXC	162	13	13	195	07	7	228	85	+	261	91	R/S	294	25	CLR
031	75	-	064	00	00	097	01	1	130	13	13	163	32	X:T	196	04	4	229	43	RCL	262	95	=	295	91	R/S
032	43	RCL	065	14	D	098	95	=	131	45	Y^x	164	07	7	197	17	B'	230	05	05	263	32	X:T			

FROM THE ANALYST'S DESK

• When attaching the listing of a program to PPX-59 submission forms, please use an adhesive that will hold the entire listing (not only corners) in place. Program listings that are not affixed at all edges are vulnerable to tearing. Also remember, tape over printing causes fading.

• The latest PPX-59 forms contradict the Member's Guide in regards to the procedures for indicating output as displayed, printed, or both. Please follow the instructions on each individual form rather than the Member's Guide.

• New members: Whenever an **asterisk** is encountered before a keystroke, it indicates that the 2nd key must be pressed.

• Program Revisions are a very important part of the Exchange as they insure top quality programs. If you decide to revise your program, the program **documentation** should follow PPX requirements.

• The dsz instruction on the TI-59 can be used with any register (except 40 which implies indirect). Registers 10-99 can not be keyed in directly but may be generated as follows: LRN *Dsz STO nn BST BST *Del SST ——— LRN.

• Mr. Peter K. Buckley shares the following: The keys 2nd, LRN, SST, BST can be used as common labels but must be written into the program. For example: To use SST as a label, determine the keycode (i.e. 41) and key (in LRN mode) *Lbl STO STO 41... next, delete the two STO instructions.

• If you have a program that has not allowed for printing, a printout similar to those obtained in programs in the Master Library can be induced for programs in calculator program memory. The sequence *Pgm 01 0 STO 00 (while the Master Library is attached) provides automatic printing of the input and output numbers associated with the user-defined keys. (Note: Storage register 00 may not be used within your program if you intend to use this print routine.)

• When using the TI-59 with PC-100A, the following printer sensing routine can be used to jump the R/S instruction. This is done by inserting the following program sequence into the **last** 5 steps of the program's partition: *Op 08 *St flg 5 INV SBR. (Note: You will be forced to increase your partition to completely key in this sequence.) This sequence must be called by an initialization routine in order to execute it. The result is that flag 5 is set when the calculator is not attached to the printer. Now, test flag 5 accordingly (e.g., INV *if flg 5 (location) R/S (location)).

• A program has recently been accepted by PPX-52 which hardcore programmers can really sink their teeth into. The program, "Utility Routines And Display Manipulations" (PPX-52 #900091) by Jared Weinberger of Bologna, Italy, includes numerous useful subroutines. The Routines include: use of the "EE" key as a flag; sum of digits routine; digit reversal routine; fix point format indicator; and exponent extractor. The Display Manipulations include: showing leftmost digit; removing leftmost digit; increasing leftmost digit by 1; and replacing all but leftmost digit with zeroes.

• **Program Errata:** Should you have any problems with or suggestions concerning a program, please document them on a PPX Program Memo. This Memo is the main vehicle of communication between program authors and program users. Through the use of this Memo, the following program corrections have been brought to PPX's attention. If you own one of these programs, please make the following changes to your program documentation:

208902 Forecasting: Automatic Curve Choice
Page 4 of 8, Step 5 should read
1=Linear; 2=Power; 3=Exponential; 4=Logarithmic
Page 6, 7, and 8 of 8, program steps 285, 286, 422, 458, and 521 should read

285	68	Nop
286	68	Nop
422	36	36
458	38	38
521	54	54

658001 Class "A" Amplifier Design
Page 7 of 12, last number in enter column, "120" should be moved down one line to be opposite the last R/S. Page 11 of 12, program steps 317 and 318 should read

317	43	RCL
318	13	13

658006 Zener Power Supply Design
Page 8 of 9, program steps 044 and 149 should read

044	00	0
149	18	18

Page 9 of 9, "Alphanumeric Data Registers Column", the contents of register 64 should be 4617311735.

918015 Yahtzee
Page 8 of 8, Add the following to the bottom of the page: The following codes should be stored before running the program.

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Datamath Calculator Museum

Codes	Reg
162417.	60
21.	61
3532461729.	62
413121.	63
3327134517.	64
3500313240.	65
0.	66
35322727.	67
45132337.	68
4617170000.	69

The PPX Exchange is published every other month and is the only newsletter published by Texas Instruments for SR-52 and TI-59 owners. You are invited to submit items you feel are of general interest to other SR-52 or TI-59 users. Inputs should be limited to 3 double-spaced typed pages. Please forward your newsletter inputs and any questions to:
TEXAS INSTRUMENTS PPX
P. O. Box 53
Lubbock, TX 79408

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